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An Evaluation of Turkey's Renewable Energy Resources and Thermal Tourism Development*

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Abstract

In recent years, energy has become one of the most important issues in the world. The world population continues to increase and the growing demand of the industry increases the demand for energy. Energy consumption, based on fossil fuels such as gasoline, coal and nuclear energy, has caused environmental pollution and increasing environmental pollution has made the use of renewable energy compulsory. Researches on renewable energy sources are increasing together with consumption of energy sources. Renewable energy sources have a wide range of uses. Renewable energy sources make it possible to sustain the supply of energy with the ability to be renewable. Renewable energy sources such as geothermal heat, sun, wind, rain, tides, currents and ripples constantly renew themselves. Turkey's renewable energy sources offer significant opportunities in terms of diversity and potential. Especially, geothermal resources are also used for centuries for both health and industrial purposes. The distribution of the geotermal areas is important. Recently, geothermal fields gained touristic attractions in some regions in Turkey. Thermal tourism makes important contributions to the economy of the country and the region, and has important effects on the social structure. Thermal tourism potential of Turkey has rapidly been increasing over the years. The aim of this study is to evaluate geothermal resources, one of the renewable energy sources in Turkey, from the point of thermal tourism. A SWOT analysis was conducted according to the literature to evaluate thermal tourism in Turkey and some strategies related to thermal tourism in Turkey were discussed.

Keyword: Renewable Energy; Thermal Tourism; Geothermal Energy

INTRODUCTION

Renewable energy sources which are widely used in the world are hydraulic energy, biomass energy, solar energy, wind energy and geothermal energy. The emphasis on the renewable energy sources is being increased in Turkey in parallel to the world because of their economic value and the sensitivity to the environment.

Geothermal resources benefits and its usage both for energy production and thermal health treatment are very important. The protection of the renewability of thermal feature or field used as health and touristic aims in Turkey has a vital importance for future generations. Geotermal energy will contribute increasingly to the world's touristic and health demands in the future. So, geothermal resources should be identified and regulated.

Thermal tourism is a significant tourism type, which helps to improve people's health condition by providing a complementary therapy and also allows many recreational activities for the visitors [1]. So, thermal tourism could contribute to economic development.

Geothermal energy can strongly play a key role in socio-economical development of Turkey. because tourism sector and health tourism demand are growing rapidly in Turkey. Although Turkey has a big geothermal energy potential of the world, it is not enough. In a bid to increase geothermal returns, the Ministry of Culture and Tourism has planned to add tens of thousands of new beds to host European visitors over the coming years. Therefore, this study of the role of geothermal energy in sustainable development of Turkey is particularly emphasized.

TURKEY'S RENEWABLE ENERGY POTENTIAL

Turkey's main energy resources consist of oil, lignite, coal, natural gas, geothermal energy and hydroelectric power. Turkey's dependence on foreign energy is an indicator explaining why the energy is a major problem in our country. In this regard, our country conducting research for new energy sources while also is making research in the quest for more efficient use of the available energy [2].

Hydropower

In determining the potential of the hydropower power of a surface water which consists of 193 billion m^3, total of average annual flow of large and small sized rivers located in 26 hydrological basins in Turkey, three different evaluations should be carried out such as "Theoretical Potential", "Feasible Technical Potential" and "Economically Viable Potential" [3].

In Turkey, the gross theoretical hydroelectric potential is estimated at 433 billion kWh, the technically assessable hydroelectric potential is 216 billion kWh, and the economic potential is 158 billion kWh / year, with new projects projected to reach more than 180 billion kWh / year with new projects. USA has developed 86% of its technical hydroelectric potential, Japan 78%, Norway 72%, Canada 56%, while Turkey has developed 37.3% [4].

The theoretical hydroelectric potential of Turkey is 433 billion kWh, technically viable potential is 216 billion kWh and economic hydroelectric potential is 140 billion kWh/year. By the end of 2016, 594 power plants with 26,678 MW were licensed. By the end of 2016, 597 licensed and unlicensed hydroelectric power plants under operations correspond to 26.681 MW of installed capacity and approximately 34% of the total potential. Hydroelectric production was 67.3 billion kWh in 2016 [5].

Biomass Energy

Turkey has a high potential in terms of agriculture and husbandry. The residues derived from agricultural products and agricultural production constitutes the raw material resource in order to obtain energy from biomass. Total calorific value of annual waste amount is approximately 228,4 PJ for field crops, and approximately 74,8 PJ for horticultural crops [6]. The largest share of this belongs to the corn with share of 33.4%, wheat 27.6% and cotton 18.1% [7]. The waste derived from husbandry is being transformed into energy using modern biomass technologies. The calorific value of the waste derived from cow, sheep and poultry is respectively about 47.8, 3.6, and 8.7 million GJ/ year [8].

The total land mass of Turkey is found to be 78.004.644 hectares, while the forest area is of 22.342.935 hectares. The amount of forested area is about 28.6% of the overall total area of the country [9]. The total amount of forest waste is 4.800.000 tons in Turkey; and feasible capacity of gasification plant is 600 MW [6].

Solar energy

USA is the country that has most solar collectors, with 15 million m². It is followed by Japan with 9-10 million m². Australia takes it place with 4 million m², Greece with 2 million m², Germany with 1 million m². Israel's installed capacity is 2.8 million m². However, when we look at those installed areas, in proportion to the population, the solar collector area per capita is 0,85 m²/person in Cyprus, 0,55 m²/person in Israel, 0,2 m²/person in Greece, 0,15 m²/person in Turkey. USA, Germany, Japan are in the same situation as with Turkey [10]. By the end of 2016, Turkey has licensed 34 solar power plants with an installed capacity of 402 MW and 2 solar power plants with an installed capacity of 12.9 MW. By the end of 2016, with the establishment of unlicensed power generation plants, the number of solar power plants is seen as 1,043, the installed power of these power plants is 819,6 MW and the total installed power together with 2 licensed solar energy power plants reached 832.5 MW [11].

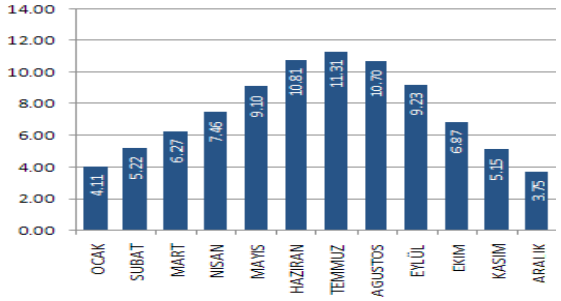
Turkey, due to its geographical position, is fortunate compared to many other countries with its solar energy potential. Turkey's most solar energy receiving region is South Eastern Anatolia Region, followed by the Mediterranean Region [12]. Taking the Table 1 into consideration, we see that shows Turkey has a long annual sunshine duration. As per Turkey's Solar Energy Potential Atlas (GEPA) prepared by General Directorate for Renewable Energy, the annual sunshine duration is 2.737 hours (daily 7.5 hours in total), the annual total incoming solar energy is estimated 1.527 kWh/m².year (daily 4,2 kWh/m² in total) [11].

Wind Power

Wind power is a natural, clean, and renewable energy source that receives is taking its source from the sun, and also can be converted quickly and easily into electrical energy. According to a report published by International Energy Agency (IEA), the global wind energy potential was calculated at 53.000 TWh/year (this is more than twice the power requirement the world will need in 2020) [14].

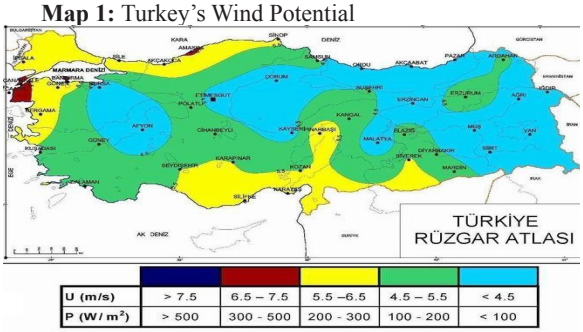
According to Turkey Wind Power Plants Atlas, Balıkesir, Istanbul, Çanakkale in Marmara Region; Izmir, Manisa in the Aegean Region; and Hatay in the Eastern Mediterranean Region, Wind Farms are densely planted. When we observe the wind potential at 50 meters high on the ground level, we assess that the Aegean, Marmara and Eastern Mediterranean Regions are considered to have high potential. Keeping the wind speeds higher than 7 m/s in view, Turkey's wind energy potential is determined to be 48.000 MW. In our country where there is a serious wind potential, we must not only contribute to the wind power investments, but also to the development of the wind power industry [15]. By the end of 2016, the installed capacity of licensed wind power plants operating is 5.751.3 MW [16].

Table 1. Turkey's Sunshine Durations



Source: [13] http://www.eie.gov.tr/MyCalculator/Default.aspx

Map 1: Turkey's Wind Potential



Source: [17] https://www.mgm.gov.tr/genel/ruzgar-atlasi.aspx

Map 1 shows Turkey's Wind Potential, as shown, there is a significant wind energy potential in Turkey. Turkey, with its current project stock of 11 GW, and its wind energy capacity which the national target is aimed to be increased up to 20 GW in the year 2023, is the most important wind power market in Europe. The fact that Turkey has become an energy hub in its region will play an important role in shaping the investment opportunities in Turkey [15].

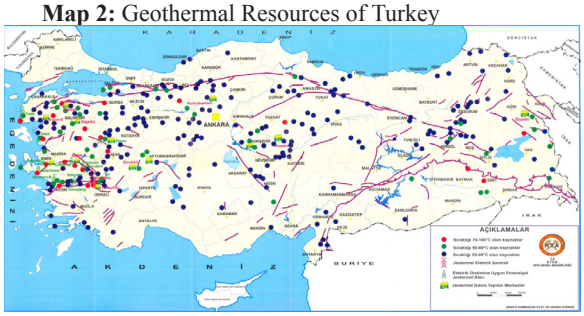
Geothermal energy

Turkey, with its geothermal energy capacity, is able to cover approximately 5% of the total electric energy requirement and 30% of the total heat energy requirement. When we look at the average weight of this potential, Turkey is able to provide 14% of its electrical and heat energy requirement with its own internal resources [18].

Turkey's geothermal heat potential is considered to be about 31.500 MW thermal. The geothermal energy studies in Turkey started about 45 years ago by the General Directorate of MTA, the presence of 190 geothermal fields have been discovered so far. 78% of those areasare located in western Anatolia, 9% in Central Anatolia, 7% in the

Marmara Region, 5% in Eastern Anatolia and 1% in other regions. 90% of our geothermal resources are of low and medium temperature, and adequate for direct applications (heating, thermal tourism, mineral recovery, etc.), and 10% for indirect applications (electricity production) [19].

Map 2: Geothermal Resources of Turkey



Source: [20] http://www.mta.gov.tr/v3.0/hizmetler/jeotermal-harita

As a result of the drilling conducted in discovered areas, 3881 MWt of heat energy has been generated, which is 12.3% of the heat potential of our country. Approximately 30% of this generated heat energy is being used for heating the housing units and thermal facilities of settlements such as Izmir, Gönen, Simav, Kırşehir, Kızılcahamam, Afyon Merkez, Sandıklı, Kozaklı, Diyadin, Salihli, Edremit, Sarayköy, Bigadiç (equivalent approximately to 100.000 residences), in greenhouses (about 1000 acres) and health and thermal tourism (215 facilities) [21]. Map 2 shows geothermal resources of Turkey, as it is seen on the table Turkey has significant geothermal energy potential.

THERMAL TOURISM POTENTIAL OF TURKEY

Energy systems are highly dependent on fossil fuels in the world. Fossil fuel dependency adversely affects sustainable development all over the World because with the increase of population and industry, the necessity to for energy is increasing. Especially, Turkey's fossil fuel reserves are very restricted. Therefore, renewable energy sources are vital for economic development. Development of renewable energy sources is inevitable for the sustainable development of Turkey. Geothermal energy is the main alternative energy source for Turkey. Due to its geographical position Turkey has advantage in using a wide range of renewable energy resources. In Turkey, geothermal energy is mainly used in thermal tourism, heating applications, obtaining industrial minerals, and electricity production

Turkey is located on the Alpine-Himalayan orogenic belt, which have high geothermal potential. The first geothermal research and investigations in Turkey started by MTA in 1960's [22; 23]. Geothermal energy fields of Turkey can be divided geographically. Thermal sources are densely located in Marmara, Aegean and Middle Anatolia regions. There are around 190 thermal facilities in 46 provinces of Turkey [1]. According to MTA (2011), Turkey is the 7th in the world for utilization of geothermal energy for direct use in the World and 1st in Europe.

Thermal tourism is very important in alternative tourism types. Recently, the demand of thermal tourism is increasing rapidly. The demand for balneological utilization of geothermal waters has been increased in the recent years in Turkey. A possible producable potential amount of geothermal flowrate (~40°) has been estimated for the balneological use in Turkey, which is 50.000 l/s. This equals to the benefit of 8 million people/day from thermal waters in spas in Turkey [24].

The geothermal production investment are very important in Turkey because geothermal energy in Turkey must be used as the main energy source at the regions where it is found. İt is very cheap, clean and sustainable for the benefit of mankind Especially, the geothermal greenhouse and Balneological Cure (Therapy) House (Thermal Facilities, Thermal Tourism Complex) investments could be realized alone by private sector in Turkey. The search and the discovery of geothermal resources was launched in 1962 by the MTA (Mineral Research & Exploration General Directorate). This work is still continuing today. This geothermal areas are used in electric, heating and thermal tourism.

In recent years, Turkey has also become a popular destination for thermal, spa, and health tourism. Also The number of tourists coming to Turkey increased over the years. Especially, number of visitors for health tourism will increase in the following years. Therefore, Geothermal potential is one of the most vital factors of health tourism in Turkey. Geothermal energy as a renewable energy source is essential for well-rounded and sustainable development. Geothermal energy is an important sustainable source and this energy is also important for health tourism, because thermal tourism is a branch of healty tourism.

Geothermal energy has been used for health services for a long time. Geothermal resources are considered as a new health tourism concept with the new developments in the tourism activities. Especially, thermal facilities have become new attraction centers within the touristic activities nowadays. Today, it serves thousands of people with its modern hotel and other facilities. Health tourism is developing in the world and Turkey. Turkey has an important role in health tourism and has a significant advantage in terms of thermal energy. The determination of the thermal field is important for the development of thermal tourism.

Geothermal fields in order to improve health and thermal tourism have been identified by the Ministry of Health. These areas Thermal Tourism Cities Project "are covered. Especially, The development of thermal tourism master plan has been created. These are:

§ Thermal Tourism Cities in South Marmara Region (Çanakkale, Balıkesir, Yalova)

§ Thermal Tourism Cities in Phrygia (Afyon, Kutahya, Istanbul, Eskisehir, Ankara, Turkey)

§ Thermal Tourism Cities in South Aegean (Izmir, Manisa, Aydin, Denizli, Turkey)

§ Thermal Tourism Cities in Central Anatolia (Yozgat, Kırşehir, Nevsehir, Nigde)

§ Thermal Tourism Cities of the North Anatolian Region: Amasya, Sivas, Tokat, Erzincan

§ Thermal Tourism Cities of the Eastern Marmara Region: Bilecik, Kocaeli

§Thermal Tourism Cities of the Western Black Sea Region: Bolu, Düzce, Sakarya [25].

Thermal tourism is rapidly developing. Also, These region can be integrated with other types of tourism, and has the capacity to create a destination. There are approximately 190 thermal facilities in 46 cities of our country. The bed capacity of the 12 facilities (the cure center of which has been approved by the Ministry of Health) which hold tourism investment certificates of the Ministry of Culture and Tourism for thermal purposes is 2.347, while the bed capacity of the 30 facilities which hold tourism management certificates are 8.567 [25].

Health tourism will continue to evolve as long as human beings exist. The thermal tourism is a part of health tourism. Accordingly, Geothermal energy-dependent developing thermal tourism will continue to develop. Recently, The

thermal tourism centers in these areas are being developed. Especially, The touristic facility number and bed number tends to increase. Also, thermal hotels in Turkey will increase total bed capacity in the coming years.

Table 2. Bed Capacity of Thermal Tourism in Turkey (2015)

Type-Class	Tourism Investment Certificate		Tourism Management Certificate		Total	
	Number of Facilities	Number of Beds	Number of Facilities	Number of Beds	Number of Facilities	Number of Beds
Thermal Facility	18	8.454	63	19.212	81	27.666
Other Facilities	1.176	254.245	2.264	422.542	3.440	676.796
Overall Turkey	1.194	262.708	2.327	441.754	3.521	704.462

Source: [25] http://www.saglikturizmi.gov.tr/thermal-tourism-regions.php

It is aimed to increase the bed capacity to 500.000 in 2023. In addition, it is aimed that Turkey will be the most important health and thermal destination of the world in thermal tourism [26]. The new incentives provided by the government will increase investments in thermal tourism area.

A SWOT ANALYSIS OF TURKISH THERMAL TOURISM

SWOT analysis is a strategic technique used to determine Strengths and weaknesses Weaknesses of a project, an institution, a situation or a person and Opportunities and Threats that can arise from the internal and external environment [27]. In this study we use the SWOT analysis to outline and understand the current situation of thermal tourism in Turkey. In table 2 it is shown the SWOT analysis of thermal tourism in Turkey.

Strengths

Strengths of thermal tourism in Turkey are as follows;

- Turkey's geographic locations make the country accessible to many of major tourism market.
- Strong government support behind the industry, by the Tourism Incentive Law (Law no: 2634) in 1983 (Deloitte, Turkish Tourism Industry Report, 2010).
- Turkey is located on the Alpine-Himalayan orogenic belt, which has high geothermal potential [22; 23].
- Turkey is located on two continents and can easily be reached by airways, highways, seaways and railways.
- Hospitality education has become popular and more than 100 undergraduate tourism management programs have been graduating potential workforce who are globally eligible. The number of the English speaking workforce is increasing as rapidly as development of tourism education in Turkey.
- Hospitality is an important feature of Turkish culture, and this traiditon is still strong in major tourist destinations.
- Turkey has relatively unspoiled nature and sea comparing with our Rivals.
- Turkey is a cradle of civilizations. There are many historical sites and museums sprinkled all over the

Table 3. A Swot Analysis of Thermal Tourism in Turkey

Strengths	**Weaknesses**
-The geographical location and proximity to markets, -Strong government support behind the industry, -High geothermal potential, -Accessibility, -Increasing potential in English speaking workforce, -Hospitality, -Unspoiled nature and sea, -Historical places, museums, ruins, archaeological sites, -Continued thermal tourism investments, -New thermal tourism areas, -Inbound thermal tourism, -The development of thermal tourism master plan, -Climate,	-Inactive capacity, -Inadequate legislation, -Authorit, -Infrastructure and superstructure, -Training of workers, -Lack ofmarketing and promotional activities, -Lack of coordination between institutions, -Cleaning and hygiene problems, -The low occupancy rate, -Low contributionof local governments, -Financing problems, -Lack of regional tourism development planning, -Bureaucratic obstacles, -Lack of accreditation, -Management problems, -Lack of Statistics and data,
Opportunities	**Threats**
-Availability of young and knowledgeable workforce, - Developing infrastructure and superstructure, - The demand of thermal tourism, -The demand for balneological utilization of geothermal waters, -Turkey's EU candidacy and the development of world tourism, -A popular destination for thermal, spa, and health tourism, -Availability of thermal facilities, -Increasing number of thermal hotels, -Recreational activities for the visitors, -The support of Ministry of Culture and Tourism for thermal tourism, -Changing customer needs and demands, -Increasing interest from Middle East -Improvement of political relations with Russia	-Terrorist attacks worldwide, -Increasing competition, -Economic crisis, -Low *average* overnight *stays*, -Inadequate facilities, -Lack of international standards, -New thermal areas, -The risk of destruction of natural resources and the environment, -Unstability in Middle East, -The coup attempt in 2016 -Political tensions with some European countries

country. There are many unique sites and museums such as Cappadoccia, Pamukkale Travertines, Hagia Sofia, Zeugma ect. which make the country more attractive.

- The thermal tourism is rapidly developing. Also, These region can be integrated with other types of tourism, and has the capacity to create a touristic destination. There are approximately 190 thermal facilities in 46 cities of our country. The bed capacity of the 12 facilities (the cure center of which has been approved by the Ministry of Health) which hold tourism investment certificates of the Ministry of Culture and Tourism for thermal purposes is 2.347, while the bed capacity of the 30 facilities which hold tourism management certificates are 8.567.Health tourism will continue to evolve as long as human beings exist. The thermal tourism is the part of health tourism. Accordingly, geothermal energy-dependent thermal tourism will continue to evolve.
- Increasing demand in inbound thermal tourism. A very large proportion of the tourists using thermal facilities are domestic tourists.
- Geothermal fields in order to improve health and thermal tourism has been identified by the Ministry of Health. These areas in Thermal Tourism Cities Project "are included. Especially, The development of thermal tourism master plan has been created.
- Optimal conditions with normal cycles of seasons much of which goes up to 210 days in Köyceğiz Sultaniye in Turkey, however this period does not exceed 120 days in any region of Germany [28].

Weaknesses

Weaknesses of thermal tourism in Turkey are as follows;

- There are approximately 190 thermal facilities in 46 cities of our country. However, the *average* overnight *stays* for foreigners and domestic tourist is low. This creates inactive capacity for thermal tourism.
- There is not enough legislation to support the public and private thermal therapy treatment [28].
- There must be an independent authority that can regulate the thermal tourism.
- Infrastructure and superstructure especially in thermal tourist destinations are still remaining undeveloped.
- Staffs need to be trained for thermal tourism sector. And also planning should take place for the professional staff for thermal tourism [29].
- Turkey's thermal tourism marketing and promotion is not sufficient enough to attract more tourists to Turkey.
- Coordination between instititions should be regulated as to act to devolop the thermal tourism in Turkey.
- Many of the thermal facilities have cleaning and hygiene problems.
- The occupancy rate of thermal hotels and thermal facilities is low. The development of the projected facility without market research make the facilities have lower occupancy rates [28].
- Local governments do not support the thermal tourism enough [30].
- Financing problems are important obstacle for the private sector to devolop new investment [30].
- There is no regional tourismdevelopment planning in many major destinations of thermal tourism [28; 30].
- There are many bureacratic obstacles that retard the investment process.
- Failure to establish the international accreditation on the thermal tourism sector [28].
- Thermal facilities are mainly controlled by municipalities and special provincial administrations [29].
- Statistics and data are limited about thermal tourism in Turkey [29].

Opportunities

Opportunities of thermal tourism in Turkey are as follows

- Turkey has a great opportunity to increase its share in the tourism industry in all type of tourism activities with its young and knowledgeable workforce [31].
- New large airport, motorways, harbours, and high speed train projects have been built and Turkish government wants to encourage the private sector by undertaking transportation projects.
- Due to its geographical position Turkey has the advantage in using a wide range of renewable energy resources. Recently, the demand of thermal tourism has been increasing rapidly.
- The demand for balneological utilization of geothermal waters has been increased in the recent years in Turkey.
- Although Turkey is not a member of the EU, Turkey's EU candidacy attracts many investors to Turkey. The development of world tourism increases the number of tourist arrivals to Turkey.
- Turkey is becoming a popular destination for thermal, spa, and health tourism with its thermal toursim potential.
- There are around 190 thermal facilities in 46 provinces of Turkey Turkey is the 7th in the utilization of geothermal energy for direct use in the world and 1st in Europe. And the number of thermal hotel increasing every year.
- There are many recreational activities for the visitors in Turkey. Especially as thermal facilities are located by the seaside and mountain region there are plenty of recreational activities nearby the thermal regions.
- The Ministry of Culture and Tourism strongly supports thermal tourism.
- Changing customer needs and demands make the thermal tourism attractive as the number of senior citizens living in western countries are increasing.
- In recent years there have been significant increases in the number of visitors coming from the Middle East countries

Improvement of political relations with Russia increased significantly the number of tourist visiting to Turkey in 2017

Threats

Threats of thermal tourism in Turkey are as follows;

- There was a 35 percent increase in terrorist attacks worldwide between 2013 and 2014 and the total number of people killed by terrorism jumped by more than 80 percent, according to the US State Department's annual Country Reports on Terrorism released [32].
- In thermal tourism increasing market competition, competitive pressures and market conditions can affect the growth of thermal tourism.
- Financial *crisis in 2008* was the worst the world has seen since the Great Depression of the 1930s and is still effecting world economy.
- The *average* overnight *stays* for foreigners and domestic tourist is low [28].
- Most of the thermal facilities is inadequate for international standards
- In many other countries there have been opening new thermal areas.
- Unplanned thermal tourism projects may destruct natural resources and the environment
- The unstable economic and political environment in Middle Eastern countries and Turkey's proximity to the political instability in neighboring countries threatens

Turkish tourism.

• The July 15 coup attempt caused significant declines in tourist numbers especially from Western European countries in 2016 and 2017.

• Political tensions with some European countries caused significant declines in tourist numbers especially from Western European countries in 2016 and 2017.

Related Strategies in Turkey

The following related strategies should be improved for thermal tourism in Turkey according to the SWOT analysis;

• Turkey needs to have a long term strategic planning for thermal tourism

• All thermal facilities must meet international standards so that more foreigner tourists can be attracted.

• Professional thermal staff must be educated and employed.

• More recreational activities should be created and promoted for thermal tourists.

• Marketing and promotional activities must be focused on Western countries in which the number of senior citizens are increasing

• While planning a thermal region, coordination must be established among universities, the tourism sector, the public sector, the local goverments and the local people

• With the improvement of competetive advantages in thermal tourism, Turkey can get ahead of its rivals [33].

• Risk management strategies must be developed against the unexpected situations.

• The potential of thermal tourism should be developed according to future tourist demand.

• Thermal tourism regions should be protected against enviromental pollution.

• Thermal tourism should support local economic development and should provide benefits to local people.

• All inadequate thermal facilities should be renovated according to international standards to attract more foreign tourists.

• İnbound thermal tourism also should be taken in to consideration. Domestic tourist should be oriented to all of the country's thermal tourism destinations to develeop the region prior to the foreign visitors.

• The Private sector should be encouraged for thermal tourism projects.

CONCLUSION

Turkey is one of the important centers of geothermal resources in the world. However, the potential of geothermal resources are not utilized efficiently in the thermal tourism. Since antiquity, Turkey has been a most important destination for those seeking vital and therapeutic water treatment. Many of the thermal fields in Turkey have been found to have high mineral content. Various minerals solve different kinds of health problems and provide significant help in medical treatment. The thermal resorts are unique places for many positive effects on human life and health. Also, thermal tourism is one of the most promising branches of medical tourism in Turkey. In particular, health of individual contributes to economic productivity. Therefore, thermal tourism is extremely important for Turkish tourism industry improving tourism benefits both for tourists and economic income.

Turkey is located on top the of a major geothermal belt and has numerous thermal fields. Although some of these facilities have modern physical therapy units, they do not have enough accommodation and recreational activities. Thermal facilities includes thermal hotels, cure centers, cure parks, thermal hotels with baths, different types of cure units, and physical treatment hospitals. Therefore, this variety facilities has an important economic and social impact.

Due to geothermal resources, in particular, thermal tourism can lead to the achievement of sustainable development. The development of thermal tourism provides economic contributions to local economies and thermal facilities should also employ professionals to ensure high quality standards and patient safety. These positive developments are having an impact on sustainable development, especially when local people benefit from the thermal tourism development. To improve thermal tourism in Turkey. The quality of thermal facilities should be improved. The bed capacity of thermal facilities should be increased. Also, basic characteristics of the facilities should be developed. Average overnight stays in the thermal facilities should be increased. To extend the stay of thermal tourists the local goverment and the private sector should create efficient recreational activities. Transportation systems and all the thermal facilities should be developed by international standards to attract more foreign and local tourists.

As a result, there is a need for comprehensive planning with the technical and economical feasibilities in Turkey. In order to reach the international standards, the Ministry of Health and the Ministry of Culture and Tourism should cooperate for thermal tourism development. In particular, in the thermal tourism potential of Turkey the economic benefits should be noted and maintained. The goverment should encourage both private and public sectors for new investment in the thermal tourism regions. A New law that meet the needs of the thermal tourism investors should be issued. There is a need for comprehensive planning considering the technical and economical feasibilities for thermal tourism in Turkey. Thermal tourism based on geothermal energy is an important tourism type because of its socio-economic impacts on tourism.

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