Chapter 5
Location Is Value: Spatial and Business Modeling Integration

Eugenia Sarafova

Abstract A business model describes the rationale of how an organization creates, delivers, and captures value. Value proposition seeks to solve customer problems and satisfy their needs. All organizations, no matter they are pure business or public bodies, have their own business model to serve their customers. For example, all the people who live in a municipality are its customers and benefit from its value. The municipality has its own business model to create, deliver, and capture value not only for all the people who live there, but for all those doing business, tourists, etc. Spatial modeling on the other side assists users in the process of decision-making and helps them solve any type of spatial problem. Since 2009 location data from millions of people holding devices in their hands is being accumulated and analyzed. One of the greatest sources of data today are not the geospatial datasets of the companies, but the ordinary people. Crowds now have the power to capture, store, and even analyze spatial data and all that could be explained by one word, which emerged just 12 years ago—crowdsourcing. This changed in an amazing way even the most traditional business models, created new ones and shaped whole industries.

Keywords Location · Spatial modeling · Business modeling · GIS

5.1 Introduction

A business model describes the rationale of how an organization creates, delivers, and captures value (Osterwalder et al. 2010). Value proposition seeks to solve customer problems and satisfy their needs. All organizations, no matter pure business or public bodies, have their own business model to serve their customers. For example, all the people who live in a municipality are its customers and benefit from its value. The municipality has its own business model to create, deliver, and capture value not only for all the people who live there, but for all those doing business, tourists, etc.

E. Sarafova (✉)
Faculty of Geology and Geography, Sofia University, Sofia, Bulgaria
e-mail: evgenia@gea.uni-sofia.bg

K. Koutsopoulos et al. (eds.), *Geospatial Challenges in the 21st Century*,
Key Challenges in Geography, https://doi.org/10.1007/978-3-030-04750-4_5

Spatial modeling on the other side assists users in the process of decision-making and helps them solve any type of spatial problem. Since the first mobile phone with Global Positioning System (GPS) integration was launched (iPhone 3 in 2009), location data from millions of people holding devices in their hands is being accumulated and analyzed. One of the greatest sources of data today are not the geospatial datasets of the companies, but the ordinary people. Crowds now have the power to capture, store, and even analyze spatial data and all that could be explained by one word, which emerged just 12 years ago—crowdsourcing. This changed in an amazing way even the most traditional business models, created new ones and shaped whole industries.

It is believed that we are now living in the times of the Fourth Industrial Revolution. Klaus Schwab has associated it with the "second machine age" in terms of the effects of digitization and Artificial intelligence (AI) on the economy (Schwab 2016).

Disruptive business models using Geospatial Technologies are emerging to provide powerful spatial knowledge to their customers. Automotive industry is an excellent example, as we are seeing some drastic changes in the way companies are changing their value proposition in two directions. First, mobility is seen not as a car, but as a service and second, developing new, environmentally friendly engine requires a reorientation of previous vehicle concepts. It is crucial that car manufacturers and suppliers reposition themselves for the two paradigm shifts (Lemmer 2017).

Global influencers nowadays share common ideas about the changes that geography is facing—it is becoming more and more complex, interdisciplinary, technological, and intelligent. The power of global connectivity and its consequences for the people around the world are reshaping the whole understanding of how our planet is going into the future (Khanna 2016). Spatial analysis, modeling, and mapping are now shifted by a new and more precise term—location intelligence (LI). LI is an emerging methodology for turning location data into business outcomes, helping businesses solve their most complex questions and challenges (de la Torre and Giraldo 2017). It plays an increasingly important role for organizations and businesses by providing accessible insight into where things happen, why they happen, and what the next best move is.

LI is believed to be the driver of significant changes in the geospatial industry. The main building blocks of that process are

- Mastering big data: satellites, sensors, crowdsourcing data are shifting the industry from "where-to-find-data" to "how-to-analyze-it" paradigm. Big data from sensors (Internet of Things or IoT) and Big data from people (Internet of People or IoP) combined form the last huge idea for the World Wide Web—Internet of everything or IoE;
- Tailoring location analysis to better serve different industries, public bodies or projects;
- No direct costs for hardware improvement due to the usage of cloud computing services and analysis;

LI has a direct connection with Business Intelligence (BI), which is related to the analysis of business data. LI is now significant part of BI and companies such as Mapbox, founded in 2010, and Carto, founded in 2011 are proof for that. They

are Software as a Service (SaaS) providers and are using cloud computing for web spatial analysis and mapping.

In this study, business modeling tool and its integration with the results from spatial modelling are demonstrated for assisting the decision-making process in the field of sustainable tourism. The Business Model Canvas was used for modeling the as-it-is and to-be business models of Municipality of Kyustendil, Bulgaria. The particular area was chosen according to the requirements of the Tourism Act in Bulgaria, which defines local government bodies as entities with specific responsibilities for tourism development. Kyustendil Municipality was selected because of the dynamics of socioeconomic processes that occur in this part of Bulgaria—on one hand depopulation in rural and border areas, unemployment, and on the other hand a major natural, cultural, historical, archaeological, and ethnographic wealth.

5.2 Study Area

Kyustendil Municipality is located in the western part of Bulgaria and is one of the nine constituent municipalities of the Kyustendil region. The municipality borders with Bulgaria's neighbors Serbia and Macedonia, as well as with Treklyano, Nevestino, Bobov Dol, Zemen, and Radomir municipalities (Fig. 5.1). Its border passes through the mountains Osogovska, Chudinska, Kobilska, Izvorska, Zemenska, and Konyavska as well as through the Zemen gorge of Struma river.

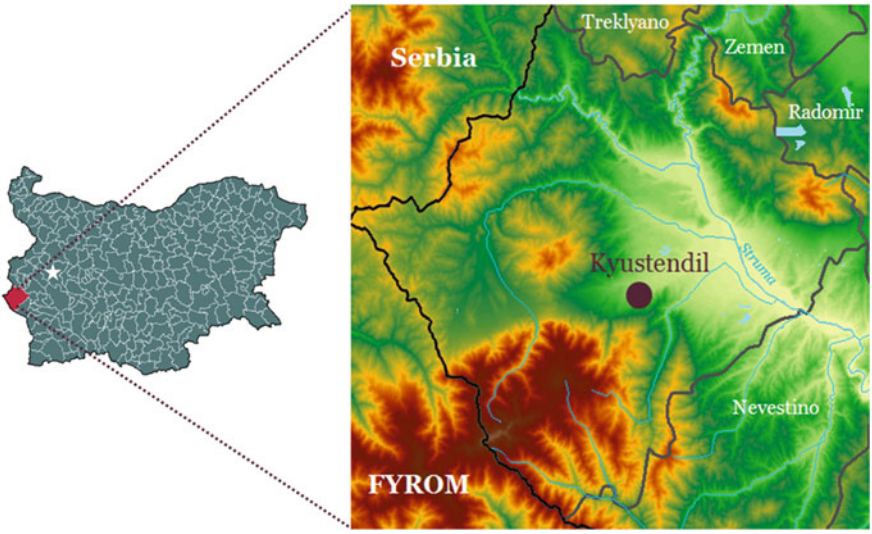

Fig. 5.1 Kyustendil municipality and its neighbors

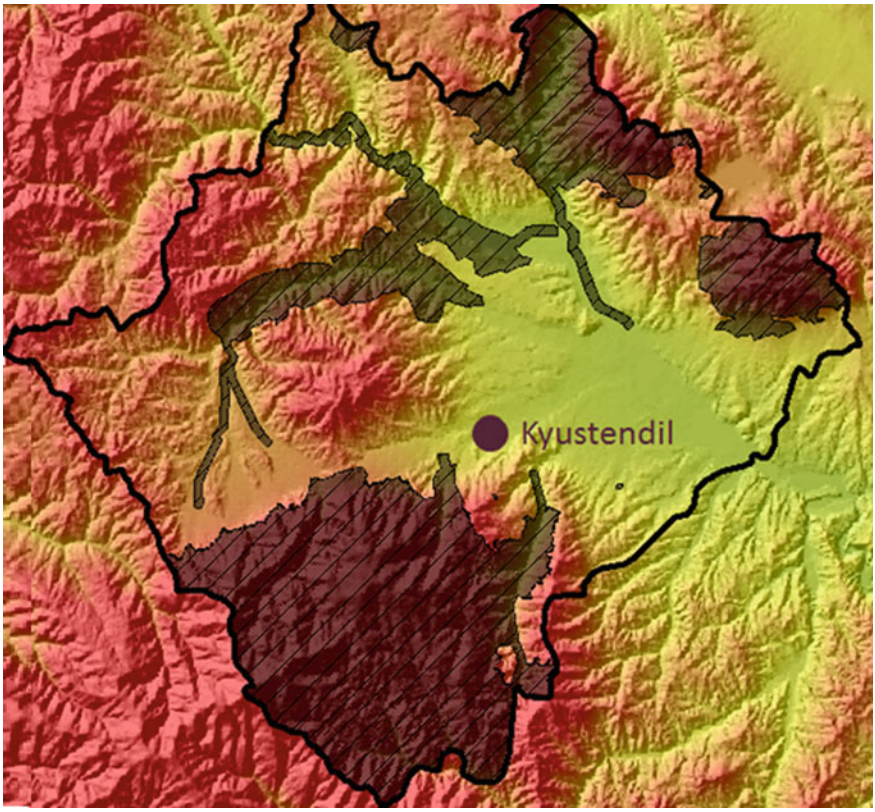

Fig. 5.2 Protected areas in the territory

The geographical location of Kyustendil determines the existence of rich natural and anthropogenic tourism resources. It is located on ancient trade routes, has a variety of well-preserved natural areas and has the potential for development of various types of tourism, including ecotourism.

The presence of karst in the area (in Zemenska and Konyavska mountains) is an opportunity for the development of tourism sector, because thanks to these processes many interesting rock formations, caves, and other sites have been formed that have a great attraction value.

One of the biggest natural resources of the municipality are the mineral springs, which have glorified the town's name as a SPA resort since the time of the Roman Empire. They are factor that determines the great opportunities of the town of Kyustendil to become a year-round resort. The municipality also has a great potential for development of ornithological tourism, because one of the main routes for birds' migration from Europe to Africa via Aristotelis passes through its territory. It has the second largest number of migrating birds in Bulgaria after Via Pontica near Black sea. Approximately 50 species of birds pass on the migration route, using the Zemen

gorge and the area around Choklyovo swamp for resting and feeding. In addition, there are very rare plant and animal species in the protected areas. This proves the excellent conditions for practicing alternative sustainable forms of tourism in the territory of Kyustendil Municipality.

39% of the territory is under the protection of NATURA 2000 or The Protected Territories Act of Bulgaria (Fig. 5.2). This is more than the average number in Bulgaria (33%) and the EU (18%).

Kyustendil is one of the few towns in the country that has heritage from all historical periods—prehistoric, Thracian, Roman, Byzantine, Ottoman, as well as remarkable examples of the Bulgarian medieval and Renaissance art.

The combination of natural, cultural, and historical heritage in the municipality implies great potential for development of various forms of tourism, especially in the archaeological reserve "Pautalia–Velbuzhd–Kyustendil". The modern holidays, festivals and other cultural events enrich and complement it.

5.2.1 Kyustendil in the Context of Tourism Industry in Bulgaria

The National Strategy for Sustainable Development of Tourism in Bulgaria 2009–2013 defined the following strategic objective: "To promote the introduction of modern information technologies and marketing of cultural heritage." In the SWOT analysis of the Bulgarian tourist product as a threat was defined the severe lagging of the penetration of new information technologies. One of the activities that support the strategy was linked to the introduction of modern information technologies to create and modernize the national systems and networks. The Strategy for Sustainable Development of Tourism in Bulgaria 2014–2030 also defines a similar vision for the integration of advanced high-tech solutions in the process of analysis and evaluation of tourism resources and their presentation to tourists in digital form. The vision that is defined at the beginning of the document states: "Bulgaria - a well-known and preferred year-round tourist destination with clearly recognizable national identity and preserved culture and nature, occupying a leading position among the top five destinations in Central and Eastern Europe." This statement is completely overlapping with the ideas for ecotourism development with specific requirements and criteria in several regions in the country. According to the data from the above-mentioned strategy, ecotourism is placed on the fifth place among the other forms of tourism in the country with only 4.6% of the total tourism product, and as the main factor that determines the destination for ecotourism is the attractiveness of the nature. It is obvious that information technologies allow easy and efficient access to wide variety of information, maps, and other products that could play a big role in attracting tourists to a destination, its marketing, and promotion among target users.

The current international political situation in Europe and in the whole world has an adverse impact on the inflow of tourists from countries, which traditionally had a

large tourist flow to Bulgaria. Because of that and many other reasons, in early 2015 the Ministry of Tourism launched the campaign "50 Little-Known Tourist Sites in Bulgaria", and its main idea was to encourage domestic tourism—to compensate for the declining number of foreign tourists and revive some of the lagging regions in the country. In November 2015, the Ministry of Regional Development and Public Works started public discussion called "Targeted Investment Program for Supporting the Development of Northwestern Bulgaria, Rhodopes, Strandzha-Sakar border and Mountainous undeveloped areas - Section I". The program aims at revitalizing the regions with the weakest economic and social indicators. One of the measures contained in it is an investment in tourism infrastructure. This shows that it is necessary that investments in alternative types of tourism to be made in the country, because Bulgaria has excellent conditions for its development in many rural areas.

As the alternative tourism activities are becoming more and more attractive, they are potentially good choice for strategic development in non-industrial territories. Many rural regions in Bulgaria have protected natural and archaeological sites, unique culture and traditions, but still do not have good economic development. Tourism could be the only alternative for the people living in those regions for prosperity. The complex international situation on the Balkans and in Europe is threat for the mass tourism in Bulgaria, so the stimulation of the domestic tourist activities is very important.

5.3 Spatial Modeling

The main objective of spatial modeling was to analyze the ecotourism potential of the territory using satellite images and GIS. The results were integrated after that into a business modeling tool—The Business Model Canvas.

In a number of scientific works authors define the most important principles of spatial modeling—Ferrier et al. (2002), Roy and Thill (2003), Ferrier and Guisan (2006), Aplin (2005) and many others. Very good understanding of the modeled objects and processes in the real world is crucial in the context of spatial modeling using Remote Sensing data and GIS. In the field of geoinformatics and GIS concepts of "modeling" and "models" are used primarily with two main meanings—as data models and as process models. We should add to this the traditional understanding of modeling in cartography.

Spatial modeling of ecotourism potential was performed by using Remote Sensing data, GIS and was based on the Analytic Hierarchy Process (AHP). To achieve this goal, three main steps were defined

- Research for the most up-to-date concepts and methods for spatial modeling for the purpose of ecotourism.
- Research for basic concepts and factors that determine ecotourism potential and the opportunities for application of satellite imagery and GIS data for its evaluation.

– Integrating the methodology for assessing ecotourism potential with data from satellite images. Testing the proposed methodology with data from the municipality of Kyustendil in Bulgaria and integration of the results with Business Model Canvas (Fig. 5.3).

The first step was preliminary study of the territory and its main features, based on scientific literature, statistics data, and historical maps. The information that was gathered helped in the process of indicators definition on a later phase. Geodatabase was created for the needs of ecotourism evaluation and all the data gathered from the preliminary study was stored there, both in geometric and attribute form, depending on its type. After the initial gathering of data, the as-it-is Business Model Canvas was created.

The Analytic Hierarchy Process (AHP) was used for comparison and analysis of the eight ecotourism indicators that were defined in the Research and Development phase of the study. It is a structured technique for organizing and analyzing complex decisions, based on mathematics and psychology. It was developed by Thomas L. Saaty in the 1970s. Users of AHP first decompose their decision problem into a hierarchy. Its elements could relate to any aspect of the decision problem—tangible or intangible, carefully measured or roughly estimated, well or poorly understood—anything that applies to the decision at hand. AHP includes combination of interviews and mathematical synthesis of the results for each indicator (Saaty 2008). Making hierarchy is a way of stratification and organization of people, ideas, objects, etc., where every element of the system, except the main goal, is subject to one or more other elements (Saaty 2010).

AHP has been used before in numerous studies related to the environment worldwide Bunruamkaew (2012), Oladi and Taheri Otghsara (2012), Shahabi et al. (2012),

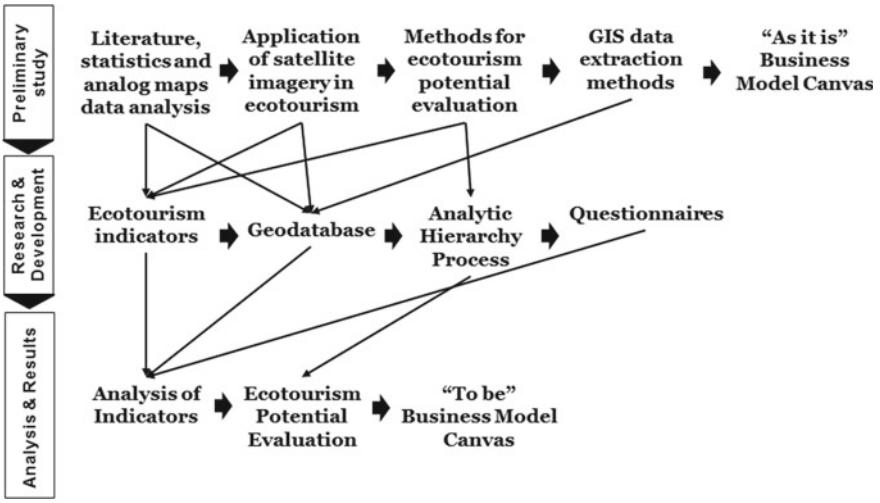

Fig. 5.3 The process of spatial and business modeling

Bozorgnia et al. (2010), Tola (2010), Abdus Salam et al. (2000), and others. Geographic Information Systems are widely used for the preparation of spatial models and maps, but unlike them the application of satellite imagery in this area still has not been studied well enough. The spatial modeling of the real world through GIS includes processes for determining the primary purpose of modeling, selection of the most appropriate data for each object that will be included in the geodatabase, identifying the most important properties of it and their correlated attribute values, and selecting appropriate cartographic methods for visualization of the model in its final form.

Software tool, developed by Oswald Marinoni in 2006 for usage in ArcGIS, was used for AHP modeling in spatial analysis. The app uses ArcMap raster files, previously generated for each criteria, and calculates their weights from the results of the questionnaire to the final result of the modeling process.

In order to define the criteria that determine the ecotourism potential of the municipality, indicators from various sources for ecotourism development were considered. This included the indicators presented by the International Ecotourism Society and European Tourism Indicators System for sustainable destination management.

The selection of criteria for Kyustendil Municipality took into account the natural, socioeconomic, and historical characteristics of the territory. Support for the selection of criteria was also provided by tourism experts working in other municipalities in Bulgaria who shared valuable experience, the Bulgarian Tourist Union, the Bulgarian Association for Rural and Ecological Tourism, members of the Osogovo Tourist Society. The criteria were grouped into three large groups: (1) natural (2) socioeconomic and (3) historical. In order to comply with AHP, each indicator received weight and evaluation, based on interviews with experts in that topic. All criteria were modeled as layers in ArcMap, where the final result was calculated (Fig. 5.4).

All eight raster layers were used to perform the analysis using the ArcGIS 10.0 and the AHP plugin. The resulting raster is shown on Fig. 5.5.

AHP, combined with data from satellite imagery and GIS data, was an excellent way to analyze the ecotourism potential of the municipality as it is possible to make a comprehensive overview of all aspects of ecotourism. Further spatial analysis with various tools was conducted in order to achieve greater precision and accuracy of the spatial modeling.

5.3.1 Customization of the Model

In twentieth century *Pinus sylvestris* and *Pinus negra* were widely used for reforestation in areas, located nearby settlements, where it was necessary to limit the erosion process. In the municipality of Kyustendil there are no natural forests of coniferous species and they create unusual ecological conditions. Therefore, these territories were excluded from the areas with high potential for development of ecotourism. This analysis was made by using data from Landsat 8 and the result is shown at Fig. 5.6.

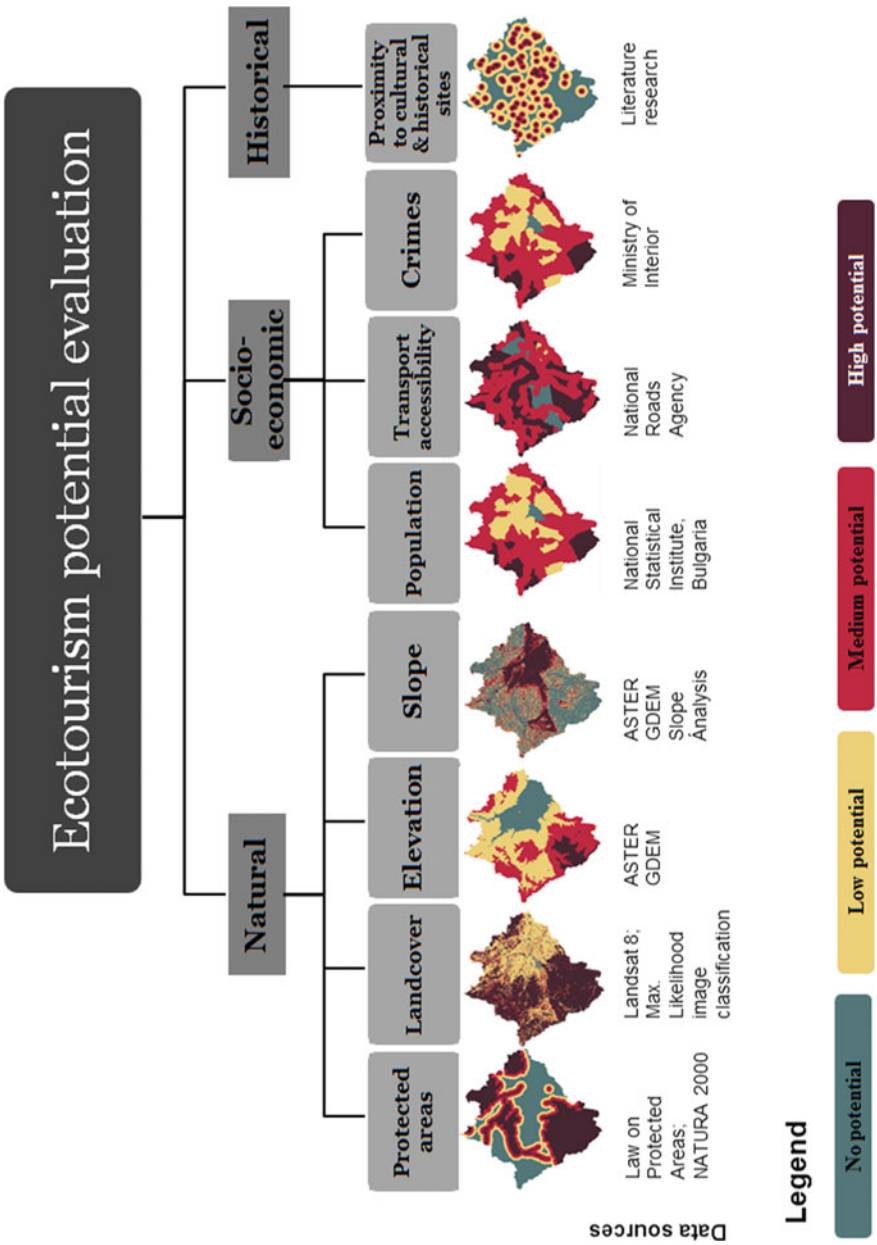

Fig. 5.4 The process of spatial and business modeling

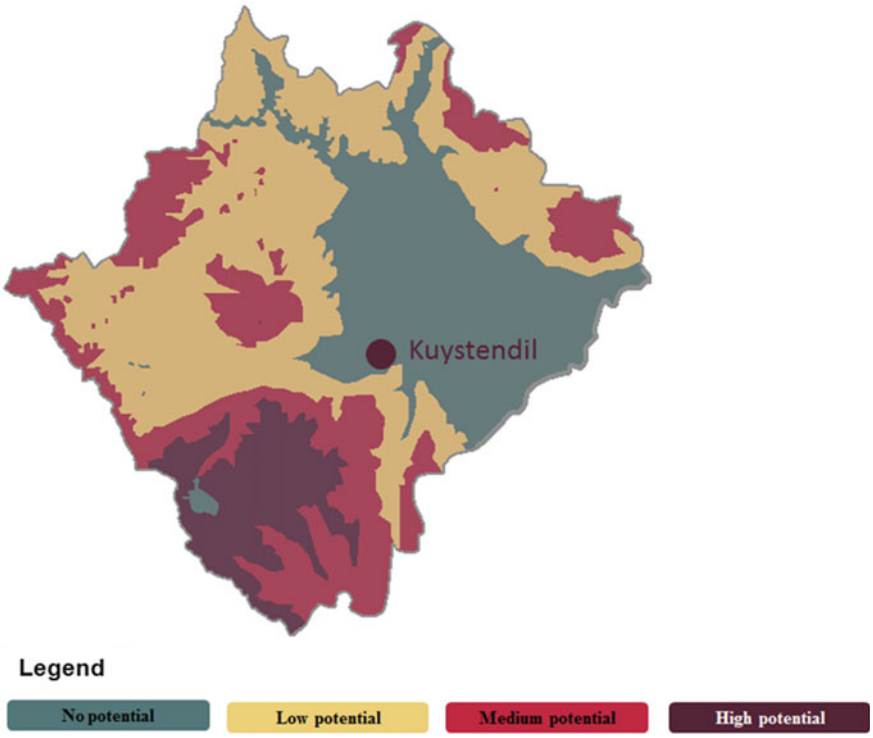

Fig. 5.5 Ecotourism potential visualized after AHP modeling in ArcGIS 10

Analysis of the visibility from several tourist routes, which tracks were collected with GPS, was also performed. Visual qualities of landscapes are of great importance for ecotourism. After the analysis, it turned out that 16 mountains, more than 2000 m high, located in Albania, Serbia, Macedonia and even the remote Mount Olympus in Greece, can be seen from the highest peak in the municipality (Fig. 5.7). This was verified by on-site field observations.

Another example of using satellite imagery in spatial analysis was comparing the border areas in Bulgaria and FYROM (Fig. 5.8). We can see very clearly the positive side of depopulation and poor economic development of the Bulgarian border areas—the Bulgarian side of Osogovo mountain is green, and its Macedonian part—deforested. This situation can be seen also in the Bulgarian border mountains near Serbia and Greece. The reasons for this are the measures of Bulgaria's neighbors to actively develop their rural and remote areas.

There are many places in Municipality of Kyustendil with concentration of cultural, historical and natural landmarks, which is a prerequisite for excellent conditions for development of eco and other forms of sustainable tourism.

Fig. 5.6 Territories with coniferous forests

5.4 Business Modeling

Business Modeling is already a widespread idea, defining the analysis and improvement of business processes in organizations. It is also topic that emerged due to the dynamic changes in the business environment. Modeling gives the management of organizations a clear picture of the whole business—internal and external processes, data flow and people.

Modern tool to simply visualize the business model of an organization is the Business Model Canvas, proposed by Alexander Osterwalder in 2008. In "Business Model Generation" from 2010 the authors crowdsource the idea to 470 practitioners from 45 countries and co-create the concept for the nine building blocks that show the logic of how a company intends to make money. The nine building blocks cover the four main areas of a business: customers, offer, infrastructure, and financial viability (Osterwalder 2010):

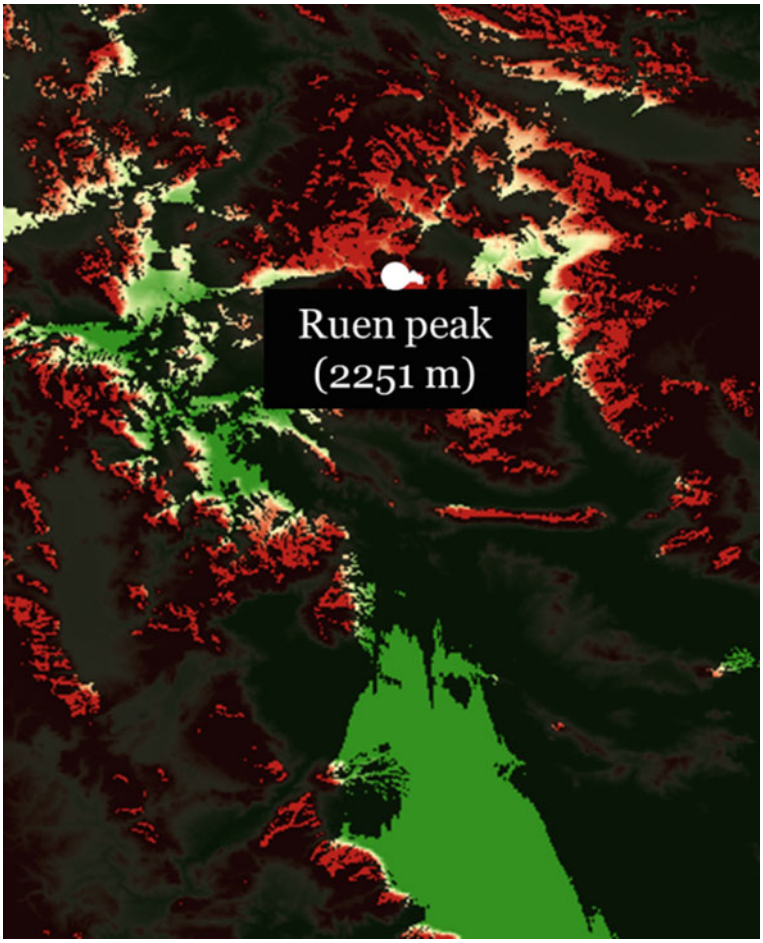

Fig. 5.7 Visibility analysis showing the territories that could be seen in light and those that could not be seen in dark

- Customer Segments
  An organization serves one or several Customer Segments.
- Value Propositions
  It seeks to solve customer problems and satisfy customer needs.
- Channels
  Value propositions are delivered to customers through communication, distribution, and sales channels.
- Customer Relationships
  Customer relationships are established and maintained with each customer segment.

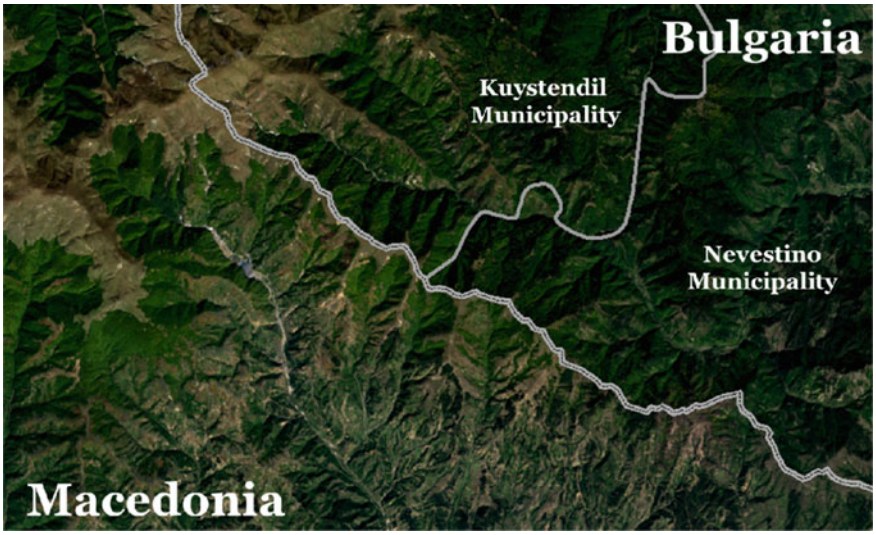

Fig. 5.8 Satellite image from Landsat 8 (14.08. 2014), Bands 4 3 2

– Revenue Streams
  Revenue streams result from value propositions successfully offered to customers.
– Key Resources
  Key resources are the assets required to offer and deliver the previously described elements.
– Key Activities
  The activities that are being done to maintain the previously described elements.
– Key Partnerships
  Some activities are outsourced and some resources are acquired outside the enterprise.
– Cost Structure
  The business model elements result in the cost structure.

Business Model Canvas could be used in two different ways. The first shows the current situation and is defined as as-it-is, and the second is used to shape the future possibilities for the organization and is defined as "to be". In this study, first the as-it-is canvas was used as a basic tool for understanding the building blocks of the organization. Second, the results of the spatial analysis provided the information about the key resources and value the organization is providing to its customers. Third, the "to be" Business Model Canvas was used to define the strategy of the organization for its development in a specific area, taking into account the results of the spatial modeling.

The Business Model Canvas was used for visualization of the current elements of Kyustendil's as-it-is together with the proposed changes in green boxes in to-be Business Model (Fig. 5.9).

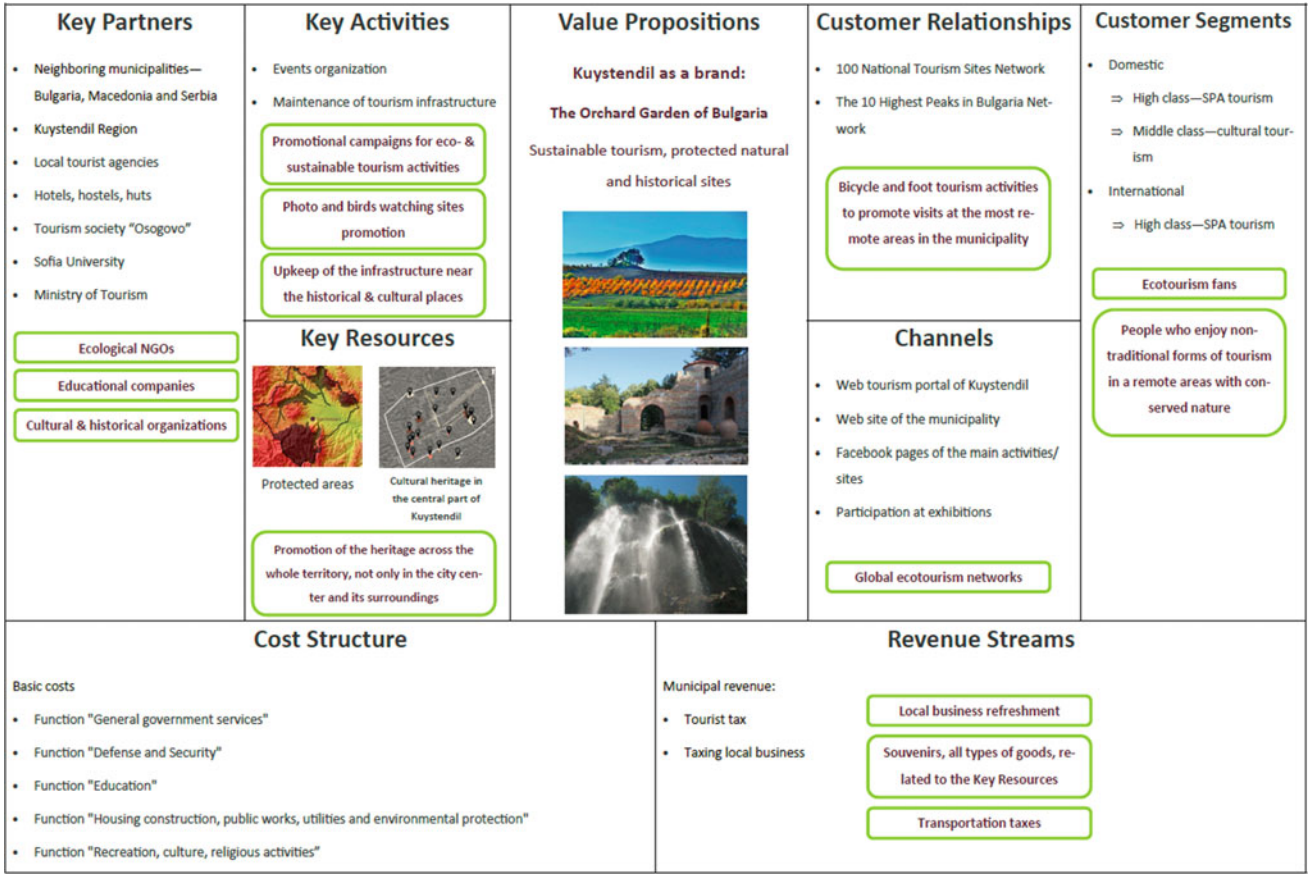

Fig. 5.9 As-it-is Business Model Canvas of Municipality of Kyustendil regarding to ecotourism and proposed changes in to-be Business Model Canvas in green boxes

Key Partners

For the municipality these are the companies working in the sphere of servicing, including travel agencies, transport companies, and accommodation. In addition, all the neighboring municipalities, from Bulgaria, but also from Serbia and Macedonia, should be listed here as they are able to partner with each other in cross-border projects or tourist services. Sofia University, and in particular the Faculty of Geology and Geography, has a major role in the promotion of the area around the Zemen gorge due to the University's Center for field studies, located nearby. The Ministry of Environment and Water and the Ministry of Tourism are institutions that play an important role in the management of the protected areas in the municipality and its positioning as a tourist center.

Key Activities

Key Activities are directly related to the development of the tourism industry. This is the most important segment of the business model pipeline and includes all the organization's work, marketing, and tourism infrastructure maintenance activities.

Key Resources

Due to the specifics of the ecotourism activities, the most important resource is the nature, which should be well preserved and attractive. Cultural, historical, and archaeological heritage are important for promoting the territory as an interesting and valuable complex product to tourists. If the region has its own well-preserved traditions, folklore as well as unique characteristics, they should be used for marketing and promotion of the destination.

Customer Relationships

Customer Relationships represent activities that bind clients (tourists) to the product/service they use. Such are, for example, the Bulgarian Tourist Union's initiatives "100 National Tourist Sites" and "Conqueror of the Ten Mountain Leaders in Bulgaria". Municipality of Kyustendil has been part of these national initiatives since many decades and has tourist sites in both of the lists.

Customer Segments

Tourists who visit the municipality can be divided into several categories that reflect the current situation with the industry in the region. If we take into account, their origin we could separate them into two major groups—domestic and international. The ideal customer for eco- and sustainable tourism activities could be described as adventurous, nature lover or person who does not want to stay in crowded, noisy places for mass tourism. This means that boutique forms of tourism activities with small groups, personal attitude, and a specially tailored program based on their specific needs will give the best value for those Customer Segments.

Channels

Channels are all tools of communication through which the municipality promotes its tourist resources. At the moment these are places on the Internet like websites and Facebook pages, as well as physical places in the real world—Tourist Information Center in the center of Kyustendil and participation in tourist fairs in Bulgaria and abroad.

Cost Structure/Revenue Streams

The financial balance of the municipality is a very complex mechanism in which it is difficult to separate a special segment for the tourism sector. This is because there are extremely many types of activities and infrastructure such as road and rail networks, public safety and security, taxes, which are related to tourism industry. However, tourism leads to diverse revenue streams, such as tourist taxes, business taxes, related to tourist services and trade, etc. They undoubtedly increase the economic and social development of the area.

Value Propositions

Value is the heart of the business model because it includes answers to questions such as "What are the issues of customers (travelers) we solve?", "What products or services do we offer to each customer segment?", "What type of customer needs are we meeting with our products and services?". Building a strong brand "Kyustendil" is very important when it comes to a sector like tourism, even more so for the specific needs of ecotourism. It is important to promote everything related to the environmentally friendly way of life, the green initiatives of the municipality, the protected areas and their characteristics, etc.

After everything listed above, we can conclude that the municipality has favorable conditions for the development of ecotourism. In order to maximize the benefits of the natural and cultural heritage available, a number of strategic resources should be highlighted in order to be used in a sustainable way. Successful models for ecotourism development are linked to places with clear individualism—a combination of unique nature and local traditions. The municipality of Kyustendil offers an attractive combination of such factors and the development of alternative tourism activities could be the key for solving problems like depopulation and unemployment in the area. Ecotourism is a fast-growing sector at international level and the interest in it is increasing. That is why it is necessary consecutive steps to be followed for its popularization at both national and local level.

5.5 Results and Discussion

The results of the study show that there are unlimited possibilities for combination of spatial analysis tools in GIS. Based on the specific needs of each particular

organization, it is possible a variety of criteria and conditions on which its strategic development depends to be defined and analyzed.

Any aspect that has spatial expression, like Kyustendil Municipality's potential for ecotourism development, can be successfully modeled in GIS. On the other hand, the results of spatial modeling should not only remain in the research papers, but be implemented through integration with various tools for business analysis, such as the Business Model Canvas. Through it, it is possible to focus the attention of all stakeholders on specific aspects of the development of the organization and the territory it manages.

In the twenty-first century, we are witnessing an increasing availability of open data that can be used in the decision-making process. This phenomenon, known as Big Data, leads to new opportunities for adding diverse data sources to all types of research activities. Ecotourism analysis for example could include also a number of weather, hydrological, satellite data, GPS tracks, and local sensor information. Another emerging source of data is the mobile applications that give us the opportunity to interpret consumer behavior and act on time.

Due to the rapid popularization of modern ideas and technologies, such as crowdsourcing and mobile services, satellite data, etc., it is possible to derive maximum benefit from any territory as long as it is innovative and smartly managed. The economic development of municipalities, regions, and even countries today is not only dependent by its physical resources, but also by their proper use, promotion and positioning on local and world markets. For the modern consumer the location, history, and the environment have great value, but on the other hand, location is losing its importance when it comes to promoting these sites, both locally and globally.

References

Abdus Salam M, Lindsay GR, Beveridge MCM (2000) Eco-tourism to protect the reserve mangrove forest the Sundarbans and its flora and fauna. Anatolia 11(1):56–66

Aplin P (2005) Remote sensing: ecology. Prog Phys Geogr 29(1):104–113

Bozorgnia D, Oladi J, Manoochehri M (2010) Evaluating the ecotourism potentials of Naharkhoran area in Gorgan using remote sensing and geographic information system. In: International archives of the photogrammetry, remote sensing and spatial information science, vol XXXVIII, Part 8, Kyoto, Japan

Bunruamkaew K (2012) Site suitability evaluation for ecotourism using GIS & AHP: a case study of Surat Thani Province, Thailand. Spatial Information Sciences, University of Tsukuba

de la Torre J, Giraldo S (2017) Location intelligence for dummies. Wiley, Hoboken

Ferrier S, Drielsma M, Manion G, Watson G (2002) Extended statistical approaches to modelling spatial pattern in biodiversity in northeast New South Wales. II. Community-level modelling. Biodivers Conserv 11(12):2309–2338

Ferrier S, Guisan A (2006) Spatial modelling of biodiversity at the community level. J Appl Ecol

Khanna P (2016) Connectography: mapping the future of global civilization, 1st edn. Random House, New York

Lemmer K (2017) Driving towards automation. Reinventing mobility through intelligent cars. DLR Magazine, September, pp 17–18

Oladi J, Taheri Otghsara F (2012) Feasibility study on ecotourism potential areas using remote sensing and geographic information system. Caspian J Environ Sci 10(1):83–90
Osterwalder A (2010) Business model generation. Self-published
Osterwalder A, Pigneur Y, Clark T (2010) Business model generation: a handbook for visionaries, game changers, and challengers. Wiley, Hoboken, New Jersey
Roy JR, Thill JC (2003) Spatial interaction modelling. Papers in regional science
Saaty TL (2008) Decision making for leaders: the analytic hierarchy process for decisions in a complex world. RWS Publications, Pittsburgh, Pennsylvania
Saaty TL (2010) Principia mathematica decernendi: mathematical principles of decision making. RWS Publications, Pittsburgh, Pennsylvania. ISBN 978-1-888603-10-1
Schwab K (2016) The fourth industrial revolution. s.l.:World Economic Forum
Shahabi H, Khezri S, Ahmad BB, Allahverdiasl H (2012) Application of satellite images and comparative study of analytical hierarchy process and frequency ratio methods to landslide susceptibility mapping in central Zab basin, NW Iran. Int J Adv Eng Technol
Tola T (2010) Geospatial approach for ecotourism development a case of Bale mountains national park Ethiopia. Thesis submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Science in Remote Sensing and Geographical Information Systems (GIS)