

## PROSPERA regional report – Municipality of Aristotelis

*An analysis of the peri-urban area that surrounds the Municipality of Aristotelis*

June 2020

Authors:

Apostolina Tsaltampasi & Zacharoula ZIKA, Municipality of Aristotelis

This regional report was produced within the PROSPERA project, funded by Interreg Europe.

More information? See the project's website: [www.interregeurope.eu/prospERA/](http://www.interregeurope.eu/prospERA/)

## Table of contents

Objective and outline of this report	3
Setting the scene	4
1. General information on the Municipality of Aristotelis and its surrounding peri-urban area	5
1.1. Geographical location	5
1.2. Identification of the peri-urban area	6
1.3. The demographic context	7
1.4. The built environment	9
2. Economic development of the peri-urban region	11
2.1 Economy (industry, offices, retail, etcetera)	11
2.2 Food production	11
2.3 Tourism	13
2.4 Mobility	15
3. Natural heritage of the peri-urban region	17
3.1 Natural heritage	17
3.2 Cultural heritage	18
3.3 Environment	20
3.4 Climate change	20
4. Policy instrument “Operational Programme for the Region of Central Macedonia 2014-2020”	21
4.1. General information	21
4.2. Governmental context of policy instrument “Operational Programme for the REGION OF CENTRAL MACEDONIA 2014-2020”	22
4.3. The challenges addressed by policy instrument “Operational Programme for the REGION OF CENTRAL MACEDONIA 2014-2020”	23
4.4. Related local policy instruments	27
4.5. The PROSPERA window of opportunity	27
5. The Good Practices of the Municipality of Aristotelis	28
6. Bibliography	31

## Objective and outline of this report

This regional analysis report was developed within **the Interreg Europe project PROSPERA, PROMoting Sustainable development and regional attractiveness through PERi-urban Areas**. The project's overall objective is to improve regional policies on protection and promotion of natural heritage by tackling loss of ecosystem services and to improve sustainable development in peri-urban areas threatened by urban sprawl. The ultimate aim of PROSPERA is to prevent biodiversity loss, soil consumption and further degradation of natural assets, by in parallel leveraging on those challenge as a way to favor regional attractiveness and economic sustainable development. To that extent, PROSPERA sets up a process of interregional learning that includes study visits and knowledge exchange sessions.

To provide sufficient and adequate background throughout the interregional learning process, each region that is involved in PROSPERA, developed a regional analysis report. In other words, each regional analysis report aims to inform the own stakeholders as well as stakeholders from other partner about the characteristics of and the challenges in their local peri-urban area. As such, **the present report is a guide for all PROSPERA partners and their local stakeholders when visiting or interacting with the Municipality of Aristotelis**. The information in the regional analysis report is not exhaustive but specific to the objective and rationale of the PROSPERA project. The regional analysis reports were developed in the first year of PROSPERA via a step-by-step process, including surveys and a workshop on the regional analysis report.

The report consists of different parts. **In the first part** of this report the **Municipality of Aristotelis sketches its general context**. This part includes information on the geographical location of the PROSPERA region, the local demography, and the built environment.

**The second part** of this report **analyses the economic development** of the local peri-urban area, whereas a **third part focuses on the natural heritage**, both PROSPERA core themes.

**The fourth part** of this report **describes the policy instrument** "Operational Programme for the REGION OF CENTRAL MACEDONIA 2014-2020". In accordance with the project's outline, the **Municipality of Aristotelis** selected a specific policy instrument to be subject of PROSPERA. The underlying idea is that PROSPERA could provide support to improve this policy instrument.

Finally, **the last part** of this regional analysis report **identifies local good practices already in place**. These good practices are as a source of inspiration for other peri-urban regions dealing with similar challenges.

## Setting the scene

In regard to the main themes of Interreg Europe and PROSPERA, the Municipality of Aristotelis identifies the following themes as most important for its peri-urban area:

- **Tourism**, which is the most important and widespread economic activity for the whole region of Chalkidikis, in which Municipality Aristotelis is located and emphasis on the agricultural, gastronomic, and cultural tourism.
- **Climate Change and Protection of Environment**, which is a global issue that needs to be addressed and affects peri-urban areas even more and in order to promote the improvement of the national environment with emphasis on the protection of biodiversity.
- **Natural Heritage**, as the Municipality of Aristotelis is established within a landscape combining mountains and the seaside.
- **Economy**, which is of course interconnected with the referred themes and its sustainable development is very important for their preservation.



*Image 1 – The monument of Aristotle at the Grave, source: website of Municipality of Aristotle*

The most naturally attractive and culturally valuable asset of the Municipality of Aristotelis Chalkidikis is the location of ancient Stagira as the birthplace of Aristotelis, the famous ancient Greek philosopher. Past and present local governance, as well as citizens, have followed actions to promote this facet of cultural heritage in the form of what has been called the **'Aristotelis brand'**. A pilot implementation of the above-mentioned ideas is the paradigm of **Aristotle's Menu**, which has been already presented and very well accepted in the Municipality of Aristotle in the region of Chalkidikis. The basic ingredients of Aristotle's menu are olives, olive oil, wheat, oat, honey, vinegar, mostly fish than meat, raisins, lettuce, and fruits. Simultaneously a new tourism product is being formed, providing a strong experience on domestic and incoming tourist population.

The importance of the abovementioned themes was also reflected in the first meeting of the *Local Stakeholders' Group* in the end of 2019 which included associations, organizations, and public benefit enterprises from the touristic, cultural and economic areas of activity, such as: ANETXA (Development Association of Chalkidikis), Chamber of Chalkidikis, Mount Athos Area Organization (MAAO), Aristotelio Cultural Center, AXTADA (Enterprise for the Utilization of Tourist Properties of Municipality Aristotelis), Municipal Port Fund of Aristotelis, Municipal Public Benefit Enterprise "FRONTIDA".

During the meeting were set up the important goals and benefits from the participation of the municipality in the PROSPERA project and were discussed the good practices to be presented from the region and as part of the future field visit.

## 1. General information on the Municipality of Aristotelis and its surrounding peri-urban area

The following paragraphs provide some general information on the territory of the Municipality of Aristotelis, case study in the PROSPERA project, with a focus on the peri-urban area. This information is not exhaustive but aims to provide sufficient background in order to enable a learning process together with local stakeholders as well as a transnational learning throughout the PROSPERA project.

### 1.1. Geographical location

Aristotelis (Greek: *Αριστοτέλης*) is a municipality in the Chalkidiki Regional Unit, Central Macedonia, Northern Greece. The size of the area is 739,9 km<sup>2</sup>. The seat of the municipality is the town **Ierissos**. The municipality is named after the ancient philosopher Aristotle, whose birthplace, Stagira, lies within its bounds. The municipality also includes the area of the mining villages, known as Mademochoria. The municipality Aristotelis was formed at the 2011 local government reform by the merger of the following 3 former municipalities, that became municipal units: Arnaia, Panagia and Stagira-Akanthos.



**Image 2 and 3:** The map of Greece in blue, indicating the region of Chalkidiki in red square. A closer look to Chalkidiki in green shows the main areas of Chalkidiki, its 'three legs' as are commonly referred to, namely Kassandra, Sithonia and Mount Athos. Aristotelis, as shown in red in the second image is the last Municipality before the semi-autonomous monastic polity Mount-Athos (Agio Oros).<sup>1</sup>

At geophysical level, Central Macedonia where the municipality is situated, is primarily one a mountainous geographical area with numerous massifs in its territorial territory. The most important massifs are: Mount Olympus and Western Pieria in Pieria, Vermio in Imathia, Athos and Holomontas in Halkidiki, Chortiatis and Vertiskos in Thessaloniki, Kerdilia (Thessaloniki, Serres), the mountains Thunder in Serres, the Kerkini mountain range (Kilkis, Serres), Voras, the Pinovo, Jena in Pella, Paiko (Pella, Kilkis). Climatically, winter is characterized by low temperatures, intense rainfall, and snowfall usually from late November to in early April, with total frosts observed. It is summer cool with a bit of local rain. Among the highlands, a rich western and eastern lowland is formed Flora and fauna.

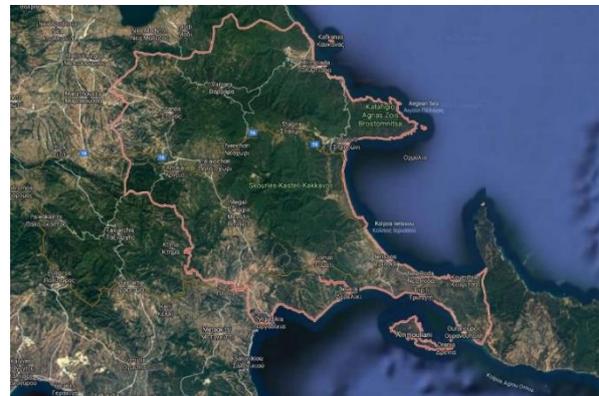
<sup>1</sup> Sources: [https://www.halkidiki.com/english/halkidiki\\_e.htm](https://www.halkidiki.com/english/halkidiki_e.htm). Accessed 18-03-2020.  
[https://el.wikipedia.org/wiki/%CE%94%CE%AE%CE%BC%CE%BF%CF%82\\_%CE%91%CF%81%CE%B9%CF%83%CF%84%CE%BF%CF%84%CE%AD%CE%BB%CE%B7#/media/%CE%91%CF%81%CF%87%CE%B5%CE%AF%CE%BF:2011\\_Dimos\\_Aristoteli.png](https://el.wikipedia.org/wiki/%CE%94%CE%AE%CE%BC%CE%BF%CF%82_%CE%91%CF%81%CE%B9%CF%83%CF%84%CE%BF%CF%84%CE%AD%CE%BB%CE%B7#/media/%CE%91%CF%81%CF%87%CE%B5%CE%AF%CE%BF:2011_Dimos_Aristoteli.png).

The municipality has an area of 747.015 km<sup>2</sup>. The Municipality is the last area of the Greek State before Mount Athos. It is commonly known as Holy Mountain, and it is the most important center of orthodox monasticism since late 10th century and one of the top monuments of the world's cultural heritage. It occupies the northern part of Chalkidiki Peninsula. Initially, cenobitic monasticism appeared in 963 during Byzantine Empire when the first monastery of Megisti (Great) Lavra was founded. Later on, in 972, the first "typicon" was signed which constitutes the Athonite monasticism, bearing the rules of organizing and operation of the cenobitic communities. Avaton, is one of the most ancient and unbreakable rules which means, the non-accessibility of Mount Athos to eunuchs, beardless children and women. The 20 "Dominant", "Royal", "Patriarchal" and "Stavropegial" holy monasteries comprising the Monastic State of Mount Athos, continue to support and spiritually reinforce the Church and the Greek society with the ascetic lifestyle. Many people from all the Christian Orthodox community commute from the Ports of Ouranoupoli, Tripiti and Ierissos in order to visit the monasteries of this sacred land.

## 1.2. Identification of the peri-urban area

In the following two images, the geophysical characteristics, main cities and villages, as well as a satellite image of the Municipality of Aristotelis can be seen. The green areas represent natural and agricultural areas, the brown areas represent mountainous areas in the north of the Municipality, and the borders of the Municipality are indicated in a red line.

**Images 4 and 5:** Geographical and political map of the Municipality of Aristotelis. Satellite image of the Municipality of Aristotelis.<sup>2</sup>



Central Macedonia is the second most populous region after Attica, with a strong urbanization and a large concentration of people in the Thessaloniki Township. According to the Spatial Plan of Central Macedonia, its residential network is structured in several levels: Thessaloniki Town Complex and Urban centers as part of the Region. The most important residential development is located in the coastal area of the Region, that is, in the "arc" of the Thermaic Gulf (Pieria - Thessaloniki - Chalkidiki), with a clear dominance of Thessaloniki. However, the uncontrolled concentration of the population on the outskirts of urban centers in recent decades has been accompanied by the need to solve the housing problem.

<sup>2</sup> Sources: Google Maps. Accessed 18-03-2020.

<https://www.google.com/maps/place/Aristotelis/@40.3770652,23.3776338,9z/data=!3m1!4b1!4m5!3m4!1s0x14a8e85b864f50e7:0xf26bade82f4a9586!8m2!3d40.4703942!4d23.7156809>.

The region of Chalkidiki is characterized as per-urban area including **mix of rural and urban area** in order to answer the needs of tourists, as one of the most known summer touristic regions in Greece. Due the increased flow of tourists during the summer the cities in the area (*such as municipality of Aristotelis*) are demographical problems. Additionally, the region is characterized by national parks and nature resorts but also cultural and historical monuments. This PI sets out measures to tackle with the issues of growing population, climate changes, migration and nature protection, energy and water deficit, fire protection updating, usage of circular economy and waste management, but also consist the protection of natural environment, such as nature and monuments heritage.

The issues of the territory of Chalkidiki that need special attention are:

- **Ensuring the resilience of the structured and natural environment:** *Improvement of the environmental footprint using energy saving technologies, water saving technologies, intelligent transportation, “intelligent buildings” technology exploitation, use of “green” materials etc.*
- **Promoting investment to prevent and address specialists’ risks (e.g. floods, coastal erosion, fires, earthquakes, etc.):** *in the region are estimated the higher risks of surface water & & groundwater salinization coastal areas. Enhancing civil protection agencies.*
- **Improvement of competitiveness and increase of surplus value of the total tourism product within limits and opportunities set by natural heritage protection, through networking, certifications, organizational innovation, etc.**
- **Strengthening collaborative innovation and interconnection with other sector areas of regional interest.**

### 1.3. The demographic context

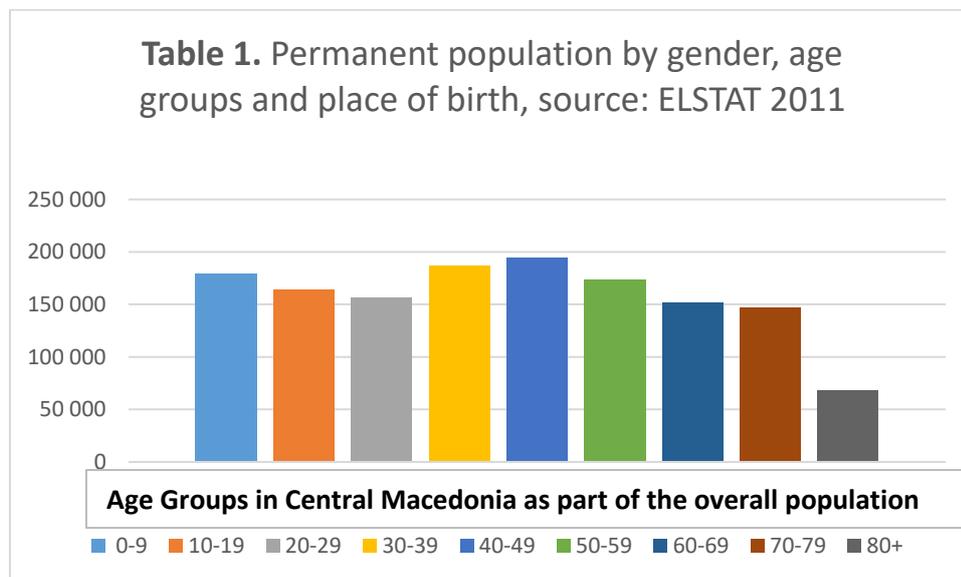
Region of Central Macedonia possesses the first position among Eastern Macedonia & Thrace (EMTH), Western Macedonia, Epirus, and Thessaly, in terms of size and population. In 2001 the region had a population of **1.871.952 inhabitants and in 2011 the population was 1.418.771 inhabitants**. As a result, comparing population in 2001 and 2011, there is a decrease of the population of the region mostly due the economic crisis and the migration flows to Europe. The population size of the Municipality of Aristotelis is **18.294 residents**<sup>3</sup>. Based on the number of residents and the size of the Municipality in km<sup>2</sup>, the population density is estimated at approximately **25 residents (24.72) per km<sup>2</sup>**. In terms of demographic evolution, in 2001, the population was estimated at 17.752. The Municipality Aristotelis Chalkidiki was formed by the integration of 3 previously separated municipalities, namely Arnaia, Panagias and Stagiron-Akanthou. In 2001, their populations were numbered as follows: Municipality Arnaia Chalkidiki 5.884 residents; Municipality Panagias Chalkidiki 3.470; Municipality Stagiron-Akanthou 8.398. Sum: 17.752. Looking at previous census indications, in 1991 the Municipality of Arnaia had 3.101 residents, followed by 5.884 in 2001 and 7.934 in 2011. As shown by the upward trend, we may expect its population to grow further during the next decade. The Municipality of Megali Panagia (also called ‘Panagia’) in 1991 recorded 3.125 residents, while showing 3.470 in 2001 and 4.113 in 2011, showing modest but steady increase. The Municipality of Stagiron (as was called at the time), in 1991, accounted for 725 residents. Municipality Stagiron-Akanthou, another joint municipality in later years, had 8.398 residents in 2001 and 9.607 in 2011. As is indicated, Stagiron’s incorporation in joint municipalities over the years resulted in a sharp surge of the

---

<sup>3</sup> ELSTAT (National Statistical Service of Greece). Census 2011.

population provisioned under the unified Municipal authority. Overall, the demographic evolution shows a modest, yet clear, increase<sup>4</sup>.

In the region there are about 48 % are till 39 years old, 26% of the population is among 40-59 years old and 26% are over 60 years old. Additionally, due the information provided by Greek Statistical Institute (ELSTAT) for 2011, 116.918 inhabitants are coming from other countries and live in the region (20.647 from EU countries, 76.497 from European non-EU member countries, 1.662 from Africa, 16.346 from Asia and 907 without citizenship). Most of the immigrants are coming from Albania, Bulgaria, and Georgia. There are no official migration camps in the region, but small percentage of young people are hosted in the town of Polygiuros.



Although it would be expected that prefectures with high touristic activity such as Chalkidiki would record high annual income per person, this is not confirmed. Chalkidiki records a GDP per capita value between 13.000 and 14.000 over the last years, which is lower than the national average (16.000 to 16.500). Thessaloniki, the biggest urban center in Central Macedonia region achieves values close to 14.000 during the last years, which is also lower than the national average, which may indicate a south-north divide in the national economy, with the South being richer than the North<sup>5</sup>.

Major demographic challenges include AGEING POPULATION and EMIGRATION OF YOUTH. A report by the Parliamentary Committee on The Demographic shows that a cross-fertility indicator is lower in Chalkidiki (at 1,26) compared to the national average (at 1,33), which shows that births are fewer in Chalkidiki than in other regions of the country. Birth deficits appear to be greater in regions where the GDP per capita is lower compared to the national average, since it cannot provide the necessary

<sup>4</sup> Sources for these population estimations: ELSTAT (National Statistical Service of Greece). Census 2011; ELSTAT (National Statistical Service of Greece), Usual Resident Population of Greece, Census 2001, Athens 2004; ELSTAT (National Statistical Service of Greece), Resident Population of Greece, Census 1991, Athens 1994.

<sup>5</sup> ELSTAT. Gross domestic product per capita by region and county. 2010-2016. Update 18-1-19; ΕΚΘΕΣΗ ΤΗΣ ΔΙΑΚΟΜΜΑΤΙΚΗΣ ΚΟΙΝΟΒΟΥΛΕΥΤΙΚΗΣ ΕΠΙΤΡΟΠΗΣ ΓΙΑ ΤΟ ΔΗΜΟΓΡΑΦΙΚΟ. Report of the inter-party parliamentary committee regarding the demographic. Athens, 2018.

financial support for starting or enlarging a family<sup>6</sup>. Furthermore, there is a further problematization in the country with the issue of 'BRAIN DRAIN', defined as emigration of highly educated individuals to other countries that can offer better career opportunities<sup>7</sup>.

Overall, we may conclude that the trends in the region show an upwards mobility, thus we may expect increased populations in the future.

#### 1.4. The built environment

Major challenges in terms of built environment include the RADICAL SLOW-DOWN OF INVESTMENT IN HOUSING AND NEW CONSTRUCTIONS. The Greek housing market was traditionally serving as the growth locomotive of the Greek economy, but the last decade has changed this reality. The construction industry in 2015 (Gross Fixed Capital Formation-GFCF) corresponded only to 0.8% of GDP and 7% of the total economy's GFCF. The Greek housing market has suffered a significant slowdown between 2008 and 2015 (loss estimated at €18bn. or 8.2% of GDP). This has led investments in construction to be lost within 2008-2015, slowing further down the economic activity and consequently, the investment in building of new constructions. Investments in the housing market are predicted to remain in low levels, specifically at €4.5 bn annually, with the investment gap having a long duration<sup>8</sup>. As such, the challenges concern LOW DEMAND FOR HOUSES, combined with an OVERSUPPLY OF HOUSES due to systematic investments in the sector in the period 2000-2007. The oversupply of houses is difficult to be absorbed, especially in a period of decreasing disposable income and limited mortgage lending, after the economic crisis 2009-onwards, while we also need to consider that the dwelling stock is aging while the lack of demand continues. As such, AGEING OF BUILT ENVIRONMENT is also a challenge. LAND MARKET MOBILITY also appears to be SLOW. Since old residences account for a significant part of the housing oversupply (approximately 55% of the urban buildings in Greece were built before 1980), these BUILDINGS ARE NOT COST-EFFECTIVE IN TERMS OF ENERGY MANAGEMENT and would NEED TECHNOLOGICAL MODERNIZATION.

In Greece, ILLEGAL CONSTRUCTIONS are a frequent occurrence in large urban areas (Athens, Thessaloniki, Irakleio, etc) and in highly touristic locations around the country. It is estimated that 75% of them are in urban areas and 25% outside urban areas. In 2015, there were 902.961 illegal constructions registered in the electronic system of the Technical Chamber of Greece (TEE), while in 2017 this number had risen over 938.000. Chalkidiki is situated within the group of regions where the illegitimate square meters of illegal constructions that were legalized exceeded one million (1,5 million). In total for Central Macedonia, the illegal square meters were estimated to be 9.1 million in 2015. The main target of illegal buildings is to convert into a holiday residence (61%), while 20% concerns a main residence. The rest includes a 14% of service buildings (i.e. offices), 3% tourist and industrial facilities, and 2% to primary sector processing facilities<sup>9</sup>.

---

<sup>6</sup> Paulakou, F. 2012. "Υπογεννητικότητα και γονιμότητα: Η εξέλιξη των δεικτών από το 1940 μέχρι και σήμερα". TEI Kalamatas. (Birth deficit and fertility: the evolution of indicators from 1940 to the present).

<sup>7</sup> Labrianidis, L. & Vogiatzis, N. 2012. Highly Skilled Migration: What Differentiates the 'Brains' Who Are Drained from Those Who Return in the Case of Greece?. *Population, Space and Place*, 19(5): 472-486.

<sup>8</sup> PwC. 2016. The housing market is no more the growth locomotive for the Greek economy, unless policies to boost demand and reduce oversupply are implemented; Mitrakos, T. 2012. The Greek real estate market. Bank of Greece.

<sup>9</sup> Τεχνικό Επιμελητήριο Ελλάδας (TEE). Technical Chamber of Greece.

Chalkidiki is situated among the prefectures that have exhibited a very HIGH URBAN SPRAWL over the past. Empirical analysis showed that the presence of valuable natural resources in a spatial entity, such as sandy beaches (which is a primary characteristic of Chalkidiki), is associated with increased levels of urban sprawl. Researchers conclude that urban development policy, as expressed through relevant regulatory frameworks, spatial design and design application, has failed to intervene decisively in the direction of a sustainable urban development of space, with the role of the state being more passive than active, confined to integrating or legalizing the already built-up areas<sup>10</sup>.

Finally, during the EXTREME WEATHER PHENOMENA of the summer of 2019, several houses were left without roofs and had various other damages. During that time, 5 municipalities of Chalkidiki were declared in a state of emergency, including Aristotelis.<sup>11</sup>

---

<sup>10</sup> Polyzos, S., Minetos, D. & Niavis S. 2013. Driving factors and empirical analysis of urban sprawl in Greece. *Theoretical and Empirical Researches in Urban Management*, 8(1): 5-29.

<sup>11</sup> Iefimerida.gr. Πέντε δήμοι κηρύχθηκαν σε κατάσταση έκτακτης ανάγκης λόγω της κακοκαιρίας στη Χαλκιδική (Five municipalities were declared at a state of emergency in Chalkidiki due to bad weather). 11-07-2019.

## 2. Economic development of the peri-urban region

The following paragraphs focus on economic developments and challenges within the peri-urban area of the region. The information provided in this part of the report is specific to the PROSPERA project, and consequently not exhaustive.

### 2.1 Economy (industry, offices, retail, etcetera)

Economic activities in the peri-urban area of the Municipality of Aristotelis include agriculture, forestry and fisheries, mining, and tourism. The wider area of Chalkidiki has high numbers of tourists during the summer months. Tourism is an important source of income for the area and a priority for the Municipality Aristotelis, as stated by Mayor Stelios Valianos. In the Municipality Aristotelis Chalkidiki, there are also significant mining activities. The mines of Chalkidiki (white stone, manganese, mixed sulphides, ferro-pyrite, copper, etc.) employ one tenth of all employees in all mines located in the country<sup>12</sup>.

In terms of major challenges, as stated by Aristotelis Mayor, Mr. Valianos, the tourism sector is a priority, while major issues can be found at the INFRASTRUCTURE level, for example in ROAD AXES, BIOLOGICAL CLEANING around the COASTAL villages, and day-to-day SERVICES for citizens<sup>13</sup>.

One of the major challenges in this municipality is managing the socially and politically contested issue of the MINES. This particular challenge falls under the main preoccupation of the PROSPERA project that aims to address the TENSIONS BETWEEN ECONOMIC DEVELOPMENT AND PROTECTION OF NATURAL HERITAGE of European regions. As proclaimed by the project itself, it should be possible to improve natural heritage protection and promotion through (and not despite of) economic growth (and vice versa).

In terms of cultural heritage, another challenge posed by the mining activity is the extraction and removal for PROTECTION OF ANCIENT FINDINGS in the mines of Skouries. As reported, some of the ancient findings have been excavated, but are left without protection<sup>14</sup>.

In 2017, Central Macedonia's employment rate for people aged between 20 and 64 was 55.9% of the total population, which is close to the national average, although slightly lower. According to Eurostat (2019), 59.5% of the population of Greece was employed in 2018.

The same source records a 19.3% unemployment rate in Greece for people aged 15-74 years in 2018. Central Macedonia's unemployment rate in 2017 was recorded at 22.9%. As such, the region's unemployment challenges are greater compared to the national average.

### 2.2 Food production

The main farming activities in the Municipality of Aristotelis and in Chalkidiki in general include arable crops, such as olive trees, vines, barley; cattle farming, such as oxen, sheep, goats, pigs, horses, rabbits, chicken, bees; horticulture, such as fruits and vegetables (olives, grapes); aquaculture (oysters); and other (honey, dairy, crafts). The main agricultural productions in the Chalkidiki prefecture is Grapes, wine and raisins (1.015 cases) and Trees (10.031) – 9.907 are olive trees. There are 344 permanent

<sup>12</sup> Dimokriteio University (DU). Diocles.civil.duth.gr. accessed 12-11-19.

<sup>13</sup> Aristoteli Mayor: "The main thing is to respond to the needs of everyday life". 23-10-19.

<sup>14</sup> Tomorrow, October 22, KAS decides the fate of antiquities in Skouries. 21-10-19.

meadows and pastures for grazing cattle in the prefecture. Some examples of products are honey (i.e. Kentri Honey, Arnaia), dairy products (i.e. feta Karagianni, Arnaia), shellfish, mussels, quinces, glossy, oysters, bubbles (i.e. Mussels Anastasiou, Olympiada), crafts (i.e. Candle World, Neochori Arnaias).

In the Chalkidiki Prefecture, 18.492 individuals are employed in agricultural activities<sup>15</sup>. There are 5 municipalities in the prefecture, including Aristotelis, which would amount to an average of 3.698 farmers. In the Chalkidiki Prefecture, there are 321 hectares occupied by farms. Within this space, there are 11.828 farms, whereby there are 10.651 agricultural farms, 270 livestock farms, and 907 mixed farms<sup>16</sup>. According to these numbers, approximately 27 hectares would correspond to each farm.

In Municipality Aristotelis there are various agricultural and Agri-touristic Women's Cooperatives in Varvara Arnaia that produce local traditional products, such as pasta, sweets, liqueur, jams, but also costumes, woven and other crafts.

Fish farming, over the last 35 years, has been one of the fastest growing animal production sectors in Greece and it is expected to grow even further in the coming years because of the ever-increasing demand for fishery products. In terms of the spatial distribution of fish and shellfish farming units around Greece, most of the fish farms are located in Sterea Ellada, Peloponisos and Southern Aegean. Although there are many shellfish farms in Central Macedonia, Chalkidiki does not score high in terms of number of farms. *These farms are structuring the food profile of the area, supporting the local and national market with fresh and natural fishery products.*

Because of CLIMATE CHANGE, there are occurrences of **EXTREME WEATHER PHENOMENA** (drought, heat, snowstorm, etc.) that sometimes endanger the agricultural production, causing many financial problems for the farmers. For example, problems caused by the bad weather in summer 2019 in Chalkidiki led farmers to submit requests to the State Secretary for Rural Development for financial help and for prompt recruitment of agronomists and veterinarians to respond to the emergency<sup>17</sup>. Some online sources report that there is WATER SCARCITY due to excessive water abstraction, as well as bureaucratic challenges for farmers who need to apply for permissions for water use<sup>18</sup>.

Prof. Panagiotopoulos from Aristotle University of Thessaloniki warns that the planned MINING ACTIVITY in the Municipality of Aristotelis Chalkidiki will have a significantly NEGATIVE IMPACT on the local natural environment and possibly the FOOD CHAIN<sup>19</sup>. More specifically, it is predicted that there will be a marked increase in heavy metal contamination of soils, surface and ground water, natural vegetation and cultivated plants and the introduction of heavy metals in the food chain (including the food consumed by animals and livestock too). The professor concludes that the local landscape will become degraded due the mining activity, the products will be fewer in terms of quantity and of lower

---

<sup>15</sup> ELSTAT. 2009.

<sup>16</sup> ELSTAT. 2009.

<sup>17</sup> Dikaiologitika.gr. News (DN). Αίτημα για προσλήψεις γεωπόνων και κτηνιάτρων λόγω της έκτακτης ανάγκης στην Χαλκιδική (Request for recruitment of agronomists and veterinarians due to the emergency in Chalkidiki). 16-07-19.

<sup>18</sup> RedLine. Στο κόκκινο οι γεωτρήσεις νερού στην Χαλκιδική, πρόβλημα στην ελαιοπαραγωγή. (Red point for water abstractions in Chalkidiki, problems in olive production). 2-9-19.

<sup>19</sup> Mining Activity Observatory (MAO). Η μεταλλουργία χρυσού είναι κατάρα για την γεωργία & κτηνοτροφία. Gold mining is a curse for agriculture and livestock. 2-6-2012.

quality, while livestock and cattle activities will become impossible. Panagiotopoulos's research is based on bibliographic research as well as case studies of previous mining activities (i.e. Gerakini, Olympiada, Laurio).

For example, in Olympiada (*which is located in the Municipality of Aristotelis*) there were cases in the past of farmers/breeders whose animals needed to be isolated and banned, as well as their products, because of the presence of lead in milk sample showing concentrations above the permitted level. Although the mining activity in the area is a work in progress and sufficient data is currently not available to be able to confirm degradation, or the lack of it thereof, the possible negative impact of mining activity is an issue worth taking seriously into account due to its possible public health consequences.

The regional unit and governance are supporting the region through national strategies and policies for food waste reduction (wholesale, logistic, retail and marketing, food preparation and consumption), climate changes and phenomena (support tools and infrastructure), promotion of local brands and products on foreign markets (under the umbrella of the chambers or the ministry) and funding programmes for the farmers and production units.

### 2.3 Tourism

Tourism Industry the last years in the most successful, profitable and productive industry in Greece. It is reassuring to have a brand that attracts visitors, investments that help the economy by creating job positions and profits that are more than welcome in a country that suffers from economic crisis. On the other hand, the tourism product is totally based on the natural resources. Visitors come in Greece for the beautiful, clean beaches, the unique landscape, to visit the archaeological sites and experience things that cannot be found anywhere in the world. It is really important, in order to preserve your product, which in this case is the Greek nature, to take all the necessary measures in order to keep the image and the quality of the product high. It is a challenge that next year needs to be won. To attract tourists from all over the world, but at the same time to keep and protect nature clean, untouched, and protected.

Traditionally, the whole prefecture of Chalkidiki experiences large waves of tourism in the summer months. The most important 'selling point' of the Aristotelis municipality is that of Stagiron as the birthplace of the famous ancient Greek philosopher Aristotle. Today there is a statue of Aristotle in Stagira, placed there since 1956 during local governmental attempts to create the touristic brand of the region. It is estimated that the scientific and recreational Alsos of Aristotle (Aristotle's Grove), one of the primary tourist attractions of the peri-urban area, receives at least 15.000 visitors during the summer months, especially by schools and students. Traditionally, the whole prefecture of Chalkidiki experiences large waves of tourism in the summer months. Major tourist attractions in the Municipality of Aristotelis include the following sites of cultural heritage:

<i>Aristotle's Grove (Άλσος Αριστοτέλη)</i>	<i>Ancient city of Akanthos (Αρχαία Ακανθος)</i>	<i>Ancient Stagira, birthplace of Aristotle, the ancient Greek philosopher (Αρχαία Στάγειρα)</i>	<i>Antiquities of Ouranopolis (Αρχαιότητες Ουρανόπολης)</i>
<i>Castle of Nerosi (Κάστρο Νέπωσι)</i>	<i>The medieval cemetery of Ierissos (Μεσαιωνικό νεκροταφείο Ιερισοπού)</i>	<i>Monastery Zygos (Μονή Ζυγού)</i>	<i>Temple of Saint Stefan (Ναός Αγίου Στεφάνου)</i>
<i>Chapel of Prophet Ilias of Arnaia (Προφήτης Ηλίας Αρναίας)</i>	<i>Tower of Krouna (Πύργος Κρούνας)</i>	<i>Tower of Prosforio (Πύργος Προσφορίου)</i>	<i>Church of Saint Paraskevi in the Saint Paraskevi's Grove (Άλσος Αγίας Παρασκευής εκκλησία)</i>

Moreover, major tourist attractions are the sandy beaches of the Municipality. In 2016, 14 beaches in the area of Aristotelis were awarded a blue flag (European award for beaches, based on cleanliness and safety)<sup>20</sup>. Other natural heritage sites include the waterfalls of Varvara<sup>21</sup>.

Central Macedonia in general exemplifies a large environmental reserve with 65 designated Natura areas. Chalkidiki in particular is characterized by wide agricultural fields, since agriculture is one of the dominant economic sectors, long beaches and coastal lines and some areas of greater altitude.

Challenges in the field of tourism in Aristotelis, as stated by Mayor, Mr. Valianos, the FURTHER AND BETTER DEVELOPMENT OF TOURISTIC & HOSPITALITY CAPACITY of the local industry in the region is a priority and relevant local needs and associated actions include better road links between the mountainous areas with the seaside ones, enhancement of religious tourism, creation of wine routes in the area, promotion of gastronomic tourism with local products and women's agricultural associations, as well as academic tourism with the initiation of an Aristotelian Institute of Science and Entrepreneurship, aspiring to be a global benchmark in the future.

Other challenges may include environmental challenges due to climate change, such as EXTREME WEATHER PHENOMENA that may interrupt energy supply and services. One such extreme case occurred in the summer of 2019 when many residences were left without roofs and several people's lives were endangered. Moreover, during the summer months, the risk of fire in Chalkidiki in general and in the municipality of Aristotelis more specifically can be quite high due to the rise of temperature, among other factors. These environmental challenges can severely disrupt the touristic experience or appeal of the region.

<sup>20</sup> In the areas of Ierissos (3), Kampoudi (3), Ouranoupoli (3), Agios Pavlos, Straton, Ammouliani Island, Nea Roda, Kampos Pirgadiikia

<sup>21</sup> Οι καταρράκτες της Βαρβάρας

Finally, to the degree that local MINING activities have negative impact on the local natural environment (plantation, cattle, water, etc.) or the quantity and quality of local food products, these possibilities could disrupt touristic experiences too.

### **Immediate plans of Municipality Aristotelis: gastronomic tourism**

Since 2020, the municipality of Aristotelis intends to join forces with the KOUZINA program with the aim of enhancing the tourist and cultural visibility of the area through the special gastronomy of the region. The KOUZINA program, a purely private initiative, made its debut in 2011 and includes a series of activities promoting teamwork, volunteering, local culinary traditions, their products and producers, local chefs, and guest reception. The municipality also intends to immediately begin the first wine route with the aim of integrating wineries into the Northern Greek Wine Routes (HN 2019).

## 2.4 Mobility

The modes of transport that are used in the Municipality of Aristotelis include bus, car, bike, walking, boats (i.e. Ferry Boat and Municipal speed craft to/from Amouliani Island). Number of commuters has not been established during the research leading to this report.

In general, the roads in Chalkidikis are widely damaged by **incomplete ROAD MAINTENANCE** over the years. These damages multiply and increase every summer because of increased tourism and vehicle traffic, as well as increased temperatures. As stated by elected regional consultant, Mr. Dimitris Tziritis, the Chalkidikis road network is outdated and, despite some limited restorations (mostly in Cassandra Municipality), extensive maintenance has not been done to the rest of the region<sup>22</sup>. In the area of the Aristotelis municipality, it is the provincial roads of Polygyros - Ierissos and Ierissos – Ouranoupolis that would need restoration. As stated by Aristotelis Mayor, Mr. Valianos, road axes need improvement, particularly in terms of better links between the mountainous areas with the seaside ones. The challenge of old road infrastructure poses an additional challenge to the mobility of tourists and the better appropriation that could be achieved in the field of tourism as the driver of Greek economy. For instance, as explained by the President of the Chalkidikis Hoteliers Association and the Panhellenic Federation of Hoteliers, Grigoris Tassios, the road system of Chalkidikis has remained unchanged for over 20 years, a fact that makes tourists' travel more difficult and less appealing<sup>23</sup>. In Aristotelis municipality, on 18-03-2019, the then mayor, Georgios Zoumpas, announces a bidding for public tender for the direct assignment of a project entitled on damage restoration of Municipal Roads and Cement Paving at the Aristotle Municipality, indicating that there are needs for road improvement in the location. Note that during wintertime there is danger of obstructed roads in the municipality Aristotelis.

In the Stratoniki location, there has been the phenomenon of appearance of cracks on houses, roads and public areas of the settlement, and there are speculations that this may be due to the MINING activity. The phenomenon is widening and worsening, which raises serious concerns for the lives and safety of residents. The Municipality of Aristotelis has asked in the past for actions imposing measures

<sup>22</sup> Voria.gr. 2018. Έργα συντήρησης σε όλους τους δρόμους της Χαλκιδικής (Maintenance works on all roads in Halkidiki). 4-9-19.

<sup>23</sup> Etravelnews. 2019. Γρηγόρης Τάσιος: Στη Χαλκιδική το οδικό δίκτυο είναι του 1973 (Grigoris Tassios: In Chalkidiki the road system is of 1973. 30-8-2019.

on the part of the mining company, as well as the Ministry of the Environment to take action in order to investigate in depth the causes of the phenomenon and to record the damage, using an independent body. Finally, during wintertime there can be danger of obstructed roads in the municipality Aristotelis due to extreme snowfall or rainfall.

**Image 6:** Geographical Map of the available roads and walks in the Municipality of Aristotelis, source: Municipality of Aristotelis Tourism Guide



### 3. Natural heritage of the peri-urban region

The following paragraphs focus on economic developments and challenges within the peri-urban area of the region. The information provided in this part of the report is specific to the PROSPERA project, and consequently not exhaustive.

#### 3.1 Natural heritage

The most important natural heritage and protected areas in the Municipality of Aristotelis are natural area surrounding Aristotle's Park, the Park of Aghia Paraskevi, and the waterfalls of Varvara. Aristotle's Grove is a unique case as it the only themed natural park in Chalkidikis, where visitors can enjoy the serene natural environment as well as the cultural heritage of the birthplace of the philosopher Aristotle. The forest is located at a 500 m. altitude and visitors can enjoy a great view over the gulf of Ierissos and the pristinely green Mount Athos (Agio Oros). This park is an ideal combination of natural and cultural heritage as visitors can interact with the displayed Aristotelian experimental instruments that function according to natural laws and are based on Aristotle's writings. Near the village of Varvara there are two waterfalls in a forest full of taxus, alders, lindens, and wild hazels. The location inspires a feeling of calmness and serenity and is of great environmental importance for the area. In addition, such areas also include at least 14 beaches in the Municipality in the areas of Ierissos (3), Kampoudi (3), Ouranoupoli (3), Agios Pavlos, Stratonis, Ammouliani Island, Nea Roda, Kampos Pirogadia.

Aristotle's Grove is a unique case as it the only themed natural park in Chalkidikis, where visitors can enjoy the serene natural environment as well as the cultural heritage of the birthplace of the philosopher Aristotle. The forest is located at a 500 m. altitude and visitors can enjoy a great view over the gulf of Ierissos and the pristinely green Mount Athos (Agio Oros). This park is an ideal combination of natural and cultural heritage as visitors can interact with the displayed Aristotelian experimental instruments that function according to natural laws and are based on Aristotle's writings. In the same area, one can also visit the castle of Madem Aga, a piece of the Ottoman heritage of the region. The park is managed by the municipality and is directly involved in its annual planning and development strategies.

The high diversity of ecosystems is reflected in the large number of protected areas. In total, the areas that are part of the NATURA / NATURE 2000 network and cover 34% of the total area of the Region are classified into 29 'Special Conservation Areas (SAC)' 10 (SAC), to 17 'Special Protection Areas (SPAs)' ( SPA) for the Birds, and in 4 areas that fall into both categories (EZO-SPA).

The main environmental problems recorded in region is concerned with **WATER POLLUTION** (sea, rivers, lakes, aquifers) and urban pollution. These problems are mainly due to the unwise use of fertilizers and pesticides in intensive housing- tourism development of coastal areas and residential expansion in the suburban and coastal areas of the Region. Over-pumping contributes even more to the degradation of water potential. According to the study "Evaluation, Review and Specialization Regional Framework for Spatial Planning and Sustainable Development Central Macedonia Region »of the Ministry of Foreign Affairs, the small improvements observed are related to pollution of water bodies by municipal waste and due to its significant expansion treatment systems and sewer networks since 2004 and post. Challenges in terms of natural heritage include POLLUTION and EROSION, WASTE MANAGEMENT and garbage collection, CLIMATE CHANGE and extreme weather phenomena. Regarding garbage collection, Aristotelis Mayor, has recently prioritised the first excursions to clean up uncontrolled garbage in the wider areas of Stagiron, Stratoniki and Neochori. There are

environmental challenges due to climate change, such as extreme weather phenomena (wind, snow, etc.) that may interrupt energy supply and services. One such extreme case occurred in the summer of 2019 when many houses were left without roofs and several people's lives were endangered. Moreover, during the summer months, the risk of fire in Chalkidiki in general and in the municipality of Aristoteli more specifically can be quite high due to the rise of temperature, among other factors.

It appears to be the case that the most salient environmental challenge of this municipality is the issue of mining activity and possible effects of pollution. In this respect, the local community is divided in two large camps. The one camp supports the investment of the Canadian Eldorado Gold and argues that it will have many positives for the local economy, as it will create many new jobs, directly and indirectly, and will generate revenues for the national economy. The other camp supports that the investment will have many adverse results on the local environment in terms of the quality of the air, water, and soil, and will disturb and endanger the lives of residents. There has been significant political turmoil over the last years in the municipality and the question of the Skouries goldmine has received a lot of public attention, dividing the totality of the country

The Constitution of Greece, as it was formed in 1975, was considered for its time particularly pioneer as Article 24 had a clear reference to the protection environment. The Article 24, which was further revised in 1986 and 2001 safeguards the protection of the environment as an obligation of the State after the 2001 redefinition of the environment as a right of everyone. Moreover, the article:

- establishes the principle of sustainability as the legal rule from which they derive obligations, commitments and constraints on the legislature, public policies, and private activities.
- places particular emphasis on the protection of forests (together with Article 117 (3,4) and prescribes:
  - Mandatory declaration of land as subject to reforestation
  - Expropriation of forests only in favor of the State (for public use) and the obligation to maintain its natural form (excluding public utility projects)
  - Obligation to draw up a forestry registry (an information capture and processing system, which is structured and based on validated Forest Charts)
  - Definition of forest and forest land
- provides for the layout of planning and planning rules; and obliges the preparation of spatial planning and urban planning. This process has been delayed for more than 20 years in Greece.
- introduces the obligation to draw up a national land registry, an obligation that still remains pending in Greece, but is at a stage of ongoing process at the moment.

### 3.2 Cultural heritage

**Aristotle's Grove** is an ideal combination of natural and cultural heritage as visitors can interact with the displayed Aristotelian experimental instruments that function according to natural laws and are based on Aristotle's writings. In the same area, one can also visit the **castle of Madem Aga**, a piece of the Ottoman heritage of the region. Ottoman rule was an important period of Greece's history. The **Ancient city of Akanthos** offers views to the ruins of the ancient walls of the city, its cemetery, and a temple, as well as a byzantine church. As it was built on an area of three hills it also offers great views of the landscape. **Ancient Sani** was the location where the Persian king Xerxes opened a sea canal, while findings of **Apollon's temple** are exhibited in the **Archaeological Museum of Poligiros**. The most important historic site in Chalkidiki is **ancient Stagira** and its tour is a real treat for tourists. Important

antiquities were discovered in the wider area of Ouranoupoli, such as **a tomb of the Roman era**. The **Castle of Neposi, Zygou monastery and the medieval cemetery of Ierissos** are important pieces of the area's Byzantine heritage. **The Temple of Saint Stephen** is the only church in Greece that operates normally, serving the needs of the pilgrims, while being built over important antiquities of priceless historical value. **The hill of Prophet Elias** has a great view and was always a key strategic point of the region, as it is located near the city Arnaia which is considered to be **the acropolis of ancient Arnaia**, mentioned by Thucydides in the Peloponnesian war. One of the most important sights in the region of Ierissos is **the tower of Krouna**. **The tower of Prosforio** is the characteristic symbol of the city Ouranoupolis and is the largest and best-preserved tower in Chalkidiki. **Park of Aghia Paraskevi** is one of the most favorable recreation destinations, located just 2km from Arnaia. Schools from all around Chalkidiki and dozens of people who are touring around the Municipality of Aristotelis visit it during all seasons. One of the most popular festivals takes place here on July 26.

Challenges to the local cultural heritage include PRESERVATION processes and the necessity to attract INVESTMENT towards this purpose. Furthermore, there may be concern in terms of the impact that mining industrial activities may have on the local cultural heritage. UNESCO recognizes the importance of mining historical heritage, but also the growing concern about the adverse impact of the extractive industries (exploration for and extraction of minerals, oil, and gas, as well as associated infrastructure) on natural World Heritage Sites. For the Municipality of Aristotle, the creation of a "Center for Aristotelian Studies" and the designation of the Ancient Stagira and Ancient Acanthus as sites of UNESCO National Monuments of World Heritage has been a target in the past and continues to be a priority. It is confirmed that there have been antiquities found in the area of Skouries during mining endeavors. According to KAS (Central Archaeological Council) there needs to be transfer of the findings, while they should be accompanied by a study of their emergence and the creation of a visitable archaeological site. It should be added that mining constitutes a massive cultural tradition in the area, since it goes back to the ancient times, while Chalkidiki has taken its name after the Greek word for copper (chalkos). Regardless, though, a Museum of Mining or of Natural History is missing in the area. Some argue that the mining industry leaves behind a large number of tangible or intangible remains and parts of them can be used by different actors as a mining heritage, whereby specific cultural or social values and meanings that remind us the importance of mining in the past and today, are represented through this mining heritage <sup>24</sup>.

The Constitution of Greece, as it was formed in 1975, article 24 (last revised in 2001) enshrines for the first time the protection of cultural property. The protection of the natural and cultural environment is explicitly mentioned as an obligation of the state, which is defined as an actor that needs to take preventive and repressive measures. In paragraph 6 of the same article, it has been declared that 'monuments, traditional areas and traditional elements are protected by the state'. Other laws, such as article 2 of 5351/1932, define what constitutes an antiquity (architecture, graphic arts, sculpture, etc.) and provides a legal framework for deciding what falls under the state's protection. The constitutional revision of 2001 emphasizes the continuous protection of the cultural environment aiming at its preservation for future generations.

---

<sup>24</sup> Jelen, J. 2018. Mining Heritage and Mining Tourism. *Czech Journal of Tourism*. 7(1): 93-105.

### 3.3 Environment

**Pollution and erosion due to mining activity:** Theassandra mines extend over a wider area of 200 square kilometres between the villages of Olympiada, Stanou, Megali Panagia and Ierissos. They include the sulfuric base and precious metal deposits of Olympiad, Madem Lakkou, Black Stone, the manganese-gold deposits of Piavitsa and Barbara, as well as the copper-gold deposit of Skouria in the Megali Panagia area. Particularly the latter case of Skouria has prompted major social unrest and disputes between many actors, such as local citizens and employees, the government, and foreign (Eldorado) or domestic enterprises (Ελληνικός Χρυσός/ Hellas Gold). One of the biggest environmental challenges in the region may be the results of the mining activity. The environmental impact of the mining operations is multifaceted and important. Besides observable visual effects due to deterioration of the landscape, there is significant and adverse impact on the ecosystems due to erosion and pollution of water, soil and air.

**Waste management and garbage collection:** Reportedly, there are also challenges in terms of waste management. For example, Aristoteli Mayor, has recently prioritised the first excursions to clean up uncontrolled garbage in the wider areas of Stagiron, Stratoniki and Neochori. In these cases, some peri-urban areas around towns become spontaneous garbage dumping areas that eventually get out of control with adverse impact on the environment (pollution, possibility of fires during the hot months, etc). Urban sprawl does not appear to be a particular challenge in this municipality as Chalkidiki is scarcely populated during the year, albeit with peaks of visitors during the summer tourist season.

### 3.4 Climate change

**Climate change and extreme weather phenomena:** There are environmental challenges due to climate change, such as extreme weather phenomena (wind, snow, etc.) that may interrupt energy supply and services. One such extreme case occurred in the summer of 2019 when many houses were left without roofs and several people's lives were endangered. Moreover, during the summer months, the risk of fire in Chalkidiki in general and in the municipality of Aristotelis more specifically can be quite high due to the rise of temperature, among other factors.

To monitor air quality in the Region a monitoring network has been installed and operates air pollution, as provided by legislation: exceedances of pollution thresholds are mainly observed in the SPA, however, degradation of atmospheric quality occurs elsewhere urban centers of central Macedonia. The main source of atmospheric pollution is road transport, existing industrial- artisanal installations and existing spaces waste, which can potentially act as a downfall air quality, especially during the summer months.

## 4. Policy instrument “Operational Programme for the Region of Central Macedonia 2014-2020”

The fourth part of this regional analysis report describes the policy instrument “Operational Programme for the REGION OF CENTRAL MACEDONIA 2014-2020”. The Municipality of Aristotelis chose to review, improve, and implement this particular policy instrument throughout the PROSPERA project. In accordance with the ambitions of PROSPERA, the focus lies on the protection and promotion of natural heritage by enhancing the sustainable development of peri-urban areas.

In the next paragraphs attention is given to what extent the selected policy instrument is currently responding to the challenges identified in the region, as described in part 2 and 3 of this report. Furthermore, attention is given to the governmental context and the analysis has been then extended, taking also into consideration other policy instruments that are relevant for the PROSPERA themes.

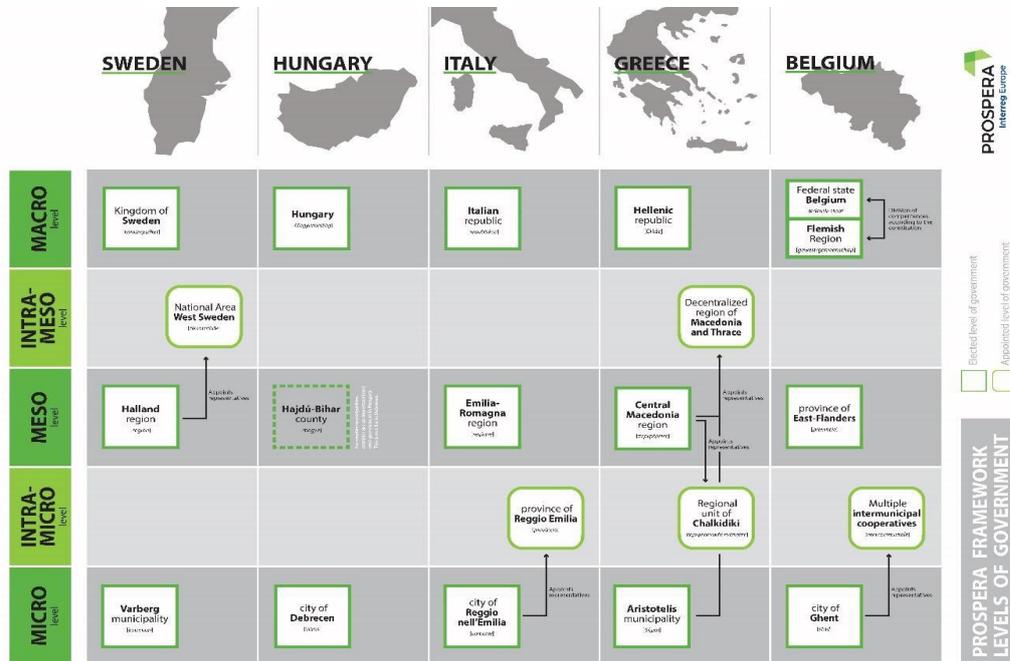
Furthermore, a window of opportunity is identified to improve this particular policy instrument supported by the PROSPERA project.

### 4.1. General information

<b>Name of the policy instrument</b>	Operational Programme for the Region of Central Macedonia 2014-2020
<b>Geographical level</b>	Region of Central Macedonia
<b>Managing Authority of European Territorial Cooperation Programmes</b>	Unit A': Planning and Monitoring of the Management and Control Systems, Monitoring of Horizontal Issues and Interreg Europe Programme

The OP “Central Macedonia” is the centralized operational programme for the region to boost economic development, environmental protection and create job opportunities. It contributes to achieving the Europe 2020 targets for smart, sustainable, and inclusive growth, also in line with the smart specialization strategy and low-carbon economy based on renewable energy sources and energy efficiency. It is aiming to create jobs and help SMEs to become more competitive and innovation driven in preserving and protecting the environment and promoting the efficiency of the use of natural resources, dealing in particular with cultural and natural heritage of Central Macedonia, Improvement and protection of the natural environment with emphasis on the protection of biodiversity; Rehabilitation and revitalization of deprived urban areas and improvement of the urban environment. In the period 2019-2020 is in process the planning of the OP for the next programme period and the municipality of Aristotelis is planning to contribute actively elaborating some important issues connected to spatial planning, population, environmental and nature preservation and protection. The OP should Improve in order to properly integrate principle of natural heritage and resource with roles SMEs and economical actors can play, considering and integrating their contribution and activities for conserving, promote and development the natural heritage and revitalize the peri urban area of the territories.

#### 4.2. Governmental context of policy instrument “Operational Programme for the REGION OF CENTRAL MACEDONIA 2014-2020”



**Imagine 7:** PROSPERA Framework Levels of Government

In principal, the Region of Central Macedonia and Municipality of Aristotelis comes under the national innovation policy framework. The main organizations drafting/implementing policy measures with impact for innovative SMEs, start-ups and spin-offs are the Ministry of Development (MoD) through its General Secretariat for Research & Development (GSRT) and the Ministry of Economy & Finance (MEF) through the General Secretariat of Investments and Development. The instruments they use for policy elaboration and implementation are the national legislation (laws, presidential decrees and ministerial decisions defining incentives to private investment, taxation, commercialization of R&D results, etc) and the multi-annual programming documents, accompanied by rules for implementation, monitoring and control, related to incentives to private investment, RTD, creation of technology transfer mechanisms, etc.

The NSRF (National Strategic Reference Framework) 20014–2020 constitutes the reference document for the programming of European Union Funds at national and regional level for the 2014–2020 period. The structure of the National Strategic Reference Framework for period 2014 – 2020, differs significantly compared to past Community Support Frameworks for Greece, mostly as far as the small number of the programs through which is implemented. Regional authorities contributed to the development of the NSRF. Proposals on development priorities and activities planning at regional level were processed taking into consideration the region’s position in the national, EU and International environment; the assessment of results of interventions during current and past programming periods; regional strengths, weaknesses, opportunities and threats; necessary institutional and organizational adjustments. Under this new concept, the country’s strategic planning for the 2014 - 2020 period is implemented through eight (8) Sectoral OPs, five (5) Regional OPs and twelve (12) European Territorial Cooperation OPs.

The capacity of the partner influence is high. The partner is represented in the council of the Region of Central Macedonia when the policies have been planned and structured. According to OP formalised process elaboration, partner is indeed participating at:

- Decentralized and Participatory Consultation to detail problems and prospects as well as identify and select appropriate policies and actions per Regional Unity
- Central Development Conference to mark the specialization of the priorities of the Regional Development Strategy as well as mapping Central Strategies of Smart Specialization Strategy, and identify the structure of the consultation
- Expert Technical Consultation with the Agencies / Partners based on an online platform for dialogue and exchange of proposals.

Consultation is planned also through Technical Meeting with representatives of structures and Special Conference for mapping of the Strategic Smart Specialization guidelines. As for the current implementation of OP 2014-2020, Regional Development Committees and Meetings can be requested by the municipality to present specific topic and issue. Monitoring Committee are also held in which are participating different stakeholders.

#### 4.3. The challenges addressed by policy instrument “Operational Programme for the REGION OF CENTRAL MACEDONIA 2014-2020”

The central themes of this policy instrument are indicated as follows:



**Image 8 and 9:** PROSPERA Municipality of Aristotelis Target Challenges and Policy Instruments

**Theme 1 ‘POPULATION/DEMOGRAPHY’ – the policy instrument addresses the following challenges:**

Though the theme of Population/Demography seems not to be addressed in ROP of Central Macedonia, there is a special mention in the Initial Planning Priorities, where the following is mentioned, as one of the 4 main Pillars of ROP:

- Supporting and strengthening the mobility and upgrading of human resources, addressing unemployment dynamically and ensuring social cohesion.

**Theme 2 ‘BUILT ENVIRONMENT’ – the policy instrument addresses the following challenges:**

The category of “Built Environment” is addressed mainly in MACRO level.

Yet, in MESO level in Priority Axis 4, we meet the need to Increase energy efficiency and utilizing renewable energy in public buildings and public infrastructures: Improving energy efficiency by refurbishing public buildings, intervening in the shell, and operating features of the building, giving priority to large, energy-intensive buildings.

Additionally, under Priority Axis 10, which is related to education, training, vocational training, the Thematic of Built Environment is one of the strongest.

**Theme 3 ‘MOBILITY’ – the policy instrument addresses the following challenges:**

Mobility is clearly Mentioned as the 3<sup>rd</sup> main Pillar of the ROP. The third Pillar focuses in Integration - promotion of the transport infrastructures and networks for the promotion of the Region in an international transport hub - utilization of its central position in the macro regions of Southeast Europe and the Eastern Mediterranean

Part of it is addressed under Priority Axis 4, as Promotion of Sustainable Urban Mobility in the Region of Central Macedonia: Management of traffic with intelligent transport systems, Promotion of the use of hybrid vehicles, Creation of cycle paths, pedestrian and mild streets, Information and awareness programmes of urban residents on multimodal urban mobility.

Most focused though we have a clear planning in Priority Axis 7, which is under the title of “Promoting sustainable transport and removing bottlenecks in core network infrastructures”. More specifically projects and actions that will cover the following areas:

- Completion of transport infrastructure projects related to the TEN-T Trans-European Transport Networks: Completion of TEN-T road links, upgrading of Thessaloniki's rail link to the road network.
- Integration of an interregional road network and interconnection with TEN-T: Improvement or construction of regional links with TEN-T, Improvement, or extension of intra-regional transport networks. Completion of the construction of evolving road works
- Gas penetration in urban and industrial areas: to supply gas to customers closest to the gas transmission network and to existing parts of the distribution network.

**Theme 4 'ECONOMY' – the policy instrument addresses the following challenges:**

Agriculture, Mining and Tourism are main drivers for Our Region (Central Macedonia). In the 1<sup>st</sup> Pillar Economy is a Priority and a wider plan is met. So, it clearly mentioned that transitioning the regional economy into a new and sustainable production model with competitiveness, extroversion, innovative entrepreneurship and smart and friendly use of Information and Communication Technologies (ICT) is addressed as a need.

**Theme 5 'NATURAL HERITAGE' – the policy instrument addresses the following challenges:**

The 2<sup>nd</sup> Pillar of the ROP includes altogether the subject of Natural heritage as well. The 2<sup>nd</sup> Pillar mentioned as: Protection and sustainable management of the natural and man-made environment and natural resources to ensure the quality of life and resource efficiency.

Both in the General Scheme of Priority Axis 1 (Strengthening research, technological development and innovation Within this axis will be implemented actions that are qualified by the Regional Strategy of Smart Specialization and concern) and Priority Axis 3 (Enhancing the competitiveness of small and medium-sized enterprises (SMEs) The Axis target's Regional SMEs with a view to promote entrepreneurship, innovation, competitiveness and extroversion in the national and global context); need **not only** to protect natural Heritage, but there is in priority to fund Schemes that include budget for this category.

**Theme 6 'CULTURAL HERITAGE' – the policy instrument addresses the following challenges:**

As in the previous category both 1<sup>st</sup> and 2<sup>nd</sup> Pillar of the ROP includes altogether the subject of Cultural heritage as well.

The 1st Pillar mentioned as: Transitioning the regional economy into a new and sustainable production model with competitiveness, extroversion, innovative entrepreneurship and smart and friendly use of Information and Communication Technologies (ICT)

The 2nd Pillar mentioned as: Protection and sustainable management of the natural and man-made environment and natural resources to ensure the quality of life and resource efficiency.

Exactly like the previous category, both in the General Scheme of Priority Axis 1 (Strengthening research, technological development and innovation Within this axis will be implemented actions that are qualified by the Regional Strategy of Smart Specialization and concern) and Priority Axis 3 (Enhancing the competitiveness of small and medium-sized enterprises (SMEs) The Axis target's Regional SMEs with a view to promote entrepreneurship, innovation, competitiveness and extroversion in the national and global context); need **not only** to protect natural Heritage, but there is in priority to fund Schemes that include budget for this category.

**Theme 7 'FOOD PRODUCTION' – the policy instrument addresses the following challenges:**

Food production is addressed mainly in Activities under Priority Axis 3, where SMEs are encouraged to join this sector, or develop their existing activities.

- -Support to knowledge-intensive, innovative entrepreneurship: provision of grants for the creation of innovative start-up (including spin-offs, spinouts)
- -Increased supply of innovative products and services by SMEs –reinforcement of SME’s capacity to innovate and introduce new products and services in the market
- -Increase SME productivity and extroversion: funding business plans for the promotion of competitive entrepreneurship, extroversion, and competitiveness. The action will target individual SMEs or SMEs formations (Clusters) in the Region of Central Macedonia

**Theme 8 ‘TOURISM’ – the policy instrument addresses the following challenges:**

Exactly like Cultural Heritage, Tourism follows the same policy.

As in the previous category both 1st and 2nd Pillar of the ROP includes altogether the subject of Tourism as well.

The 1st Pillar mentioned as: Transitioning the regional economy into a new and sustainable production model with competitiveness, extroversion, innovative entrepreneurship and smart and friendly use of Information and Communication Technologies (ICT)

The 2nd Pillar mentioned as: Protection and sustainable management of the natural and man-made environment and natural resources to ensure the quality of life and resource efficiency.

Exactly like the previous category, both in the General Scheme of Priority Axis 1 (Strengthening research, technological development and innovation Within this axis will be implemented actions that are qualified by the Regional Strategy of Smart Specialization and concern) and Priority Axis 3 (Enhancing the competitiveness of small and medium-sized enterprises (SMEs) The Axis target’s Regional SMEs with a view to promote entrepreneurship, innovation, competitiveness and extroversion in the national and global context); need not only to protect natural Heritage, but there is in priority to fund Schemes that include budget for this category.

Tourism is declared as one of the Top 5 Industries of our Region.

**Theme 9 ‘ENVIRONMENT’ – the policy instrument addresses the following challenges:**

The 2<sup>nd</sup> Pillar is mostly dedicated to Environment. It is about “Protection and sustainable management of the natural and man-made environment and natural resources to ensure the quality of life and resource efficiency”. A full Axis, is dedicated to this category:

**PRIORITY AXIS 6**

Preserving and protecting the environment and promoting the efficiency of the use of natural resources Projects and actions are foreseen.

**Theme 10 ‘CLIMATE CHANGE’ – the policy instrument addresses the following challenges:**

The category of “Climate Change” is addressed mainly in MACRO level.

Yet, in MESO level there is a full Priority Axis 5, dedicated to this category.

PRIORITY AXIS 5 is about Promoting adaptation to climate change, preventing, and managing risks from natural disasters such as floods, fires and earthquakes in particular.

#### 4.4. Related local policy instruments

Above the Operational Programme for the REGION OF CENTRAL MACEDONIA 2014-2020, there is a National Operational Plan, called «Εθνικό Στρατηγικό Πλαίσιο Ανάπτυξης, ΕΣΠΑ 2014-2020» (National Strategic Development Plan, ESPA 2014-2020). This Operational Plan is focused on national Needs and usually entities that have National coverage can apply for Funding under this it.

#### 4.5. The PROSPERA window of opportunity

PROSPERA intends to capitalize the potential of innovative SMEs to exploit natural heritage in a sustainable way, by creating new services for citizens and tourists, enhancing the environmental resilience, and creating synergies with the urban context.

The PROSPERA project is designed around two basic assumptions. Firstly, that it is possible to improve natural heritage protection and promotion through (and not 'despite of') economic growth (and vice versa). And secondly it indicates that it is possible to promote the regional attractiveness and sustainable development through (and not 'despite of') peri-urban areas.

The improvement in the policy instruments is made mainly in terms of improved governance of policies and interventions and improved awareness and knowledge acquired about roles economical actors/SMEs can play towards natural heritage. Municipality of Aristotelis work on the improvement of the following points of the PI:

- Creation local committees among SMEs and tourism actors and discussing the issues of population, spatial planning, environmental measures, and weak points of PI
- Elaboration of study recording the problem of water and ground water salinization in coastal areas
- Ensuring the civil and environmental protection planning during the high season period and creation of board to elaborate possible solutions and propose as part of PI
- Organization of meetings with the local and national stakeholders regarding the land register in the agricultural areas and ensuring the procedures
- Meetings with stakeholders regarding the environmental protection plans and ensuring their effectiveness in PI 2021-2024

The Operational Programme should be improved to properly integrate principles of natural heritage protection and promotion with roles economical actors can play, considering SMEs activities as leverage to promote and develop the natural heritage, exploiting their potential to revitalize peri-urban area of the territories and contribute to address issues connected to spatial planning, population and environmental challenges.

## 5. The Good Practices of the Municipality of Aristotelis

- In Aristotelis Chalkidiki, efforts for place branding of the peri-urban area around the town Stagira, has resulted in the creation of **Aristotle's Grove**, an outdoors theme park situated a few kilometers outside Stagira. Aristotle's Grove combines elements of educational and outdoors recreational tourism, as it is situated in a green area, uphill, overlooking the sea and with views of close by mountains, while it contains a series of experimental, scientific and interactive instruments that visitors can play with and learn about the laws of physics and Aristotle's writings. There is an entrance fee which is 2€ for adults and 1€ for children. The low price makes the park accessible to the majority of people. The way the wider task of the Aristotelian brand has been shaped and appropriated combines elements of both natural heritage and cultural heritage, integral to the **PROSPERA** project, since it concerns practices within the natural environment of the locality that are infused with historical and cultural experiences and organized touristic products.
- The Municipality of Aristotelis have implemented a grassroots development and social economy practices in peri-urban areas for the promotion of sustainable development and regional attractiveness in case of **Women's Cooperatives and Associations** in the region. The Women's Cooperative that is active in Aristotelis Chalkidiki is the *Varvara Agricultural Association*, called Dryades. The association was founded in 1998, it consists of 11 members, and it is based in Varvara Chalkidiki, within the municipality of Aristotelis. It is a partnership of housewives, who many years ago combined their strengths and culinary knowledge to create a fragrant home, with the aim of turning rich local produce into a tradition and gastronomic brand. Its main traditional products include pasta, sweets, jams, liqueurs, and aromatic herbs. The women of Dryades use local raw materials, such as local milk produce, to make traditional products, such as trachana pasta, a traditional Greek recipe for pasta or local fruit produce for making jams and sweets. There are various other Women's associations (hereafter WAs) and clubs in Aristotelis Chalkidiki, include the Association Anagennisi Gynaikon (Rebirth of Women) of Megali Panagia, the Ierissos Women's Association, Arnaia Women's Association, and Stanos Women's Association. These associations organize local events of culinary (feasts, invitation of chefs, etc.), cultural (traditional practices, festivities, etc.) and social interest (i.e. blood donations, etc.). Cooperatives like that can change women's lives by providing them with income, decent work, new horizons, and autonomy, but as reported women's associations and cooperatives in Greece face several challenges. The purpose of a Cooperative is to employ rural women, enhance their family income, develop the place, maintain, and disseminate tradition through the production and distribution of a range of healthy, quality handmade products. (Drakaki, 2012).
- In the wider efforts of the Aristotelis community to promote its local heritage and benefit its economy, the branding of the locality has been instrumental. Within this context of branding efforts and tourism promotion, one of the good practices that has been implemented over the last years is that of the **KOUZINA program**, a private initiative taken by the local Mount Athos Area Organization (MAAO) in order to create and promote tourist products and services in the field of gastro-tourism. In the case of Aristotelis Chalkidiki, the KOUZINA program is an annual gastronomic festival that takes place towards the end of spring and beginning of summer. It always lasts one month, and it includes a series of gastronomic events that represent the national

and local culture. The festival focuses on local tradition, products and recipes and it is a vehicle for honoring the local land and the gifts it offers. The gastronomic approach includes marrying local tradition with modern gourmet creations, while using always local organic produce. Gastronomic tourism is an emerging phenomenon that is being developed as a new tourism product because of the fact that according to the specialized literature, over a third of tourist spending is devoted to food consumption (Herrera et al. 2012). As such, the cuisine of a tourist destination is an aspect of utmost importance in the quality of the holiday experience, as well as the local economy of the visited place (ibid). Today, gastro-tourism is a very popular tourist activity that attracts billions in revenue (Williams et al. 2014).

- In Aristotelis Chalkidiki, efforts for place branding of the peri-urban area around the town Stagira, has resulted in the creation of the **Aristotelian Route**, *an outdoors hiking pathway, connecting the new town of Stagira to the ancient city of Stagira, which is now an archaeological site*. The way the wider task of the Aristotelian brand has been shaped and appropriated combines elements of both natural heritage and cultural heritage, integral to the PROSPERA project, since the branding process concerns practices within the natural environment of the locality of Aristotelis Chalkidiki that are infused with historical and cultural experiences and organized touristic products (i.e. tours, culinary events, etc.). Furthermore, the Aristotelian Route is not only meant to be an individual route, but also part of a wider network of Aristotelian routes, as well as other culturally defined routes such as the Mount Athos borderline routes, and more. As such, there is a wider effort for 'heritage hiking tourism' in the area with 8 hikes mapped.
- **A good practice** that has emerged over time, aiming to tackle the problems generated by the mining industry, **is that of 'parallel restoration'**. In the literature, the term 'restoration' is also used interchangeably with the terms 'reclamation', 'revitalization', 'recuperation' and 'rehabilitation' (Agele, 2003; Griffith & Toy, nds; Kuter, 2013; Maiti, 2018). Today, land reclamation is a comprehensive interdisciplinary subject that covers the problems of landscape redevelopment and the restoration of its productivity, ecological integrity, and economic and aesthetic value (Chadwick *et al.* 1987). Parallel restoration implies that locations where individual mining projects are completed, get immediately restored, in parallel with the progress of other mining and restoration projects. There are mines in three locations which are owned and operated by the Canadian firm Eldorado Gold Corporation and the Greek firm Hellas Gold (Ελληνικός Χρυσός). These sites are in Olympiada, Stratoni and Skouries. According to many Greek media, as well as the official websites of the firms, there have been actions of parallel restoration applied in the Municipality of Aristotelis by Hellas Gold. In this effort, designs were made to manage the overall footprint from the long-term prior mining activity (1975-1996) and to achieve the environmental remediation of the area in order to give to the local community for utilization. From 2012 to the present, the work of removing old deposits from Stratoni and Olympiada has been completed and the phase of Phyto-technical restoration and environmental upgrading is in progress (HG, 2019). The location Karakoli is presented as 'an example of best-practice restoration with related work having ensured landscape upgrades, new vegetation development and ecosystem protection' as well as 'a case study for those who study the environment' (HG, 2019). In terms of Aristotelis, the transformation of an old mining dump and storage site, located in the courtyard of the Olympiada mine, into a large plant nursery of 150 acres with a plant bank of more

than 400 species to be used for restoration of the surrounding area, can only be a positive development. The subject of the mines in Skouries has been a highly contested public debate (Calvario et al. 2015) and the local community is divided into two camps, the ones who support the mining initiative (government, municipality, employees) and those who resist it (local citizens, environmental activists).

## 6. Bibliography

- Alcocer, Amy (2019). The Impact of Theme Parks in the Tourism Industry. Available at <https://study.com/academy/lesson/the-impact-of-theme-parks-in-the-tourism-industry.html>. Accessed 25-11-19
- Anholt, S. (2010). Definitions of place branding - Working towards a resolution. *Place Brand and Public Diplomacy*, 6(1): 1-10
- ELSTAT (National Statistical Service of Greece), Resident Population of Greece, Census 1991, Athens 1994
- ELSTAT, Usual Resident Population of Greece, Census 2001, Athens 2004
- ELSTAT, Agriculture and livestock Census, 2009
- ELSTAT, Census 2011
- ELSTAT, Economic characteristics of the permanent population of the country. Peiraias, 2014
- ELSTAT, Gross domestic product per capita by region and county, 2010-2016. Update 18-1-19
- European Environment Agency (EEA), 2016. Urban sprawl in Europe. Joint EEA-FOEN report
- Eurostat (2019), Key figures on Europe, Publication Office of the EU
- Fischer, Frank (2012). Participatory Governance: From Theory to Practice. In David Levi-Faur (ed.), *The Oxford Handbook of Governance*, Oxford: Oxford University Press
- Grossman, Samantha (2012). French Theme Park 'Napoleonland' in the Works. TIME Available at <http://newsfeed.time.com/2012/01/24/french-theme-park-napoleonland-in-the-works/>. Accessed 25-11-2019
- Hermes, Jennifer (2012). Value Chain Sustainability: Collaboration the Key to Success. ENVIRONMENT AND ENERGY LEADER. Available at <https://www.environmentalleader.com/2012/06/value-chain-sustainability-collaboration-the-key-to-success/>. Accessed 21-11-19
- Ibanescu, Bogdan-Constantin & Mihai Bulai (2016). TOURISM BEHAVIOUR OF PERIURBAN LOCALITIES IN RELATION TO THE URBAN CENTRES. CASE STUDY: ROMANIA. *Economics & Tourism*, 3rd International Multidisciplinary Scientific Conference on Social Sciences & Arts SGEM 2016
- Labrianidis, L. & Vogiatzis, N. 2012. Highly Skilled Migration: What Differentiates the 'Brains' Who Are Drained from Those Who Return in the Case of Greece?. *Population, Space and Place*, 19(5): 472-486
- Matthews, Chris (2012). Top 10 Weirdest Theme Parks. TIME. Available at [http://content.time.com/time/specials/packages/article/0,28804,2106937\\_2106938\\_2106941,00.html](http://content.time.com/time/specials/packages/article/0,28804,2106937_2106938_2106941,00.html). Accessed 25-11-19
- Mitrakos, T. 2012. The Greek real estate market. Bank of Greece
- Paulakou, F. 2012. "Υπογεννητικότητα και γονιμότητα: Η εξέλιξη των δεικτών από το 1940 μέχρι και σήμερα". TEI Kalamatas. (Birth deficit and fertility: the evolution of indicators from 1940 to the present)
- Pesonen, Hanna-Leena (2001). Environmental Management of Value Chains Promoting Lifecycle Thinking in Industrial Networks. *Greener Management International*. 33: 45-58
- Polyzos, S., Minetos, D. & Niavis S. 2013. Driving factors and empirical analysis of urban sprawl in Greece. *Theoretical and Empirical Research in Urban Management*, 8(1): 5-29
- PwC. 2016. The housing market is no more the growth locomotive for the Greek economy, unless policies to boost demand and reduce oversupply are implemented
- Rawlins, Jonathan M., Willem J. De Lange & Gavin C. G. Fraser (2018). An Ecosystem Service Value Chain Analysis Framework: A Conceptual Paper. *Ecological Economics*. 147: 84-95
- Ravetz, Joe (2017). From 'smart' cities to 'wise': synergistic pathways for collective urban intelligence. JPI Urban Europe - URBAN TRANSITIONS PATHWAYS SYMPOSIUM. Available at [https://jpi-urbaneurope.eu/app/uploads/2017/04/Ravetz\\_From-smart-to-wise.pdf](https://jpi-urbaneurope.eu/app/uploads/2017/04/Ravetz_From-smart-to-wise.pdf). Accessed 25-11-19
- Report of the inter-party parliamentary committee regarding the demographic. Athens, 2018
- Richard, B., Kaak, K., & Orłowski, M. (2017). Theme Park Tourism. In *The SAGE International Encyclopedia of Travel and Tourism*. New York, NY: Sage, 1218-1221
- SISCODE (2019). Co-creation in Responsible Research and Innovation (RRI): Lessons learnt. Available at <https://siscodeproject.eu/article/co-creation-in-responsible-research-and-innovation-rri-lessons-learnt/>. Accessed 25-11-19
- UNDG (2016). APPLYING MULTI-STAKEHOLDER APPROACHES FOR SDG INTEGRATION. United Nations Sustainable Development Group. Available at <https://undg.org/programme/2030-agenda-section/multi-stakeholder-approaches/>. Accessed 25-11-19
- Vuignier, Renaud (2010). Place marketing and place branding: A systematic (and tentatively exhaustive) literature review. Working Paper de l'IDHEAP 5/2016. HAL Archives-ouvertes.fr. Available at <https://hal.archives-ouvertes.fr/hal-01340352/document>. Accessed 25-11-19