

# Estimating the economic impact of a long-term hunting ban on local businesses in rural areas in Greece: a hypothetical scenario

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## Abstract

*Estimating the economic impact of a long-term hunting ban on local businesses in rural areas in Greece: a hypothetical scenario.*— In December 2009, hunting was banned for a few days in Greece following the decision of the Council of State. The decision was issued when an animal rights organization claimed to the Court that there was no updated evidence about the impact of hunting on wild populations. This case prompted the present study, which focused on examining the hypothetical scenario of the possible impact of a long-term hunting ban on local businesses in rural areas in Greece. We carried out face-to-face interviews with entrepreneurs from the accommodation and food service sectors. Our results showed that most business owners interviewed considered the impact would be significant for their annual earnings. This finding should be taken into account by environmental decision makers because rural and mountainous areas in Greece are sparsely populated, and the few small businesses that still operate would not withstand drastic changes in rural tourism.

Key words: Economic contribution of hunting, Hunting restrictions, Accommodation services sector, Food service sector

## Resumen

*Estimación del impacto económico de una veda de caza a largo plazo sobre los negocios locales en las zonas rurales de Grecia: una situación hipotética.*— En diciembre del 2009, en Grecia se prohibió la caza durante unos pocos días, siguiendo la decisión del Consejo de Estado. Esta se tomó cuando una organización defensora de los derechos de los animales recurrió a la Corte argumentando que no existían pruebas actualizadas sobre el impacto de la caza sobre las poblaciones de animales salvajes. Estas circunstancias promovieron el presente estudio, que se enfocó hacia el examen de unas hipotéticas circunstancias del posible impacto de la veda de caza a largo plazo sobre los negocios locales de las zonas rurales de Grecia. Llevamos a cabo entrevistas cara a cara con los empresarios de los servicios de alojamiento y gastronomía. Nuestros resultados mostraron que la mayoría de propietarios de negocios entrevistados consideraban que el impacto sería significativo para sus ingresos anuales. Los gestores del medio ambiente deberían tener en cuenta este resultado, dado que las áreas rurales montañosas de Grecia están escasamente pobladas, y los pocos negocios que aún funcionan en ellas no podrían soportar cambios drásticos en el turismo rural.

Palabras clave: Contribución económica de la caza, Veda, Sector de servicios hoteleros, Sector de servicios gastronómicos.

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## Introduction

Hunting activity contributes to the economies of rural and mountainous areas (Booth, 2010; Samuelsson & Stage, 2007; Papaspyropoulos et al., 2012) and relatively high revenues can be generated by few clients (CIC, 2008; Lindsey et al., 2007). In Greece, the hunting period lasts from August 20th to March 10th (Hellenic Ministry of Environment, Energy, and Climate Change, 2012). During this period, business sectors close to hunting sites, such as those in the accommodation and food service sectors, are influenced financially by the hunting activity. The accommodation sector generates more than 1.3 million €, while the food service sector generates almost 7.3 million €, according to an independent survey ordered by the Panhellenic Union of Hunting Material Merchants (PEVEKE, 2011).

At the same time, there is a strong anti-hunting movement in Greece. Many animal rights organizations, environmental NGOs, and other groups undertake actions trying to restrict or completely ban hunting activity. During one such event, in 2009, the 'Greek Animal Rights and Ecological Association' was heard by the Hellenic Council of State for judicial review of the annual act which regulates hunting in Greece. The Council of State agreed the act needed updating and it ordered a hunting ban until this was undertaken. In reality, the ban lasted only a few days because an updated study about the abundance of game populations in Greece was submitted to the Ministry of Environment.

The idea of the present research paper was prompted by this incident, and by the fact that the anti-hunting movement is quite strong in Greece, and there are constant conflicts between hunting organizations and groups trying to restrict or ban hunting activity. We therefore set up a hypothetical scenario to examine how entrepreneurs considered their business would be affected if at some time a long-term hunting ban was imposed on a local area, or generally, in Greece. In this study we assessed the economic impact of a hypothetical hunting ban on small local businesses in terms of mean percentage of the total annual income of businesses, based on the entrepreneurs' testimonies.

## Background

### Economic contribution of hunting

Hunting plays a significant role in the economy of many countries (Molina-Martinez et al., 2002; Sokos et al., 2003; Croitoru, 2007; Sokos et al., 2009). In most northern Mediterranean countries, hunting benefits range from €4–8/ha, while for most southern and eastern Mediterranean countries estimated values are within €1–4/ha (Croitoru, 2007). In Greece, hunting contributes 2.3 billion €/annum to the country's economy (PEVEKE, 2011). A significant part of this amount can be allocated to hunting tourism (accommodation and food service sectors). Hunters spend a mean of 558€/annually and 58 €/hunting trip per person for accommodation and dining, respectively.

Many hunters, however, prefer to travel abroad to hunt, contributing significantly to the economies of the host countries. For example, the gross value of hunting tourism in South Africa was estimated at 68.4 million \$ in 2003 (Booth, 2010), and 30 million \$ in Canada (MacKay & Campbell, 2004). Overall, in Europe and the USA hunting revenues are estimated at 16 billion €/annum and 76 billion \$/annum, respectively (Booth, 2010; Grado et al., 2011).

### Hunting and anti-hunting in Greece

There are approximately 220 thousand hunters in Greece. Hunting is regulated by the Hellenic Ministry of Environment, Energy and Climate Change (2012). According to the Forest Law of 1969, the quarry belongs to the hunter and not to the land owner, a quite unique situation compared to other countries. A hunting license is required and is valid for a prefecture, a geographical region, or the whole country. The hunting licence fee is 100–150€. This money is then allocated to the Hunting Organizations and the public 'Green Fund' for the management of hunting activity. It is the hunting organizations that mainly employ wildlife ecologists and wardens and finance hunting management. The contribution of the Green Fund through Forest Service to hunting development is low (Birtsas et al., 2009).

Additionally, hunting organizations, as institutional actors in hunting, put pressure on the Government for fundamental hunting issues such as hunting restrictions. Pressure on the Government is also exerted by the anti-hunting movement in Greece, which is guided by animal rights organizations, environmental NGOs, political movements and other actors. This movement seems to present a strong urban character, similar to movements in other countries (Duda & Jones, 2009). The anti-hunting movement peaked in December 2009 when the Hellenic Council of State decided that the petition of the 'Greek Animal Rights and Ecological Association' against the annual hunting law was fair and that there was not available updated evidence about the abundance of wild populations of game species in Greece. The following analysis was prompted by the fact that the conflicts between hunting organizations and the anti-hunting movement may sometime in the future result in a local or general long-term hunting ban.

## Methodology

Data were collected through structured, face-to-face interviews conducted in the autumn of 2010. According to Maughan et al. (2004), 'the advantages of this approach for quantitative studies are that researchers can feel confident that the same 'stimulus' has been presented to all study participants, interviewer effects are minimised and, provided the questions are well-worded, good reliability should be relatively easy to achieve'. The questionnaires were administered to businesses in three administrative regions (former prefectures) Evritania, Messinia and Aitolokarnania

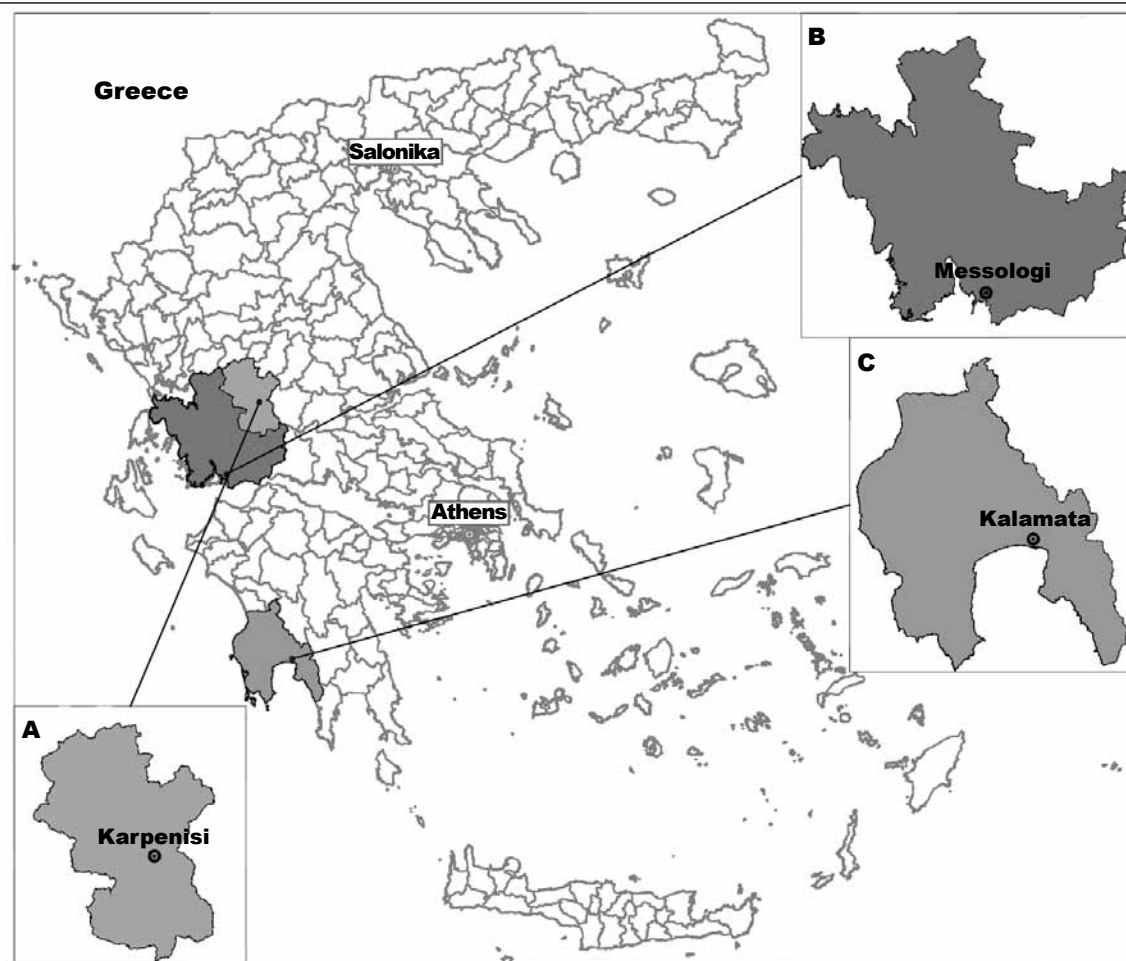


Fig. 1. Research area: A. Evritania Prefecture; B. Aitoloakarnania Prefecture; C. Messinia Prefecture.

Fig. 1. Área de investigación: A. Prefectura Evritania; B. Prefectura Aitoloakarnania; C. Prefectura Messinia.

(fig. 1). Evritania is a winter destination for domestic tourists (accommodation capacity peaks in December and January), while Messinia and Aitoloakarnania are mostly summer destinations for domestic and outbound tourists (accommodation capacity peaks in July–August) (Hellenic Statistical Authority, 2012)

Two types of questionnaires were administered; one for the accommodation service sector and one for the food service sector. The businesses were selected from the business catalogs obtained from the 'Chambers of Commerce and Industry' in each of the three regions (six catalogs). The catalogs were merged into two (one for each sector). A simple random sample was then taken from every catalog with the use of a random number table (Fowler & Cohen, 1995), and 74 businesses from the accommodation sector (20% of the population) and 89 from the food service sector (5% of the population) participated in the research. The uneven percentages of samples are due to the fact that the businesses in the food

service sector were far more numerous than those in the accommodation sector. Because all the interviews were personal (all three researchers visited the businesses, and they had to revisit some of them in order to interview the entrepreneurs), all the participants responded; therefore, the response rate was 100%.

Table 1 shows the variables used in the survey; these were used as the main questions during the interviews. The statistical analysis was performed using basic descriptive statistics, such as frequencies and means (Bradley, 2007) and the multivariate statistical method Correspondence Analysis. According to Markos et al. (2010) 'Correspondence Analysis is a multidimensional data analytic method, suitable for graphically exploring the association between two or more, non-metric variables without a priori hypotheses or assumptions'. The theoretical foundations of this method can be found in Papadimitriou (2007) and Greenacre (2010). The nominal variable 'Administrative region' and the ordinal one 'Do you consider this turnover significant for your

Table 1. Variables used in the survey.

*Tabla 1. Variables utilizadas en el estudio.*

Variable	Type	Levels
Administrative region (prefecture)	Nominal	Evritania Messinia Aitoloakarnania
Type of business	Nominal	Accommodation sector Food service sector
Do hunters use the business?	Nominal	Yes No
Price of the service	Scale	–
Perception about hunting	Nominal	Agree with hunting Neutral Disagree with hunting
Perception about hunter as client	Nominal	I want the hunter as a client Neutral I do not want hunter as a client
Turnover percentage by hunters as clients	Scale	
Do you consider this turnover significant for your business?	Ordinal	Important Neutral Negligible
Would a hunting ban result in an economic impact on your business?	Nominal	Yes No

business?’ were used in the Correspondence Analysis. The reason for using such a technique was that it can visualize data of a contingency table of two categorical variables and reveal patterns not apparent on the table frequencies (Greenacre, 2010). The variables that were used were determinant for revealing if the perceived category of economic impact (important, neutral, negligible) is related to a specific Greek rural area. Prior to performing correspondence analysis, the two variables were tested for collinearity with the Variance Information Factor, after they had been transformed to dummy variables (Hair et al., 2006).

All statistical analyses and the model validation were performed and confirmed using SPSS 19.0 (Kinnear & Gray, 2011).

## Results

Some descriptive statistics from the business owners’ answers were extracted first. Table 2 shows the absolute value and the percentage of businesses in the accommodation and food service sectors used by hunters in the three administrative regions. It also shows the mean price per service offered by the two sectors in the corresponding regions.

It was found that most businesses included in the sample are used by hunters. Businesses in the Evritania region, especially those in the accommodation sector, seem to be used less. This can be explained by the fact that Evritania is a region that is more than four hours drive away from Athens and Thessaloniki (the two largest cities in Greece and those with most hunters). Therefore, hunters may not choose it very often as a hunting place. Furthermore, Evritania is a mountainous area which, during the hunting period, is also influenced by other forms of tourism, such as adventure sports tourism, or religious tourism. Accommodation is expensive, and maybe hunters choose not to stay overnight in the region.

Table 3 shows owners’ perceptions about hunting and about hunters as clients. It shows a similar pattern to table 2. The Evritania region, especially concerning its accommodation sector, seems to differ from the other two regions. Less than half the businesses in Evritania’s accommodation sector seem to support hunting activity (slightly higher in the food service sector). However, the relation between the two variables was significant (Phi & Cramer’s  $V$   $p$ -value < 0.05), which means that those who wanted hunters as clients were also in agreement with hunting activity. Only 4.3% of the entrepreneurs were against hunting: however all of them wanted hunters as clients.

Table 2. Hunters' use of local businesses and businesses' mean price per service: Uh. Used by hunters; Mr. Mean price per room; Mp. Mean price per person.

*Tabla 2. Uso por parte de los cazadores de los negocios locales y precio medio por cada servicio: Uh. Utilizado por los cazadores; Mr. Precio medio por habitación; Mp. Precio medio por persona.*

	Accommodation sector			Food service		
	Total	Uh	Mr	Total	Uh	Mp
Evritania	19	12 (63%)	68.5	30	26 (87%)	15.0
Messinia	30	28 (93%)	35.0	29	28 (97%)	12.6
Aitoloakarnania	25	19 (76%)	38.0	30	30 (100%)	12.2

Table 3. Entrepreneurs' perceptions about hunting and hunters as clients: Ah. Agree with hunting; Hc. I want hunter as a client.

*Tabla 3. Percepciones de los propietarios de los negocios sobre la caza y los cazadores como clientes: Ah. Estoy de acuerdo con la caza; Hc. Quiero al cazador como cliente.*

	Accommodation sector			Food services sector		
	Total	Ah	Hc	Total	Ah	Hc
Evritania	19	8 (42%)	14 (74%)	30	16 (53%)	23 (77%)
Messinia	30	22 (73%)	25 (83%)	29	22 (76%)	25 (86%)
Aitoloakarnania	25	15 (60%)	25 (100%)	30	22 (73%)	30 (100%)

Table 4. Economic impact of hunting ban and its significance for the entrepreneurs: Ma. Mean annual income (in %). Ts. Do you consider this turnover significant for your business? (answering yes); Hb. Would a hunting ban result in an economic impact on your business? (answering yes).

*Tabla 4. Impacto económico de la veda de caza y su importancia para los propietarios de los negocios: Ma. Ingreso anual medio (en %); Ts. ¿Considera este intercambio significativo para su negocio? (sí como respuesta); Hb. ¿La prohibición de caza afectará económicamente a su negocio? (sí como respuesta).*

	Accommodation sector			Food services sector		
	Ma	Ts	Hb	Ma	Ts	Hb
Evritania	6.4	21%	63%	6.3	33%	73%
Messinia	8.6	39%	90%	11.5	14%	90%
Aitoloakarnania	20.0	84%	100%	17.5	95%	100%

Table 4 shows the answers to the main question in this study: how much and how significantly would a hunting ban affect local businesses? The table presents the estimates from the owners' mean annual income from hunters, its significance compared to their total annual income, and, if eliminated due to a hunting ban, whether this would have a significant economic impact on their businesses. It shows that the mean annual in-

come that would be lost for the businesses in the three regions varies from 6.3 to 20.0%. All three regions and both sectors believe that this would be an economic impact for their operation. However, especially in the Evritania region, it seems that there are few businesses which consider this turnover significant. This seems to confirm the previous finding, which showed that in Evritania, where the two sectors can rely on other

Table 5. Results of Correspondence Analysis.

Tabla 5. Resultados del Análisis de Correspondencias.

'Administrative unit' x 'Significance of economic impact'				
Dimension	Inertia	Variance explained	Chi-square	p-value
First	0.36	85.8	252 (df = 4)	0.000
Second	0.06	14.0		

forms of winter tourism, the impact of a hunting ban is considered important but not as significant as the turnover from other activities.

The above findings also seem to be confirmed by the application of the Correspondence Analysis. This methodology revealed that most of the information (variance) of the model is explained at the first dimension, thus the one-dimension solution is the best one. More than 85% of the total variance is explained, giving a good picture of the relation between the variables of 'Administrative region' and 'Significance of economic impact'. A little variation is explained by the second dimension, not more than 14%. Table 5 shows the inertia value of the first two dimensions, the variance explained, and the chi-square statistic, which justifies the assumption that the two variables are related. However, there was no collinearity because the Variance Inflation Factor had a value < 2 in all cases.

Figure 2 shows the interaction of the two variables. This figure reveals a pattern for the relation between the administrative region and the perception of the business owners in these regions about the economic impact of a hunting ban. It indicates that Aitoloakarnania's accommodation and food service sectors consider the economic loss as important for their operation. Messinia and Evritania, if seen in the first dimension, consider this impact as neutral or negligible. However, in the second dimension, it is only Evritania which is seen to consider the impact as negligible.

## Discussion

The research confirmed that local businesses are used by hunters during their hunting trips. Entrepreneurs understand the economic contribution of the activity

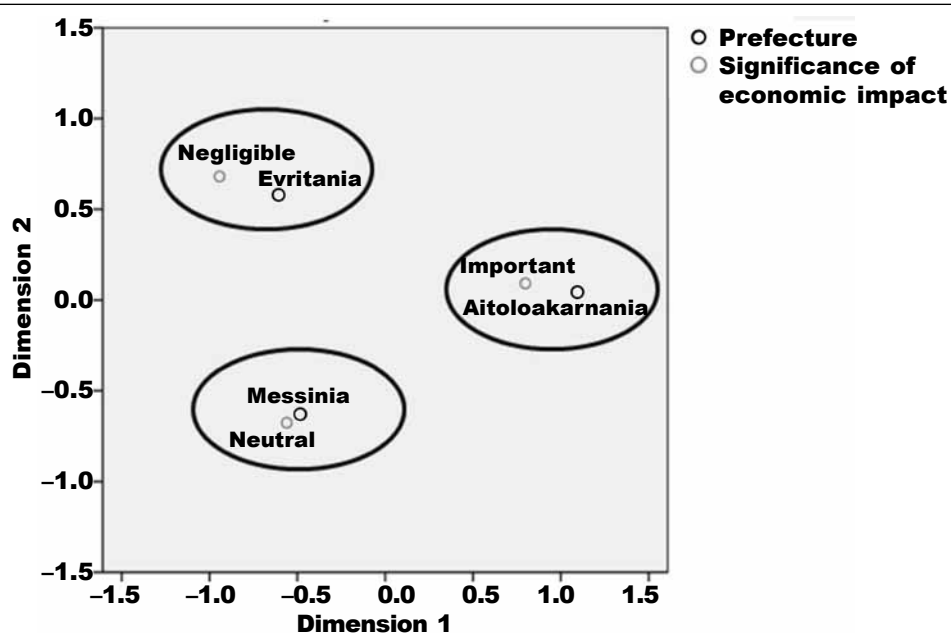


Fig. 2. Interaction of the two variables.

Fig. 2. Interacción de las dos variables.

and rely on income from hunting. They see hunting as positive, and they understand that a long-term ban may worsen their business' financial position.

Our results imply that in a region where winter tourism is not especially popular, such as the Aitolokarnania region, the economic impact of a hypothetical long-term hunting ban is considered important. Hunters support the viability of small local businesses through their activity, and they cannot rely on other forms of tourism in the winter. On the other hand, in a region where the income in the accommodation or the food service sectors relies on tourism in a particular season, such as ski-tourism, then hunting tourism, and hunting in general seems necessary but not determinant for the viability of the local businesses. Evritania and Messinia are two such regions; the former in the winter, and a little bit in the summer, and the latter especially in the summer. This pattern confirms previous studies in Greece which report that hunting supports small businesses in rural areas, especially in winter, where there are no other visitors and few other potential revenue sources (Sokos et al., 2003; Tsachalides et al., 2003; Hasanagas et al., 2008). Of course, the present results cannot be generalized for the whole of Greece. Other regions would need to be included in the sample before more general conclusions can be extracted. It could be expected, however, that the pattern would be confirmed if rural regions in northern Greece were included in the research as such areas are not characterized as attractive to commercial tourism, especially if compared to the Greek islands or other renowned regions.

Future studies could be conducted to estimate such an impact in terms of jobs lost, in terms of businesses closing down, or in terms of people leaving their homeland to find new jobs. The impact on other sectors—such as the energy sector and the hunting merchandise sector—could also be estimated. Findings from such studies could translate all these effects into actual amounts of money, and not percentage estimations, which is a limitation of the present paper.

Results from the present study suggest that a long-term hunting ban would have a significant economic impact (6.3–20%) on businesses that depend on hunting activity. It should be kept in mind that there are instances when hunting bans did not achieve the main objectives that they were set out to meet, that is, to increase populations and eliminate poaching. Baker et al. (2002), for example, found that the hunting ban of foxes in Britain had no measurable impact on fox populations. Additionally, in a study of sub-Saharan Africa, Lindsey et al. (2007) found that as well as a loss in revenue, a hunting ban led to an upsurge in poaching due to the removal of incentives for conservation. This latter finding is also apparent in Greece, in the Amvrakikos wetland. Although a hunting ban has been in place for many years in this region, both environmental NGOs (which are still in favour of the ban) and hunting organizations (which are against the ban) complain about the poaching in the region, illustrating how a hunting ban can impact on species abundance policy as well as on the local economy. Therefore, the state should develop and implement more integrated management plans for wildlife, also

taking into account the local people needs and the socioeconomic impacts of hunting bans on small local businesses in rural areas.

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