ANALYZING THE IMPACTS OF INFORMATION IN THE PREVENTION OF FOREST FIRES IN GREECE

Paraskevi Karanikola
Stilianos Tampakis
Evangelos Manolas
Georgios Tsantopoulos

ABSTRACT

The forest fires which occurred in the prefecture of Ilia, Greece, in August 2007 resulted in significant losses in forest lands, property and human lives. The citizens behaved as simple spectators of the disaster. Although they could have reacted, they did nothing. The citizens, however, declare that they know what actions they need to take in case of fire. Their information regarding forest fires mainly comes from television and radio, family and friends, newspapers and magazines and education. Indeed, it seems that through interpersonal channels of communication better results are achieved. In confronting forest fires, knowledge alone is not sufficient. In order to effectively confront forest fires, the local population also needs to be trained and organized in a voluntary system of confrontation.

Keywords: Forest Fire, Ilia 2007, View of Citizen, Citizen Participation, Greece

JEL Classification: Q28, Z18, Z13

1. INTRODUCTION

The prefecture of Ilia is among the most fire-struck prefectures of Greece. For the period 2000-2009 it was second in the list of prefectures with the greatest number of agro-forest fires and first in the list of prefectures with the most destructive agro-forest fires (Gourbatsis, 2010). Indeed, in the period 24-28 August 2007 it had the most serious problem of all areas in Greece as a result of extreme weather temperatures which were higher than 40°C and north-eastern winds of a speed of 29 km/h (Xanthopoulos et al., 2008). As a result of these fires, 38.94% of forest land in the prefecture of Ilia was burned (Kaoukis, 2008) while 44 people lost their lives (Riga, 2010).

The synergistic effect of fuel accumulation and weather can explain the large and catastrophic wildfires of 2007 in Peloponnisos (Koutsias et al., 2012). These characteristics did not allow the confrontation of fire in a direct manner, since it was difficult to confront them by ground forces or even by air forces. However, in many cases it was possible, and there was time for clear-cutting in the perimeter of villages during evening or morning hours; however, in many of these cases, the locals did not engage in such activity (Miltiadis and Xanthopoulos, 2009). Indeed, in one case the citizens, in their effort to escape from their village, which eventually did not get burned, were trapped in open space and finally lost their lives. Generally, we can say that the citizens did not have the necessary knowledge and guidance as to how they should react. The above was also confirmed through a research project in which the majority of citizens in Ilia replied there was a lack of education and

provision of information to the citizens regarding how forest fires are confronted (Karanikola et al., 2011). Having an informed public is an important part of the mechanism for the prevention and confrontation of forest fires. The aim of such information is to make the public aware of the causes and handling of forest fires (Baden, 1981). Such information can also contribute greatly to the formation of effective policy at both national and regional levels (Gonzalez-Duque and Panagopoulos, 2010; Noronha, 2011).

The basic aims of the research are to investigate how citizens get their information regarding forest fires, how informed they are regarding actions they need to take in case of forest fires and the evaluation of the causes of the forest fires which took place in the prefecture of Ilia in 2007. The paper also attempts to connect information sources with the actions which citizens need to take in case of forest fires. The investigation of the sources from which citizens get their information is an important tool for the purpose of designing appropriate strategies for the solution of problems (Tsantopoulos and Karamichas, 2009). Real and substantial environmental information becomes practice when citizens, through appropriate methods, equip themselves with adequate information so that they can develop an informed opinion on environmental issues which, in turn, will be the basis for good decisions regarding the necessary actions (Skanavis, 2004; Alberto Pérez, 2012).

2. METHOD OF RESEARCH

The area of this research was the prefecture of Ilia. The research was carried out in 2008, a year after the destructive fires of 2007, so that the citizens of the areas would have ceased being emotionally charged and be able to freely speak about the forest fires which occurred in their area. To investigate the views of the citizens of the prefecture of Ilia, the method used was simple random sampling. This method was chosen because of its simplicity and the fact that, when compared to other methods, it needs less information about the population under study (Freese, 1984; Matis, 1992; Damianos, 1999; Kalamatianou, 2000). The 'population' studied was the total of households of the prefecture of Ilia. As a framework of sampling, we used the catalogues of electricity consumers. The estimation of the proportion of the population and of standard error, sp, is given by the formulas of simple random sampling.

In order to calculate the size of the sample, we needed to conduct pre-sampling, with the size of the sample being 50 people. The size of the sample for each variable was estimated on the basis of the formulas of simple random sampling (for probability (1-a) 100 = 95%, e = 0.05 and without the correction of finite population because n is small in relation to the size of the population N) (Freese, 1984; Matis, 1992; Pagano and Gauvreau, 1996; Kalamatianou, 2000). Thus, the most changing variable is estimated with desirable precision, and the rest with higher precision than originally determined (Matis, 1992). In this case the size of the sample was calculated to be 385 households. For the analysis of the data, the statistical package SPSS was used.

The total of the questions on sources of information constitute a multi-theme variable on which reliability is tested (reliability analysis). In order to find the internal reliability of a questionnaire, we use the alpha co-efficient (or the reliability co-efficient α-Cronbach); that is, we try to find if the data have the tendency to measure the same thing (Howitt and Gramer, 2003). When the alpha coefficient is 0.70 or greater it is regarded as satisfactory (Howitt and Gramer, 2003), and when it is greater than 0.80 it is regarded as very satisfactory. In practice, smaller alpha co-efficients, with values not less than 0.60, may also be accepted (Siardos, 1999).

The testing must be reliable in order to be useful. However, it is not enough to be reliable, it must also be credible, and this can be done through the application of factor analysis

(Siardos, 1999). Factor analysis is a statistical method which aims to find the common factors within a group of variables (Sharma, 1996). It tries to interpret structure rather than the variability (Djoufras and Karlis, 2001). Its goal is to reproduce the correlations between the variables to the highest degree, by using the smallest possible number of factors and thus lead to a solution which is "unique" and easily interpreted (Siardos, 1999).

More specifically, we used the principal components method, which is based on a spectral analysis of the variance table (correlation) (Djoufras and Karlis, 2001). The criterion used for the significance of the principal components is the one proposed by Guttman and Kaiser (Cattell, 1978; Frangos, 2004), according to which, the limit for receiving the appropriate number of principal components is determined by the values of the typical roots which are equal or greater than one. We also resorted to the rotation of the principal components matrix by using the maximum variance rotation method by Kaiser (Harman, 1976). According to Frangos (2004), the variables which "belong" to each factor are those whose burden, on the table indicating the burdens of the factors after rotation, is greater than 0.5 for that factor.

In order to test the pairs of variables which refer to the sources from which the citizens get their information and the pairs of variables which refer to knowledge citizens say they have regarding actions they need to take in case of forest fires, the test of independence was used. The criterion used was X2 (Mendenhall, 1979; Kiohos, 1993; Steel et al., 1997; Makrakis, 1997; Pagano and Gauvreu, 2000; Retiniotis, 2004). In the test of independence of features, the null hypothesis that is tested is "Ho: there is no difference between the variables".

In order for the test of independence to be credible, the expected frequencies should not be less than 1, while those that are less than 5 should not exceed 20% of the total of the frequencies (Koliva-Machaira and Mpora-Senta, 1995; Gnardellis, 2003; Siomkos and Vasilikopoulou, 2005). So, in order to avoid problems with the expected frequencies, we grouped the answers in each of the two groups of variables as follows: a) "very unimportant – mediocre" and "important – very important", b) "none – fairly" and "much – very much". The statistical measure X2 is based on comparing the expected frequencies to the observed frequencies and is done through the Crosstabs procedure of the statistical program SPSS (Apostolakis and Kastania, 1994; Howitt and Gramer, 2003; Frangos, 2004).

However, neither the measurement of intensity nor the specification of the nature of the (probable) relation of the variables can result from the statistical X2 (Tsantas et al., 1999). This is the reason contingency measures were created. In categorical imperatives only the intensity is meaningful, and the measures which rely on the statistical X2 are the phi coefficient, Gramer's V coefficient and the contingency coefficient (Tsantas et al., 1999; Retiniotis, 2004). The phi coefficient examines the direction between the variables (Siomkos and Vsilikopoulou, 2005). For reasons of space, although the above contingency measures were checked, nevertheless, these are not presented in the results. Indeed, for the pairs of variables, the co-efficient phi (Table 4) receives a positive value.

3. RESULTS – DISCUSSION

The dominance of the mass media regarding communication practices has brought several changes in the sector of provision of information to the public. The transmission of large amounts of information very quickly creates a false feeling of directness and active participation in what is happening (Bibi, 2009). During the awareness stage, mass media is the most effective communication channel. However, after the persuasion stage has been completed, interpersonal communication channels, particularly with expert information sources, become the most influential method (Fliegel, 1993). Citizens prefer more interactive

forms of information exchange (Daniels et al., 1996; Parkinson et al., 2003). Such two-way communication is most effective in reducing the inherent uncertainty of adopting a new innovation, as it promotes discussion and clarification. It is no surprise that interpersonal communication is particularly important for complex innovations or ones that require continual monitoring (Fliegel, 1993). People tend to respond better to messages coming from recognized sources, instead of anonymous information that comes from brochures, newspaper articles, written plans, and so forth (Shindler, 2007).

The results regarding the evaluation of the sources on forest fires from which the citizens of Ilia get their information, are presented in Table 1. 38.4% of the citizens of Ilia believe television and radio are very important sources, 26.5% important and 23.6% mediocre. 38.7% of the citizens believe family and friends are very important sources and 24.4% important and 24.4% mediocre. 34.5% of the citizens accept newspapers and magazines as important sources of information, while 23.6% and 22.6% as mediocre and very important respectively. 36.6% of the citizens think education is an important source of information while 26.8% think of it as mediocre. Next in order of importance comes the internet, noting that 21.3% characterizes this source as important and 25.7% as very unimportant, showing that a big percentage of the population (older in age) does not have access to the internet. 27.0% of the citizens think information booklets are a mediocre source of information, 22.3% important, 21.3% unimportant and 21.3% very unimportant. 27.5% of the citizens think books and encyclopedias are a mediocre source of information, 24.9% unimportant and 21.3% important. Finally,27.5% believe voluntary organizations are a very unimportant source of information and 24.7% a mediocre one.

Table 1. Sources of information regarding forest fires

		Very unimportant	Unimportant	Mediocre	Important	Very important
Family and friends	%	2.9	9.6	24.4	38.7	24.4
	s_p	0.0850	0.0150	0.0219	0.0249	0.0219
Education	%	4.4	16.4	26.8	36.4	16.1
	s_p	0.0105	0.0189	0.0226	0.0245	0.0188
Television - radio	%	1.3	7.5	26.2	26.5	38.4
	s_p	0.0058	0.0135	0.0224	0.0225	0.0248
Newspapers and magazines	%	4.7	14.5	23.6	34.5	22.6
	s_p	0.0108	0.0180	0.0217	0.0243	0.0213
Books - encyclopedias	%	18.4	24.9	27.5	21.3	7.8
	s_p	0.0198	0.0221	0.0228	0.0213	0.0137
Internet	%	25.7	17.7	18.7	21.3	16.6
	s_p	0.0223	0.0195	0.0199	0.0209	0.0190
Information booklets	%	21.3	21.3	27.0	22.3	8.1
	s_p	0.0209	0.0209	0.0227	0.0213	0.0139
Voluntary organizations	%	27.5	18.7	24.7	19.7	9.4
	s_p	0.0228	0.0199	0.0220	0.0203	0.0149

The total of the above questions constitutes a multi-theme variable. In order to check the consistency of these equivalent questions (variables), we used reliability analysis. The value of the reliability co-efficient alpha is significantly high (0.801). This constitutes a strong

indication that the degrees of the scale are logically consistent; that is, the data have the tendency to measure the same thing.

Before applying factor analysis, we checked our data in order to ensure that they are appropriate. We also checked if all variables are suitable for use in the model. In table 2, we see the burdens, which are the partial correlation coefficients of the eight variables with each of the three variables that have been extracted from the analysis. The greater the burden of a variable in a factor, the more this factor is responsible for the total variance of degrees in the variable we study. The variables which "belong" to each factor are those for which the burden (columns 1, 2, 3) is greater (than 0.5) in this factor.

Table 2. Table of factor burdens, before and after rotation

Variable	Factor burdens					
	Before rotation			After rotation		
	1	2	3	1	2	3
Family and friends	0.415	-0.269	0.786	0.032	0.088	0.924
Education	0.699	-0.283	0.318	0.499	0.107	0.639
Television and radio	0.500	0.700	0.285	0.067	0.887	0.177
Newspapers and magazines	0.588	0.646	0.001	0.295	0.822	-0.012
Books and encyclopedias	0.707	-0.287	-0.080	0.703	0.032	0.306
Internet	0.731	-0.063	-0.359	0.795	0.187	-0.004
Information leaflets	0.759	-0.141	-0.205	0.765	0.159	0.166
Voluntary organizations	0.721	-0.089	-0.301	0.766	0.171	0.051

According to the above results, the first factor includes the variables "books and encyclopedias", "internet", "information leaflets" and "voluntary organizations". This factor can be named "informing after the activation of the citizens".

The second factor titled "provision of information by the mass media" includes the variables "television and radio" and "newspapers and magazines".

The third factor titled "interpersonal channels of communication" includes the variables "family and friends" and "education". Indeed, we can accept that the variable "education", since the value is marginally less than 0.5, belongs to the first factor and constitutes a bridge between the first and third factors. In other words, the first and third factors are connected to each other. This is logical since the institutions of family and education teach/activate people to collect the information they need.

However, the issue is how today's confusion of knowledge with information is not a simple confusion of ideas but a confusion of mental processes that pushes people towards a more and more shallow evaluation of pieces of information without direction and cohesion (Davou, 2000). Therefore, the citizens of Ilia were asked if they know or if they are aware of the actions they need to take in case of fire; or, in other words, the knowledge they have is indeed deeper. In addition, an effort was made to connect sources of information to this particular knowledge. We should accept that the answers of the citizens are likely a reflection of the numerous formal and informal ways in which people may learn about and understand wildfire mitigation (McCaffrey et al., 2011).

In general, we see that the citizens of Ilia declare that they are knowledgeable as to how they should act in case of forest fire (Table 3). In particular, regarding ways of protecting their lives, 29.6% say they are very knowledgeable, 27.3% sufficiently knowledgeable and 26.5% extremely knowledgeable. Regarding more general measures of forest fire prevention, 33% declare they are very knowledgeable, 27% sufficiently knowledgeable and 20.5% extremely

knowledgeable. In relation to preventive measures regarding protection of houses from forest fires, 38.2% say they are very knowledgeable and 29.4% sufficiently knowledgeable. Regarding ways for protecting houses during forest fires, 30.1% declare they are sufficiently knowledgeable and 27.8% very knowledgeable. The citizens of Ilia seem less knowledgeable regarding ways of putting out forest fires since 29.1% declare they are very knowledgeable, 26.8% sufficiently knowledgeable and 20.3% characterize their knowledge as poor. There is a need for more systematic education – provision of information to the citizens on how forest fires should be confronted (Karanikola et al., 2011).

Table 3. Information regarding actions in case of forest fires

		None	Poor	Fairly	Much	Very much
More general preventive measures regarding forest fires	%	4.9	14.5	27.0	33.0	20.5
	s_p	0.0111	0.0180	0.0227	0.0240	0.0206
Preventive measures regarding protection of houses from forest fires	%	3.1	16.1	29.4	38.2	13.2
	s_p	0.0089	0.0188	0.0232	0.0248	0.0173
Methods for putting out forest fires	%	7.5	20.3	26.8	29.1	16.4
	s_p	0.0135	0.0205	0.0226	0.0232	0.0189
Ways for protecting houses during forest fires	%	4.9	18.7	30.1	27.8	18.4
	s_p	0.0111	0.0199	0.0234	0.0229	0.0198
Ways for protecting your life during forest fires	%	5.2	11.4	27.3	29.6	26.5
	s_p	0.0113	0.0162	0.0227	0.0233	0.0225

Table 4 presents the results of the test of independence on forest sources regarding forest fires, as well as information regarding actions which citizens need to take in case of forest fires. Therefore, we see that better information coming from family and friends and education (that is what we call basic education) leads to better knowledge regarding what to do in case of fire. Also, better knowledge provided by information leaflets leads to better knowledge as to what to do in case of fire with the exception of ways for putting out forest fires. Better information from books and encyclopedias leads to better knowledge regarding ways for putting out forest fires. Better information coming from television and radio leads to better knowledge regarding more general, preventive measures against forest fires. Finally, better information from voluntary organizations leads to better knowledge regarding ways for protecting life during forest fires. For pairs in Table 4 for which no values are mentioned, we cannot reject the null hypothesis (Ho); therefore, we are not certain whether or not the pairs of the variables are independent among them.

Table 4. Results of the test of independence among sources of information and information regarding actions in case of forest fires

		Family and friends	Education	Television-Radio	Newspapers and magazines	Books-encyclopedias	Internet	Information leaflets	Voluntary organizations
More general preventive measures against forest fires	Value	6.436	5.945	8.031				11.701	
	A. Sig.	0.011	0.015	0.005				0.001	
Preventive measures regarding protection of houses against forest fires	Value	7.582	8.306					13.920	
	A. Sig.	0.006	0.004					0.000	
Methods for putting out forest fires	Value	10.875	6.234			4.304			
	A. Sig.	0.001	0.013			0.038			
Ways for protecting houses during forest fires	Value	9.636	14.507					5.875	
	A. Sig.	0.002	0.000					0.015	
Ways for protecting your life during forest fires	Value	12.596	13.204					20.664	5.282
	A. Sig.	0.000	0.000					0.000	0.022

In order to confront forest fires, we should work as much as possible for the eradication of the causes which create them (Kailidis et al., 2004). Through the evaluation of the causes of the forest fires which occurred in 2007 in the prefecture of Ilia, it becomes obvious that the citizens think that the most important causes of forest fires are either from being on purpose (arson) or from negligence, while the causes of random event or natural causes are the least accepted causes (Table 5). 40.5% of the citizens think that setting a fire on purpose for economic reasons is a very important cause of forest fires, 31.7% an important cause and 17.9% a mediocre cause. Urban and tourist areas were developed at the expense of forest lands, and fire was used as a "tool" for making land appear as agricultural land so that such lands could be exploited for commercial purposes (Karanikola and Tampakis, 2003).

Table 5. Evaluation of the causes of forest fires which occurred in 2007 in the prefecture of Ilia

		Very unimportant	Unimportant	Mediocre	Important	Very important
Negligence	%	5.7	10.9	19.7	35.6	28.1
	s_p	0.0118	0.0159	0.0203	0.0244	0.0229
Random event	%	17.7	28.8	26.5	20.0	7.0
	s_p	0.0195	0.0231	0.0225	0.0204	0.0130
Natural cause - thunderstorm	%	30.6	28.8	19.2	9.9	11.4
	s_p	0.0235	0.0231	0.0201	0.0152	0.0162
Economic expediency	%	4.4	5.5	17.9	31.7	40.5
	s_p	0.0105	0.0116	0.0196	0.0237	0.0251
Political expediency - elections	%	6.2	11.9	23.4	25.7	32.7
	s_p	0.0123	0.0166	0.0216	0.0223	0.0239
Absence of forest cadastre	%	12.7	18.7	26.0	22.3	20.3
	s_p	0.0170	0.0199	0.0224	0.0213	0.0205

Thirty-five percent of the citizens think that negligence is an important cause of forest fires and 28.1% a very important cause. Programs for informing the public regarding prevention and control of forest fires should be intensified in Mediterranean countries so that they can contribute to a gradual reduction of forest fires which are caused by negligence (Tampakis et al., 2005).

32.7% of the citizens think that political expediency – elections is a very important cause of forest fires, 25.7% an important cause and 23.4% a mediocre cause. In periods of national disasters, political crises and elections, we generally witness an increase of forest fires in Greece (Kailidis and Karanikola, 2004). 26.0% of the citizens think that the absence of forest cadastre is a mediocre cause of forest fires, 22.3% an important cause and 20.3% a very important cause. Preventing building activities on forest lands essentially constitute an indirect method of protecting these lands, because the easiest way of removal of vegetation is repetitive forest fires. Indeed, the best way for achieving that is the creation of a forest cadastre (Karanikola and Tampakis, 2005).

Finally, 28.8% of the citizens think that random events are an unimportant cause of forest fires and 26.5% a mediocre cause, while 30.6% of the citizens think that natural events – thunderstorms are a very unimportant cause and 28.8% unimportant cause. We see the same in another paper on the views of citizens in Greece as a whole: thunderstorms as natural causes and forest fires caused by random events have small percentages of acceptance as a cause of forest fires (Karanikola and Tampakis, 1998).

4. CONCLUSIONS

The citizens of Ilia say that they get their information regarding forest fires from television and radio, family and friends, newspapers and magazines and education. Through the aid of factor analysis, the variables "television and radio" and "newspapers and magazines" constitute a factor titled "information from the mass media", while the variables "family and friends" and "education" constitute a factor titled "interpersonal channels of communication". Next in order of importance comes the internet – although a large percentage of the population (those older in age) do not have access to it – information leaflets, books and encyclopedias, and voluntary organizations which constitute a factor named "informing after the activation of the citizens".

The citizens also declare that, regarding confrontation of forest fires, they have deeper knowledge; in other words, they know the actions they need to take in case of fire. In particular, they know how to protect their lives during forest fires, about more general preventive measures against forest fires, about preventive measures regarding protection of houses from forest fires and about ways for protecting houses during forest fires. However, on ways of putting out forest fires, they seem to be less knowledgeable.

This research becomes interesting when, via the test of independence, information sources and existing knowledge are connected. This is because the results are fully compatible with everything mentioned above on different forms of communication. Therefore, we see that better information from family and friends and education, i.e. information from interpersonal channels of communication, leads to better knowledge as to what we should do in case of fire. We also see that information leaflets are an important source of information, which in the case of forest fires are published by the Forest Service and the Fire Department, that is, from recognized sources of information. However, information leaflets, due to the large amounts of knowledge involved, cannot cover the subject of putting out forest fires. This seems to be done through information from books and encyclopedias. Regarding more general preventive measures against forest fires, information from television and radio lead to better knowledge.

It is a fact that the messages from the mass media mainly concern the prevention of fire from citizen negligence and immediately contacting the Forest Service when they realize that a fire has started. On the other hand, better information from voluntary organizations leads to better knowledge regarding ways of protecting life during forest fires.

It becomes obvious that education and, indeed, education from recognized sources such as the Forest Service and the Fire Department would constitute a positive development towards better knowledge and training of citizens on issues related to forest fires.

However, it remains a question as to why the majority of citizens did not do what they had to do in case of fire, since they declare that they know what they needed to do. Confronting forest fires is a science (knowledge), but it is also an art. In other words, it is necessary to combine theoretical knowledge with practical (manual) action. Indeed, the activation of citizens should assist fire extinguishing forces and be done under their guidance, e.g. clear-cutting in the perimeter of inhabited areas and when the fire has not yet reached the specific area. Indeed, we do not need theoretical education but practical education and organization of voluntary groups for dealing with natural disasters that will be guided by specialists, e.g. those who trained these groups, when this is necessary.

Finally, in assessing the causes of the forest fires which occurred in 2007 in the prefecture of Ilia, the citizens think that the most important causes of forest fires are expediency (arson) and negligence rather than random events or natural causes.

REFERENCES

Alberto Pérez, R. (2012). The State of the Art in Strategic Communication. Spatial and Organizational Dynamics, 10:52-101.

Apostolakis, I.A. and Kastania, A.N. (1994). Decision Making Using SPSS/PC+. A. Stamoulis Publications. Thessaloniki.

Baden, W.J., Translated by Megalophonos K. (1981). Informing the public on the prevention and control of forest fires. Dasika Chronika. Issue 9-10:300-304.

Bibi, M. (2009). Mass Media of Communication and Ethics of Journalism in Crisis. The Role of Digital Reality. Program of Post-graduate Studies "Psychology and Mass Media of Communication''. Pantion University of Social and Political Sciences. Athens.

Cattell, R.B. (1978). The Scientific Use of Factor Analysis in Behavioral and Life Sciences. Plenum. New York.

Damianos, X.X. (1999). Sampling Methodology: Techniques and Applications. Third Printing, Aethra Publications. Athens.

Daniels, S.E, Walker, G. Carroll, M. and Blatner, K. (1996). Using collaborative learning in fire recovery planning. Journal of Forestry. 94(8):4-9.

Davou, M. (2000). Processes of Thought in the Age of Information. Papazisis. Athens.

Djoufras, I., and Karlis, D. (2001). Elements of Multivariate Data Analysis, Notes for the course Data Analysis I, Department of Business Administration, University of the Aegean.

Frangos, C.K. (2004). Market Research Methodology and Data Analysis with the Application of the Statistical Package SPSS for Windows. Interbooks Publications. Athens.

Freese, F. (1984). Principles of Forest Sampling, Translation – Editing, M. A. Karteris, Thessaloniki.

Fliegel, E.C. (1993). Diffusion Research in Rural Sociology: The Record and Prospects for the Future. Greenwood Press. Westport, Connecticut.

Gnardellis, C. (2003). Applied Statistics. Papazisis Publications. Athens.

Gonzalez-Duque, J.A., Panagopoulos, T. 2010. Urban planning throughout environmental quality and human well-being. Spatial and Organizational Dynamics, 4, pp. 7-20.

Gourbatsis, A. (2010). The crime of arson: The geography of agro-forest fires 2000-2010. Acceded in 10th of January 2011, on the Web site of: http://www.isthmos.gr/article.php?news_id= 18046.

Harman, H.H. (1976). Modern Factor Analysis. The University of Chicago Press. Chicago.

Howitt, D., and Gramer, D. (2003). Statistics with SPSS 11 and Windows. Klidarithmos. Athens.

Kailidis, D., Karanikola, P. and Tampakis, S. (2004). Forest fires in Greece in the 20th century. Proceedings of the 1st Environmental Conference, Orestiada, 7-9 May 2004, p. 249-258.

Kailidis, D., and Karanikola, P. (2004). Forest Fires 1900-2000. Giahoudis. Thessaloniki.

Kalamatianou, A.G., (2000). Social Statistics, Methods of One-Dimensional Analysis. To Ikonomiko. Athens.

Kaoukis, K. (2008). Forest Fires in the prefecture of Ilia in the period 1987-2007 and their peculiarities. Day conference organized by the Department of Geography of Charokopeio University on "Forest Fires in Southern Europe and the Experience of the Summer 2007'', Athens 2008. Acceded in 10th of January 2011, on the Web site of: http://portal.tee.gr/portal/ page/portal/SCIENTIFIC_WORK/anasigr/files/Kaoukis-Imerida-ForFire-Harokopio.pdf

Karanikola, P., and Tampakis, S. (1998). Causes of Forest Fires and Citizens. Scientific Annals of the Department of Forestry and Natural Environment, Aristotle University of Therssaloniki. Volume MA/2 – Vol. 41/2, p. 1387-1410.

Karanikola, P., and Tampakis, S. (2003). Social groups and forest fires. Proceedings of the 11th National Forestry Conference, Olympia, 30 September - 3 October 2003, p. 583-590.

Karanikola, P., and Tampakis, S. (2005). Building activities on forest lands. Scientific Annals of the Department of Forestry and Natural Environment, Aristotle University of Therssaloniki. Vol. MB/1 – Vol. 42/1, p. 169-184.

Karanikola, P., Tampakis, S. Manolas, E. and Papalinardos, I. (2011). The 2007 forest fires in the prefecture of Ilia: The views of citizens with regard to the actions taken before, during and after the fires. International Journal of Environmental Studies. 68(4):687-701.

Kiohos, P.A. (1993). Statistics. "Interbooks" Publications. Athens.

Koliva-Machaira, F., and E. Mpora-Senta. (1995). Statistics, Theory and Applications. Zitis Publications. Thessaloniki.

Koutsias, N., Arianoutsou, M. Kallimanis, A. Mallinis, G. Halley, J. and Dimopoulos, P. (2012). Where did the fires burn in Peloponnisos, Greece the summer of 2007? Evidence for a synergy of fuel and weather. Agricultural and Forest Meteorology. 156:41- 53.

Makrakis, V.G. (1997). Data Analysis in Scientific Research using SPSS. Gutenberg Publications. Athens.

Matis, K. (1992). Forest Sampling. Aristotle University of Thessaloniki. Thessaloniki.

McCaffrey, S.M., Stidham, M. Toman, E. and Shindler, B. (2011). Outreach Programs, Peer Pressure, and Common Sense: What Motivates Homeowners to Mitigate Wildfire Risk? Environmental Management. 48:475–488.

Mendenhall, W. (1979). Introduction to Probability and Statistics. Fifth Edition. Duxbury Press.

Miltiadis, A., and Xanthopoulos, G. (2009). The behaviour of the big forest fires of 2007 in Greece. Proceedings of the 14th National Forestry Conference, Patra 1-4 October 2009, p. 591-602.

Noronha, T. (2011). The Impacts of Public Policies for Regional Development in Portugal. Spatial and Organizational Dynamics, 6:39-51.

Pagano, M., and K. Gauvreau. (2000). Principles of Biostatistics. Ellin. Athens.

Parkinson, .M., Force, J.E. and Kapler, J. (2003). Hands-on learning: Its effectiveness in teaching the public about wildland fire. Journal of Forestry. 10:21-26.

Retiniotis, S.N. (2004). Statistics: From Theory to Practice with SPSS 11.0. New Technologies Publications. Athens.

Riga, X. (2010). Investigating the Effects of Forest Fires in the Atmosphere: The Case of the Prefecture of Ilia. B.A. dissertation, Department of Geography, Charokopio University.

Sharma, S. (1996). Applied Multivariate Techniques. John Wiley and Sons, New York.

Shindler, B. (2007). Public Acceptance of Wildland Fire Conditions and Fuel Reduction Practices: Challenges for Federal Forest Managers. In T.C. Daniel, M. Carroll, C. Moseley and C. Raish (eds), A Synthesis of Wildfire Social Science, People, Fire and Forests. Oregon State University Press Corvallis. p. 37-54.

Siardos, G.K. (1999). Methods of Multivariate Statistical Analysis, Part I: Investigating Relationships between Variables. Zitis. Thessaloniki.

Siomkos, G.I., and Vasilikopoulou, A.I. (2005). Applying Analysis Methods in Market Research. A. Stamoulis Publications. Athens.

Skanavis, C. (2004). Environment and Communication: Having the Right to Choose. Kalidoskopio publishing Company. Athens.

Steel, R.G.D., Torrie, J.H. and Dickey, D.A. (1997). Principles and Procedures of Statistics a Biometrical Approach. Third Edition. WCB/McGraw-Hill.

Tampakis, S., Papageorgiou, A. Karanikola, P. Arabatzis, G. and Tsantopoulos, G. (2005). The forest fires in the Mediterranean from a policy point of view. New Medit, Mediterranean Journal of Economics, Agriculture, and Environment. 3:47-51.

Tsantas, N., Moisiadis, C. Bagiatis, N. Chatzipantelis, T. (1999). Data Analysis using Statistical Packages. Zitis Publications. Thessaloniki.

Tsantopoulos, G., and Karamichas, J. (2009). Communication and Greek environmental organizations: Means of communication and influencing factors. Journal of Environmental Protection and Ecology. 10:266-284.

Xanthopoulos, G. (2009). Forest Protection and Fire Suppression. WWF Greece. Athens.