

Nature and quality of life: the case of Kolindros, prefecture of Pieria, Greece. An application of multidimensional data analysis methods

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1. Introduction

In any forest, it is possible to observe the multiple functions of forests – productive, protective, regulatory and social – (Kassioumis and Papageorgiou, 2001).

As natural result of the multiple functions of forests and of their contribution to the improvement of life quality in rural societies, and within the framework of efforts made to improve socio-economic parameters and strengthen the environmental and aesthetic functions of this natural resource, users of forests offer a plethora of mainly consenting but also conflicting viewpoints, which require further investigation. For any forest policy to be successful, it is important to pay special attention to the views, attitudes and reactions of members of the involved society, while also taking into account the increasing trend in organizing the relevant planning on a more democratic basis.

Several studies have been carried out on public perceptions and landowners' attitudes towards forestry, quality of life and rural development (Van der

Abstract

In the framework of the Multifor.RD project (Multifunctional Forestry as a Means to Rural Development), residents from specific areas under research in the nine participating countries (Greece, France, Denmark, Hungary, Ireland, The Netherlands, Austria, Germany, and Spain) were interviewed in relation to: a) the quality of life in rural societies and b) the contribution of forests to this quality. As regards the first aim, in the case of one of the two Greek areas - the Municipality of Kolindros - it was considered necessary to construct a suitable measurement scale. The methodology that was applied for this construction was a combination of applied methodological research techniques, mainly from the field of Social Sciences. Collected data were analyzed using applied methods of multidimensional data analysis. More specifically, at a first level, the Cronbach's α coefficient was estimated and Principal Component Analysis was applied in order to determine the internal consistency (reliability) and the factorial validity of the measurement scale respectively. At a second level, resulting factors were used for the development of a typology of the area's residents through the use of Cluster Analysis. The clusters' profile was examined in relation to other variables of research with the assistance of Correspondence Analysis. The use of the resulting three residents' groups (clusters), with a first and second-degree profile, is necessary at any level of decision-making in Greece, linked to the regional and particularly local development and to the improvement of the local residents' quality of life. Such analysis is also essential in order to provide the European Commission with the relevant information required for the development of region-specific forest policies.

Key words: quality of life, rural societies, forests, multidimensional data analysis.

Résumé

Dans le cadre du projet Multifor.RD (Forêt Multifonctionnelle comme moyen pour le Développement Rural), les points de vue des résidents des régions de recherche spécifiques dans les neuf pays participants (Grèce, France, Danemark, Hongrie, Irlande, Pays Bas, Autriche, Allemagne, Espagne) ont été étudiés en relation avec: a) la qualité de vie dans des sociétés rurales et b) la contribution des forêts à cette qualité. En ce qui concerne le premier but, dans le cas d'une de deux régions grecques - la municipalité de Kolindros - il a été nécessaire de mettre au point une échelle de mesure adéquate. La méthodologie qui a été appliquée pour cette construction était une combinaison de techniques méthodologiques de recherche appliquée, provenant principalement des Sciences Sociales. Pour l'analyse des données, des méthodes de l'analyse multidimensionnelle ont été appliquées. Plus spécifiquement, tout d'abord, le coefficient alpha de Cronbach a été estimé et une analyse en composantes principales a été réalisée afin de déterminer la consistance interne (fiabilité) et la validité des facteurs de l'échelle de mesure. Puis, les facteurs obtenus ont été utilisés pour le développement d'une typologie des résidents de la région au moyen de l'utilisation d'une classification ascendante hiérarchique. Le profil de la classification a été examiné en relation avec les autres variables de l'étude à l'aide d'une analyse de correspondance. L'utilisation des trois groupes de résidents (classes), avec un profil de premier et de second degré, est considérée comme étant nécessaire à tous les niveaux de prise de décisions en Grèce, en ce qui concerne le développement régional et particulièrement local et l'amélioration de la qualité de vie des résidents. Une telle analyse est aussi essentielle afin de fournir à la Commission Européenne les informations appropriées et indispensables pour le développement de politiques forestières spécifiques au niveau régional.

Mots clés: qualité de vie, sociétés rurales, forêts, analyse multidimensionnelle.

Ploeg, 1997; Koch & Rasmussen, 1998; Terrasson, 1998; Wiersum, 1998; Hyttinen *et al.*, 2002). However, the corresponding research in Greece is still in its very early stages (Kassioumis *et al.*, 2000; Kassioumis and Papageorgiou, 2001).

The research project "Multifunctional forestry as a means to rural development: establishing criteria for region-specific strategies to balance public demands and forest owners' objectives" (Multifor.RD) began in 1999 with funding from the European Commission under the FAIR Programme and ended in 2003 (Elands *et al.*, 2000). The main objective of the project was to make a comparative European study on the nature and dynamics of the landowners' and public attitudes towards forests and forestry, and develop criteria in order to define region-specific strategies for multifunctional forestry that would enhance rural development. The project involved partners from 11 countries s-

cattered throughout Europe, of which 9 (Greece, France, Denmark, Hungary, Ireland, the Netherlands, Austria, Germany, Spain) were research partners and 2 (Finland, Switzerland) were research advisors. It was considered that, as a result of changes in the rural environment, the role of

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forests in relation to the society is also gradually changing. Therefore, it is important to have a sound understanding of the various perspectives of different stakeholders' groups regarding the changing role of forestry under different rural conditions. The aim of this study was to find out the perceptions and attitudes that landowners, inhabitants and policy makers with an interest in the area have about local forests, in order to provide the European Commission with information linked to the development of region-specific forest policies (Elands and Wiersum, 2003).

The Municipality of Kolindros is situated in northern Greece, approximately 55 km southwest of Thessaloniki, covering an area of 124 km². The landscape comprises a relatively even terrain of agricultural fields with hills covered by non state-owned forests (private and municipal) at an average altitude of 400 m. The region is sparsely populated, encompassing 4 independent communities with a total population of 5,245 people and an average population density of 42 people per km². Approximately half of the land (45%) is devoted to agriculture, which is the backbone of the local economy. Most employment opportunities are sought in the agricultural sector, especially in tobacco and wheat-growing activities. Manufacturing and trade are limited and tourism is hardly developed. Private forests are managed for firewood production and employment in the forest sector has declined over the last few decades, accounting now for less than 1% of the total active population in the region (Kassioumis *et al.*, 2000).

The purpose of this paper was to enquire into the opinions of residents concerning their image of their own area in relation to quality of life (case of Kolindros Municipality). For the above-mentioned purpose, we emphasized the use of applying multidimensional data analysis methods. The proposed statistical analyses will allow us to formulate initial conclusions for the improvement of management methods to be applied in the area under study for the benefit of the local society. A study of the perceptions and attitudes of local landowners and inhabitants, with an interest in the area, concerning forests and other parameters which determine life quality, can be a source of information for policy makers and community leaders in the development of region-specific policies.

2. Materials and methods

The integrated research methodology developed to the Multifor.RD project identified four main phases: (a) selection and comparative characterization of research areas, (b) comparative qualitative survey, (c) follow-up of comparative quantitative survey and (d) assessment of the policy relevance of research findings. Two areas were selected: the Municipalities of Kolindros and Konitsa. The selection was based on the consideration that the areas should illustrate the variety of rural conditions found in Europe, rather than represent pre-determined "typical" examples on either

national or European scale. The selected areas in Europe cover a large range of agricultural and forestry conditions.

With the purpose of investigating the perceptions of people about their region through a qualitative survey, we therefore approached the directly concerned individuals (Elands *et al.*, 2000). The results of the qualitative survey (Kassioumis *et al.*, 2000) indicated that quality of life can be examined in relation to a locality in general, and to the contribution of forestry and forests to life quality. The interview results showed that quality of life can be assessed by means of four criteria, which are further subdivided into specific indicators (Elands & Wiersum, 2003): (a) community benefits (recreation potential, social cohesion, quality of living environment, social equity and autonomy); (b) economic welfare (income from goods and services, employment creation, economic stability); (c) landscape identity (aesthetic quality, image and uniqueness of the landscape, cultural and historical associations); and (d) quality of the environment and nature (impact on natural resources, contribution to biodiversity).

The next part of the study, regarding planning, methodology and implementation, was also based on a joint decision of the nine participating countries. A common questionnaire was compiled for the quantitative survey, which included a multi-thematic question on how residents view the particular characteristics of their area. The respondents were asked to answer according to a five-degree Likert scale.

The sample was taken, according to the principles of random sampling, from the register kept at the Municipality of Kolindros and from the Agricultural Insurance Organization records, which detail the owners of the existing agricultural land. The same methodology was applied for all nine countries (Elands *et al.*, 2000). In the case of Kolindros, 621 questionnaires were mailed to landowners (people owning agricultural and/or forested land in the locality) and 801 to the local community (to permanent residents who were not included in the previous category). The survey took place in February and April 2001, during which 214 (34.5%) and 277 (34.6%) questionnaires were returned respectively. The response rates were considered sufficient for the standards of the particular region, whose population is characterized by a low educational level and unaccustomed to filling in questionnaires and participating in similar research. It should also be taken into account that the response rate is generally low in research by mail.

Table I summarizes the overall research approach.

Since there was no prior evidence related to the validity and reliability of the scales used to measure the residents' opinions, we applied a *post hoc* procedure based on a series of Multidimensional Data Analysis methods. Therefore, in order to test the construct validity (Carmines and Zeller, 1979; Bryant, 2000) of the measurement scale reflecting the residents' views on their region with respect to quality of life, we used Principal Component Analysis - PCA (Kim and Mueller, 1978; Johnson & Witchern, 1992; Norusis, 1992).

Table 1 – Summary of integrated research approach.

Main research approach	Main research steps	Method
Descriptive approach	Selection of location-specific information on the case study area	Desk research
Social representations approach	Perspectives of landowners and inhabitants about the image of their area with respect to their quality of life	Qualitative interviews
	Distribution of perspectives of landowners and inhabitants about the image of their area with respect to their quality of life	Quantitative interviews
Synthesis approach	Synthesis of research findings	Multidimensional methods of data analysis
	Conclusions for the development of region-specific policies	

The Varimax method was used for the rotation of axes that attempts at minimizing the number of variables that have high loadings on a factor. Several criteria have been proposed for determining the number of factors to keep in a model. One of them, the Kaiser's rule of thumb, suggests that only factors that account for variances greater than one (Eigenvalue >1) should be included. This rule was used for determining the number of factors (Hair *et al.*, 1995; Sharma, 1996). To test the reliability (Strub, 2000) - in the sense of internal consistency (Traub, 1994) - of the measurement scale and/or its subscales (factors or principal components) presented by the previous PCA, the Cronbach's α coefficient was used (Spector, 1992; Kim and Mueller, 1978; Norusis, 1992). Then, in order to summarize the residents' opinions, we calculated an average score per factor for each one. This score was computed as the average of the respondents' scores (answers) on the items that load significantly on a factor. Following this, based on the average scores, and only for the factors that had acceptable reliability indices, we applied Hierarchical and K-means Cluster Analysis techniques (Aldenderfer and Blashfield, 1984; Norusis, 1992; Everitt, 1993) so as to develop segmentation (typology) of the residents, according to their opinions on the image of their region in respect to quality of life. Finally, we developed enriched cluster profiles through the application of Multiple Correspondence Analysis (Benzécri, 1992; SPSS Inc., 1998). Although the statistical methods used to analyze the avail-

able data may seem rather complex, they did however reveal substantial information on the multidimensional nature of the relations between the various variables and constructs measured in this study.

3. Results - Discussion

The PCA provided 6 factors that explain 61% of the variance of the original variables (Table II). This proportion is just over the conventionally accepted limit of 0.60 (Hair *et al.*, 1995). In Table II, only the loadings with absolute values ≥ 0.40 are shown. In general, loadings ≥ 0.30 have practical significance, but for the specific sample size, loadings ≥ 0.40 are also statistically significant at a significance level of 0.05 and power $\gamma = 0.80$ (Hair *et al.*, 1995).

In order to calculate the reliability indexes, the coding for items 12 to 20 was reversed as having a negative content (Spector, 1992). We observe that the internal consistency in-

Table 2 – Results of Principal Components Analysis and Reliability Analysis.

Multi-thematic Question Q	Factors (Components)						Communality
	Items	F1	F2	F3	F4	F5	
Q-5 Unpolluted air, water and soil	0.716						0.574
Q-2 Peace and quiet with low traffic	0.712						0.622
Q-3 Beautiful landscape scenery	0.708						0.667
Q-4 Landscape which is characteristically different from other places	0.594						0.556
Q-1 A very attractive setting for houses	0.587						0.501
Q-11 A strong sense of history and tradition		0.737					0.673
Q-6 Very good overall services		0.731					0.653
Q-10 A closely knit community		0.656					0.570
Q-7 Plenty of opportunities for recreation and sports		0.643					0.624
Q-19 Too many houses being built in the recent past				0.752			0.629
Q-14 Too many visiting tourists				0.687			0.557
Q-18 Conflict between different uses of land					0.443		0.534
Q-16 Very few employment opportunities					0.703		0.523
Q-13 A prevalence of low income					0.676		0.542
Q-17 No involvement of locals in how the area is developed					0.622		0.509
Q-9 A rich variety of nature and wildlife						0.833	0.758
Q-8 A lot of forests						0.785	0.731
Q-15 Too much crime							0.827
Q-12 A very sparse population							0.547
Q-20 Too much industrial development							0.541
0.638							
Explained Variance %	12.7	12.2	10.3	9.4	8.7	7.6	
Cronbach's α coefficient	0.77	0.77	0.64	0.52	0.71	0.43	
Total Explained Variance %	61						
Total Reliability	0.65						
Reliability of Positively Expressed Items (1-11)	0.84						
Reliability of Negatively Expressed Items (12-20)	0.44						
Average score per Factor	4.3	3.9	3.1	2.6	3.4	4.0	
Standard Deviation	0.64	0.84	0.95	0.75	1.00	0.71	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.776							
Bartlett's Test of Sphericity: $X^2=1736.693$, d.f.=190, p=0.000							

dex (reliability) α of Cronbach for the entire scale of 20 items is 0.65. In other words, it appears to be sufficient but rather moderate, considering the sample size and the relatively large number of items in the multi-thematic question (Spector, 1992; Norusis, 1992). Traditionally, reliability indexes ≥ 0.60 (Malhotra, 1996; Siardos, 1999) or ≥ 0.70 (Nunnally, 1978) are considered as being sufficient. Thus, in our case, the total scale of 20 items of the multi-thematic question was considered as moderately reliable in the sense of internal consistency. The relatively moderate value of coefficient α may be explained by the fact that the 9 items (12-20) which are negatively expressed, have a low coefficient $\alpha = 0.44$, differently from the 11 items (1-11) which are positively expressed and have a high coefficient $\alpha = 0.84$. Therefore, in similar future research concerning Greece, it is advisable to initially make a better adjustment of the relative items.

For the first factor F1, which explains 12.7% of the total variance, the items that mainly load are 5, 2, 3, 4 and 1. The reliability of the factor is $\alpha = 0.77$ (satisfactory). For the second factor F2, which explains 12.2% of the total variance, the items that mainly load are 11, 6, 10 and 7. The reliability of the factor is $\alpha = 0.77$ (satisfactory).

For the third factor F3, which explains 10.3% of the total variance, the items that mainly load are 19 and 14. The reliability of the factor is $\alpha = 0.64$ (satisfactory).

For the fourth factor F4, which explains 9.4% of the total variance, the items that mainly load are 16, 13, 17 and 18. The reliability of the factor is $\alpha = 0.52$ (below the limit of 0.60).

For the fifth factor F5, which explains 8.7% of the total variance, the items that mainly load are 9 and 8. The reliability of the factor is $\alpha = 0.71$ (satisfactory).

For the sixth factor F6, which explains 7.6% of the total variance, the items that mainly load are 15, 12 and 20. The reliability of the factor is $\alpha = 0.43$ (below the limit of 0.60).

The identification and interpretation of the six factors quoted in Table III, was made in accordance with the common characteristics (attitudes, viewpoints) or the contradictions (in the case of negative loadings) of items loaded upon each factor.

According to the table above and the results of the PCA, and particularly based on the average scores per factor (a.s.p.f.), we can conclude that all respondents:

agree (a.s.p.f.=4.3) that they live in a beautiful, unpolluted, peaceful and characteristically varied environment, appropriate for construction (F1).

agree (a.s.p.f.=3.9) that it is all about a traditional, historically-significant society with very good services and many opportunities for recreation and sports (F2).

maintain a neutral standpoint (they do not agree or disagree) (a.s.p.f.=3.1) about whether there is tourist development and recent intensive construction work (F3).

maintain a neutral standpoint with a slight inclination towards agreement (a.s.p.f.=2.6) that this is a region with a low income and employment rate, with conflicting land use and without any participation of the local community in development planning for the region (F4).

maintain a neutral standpoint with a slight inclination towards agreement (a.s.p.f.=3.4) that this is a region with many forests and a rich variety of fauna and flora (F5).

disagree (a.s.p.f.=4.0) that there is high criminality and that it is a very sparsely populated region with intense industrial development (F6).

With respect to the suitability of the PCA model, the Bartlett's test of sphericity has shown that the correlation matrix presents a statistically significant difference from the identity matrix ($\chi^2=1736.693$, d.f.=190, $p=0.000$). Finally, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is equal to 0.776, which is above the permissible limit of 0.50 (Hair *et al.*, 1995) or 0.60 (Coakes and Steed, 1999; Sharma, 1996).

3.1. Typology of Residents Based on Factorial Average Scores

The factors with the highest reliability coefficients are F1, F2, F3 and F5. Based on the a.s.p.f. results, a typology of residents of the Kolindros Municipality was developed in order to examine how they can be grouped into distinct clusters.

For the typology development, Hierarchical Cluster Analysis was initially applied; Ward's method was used for the cluster construction according to the squared Euclidean distance (Hair *et al.*, 1995; Sharma, 1996). The purpose of the analysis was to estimate some initial centers of clusters and to investigate the possible range of solutions, i.e. the satisfactory number of clusters. Results showed that the solution should be sought at 3 or 4 clusters.

Subsequently, due to the high number of subjects, the method of K-means Cluster Analysis was applied. The results of two solutions were tested and checked, one solution with 3 clusters and one with 4 clusters. The solution providing the most efficient explanation was the one with 3 clusters (for the precise composition of clusters, see the next two chapters). Table IV illustrates obtained results.

Tableau 3 – Identification of Factors.

Factors	Items	Interpretation	Average Scores per factor*
F1	5, 2, 3, 4, 1	Landscape and environment with positive parameters	4.3
F2	11, 6, 10, 7	Traditional society with good services	3.9
F3	19, 14	Tourist development	3.1
F4	16, 13, 17, 18	Low employment and income	2.6
F5	9, 8	Varied natural environment with many forests	3.4
F6	15, 12, 20	Criminality and industrial development	4.0

* 5=strongly agree, 4=agree, 3=neither agree nor disagree, 2=disagree, 1= strongly disagree, for the items having a positive formulation (items 1-11) and 1= strongly agree, 2=agree, 3= neither agree nor disagree, 4=disagree, 5=strongly disagree, for the items having a negative formulation (Items 12-20).

Table 4 – Final Cluster Centers.

	Clusters		
	C1	C2	C3
Average Score F1	3.81	4.43	4.48
Average Score F2	3.90	4.05	4.38
Average Score F3	3.59	3.54	2.14
Average Score F5	2.37	4.07	3.68
Replies (individuals)	n	150	149
Total		457	158

3.2. First level cluster profile

Based on the final cluster centers (Table IV), a first level profile was constructed for the proposed typology (Table V).

Table 5 – First level profile of the clusters.

Factors	Identification	C1	C2	C3
F1	Landscape and environment with positive parameters	Mainly agree	Mainly strongly agree	Mainly strongly agree
F2	Traditional society with good services	Neutral tending to agreement	Agree	Mainly strongly agree
F3	Tourist development	Mainly disagree	Mainly disagree	Agree
F5	Varied natural environment with many forests	Mainly disagree	Mainly agree	Mainly agree

According to Table V, there is relative agreement among the individuals of the three clusters as regards factors F1 and F2. There is a differentiation as regards factors F3 and F5, and more specifically: the individuals of C3 agree that there is tourist development in their region, whereas the individuals of C2 and C1 more or less disagree. Furthermore, although the individuals of C2 and C3 more or less agree that their region is characterized by a rich natural environment with many forests, the individuals of C1 mostly disagree with this.

To test the stability of the three-cluster solution, the association or the differences between clusters according to status (resident or farmer), sex, and the professional state of interviewees was explored. No statistically significant differences arose. Tests were carried out by means of χ^2 -test at $\alpha=0.05$.

3.3. Second level cluster profile

In order to acquire deeper insight into the special characteristics of the emerging clusters, an investigation of the cluster profile was carried out with respect to other variables that were not included in the cluster formation but were investigated via the questionnaire. The following variables were considered to be of special interest: degree of attachment to the area, degree of attachment to the area's forests, annual net household income, level of education, as well as the interviewees' views on the importance that the following activities may have for the local economy: agriculture/livestock breeding, forestry, commerce, tourism, industry and folk art/handicrafts.

By means of the Correspondence Analysis-CA, it was possible to investigate the relation between all the above-mentioned variables. However, only the relations

and interactions of clusters with the above-mentioned variables were investigated. The application of CA to the SPSS was performed using the method proposed by Menexes (2001).

The analysis has generally shown that, in relation to:

the degree of attachment to the area: in cluster 1 (C1), 41.5% of the subjects answered «strongly attached» and 34.7% «attached». In C3, the percentages are 62% and 29% respectively;

the degree of attachment to the area's forests: it seems that C2 and C3 differ from C1. In C1, 18.1% of the subjects answered "very attached" and 31.5% "attached". In C2, the relevant percentages are 28.1% and 50%, while in C3 they are 30.7% and 42.7%;

the annual net household income: a relative differentiation is noted in C1 and C2 as to C3, regarding the income category 7,300-13,200 €. In C1, 30.1% declared an income of this level, 30% in C2, and 38.7% in C3. A relative differentiation is presented between C1 and C3 as to C2, for the income category 13,200-20,500 €. In C1, 4.2% declared an income of this level, 3.3% in C3, and 10.7% in C2;

the level of education: the 3 clusters seem to substantially differentiate according to their educational level: "Primary School completed", "High School completed", "Technical School Diploma" and "University-TEI Degree". In C2 and C3, primary education graduates seem to predominate with 53.4% and 57.7% respectively. In C1, the relevant percentage is 47.6%. In C1 and C3, those who have completed high school amount to 15.2% and 18.6% respectively, while in C2 the relevant percentage is 10.8%. In C1 and C2, those who hold a Technical School Diploma amount to 7.6% and 10.1% respectively, while in C3 the relevant percentage is 3.8%. Finally, in C1 and C2, the percentage of those who hold a University-TEI Degree is 10.3% and 8.8% respectively, while in C3 the relevant percentage is 1.9%;

the importance they attribute to "Agriculture/Livestock breeding" as regards current economic conditions in their municipality: C1 and C2 seem to slightly differ from C3. In C1, 92.5% stated "a high importance" and 91% in C2, while in C3, 97.4%;

the importance they attribute to "Forestry" as regards current economic conditions in their municipality: C2 and C3 seem to differ from C1. In C2, 44.6% stated "a high importance" and 43.3% in C3, while in C1, 13.6%;

the importance they attribute to "Commerce" as regards current economic conditions in their municipality: C1 and C2 seem to differ from C3. In C1, 32.1% stated "a high importance" and 28.9% in C2, while in C3, 57.5%;

the importance they attribute to "Tourism" as regards current economic conditions in their municipality: the 3 clusters seem to differ considerably. In C1, 20.1% stated "a high importance", 33.6% in C2 and 62.3% in C3;

the importance they attribute to "Industry" as regards current economic conditions in their municipality: the 3

clusters seem to differ greatly. In C1, 13.8% stated "a high importance", 26.4% in C2 and 39.7% while in C3;

Finally, concerning the importance they attribute to "Folk Art/Handicrafts" as regards current economic conditions in their municipality: the 3 clusters seem to completely differ. In C1, 17.4% stated "a high importance", 28.2% in C2 and 47.5% in C3.

4. Conclusions

This study demonstrated a relative agreement among the subjects of the three clusters as to the positive parameters of the environment (Unpolluted air, water and soil - Peace and quiet, little traffic - Beautiful scenery - Landscape which is characteristically different from other regions.

A very attractive setting for houses) and the existence of a traditional society. Nonetheless, there is differentiation concerning the following issues: the subjects of C3 agree that there is tourist development in their region, while the subjects of C2 and C1 mostly disagree. Furthermore, although the subjects of C3 and C2 more or less agree that their region is characterized by a varied natural environment with many forests, the subjects of C1 mostly disagree with that statement.

In addition:

the subjects of C3, compared to the subjects of C2 and C1, seem to be more attached to their region and to the region's forests as well. Their income is the lowest, as it is their educational level. They attribute greater significance to the effect that all relative variables (agriculture-livestock breeding, forestry, commerce, tourism, industry and folk art/handicrafts) have on the current economy of their region.

the subjects of C2, compared to the subjects of C1, seem to be more attached to the forest, have a higher income and a similar educational level. They attribute greater significance to the effect that forestry, tourism, industry and folk art/handicrafts have on the current economy of their region.

The aforesaid analysis and the determination of the three groups of interviewed residents in the Municipality of Kolindros, with their respective profiles, constitute the basic parameters that should be taken into consideration at any stage of decision-making, which aims at regional and primarily local development and the improvement of the residents' quality of life, by utilizing the natural resources of the region. The analysis creates the preconditions for a decision-making process whose objective is economic development with a concurrent improvement of employment, but also at an upgrading of social and environmental conditions. Such a step would increase the possibility of unanimous approval or at least reduce the number of potential reactions on the residents' behalf, especially when such decisions are in the process of implementation at a specific point in time. Of course, it is also likely that the groups that are well disposed towards the specific measures will even-

tually manage to positively influence the dissenting groups. Finally, it is important to mention that the provision of such information is essential in order to allow the European Commission to develop region-specific forest policies.

This study is one of the very few that have been conducted in Greece on the relation between quality of life and the natural environment. It is also quite unique, since it focuses on the forest environment, which local communities have until now regarded exclusively as a means for wood production and pasture, and therefore a direct source of income. The aforementioned conclusions are of great significance since:

- they reveal that local communities have already incorporated the environmental dimension in their considerations about life quality, local development, and the development of the rural provinces in general;

- they form the basis for the formulation of a coherent forest policy aiming at a multi-functional management of the forest, where forest recreation and environmental tourism in forests will play a major role;

- they indicate that local communities may potentially accept the forest policies in question, particularly if they are allowed to participate in planning activities;

- they create new prospects for a quantitative and qualitative upgrading of the natural forest environment, using measures that are well-received by the local communities.

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