

The contribution of herbs to the quality of life: The case of Evros prefecture (A first approach)

Arabatzis G.D., Tsiantikoudis S.Ch., Kyriazopoulos A.P.

**Department of Forestry and Management of the Environment and Natural Resources, Democritus University of Thrace, Orestiada, Evros, Greece,
email: garamp@fmenr.duth.gr, stsianti@fmenr.duth.gr, apkyriaz@fmenr.duth.gr**

Abstract

Herbs (aromatic, edible, medicinal plants) constitute an important natural resource. They are mostly used for medicinal purposes as they contain antioxidants, vitamins and trace elements. They have numerous other applications in aromatherapy, in human nutrition and in cosmetics. Additionally, they support agricultural activities such as apiculture and livestock farming. The aim of this paper was to investigate the attitudes of the local people in a remote rural area regarding the contribution of herb resources in the quality of their life, and to indicate the typology of these attitudes. The study was conducted in the area of Evros prefecture, Greece, with the use of a specially designed questionnaire. The data was processed using the methods of descriptive statistics and multivariate analysis. The results indicated that local people recognize the contribution of herb resources in human health and that they are products of high nutritional value. The inadequate management and wildfires were recognized as major threats. Finally, people value all of the intended benefits that herb resources offer and especially the protection of nature and the landscape and the enhancement of well being through healthy nutrition. The implementation of the non – linear analysis in principal components with optimal scaling method reveal that local people of Evros prefecture can be grouped according to their attitudes towards herb resources.

Keywords: herbs, quality of life, threats, attitudes, non – linear analysis in principal components

Introduction

Herbs (aromatic, edible and medicinal plants) are a natural resource that is scattered into the natural ecosystems. They play an important role in the human health as many of them contain antioxidants, vitamins and micronutrients. Additionally, they are essential for many economic activities like apiculture, livestock farming and energy production (Kyriazopoulos et al. 2008). Herbs are also used in every day human diet. Mediterranean area is extremely rich in herb species while Mediterranean nutrition ought its name in the existence and use of many herbs species that are not met anywhere else (Hadjichambis et al. 2008). In modern societies some of the herbs are used, after processing, in cosmetics and health care (Singh and Chapagain 2006).

A series of case studies where herbs contribute in the economy of many rural communities has been reported in the literature. The aim of this paper

was to investigate the attitudes of the local people in a remote rural area regarding the contribution of herb resources in the quality of their life, and to indicate the typology of these attitudes.

Materials and methods

The research was conducted in Evros prefecture, north – eastern Greece. The total area is 4,241.6 km². The majority of the local people are involved in agricultural activities (agriculture, livestock farming) as their main or secondary activity as well as in herb cultivation.

For the data collection a predetermined questionnaire and personal interviews were used. The research was carried out in 2009. The "population" under study was the total number of households in the Evros prefecture. Simple random sampling was the sampling method that selected, due to its simplicity and the fact that it requires a minimal knowledge of the population compared to any other method (Kalamatianou, 1997; Matis, 2001; Damianou, 2007).

In order to estimate the sample size, the following simple random sampling formula is used:

$$n = t^2 \hat{p}(1 - \hat{p}) / e^2$$

Pre – sampling was conducted on a sample size of 50 households to estimate the variable with the greatest variance under the desired selected error, while the rest are estimated with a greater accuracy than was initially defined.

The variable "constitute organic products with high nutrition value" presented the largest sample size, with a proportion of approximately $p=0.5$, therefore $1-p=0.5$, which means that the sample size is:

$$n = t^2 \hat{p}(1 - \hat{p}) / e^2 = 1.96^2 \cdot 0.5 (1 - 0.5) / 0.05^2 = 384.16$$

The final sample is 385 households or individuals.

In order to group all the information that we received from the three multivariate questions we constructed an Indicator (I), with its value to represent and characterize in their total all the questions in every multivariate question. In order to estimate the above mentioned Indicator I the Non Linear Analysis in Principal Components with Optimal Scaling was applied (Van de Geer 1993a, 1993b, Gifi 1996, Siardos 1999, Meulman and Heiser 2004).

The optimal ranks were concerned to be z – scores as they have average = 0 and standard deviation = 1. Then, optimal ranks were transformed in a new scale with 0 to be the minimum and 100 to be the maximum value using the following equation:

$$t_i = [z_i - \min(z_i)] \times 100 / [\max(z_i) - \min(z_i)]$$

Where:

z_i: the optimal rank of the respondent i

t_i: the transformed optimal rank of the respondent i

min(z_i): the minor optimal rank

max(z_i): the major optimal rank

The natural interpretation of the transformed ranks was the following:

Respondent having a total rank = 100 have stated or have attributed the highest preference of significance or agreement for the variables or the subjects of every question group, compared to the others.

Reliability as a meaning of internal consistency of the optimum ranks is tested and valued using Cronbach's α index (Spector 1992). Satisfactory are considered reliability indexes equal or over 0.70 (Nunnally and Bernstein 1994, Malhotra 1996).

Results

Most of the respondents were men (59.2%), the average age was between 18 and 40 years old (55.0%) and they were secondary (34.0%) and tertiary graduates (41.7%). Most of them were wage workers (private sector and civil servants) and farmers (23.3%), while over 50% was involved in various agriculture activities as main or secondary occupation (51.4%). Mean annual net income was between 10,001 and 20,000 € (66.5%).

Respondents consider herbs as resources that contribute mainly to "preserve a good human health" (72.7% agree and absolutely agree), "constitute organic products of high nutrition value" (67.5% agree and absolutely agree), "can be used for disease prevention" (58.9%), while "contribute to nature protection" (52.0%). Most important threats for herb resources are "inadequate management of habitats" (27.3%), "wildfires" (19.7%) and "livestock farming" (17.4%). "Industrial development" was not considered to have any negative impacts in herb resources (40.0%). People, consider as priority for the protection and management of herbs "nature protection" (54.7%), "enhancement of living standards through healthy nutrition" (51.5%), "disease prevention" (49.2%) and "tourism growth (agro-tourism, collection, leisure and research of herbs)" (40.2%).

For optimal total indicator estimation in the selected multivariate questions the nonlinear analysis in principal components with optimal scaling in every one of the variables of every group of questions was applied

and a representative indicator for every one of them was estimated (Table 1).

Table 1. Results of the optimal total indicator construction methodology

Indicator	Cronbach's α	Total variance (%)	Max – dimension	Average	Median value	Standard deviation	K – S Z	Normal distribution
I1 (Contribution of herbs in quality of life)	0.84 Satisfactory	32.3	56	33	28	20	1.92*	$p < 0.01$ non normal
I2 (Threats)	0.84 Satisfactory	47.3	24	37	34	22	1.67*	$p < 0.05$ non normal
I3 (Priorities of benefits)	0.88 Satisfactory	67.0	15	72	79	27	2.58*	$p < 0.01$ normal

*. Statistically significant $p < 0,01$

K – S: Kolmogorov – Smirnov test for testing normal distribution

In Table 2 the relations between the three indicators were estimated. For indicators I1 and I2 positive, statistically significant and high relation ($\rho = 0.46$, $p < 0.01$) was found.

Table 2. Relation between indicators

	I1	I2	I3
I1	1,000		
I2	0,461 *	1,000	
I3	0,191 *	0,129 **	1,000

**. Statistically significant $p < 0,05$, *. Statistically significant $p < 0,01$

For a high percentage of the respondents the attitudes for the contribution of herbs in quality of life are in agreement with their attitudes for the existence of factors that constitute threats. We found positive, statistically significant and weak relation between indicators I1 and I3 ($\rho = 0.19$, $p < 0.05$). For a low percentage of respondents the attitudes for the contribution of herbs in quality of life are in agreement with their attitudes for the priority of benefits. Finally, a positive, statistically significant and weak relation between indicators I2 and I3 ($\rho = 0.13$, $p < 0.05$) was

recorded. For a low percentage of respondents the attitudes for the related factors that constitute threats are in agreement with their attitudes for the priority of benefits.

Conclusions

The indicators that were estimated by the application of the method of non linear analysis in principal components with optimal scaling were adapted very well in the collected data and represent in a high degree the attitudes of the local people towards herb resources. The local population can be grouped (3 groups) through which it can be concluded that local people introduce generally the same attitude for the factors and characteristics of herb resources that contributed in their quality of life and for the factors that threaten these resources. On the contrary, they introduced different attitudes towards the promotion of the benefits that occur using herbs in everyday life.

Policy makers that are design management and enhancement policies and plans for herb resources and for any other natural resource must consider local people's attitudes. They must have in mind that the implementation of such policies have to be well designed and organized in collaboration with local people which are the direct and final users of these policies. The results of this research are an important tool for development and enhancement of the unique local characteristics and implementation of certain targeted actions for the development of herb resources in order to improve local well being.

References

- Damianou C. 2007.** Sampling Methodology: Techniques and Applications. Sofia Publications. Thessaloniki. (In Greek).
- Gifi A. 1996.** Non-Linear Multivariate Analysis. Chichester: John Wiley & Sons Ltd.
- Hadjichambis A.C.H., D. Paraskeva – Hadjichambi, A. Della, M. Giusti, C. De Pasquale, C. Lenzarini, E. Censorii, M.R. Gonzales – Tejero, C.P. Sanchez – Rojas, J. Ramiro – Gutierrez, M. Skoula, C.H. Johnson, A. Sarpakia, M. Hmouchi, S. Jorhi, M. El – Demerdash, M. El – Zayat and A. Pioroni. 2008.** Wild and semi – domesticated food plant consumption in seven circum – Mediterranean areas. *International Journal of Food Sciences and Nutrition*, 59(5):383–414.
- Kalamatianou A. 1997.** Social Statistics. Multidimensional Analysis Methods. The Economic, Athens. (In Greek).
- Kyriazopoulos A.P., E. Hormova, G. Fotiadis, Z.M. Parissi and E.M. Abraham. 2008.** Alternative uses of herbaceous species of the Gramineae family. In: K. Mantzanas and V.P. Papanastatis (eds). Range Science and Protected Areas. Proceedings of the 6th Panhellenic Rangeland Congress. pp 147-152. (In Greek with English Abstract).
- Malhotra N.K. 1996.** Marketing Research. An Applied Orientation. Englewood Cliffs: Prentice Hall.

Matis K. 2001. Forest Sampling. Management and Development Company Resources of Democritus University of Thrace, Xanthi. (In Greek).

Meulman J. and W. Heiser 2004. SPSS Categories 13.0. Chicago: SPSS Inc.

Nunnally J.C. and I.H., Bernstein 1994. Psychometric Theory (3rd ed.). New York: McGraw Hill Book Co.

Singh B.K. and D.P. Chapagain 2006. Trends in Forest Ownership, Forest Resources Tenure and Institutional Arrangements: Are They Contributing to Better Forest Management and Poverty Reduction? In Understanding Forest Tenure in South and Southeast Asia. Forestry Policy and Institutions. Working Paper 14:115 – 151. FAO, Rome.

Siardos G. 1999. Methods of multi-variable statistical analysis, Thessaloniki, Ziti. (In Greek).

Spector P.E. 1992. Summated Rating Scale Construction: An Introduction. Newbury Park: Sage Publications.

Van de Geer J.P. 1993a. Multivariate Analysis of Categorical Data: Theory. Thousand Oakes: Sage Publications, Inc.

Van de Geer J.P. 1993b. Multivariate Analysis of Categorical Data: Applications. Thousand Oakes: Sage Publications, Inc.