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Envisaging Participatory Management in Protected Areas: Local Response to Proposed Conservation Actions in Relation to Environmental Orientation

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Abstract: Involving local people in natural area management is very important to address the complexity of environmental management issues for sustainable use of local resources. Participatory methods require the contribution of local stakeholders in decision making. Mapping the environmental views of local communities allows for detecting aspects that could facilitate management efforts. This research – in the frame of the Skyros LIFE project and the PAMNATURA project - measures local acceptability of the conservation actions proposed by the LIFE project in Skyros Island (Greece) in relation with recording local people's environmental orientation using the 15-item revised New Ecological Paradigm (NEP) scale. The research was carried out by means of questionnaires. The LIFE project proposed actions were grouped into three categories according to their theme, i.e., promoting (a) Nature protection, (b) Agro-pastoralism and (c) Ecotourism. The sample seems to largely agree with the LIFE project proposals, while the results showed high scores for most of the NEP scale items, implying pro-environmental beliefs, though there appears disagreement or neutrality regarding a few items. Local acceptability of the proposed actions was found to correlate to local people's environmental concern measured through the NEP scale. Drawing on the results, implementation of actions related directly or indirectly to economic activities, preservation of traditional activities, as well as environmental education, interactive informing and consultation could enhance local participation. Skyros island seems to offer an appropriate social background for applying participatory and adaptive management and implementing conservation programs.

Keywords: participatory management; NEP scale; protected areas; environmental perceptions; stakeholders

1. Introduction

Participation of local people is considered nowadays as condition *sine qua non* for successful environmental management of protected areas. McAllister [1] has emphasized the importance of participatory processes to illustrate the complexity of environmental management issues, the involvement of local people in this process and the promotion of systems for the sustainable and equitable use of natural resources. Participation in decision-making has been encouraged as a means to promote the importance, the legality and enforceability of decisions taken [2–5], while, apart from the fact that strengthens the relationship among those who govern and those governed, has essentially the power to alter or even reverse the implementation of a particular policy [6–8].

According to Kapoor [9], some of the basics and advantages of participative management, at least in theory, is that participation helps clear and constant communication and strong relationships between the stakeholders, while encourages their commitment and responsibility. Chambers [10] describing ways in which "participation" is used, emphasizes on that of an empowering process which enables local people to make their own decisions. Because of the complexity that characterizes

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the management of protected areas [11,12], the effective, efficient and successful involvement of all stakeholders, which requires dealing with potential conflict and achieving consensus [2], is a real challenge.

Involvement of all stakeholders in the management process is essential [13–15]. It has been pointed out that the exclusion of those stakeholders who have strong interests or significant influence in the region has resulted in inability of resolving possible disagreements and conflicts, as there is not enrichment by their empirical knowledge [16]. As the local community is not homogeneous and has no common standards, interests and patterns of resource use vary widely. To ignore this diversity would prevent the achievement of the conservation and management objectives [17–19]. Conflicts and negative attitudes towards protected areas have been recorded in studies worldwide, relating - among others - with different economic interests, aspirations and values of the stakeholders [2,20–23]. A usual "victim" of such negative attitudes is the various management projects running in protected areas that frequently have to struggle with local society's prejudice. Consideration of the views of the local population in a protected area can provide valuable information base and un-cover beliefs that lead to potential conflicts that need to be addressed. Understanding the views enables the relevant support services to manage conflicts between those involved in managing, in order to achieve consensus [21,24–26]. Therefore, many studies [24,27–35] stress the importance of using the views of the local population as a contribution to the design and implementation of appropriate management measures for sustainable development. More specifically, when it comes to management projects, detection of views could focus on specific proposed actions, allowing for identification of key issues. Complementary to the detection of local people's opinions, using a tool for predicting environmental attitudes and behaviors could build a sufficient frame to portray local environmental orientation. The New Environmental Paradigm (NEP) is one of the most common tools used worldwide as a measure of ecological beliefs, appraising the degree to which respondents view the world ecologically, thus giving their ecological worldview [36–40].

According to Mannigel [41], adapted from Borrini-Feyerabend [42], Pimbert and Pretty [43], Mattes [44], and Diamond [45], there are seven different levels of participation along a continuum, from simple sharing of information to transfer of power and responsibilities (Table 1). LIFE projects developed across Europe, by virtue of their purpose, allow for effective interventions in terms of environmental planning and management, aiming to a favorable conservation status [46–49], and enhancement of local participation is among their main objectives. Given that such projects are of specific duration and also of demonstration and/or implementation role, in most cases raising local people's participation is achieved through information actions, such as campaigns, falling in the B Level of participation [28,42–44], where information receiving is a unilateral interaction. However, the LIFE project implemented in Skyros Island, Greece, included an action of consultation with local people upgrading the participation directly to Level D, where actively consulting or giving of opinions/views is an engaged interaction with the active exchange of views and opinions. Siebert et al. [50], analyzing literature from six EU member states in relation with factors affecting European farmers' participation in biodiversity policies, find that one of the key parts of the literature emphasizes that policy needs to be sensitized to local conditions, and suggest that active acceptance of biodiversity protection can only be achieved through a process of dialogue. Yet, such approach contains the risk of possible strong local disagreement during the consultation meetings, endangering the project communication. For this reason, there is the need for a smoother transition from Level B to level D, incorporating Level C (information seeking or informing represents the canvassing of local stakeholders for factual information by the institution).

Table 1. Different levels of participation (according to Mannigel [41], adapted from Borrini-Feyerabend [42], Pimbert and Pretty [43], Mattes [44], and Diamond [45]).

Level	Description of participation
A	Minimal or nominal participation, where almost no interaction occurs between local stakeholders and managing institutions.

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B	Informing or passive, where information receiving is a unilateral interaction.
C	Information seeking or informing represents the canvassing of local stakeholders for factual information by the institution.
D	Actively consulting or giving of opinions/views is an engaged interaction with the active exchange of views and opinions. Decisions are made by the managing institution alone.
E	Negotiation or active=functional participation where local stakeholders are able to take part in decision-making to some extent.
F	Sharing of authority or interactive participation where formalized decision-making structures such as management councils involve local stakeholders and meet on a regular basis.
G	Transferring authority or taking over of the responsibility, in which local stakeholders assume primary management responsibility.

The present research suggests a way to facilitate transition from Level B to level D, by incorporating Level C, with aim to pave the way for active consulting and, furthermore, negotiation with local people. More specifically, the research combines detection of the

(a) acceptance of the proposed LIFE project conservation actions by local people - as an indication of their intention to participate - by both informing them and asking for their opinions about specific LIFE project management actions, and

(b) environmental orientation of local people, by measuring endorsement of the New Environmental Paradigm, a widely accepted scale for capturing environmental beliefs.

The aim of the research was to investigate main drivers that could enhance acceptance and local participation in relation to management projects, strengthening the effectiveness of participatory and adaptive management of natural areas.

2. Materials and Methods

2.1. Study Area

Skyros (land area: 20,900 Ha, latitude: 38.854411°, longitude: 24.566986°) is one of the larger islands, located at the centre of the Aegean Archipelago, Greece (Figure 1). It is considered one of the most biodiversity-rich islands in the Aegean Sea and an area of special ecological importance. The Mount Kohylas (792 m) in the southern part of Skyros as well as the islets around the island are designated as sites of the Natura 2000 network (92/43/EEC Directive).

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Figure 1. Map of Skyros island, Greece.

According to the census of 2011, 2994 people live permanently in the island [51]. Active workforce consists of 1054 individuals (35.20%); the majority of them have been inventoried in the tertiary sector of economy (687 ind., 65.18%), mostly in occupations related to tourism, and a less percentage (135 ind., 12.81%) in the primary sector, i.e., agriculture, livestock husbandry and fishing. Major land uses are pastures (61.18%), forests (26.40%) and agricultural land (5.80%), while settlements and open waters cover the rest land. Skyros holds a remarkable biodiversity, in terms of local or very restricted endemic plants and lizards, mainly related to rocky and coastal habitats, as well as native maple forests (*Acer sempervirens*), unique in the Aegean Archipelago. Posidonia meadows (*Posidonia oceanica*), a breeding habitat for many species of fish and crustaceans, lie on the sea bottom in the marine coastal zone of the island. Also, the Mediterranean monk seal (*Monachus monachus*) is frequently found in sea caves. The southern part of the island with Mount Kohylas (792 m) and the surrounding islets as well as the island's remaining wetlands are important areas for significant see birds. Eleonora's falcon (*Falco eleonorae*), a globally threatened migratory falcon species, nest at the rocky coastline; the area hosts 8.5% of its national breeding population. The unique miniature Skyrian horse (a protected by EU breed of *Equus cabalus*) has been living in a semi-wild state in the southern part of the island. Skyrian horses play a significant role in the rural heritage of the island, since in the past they were used by locals for farming, especially during the summer months. The cultivated land of Skyros still maintains features of traditional agricultural fields of high nature value, while the remaining wetlands of Kalamitsa and Palamari are ecosystems of great significance.

Skyros is considered one of the few islands where the natural environment and biodiversity are maintained to a satisfactory degree of naturalness. This is mainly due to the way of using ecosystems in the region for centuries, namely a direct relationship with the benefits provided by the biodiversity of the island to its residents, in terms of practicing agriculture and livestock husbandry. In recent years, however, as in many other islands, this model began to crumble mainly because of the intense development activity and tourism. Specifically, the construction of the airport of Skyros destroyed the extensive seasonal wetlands and grasslands in the region resulting in disruption of the traditional agro-pastoral model, while the development of mass tourism led to the abandonment of remote agricultural crops and the expansion of residential complexes in the coastal region resulted in the deterioration or destruction of the remaining wetlands on the island. Also, livestock husbandry gradually moved out of the framework of sustainability, as the latter was traditionally perceived by local stock breeders, to uncontrolled (a) increase of livestock numbers, and (b) exploitation of land resources. According to LIFE project, current stocking rates amount to a number which strongly exceeds current grazing capacity [52]. More heavily, these animal units concentrate into a rather short area of productive rangelands, since pastures previously devoted to livestock husbandry have changed their use during the years. Thus, the main characteristics of current livestock husbandry in Skyros are its traditional base, and its modern uncontrolled implementation, in terms of space and time, which is common to other places of Greece [53,54].

On the other hand, Skyros still retains a character and a natural and cultural landscape of unique beauty that attracts good quality tourism, and this increases the value of well-preserved natural ecosystems, biodiversity and landscape for the local community. The nature of the island together with its products could provide significant economic benefit to the local community and the opportunity for a higher standard of living through sustainable tourism.

2.2. Projects Related to Environmental Upgrade

The present study is conducted under the following projects:

- "LIFE09NAT/GR/000323": «Demonstration of the Biodiversity Action Planning Approach, to Benefit Local Biodiversity on an Aegean Island, Skyros» (01/09/2010 – 28/02/2016).

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- "PAMNATURA" (Participatory and Adaptive Management in NATURA areas): «Model Design for Participatory and Adaptive Management of Greek Natura 2000 sites» (27/08/2012-26/08/2015).

The LIFE programme is the European Union's funding instrument for the environment and climate action. The general objective of LIFE programme is to contribute to the implementation, updating and development of EU environmental and climate policy and legislation by co-financing projects with European added value. The aim of the LIFE project in Skyros Island, launched in 2010, was the demonstration of integrated planning methods and management measures in order to maintain and restore the biodiversity of Skyros, thus fulfilling the requirement of the local community for conservation of biodiversity, and for compatible sustainable economic and social development of the area. The LIFE project aimed to demonstrate the feasibility of revitalizing the traditional model of integrated management of agricultural and pasture ecosystems of the island, enhancing at the same time the ecosystems protection and promoting sustainable tourism. To achieve this goal, the project used the approach of the participatory development of a Biodiversity Action Plan (BAP), which is a continuous process of action on the part of the local community of Skyros to ensure that important species, habitats and ecosystems will be preserved for the benefit of people and the environment. The BAP included 6 different thematic Action Plans (AP) developed for the LIFE project, namely the Agro-Pastoral AP, the Wetlands AP, the Maple (*Acer sempervirens*) stands AP, the Islets AP, the Tourism AP and the Endemic plants AP, developed to analyze and propose conservation actions for the island's important habitats and species.

The aim of the «PAMNATURA» project, launched in 2012, under the aegis of the European Union and the General Secretariat for Research and Technology (Greek Ministry of Education and Religious Affairs), was to develop an integrated model that facilitates the activation and involvement of local stakeholders in the management process design, enhancing participatory and adaptive management. This model was developed through primary social research in Skyros and Andros islands and the Thessaly plain, as a flexible and useful tool in planning participatory and adaptive management of protected areas. The project focused on management projects that were running in each area. In the case of Skyros Island, the "PAMNATURA" project detected acceptance of the LIFE project management actions by local people, together with application of the NEP scale.

2.3. Questionnaire's Structure

The questionnaire was constructed to record the local acceptability of the LIFE project proposed actions as well as to measure the ecological attitudes using the revised NEP scale [37,55]. The questions were grouped into three thematic sections: (i) socio-demographic characteristics, (ii) LIFE project conservation proposals, and (iii) NEP scale items. All questions were closed-ended. The socio-demographic characteristics of the sample were described through gender, age, education level and occupation of the respondents.

Regarding the LIFE project conservation proposals, they were derived from the 6 different thematic Action Plans developed in the frame of the project. Three categories related to protection and promotion of the natural capital of the island were set, corresponding to three important aspects that have to be detected in terms of local views, in order the LIFE project to be strengthened. These categories were: a) nature protection, b) agro-pastoralism, and c) ecotourism. The "nature protection" category consisted of questions regarding impose of stricter protection measures in Kochilas mountain and wetlands. The "agro-pastoralism" category comprised questions about the farming activity on the island, such as the re-cultivation of local traditional crop varieties, such as local variety of Vicia faba ("fava") and the restarting of the agro-pastoral cooperative. Finally, the "ecotourism" category included questions about the eco-touristic emergence of the local wetlands and the further enhancement of the Skyrian horse. For each question or statement there was a 5-point scale, starting from "strongly agree" to "strongly disagree".

The New Ecological Paradigm (NEP) scale, originally constructed by Dunlap and VanLiere [38] as having 12 items, is now a 15-item questionnaire designed to address the five facets of an ecological worldview [37]. These facets are: a) reality of limits to growth, b) anti-anthropocentrism, c) fragility

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of nature's balance, d) rejection of exemptionalism, and e) the possibility of an eco-crisis. The 15 items of the revised NEP scale were accurately translated in Greek, maintaining the facets of an ecological worldview that are designed to address. For each question or statement there was a 5-point Likert scale, starting from "strongly agree" to "strongly disagree". Agreement with the eight odd-numbered items and disagreement with the seven even-numbered items indicate pro-NEP responses (Table 4).

2.4. Sampling–Data Analysis

About 40 pilot questionnaires were applied on a small sample of the population, to check their clarity, identify possible shortcomings or errors and calculate the time required to complete them.

The final questionnaires were applied using the method of simple random sampling. A large number of questionnaires (165) were completed through personal interviews, in public buildings, shops, recreation areas and open spaces. The interview lasted approximately 20'-30'. A number of questionnaires (50) were distributed to the respondents. The process of sampling was carried out in two phases, in November and December 2012.

Following the results of descriptive analysis, the questions of the three different categories of the LIFE project actions were grouped to form three new respective variables, with acceptable Cronbach's alphas. The questions of the NEP scale were also grouped, reversing the scale for the seven even-numbered questions, with acceptable Cronbach's alpha, which suggests that the use of the NEP scale as a single measure is basically reasonable. Correlation among different variables was detected, by calculation of the Pearson *r*.

This way, four distinct dependent variables were formed: (a) Single NEP score, (b) Nature protection, (c) Agro-pastoralism, and (d) Ecotourism. These variables were correlated (Pearson r) to each other as well as to the independent variables corresponding to the social characteristics of the sample (Gender, Age, Education level and Occupation). Additionally, analysis of variance (ANOVA) was used to detect possible impact of specific occupation (agro-pastoralism) to the dependent variables.

3. Results and Discussion

3.1. Socio-Demographic Characteristics

The total number of questionnaires was 200. A number of 165 questionnaires were completed through personal interviews and 35 questionnaires were returned after distributing (50 were distributed, response rate=70%). The sample corresponds approximately to 7% of the total population of Skyros (National Statistical Service of Greece, Census 2011).

Of them, 63% were male and 37% female (Table 2). There was adequate representation of the different age classes, as well as the different levels of education. As regards occupation, about one third of the sample work in the primary sector exclusively or not (mainly in agriculture and livestock husbandry, rather than fishing), a large percentage are civil servants, while the majority of the sample work in the private sector (employees, merchants).

Table 2. Socio-demographic characteristics of the sample.

Social characteristics	(%)
Gender	
Male	63
Female	37
Age	
18- 30	25
31-40	29
41-50	29
50-60	12
>60	5

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Education	
Compulsory	15
Post compulsory	53
Higher, Post graduate	32
Occupation	
Primary sector (farmers, shepherds, fishermen)	20
Primary in parallel with another sector	11
Public sector	19
Private sector	37
Education	6
Unemployed, Retired	7

3.2. Acceptability of the LIFE Project Actions by Local People

The majority of the sample generally agrees with the LIFE project proposed actions, though there ap-pears notable disagreement or neutrality regarding specific actions (Table 3).

Table 3. Views of the general population sample on the actions proposed by the LIFE project.

Category / **Proposed Action**	**Responses (%)***					**Mean**
	SA	A	U	D	SD	
Nature protection						
Zoning of tourist activity in order to minimize impacts on the natural environment of the irrational tourism development	32	47	15	4	1	**4.06**
Integration of Mount Kohylas areas into a protection scheme with stricter regulations	40	37	15	5	3	**4.06**
Creation of zones exclusively for the Skyrian horse	42	39	12	4	3	**4.13**
Delineation, protection and enhancement of wetlands for the benefit of migratory birds and riparian vegetation	40	47	12	0	1	**4.24**
Agro-pastoralism						
Exploitation of abandoned terraces	27	55	13	4	1	**4.04**
Gradual reduction in the number of sheep until it reaches about 75% of the current number	34	39	16	7	5	**3.90**
Re-cultivation of local traditional varieties (e.g., fava beans)	55	42	1	1	1	**4.49**
Re-cultivation of traditional varieties of fodder crops	52	45	1	2	0	**4.48**
Application of grazing system with changes in time	44	43	9	2	2	**4.26**
Activation of Local Shepherd cooperative	58	36	5	1	1	**4.50**
Ecotourism						
Removal of debris from wetlands of the island, such as Kalamitsa and Aspous to upgrade the landscape	61	35	4	1	0	**4.56**
Emergence of wetland Kalamitsa, creating ecotourism routes	50	41	7	1	1	**4.38**
Further enhancement of Skyrian horse, to promote agro- and eco-tourism activities	51	39	9	2	1	**4.38**

**SA: Strongly Agree A:* Agree U: Undecided (Neither Agree nor *Disagree) D:* Disagree SD: *Strongly Disagree.*

Among the questions of Nature protection category, the highest mean scores were recorded for those regarding the protection of coastal marine areas as important habitat for breeding fish and seabird colonies, as well as the delineation and enhancement of wetlands for the benefit of migratory birds and riparian vegetation. However, remarkable percentages (12-15%) of the sample were not sure or took no position (nor agreement, nor disagreement) for all the five questions of this category.

As regards the Agro-pastoralism category, the highest mean scores were recorded for the questions about the re-cultivation of local traditional varieties (including both fodder crops and other varieties, like fava beans) and the activation of the local Shepherd Cooperative. The only question of

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this category that scored under 4 (3,90), was that concerning the proposal of the gradual reduction in the number of sheep until it reaches about 75% of the current number. Regarding answers to the latter question, further statistical analysis showed that there is not significant differentiation ($p>0.05$) between farmers and the rest of the sample.

As for the Ecotourism category, all three questions reached really high scores.

3.3. The NEP Scores

Agreement with the eight odd-numbered items and disagreement with the seven even-numbered items indicate pro-environmental views (Table 4). The highest mean scores were recorded for items 3 and 7 related to fragility of nature's balance and anti-anthropocentrism, respectively; the vast majority of the sample believes that human interference with nature often produces disastrous consequences, as well as that plants and animals have as much right as humans to exist. The lowest mean score was recorded for item 6, which was designed to address the facet of recognition of limits to growth and was the only item which scored below 2.50. According to this, the majority of the sample seems to believe that the earth has plenty of natural resources if people just learn how to develop them. Items 1, 4, 10, 11 and 14 scored from 2.50 to 3.50, indicating neither agreement nor disagreement. Items 1 and 11 were designed to address the facet of limits to growth. Items 4 and 14 were designed to address the facet of human exemptionalism, while item 10 the possibility of an eco-crisis.

Table 4. Percentage distributions and means for the responses to the New Ecological Paradigm (NEP) scale.

Statement	Responses (%)*					Mean
	SA	A	U	D	SD	
	(%)					
1. We are approaching the limit of the number of people the earth can support	18	33	14	26	9	3.25
2. Humans have the right to modify the natural environment to suit their needs	1	4	7	37	51	4.33
3. When humans interfere with nature, it often produces disastrous consequences	58	37	3	1	1	4.50
4. Human ingenuity will ensure that we do NOT make the earth unlivable	6	13	23	38	20	3.50
5. Humans are severely abusing the environment	35	52	6	5	2	4.13
6. The earth has plenty of natural resources if we just learn how to develop them	45	34	5	11	6	1.98
7. Plants and animals have as much right as humans to exist	60	35	3	1	1	4.51
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations	2	7	13	48	30	3.97
9. Despite our special abilities, humans are still subject to the laws of nature	39	48	4	7	1	4.19
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated	12	16	16	39	17	3.34
11. The earth is like a spaceship with very limited room and resources	14	43	17	20	6	3.39
12. Humans were meant to rule over the rest of nature	4	10	14	49	24	3.80
13. The balance of nature is very delicate and easily upset	31	49	9	9	2	3.99
14. Humans will eventually learn enough about how nature works to be able to control it	5	21	24	41	9	3.28
15. If things continue on their present course, we will soon experience a major ecological catastrophe	43	47	6	3	1	4.28

**SA: Strongly Agree A:* Agree U: Undecided (Neither Agree nor *Disagree) D:* Disagree SD: *Strongly Disagree.*

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3.4. Correlation between Acceptability of the LIFE Project Actions and the Single NEP Scale Score

The questions of the three categories of the LIFE project actions were grouped and mean scores emerged for each category, with acceptable Cronbach's alphas, forming four distinct variables: (a) Single NEP score, (b) Nature protection, (c) Agro-pastoralism, and (d) Ecotourism (Table 5).

Table 5. Cronbach's alpha, means and standard deviations for the responses to each category of proposed actions.

Category	Cronbach alpha	Mean	SD
Nature Protection	0.78	4.12	0.7
Agro-Pastoralism	0.69	4.28	0.5
Ecotourism	0.69	4.43	0.6
NEP scale	0.63	3.76	0.4

The sample seems to largely agree with the LIFE project proposals, noting high scores (>4.0) for all the three categories of proposed actions (Table 5). With slight difference, the actions related to ecotourism scored higher than those related to agro-pastoralism and nature protection. Cronbach's alpha for all the NEP scale questions was 0.63, which suggests that the use of the NEP scale as a single measure is basically reasonable.

Correlation between the Single NEP score and the acceptability of the different categories of the proposed actions resulted significant, regarding all the three different categories ($p<0.001$). Calculation of Pearson r showed almost the same moderate correlation between the Single NEP score and the Nature protection and Agro-pastoralism, while correlation between the NEP score and the Ecotourism was rather weaker (Table 6).

Table 6. Correlation (Pearson r) between the Single NEP score and the Nature protection, Agro-pastoralism, and Ecotourism variables.

	Nature protection	Agro-pastoralism	Ecotourism
Single NEP score	0.423***	0.392***	0.275***

3.5. The Single NEP Score and the Acceptability of the LIFE Project Actions in Relation to the Characteristics of the Sample

Possible relationship between the single NEP scale score and the acceptability of the LIFE project actions with the demographic data of the sample was detected. Gender and age were not found to significantly differentiate the sample's perceptions regarding both the single NEP scale score and the acceptability of the LIFE project actions. However, statistical analysis showed that the education level of the sample correlates weakly to the single NEP score, as well as to the acceptability of the Nature protection and the Agro-pastoralism variables (Table 7). Specifically, the higher the educational level the higher the NEP score and the approval of the proposed actions related to the protection of nature and the agro-pastoral issues. No significant correlation was found for the Ecotourism variable.

Table 7. Correlation between Education of the sample and the Single NEP score, Nature protection, Agro-pastoralism, and Ecotourism variables.

	Single NEP score	Nature protection	Agro-pastoralism	Ecotourism
Education	0,230**	0,174*	0,191*	0,114

(**): $p<0.01$, (*): $p<0.05$.

Moreover, considering that people who work in farming and livestock husbandry - of the main stakeholders in the area - are considered to be more or less influenced by the proposed actions, further statistical analysis was carried out to detect any relationship between the single NEP scale score and

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the acceptability of the LIFE project actions with the relative occupation. In the island, it is usual for people who work in the agro-pastoral sector to work, also, in different sector. For this reason, we grouped occupation of the sample into three groups: those who work in the agropastoral section exclusively, those who work in other section in parallel with agro-pastoralism, and those who work in different sector. The results showed that those who are exclusively farmers scored lower and significantly differentiated from the rest of the sample, as regards the Nature protection and the Ecotourism variables (Figures 1 and 2).

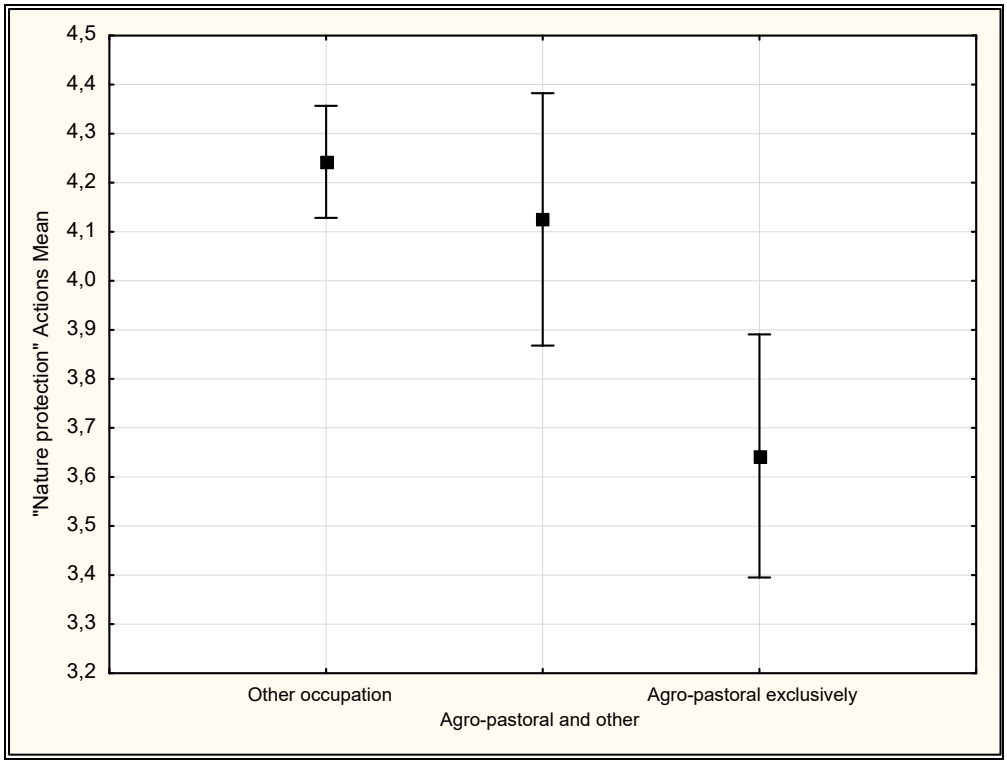

Figure 1. Effect of occupation (working in the agro-pastoral section or not) in the Nature protection variable ($p<0.001$).

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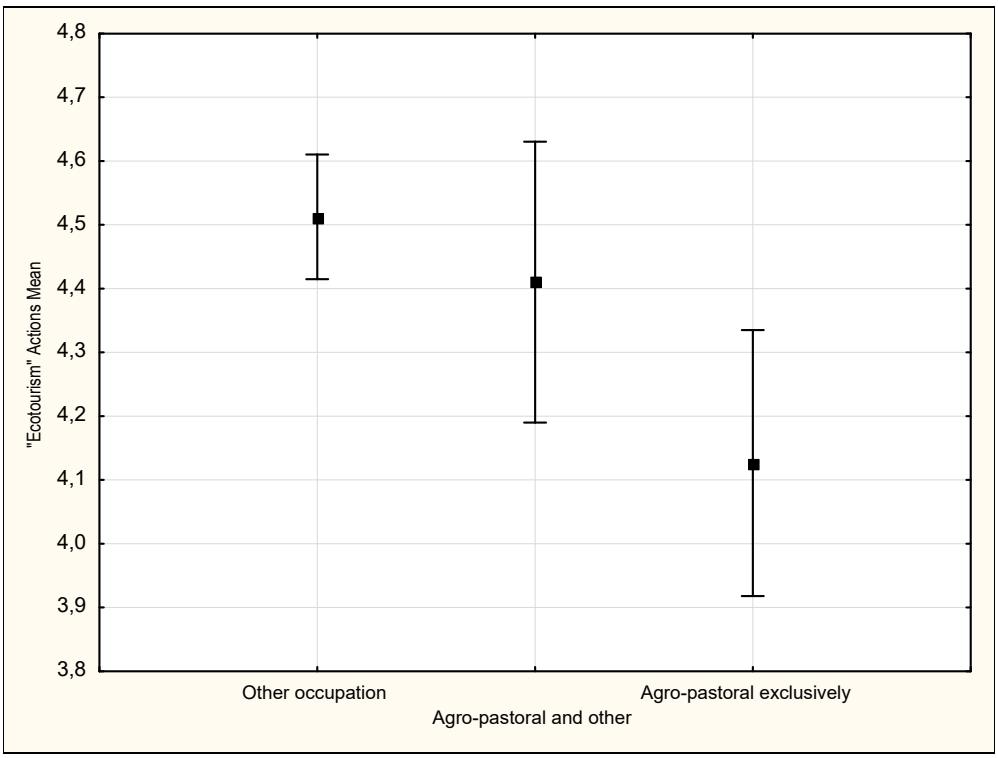

Figure 2. Effect of occupation (working in the agro-pastoral section or not) in the Ecotourism variable ($p<0.01$).

4. Discussion

The results showed that the majority of the sample agrees with all the three categories of the LIFE proposed actions, studied in the present research, though there appears notable disagreement or neutrality regarding specific actions. With slight difference, the actions related to ecotourism scored higher than those related to agro-pastoralism and nature protection.

The respondents disagreed or did not take place in notable percentages (8% and 15% respectively) regarding the proposed action about integration of Mount Kohylas' sites in protection regime with stricter regulations, concerning the questions of Nature protection category. Also, remarkable percentages of the sample (12-15%) chose the "nor agree, nor disagree" answer for all the five questions of this category, implying possible caution about the proposed protection measures. Skyros is designated as one of the receptor islands of the Aegean Sea, where a major renewable development process of 9 wind farms establishment was to take place. The investment involved the installation of 111 wind turbines, under environmental permit procedure, distributed in an area of 2602 ha in Mount Kohylas, i.e., more than 60% of the protected Natura 2000 site. Given the high economic interest anticipated from the investment, reluctance about topics related to the protection of nature is partly understandable and justified. Reluctance seems to be further amplified by the interests related with agro-pastoralism, as additional analysis revealed; those who are exclusively farmers scored lower and significantly differentiated from the rest of the sample regarding the Nature protection proposed actions. Conflicts and negative attitudes towards protected areas have been documented in studies worldwide, related to different economic interests, aspirations, and values of the management shareholders [2,20–23]. The declaration of an area as protected is connected to concerns on the part of those residents that base their livelihood on natural resources, resulting in the adoption of a not-so-positive attitude towards protection [2,56–58]. This is also the case in Skyros island, though it has to be pointed out that farmers may score lower in comparison with the rest of the sample, but their total mean score is high, implying approval of the proposed actions. Siebert et al. [50] reviewing publications and research reports from six EU member states in relation with factors

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affecting European farmers' participation in biodiversity policies, suggested that economic interests are an important, but not the only, determining factor for farmers' decision-making.

However, when it comes for the actions related to ecotourism activities, the respondents seem to be more receptive as they strongly advocate both the actions relevant to the wetlands, together with the action about the Skyrian horse. Those who are exclusively farmers scored lower in comparison with the rest of the sample, implying less interest in ecotourism activities, though sufficiently high. One of the main elements of successful participatory planning of ecotourism is empowering local communities by linking economic benefits to conservation [59]. Furthermore, from the Agro-pastoralism category, the questions about the re-cultivation of local traditional varieties and the activation of the local Shepherd Cooperative scored the highest means, with no significant differentiation between farmers and other professionals. This wide acceptance could be attributed to the economic dimension, inherent with the above proposed actions. It seems that an eco- and agro-tourism perspective along with local agro-pastoral development is really appealing to the respondents. This outcome is associated with the possibility of applying participatory and adaptive management in the area, implying willingness for active participation, as the above-mentioned actions are to be performed by the locals themselves.

Henle et al. [47] argue that conflicts generated from the need to secure biodiversity should be solved by implementing creative management. The latter is based on open and creative partnerships between all parts that have interests on natural resources [60]. Such approach demands combined actions to exploit information stemmed from the different perceptions of causes, pathways, and consequences and to create joint initiatives. In this respect, three types of conflict reconciliation strategies may be built [47], (a) regulatory, related to institutional means, (b) participatory, to include interactions with local perceptions into active management processes, and (c) incentives, i.e., compensation means and windows for economic return. Complementary to the latter, Bartkowski and Bartke [61], reviewing empirical studies of European farmers' decision-making, pointed out the significant influence of economic incentives on farmers' decision-making, considering that farmers are also, entrepreneurs.

From the Agro-pastoralism category, the gradual reduction in the number of livestock was the proposed action that scored the least, compared to the other actions of this category. A notable proportion (12%) disagreed with this proposed action, while 16% of the sample seemed to be cautious. However, further statistical analysis regarding this action showed no differentiation between the answers of farmers and the rest of the sample. Extensive livestock husbandry is deeply rooted in the professional life of Skyrians. For centuries, there were three castes in Skyros, those engaged in sea-related professions, those in agricultural activities and those in livestock husbandry. The latter were forming the caste of "tsompanides", which was the base of traditional Skyrian culture, and livestock was the centre of this culture [62,63]. Disagreement and prejudice, regarding the livestock reduction, expressed in remarkable percentages by the sample (and not particularly by farmers), could reflect this traditional culture aspect - on the side of the general population - in combination with the farmers' concerns. The negative effects on main stakeholders' activities in protected areas and the relative arising reactions and conflicts have been reported by numerous works [21,64–68].

As a common rule, conflicts are generated when a specific conservation measure touches the economic interests of local people. For example, Reading et al. [69] reported several areas of conflicts between pastoralism and conservation in the rangelands of Mongolia. Similarly, several reactions from local herders to the introduction of conservation measures for wild fauna have been recorded worldwide (e.g., [70–73]. Often, the reduction of conflicts (human activities that oppose to the conservation measures) are found in the core of several conservation programs, like the one for brown bear in the National Park of Abruzzo - Italy (LIFE09 NAT/IT/000160 project). For this reason, specific guidelines for the prevention and management of conflict were realized [74].

As regards the NEP scale questions, it is noteworthy that all the NEP questions addressing the facet of "reality of limits to growth" scored under 3.5. More specifically, the majority of the sample seems to believe that the earth has plenty of natural resources if people just learn how to develop

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them, while large percentages of the respondents disagree with the statements that we are approaching the limit of the number of people the earth can support, and that the earth is like a spaceship with very limited room and resources. From the above it could be drawn that those low means concerning the facet of "reality of limits to growth" could be probably associated to some extent to the reluctance expressed regarding the questions about "Nature protection", reflecting a rather "loose" conception of the capacity and the extent of natural resources utilization, either assisting the relevant reluctance about "Nature protection" issues or originated from it.

The single NEP score of the sample was rather high, implying pro-environmental beliefs. The NEP scale score has been used worldwide in the prediction of behavior and support for conservation programs and management policy and has been found to correlate significantly to behavioral intentions [40,75–78]. Xiao et al. [79] found the NEP scale as the most powerful predictor of "environmental concern". Dunlap and Jones [80] defined "environmental concern" as "the degree to which people are aware of problems regarding the environment and support efforts to solve them and/or indicate a willingness to contribute personally to their solution". Xiao et al. [79] also reported that in most cases, studies employing the NEP scale as a predictor of specific environmental beliefs, attitudes, and behaviors, found that the NEP has considerable power in predicting pro-environmental behaviors. Moreover, in the case of Skyros island, the positive correlation between this high single NEP score and the mean scores in all the different categories of the proposed actions further strengthens the possible relationship between pro-environmental beliefs and predicting of behavioral intentions.

The fact that the educational level of the sample positively correlates both to the single NEP score and the acceptability of the proposed actions related to the protection of nature and the agro-pastoral issues, emphasizes the possible significant role of environmental education in raising awareness of local people, that could lead to better understanding of environmental management actions and consequently to higher approval of them. Studies have reported positive correlation between education level and the NEP [81–84], as well as the role of education in shaping views related to environmental conservation [11,27,50,85–91].

5. Conclusions

The NEP scale, in agreement with the literature worldwide, could be a reliable predictor tool for pro-environmental beliefs, attitudes, and behaviors. In Skyros island the rather high NEP score correlates positively to the high recorded local reception of the proposed management actions, confirming the above. Use of the NEP scale during designing a management project could be a first detection step for making the "environmental profile" of local society.

High mean scores regarding all the different categories of the proposed management actions reflect a generally positive attitude towards the relative management project and implies a proper basis for developing cooperation with the inhabitants. There seems to be fertile ground for flourishing of the local Shepherd Cooperative, as well as, for re-cultivating local varieties, while prospect of ecotourism was also well received by locals; agro- and eco-tourism actions exhibit good perspectives for the local economy. In this sense, implementation of actions related directly or indirectly to economic activities, that are more likely to be adopted by the local community, e.g., fava bean cultivation and reconstitution of traditional terraces should be promoted and possibly combined into the agrotourism portfolio. Linking financial incentives to environmental conservation could motivate local societies to be actively involved in management projects. The message of this study regarding the revitalization of local Shepherd Cooperative is not only of local importance; it may serve as a model to be adopted by other local shepherd communities throughout Greece. Indeed, the active connection of rural people in nature conservation projects that simultaneously safeguard or even increase their income and societal status looks like a win-win condition.

Old-fashioned mentalities regarding livestock husbandry are still traceable in the local society, reflected in the reluctance (though, by a small percentage of the sample and - additionally - not exclusively farmers) of the adoption a 1/4 reduction of the livestock capital to restore the pastureland. Such mentalities are deeply rooted in the traditional bonds local people still retain with the activity

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of stocking animals. The modern appreciation of values that natural environment generates may serve as a boost to accept balanced livestock numbers in respect to carrying capacity of rangelands. Further, it is expected that the inclusion of this professional activity into a developmental framework based on promotion of natural resources will give new perspectives in this activity. Thus, it is expected that nature's conservationism may serve as a vehicle to shift towards sustainable land use practices.

Respect for local tradition could enhance local participation. When developing management projects, preservation of traditional activities that connect local people with their past is crucial, as it makes them feel safeguarding cultural values, preserving this way the unique local character amid new proposed approaches and actions. Environmental education together with consultation and interactive informing, in the frame of management projects design and implementation, could also enhance local participation. In the case of Skyros island, it is essential the proposed project actions related (directly or not) to protection measures and restrictions to be effectively communicated, so the main stakeholders (farmers, shepherds and fishermen) to be well-informed, in parallel with environmental education activities. This way, misunderstanding, reluctance as well as possible conflicts will be avoided, facilitating the projects' objectives but also helping in addressing people's prejudice about protected area.

From the above, it could be argued that Skyros offers an appropriate social background for applying participatory and adaptive management and implementing conservation programs.

6. Patents

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