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Environmental Policy Beliefs of Stakeholders in Protected Area Management

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Abstract Although the importance of understanding stakeholder beliefs regarding environmental policy has been noted by many authors, research focusing on the heterogeneity of stakeholder views is still very scarce and concentrated on a product-oriented definition of stakeholders. The aim of the present study is to address this gap by examining environmental policy beliefs of stakeholder groups engaged in protected area management. Questionnaires containing 73 five-point Likert scale items were administered to eight different stakeholder groups involved in the management of Greek protected areas. Items referred to core beliefs on environmental policy, namely, the value framework and sustainable development, and secondary beliefs, that is, beliefs on social consensus and ecotourism development. Our study used as a starting point respondent recruitment on the basis of a traditional product-centered approach. We investigated whether environmental policy beliefs can be used to effectively segregate stakeholders in well-defined segments, which override the product-oriented definition of stakeholders. Indeed, K-means clustering revealed an innovation-introduction and an implementation-charged sample segment. The instrument utilized in this research proved quite reliable and valid in measuring stakeholder environmental policy beliefs. Furthermore, the methodology implied that stakeholder groups differ in a significant number of belief-system elements. On the other hand, stakeholder groups were effectively distinguished on a small set of both core and secondary beliefs. Therefore, the instrument used can be an effective tool for determining and monitoring environmental policy beliefs of stakeholders in protected area management. This is of considerable importance in the Greek case, given the recent establishment of 27 administrative bodies of protected areas, all of which are required to incorporate public consultation into management practices.

Keywords Ecotourism · Environmental policy beliefs · Protected areas · Social consensus · Stakeholders · Sustainable development · Values

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Introduction

Until very recently, protected area (PA) designation in Greece has been coordinated by national and international nongovernmental organizations (NGOs) and the State Forest Service (Trakolis 2001a, 2001b). In this expert-led process, local people have rarely had the chance to participate, and this resulted in strong local opposition (Hovardas 1999). Local residents' call for participation in environmental policymaking has only recently been addressed by a governmental initiative that established 27 administrative bodies to manage national parks all over Greece; local representatives are considered stakeholders and will have the chance to take part in the decision-making processes (Greek Ministry of Environment, Physical Planning and Public Works 2003).

Apart from local communities, NGOs, and the Forest Service, there are many other stakeholder

groups that have now become engaged in PA management mainly through their connectedness to ecotourism development: employees in state agencies supporting rural development (RD) at the level of Greek Prefectures, tourism managers working in Greek National Tourism Organization offices spread throughout Greece, owners of travel agencies specialized in ecotourism, and environmental education (EE) instructors working in EE centers. In many cases, academics have been appointed as presidents of the PA administrative bodies; this probably reflects the increase in interrelations between Greek universities and a wide array of PAs, because many researchers have lately conducted their studies in the latter.

Decentralization in decision-making reinforces the complexity not only of negotiating solutions and implementing plans (Swaffield 1998), but also in the delineation of environmental management problems themselves (Hull and others 2003). Thus, differences in stakeholder views (based on their beliefs) do not necessarily lend themselves to practical characteristics that can favor one choice over a number of alternative choices, but the challenge also expands to affect the crucial issue of problem ''construction'' (Miller 2000, Brown and others 2001).

To understand this further it must be recognized that, within belief systems, one can distinguish between core and secondary beliefs (Jenkins-Smith and Sabatier 1994, Glück 2000): the former include a relatively restricted set of abstract beliefs, such as fundamental environmental value priorities, and positions on sustainable development; secondary beliefs comprise policy preferences regarding desirable policy regulations and the design of specific institutions for pursuing the policy core, such as dispositions toward the establishment of social consensus and ecotourism development. Indeed, consensus-driven policy was highlighted as a crucial component in the success of natural resources planning (McCreary and others 2001, Mascarenhas and Scarce 2004), especially when it is facilitated by the diversity in perceptions and values of actors engaged (Brown and others 2001).

Because consensus is required and all key affected stakeholders (with their different values) need to be included in the decision-making process in order to create durable agreements, there is a need to identify how environmental management via stakeholder engagement can be improved (Lane 2003). Although environmental management conflicts include value-laden struggles, such as maintaining social identities (Cheng and others 2003), the tendency has been to identify stakeholders in very specific and narrow terms as product-centered resource user groups (Castro and Nielsen 2001). Stakeholders are frequently selected in terms of interests rather than values (Hoffman and Ventresca 1999, Gamborg 2002). In an attempt to negotiate workable compromises within the current neocorporatist nature policy, conflicts of value are often transformed in conflicts of interest, but ''value'' management might be the key to successful stakeholder consultation (Keulartz and others 2004).

Although the importance of understanding stakeholder beliefs regarding environmental policy has been noted by many authors (Harrison and Burgess 2000, Stoll-Kleemann 2001, Tarrant and Cordell 2002), research focusing on the heterogeneity of stakeholder views is still very scarce and concentrated on a product-oriented definition of stakeholders (Cordano and others 2004). The aim of the present study is to address this gap by examining environmental policy beliefs of stakeholder groups engaged in PA management. More specifically, the objectives of the research are to determine differences between stakeholder groups in core and secondary beliefs, to investigate whether belief systems can be used to effectively segregate stakeholders in well-defined segments, which override the product-oriented definition of stakeholders, and to define those beliefs that contribute most in delineating stakeholder groups.

Methods

Instrument

All items included in the instrument were pre-tested using a student sample. Based on pre-test results, scales were modified (i.e., items were rejected or new items were included) to improve scale reliability and validity (see the Results section, under Questionnaire Reliability and Validity). The final version of the questionnaire comprised four subunits. The ''value frame'' and ''sustainable development'' subunits contained 16 and 18 items, respectively, which adhered to core environmental policy beliefs. The ''social consensus'' and ''ecotourism development'' subunits included 20 and 19 items, respectively, that corresponded to secondary environmental policy beliefs. In order to avoid spontaneous, unreflexive responses, a technique based on cognitive conflict was followed, in order to construct questionnaire items (Koskinas and others 2000), namely, most items described a dilemma situation, which participants were requested to respond to. All questionnaire items can be provided by the authors upon request.

For each subunit, items were organized in terms of research hypotheses, which referred to main reflections in the field of environmental policy. Within the ''value frame'' subunit, research hypotheses addressed the following: the issue of nature's intrinsic value (Morito 2003) and self-regulation (Korfiatis 1999); human intervention (Hull and others 2003); the contribution of science (Louloudis 1998), conceptual controversies between terms, such as the attribution of ''nature'' to biophilic associations, and the attribution of ''environment'' to biophobic associations (Harré and others 1999, Hovardas and Stamou 2006); and the association of the term ''ecology'' with ''urbanites'' and the association of the term ''pollution'' with ''rural people'' (Louloudis 1999a).

Accordingly, the ''sustainable development'' subunit involved the following: the cost of sustainability regarding resource use and various social groups (Harré and others 1999); the contribution of sustainable development in maintaining the balance of ecosystems (Palmer 1998); the technocratic approach to sustainability (Louloudis 1999b); ecotourism as a sustainable perspective (Minca and Linda 2000); and the potential of sustainability under current social structures (Palmer 1998).

Within the environmental policy agenda, environmental conservation objectives are most often considered by environmental managers as given, that is, they are not negotiated by stakeholders (Brandon 1993, Sgardelis 1996). The first research hypothesis of the ''social consensus'' subunit reflected this claim. Other hypotheses referred to the following: local participation (Greek National Tourism Organization and WWF Hellas 2000); the supposed difficulty of local communities to comprehend innovative environmental conservation initiatives (Bengston 1994); the dependence of PAs on external sources of funding (Dharmaratne and others 2000, Greek Ministry of Environment, Physical Planning and Public Works 2003); ecotourism as the means of changing production patterns within PAs (Lindberg and others 1996); and local support for environmental conservation (Greek National Tourism Organization and WWF Hellas 2000).

The ''ecotourism development'' subunit of the questionnaire contained hypotheses regarding the following: long-term planning (Brandon 1993); ecotourism monitoring, the supply versus demand controversy and ecotourism-carrying capacity (Greek National Tourism Organization and WWF Hellas 2000); stakeholder participation in ecotourism development (Fennell 1999); the role of EE in the definition of ecotourism (Björk 2000); the role of environmental awareness in the definition of EE (Palmer 1998); and the deficit in the evaluation of EE programs (Paraskevopoulos and Korfiatis 2003).

Data Selection

Questionnaires were mailed to six different stakeholder groups involved in PA management situated all over Greece, namely: members of NGOs engaged in PA management; forest managers; employees of state agencies supporting RD at the level of Greek Prefectures; tourism managers working in Greek Tourism Organization Offices; owners of travel agencies specialized in ecotourism; and EE instructors working in EE Centers. The sample also included local government (LG) members of municipalities situated at the Kerkini Lake Protected Area and the Dadia Forest Reserve, which are considered exemplary among Greek PAs (Greek National Tourism Organization and WWF Hellas 2000). The questionnaire was also administered to postgraduate students of Environmental Biology at the School of Biology of the Aristotle University of Thessaloniki.

The questionnaire was introduced by an invitation letter as a survey on environmental policy beliefs. Respondents were asked to state whether they agree or disagree with questionnaire items on a five-point Likert scale. Responses were coded as ''+2'' and ''+1'' for strong and moderate agreement, respectively, ''0'' for neutral dispositions, as well as ''–1'' and ''–2'' for moderate and strong disagreement, respectively. Respondents also completed a demographic section ascertaining gender, age, level of education, and monthly income.

The research utilized a three-contact procedure (initial mailing, telephone reminder, and follow-up full mailing). In total, 480 questionnaires were mailed and 290 questionnaires were returned during the second half of 2001, resulting in a response rate of 60.42%. Response rate varied significantly per stakeholder group and ranged from about 50% for travel agencies to more than 80% for RD agencies. In total, there were 276 usable questionnaires.

Data Analyses

For each research hypothesis, respondent replies were summed across items and divided by the number of items included in the hypothesis. This quotient refers to research hypotheses' scores. Coding for several items was reversed, in order for all items to present the same polarity before computing research hypotheses' scores.

Table 1 Sample characteristics

Category	χ^2	LG members	NGO members	Forest managers	RD agencies	Tourism managers	Travel agencies	EE instructors
Sample percentage[a]		11.96	10.14	11.96	17.75	13.41	9.78	13.41
Gender	10.14^{ns}							
Male		50.00	46.67	77.27	51.22	37.93	71.43	54.17
Female		50.00	53.33	22.73	48.78	62.07	28.57	45.83
Age	36.46^{***}							
<30		61.11	13.33	4.55	34.15	0.00	28.57	0.00
31–50		38.89	86.67	45.45	63.41	75.86	64.29	91.67
>50		0.00	0.00	50.00	2.44	24.14	7.14	8.33
Education level	46.83^{***}							
High school		22.22	0.00	0.00	7.32	13.79	50.00	0.00
University		22.22	33.33	77.27	70.73	79.31	35.71	87.50
Postgraduate		55.56	66.67	22.73	21.95	6.90	14.29	12.50
Income	56.25^{***}							
<900 Euro		63.41	22.73	34.48	50.00	4.17	83.33	60.00
900 – 1200 Euro		19.51	45.45	41.38	21.43	87.50	5.56	30.00
>1200 Euro		17.07	31.82	24.14	28.57	8.33	11.11	10.00

Note: Levels of significance for the χ^2 test of independence: ns = nonsignificant, $*P < 0.05$, $**P < 0.01$, $***P < 0.001$

LG = local government, NGO = nongovernmental organization, RD = rural development, EE = environmental education

[a] Postgraduate students are not included in the table, because they all belonged to the first age class, the third education level class, and the first income class; they contained equal numbers of males and females and comprised 11.59% of the sample

The coherence of belief systems has been highlighted by previous research as a crucial question to be addressed (Dunlap and others 2000, Hodgkinson and Innes 2000). Inconsistencies between beliefs have been detected in the cases of nature's intrinsic value (Proctor 1998), sustainability (De Avila-Pires and others 2000, Filho 2000), and locals' dispositions towards the environment versus economy controversy (Stoll-Kleemann 2001). To study the coherence of stakeholders' belief systems, contradiction index scores were calculated for a selected number of items. A contradiction between two items arises when a subject is expected to agree or disagree with both items of an item pair, or agree with one item and disagree with the other; these combined responses are expected on the basis of logical compatibility, namely, a contradiction between two items can be established provided they are formulated in the form ''A'' and ''non-A'' (Van der Steen 1993). In this case, items are logically incompatible, that is, each item is the logical negation of the other.

In the contradiction category of the same polarity, when a subject is expected to agree or disagree with both items of an item pair, the following item pairs were included: ''A mosquito cannot have the same value with an individual of an endangered species'' and ''Endangered species are of higher value compared to other species,'' which comprise the first contradiction index termed ''intrinsic value–scarcity context''; ''Sustainable development is the only form of development, which guarantees ecosystems' resilience'' and ''Under sustainable development, economy's enlargement no longer threatens ecosystems' balance,'' which comprise the third contradiction index termed ''sustainability–ecosystems' balance.'' In the contradiction category of reversed polarity, when a subject is expected to agree with one item and disagree with the other, the following item pairs were included: ''It is more painful to have to cut a tree in the city than in the forest'' and ''A tree in the city has the same value with a tree in the forest,'' which comprise the second contradiction index termed ''intrinsic value–sense of place''; ''Sustainable development is a strategy that presupposes social change'' and ''Sustainable development is possible in Western societies even under current consumption rates,'' which comprise the fourth contradiction index, termed ''sustainability–social change''; ''Protected areas should be established only after locals have been compensated'' and ''The implementation of environmental measures should not be delayed due to the need of locals' compensation,'' which comprise the fifth contradiction index termed ''local communities–environment versus economy.''

Scores for contradiction indices were computed as the algebraic sum of respondent replies in the items divided by 4, which is the biggest possible distance between replies in a five-point Likert scale. In the contradiction category of the same polarity, the contradiction index scores were derived by subtracting replies; scores had a positive sign when respondents

Table 2 Mean score of research hypotheses per stakeholder group

Research hypotheses	F	LG members	NGO members	Forest managers	RD agencies	Tourism managers	Travel agencies	EE instructors	Postgraduates	Sample average
Intrinsic value (1)	2.19*	0.14	0.22	0.54	0.18	0.52	0.02	0.24	0.10	0.25
Self-regulation (2)	8.67***	1.06	0.46	1.13	1.14	1.26	1.21	1.11	0.63	1.02
Human intervention (3)	4.51***	0.62	0.32	0.59	0.56	0.65	0.26	–0.09	0.53	0.44
Science contribution (4)	1.02ns	0.74	0.70	0.98	0.81	0.82	0.83	0.61	0.67	0.77
''Nature'' vs. ''Environment'' (5)	6.51***	0.33	–0.54	0.09	0.11	0.38	0.31	–0.43	0.09	0.05
''Urbanites'' vs. ''Rural people'' (6)	5.36***	–0.06	–0.66	–0.18	0.12	0.18	0.17	–0.43	–0.70	–0.17
Resource use (7)	3.36**	0.51	0.40	0.55	0.73	0.77	0.79	0.65	0.25	0.59
Social groups (8)	3.31**	0.55	0.81	1.05	0.86	0.97	0.94	0.97	0.78	0.87
Ecosystems' balance (9)	3.15**	0.15	0.39	0.62	0.47	0.73	0.37	0.81	0.33	0.50
Technocratic approach (10)	7.36***	0.66	–0.05	0.48	0.39	0.74	0.81	0.14	0.17	0.42
Sustainable ecotourism (11)	6.17***	0.77	–0.02	0.52	0.21	0.88	0.54	0.88	0.31	0.51
Sustainability as change (12)	3.00**	0.41	0.73	0.36	0.62	0.43	0.52	1.00	0.80	0.61
Given objectives (13)	2.39*	0.31	–0.13	0.32	0.12	0.40	0.21	0.07	–0.02	0.17
Local participation (14)	7.75***	–0.09	–0.77	–0.07	–0.30	–0.15	–0.09	–0.78	–0.39	–0.33
Innovation deficit (15)	2.29*	0.85	0.69	1.00	0.95	1.13	1.02	0.99	0.90	0.95
Production patterns (16)	2.83**	0.48	0.21	0.47	0.50	0.53	0.72	0.49	0.27	0.46
PAs dependence (17)	3.88***	0.70	0.58	0.67	0.77	0.49	0.56	0.25	0.27	0.54
Local support (18)	3.22**	0.65	0.05	0.24	0.24	0.37	0.33	0.42	0.22	0.32
Long-term planning (19)	1.09ns	0.89	0.71	1.02	0.82	0.97	0.91	0.85	0.73	0.86
Ecotourism monitoring (20)	4.40***	–0.12	–0.89	–0.59	–0.67	–0.34	–0.54	–0.78	–0.66	–0.57
Supply vs. demand (21)	3.71***	–0.03	–0.49	–0.34	–0.35	–0.55	–0.24	–0.71	–0.40	–0.40
Stakeholder participation (22)	3.10**	0.06	–0.38	0.11	–0.22	–0.12	–0.07	–0.53	0.09	–0.14
Carrying capacity (23)	3.64***	0.18	–0.21	0.21	0.17	0.12	0.40	–0.13	0.06	0.10
Environmental education (24)	2.72**	0.94	0.20	0.61	0.61	0.84	0.93	0.84	0.72	0.71
Environmental awareness (25)	3.47**	1.05	0.61	1.21	1.03	1.32	1.11	1.18	0.94	1.07
Evaluation deficit (26)	0.63ns	0.80	0.80	0.79	0.77	0.91	0.83	0.62	0.77	0.78

Note: ns = nonsignificant; *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$

LG = local government, NGO = nongovernmental organization, RD = rural development, EE = environmental education, PAs = protected areas

agreed with the first item of the pair and disagreed with the second item, and a negative sign in the opposite case. In the contradiction category of reversed polarity, the contradiction index scores were derived by adding replies; scores had a positive sign when respondents agreed with both items of the pair, and a negative sign when respondents disagreed with both items of the pair.

K-means clustering was conducted on research hypotheses' scores and contradiction index scores to investigate whether respondents can be effectively divided into homogenized segments in terms of their

Table 3 Mean score of contradiction indices per stakeholder group

Contradiction indices	*F*	LG members	NGO members	Forest managers	RD agencies	Tourism managers	Travel agencies	EE instructors	Postgraduates	Sample average
Intrinsic value – scarcity context (1)	2.39*	0.09	0.10	0.20	0.04	0.01	0.17	–0.01	0.23	0.09
Intrinsic value – sense of place (2)	2.22*	0.07	–0.07	0.15	0.12	0.23	0.06	0.07	–0.01	0.09
Sustainability – ecosystems' balance (3)	2.25*	0.02	0.11	0.17	0.07	0.20	0.22	0.18	0.16	0.14
Sustainability – social change (4)	1.21ns	0.14	0.15	0.18	0.20	0.20	0.35	0.15	0.18	0.19
Local communities – environment vs. economy (5)	1.27ns	0.08	0.01	0.14	0.09	0.16	0.18	0.03	0.02	0.09

Note: ns = nonsignificant; *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$

LG = local government, NGO = nongovernmental organization, RD = rural development, EE = environmental education

environmental policy beliefs. Next, discriminant analysis was conducted on research hypotheses' scores and contradiction index scores to determine those belief-system elements that significantly contribute to distributing respondents into their actual stakeholder groups. All data analyses were performed by using STATISTICA 6.0 software.

Results

Sample Demographics

Aside from gender, differences between stakeholder groups in all other demographic variables were highly significant (Table 1). Forest managers presented the highest percentages in the higher age cohort, while LG members showed the opposite trend. NGO members revealed the highest numbers of postgraduate degrees, whereas travel agency employers showed the highest percentage among stakeholder groups with high school degrees.

Questionnaire Reliability and Validity

Computed for the entire questionnaire, Cronbach's ''A'' amounted to 0.88; when analyzed separately for each subunit, Cronbach's ''A'' ranged from 0.61 for ''sustainable development'' to 0.74 for ''ecotourism development.'' The validity of the instrument was examined by means of the Spearman's rank correlation coefficient (Hovardas 2005). For each research hypothesis, items should reveal significant coefficients as well as expected signs, namely, when respondents were expected to agree at the same time with two items, the correlation between these items should reveal a significant, positive coefficient. In cases in which respondents were expected to agree with one item and disagree with the other, there should be a significant, negative correlation. Items presented within research hypotheses all complied with the above-mentioned prescriptions of questionnaire validity. Accordingly, all research hypotheses were verified.

Research Hypotheses' Scores and Contradiction Index Scores

Research hypotheses' scores are presented in Table 2. There were few hypotheses where differences between stakeholder groups were not significant, namely, ''science contribution'' (4th research hypothesis), ''long-term planning'' (19th research hypothesis), and ''evaluation deficit'' (26th research hypothesis) (Table 2). This implies that these environmental policy beliefs were quite homogenized among stakeholder groups. In all other cases, least significant difference (LSD) tests revealed that NGO members, EE instructors, and postgraduates tended to significantly differentiate from other stakeholder groups by lower research hypotheses scores. The only exception to this trend was linking sustainability to social change (''sustainability as change''; 12th research hypothesis), where the three above-mentioned groups presented relatively higher scores. Across stakeholder groups, disagreement was strongest in two cases included in the ''ecotourism development'' subunit, namely, ''ecotourism monitoring'' (20th research hypothesis), where respondents were not willing to undermine the need of ecotourism monitoring, and ''supply versus demand'' (21st research hypothesis), where respondents were reluctant to accept the primacy of demand over supply. Accordingly, agreement was higher in endorsing

Table 4 K-means clustering of the sample on scores of research hypotheses' and contradiction index

		1st cluster		2nd cluster	
	F	Average	SD	Average	SD
Research hypotheses					
Intrinsic value (1)	0.00^{ns}	0.25	0.75	0.25	0.74
Self-regulation (2)	72.73^{***}	1.27	0.40	0.72	0.66
Human intervention (3)	16.01^{***}	0.60	0.74	0.25	0.72
Science contribution (4)	18.71^{***}	0.93	0.57	0.59	0.75
''Nature'' vs. ''Environment'' (5)	63.25^{***}	0.38	0.79	–0.33	0.69
''Urbanites'' vs. ''Rural people'' (6)	106.10^{***}	0.29	0.90	–0.72	0.69
Resource use (7)	11.37^{***}	0.71	0.60	0.46	0.61
Social groups (8)	0.32^{ns}	0.89	0.52	0.85	0.51
Ecosystems' balance (9)	1.68^{ns}	0.55	0.71	0.43	0.80
Technocratic approach (10)	182.99^{***}	0.82	0.47	–0.06	0.60
Sustainable ecotourism (11)	34.88^{***}	0.77	0.66	0.22	0.89
Sustainability as ''change'' (12)	9.35^{**}	0.48	0.72	0.76	0.81
Given objectives (13)	95.46^{***}	0.49	0.60	–0.21	0.58
Local participation (14)	61.55^{***}	–0.07	0.64	–0.64	0.55
Innovation deficit (15)	14.72^{***}	1.05	0.42	0.83	0.54
Production patterns (16)	28.89^{***}	0.61	0.47	0.29	0.52
PAs dependence (17)	10.82^{**}	0.65	0.59	0.41	0.62
Local support (18)	37.59^{***}	0.50	0.51	0.11	0.56
Long-term planning (19)	2.30^{ns}	0.91	0.57	0.81	0.59
Ecotourism monitoring (20)	82.85^{***}	–0.26	0.70	–0.94	0.51
Supply vs. demand (21)	53.45^{***}	–0.16	0.63	–0.68	0.55
Stakeholder participation (22)	55.13^{***}	0.15	0.76	–0.49	0.67
Carrying capacity (23)	68.33^{***}	0.34	0.50	–0.18	0.54
Environmental education (24)	35.57^{***}	0.97	0.65	0.41	0.91
Environmental awareness (25)	31.70^{***}	1.27	0.52	0.83	0.74
Evaluation deficit (26)	8.41^{**}	0.88	0.56	0.67	0.64
Contradiction indices					
Intrinsic value–scarcity context (1)	0.07^{ns}	0.09	0.38	0.10	0.33
Intrinsic value–sense of place (2)	25.99^{***}	0.18	0.38	–0.03	0.30
Sustainability–ecosystems' balance (3)	0.00^{ns}	0.14	0.29	0.14	0.27
Sustainability–social change (4)	12.56^{***}	0.26	0.33	0.12	0.31
Local communities–environment vs. economy (4)	2.43^{ns}	0.12	0.32	0.06	0.34

Note: ns = nonsignificant; $*P < 0.05$; $**P < 0.01$; $***P < 0.001$

PAs = protected areas, SD = standard deviation

nature's self-regulation (''self-regulation''; 2nd research hypothesis) and accepting that raising environmental awareness of ecotourists is the main goal of EE in ecotourism (''environmental awareness''; 25th research hypothesis). It should be mentioned that sample demographics did not influence research hypothesis scores significantly, as revealed by χ^2 tests.

The first three contradiction index scores varied significantly between stakeholder groups (Table 3). In contrast to trends for research hypotheses' scores, LSD tests showed that EE instructors and postgraduates responded differently in the case of the 1st contradiction index (''intrinsic value–scarcity context''): the former presented the only negative score, whereas the latter the highest score among stakeholders. However, postgraduates presented the lowest absolute value in the score of the 2nd contradiction index (''intrinsic value–sense of place''). Concerning the 3rd contradiction index (''sustainability–ecosystems' balance''), scores had all positive signs among stakeholders; LG members presented the lowest score, while travel agency owners the highest. Absolute values for scores were relatively high in the 4th contradiction index (''sustainability–social change''). Once again, sample demographics did not influence contradiction index scores significantly.

K-means Clustering

In the process of K-means clustering, solutions ranging from two to five clusters were requested. Analysis of these options led to the acceptance of a two-cluster solution, because the other versions produced sample segments that were less differentiated from one another. Table 4 shows average scores and standard deviations for research hypotheses and contradiction

indices in the first and second cluster. An analysis of variance was conducted to reveal significant differences between clusters. Apart from research hypotheses' scores referring to ''intrinsic value'' (1), ''social groups'' (8), ''ecosystems' balance'' (9), and ''long-term planning'' (19), as well as contradiction indices with serial numbers 1 (''intrinsic value–scarcity context''), 3 (''sustainability–ecosystems' balance''), and 5 (''local communities–environment versus economy''), all other research hypotheses and contradiction indices contributed significantly in distinguishing between the first and the second cluster.

With the exception of research hypothesis ''sustainability as change'' (12), the second cluster presented relatively lower scores. This finding reflects results mentioned earlier, which again differentiated NGO members, EE instructors, and postgraduates from all other stakeholders. Indeed, the cross-tabulation of stakeholder group adherence by cluster adherence showed that the majority of NGO members, EE instructors, and postgraduates belonged to the second cluster (Table 5). Accordingly, the majority of LG members, forest managers, RD agency employees, tourism managers, and travel agency owners belonged to the first cluster.

Table 5 Cross tabulation of stakeholders' group by K-means clustering results

Stakeholders' group	1st cluster	2nd cluster
LG members	81.82	18.18
NGO members	7.14	92.86
Forest managers	60.61	39.39
RD agencies	59.18	40.82
Tourism managers	75.68	24.32
Travel agencies	74.07	25.93
EE instructors	27.03	72.97
Postgraduates	40.63	59.38

Note: Numbers presented correspond to percentages of stakeholder groups that adhere to the first and second cluster, respectively; $\chi^2 = 66.27$; $P < 0.001$

LG = local government, NGO = nongovernmental organization, RD = rural development, EE = Environmental Education

Discriminant Analysis

Discriminant analysis showed that research hypotheses' scores and contradiction index scores can effectively distribute respondents in their actual stakeholder group (Wilks' Lambda = 0.18, $P < 0.001$). Percentages for correct classifications ranged from 50.00 for postgraduates to 66.67% for LG members (stakeholder group average = 56.52%). Because these percentages are a measure of stakeholder group homogeneity concerning environmental policy beliefs, one can infer that LG members were characterized by highest and postgraduates by lowest homogeneity among stakeholder groups. Travel agency owners (59.26%) and EE instructors (64.86%) should be placed nearer the high-homogeneity end of the spectrum, whereas NGO members (53.57%), forest managers (54.55%), RD agency employees (53.06%), and tourism managers (51.35%) should be placed nearer the low-homogeneity end.

Research hypotheses' scores that contributed significantly in the distribution of respondents into their stakeholder group correspond to both core and secondary beliefs. Core beliefs pertain to the ''value-frame'' subunit and comprise the acceptance of nature's self-regulation (''self-regulation''; 2nd research hypothesis) ($F = 2.84$, $P < 0.01$), the acceptance of human intervention (''human intervention''; 3rd research hypothesis) ($F = 2.59$, $P < 0.05$), and the ''urbanites versus rural people'' controversy (6th research hypothesis) ($F = 2.40$, $P < 0.05$). Secondary beliefs are confined to the ''social consensus'' subunit and include linking ecotourism to changing production patterns (''production patterns''; 16th research hypothesis) ($F = 3.34$, $P < 0.01$), the acceptance of PAs dependence on external funding (''PAs dependence''; 17th research hypothesis) ($F = 2.80$, $P < 0.01$), and the need for local support (''local support''; 18th research hypothesis) ($F = 2.54$, $P < 0.05$). Apart from research hypotheses' scores, the 3rd contradiction index (''sustainability–ecosystems' balance'') also contributed significantly to respondents' dispersal into their actual stakeholder groups ($F = 2.77$, $P < 0.01$).

Discussion

Our study used as a starting point respondent recruitment on the basis of a traditional product-centered approach. We investigated whether environmental policy beliefs can be used to effectively segregate stakeholders in well-defined segments, which override the product-oriented definition of stakeholders. Indeed, K-means clustering revealed two sample segments: the cluster comprising NGO members, EE instructors, and postgraduates indicates a grouping related to innovation introduction in environmental policy. Postgraduates, as part of the scientific community, could be considered responsible for producing innovative solutions in the field of environmental management; NGOs, on the other hand, are the organizations that usually translate these solutions in on-site practice; finally, EE instructors could be seen as

the mediators between the public and the scientific community, so that innovation can adjust to common views and diffuse in society. Stakeholders in the other sample cluster (i.e., LG members, forest managers, RD agencies, tourism managers, and travel agencies) are mainly charged with implementing environmental policy innovations in the field of environmental conservation and ecotourism development. This polarity between innovation and implementation can describe the main roles available for social actors to undertake within the frame of decentralized environmental governance (Jonas and Bridge 2003, Keulartz and others 2004).

Differences between clusters involved both core and secondary beliefs and it was both belief types (i.e., core beliefs from the ''value frame'' subunit and secondary beliefs of the ''ecotourism development'' subunit) that contributed to classifying respondents into their actual stakeholder groups. These findings point to the importance of investigating the entire complexity of belief systems in terms of framing contested constructions of environmental policy issues, which could enrich the research agenda and inform environmental policy.

Within the implementation-charged configuration, LG members did not possess a contrasting position to forest managers, because they belonged to the same cluster. The traditional conflict over competing land uses seems to have transformed into a stakeholder coalition that pursues common goals (Hovardas and Stamou 2006). Indeed, participants believed that local communities should engage in decision-making processes in the frame of PA management. However, the entire sample acknowledged the need of implementing EE projects in order to overcome locals' reservations about environmental measures. Quite interestingly, LG members themselves believed more in locals' inability to comprehend innovations compared to NGO members. Both of the above findings might imply that the role of local communities in environmental policymaking is perceived more as an advisory one instead as one of being equally responsible for setting the environmental policy agenda (Abakerli 2001). In this scenario, management goals are first determined by a confined number of stakeholders, and then local people are asked to simply comply with decisions already taken (Hull and others 2003). This might not be considered ''true'' community consultation.

All stakeholder groups endorsed a change in the production patterns within protected areas, that is, the restructuring of the primary sector and the subsequent shift to nonconsumptive land uses (Jonas and Bridge 2003). However, both value frame elements and beliefs on social consensus were found to most significantly differ among stakeholder groups. On the one hand, this could imply that the distinction between core and secondary beliefs cannot be considered as a simple, linear function of a supposed degree of generality in stakeholders' views (Jenkins-Smith and Sabatier 1994, Glück 2000). On the other, it indicates that the convergence of stakeholders' dispositions in the need for ecotourism development is accompanied by a divergence in their environmental values and attitudes toward possible ways of establishing social consensus. These findings point to a mixed-motive perspective in environmental policymaking (Hoffman and Ventresca 1999) that is quite different from win–win and win–lose approaches (Swaffield 1998, Lundqvist 2000, De Oliveira 2002) in that it facilitates mutual gain solutions for both environmental and economic concerns while acknowledging their distributive aspects (Hoffman and Ventresca 1999). Such a stance could explain the compliance of locals with prespecified arrangements in environmental policy and raises the issue of supporting policy initiatives in a coincidental way, but this cannot actually guarantee any consent to long-term planning.

Management and Research Implications

Our study showed how monitoring of the governance of PAs could be expanded to include stakeholder beliefs (Hockings and others 2004). The instrument utilized in this research proved quite reliable and valid in measuring environmental policy beliefs of stakeholders involved in PA management. The use of such a survey could support participatory approaches proposed by many authors (van den Hove 2000, Burger 2002, Robertson and Hull 2003). Furthermore, the methodology implied that stakeholder groups differ in a significant number of belief-system elements. On the other hand, stakeholder groups were effectively distinguished on a small set of both core and secondary beliefs. Therefore, the instrument used can be an effective tool for determining and monitoring environmental policy beliefs of stakeholders in PA management (Iannantuono and Eyles 2000). This is of considerable importance in the Greek case, given the recent establishment of 27 administrative bodies of PAs and the need for effective public consultation.

Cordano and others (2004) argued that the attention given so far to intragroup belief heterogeneity has been very limited. Our findings highlighted the significance of coherence of views, as reflected by contradiction indices and stakeholder group homogeneity revealed by the discriminant analysis, in investigating environ-

mental policy belief systems. More specifically, stakeholder groups within the same sample segment responded quite differently in terms of belief-system coherence (i.e., EE instructors and postgraduates). Moreover, our results showed that the same stakeholder group (i.e., postgraduates) could respond differently across different contradiction indices.

Future research should determine the possible reasons behind this apparent complexity in belief aggregates. Apart from looking at specific beliefs separately, one should examine higher levels of organization of belief systems when determining and monitoring stakeholder beliefs on environmental policy. More specifically, future research should focus on the contradictions revealed in the case of the intrinsic value of nature, which were more often than not highlighted by previous research (Proctor 1998, Hull and others 2003, Rosa and da Silva 2005). For instance, the rejection of nature's intrinsic value and, at the same time, the adherence to nature's self-regulation seem to reflect the shift in conceiving protected areas from romantic visions of nature, constructed around the notion of ''wilderness'' separate from human culture, to a version of concentric circles of differing levels of ''naturalness'' based on zoning (Fall 2002).

Complexity in belief systems also influences the way management goals and measures are negotiated. This was indicated by the apparent mixed-motive perspective followed by stakeholder groups, which stands in opposition to win–lose or win–win approaches. For instance, serious reservations have been expressed on the potential of decentralization to strengthen the position of local communities (Castro and Nielsen 2001). Multistakeholder collaborative arrangements in management bodies may lock local residents into an inferior position: government agencies, private firms, global NGOs, and other interest groups can set the agenda and limit local people to a mere consultative role (Lane 2003). Future research on environmental belief systems can prove most valuable in this direction: rendering salient divergent views in terms of different belief systems instead of simply focusing on conflicting interests can significantly add to calls for equal stakeholder treatment and thereby reinforce the democratic mandate in environmental policymaking.

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