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Chapter: Fostering Transformative Shifts in Sustainability and Environmental Behaviour

MAJOR SOCIO-ECONOMIC FACTORS INFLUENCING ENVIRONMENTAL CONCERN. STUDY ON SEVERAL EUROPEAN UNION COUNTRIES

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Annotation. Our study aims to measure the environmental concern across some EU member states and to provide a better understanding of its determinants. Using data from the World Values Survey, there were firstly analysed the individual perceptions (care for environment, perspective on environmental pollution, protecting environment vs. economic growth), then active participation (membership in an environmental organization, financing ecological organization, participation in pro-environmental demonstration) and, lastly, integrating both in one general composite index. Our results showed that Poland, Romania, and Spain register the lowest levels of general environmental concern, while Sweden attains the highest level among the analysed EU countries. Although both Spain and Sweden are advanced economies, there are significant differences between their national general environmental concerns. Using the Binomial Logistic Regression, we found that the position of an individual highly concerned with environmental problems is mainly influenced by (1) age, nature of tasks, post-materialist values, and satisfaction in life in Sweden, while, (2) in Spain, the most important

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determinants are educational level and post-materialist values. Accordingly, our findings might support better-targeted EU and national environmental policies.

Keywords: environmental concern, intent-oriented to the environment, action-oriented to the environment, environmental policies, composite index.

JEL classification: C51, O52, P18, Q56.

Introduction

Environment has become one of the main issues in the discussions related to development. Although it is largely accepted that environmental problems have their roots mostly in behavioral and socioeconomic factors, there are few studies confronting perceptions versus actions.

One of the most frequently used theories is the *theory of planned behavior*, which considers behavior to be a result of a person's intention to engage in certain behaviors (Demeter *et al*., 2023, p.2). There is also a distinction between descriptive norms (i.e., a person's perception of how common a certain behavior is within a population) and injunctive norms (i.e., which behaviors people approve or disapprove in certain situations) in the *theory of normative conduct* (Cialdini *et al*., 1991). In addition, according to the *norm activation theory* (Schwartz, 1977), awareness of consequences, ascription of responsibility, and personal norms might predict pro-environmental behavior. Another theory is the *value belief norm theory* (Stern, 2000) which considers the levels of environmental concern as drivers of behavior. Thus, the studies regarding environmental concern have to focus on their analysis, confronting perceptions with actions. Following Ulman and Dobay (2020) that applied such an approach to the case of Romania, in this study, we analyze the perceptions (care for environment, perspective on environmental pollution, protecting environment vs. economic growth), and active participation (membership in an environmental organization, financing ecological organization, participation in demonstration for environment) in several EU countries.

1. Literature Review

Different studies attract more and more attention to the environmental problems that cannot be any more neglected. If these kinds of problems were not tangible in the past and only felt punctual on specific local levels, nowadays, all over the world, people have to directly confront them. More and more specialists point out that humans caused a large alteration of the global environment by their irrational ways of attaining the objectives related to growth (Ghinea *et al*., 2017, p.935; Wackernagel, Rees, 1995, p.XI). Taking into consideration the dilemmatic character of human-nature relations (Bonnes, Bonaiuto, 2002), the necessity of assuming the responsibility of humans for understanding their role concerning the environment is frequently mentioned in different studies like Costanza *et al*. (2015) or Al-Masri *et al*. (2023).

In this context, the importance of studying environmental concern, as a social and personal value (Hackett, 1993, p.118), is still of prime interest as it represents, according to the perspective presented in this paper, but also to other studies (i.e. Hackett, 1993; Sneddon *et al*., 2006; Ulman, Dobay, 2020; Saari *et al*., 2021; Peisker, 2023), an initial and essential step in the entire endeavor of environmental protection, process necessary to be attentively implemented as it is imposed by our current global problems. Following one of the most comprehensive definitions, i.e. the one proposed by Dunlap and Jones (2002, p.485), environmental concern represents "the degree to which people are aware of environmental problems and support efforts to solve them and/or indicate a willingness to contribute personally to their solution",

clearly underlying the multifaceted characteristic of it. It is part of the list of quality-of-life concerns (Hao, Song, 2020, p.4), viewed as a normal good for which the demand increases concomitantly with affluence, from the perspective of affluence hypothesis or as stemming from people experiencing environmental challenges, accordingly to the degradation hypothesis (Diekmann, Franzen, 1999; Franzen, 2003; Inglehart, 1995).

In addition, having into attention the assumption formulated by Wackernagel and Rees (1995), pointing to the fact that environmental crisis is especially a behavioral and social one, understanding the closely related socio-economic factors that influence the level of environmental concern, both in attitude and in practice, represents a distinct and imperative requirement in the analysis of this type of concern. As Hao and Song (2020, p.1) mentioned, we still know little about how these contextual individual factors shape environmental concern within countries, while studies have expanded by identifying and comparing them within countries (for example, in Clements *et al*., 2013; Hao, Song, 2020; Ulman, Dobay, 2020; Zhou, 2013). More, there are studies exploring environmental concern and its main factors as a comparison between two countries, such as Japan and the United States of America (Pierce *et al*., 1987), Russia and the USA (Dalton *et al*., 1999), or Brazil and Mexico (Bechtel *et al*., 1999). It is expected that, in time, the rise of environmental concern will probably undermine the influence of the positional factors (Marquart-Pyatt, 2008, p.248), but, till then, a lot of work has to be done to improve our knowledge regarding its general and, also, specific particularities, while "additional cases should be introduced to test explanations of environmental concern as a global phenomenon" (p.236).

Socioeconomic predictors of environmental concern include age, gender, education, income, post-materialist values (striving for self-actualization; stressing the aesthetic and the intellectual; cherishing belonging and esteem), employment status, etc. (Mihai, Hatmanu, 2018). Although previous research is both consistent and inconsistent in terms of the relationships between these factors and environmental concern, depending on each study's peculiarities, but, in general, the results suggest that (1) education; (2) income; (3) post-materialist values, or (4) age are positively associated with pro-environmental positions (Diekmann, Franzen, 1999; Dietz *et al*., 1998; Hao, Song, 2020; Kemmelmeier *et al*., 2002; Marquart-Pyatt, 2008; Tadesse, 2009; Suarez-Perales *et al*., 2021).

Following these approaches, we compared the levels of environmental concern among some EU member states, emphasizing then on two countries that attracted our attention and that were considered to be the subject of deeper analysis for understanding their peculiarities in terms of determining factors of environmental concern.

Starting from the synthetized points in the section dedicated to the literature review and, also, the facts that the European Union and its member states were not enough particularly analyzed in terms of environmental concern and their national environmental well-being is not sufficiently high, even in the countries in which it registers the highest levels (van de Kerk, Manuel, 2017), our study attempts to:

(1) measure the environmental concern across some EU member states (Cyprus, Estonia, Germany, Netherlands, Poland, Romania, Slovenia, Spain, Sweden);

(2) investigate the profiles of the individuals with a positive environmental attitude (both perceptions and active participation) in Spain and Sweden, two advanced economies, but found to register opposite environmental concern levels;

(3) provide a better understanding regarding the determinants of environmental concern, analyzing the most significant socioeconomic factors of environmental awareness and involvement in the national context in the selected countries for deeper analysis.

The paper is structured as follows: Section 2, dedicated to the methodology and the data used to compose the environmental concern indices and to measure their level in several EU countries; Section 3, illustrating and discussing the main empirical results and Section 4, for concluding remarks.

2. Data and Methods

2.1 Environmental concern indices

We followed the methodology proposed in the paper entitled "Environmental Protection in Romania: Perceptions versus Active Participation" (Ulman, Dobay, 2020), initially concentrating on environmental perceptions, then observing the active participation in pro-environmental activities and, lastly, integrating both in one index, for offering a wider perspective regarding environmental concern.

Intent oriented to environment Index ($I_{env\_intent\text{-}oriented}$)
Analysing perceptions regarding environment and its problems ($A_{env\_intent\text{-}oriented}$, $B_{env\_intent\text{-}oriented}$, $C_{env\_intent\text{-}oriented}$) (*high*, *low*)
= ***high*** (if the respondent gives at least two *high* responses to $A_{env\_intent\text{-}oriented}$, $B_{env\_intent\text{-}oriented}$, $C_{env\_intent\text{-}oriented}$)
= ***low*** (if the respondent gives only one or none *high* response to $A_{env\_intent\text{-}oriented}$, $B_{env\_intent\text{-}oriented}$, $C_{env\_intent\text{-}oriented}$)
Care for environment ($A_{env\_intent\text{-}oriented}$)
Looking after the environment is important to this person: to care for nature and save life resources (yes = *high*; no = *low*)
Perspective on environmental pollution ($B_{env\_intent\text{-}oriented}$)
Most serious problem of the world: environmental pollution (yes = *high*; no = *low*)
Protecting environment vs. Economic growth ($C_{env\_intent\text{-}oriented}$)
Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs (yes = *high*; no = *low*)
Action oriented to environment Index ($I_{env\_act\text{-}oriented}$)
Analysing active participation of the respondents on diverse activities for improving environmental conditions ($A_{env\_act\text{-}oriented}$, $B_{env\_act\text{-}oriented}$, $C_{env\_act\text{-}oriented}$) (*high*, *low*)
= ***high*** (if the respondent gives at least two *high* responses to $A_{env\_act\text{-}oriented}$, $B_{env\_act\text{-}oriented}$, $C_{env\_act\text{-}oriented}$)
= ***low*** (if the respondent gives only one or none *high* response to $A_{env\_act\text{-}oriented}$, $B_{env\_act\text{-}oriented}$, $C_{env\_act\text{-}oriented}$)
Member of an environmental organization ($A_{env\_act\text{-}oriented}$)
Active/Inactive membership: environmental organization (yes = *high*; no = *low*)
Given money to ecological organization ($B_{env\_act\text{-}oriented}$)
Past two years: given money to ecological organization (yes = *high*; no = *low*)
Participation in demonstration for environment ($C_{env\_act\text{-}oriented}$)
Past two years: participated in demonstration for environment (yes = *high*; no = *low*)
Environmental concern Index (I_{env})
Integrating the general concern regarding environment comprised both in perceptions and in active participation ($I_{env\_intent\text{-}oriented}$ and $I_{env\_act\text{-}oriented}$) (*high*, *low*)
= ***high*** (if the respondent gives at least three *high* responses to $A_{env\_intent\text{-}oriented}$, $B_{env\_intent\text{-}oriented}$, $C_{env\_intent\text{-}oriented}$, $A_{env\_act\text{-}oriented}$, $B_{env\_act\text{-}oriented}$, $C_{env\_act\text{-}oriented}$)
= ***low*** (if the respondent registers maximum two *high* from six possible ones)

Source: created by the authors.

Figure 1. **Definition of the Environmental Indices**

Ulman and Dobay (2020, p.185) emphasized in their study that their proposed index followed Inglehart's (1995) approach regarding the Environmental Protection Index, with 2 categories (high and low) according to the answers of the respondents regarding the environmental problem. In this way, the care for

environment, the perspective on environmental pollution, and the chosen option between protecting the environment vs. economic growth, as resuming the declared perceptions, were integrated into a composite index ($I_{env\_intent\text{-}oriented}$). Then, membership in an environmental organization, the action of financing ecological organization, and participation in demonstrations for the environment were considered to be representative of active participation, constituting the second composite index ($I_{env\_act\text{-}oriented}$). Both indices in terms of perceptions and active participation were unified into one single measure, i.e. a general index for environmental concern (I_{env}) (*Figure 1*).

We analyzed the data provided by World Values Surveys, wave 6, 2010-2014, emphasized in the literature as conducting credible and large (since 1991 in almost 100 countries) national representative surveys (Brieger, 2018), also used by other studies relevant for the topic of environmental concern (Inglehart, 1995; Dunlap, York, 2008). The selected countries were the ones belonging to the European Union with available data on WVS, as follows: Cyprus, Estonia, Germany, Netherlands, Poland, Romania, Slovenia, Spain, and Sweden. In the end, we included in our study 12415 observations, as the sum of all the respondents from the analyzed countries for which all the necessary items for calculating our indices were available. Taking into consideration the fact that our previous study (Ulman, Dobay, 2020) conducted for Romania and using the same methodology was based on wave 6 of WVS, to obtain comparable results, we selected the same database for the same wave.

2.2 Factors Determining the Environmental Concern

Among the nine analyzed countries, in the next step, for a deeper analysis, we selected the ones that attracted our attention because of their similitude in terms of stage of development, but different levels of environmental concern: Spain and Sweden. For this reason, we continued with a comparative study, observing the main determinant factors of the environmental concern, and seeking to explain the difference found in the case of these countries (*Table 1*).

Table 1. Description of the variables selected as potential determining factors

Variables	***Description***	***Reference category***
Gender	Gender of the respondent (1=male, 2=female)	male
Educational level	Highest educational level attained (1=lower-secondary, 2=secondary, 3=tertiary)	lower-secondary
Employment status	Employment status (1=employed, 2=retired, 3=unemployed, 4=student)	employed
Social class	Social class (1=upper class; 2=upper middle and lower middle class; 3=working and lower class)	upper middle and lower middle class
Nature of tasks: routine vs. creative	If the respondent has on his job mostly routine task or mostly creative tasks (1=mostly routine, 2=mostly creative)	mostly routine
Nature of tasks: manual vs. intellectual	If the respondent has on his job mostly manual or mostly intellectual tasks (1=mostly manual, 2=mostly intellectual)	mostly manual
Nature of tasks: independence	If the respondent has on his job mostly complete independence or mostly no independence at all (1=mostly independence, 2=mostly no independence)	mostly no independence
Post-materialist values	Post-materialist index (1=materialist; 2=post-materialist)	materialist
Financial satisfaction	Satisfaction with financial situation of household (1=completely dissatisfied; 2=completely satisfied)	completely dissatisfied
Satisfaction in life	Satisfaction with personal life (1=completely dissatisfied; 2=completely satisfied)	completely dissatisfied

Source: created by the authors.

Using 1190 entries for Spain and 1207 for Sweden, we separately tested the significant variables that can be associated with the three different perspectives regarding citizens' environmental concern in both countries. The dependent variables related to the environment were: $I_{env\_intent\text{-}oriented}$, $I_{env\_act\text{-}oriented}$, and I_{env}. The selected independent variables were as follows: (1) gender; (2) educational level; (3) employment status; (4) social class; (5) nature of tasks: routine vs. non-routine; (6) nature of tasks: manual vs. intellectual; (7) nature of tasks: independence; (8) post-materialist values; (9) financial satisfaction, and (10) satisfaction in life.

2.3 Model Statistical methods

Following the classification of the percentages of people with a high environmental concern, provided by Ulman and Dobay (2020, p. 186), we descriptively analyzed the categories of environmental concern in terms of national levels: (1) extremely low < 10%; (2) very low = 10%-19.9%; (3) low = 20%-29.9%; (4) low to medium = 30%-39.9%; (5) medium = 40%-49.9%; (6) medium to high = 50%-59.9%; (7) high = 60%-69.9%; (8) very high = 70%-79.9%; (9) extremely high ≥ 80%, obtaining also some representative maps (*Figure 2, Figure 3, Figure 4, Figure 5*).

Secondly, we decided to continue our empirical endeavor maintaining only Spain and Sweden in our analysis. In this context, we aimed to describe the associations between the dependent variables and each independent variable and to identify the profiles of individuals in terms of environmental concern separately in both countries. We linked the high or low environmental concern, with the mentioned independent variables with their categories using a Joint Correspondence Analysis. This type of analysis represents a preliminary step for the Logistic Regression Analysis, used to estimate the probability of an individual being part of a high-level environmental concern group, considering the mentioned socioeconomic characteristics (following Ulman and Dobay, 2020).

The logistic regression model has at its basis the link between the dependent variable ($I_{env\_intent\text{-}oriented}$, $I_{env\_act\text{-}oriented}$ and I_{env}) and independent variables, X1: gender; X2: educational level; X3: employment status; X4: social class; X5: nature of tasks: routine vs. creative; X6: nature of tasks: manual vs. intellectual; X7: nature of tasks: independence; X8: post-materialist index; X9: financial satisfaction; and X10: satisfaction in life. The logistic regression equation is expressed by Eq. (1).

$$P(Y=1|X_j) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \varepsilon_i \quad (1)$$

The Logistic Regression models are built taking into consideration three dependent variables (Ulman, Dobay, 2020): $I_{env\_intent\text{-}oriented}$ for the Models 1(a) and 2(a) for Spain; 1(b) and 2(b) for Sweden; $I_{env\_act\text{-}oriented}$ for the Models 3(a) and 4(a) for Spain; 3(b) and 4(b) for Sweden; I_{env} for the Models 5(a) and 6(a) for Spain; 5(b) and 6(b) for Sweden. In addition, Models 1(a and b), 3(a and b), and 5(a and b) include all the independent variables taken into consideration, while Models 2(a and b), 4(a and b), and 6(a and b) include only the variables significantly associated with each dependent variable in part.

The categories describing the reference group (*Table 1*) were used for the interpretation of signs and estimated regression coefficients' significance, also determining the Adjusted Odds Ratio for each category of the above-mentioned variables in relation to the reference category.

3. Empirical Results

3.1 Descriptive Analysis

Analyzing the percentages of people, at the national level among some European Union member states (*Table 2*) that have positive perceptions, we observed that: (1) Sweden and Slovenia obtain the highest percentages, being integrated into the medium category; (2) Cyprus, Estonia, and Poland register lower percentages and are part of the low to medium category; (3) Germany, Netherlands, Romania, and Spain integrate into the low category (*Figure 2*). Referring to active participation, it can be noticed that almost all the countries register extremely low levels of personal involvement in environmental activities, exception being made by Netherlands and Sweden, which are found to have better levels (*Figure 3*). At the general level, the environmental concern is generally low, but (1) Sweden registers better levels (being included in the low to medium category). Besides this, (2) Cyprus, Estonia, Germany, Netherlands, and Slovenia are integrated into the very low group, while (3) Poland, Romania, and Spain are part of the category of countries with extremely low levels (*Figure 4*). This grouping and the constituents of each category attract our attention to two nations that, although belong to the same stage of development, both being developed countries (innovation-driven economies) (Schwab, 2016), still have very different levels of environmental concern, i.e. Sweden and Spain. As it was shown, Sweden detains the best position among the analyzed EU member states, being the only country included in the low to medium level of environmental concern. Contrary, Spain is part of the worst-positioned category of countries, being the only developed nation with extremely low environmental concern.

Source: created by the authors.

Figure 2. $I_{env\_intent\text{-}oriented}$

Source: created by the authors.

Figure 3. $I_{env\_act\text{-}oriented}$

Source: created by the authors.

Figure 4. I_{env}

Table 2. National levels of environmental concern

Country	$I_{env\_act\text{-}oriented}$	$I_{env\_intent\text{-}oriented}$	I_{env}	$I_{env\_act\text{-}oriented}$	$I_{env\_intent\text{-}oriented}$	I_{env}
Cyprus	8.1	36.8	19.4	extremely low	low to medium	very low
Estonia	1.7	32.4	13.0	extremely low	low to medium	very low
Germany	5.7	26.7	13.2	extremely low	low	very low
Netherlands	10.4	24.0	18.8	very low	low	very low
Poland	1.0	33.2	9.1	extremely low	low to medium	extremely low
Romania	3.9	26.1	9.8	extremely low	low	extremely low
Slovenia	3.7	43.8	18.5	extremely low	medium	very low
Spain	2.7	25.1	9.2	extremely low	low	extremely low
Sweden	11.9	47.7	33.9	very low	medium	low to medium

Source: Authors' representation based on WVS, wave 6, 2010-2014.

It seems that people value more highly the environment in developed countries compared to developing ones, where jobs and detaining a satisfactory level of necessary income are positioned at the center of personal interests and actions, as primary concerns (Dasgupta *et al.*, 2002, pp.147-148; Ulman *et al.*, 2020, p.4; Hao, Song, 2020, p.2; Hatmanu *et al.*, 2022; Hatmanu, Cautisanu, 2023). This perspective follows the affluence hypothesis, developed from the environmental economics literature, predicting a positive connection between affluence and environmental concern (Diekmann, Franzen, 1999; Franzen, 2003; Hao, Song, 2020). In this way, although different levels of environmental concern are expected to be met in different stages of country development, in this article, it was shown that Spain and Sweden, two nations belonging to the last stage of development, being innovation-driven economies, registered opposite levels of environmental concern, different both in terms of perceptions and active participation. Starting from this initial result, we expect to find different relationships between environmental concern and its main determinants.

3.2 Identifying the Profiles of Groups Regarding the Environmental Concern

The specific profiles of environmental concern in terms of socioeconomic personal characteristics for the Spanish and Sweden respondents were detailed, keeping into analysis only the factors that were significantly correlated to the dependent variable (Table 3).

Table 3. Test results for independence between environmental concern indices and each independent categorical variable

Variables	***Pearson Chi-square***					
	$I_{env\_intent\text{-}oriented}$		$I_{env\_act\text{-}oriented}$		I_{env}	
	Spain	Sweden	Spain	Sweden	Spain	Sweden
Gender	0.237	0.917	7.020***	4.512**	2.478	0.943
Education level	17.633***	6.927**	57.921***	26.215***	81.903***	20.428***
Employment status	3.267	27.800***	3.597	14.913***	16.697***	22.378***
Social class	18.834***	1.884	39.273***	6.567**	21.456***	3.569
Nature of tasks: routine vs. creative	10.081***	22.160***	21.772***	8.982***	21.963***	27.170***
Nature of tasks: manual vs. intellectual	12.735***	11.224***	16.627***	11.931***	24.211***	17.777***
Nature of tasks: independence	1.070	4.788**	1.243	9.198***	3.757*	13.786***
Post-materialist values	31.144***	31.145***	12.072***	10.943***	18.939***	32.249***
Financial satisfaction	13.447***	6.161**	1.648	0.162	11.907***	6.258**
Satisfaction in life	7.665***	5.061**	0.025	6.372**	5.186**	7.709***

Note: (***) indicates the null hypothesis rejection for 1%; (**) indicates the null hypothesis rejection for 5%; (*) indicates the null hypothesis rejection for 10%.

Source: created by the authors.

Having the obtained results from the Pearson Chi-square statistic, the calculated value of the statistical test was lower than the theoretical value (or Sig > α=0.10), for the following correlations between:

(1) $I_{env\_intent\text{-}oriented}$ and, on one hand, gender, employment status, nature of tasks: independence in Spain, and, on the other hand, gender and social class in **Sweden**;

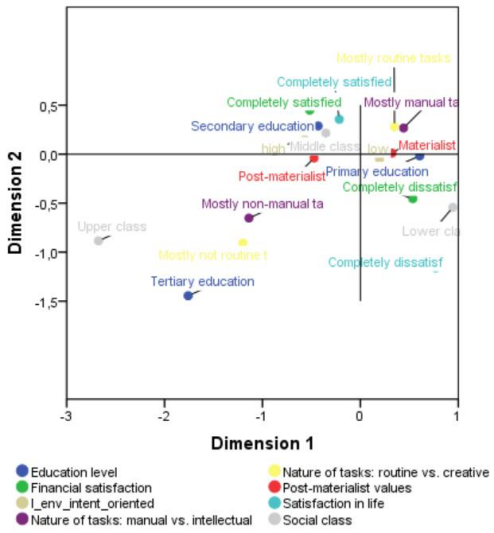
(2) $I_{env\_act\text{-}oriented}$ and, firstly, employment status, nature of tasks: independence, financial satisfaction and satisfaction in life in **Spain**, and, secondly, only financial satisfaction in **Sweden**;

(3) I_{env} and, on one hand, gender in **Spain** and, on the other hand, gender and social class in **Sweden**.

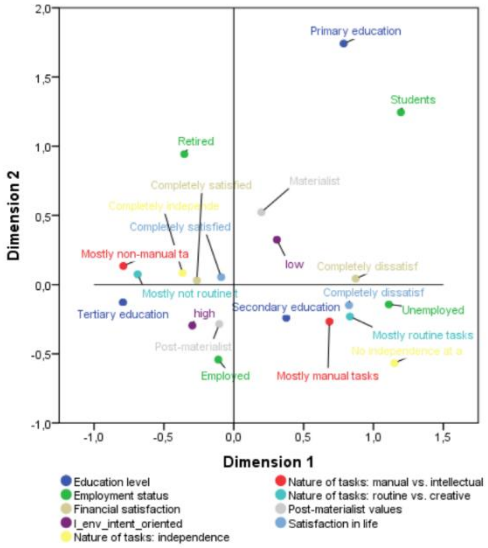
This result implied the decision to accept the hypothesis of independence between each index regarding environmental concern and the independent variables. In the case of the other variables taken into analysis, the calculated values of the statistical test indicated the rejection of the null hypothesis with a probability equal to 0.95, observing the fact that, between the three variables related to environment and each other variable, significant associations were shown to be present (*Table 3*).

3.3 Joint Correspondence Analysis

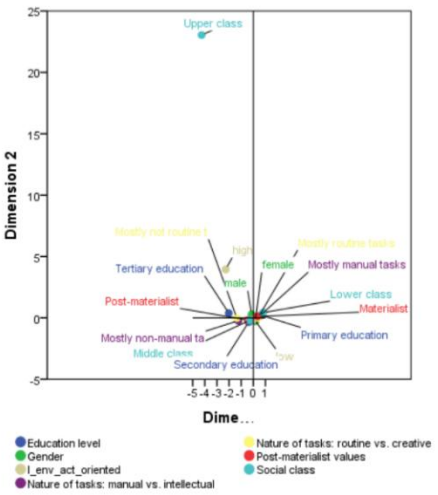
To identify the respondents' profiles in the two selected countries, after analyzing the test results for independence between variables, we applied the Joint Correspondence Analysis. The presence of some associations between the categories of considered variables may be observed in the graphical representation (*Figure 5*).



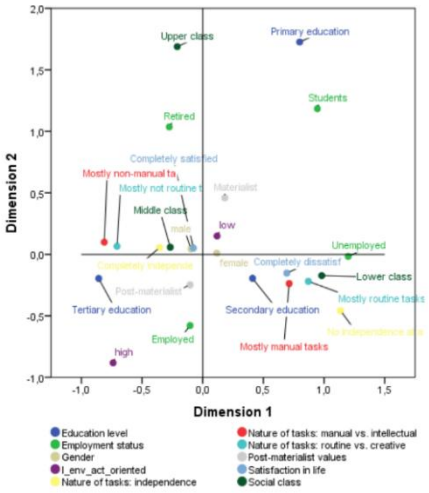
$I_{env\_intent\text{-}oriented}$ – Spain



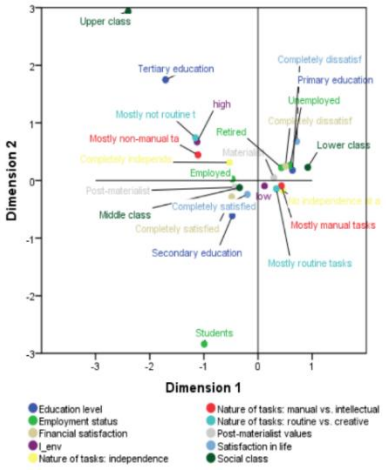
$I_{env\_intent\text{-}oriented}$ – Sweden



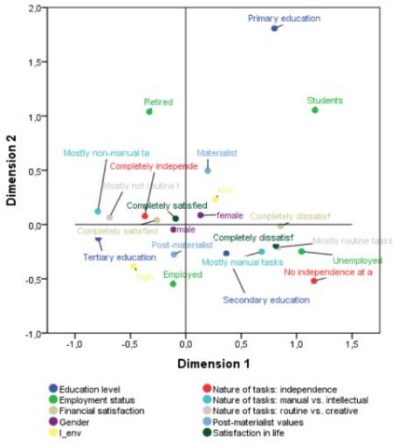
$I_{env\_act\text{-}oriented}$ – Spain



$I_{env\_act\text{-}oriented}$ - Sweden



I_{env} - Spain



I_{env} - Sweden

Source: authors' representation based on WVS, wave 6, 2010-2014, using SPSS 26.

Figure 5. **The Values Representation on the First Two Factorial Axes**

Differences in the respondents' perceptions, behaviors in terms of environmental activities, and, also, general environmental concerns and the categories of the significant independent variables were recorded. Based on the correspondent point representation for the variables, the profiles in terms of each environmental index were obtained, both with a high and a low environmental orientation. Thus, firstly, in terms of **perceptions**, it was found that:

(1) the profile of respondents with a high $I_{env\_intent\text{-}oriented}$ in Spain is related to secondary education; mostly non-routine and non-manual tasks; post-materialist values; completely satisfied with personal financial situation; and completely satisfied in life.

(2) the profile of respondents with a high $I_{env\_intent\text{-}oriented}$ in Sweden is related to tertiary education; employed; mostly non-routine and non-manual tasks; completely independent; post-materialist values; and completely satisfied with the personal financial situation.

Secondly, in terms of **active participation**, it was found that:

(3) the profile of respondents with a high $I_{env\_intent\text{-}oriented}$ in Spain is related to tertiary education; mostly non-routine; and non-manual tasks.

(4) the profile of respondents with a high $I_{env\_intent\text{-}oriented}$ in Sweden is related to tertiary education; middle class; employed; mostly non-routine and non-manual tasks; completely independent; and post-materialist values.

Finally, in terms of **general environmental concern**, it resulted in:

(5) the profile of respondents with a high I_{env} in Spain is related to tertiary education; middle class; employed; mostly non-routine and non-manual tasks; completely independent; post-materialist values; and completely satisfied with the personal financial situation.

(6) the profile of respondents with a high I_{env} in Sweden is related to tertiary education; employed; mostly non-routine and non-manual tasks; completely independent; post-materialist values; and completely satisfied with the personal financial situation.

3.4 Binomial Logistic Regression Analysis

The proposed Binomial Logistic Regression models were based on the three dependent variables related to environmental concern and their main potential determinants in terms of socioeconomic personal peculiarities. The Wald statistic test was used to test the influence of independent variables on the probability of belonging to a specific group related to the environment. The results were summarized in *Table 4* and *Table 5*.

Table 4. Econometrical modelling results

Independent variables	**Spain**					
	$I_{env\_intent\text{-}oriented}$		$I_{env\_\ act\text{-}\ oriented}$		I_{env}	
	Model 1(a)	*Model 2(a)*	*Model 3(a)*	*Model 4(a)*	*Model 5(a)*	*Model 6(a)*
Age	0.002	-	0.014	-	-0.005	-
Gender	-0.131	-	-1.208**	-1.122**	-0.284	-
Educational level	0.217	0.313***	1.622***	1.680***	0.890***	1.117***
Employment status	-0.050	-	0.194	-	-0.107	-
Social class	-0.419**	-0.515***	-0.773	-	-0.226	-
Nature of tasks: routine vs. creative	0.085	-	0.609	0.985**	0.234	-
Nature of tasks: manual vs. intellectual	0.239	-	0.434	-	0.206	-
Nature of tasks: independence	-0.168	-	-0.879*	-0.785*	-0.217	-
Post-materialist values	0.499***	0.509***	0.688	-	0.410*	0.455**
Financial satisfaction	0.117	-	0.153	-	0.234	-
Satisfaction in life	0.236	-	-0.624	-	0.286	-
Constant	-1.804**	-1.187**	-4.748*	-5.500***	-4.280***	-4.918***

Note: (***) indicates the null hypothesis rejection for 1%; (**) indicates the null hypothesis rejection for 5%; (*) indicates the null hypothesis rejection for 10%; the values represent the regression coefficients estimators.

Source: authors' computation based on WVS, wave 6, 2010-2014, using SPSS 26.

The results showed that: (1) in Spain, educational level, social class, and post-materialist values and (2) in Sweden, age, employment status, nature of tasks: routine vs. creative, post-materialist values, and

satisfaction in life had a significant influence on the belonging of the group with a high level of **environmental awareness**.

The probability for a high level of **active participation** in environmental activities was significantly explained by (1) gender, educational level, nature of tasks: routine and creative, and nature of tasks: independence in Spain and by (2) gender, educational level, employment status, nature of tasks: independence, post-materialist values, financial satisfaction, and satisfaction in life in Sweden.

In addition, the results indicated a significant influence of (1) educational level and post-materialist values in Spain and (2) age, nature of tasks: routine and creative, post-materialist values, and satisfaction in life in Sweden, on the probability of being included in the group with a high level of **general environmental concern**.

In the case of Spain (*Table 4, Table 6*), for Model 4(a), the results suggested that the probability of belonging to the group with a high level of *active participation* in environmental activities was *lower for males than for women*. For the other models, gender was no longer a significant variable.

Education was found to be significant in the case of all our three models. This indicated the fact that the probabilities for persons with *tertiary education* to have high $I_{env\_intent\text{-}oriented}$, $I_{env\_act\text{-}oriented,}$ and I_{env} were higher than for the ones with lower-secondary education (*Table 4*). The estimated chances to belong to the group with a high $I_{env\_act\text{-}oriented}$ for a male, with tertiary education, from the middle social class, with mostly routine tasks, and with materialist values were *18.44 times higher* than the chances for a male with lower-secondary education in the same conditions, while the estimated chances to belong to the group with a high I_{env} for a male, with tertiary education, from the middle social class, with mostly routine tasks and with materialist values were *9.42 times higher* than the chances for a male with lower-secondary education in the same conditions.

Analyzing the results of the impact of social class on the probability of belonging to a specific group, non-significant results were observed for the last two models. For Model 2(a), the results suggested that the probability for the Spanish respondents to be part of the group with a high level of orientation to the environment was significantly influenced by social class. The estimated chances to belong to the group with a high $I_{env\_intent\text{-}oriented}$ for a male, with lower-secondary education, from the middle social class, with mostly routine tasks, and with materialist values were *1.89 times higher* than the chances for a male from the lower class in the same conditions.

The coefficient estimations of the *nature of tasks: routine vs. creative*, in Model 4(a), indicated significant differences between the ones that declare themselves to have mostly creative tasks than the ones saying that they have mostly routine tasks. The results showed that the estimated chances to belong to the group with a high $I_{env\_act\text{-}oriented}$ for a male, with lower-secondary education, from the middle social class, with mostly non-routine tasks, and with materialist values were *2.385 times higher* than the chances for a male with mostly routine tasks in the same conditions. In the same way, the results suggested that the probability of being part of the group with a high level of implication in environmental activities is higher for the ones declaring themselves as being mostly independent in their work comparatively to the ones that considered to *have mostly no independence* at all.

Significant differences were also recorded between *materialist and post-materialist orientations*, regarding the first and the last indices, i.e. $I_{env\_intent\text{-}oriented}$ and I_{env}. The post-materialist people tended to have a higher environmental concern, in terms of perceptions and, also, at the general level. The estimated

chances to belong to the group with a high $I_{env\_intent\text{-}oriented}$ for a male, with lower-secondary education, from the middle social class, with mostly routine tasks, and with post-materialist values were *2.221 times higher* than the chances for a male with materialist values in the same conditions. Also, the estimated chances to belong to the group with a high I_{env} for a male, with post-materialist values, while the other personal characteristics remain constant, were *1.873 times higher* than the chances for a male with materialist values in the same conditions.

In the case of Sweden (*Table 5* and *Table 6*), contrary to the situation of Spain, age represented a significant variable in relation to pro-environmental attitude. For Model 2(b) and Model 6(b), the results suggested that the probabilities for the Sweden respondents to be part of the group with a high level of orientation to the environment, but also to the group with a high general environmental concern were *higher for the elder* than for the younger ones.

Analyzing the results of the influence of gender on the probability of belonging to a specific group, non-significant results were observed for Model 2(b) and Model 6(b). In the case of Model 4(b), the probability of belonging to a group with a high level of involvement in environmental activities was *higher for males* than for women.

Education also represented a significant variable only in relation to $I_{env\_act\text{-}oriented}$, the probability being higher for the one with tertiary education. The results showed that the estimated chances to belong to the group with a high $I_{env\_act\text{-}oriented}$ for a male, with secondary education, from the middle social class, employed, with mostly routine tasks, mostly dependent, completely dissatisfied regarding the personal financial situation and, also, satisfaction in life and with materialist values were *2.53 times higher* than the chances for a male with lower-secondary education in the same conditions, while the estimated chances to belong to the same group for a male, with tertiary education, and with the same above-mentioned characteristics were *3.838 times higher* than the chances for a male with lower-secondary education in the same conditions.

Table 5. Econometrical modeling results

Independent variables	**Sweden**					
	$I_{env\_intent\text{-}oriented}$		$I_{env\_act\text{-}oriented}$		I_{env}	
	Model 1(b)	*Model 2(b)*	*Model 3(b)*	*Model 4(b)*	*Model 5(b)*	*Model 6(b)*
Age	0.016***	0.016***	0.007	-	0.019***	0.019***
Gender	0.122	-	0.450**	0.403**	0.162	-
Education level	-0.046	-	0.380**	0.512***	0.126	-
Employment status	-0.136*	-0.133*	-0.425**	-0.349**	-0.115	-
Social class	0.270	-	-0.368	-	0.062	-
Nature of tasks: routine vs. creative	0.358**	0.317**	-0.086	-	0.241	0.409***
Nature of tasks: manual vs. intellectual	0.087	-	0.310	-	0.095	-
Nature of tasks: independence	-0.028	-	0.451	0.604**	0.217	-
Post-materialist values	0.664***	0.655***	0.516**	0.516**	0.773***	0.790***
Financial satisfaction	0.125	-	-0.590**	-0.438*	0.032	-
Satisfaction in life	0.451**	0.447**	1.063**	1.082**	0.620**	0.673***
Constant	-4.099***	-3.049***	-5.501***	-6.534***	-5.478***	-4.790***

Note: (***) indicates the null hypothesis rejection for 1%; (**) indicates the null hypothesis rejection for 5%; (*) indicates the null hypothesis rejection for 10%; the values represent the regression coefficients estimators.

Source: authors' computation based on WVS, wave 6, 2010-2014, using SPSS 26.

The results suggested that the probability of belonging to the group with a high level of environmental orientation, both in terms of perceptions and active participation, was *higher* for the employed than for the other groups of people divided in terms of *employment status*. The estimated chances to belong to the group with a high $I_{env\_intent\text{-}oriented}$ for a male, with tertiary education, from the middle social class, employed, with mostly routine tasks, mostly dependent, completely dissatisfied regarding the *personal financial situation* and, also, *satisfaction in life* and with materialist values were higher than the chances for a retired or student male in the same conditions.

Table 6. Econometrical modeling results

Variables/Models	**Spain**			**Sweden**		
	Model 2(a)	*Model 4(a)*	*Model 6(a)*	*Model 2(b)*	*Model 4(b)*	*Model 6(b)*
Age				0.022*** (0.005)		0.018*** (0.004)
Gender: female		-0.935** (0.439)			0.469** (0.194)	
Education level: secondary	0.151 (0.153)	1.959** (0.771)	0.878*** (0.256)		0.876* (0.491)	
Education level: tertiary	0.561** (0.254)	3.361*** (0.829)	2.204*** (0.314)		1.304*** (0.491)	
Employment status: retired				-0.437** (0.208)	-0.283 (0.237)	
Employment status: unemployed				-0.613 (0.415)	-1.247 (1.033)	
Employment status: students				-0.101 (0.253)	-1.107** (0.538)	
Social class: upper class	22.933 (4.019)					
Social class: lower class	0.496*** (0.177)					
Nature of tasks: mostly non-routine tasks		0.944** (0.467)		0.282** (0.133)		0.422*** (0.140)
Nature of tasks: completely independent		-0.663 (0.456)			0.642** (0.290)	
Values: post-materialist	0.654*** (0.144)	-0.747* (0.441)	0.596** (0.223)	0.725*** (0.131)	0.589*** (0.214)	0.776*** (0.141)
Financial satisfaction: completely satisfied					-0.467** (0.237)	
Satisfaction in life: completely satisfied				0.341* (0.200)	1.027*** (0.421)	0.554** (0.224)
Constant	-1.881*** (0.169)	-4.465*** (0.770)	-3.322*** (0.228)	-1.887*** (0.305)	-4.574*** (0.677)	-3.148*** (0.345)
Hosmer and Lemeshow Test	2.903	4.502	1.055	5.282	3.301	4.813

Note: (***) indicates the null hypothesis rejection for 1%; (**) indicates the null hypothesis rejection for 5%; (*) indicates the null hypothesis rejection for 10%; the values represent the regression coefficients estimators.

Source: authors' computation based on WVS, wave 6, 2010-2014, using SPSS 26.

The coefficient estimations of the *nature of tasks: routine vs. creative*, in Model 2(b) and Model 6(b), indicated significant differences between the ones that declare themselves to have mostly creative tasks than the ones saying that they have mostly routine tasks, the probabilities for a high level of active participation to environmental activities, but also of belonging to the group with a high general environmental concern being higher for the ones that considered to have mostly non-creative tasks.

The results also suggested that the probability of being part of the group with a high level of implication in environmental activities is lower for the ones declaring themselves as being *mostly independent in their work* comparatively to the ones that considered to have mostly no independence at all.

Significant differences were also recorded between *materialist and post-materialist orientations*, regarding all three indices, i.e. $I_{env\_intent\text{-}oriented}$, $I_{env\_act\text{-}oriented}$ and I_{env}. The *post-materialist people* tended to have a *higher environmental concern*, in terms of perceptions, active participation, and, also, at the general level.

The aspects regarding subjective well-being were significant as follows: *financial satisfaction* in Model 4(b), with a negative sign, and *satisfaction in life* in Model 2(b), Model 4(b), and Model 6(b), with positive signs in all the three models. This translated into the fact that the probability of being part of the group with a high level of implication in environmental activities *is higher* for the ones declaring themselves as not being satisfied with their financial situation compared to the ones that are considered to have a satisfactory financial status. Contrary, people with high satisfaction in life tended to have a *higher environmental concern*, in terms of perceptions, active participation, and, also, at the general level.

Applying the Hosmer and Lemeshow Test, the small Chi-squared values (with a larger p-value closer to 1) indicated a good logistic regression model fit.

3.5 Main drivers of environmental concern

To identify the most important directions for improving environmental concern, besides the two innovation-driven countries, we introduced the third one, Romania, an efficiency-driven economy (Ulman and Dobay, 2020). The results are presented in *Table 7*.

Table 7. Comparative perspective of the main results for the three analyzed countries

Variables	***Spain***	***Sweden***	***Romania***
Age	Non-significant	$I_{env\_intent\text{-}oriented}$ (+) I_{env} (+)	Non-significant
Gender_female	$I_{env\_act\text{-}oriented}$ (-)	$I_{env\_act\text{-}oriented}$ (+)	$I_{env\_intent\text{-}oriented}$ (-) I_{env} (-)
Education level_tertiary	$I_{env\_intent\text{-}oriented}$ (+) $I_{env\_act\text{-}oriented}$ (+) I_{env} (+)	$I_{env\_act\text{-}oriented}$ (+)	I_{env} (+)
Employment status_retired	Non-significant	$I_{env\_intent\text{-}oriented}$ (-)	-
Employment status_students	Non-significant	$I_{env\_act\text{-}oriented}$ (-)	-
Social class_lower class	$I_{env\_intent\text{-}oriented}$ (-)	Non-significant	$I_{env\_act\text{-}oriented}$ (-)
Nature of tasks: mostly non-routine tasks (creative)	$I_{env\_act\text{-}oriented}$ (+)	$I_{env\_intent\text{-}oriented}$ (+) I_{env} (+)	$I_{env\_act\text{-}oriented}$ (+)
Nature of tasks: completely independent	Non-significant	$I_{env\_act\text{-}oriented}$ (+)	-
Post-materialist values	$I_{env\_intent\text{-}oriented}$ (+) I_{env} (+)	$I_{env\_intent\text{-}oriented}$ (+) $I_{env\_act\text{-}oriented}$ (+) I_{env} (+)	$I_{env\_intent\text{-}oriented}$ (+) $I_{env\_act\text{-}oriented}$ (+) I_{env} (+)
Financial satisfaction: completely satisfied	Non-significant	$I_{env\_act\text{-}oriented}$ (-)	-
Satisfaction in life: completely satisfied	Non-significant	$I_{env\_intent\text{-}oriented}$ (+) $I_{env\_act\text{-}oriented}$ (+) I_{env} (+)	-

Source: authors' centralization based on WVS, wave 6, 2010-2014, and Ulman and Dobay (2020, p. 192).

As it can be noticed, regardless of the development stage of each country, there are some variables with considerable influence on environmental concern like education, the nature of tasks, post-materialist values, and gender.

Conclusions

In this paper, we observed the perceptions (care for environment, perspective on environmental pollution, protecting environment vs. economic growth) and active participation (membership in an environmental organization, financing ecological organization, participating in demonstration for environment) in several EU countries (Cyprus, Estonia, Germany, Netherlands, Poland, Romania, Slovenia, Spain, Sweden). Our results showed that Poland, Romania, and Spain registered the lowest levels of general environmental concern, while Sweden attained the highest level among the analyzed EU countries.

In the case of Spain and Sweden, both advanced economies, the profiles of individuals with a high pro-environmental attitude from each country were associated especially with: education, employment status, nature of tasks, post-materialist values, and subjective well-being. Still, there were significant differences between their national general environmental concerns. Thus, in Spain, *age* was not a significant factor, but in Sweden, it was positively associated with positive perceptions. Also, in Spain, women were more involved in pro-environmental activities than men, while, in Sweden, the situation seemed to be the opposite. Regarding *education*, positive associations were registered both in Spain and Sweden, but, in Sweden, it was significant only in the case of active participation. *Employment status* was important regarding the environmental concern only in Sweden, where the employed ones seemed to have a higher pro-environmental attitude than the retired ones (in terms of positive perceptions) and the students (in terms of active involvement), in the context in which, in Spain, the *social class* seemed to matter in terms of perceptions, with a higher probability of the ones from the lower class to belong to the group highly oriented to the environment. The *nature of tasks* played an important role, especially in Sweden, where the ones with mostly creative tasks and being completely independent at their job registered a higher probability of belonging to the group with a high environmental concern. *Post-materialist values* had a positive role both in Spain and Sweden. While in the case of Spain, subjective well-being seemed to be insignificant in relation to openness to the environment, in Sweden, it appeared to play a significant role in the case of environmental concern.

Furthermore, it seems that, regardless of the national development stage, there are some variables with considerable influence on environmental concern like education, the nature of tasks, post-materialist values, and gender. In consequence, it seems that especially having a tertiary education, a job with creative tasks, and post-materialist values could be translated into a higher probability of having a high pro-environmental attitude. In this regard, our findings might support better-targeted EU and national environmental policies.

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ĮMONIŲ VALDYMAS (CG) IR APLINKOSAUGOS ATSKAITOMYBĖ (ER): KINIJOS FINANSŲ IR NEFINANSINIŲ SEKTORIŲ DUOMENYS

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Santrauka. Tyrimo tikslas – įvertinti aplinkosauginį susirūpinimą kai kuriose ES valstybėse narėse ir geriau suprasti jo veiksnius. Remiantis Pasaulio vertybių apklausos duomenimis, pirmiausia buvo analizuojami individualūs vertinimai (rūpinimasis aplinka, požiūris į aplinkos taršą, aplinkos apsauga vs. ekonomikos augimas), vėliau – aktyvus dalyvavimas (narystė aplinkosaugos organizacijoje, finansinė parama ekologinei organizacijai, dalyvavimas aplinkosaugos demonstracijose), o galiausiai abu aspektai integruoti į bendrą sudėtinį indeksą. Rezultatai parodė, kad Lenkija, Rumunija ir Ispanija pasižymi žemiausiu bendru aplinkosauginio susirūpinimo lygiu, o Švedija – aukščiausiu tarp analizuotų ES šalių. Nors tiek Ispanija, tiek Švedija pasižymi pažangia ekonomika, jų bendras nacionalinis aplinkosauginis susirūpinimas reikšmingai skiriasi. Pritaikius binominę logistinę regresiją nustatyta, kad Švedijoje didelį susirūpinimą aplinkosaugos problemomis daugiausia lemia (1) amžius, atliekamų užduočių pobūdis, postmaterialinės vertybės ir pasitenkinimas gyvenimu, o (2) Ispanijoje svarbiausi veiksniai yra išsilavinimo lygis ir postmaterialinės vertybės. Atitinkamai tyrimo išvados gali prisidėti prie tikslesnės ES ir nacionalinės aplinkosaugos politikos formavimo.

Reikšminiai žodžiai: aplinkosauginis susirūpinimas; į aplinką orientuota intencija; aplinkosauginis elgesys; aplinkosaugos politika; sudėtinis indeksas.