

Article

A Systems Perspective on Ecological Citizenship in Libya: Cultural Mediation of Environmental Attitudes in a Socio-Economic Context

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Abstract

Ecological citizenship offers a framework for understanding how individuals translate environmental knowledge and concern into civic environmental engagement. However, the cultural mechanisms shaping this process remain understudied, particularly in Libya and comparable socio-cultural contexts. This study examines how environmental concern and the New Environmental Paradigm (NEP) influence ecological citizenship and the extent to which cultural factors mediate these relationships in Libya. Using a quantitative design, data were collected from 509 adults through validated scales measuring ecological citizenship, environmental concern, the NEP, and cultural values. The statistical analysis results show that environmental concern positively predicts ecological citizenship, with altruistic and biospheric concerns exerting the strongest effects. While the NEP correlates positively with ecological citizenship, its direct impact becomes non-significant when cultural factors are introduced. Cultural values, particularly religiosity, family orientation, generosity, and interdependence, demonstrate strong positive associations with ecological citizenship and mediate the effects of both the NEP and environmental concern, while materialism shows an inverse relationship. The findings of this research highlight that ecological citizenship is shaped not only by environmental attitudes but also by culturally embedded norms and values.

Keywords: cultural factors; ecological citizenship; environmental concern; environmental sustainability in Libya; new environmental paradigm; pro-environmental behavior

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1. Introduction

Currently, there is a brewing environmental crisis that is progressing at an alarming rate. This crisis poses severe global environmental challenges that require urgent mitigation and a collective global approach before it exceeds a point where it cannot be reversed [1]. Now more than ever, there is a need for empowered, aware, and active global citizens to contribute towards the mitigation of global environmental challenges [2]. Environmental education was designed to ensure global environmental citizenship. The Tbilisi declaration of 1977 sanctioned conventional environmental education with the aim of developing the environmental awareness of individuals, equipping them with the necessary environmental management skills, and enabling them to adopt pro-environmental behaviors [3]. Environmental education is characterized by many scholars as an endeavor to support individuals to become informed and empowered global citizens—termed ecological citizenship [4].

Ecological citizenship as a concept has been well defined in the context of environmental education. Ecological citizenship is not a new concept, but has gained significant attention in recent years due to the popularization of environmental education and current global environmental trends [5]. According to a study by Hadjichambis and Reis [6], ecological citizenship is a multidimensional concept, and this has led to a fragmentation of research on the topic. Hadjichambis and Reis posited that the multidimensionality of the concept relative to economics, society, and politics limits its integration into policy frameworks and good practices. Despite the multidimensionality of the concept, there is a consensus on the general characterization of ecological citizens. Ecological citizens are individuals with adequate knowledge of the environment, who have relevant skills to manage it, and understand the cause and effects of their relationship with ecological systems [7].

1.1. Research Background

Global efforts towards environmental sustainability and climate change mitigation acknowledge that these challenges are not only economic and technical. Environmental challenges are deeply rooted in cultural systems of values and belief systems [8]. Environmental education has a critical role in fostering ecological citizenship by increasing environmental awareness and encouraging pro-environmental behavior [9]. However, environmental attitudes and behaviors do not develop in isolation away from the impacts of social and cultural contexts. Culture influences societal moral norms, perceptions of environmental responsibility, and the interpretation of environmental education [10]. Hence, culture mediates the relationships between environmental knowledge and behavioral outcomes. For example, societies with collectivist cultural values may express cooperative ecological stewardship, while individualistic societies may emphasize personal ecological stewardship [11].

Ecological citizenship as a multidimensional construct embodies environmental responsibility and participation in environmental management [12]. It reflects how individuals and communities translate their understanding of the environment into sustained civic and moral engagement with the environment [13]. Two critical attitudinal dimensions, environmental concern and the New Environmental Paradigm (NEP), have been widely associated with ecological citizenship [14]. Empirical findings suggest that the effects of these two factors may be contingent on the underlying cultural factors in a community influencing the individual [15]. Hence, this study is motivated by the acknowledgement that environmental attitudes, responsibility, and practices are filtered through cultural norms and values, which either reinforce or constrain ecological citizenship in individuals.

1.2. Aim and Objectives

This study aims to examine the influence of environmental concern and the New Environmental Paradigm (NEP) on ecological citizenship. This study also carries out an analysis of cultural factors such as religiosity, materialism, family values, and interdependence in shaping individual ecological citizenship. This study also aims to determine the effect of cultural factors in mediating the relationship between environmental concern, the NEP, and ecological citizenship. This study acknowledges the significance of society's socio-cultural factors and how they can contribute towards a context-sensitive understanding of the environment and ecological citizenship through cultural pathways.

2. Literature Review

According to Dobson [16], ecological citizenship represents both moral and civic orientations whereby individuals achieve environmental stewardship. The current global

environmental situation requires the adequate fostering of ecological citizenship; this will mitigate the gap between environmental awareness and pro-environmental behavior [17]. Though ecological citizenship is acknowledged to be multidimensional, it has been linked to pro-environmental attitudes and concern. Studies have also acknowledged the influence of deeper worldviews and cultural dynamics in shaping ecological citizenship, especially in developing regions [18].

2.1. Environmental Concern and Ecological Citizenship

Environmental concern is defined as the extent to which individuals are aware of current environmental challenges and have the will to support or engage in actions aimed at mitigating them [19]. Several empirical studies have reported that environmental concern is a predictor of pro-environmental attitudes and behaviors [20]. Environmental or ecological citizenship is sometimes referred to as an enhanced sense of environmental concern in individuals [21]. While environmental concern entails the awareness of and the will to act towards environmental challenges, ecological citizenship is a sense of responsibility to participate and act toward safeguarding the environment [22]. According to Chen et al. [23], environmental concern is expected as a prerequisite to ecological citizenship. Individuals concerned about the environment are more likely to embody ecological citizenship and engage in civic environmental actions [24].

Despite substantial empirical support, the relationship between environmental concern and pro-environmental behavior is not universally consistent. Meta-analytic and cross-cultural studies have highlighted the persistence of an attitude–behavior gap, whereby great concern does not necessarily result in civic or collective environmental action. Structural constraints, cultural norms, and differing moral frameworks have been identified as key boundary conditions that weaken direct relationships, particularly in developing and non-Western contexts. These inconsistencies suggest that environmental concern alone may be insufficient to foster ecological citizenship without culturally embedded normative mechanisms.

H1. *Environmental concern has a significant and positive impact on ecological citizenship.*

2.2. The New Environmental Paradigm and Ecological Citizenship

The New Environmental Paradigm (NEP) is a concept that is used to define ecological worldviews in which humans are a part of the natural world and not its masters [25]. The NEP recognizes and acknowledges the fragility of nature and the need for balance and interconnectedness with human development [26]. The NEP prioritizes a shift from the traditional worldview of humans' dominance over the environment, towards a view that acknowledges humans as part of it and promotes its sustainability [27]. The NEP has four key principles: humans being a part of nature, acknowledging the limits of nature and requiring balance, anti-anthropocentrism, and acknowledging the consequences of human actions on the environment [28].

Studies have reported the positive correlation between the NEP and pro-environmental attitudes and behaviors. For example, a study carried out among Chinese farmers found a correlation between favorable environmental values and attitudes with higher scores on the NEP [29]. Another study by Sulphrey et al. [30] investigated the influence of the NEP on environmental attitude and behavior in Saudi Arabia; the study reported a high correlation between NEP scores and pro-environmental attitudes and behaviors. The NEP is more distal than constructs such as environmental concern and provides an underlying worldview that shapes how environmental problems are noticed and perceived, which is critical to ecological citizenship [31].

While the NEP has been widely associated with pro-environmental attitudes, several studies report that its behavioral effects are indirect or context-dependent. The NEP represents an abstract worldview that may lack motivational force unless embedded within culturally meaningful norms and social expectations. As such, the NEP is increasingly conceptualized as a distal antecedent whose influence on ecological citizenship is mediated by value systems and moral norms rather than exerting a uniform direct effect.

H2. *The New Environmental Paradigm has a significant positive impact on ecological citizenship.*

2.3. Cultural Factors and Ecological Citizenship

Cultural factors describe the shared values, beliefs, languages, traditions, and behaviors of a group in the context of a community or nation [32]. Cultural factors comprise both learned and shared elements of a group that influence everything, ranging from perceptions to behaviors [33]. Sarid and Goldman [34] used the Schwartz theory of universal values as a framework to explain ecological citizenship. Using a three-level framework, individual, community, and social transformative levels, Sarid and Goldman characterized ecological citizenship as being significantly influenced by socio-cultural factors. A study carried out by Alizade Aghdam et al. [35] reported a significant and positive correlation between cultural capital and ecological citizenship among the population of Tabriz in Iran.

This study adopts a systems perspective to conceptualize ecological citizenship as an emergent outcome of interacting cognitive, cultural, and normative subsystems. Drawing on ecological citizenship theory and the Value–Belief–Norm (VBN) framework, environmental concern and the New Environmental Paradigm (NEP) are understood as cognitive and moral inputs that shape individuals’ environmental orientations. However, these inputs do not operate in isolation. Their influence on civic environmental engagement depends on how they are embedded within broader cultural and social systems.

From a systems perspective, cultural values function as integrative mechanisms that connect individual-level environmental beliefs to collective norms and civic practices. Prior research has demonstrated that environmental attitudes are more likely to result in civic engagement when they are aligned with culturally legitimate norms of responsibility, obligation, and social interdependence. Accordingly, ecological citizenship is conceptualized in this study as a system-level outcome produced through the interaction of environmental attitudes and culturally embedded value structures.

In this study, cultural factors, namely religiosity, materialism, family values, generosity, and interdependence, are conceptualized as culturally embedded normative mechanisms that translate environmental beliefs into ecological citizenship. These cultural values provide the moral justification through which individuals internalize environmental concern and ecological worldviews as civic duties. Accordingly, cultural factors are theorized to mediate, rather than moderate, the relationships between environmental concern, NEP, and ecological citizenship.

H3. *Cultural factors have a positive and significant impact on ecological citizenship.*

H4. *Cultural factors have a significant mediating impact on the relationship between environmental concern and ecological citizenship.*

H5. *Cultural factors have a significant mediating impact between the NEP and ecological citizenship.*

3. Methodology

This study is designed using a quantitative research approach. Using the empirical literature review presented in Section 2, a comprehensive research model was designed

to enable statistical testing for both direct and indirect relationships between the research constructs and variables. The research model is presented in Figure 1. The research uses the case study of Libya, which is suitable for both developing nations and nations significantly impacted by climate change. Libya is geographically located in North Africa, giving it an arid and semi-arid climate. The region faces severe environmental challenges, which are exacerbated by climate change associated with environmental deterioration.

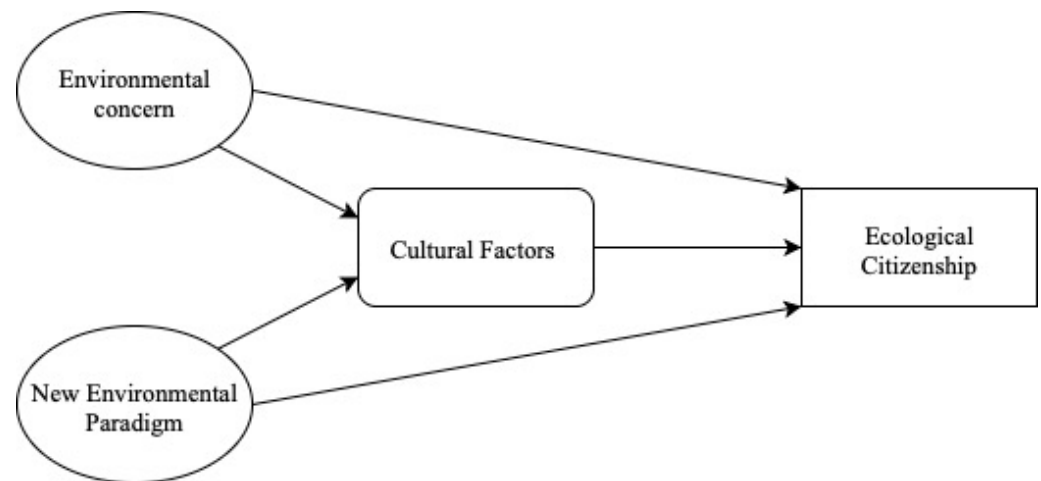


Figure 1. Conceptual research model.

The Libyan context provides a theoretically meaningful setting for examining ecological citizenship due to its socio-political and institutional characteristics. Prolonged political instability, limited formal environmental governance, and weak civic institutions place greater emphasis on informal cultural norms, religious values, and family-based obligations in shaping social behavior. In such contexts, environmental engagement is less likely to be driven by institutional incentives and more likely to be mediated by culturally embedded moral frameworks. This makes Libya a particularly relevant case for examining how ecological citizenship emerges through cultural pathways rather than formal governance mechanisms.

3.1. Research Population and Sampling

This study's research population comprised Libyan adults, who were cross-sectionally targeted from across a diverse set of demographic factors, educational backgrounds, age groups, occupational backgrounds, and gender. This study applied a convenience sampling approach to target a sample size of about 500 respondents to ensure research findings' generalizability. This sample size is guided by the minimum requirement necessary for multivariate analysis and ensuring adequate statistical power. It should be noted that the use of convenience sampling limits the representativeness of the sample, and the response rate could not be precisely determined due to mixed online and paper-based data collection.

3.2. Data Collection Tool

Research data was collected using a structured questionnaire; this data collection tool was designed using standardized and previously validated scales with demonstrated reliability and validity from prior environmental behavior studies, which were identified through a comprehensive literature review. The structured questionnaire was made up of five sections, which are characterized as follows. Section A was made up of demographic data collection items for gender, age, occupation, level of education, marital status, and number of children. Section B was made up of ecological citizenship data collection items adapted from Karatekin and Uysal [36]; the ecological citizenship scale (ECS) has

sub-dimensions covering participation, sustainability, responsibility, and rights and justice. Section C was made up of environmental concern data collection items adapted from Snelgar [37]; the environmental concern scale has sub-dimensions covering egoistic, altruistic, and biospheric environmental concerns.

Section D was made up of cultural factor data collection items adapted from Leonidou et al. [38]. The cultural factors scale comprised five first-order dimensions: materialism, religiosity, interdependence, generosity, and family values. These dimensions were modeled in this study as indicators of a second-order latent construct representing culturally embedded moral and normative orientations. This conceptualization aligns with prior research that treats cultural values as interrelated dimensions reflecting shared systems of obligation, responsibility, and social conduct. Although analytically distinct, these dimensions collectively reflect shared systems of obligation, social responsibility, and value-based reasoning that shape civic behavior. From a systems perspective, these cultural dimensions operate interactively rather than independently, justifying their treatment as a unified construct in the mediation model. Section E is made up of NEP data collection items adapted from Dunlap et al. [39].

All items on the structured questionnaire were rated using a five-point Likert scale, with feedback responses ranging from 1 = strongly disagree to 5 = strongly agree, except for the demographic data collection section, which used multiple-choice questions structured for adequate grouping of the research sample. The data collection tool was used in a survey administered to the research sample using both electronic and paper formats to optimize participation and accessibility. Participation was voluntary, and informed consent was obtained from all respondents. All ethical protocols were ensured, and respondents were assured anonymity and confidentiality throughout and after the research process.

3.3. Measurement Reliability and Validity

Table 1 shows that Cronbach's alpha and composite reliability (CR) values exceed the recommended threshold of 0.70, indicating satisfactory internal consistency. Average variance extracted (AVE) values exceed 0.50, demonstrating adequate convergent validity for all constructs. Cultural factors are modeled as a higher-order latent construct composed of five first-order dimensions.

Table 1. Reliability and convergent validity statistics.

Construct	Cronbach's α	Composite Reliability (CR)	Average Variance Extracted (AVE)
Ecological Citizenship	0.87	0.89	0.58
Environmental Concern	0.84	0.86	0.55
New Environmental Paradigm (NEP)	0.82	0.85	0.53
Cultural Factors (Higher-Order)	0.90	0.92	0.57
└ Religiosity	0.85	0.88	0.60
└ Family Values	0.83	0.86	0.56
└ Generosity	0.81	0.84	0.52
└ Interdependence	0.84	0.87	0.58
└ Materialism	0.79	0.82	0.51

4. Results

As seen in Table 2, 50.3% of the participants were female, and 49.7% were male; 22.6% were between the ages of 18–25, 37.9% were between 26 and 35, and 39.5% were 36 years and older. In terms of occupation, 12.2% were students, 40.7% were engaged in housework,

and 47.2% were employed. Regarding educational status, 12% had completed primary school, 43.6% secondary school, 28.9% undergraduate, and 15.5% postgraduate education. In terms of marital status, 37.3% were single, and 62.7% were married. Considering the number of children, 53.4% had no children, 25.9% had one child, and 20.6% had two or more children.

Table 2. Participants' socio-demographic characteristics.

	Frequency	Percent
Gender		
Female	256	50.30
Male	253	49.70
Age		
18–25	115	22.60
26–35	193	37.90
36 and older	201	39.50
Occupation		
Student	62	12.20
Housework	207	40.70
Employed	240	47.20
Education		
Primary	61	12.00
Secondary	222	43.60
Undergraduate	147	28.90
Postgraduate	79	15.50
Marital status		
Single	190	37.30
Married	319	62.70
Number of children		
No children	272	53.40
One child	132	25.90
Two or more	105	20.60
Total	509	100.00

Table 3 presents the ECS scores of the participants included in the study. As seen in Table 2, the mean score of the ECS—Participation sub-dimension was 2.98 ± 0.42 (min = 1.75, max = 4.13), the mean score of the ECS—Sustainability sub-dimension was 2.97 ± 0.49 (min = 1.43, max = 4.43), the mean score of the ECS—Responsibility sub-dimension was 3.06 ± 0.48 (min = 1.67, max = 5.00), and the mean score of the ECS—Rights and Justice sub-dimension was 2.99 ± 0.69 (min = 1.33, max = 4.67). In addition, the overall ECS mean score was found to be 3.00 ± 0.23 (min = 2.38, max = 3.79).

Table 3. Participants' ECS scores.

	n	$\bar{x}$	s	Min	Max
ECS—Participation	509	2.98	0.42	1.75	4.13
ECS—Sustainability	509	2.97	0.49	1.43	4.43
ECS—Responsibility	509	3.06	0.48	1.67	5.00
ECS—Rights and Justice	509	2.99	0.69	1.33	4.67
Ecological Citizenship Scale	509	3.00	0.23	2.38	3.79

The results of the normality tests carried out on the ECS scores are presented in Table 4. Both skewness and kurtosis values are within the ± 1.5 range. Hence, this indicates a normal distribution.

Table 4. Normality test results for participants' ECS scores.

	Kolmogorov–Smirnov				
	İst	sd	<i>p</i>	Çarpıklık	Basıklık
ECS—Participation	0.075	509	0.000	0.052	−0.192
ECS—Sustainability	0.076	509	0.000	0.053	−0.076
ECS—Responsibility	0.086	509	0.000	0.296	0.556
ECS—Rights and Justice	0.098	509	0.000	0.050	−0.545
Ecological Citizenship Scale	0.072	509	0.000	0.147	−0.049

Table 5 shows the results of gender comparisons of participants' ECS scores. The results show no statistically significant difference relative to the ECS—Participation, ECS—Sustainability, ECS—Responsibility, and ECS—Rights and Justice sub-dimensions, as well as the overall ECS scores ($p > 0.05$).

Table 5. Gender comparison of participants' ECS scores.

	Gender	n	$\bar{x}$	s	t	<i>p</i>
ECS—Participation	Female	256	2.96	0.40	−0.883	0.377
	Male	253	2.99	0.44		
ECS—Sustainability	Female	256	2.98	0.51	0.082	0.935
	Male	253	2.97	0.48		
ECS—Responsibility	Female	256	3.08	0.48	0.887	0.376
	Male	253	3.04	0.49		
ECS—Rights and Justice	Female	256	2.96	0.69	−0.979	0.328
	Male	253	3.02	0.70		
Ecological Citizenship Scale	Female	256	2.99	0.22	−0.418	0.676
	Male	253	3.00	0.23		

The results in Table 6 show no statistical difference when comparing the ECS—Participation, ECS—Sustainability, ECS—Responsibility, and ECS—Rights and Justice sub-dimensions between different age groups. The overall ECS scores by age group showed statistical significance. This difference was due to participants aged 36 and older having higher total scores ($\bar{x} = 3.03$) compared with those aged 26–35 ($\bar{x} = 2.97$).

Table 7 presents the ANOVA results comparing the ECS scores of the participants by occupational status. The results show no statistical significance between the comparisons.

According to the results presented in Table 8, there was no statistical significance found in the differences between the scores when comparing them by participants' educational status. However, statistical significance was found between the overall scores of the ECS according to the educational status of the participants ($p < 0.05$). This difference was due to the fact that the total scores of the participants with postgraduate education ($\bar{x} = 3.06$) were higher than the total scores of the participants with secondary education ($\bar{x} = 2.98$).

According to the results presented in Table 9, no statistical significance was found in the comparison between the marital status of the participants and the sub-dimensions and the overall ECS score.

Table 6. Age group comparison of participants' ECS scores.

	Age Group	n	$\bar{x}$	s	Min	Max	F	p	Fark
ECS— Participation	18–25	115	2.99	0.41	2.00	4.00	0.512	0.600	
	26–35	193	2.95	0.41	1.75	4.13			
	36 and older	201	2.99	0.44	1.75	4.13			
ECS— Sustainability	18–25	115	2.98	0.49	1.57	4.29	2.405	0.091	
	26–35	193	2.92	0.47	1.43	4.43			
	36 and older	201	3.03	0.51	1.71	4.29			
ECS— Responsibility	18–25	115	3.02	0.48	1.83	4.67	0.361	0.697	
	26–35	193	3.06	0.47	1.67	4.33			
	36 and older	201	3.07	0.50	1.83	5.00			
ECS—Rights and Justice	18–25	115	3.00	0.72	1.33	4.67	1.848	0.159	
	26–35	193	2.92	0.71	1.33	4.67			
	36 and older	201	3.06	0.66	1.33	4.67			
Ecological Citizenship Scale	18–25	115	3.00	0.23	2.46	3.58	3.714	0.025 *	2–3
	26–35	193	2.97	0.22	2.38	3.54			
	36 and older	201	3.03	0.23	2.46	3.79			

* $p < 0.05$.**Table 7.** Occupation comparison of participants' ECS scores.

	Occupation	n	$\bar{x}$	s	Min	Max	F	p
ECS— Participation	Student	62	3.05	0.47	2.00	4.00	2.437	0.088
	Housework	207	3.00	0.43	1.75	4.13		
	Employed	240	2.94	0.40	1.75	4.13		
ECS— Sustainability	Student	62	3.00	0.50	1.86	4.29	0.177	0.838
	Housework	207	2.96	0.51	1.57	4.29		
	Employed	240	2.98	0.48	1.43	4.43		
ECS— Responsibility	Student	62	2.94	0.48	2.00	4.67	2.006	0.136
	Housework	207	3.06	0.47	1.83	5.00		
	Employed	240	3.08	0.49	1.67	4.67		
ECS—Rights and Justice	Student	62	3.06	0.72	1.33	4.67	2.199	0.112
	Housework	207	2.92	0.66	1.33	4.33		
	Employed	240	3.04	0.71	1.33	4.67		
Ecological Citizenship Scale	Student	62	3.01	0.22	2.58	3.58	0.093	0.911
	Housework	207	3.00	0.23	2.46	3.79		
	Employed	240	3.00	0.23	2.38	3.58		

Table 8. Educational status comparison of participants' ECS scores.

	Education	n	$\bar{x}$	s	Min	Max	F	p	Fark
ECS— Participation	Primary	61	3.02	0.38	2.25	4.00	1.973	0.117	
	Secondary	222	2.93	0.43	1.75	4.13			
	Undergraduate	147	2.98	0.43	2.00	4.00			
	Postgraduate	79	3.06	0.42	1.75	4.13			
ECS— Sustainability	Primary	61	3.00	0.46	2.14	4.14	1.188	0.314	
	Secondary	222	2.96	0.52	1.43	4.43			
	Undergraduate	147	2.94	0.48	1.71	4.14			
	Postgraduate	79	3.06	0.48	2.00	4.29			
ECS— Responsibility	Primary	61	2.99	0.46	1.83	4.33	1.414	0.238	
	Secondary	222	3.05	0.48	1.67	4.67			
	Undergraduate	147	3.12	0.50	1.83	5.00			
	Postgraduate	79	3.00	0.45	2.00	3.83			
ECS— Rights and Justice	Primary	61	3.04	0.71	1.67	4.67	2.594	0.052	
	Secondary	222	2.96	0.68	1.67	4.33			
	Undergraduate	147	2.93	0.68	1.33	4.67			
	Postgraduate	79	3.18	0.71	1.33	4.67			
Ecological Citizenship Scale	Primary	61	3.01	0.24	2.50	3.58	2.902	0.034 *	2–4
	Secondary	222	2.98	0.22	2.38	3.58			
	Undergraduate	147	3.00	0.22	2.46	3.79			
	Postgraduate	79	3.06	0.22	2.63	3.58			

* $p < 0.05$.

Table 9. Marital status comparison of participants' ECS scores.

	Marital Status	n	$\bar{x}$	s	t	p
ECS— Participation	Single	190	3.00	0.43	0.923	0.356
	Married	319	2.96	0.42		
ECS— Sustainability	Single	190	2.95	0.50	−1.022	0.307
	Married	319	2.99	0.49		
ECS— Responsibility	Single	190	3.06	0.51	0.234	0.815
	Married	319	3.05	0.47		
ECS—Rights and Justice	Single	190	3.04	0.72	1.267	0.206
	Married	319	2.96	0.67		
Ecological Citizenship Scale	Single	190	3.01	0.23	0.545	0.586
	Married	319	2.99	0.22		

According to the results presented in Table 10, the number of children compared among the respondents as a factor in the ECS and its sub-dimensions showed no statistically significant difference.

Table 10. Number of children comparison of participants' ECS scores.

	Number of Children	n	$\bar{x}$	s	Min	Max	F	p
ECS— Participation	No children	272	2.98	0.42	1.75	4.00	0.804	0.448
	One child	132	2.95	0.43	2.00	4.00		
	Two or more	105	3.02	0.44	2.00	4.13		
ECS— Sustainability	No children	272	2.95	0.52	1.43	4.43	1.021	0.361
	One child	132	3.03	0.49	2.00	4.29		
	Two or more	105	2.96	0.43	2.00	4.00		
ECS— Responsibility	No children	272	3.06	0.50	1.67	4.67	1.636	0.196
	One child	132	3.10	0.46	2.00	5.00		
	Two or more	105	2.99	0.47	2.00	4.67		
ECS—Rights and Justice	No children	272	2.99	0.70	1.33	4.67	2.322	0.099
	One child	132	3.09	0.65	1.33	4.67		
	Two or more	105	2.90	0.73	1.33	4.67		
Ecological Citizenship Scale	No children	272	2.99	0.23	2.38	3.79	1.650	0.193
	One child	132	3.03	0.22	2.46	3.58		
	Two or more	105	2.98	0.21	2.46	3.58		

Table 11 presents the results of the participants' responses on the NEP scale; the results show that the overall mean score on the NEP scale is 3.06 ± 0.74 (min = 1.00, max = 5.00).

Table 11. Participants' NEP scores.

	n	$\bar{x}$	s	Min	Max
New Environmental Paradigm Scale	509	3.06	0.74	1	5

Table 12 presents the findings regarding the correlations between the ECS scores and NEP scores of the participants. The results show statistically significant correlations between all the sub-dimensions of ECS and the NEP. In addition, a positive and significant correlation was also found between NEP scores and the total ECS score ($r = 0.495$).

Table 12. Correlations between participants' ECS scores and NEP scores.

		NEP
ECS— Participation	r	0.277 *
	p	0.000
	N	509
ECS— Sustainability	r	0.269 *
	p	0.000
	N	509
ECS— Responsibility	r	0.163 *
	p	0.000
	N	509
ECS—Rights and Justice	r	0.158 *
	p	0.000
	N	509
Ecological Citizenship Scale	r	0.495 *
	p	0.000
	N	509

* $p < 0.05$.

Figure 2 shows the prediction of the ECS scores according to the NEP scale scores of the participants. The results indicate that the NEP score predicted the ECS score positively and significantly ($\beta = 0.49$).

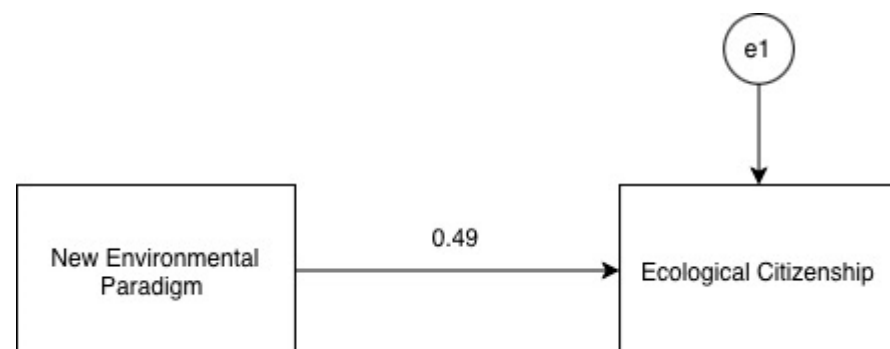
**Figure 2.** Prediction of participants' NEP scores according to their ECS scores.

Table 13 presents results for environmental concern and its sub-dimensions. As seen in Table 13, it was determined that the mean scores of egoistic belief, altruistic belief, and biosphere belief were 3.09, 3.01, and 2.88, respectively.

Table 13. Participants' environmental concern scores.

	n	$\bar{x}$	s	Min	Max
Egotistic Belief	509	3.09	0.69	1	5
Altruistic Belief	509	3.01	0.76	1	5
Biosphere Belief	509	2.88	0.68	1.08	5

Table 14 presents the findings regarding the correlations between the ECS and the environmental concern scores of the participants. It was found that the ECS score was negatively correlated with egoistic belief ($r = -0.416$) and positively correlated with altruistic belief ($r = 0.474$) and biosphere belief ($r = 0.467$), all at statistically significant levels. Also, the sub-dimensions of the ECS were found to be negatively correlated with egoistic belief and positively correlated with altruistic and biospheric belief.

Table 14. Correlations between participants' ECS score and environmental concern.

		Environmental Concern		
		Egotistic Belief	Altruistic Belief	Biosphere Belief
ECS— Participation	r	−0.213 *	0.241 *	0.245 *
	p	0.000	0.000	0.000
	N	509	509	509
ECS— Sustainability	r	−0.264 *	0.224 *	0.320 *
	p	0.000	0.000	0.000
	N	509	509	509
ECS— Responsibility	r	−0.115 *	0.202 *	0.132 *
	p	0.010	0.000	0.003
	N	509	509	509
ECS—Rights and Justice	r	−0.139 *	0.187 *	0.102 *
	p	0.002	0.000	0.022
	N	509	509	509
Ecological Citizenship Scale	r	−0.416 *	0.474 *	0.467 *
	p	0.000	0.000	0.000
	N	509	509	509

* $p < 0.05$.

Figure 3 shows the prediction of ECS score according to the environmental concern of the participants. The results show that biosphere belief ($\beta = 0.36$) and altruistic belief ($\beta = 0.37$) predict ECS score positively, while egoistic belief ($\beta = -0.29$) predicts ECS score negatively.

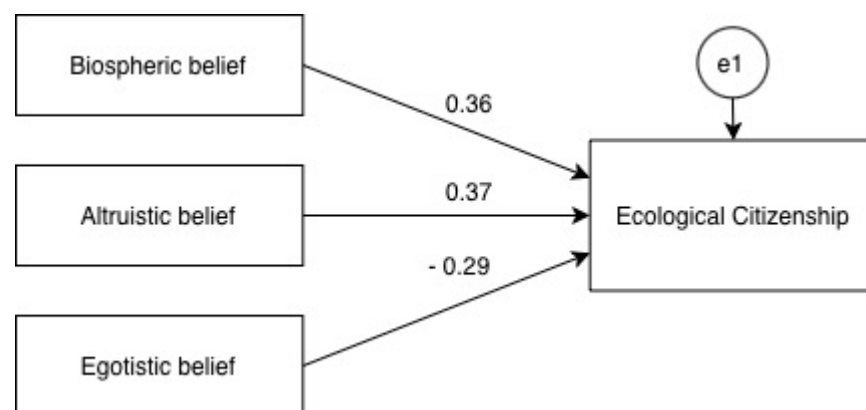
**Figure 3.** Prediction of participants' environmental concern scores by their ECS scores.

Table 15 presents the cultural factor scores of the participants. As seen in Table 15, the mean scores of generosity, materialism, religiosity, family values, and interdependence are 2.93, 3.03, 3.02, 2.95, and 2.87, respectively.

Table 15. Participants' cultural factor scores.

	n	$\bar{x}$	s	Min	Max
Generosity	509	2.93	0.66	1	5
Materialism	509	3.03	0.64	1	5
Religiosity	509	3.02	0.64	1	5
Family Values	509	2.95	0.56	1	5
Interdependence	509	2.87	0.73	1	5

Table 16 presents the findings regarding the correlations between the ECS and the cultural factors of the participants.

Table 16. Correlations between participants' ECS score and cultural factors.

		Cultural Factors				
		Generosity	Materialism	Religiosity	Family Values	Interdependence
ECS—Participation	r	0.278 *	−0.290 *	0.224 *	0.258 *	0.264 *
	p	0.000	0.000	0.000	0.000	0.000
	N	509	509	509	509	509
ECS—Sustainability	r	0.279 *	−0.266 *	0.250 *	0.208 *	0.183 *
	p	0.000	0.000	0.000	0.000	0.000
	N	509	509	509	509	509
ECS—Responsibility	r	0.215 *	−0.208 *	0.181 *	0.192 *	0.191 *
	p	0.000	0.000	0.000	0.000	0.000
	N	509	509	509	509	509
ECS—Rights and Justice	r	0.040	−0.104 *	0.081	0.116 *	0.083
	p	0.372	0.019	0.068	0.009	0.061
	N	509	509	509	509	509
Ecological Citizenship Scale	r	0.482 *	−0.503 *	0.428 *	0.442 *	0.416 *
	p	0.000	0.000	0.000	0.000	0.000
	N	509	509	509	509	509

* $p < 0.05$.

As seen in Table 16, ECS score is positively correlated with generosity, religiosity, family values, and interdependence, and negatively correlated with materialism. In addition, it was observed that the participation, sustainability, and responsibility sub-dimensions of ECS were positively correlated with generosity, religiosity, family values, and interdependence, and negatively correlated with materialism. For the rights and justice sub-dimension, negative correlations were found with materialism and positive correlations with family values.

Figure 4 shows the prediction of ECS score according to the cultural factors of participants. It was determined that generosity, religiosity, family values, and interdependence predicted ECS score positively, while materialism predicted ECS score negatively.

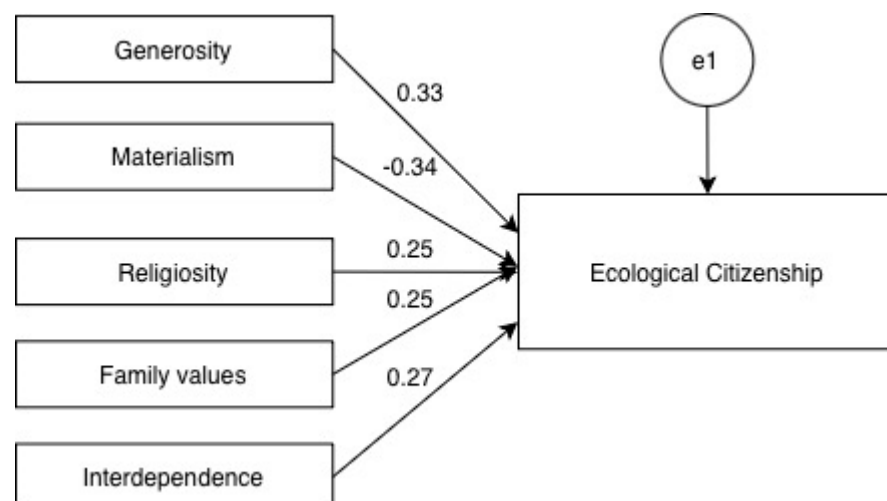


Figure 4. Prediction of participants' cultural factors scores according to their ECS scores.

Figure 5 presents the results of the structural equation modeling conducted to determine the mediating role of cultural factor scores in the relationship between NEP scores, environmental concern scores, and ECS scores of participants. Age and educational level, which demonstrated statistically significant differences in ecological citizenship scores in

preliminary analyses, were included as control variables in the mediation model. The mediation results remained substantively unchanged after controlling for these demographic factors.

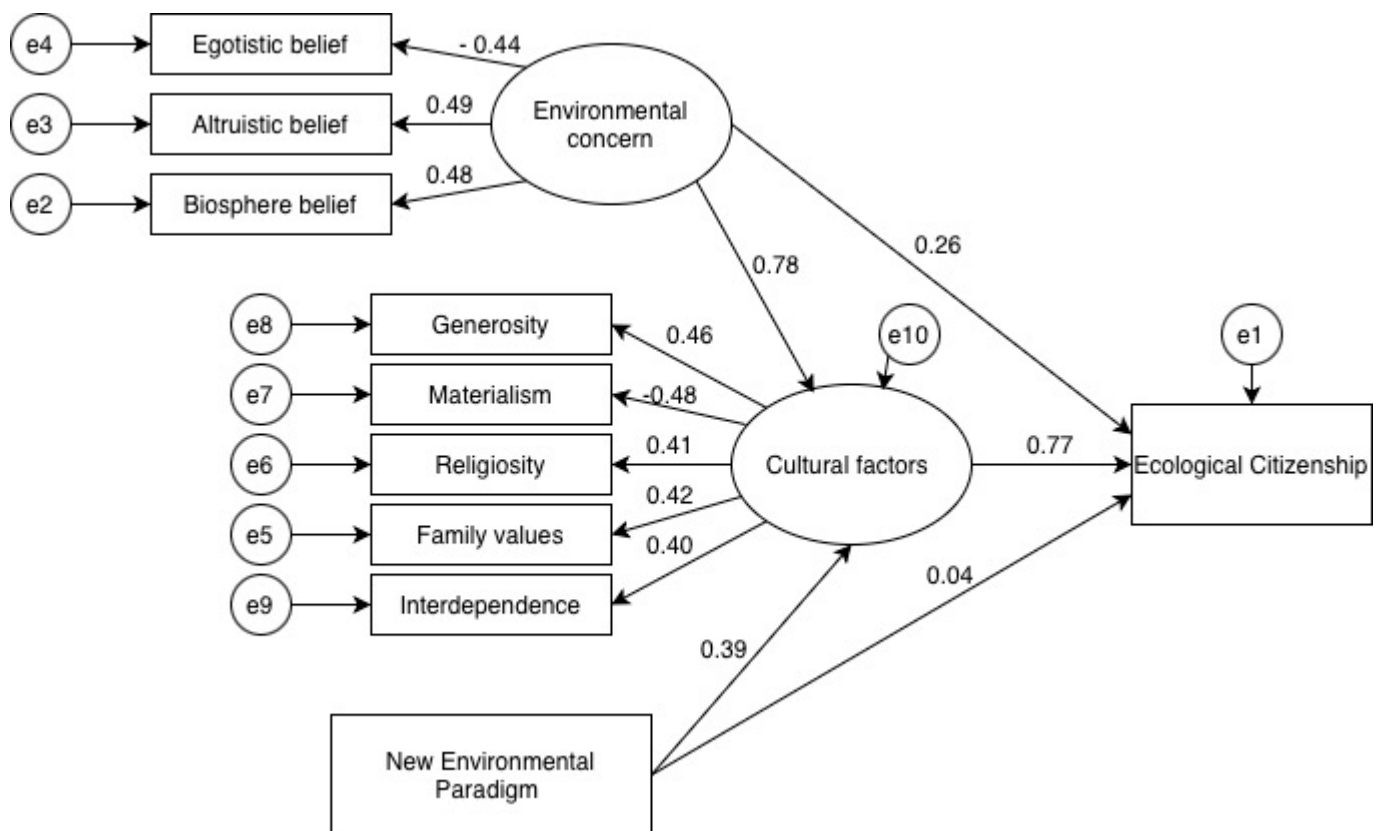


Figure 5. The mediating role of cultural factor scores in the relationship between participants' NEP, environmental concern, and ECS score.

According to the results in Figure 5, environmental concern has a significantly positive effect on cultural factors, while cultural factors have a significantly positive effect on ECS score. Also, the direct effect of environmental concern on ECS scores was also found to be statistically significant, though weaker. Furthermore, NEP score had a statistically significant effect on cultural factors, but their direct effect on ECS score was not statistically significant.

The mediating effects were examined using a bootstrapping procedure with 5000 resamples. The results indicate that the indirect effects of environmental concern and the NEP on ECS score through cultural factors were statistically significant. The 95% bootstrap confidence intervals for both indirect effects did not include zero, providing robust statistical support for the proposed mediation relationships and indicating that these indirect effects were significant. These findings indicate that cultural factors significantly mediate the relationships between environmental concern, the NEP, and ecological citizenship. While environmental concern retains a weakened direct association with ecological citizenship, the direct association between the NEP and ecological citizenship becomes non-significant once cultural factors are included, suggesting that the NEP primarily influences ecological citizenship through culturally embedded normative mechanisms rather than exerting an independent direct effect. Hence, according to the analysis of results presented in Figure 5, the hypotheses' validity outcomes are as follows:

H1. *Environmental concern has a significant and positive impact on ecological citizenship—Accepted.*

H2. *The New Environmental Paradigm has a significant positive impact on ecological citizenship—Rejected.*

H3. *Cultural factors have a positive and significant impact on ecological citizenship—Accepted.*

H4. *Cultural factors have a significant mediating impact between environmental concern and ecological citizenship—Accepted.*

H5. *Cultural factors have a significant mediating impact between the NEP and ecological citizenship—Accepted.*

5. Discussion

5.1. Relationship Between Environmental Concern and Ecological Citizenship

The findings in this study have shown a positive relationship between environmental concern in individuals and ecological citizenship in Libya. Individuals with higher levels of environmental concern on environmental issues have been found to be more likely to exhibit aspects of ecological citizenship, such as responsibilities and participation towards environmental sustainability. The direct relationship between environmental concern and ecological citizenship is found to be strong and meaningful. This strong and direct relationship aligns with the findings of Milfont et al. [40], which showed that environmental concern, especially relative to biospheric and altruistic concerns, strongly influenced pro-environmental behaviors. The findings in this study indicate that environmental concern does not merely lead to isolated pro-environmental behaviors but contributes to ecological citizenship orientation. Environmental concern aids in the perception of environmental responsibility as a civic duty and enables engagement in public sphere aspects of environmental justice [41].

From a systems perspective, ecological citizenship can be understood as an emergent form of civic engagement arising from the interaction between individual environmental attitudes and broader socio-economic and institutional structures. Recent systems-oriented research emphasizes that effective environmental action requires not only policy interventions and technological solutions but also active citizen participation that connects top-down governance with bottom-up civic engagement [42]. In this regard, ecological citizenship functions as a critical mechanism through which environmental knowledge and concern are translated into socially embedded and collectively meaningful action.

This interpretation is consistent with recent systems-based analyses of sustainability transitions, which conceptualize citizens as active agents embedded within complex socio-economic systems rather than passive recipients of environmental policy [42,43]. These perspectives emphasize that civic environmental engagement is shaped by institutional conditions, cultural norms, and moral frameworks that legitimize participation, reinforcing the view that ecological citizenship is embedded within broader social systems rather than driven solely by individual environmental attitudes.

Cultural factors were also found to have a significant mediating influence on the relationship between concern and ecological citizenship. This indicates the role of cultural and social values in influencing behavioral engagement via attitudes and identities. The observed nuance on the role of cultural factors in this relationship emphasizes that while environmental concern has an independent direct impact on ecological citizenship, it is also affected by cultural factors. These findings imply that consistent and continual emphasis on environmental concern should be continued to increase environmental engagement. Also, environmental education and campaigns should be embedded in cultural narratives to increase the effectiveness of promoting ecological citizenship.

5.2. Relationship Between the New Environmental Paradigm and Ecological Citizenship

The findings indicate that the NEP does not exert a strong independent direct effect on ecological citizenship once cultural factors are considered. Instead, the NEP appears to shape ecological citizenship indirectly by influencing culturally embedded norms that legitimize civic environmental responsibility. Also, a significant mediating effect of cultural factors between the NEP and ecological citizenship exists. These findings align with prior studies, which report the positive effect of the NEP on ecological citizenship [44–46]. This implies that there is a need to adequately integrate environmental worldviews into cultural values and norms to achieve more ecological citizenship. A study by Tarinc et al. [15] found a significant impact of the NEP on ecological attitudes.

The findings in this study imply that the NEP is more than a mere abstraction of environmental belief; it has a significant impact on ecological citizenship and is supported by cultural factors. The NEP contributes to environmental responsibilities, rights, and justice, which are critical to ecological citizenship. Hence, there is a need for tailored environmental interventions towards the adequate global framing of environmental trends. Also, cultural narratives should be used to reinforce environmental stewardship and interdependence among people.

5.3. Influence of Cultural Factors on Ecological Citizenship

The role of cultural factors found in this study emphasizes the influence of cultural values and norms on ecological citizenship. This study found that cultural factors have a direct and indirect influence on ecological citizenship. A study by Chwialkowska et al. [47] found that cultural values have a significant impact on pro-environmental behaviors as they are significant variables in shaping attitude and behavior. A study carried out on Korean universities found that cultural orientations have an influence on pro-environmental behaviors among the students [48]. Jiang and Gossage [49] more recently reported that environmental attitudes and cultural attitudes directly promote responsible environmental behavior. These prior findings align with the findings of this study on the impact of cultural factors on ecological citizenship.

This study reinforces the role of cultural values as indicated in integrative theories and models such as Value–Belief–Norm and ecological citizenship theory. Hence, environmental education should be designed to engage cultural values to foster ecological citizenship. Environmental programs should not ignore pro-environmental cultures, and cultural inclinations that are detrimental should also be adequately addressed. Environmental policy and intervention design should leverage the use of cultural factors to promote cultural narratives, norms, and values that encourage ecological citizenship and environmental sustainability.

6. Conclusions

This study investigated the relationship between environmental concern, the NEP, cultural factors, and ecological citizenship. The study demonstrates that environmental concern and ecological views, as defined by the NEP, have a significant influence on ecological citizenship development among individuals in Libya. This study also found that the relationships between environmental concern, the NEP, and ecological citizenship are substantially influenced and shaped by cultural factors in Libya. The findings in this study confirm that environmental concern and the NEP are essential determinants of cultivating ecological citizenship. Also, cultural factors such as interdependence, family orientation, religiosity, and generosity serve as critical mediating mechanisms that translate environmental understanding into civic environmental engagement. This study's analytical framework underscores the importance of culturally grounded environmental efforts that

align with pro-environmental societal norms and values. Fostering ecological citizenship in Libya and comparable socio-cultural contexts requires equipping individuals with ecological principles enhanced with embedded cultural narratives.

While the mediation findings offer valuable insights, they should be interpreted with caution. First, the cross-sectional design limits causal inference, and alternative causal pathways, such as ecological citizenship, that reinforce cultural values cannot be ruled out. Second, the aggregation of cultural dimensions into a higher-order construct may obscure the distinct effects of individual cultural values. Third, unmeasured contextual factors, such as trust in institutions or exposure to environmental education, may also contribute to the observed relationships. Future research employing longitudinal or comparative designs is needed to further clarify these dynamics.

6.1. Theoretical Contributions

This study contributes to ecological citizenship research in three key ways. First, it extends ecological citizenship theory to a non-Western, post-conflict context where civic engagement is strongly mediated by cultural and moral norms. Second, it advances prior research by empirically demonstrating cultural mediation, rather than moderation, as a mechanism linking environmental worldviews and concern to ecological citizenship. Third, the findings show that the NEP alone is insufficient to predict ecological citizenship, highlighting the necessity of culturally embedded normative pathways for translating environmental beliefs into civic environmental engagement.

6.2. Recommendations

Based on the findings of this study, environmental education programs should be designed to consider incorporating pro-environmental cultural values and social norms that are contextual to local communities. Incorporating environmental stewardship, interdependence, and responsibility within the context of cultural values can strengthen the internalization of ecological citizenship in individuals. Also, policy design and implementation should consider the use of culturally adaptive strategies to enable adaptive communication with local communities. Finally, future studies should consider longitudinal and cross-cultural research designs to investigate how cultural norms and values influence environmental concern, the NEP, and sustained pro-environmental behavior. Such a study will offer insight into diverse cultural settings for environmental sustainability.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are available upon request due to restrictions for privacy and ethical reasons.

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