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Environmental worldviews in Ethiopia: Level of endorsement and factor structure analytics of the revised New Ecological Paradigm (NEP) scale in developing countries context

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Abstract

Understanding public environmental worldviews is essential for addressing the behaviors that significantly contribute to environmental problems, especially in developing countries where the need for rapid economic growth often coincides with addressing the challenges of environmental degradation. This study investigates the endorsement and dimensionality of the New Ecological Paradigm (NEP) scale among university students in Addis Ababa, Ethiopia, using the revised NEP scale. Survey data from 657 students revealed a moderate endorsement of pro-ecological beliefs (Mean NEP score = 3.65, SD = 0.446), marked by an awareness of the fragility of nature's balance, limits to growth, rights of non-human species, and awareness of environmental crisis. However, these attitudes coexist with persistent anthropocentric and techno-optimistic beliefs, reflecting a hybrid worldview shaped by local realities and development needs. The study found that the NEP scale did not function as a single, coherent measure ($\alpha = 0.659$), and the Principal Components Analysis (PCA) rejects the unidimensionality of the NEP scale in this context, instead revealing a four-factor structure that explained 46.426% of the variance. The findings highlight the importance of "environmentalism of livelihood" where ecological concerns are closely linked to survival and development priorities. Methodologically, the study demonstrated that relying on a single aggregate NEP score risks obscuring critical tensions within respondents' belief systems. The results further underscore the need for culturally sensitive measurement tools and interventions that address the multidimensional nature of environmental attitudes in developing societies.

Keywords: New Ecological Paradigm; NEP Scale; Environmental Concern; Environmental Attitudes; Dominant Social Paradigm (DSP); Environmental Worldviews; Factor Analysis; Ethiopia

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1. Introduction

The environmental challenges of the 21st century, including climate change, biodiversity loss, deforestation, and pollution, have underscored the critical need to understand public attitudes towards environmental issues. This is particularly crucial in developing nations, where the need for rapid economic growth often coincides with addressing the challenges of environmental degradation. These crises, which transcend national borders, pose significant threats to both ecological sustainability and human well-being, particularly in developing countries where communities often depend directly on natural resources for their livelihoods. Scholars and policy makers have increasingly recognized that technological solutions alone are not sufficient to address these challenges. Instead, it is essential to understand and integrate public perceptions, values, and behaviors into sustainability strategies. Accordingly, the systematic measurement of environmental attitudes has become a vital component of environmental research and policy development. One of the most widely used instruments for assessing environmental worldviews is the New Ecological Paradigm (NEP) scale, initially developed by Dunlap and Van Liere in 1978 and later revised by Dunlap et al. (2000). The NEP scale evaluates individuals' perspectives on the relationship between humans and the natural environment, providing insight into ecological concern (Dalelo, 2015).

Despite its global popularity, the NEP scale has generated debates regarding its dimensionality, validity, and cross-cultural applicability. Dunlap et al. (2000) originally presented the scale as a unidimensional, yet multiple studies using exploratory factor analysis and principal component analysis have found evidence of multidimensionality, often identifying three or more factors (Amburgey and Thoman, 2012, Corral-Verdugo and Armendariz, 2000, Erdoğan, 2009, Berze et al., 2022). This suggests that endorsement of the NEP may vary depending on cultural, political, and socio-economic contexts. Although the NEP scale has been used in a wide range of other non-Western countries, including Mexico, Brazil, Turkey, China, Japan, its application in developing countries, particularly Africa, remain scarce. Given this backdrop, the purpose of this study is to measure the level of endorsement and dimensionality of the revised NEP scale in Ethiopia. This study thus aims to contribute to the cross-cultural validation literature on the revised NEP scale by examining both endorsement level and dimensionality of the scale within a Sub-Saharan African university context, where such validations remain limited.

1.1. The New Ecological Paradigm (NEP) scale

For decades, the dominant worldview in many industrialized societies, and increasingly in a globalized world, has been characterized by what Pirages and Ehrlich (1974) termed the "Dominant Social Paradigm" (DSP). They described the DSP as "the dominant world view, model, or frame of reference through which individuals or collectively, a society, interpret the meaning of the external world" (Pirages and Ehrlich). This paradigm, deeply rooted in Western cultural and economic history, is predicated on several core tenets: a commitment to individualism, a belief in laissez-faire government, and an unwavering faith in the virtues of progress and material abundance. The DSP is built on the premise that economic growth is inherently good and limitless, and that science and technology will provide solutions to any problems that arise (Dunlap and Van Liere, 1978). Within this framework, nature is viewed as an inexhaustible resource to be exploited and a force to be subdued for human benefit (Dunlap and Van Liere, 1978, Dunlap and Catton, 1979). This anthropocentric perspective prioritizing human interests above all else, has been a major driver of the very environmental crises we face today (Albrecht et al., 1982, Erdoğan, 2009).

However, the mounting evidence of environmental degradation, such as diminishing resources and widespread pollution, gradually eroded the credibility of the DSP's anthropocentric view—a process powerfully accelerated by Rachel Carson's landmark 1962 book, *Silent Spring*. By exposing the environmental

and health dangers of indiscriminate pesticide use through a compelling combination of science and narrative, Carson challenged the prevailing faith in technological progress, demonstrated the fragility of nature's balance, and reshaped public consciousness (Carson, 1962). In response to growing public perceptions and environmental consciousness on one hand and the limitations and ecological consequences of the DSP on the other, social scientists began to formulate a counter-paradigm, which eventually led to the development of the New Environmental Paradigm (NEP) by Dunlap and Van Liere (1978).

Table 1. Revised NEP Scale items categorized according to their corresponding five hypothesized facets, and their corresponding paradigm indicators.

NEP Items (statements)[a]		Paradigm indicator
**** Reality of limits to growth***		
NEP1	We are approaching the limit of the number of people the earth can support	Pro-NEP
NEP6	The earth has plenty of natural resources if we just learn how to develop them	Pro-DSP
NEP11	The Earth has only limited room and resources for humans to use.	Pro-NEP
****Anti-anthropocentrism***		
NEP2	Humans have the right to modify the natural environment to suit their needs	Pro-DSP
NEP7	Plants and animals have as much right as humans to exist	Pro-NEP
NEP12	Humans were meant to rule over the rest of nature	Pro-DSP
**** Fragility of nature's balance***		
NEP3	When humans interfere with nature it often produces disastrous consequences	Pro-NEP
NEP8	The balance of nature is strong enough to cope with the impacts of modern industrial nations	Pro-DSP
NEP13	The balance of nature is very delicate and easily upset	Pro-NEP
****Rejection of human exemptionalism***		
NEP4	Human ingenuity will ensure that we do NOT make the earth unlivable	Pro-DSP
NEP9	Despite our special abilities humans are still subject to the laws of nature	Pro-NEP
NEP14	Humans will eventually learn enough about how nature works to be able to control it	Pro-DSP
****The possibility of an eco-crisis***		
NEP5	Humans are severely abusing the environment	Pro-NEP
NEP10	The so-called "ecological crisis" facing humankind has been greatly exaggerated	Pro-DSP
NEP15	If things continue on their present course, we will soon experience a major ecological catastrophe	Pro-NEP

Source: Dunlap et al. (2000).

** Hypothesized facets*

[a] the seven even numbered items, if agreed to by a respondent, are meant to represent statements endorsed by the dominant social paradigm (DSP). The eight odd items, if agreed to by a respondent, are meant to reflect endorsement of the new ecological paradigm (NEP).

The NEP represents a fundamental shift from the DSP's anthropocentric and growth-oriented worldview. It posits a more eco-centric perspective, recognizing the interconnectedness of human societies with the natural environment (Dunlap and Van Liere, 1978, Dunlap, 2008, Van Petegem and Blieck, 2006). Central to the NEP

are several key belief: the belief in the fragility of nature's balance, the recognition of limits to growth, the conviction that humans are not exempt from the laws of nature, and the rejection of human dominion over the natural environment (Dunlap, 2008). The NEP thus provides a theoretical framework for understanding pro-environmental attitudes and behaviors, as it reflects a shift towards more sustainable and harmonious relationships with the natural environment (Van Petegem and Blieck, 2006, Vikan et al., 2007). These contradicting ideological views—anthropocentric vis-à-vis ecological worldviews—forms the central theoretical framework for assessing environmental consciousness and the basis for the NEP scale (Dunlap, 2008). The evolution of these two opposing paradigms underscores that the ecological crisis is not merely a technical problem but a profound difference in fundamental societal beliefs (Dunlap and Van Liere, 1978, Dunlap and Catton, 1979).

Despite its innovative approach, the original NEP scale faced several criticisms. Scholars pointed to its limited internal consistency, its weak correlation with observable pro-environmental behaviors, and the use of dated language in its statements(Albrecht et al., 1982; Dunlap et al., 2000). In response to these critiques, Dunlap and his colleagues (2000) revised the instrument and introduced the New Ecological Paradigm (NEP) scale, often referred to as the "revised NEP". The revised NEP scale expanded the number of items from twelve to fifteen and refined their wordings to improve clarity and relevance. The revised NEP includes eight pro-ecological statements and seven pro-DSP statements, which are typically measured using a five-point Likert scale ranging from *strongly agree* to *strongly disagree*. Agreement with the eight odd-numbered items and disagreement with the seven even-numbered items indicate endorsement of the pro-ecological worldviews.

The revised NEP was designed not only to improve reliability but also to expand its conceptual scope. The researchers sought to achieve a better balance between pro and anti-NEP statements and broaden the scale beyond the three original facets –*balance of nature, limits to growth, and anti-anthropocentrism* (Dunlap et al., 2000). One significant addition was the inclusion of items addressing *human exemptionalism*, a concept prominent in the 1980s that posits humans are uniquely exempt from natural constraints, unlike other species. Additionally, the researchers included items related to the possibility of *eco-crisis* or potential catastrophic environmental changes, in response to the growing global concerns such as ozone depletion and climate change. Accordingly, the revised scale was structured around five hypothesized facets of ecological worldviews (Table 1): the reality of limits to growth (1, 6, 11), anti-anthropocentrism (2, 7, 12), the fragility of nature's balance (3, 8, 13), rejection of human exemptionalism (4, 9, 14) and the possibility of an eco-crisis (5, 10, 15).

2. Methodology

This study employed a quantitative cross-sectional survey design to examine environmental worldviews among university students in Ethiopia using the revised New Ecological Paradigm (NEP) scale developed by Dunlap et al. (2000). The NEP scale was chosen due to its extensive use in cross-cultural research as a measure of ecological worldviews (Dunlap, 2008; Dunlap et al., 2000). The data for this study was collected from students at Addis Ababa University (AAU), the oldest and largest learning institution in Ethiopia, which draws students from a wide range of social, cultural, and regional backgrounds. This diversity made AAU an appropriate setting for examining environmental attitudes in a society undergoing socio-economic transitions. A total of 657 students participated in the study, including undergraduate, graduate, and PhD students enrolled at AAU during the 2016-17 academic year. Due to typical logistical challenges in university-based research within developing countries' settings, a convenience sampling method was adopted. Efforts were made to ensure proportional representation across different colleges and faculties thereby achieving a broad coverage of academic disciplines.

Questionnaires were administered in classroom settings with permission of course instructors. The primary researcher visited selected classes, explained the purpose of the study, and distributed paper questionnaires to all students present. Participation was voluntary and anonymous, and all students who were present on the day of data collection were eligible to participate. The instrument was distributed and collected immediately during class, and 100% response rate was achieved among those in attendance. Following data cleaning, 16 cases were excluded from data analysis due to incomplete responses on one or more of the NEP items. Listwise deletion was employed for cases with missing data on any of the 15 NEP items, resulting in a final sample of N = 641 for descriptive statistics, reliability analysis, and factor analysis.

The NEP scale administered in this study comprised 15 items (see table 1), based on the revised scale by Dunlap et al. (2000). A pilot test was conducted with a small group of students (n = 10) to assess the clarity, cultural relevance, and language comprehension of the items. No major modifications were needed, only minor adjustments in NEP item 4 where the word "ingenuity" was supplemented with synonyms in parentheses ("cleverness, creativity"). Responses were recorded using a five-point Likert scale ranging from *strongly agree* (5) to *strongly disagree (1).* To facilitate interpretation of an overall mean NEP score, the seven even numbered items were reverse coded during statistical analysis so that higher scores indicated a stronger endorsement of pro-ecological worldviews.

3. Results

The frequency distribution, mean scores, and standard deviations for responses to the 15-item New Ecological Paradigm (NEP) scale are presented in Table 2. Consistent with previous research in diverse cultural contexts (Dunlap et al., 2000, Hawcroft and Milfont, 2010), the results demonstrate a general tendency among the respondents to endorse moderately pro-ecological beliefs (Mean = 3.65, SD = 0.446, N = 641), though with notable variations across specific dimensions of environmental worldviews.

The highest levels of pro-ecological agreement emerged for items addressing clear environmental concerns. Specifically, a substantial majority (86.9%) agreed or strongly agreed that "Humans are seriously abusing the environment." (Item 5, Mean = 4.22, *SD* = 0.92), while 79.3% endorsed the statement "When humans interfere with nature it often produces disastrous consequences." (Item 3, Mean = 4.02, *SD* = 1.11). Similarly, strong pro-ecological orientations were evident in response to Item 7, "Plants and animals have as much right as humans to exist," with 79.5% agreement (Mean = 4.00, *SD* = 1.08).

However, respondents revealed more nuanced perspectives on certain concepts. While 61.9% of the respondents agreed that "We are approaching the limit of the number of people the Earth can support," (Item 1, Mean = 3.43, *SD* = 1.33), substantial minorities expressed skepticism about ecological limits in other contexts. For instance, 88.8% of respondents disagreed that "The Earth has plenty of natural resources if we just learn how to develop them" (Item 6, Mean = 4.30, *SD* = 0.90), suggesting recognition of resource constraints despite uncertainty about population carrying capacity.

Conversely, there was notable disagreement with anthropocentric or human-exemptionalist statements. For instance, 78.8% rejected the assertion that "Humans have the right to modify the natural environment to suit their needs" (Item 2, Mean = 3.92, *SD* = 1.17), while 68.5% disagreed with "Humans were meant to rule over the rest of nature" (Item 12, Mean = 3.65, *SD* = 1.25). However, responses to Item 4, concerning faith in human ingenuity to prevent environmental catastrophes, were more divided, with only 53.2% expressing agreement with this DSP-aligned statement. These patterns indicate a general endorsement of pro-ecological worldviews among Ethiopian university students, though some items elicited more mixed responses.

Table 2. Frequency distributions, mean score, and standard deviations for the new ecological paradigm (NEP) scale (N = 641)

NEP Items (statements)[a]		*% Distribution*					*Mean*	*SD*
		Strongly Disagree	Disagree	*Neither/Nor*	*Agree*	*Strongly Agree*		
1	We are approaching the limit of the number of people the Earth can support.	11.1	19.5	7.5	38.8	23.1	3.43	1.328
2	Humans have the right to modify the natural environment to suit their needs.	35.3	43.5	5.9	8.4	6.9	3.92	1.167
3	When humans interfere with nature it often produces disastrous consequences.	5.1	6.9	8.7	39.2	40.1	4.02	1.108
4	Human ingenuity (cleverness, creativity) will ensure that we do not make the Earth unlivable [b]	10.5	15.6	20.7	38.7	14.5	2.69	1.203
5	Humans are seriously abusing the environment.	2.5	4.2	6.4	42.6	44.3	4.22	0.924
6	The Earth has plenty of natural resources if we just learn how to develop them.	49.6	39.2	6.1	2.3	2.8	4.30	0.901
7	Plants and animals have as much right as humans to exist.	3.3	10.8	6.4	42.1	37.4	4.00	1.080
8	The balance of nature is strong enough to cope with the impacts of modern industrial nations.	22.5	27.0	9.5	26.2	14.8	3.16	1.414
9	Despite our special abilities, humans are still subject to the laws of nature.	5.6	18.3	10.6	40.7	24.8	3.61	1.199
10	The so-called "ecological crisis" facing humankind has been greatly exaggerated.	14.2	35.0	12.9	26.8	11.1	3.14	1.269
11	The Earth has only limited room and resources for humans to use.	9.5	20.0	15.3	34.1	21.1	3.37	1.276
12	Humans were meant to rule over the rest of nature.	27.4	40.9	9.8	13.3	8.6	3.65	1.248
13	The balance of nature is very delicate and easily upset.	6.3	21.4	12.3	43.5	16.5	3.43	1.175
14	Humans will eventually learn enough about how nature works to be able to control it.	36.8	37.3	9.4	11.5	5.0	3.89	1.168
15	If things continue on their present course, we will soon experience a major ecological catastrophe.	5.5	11.4	8.4	40.5	34.2	3.87	1.165

[a] *Question wording: To what extent do you agree or disagree with these statements about environmental/ecological worldviews in general?*

[b] *Modified to improve comprehensibility*

Note: the seven even numbered items (2, 4, 6, 8, 10, 12, 14) were reverse-coded to obtain an overall NEP score; the overall mean scale for the revised NEP scale is 3.65.

The internal consistency of the 15-item revised NEP scale was assessed using *Cronbach's alpha*, which yielded $\alpha = 0.659$ (15 items). Table 3 presents the item-level statistics.

Further analysis of item-level statistics, presented in Table 3, provides insight into the scale's performance. The corrected item-total correlations, which measure how well each item correlates with the total scale score, ranged from -0.018 to 0.387. Most items demonstrated positive corrected item-total correlations, suggesting that they are consistent with the overall construct being measured.

Item 7 ("Plants and animals have as much right as humans to exist"), Item 15 ("If things continue on their present course, we will soon experience a major ecological catastrophe"), Item 3 ("When humans interfere with nature, it often produces disastrous consequences"), and Item 9 ("Despite our special abilities, humans are still subject to the laws of nature") showed the strongest item-total correlations (corrected item-total correlation = 0.387, 0.348, 0.348, 0.340 respectively), suggesting these items are particularly effective at measuring the underlying environmental worldview construct in this population.

Table 3. Item-total statistics (N = 641); Cronbach's Alpha = 0.659; N of Items = 15

	NEP Items	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1	We are approaching the limit of the number of people the Earth can support	.337	.167	.633
2	Humans have the right to modify the natural environment to suit their needs	.331	.212	.635
3	When humans interfere with nature, it often produces disastrous consequences	.348	.237	.633
4	Human ingenuity (cleverness, creativity) will ensure that we do not make the Earth unlivable	-.018	.060	.683
5	Humans are seriously abusing the environment	.227	.156	.649
6	The Earth has plenty of natural resources if we just learn how to develop them	.338	.241	.637
7	Plants and animals have as much right as humans to exist	.387	.220	.628
8	The balance of nature is strong enough to cope with the impacts of modern industrial nations	.315	.219	.636
9	Despite our special abilities, humans are still subject to the laws of nature	.340	.270	.633
10	The so-called "environmental crisis" facing humankind has been greatly exaggerated	.269	.202	.644
11	The Earth has only limited room and resources for humans to use	.097	.086	.669
12	Humans were meant to rule over the rest of nature	.244	.101	.647
13	The balance of nature is very delicate and easily upset	.282	.151	.641
14	Humans will eventually learn enough about how nature works to be able to control it	.297	.136	.639
15	If things continue on their present course, we will soon experience a major ecological catastrophe	.348	.236	.632

However, some items, such as "Human ingenuity (cleverness, creativity) will ensure that we do not make the Earth unlivable" (Item 4, -0.018), exhibited low or negative corrected item-total correlations, indicating weaker alignment with the overall scale. Similarly, Item 11 ("The Earth has only limited room and resources for humans to use") showed a weaker positive correlation (0.097), indicating poor integration with the overall scale. The "alpha if item deleted" statistics reveal that removing either Item 4 or Item 11 would improve the scale's reliability, though the magnitude of reliability remains modest. This pattern of item performance is

consistent with previous research, which has noted that certain NEP items may be interpreted differently across cultural contexts, potentially affecting their reliability (Dunlap et al., 2000, Ogunbode, 2013). Overall, while the scale demonstrates reasonable internal consistency, the variability in item-total correlations suggests that some items may require further refinement or cultural adaptation to improve reliability in this setting.

To explore dimensionality and underlying structure of the NEP scale, a Principal Components Analysis (PCA) with Varimax rotation was conducted. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.741, and Bartlett's Test of Sphericity was significant (Chi-Square (χ^2) = 1123.25, df = 105, $p < .001$), indicating that the data were suitable for factor analysis (Table 4).

Factor retention was based on multiple criteria. The Kaiser criterion (eigenvalue > 1.0) indicated four factors, and visual inspection of the scree plot revealed a clear elbow after the fourth component, with subsequent eigenvalues leveling off (Figure 1).

Table 4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.741
Bartlett's Test of Sphericity	Approx. Chi-Square	1123.251
	df	105
	Sig.	.000

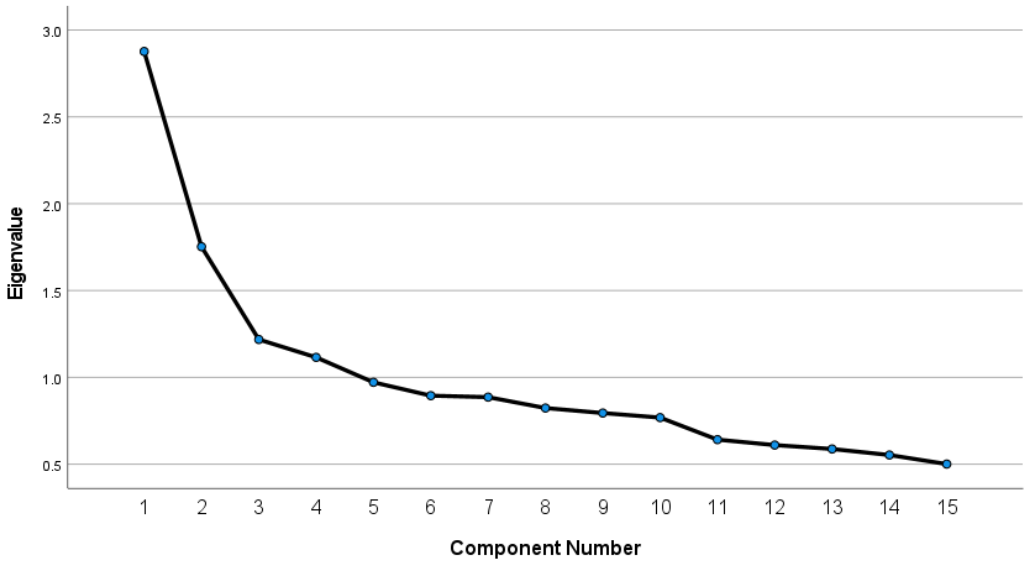


Figure 1. Scree plot

The total variance explained is presented in Table 5. The analysis revealed four components with eigenvalue greater than 1.0, collectively explaining 46.43% of the total variance. This percentage, while moderate, is

consistent with previous factor analytics studies of the NEP scale in cross-cultural contexts (Amburgey and Thoman, 2012)

Component 1 accounted for 19.18% of the variance initially, with 14.01% after rotation. Component 2 explained 11.69% of the variance initially (13.75% after rotation), component 3 accounted for 8.12% of the variance initially (10.81% after rotation), while component 4 explained 7.44% initially (7.86% after rotation). The rotation method successfully redistributed the variance more evenly across the four components, with the rotated solution providing a more interpretable factor structure.

The four component solution diverges from the theoretical five-factor structure proposed by Dunlap et al. (2000) and explains a lower proportion of variance than typically reported in western samples, where explained variance often exceeds 50% (Hawcroft and Milfont, 2010). This pattern suggests that the NEP scale may function differently in the Ethiopian context, with either a simpler underlying structure or additional cultural factors influencing responses.

Table 5. Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.877	19.180	19.180	2.877	19.180	19.180	2.101	14.005	14.005
2	1.753	11.685	30.865	1.753	11.685	30.865	2.062	13.750	27.755
3	1.219	8.124	38.989	1.219	8.124	38.989	1.621	10.807	38.562
4	1.116	7.437	46.426	1.116	7.437	46.426	1.180	7.864	46.426
5	.972	6.479	52.905						
6	.895	5.967	58.872						
7	.887	5.910	64.783						
8	.824	5.492	70.275						
9	.795	5.300	75.574						
10	.769	5.125	80.700						
11	.642	4.279	84.979						
12	.611	4.070	89.049						
13	.588	3.920	92.970						
14	.553	3.689	96.659						
15	.501	3.341	100.000						

Extraction Method: Principal Component Analysis

The factor loading matrix (Table 6) presents how each of the revised 15 NEP items aligns with the four extracted components (factors) from the Principal Components Analysis (PCA) after varimax rotation. Loadings represent the correlation between each NEP item and the extracted underlying factor; a loading ≥ .30 indicates that an item contributes meaningfully to that factor. Loadings above this threshold are presented in bold for clarity.

Table 6. Factor loadings in the Principal Components Analysis (PCA) of the revised NEP Items with Varimax Rotation

		Factors			
		1	2	3	4
NEP 6	(Limits)	**.704**	.080	.072	-.106
NEP 5	(Eco-Crisis)	**.626**	-.013	-.003	.071
NEP 3	(Balance)	**.611**	-.021	.294	-.010
NEP 7	(Anti-Anthro)	**.606**	.237	.097	.058
NEP 9	(Anti-Exempt)	.020	**.756**	.056	.002
NEP 15	(Eco-Crisis)	.291	**.707**	-.175	.036
NEP 2	(Anti-Anthro)	.038	**.602**	.206	-.010
NEP 10	(Eco-Crisis)	-.068	**.564**	.222	-.214
NEP 1	(Limits)	.083	.122	**.694**	-.022
NEP 8	(Balance)	-.204	**.342**	**.663**	.140
NEP 14	(Anti-Exempt)	**.318**	-.011	**.489**	.028
NEP 12	(Anti-Anthro)	.239	.015	**.434**	-.088
NEP 4	(Anti-Exempt)	-.062	.075	-.007	**.826**
NEP 11	(Limits)	**.326**	-.132	.113	**.502**
NEP 13	(Balance)	.254	**.303**	.182	**-.386**

Note: Loadings of .30 and above are in bold

The loading pattern revealed several groupings that diverged from the theoretical framework. The rotated component matrix revealed that four items loaded highly on the first factor. It combined items from four theoretical dimensions: limit to growth (NEP 6, .704), eco-crisis (NEP 5, .626), balance of nature (NEP 3, .611), and anti-anthropocentrism (NEP 7, .606). This convergence suggests that for Ethiopian students, these distinct theoretical constructs may represent a unified dimension of general environmental concern rather than separate cognitive domains. Factor 2 was defined by items reflecting anti-exemptionalism and eco-crisis (NEP 9, 15, 2, 10). Factor 3 captured items related to limits to growth (NEP 1, .694), balance of nature (NEP 8, .663), anti-anthropocentrism (NEP 14, .489; NEP 12, .434). Factor 4 is primarily associated with human exemptionalism and limits to growth (NEP 4, 11, 13)

Multiple items exhibited significant cross-loading, revealing overlap between factors in this cultural context. NEP 8 ("The balance of nature is strong enough to cope with the impacts of modern industrial nations") showed meaningful loading on Factor 2 (.342), and Factor 3 (.663), indicating that beliefs about nature's resilience are associated with both crisis awareness and limits to growth perspectives. Similarly, NEP 13, and NEP 11 loaded on more than one factor. NEP 13 ("The balance of nature is very delicate and easily upset") demonstrated the most complex loading pattern, with moderate association with Factor 2 (.303) and a negative loading on factor 4 (-.386).

Overall, the factor-loading pattern supports the multidimensional nature of the NEP scale but also highlights the importance of cultural context in shaping the structure of environmental attitudes. These findings are consistent with previous research in non-Western settings, which often report variation in factor structure and item loadings (Dunlap et al., 2000, Erdoğan, 2009, Ogunbode, 2013, dos Reis Neto et al., 2021).

4. Discussion

The study examined the endorsement and dimensionality of the New Ecological Paradigm (NEP) within an Ethiopian university context, revealing both the instrument's cross-cultural applicability and its contextual limitations, thereby contributing to the growing body of research on environmental worldview in developing

countries. The findings reveal both consistencies and divergences with international literature, offering important implications for environmental education, policy, and cross-cultural measurement.

The results indicate a moderate endorsement of pro-ecological beliefs among Ethiopian students, evidenced by a mean NEP score of 3.65 (SD = 0.446). The endorsement of a pro-ecological worldview is largely driven by consensus on the scale's more immediate, tangible facets, with particularly strong agreement on item regarding fragility of nature, the rights of non-human species, and the reality of environmental abuse. Specifically, items related to the possibility of an eco-crisis (NEP 5: "Humans are seriously abusing the environment"), and limits to growth (strong rejection of NEP 6: "The Earth has plenty of natural resources if we just learn how to develop them") received overwhelming support. These findings align with studies in other Global South contexts, where environmental concerns often stem from direct livelihood dependencies and observable ecological changes rather than abstract post-materialist values(Ogunbode, 2013, Clayton and Karazsia, 2020). The high agreement rates for items addressing environmental abuse (86.9%), disastrous consequences of human interference (79.3%), and rights of non-human species (79.5%) suggest that Ethiopian students conceptualize environmental issues through an ethical and communal lens, consistent with collectivist cultural orientations prevalent in many African societies (Shumba, 2011, Stern et al., 1999, Tam and Chan, 2017).

However, the results also reveal nuanced perspectives. While there was strong agreement with some pro-ecological statements, responses to responses to items about limits to growth and human exemptionalism were more mixed, A significant proportion of students expressed skepticism about the earth's carrying capacity and the sufficiency of natural resources, reflecting the complex interplay between environmental awareness and socio-economic realities, that is, mixed views emerged regarding the fundamental human-nature relationship. Despite acknowledging the limits, a substantial number also endorsed the anthropocentric statement NEP 8 ("The balance of nature is strong enough to cope with the impacts of modern industrial nations"). This tension between perceived ecological-crisis awareness and pragmatic resource utilization is evident in developing economies where the immediate need for economic growth, infrastructure, human welfare often moderate purely eco-centric values (Dunlap and York, 2008, Franzen and Vogl, 2013, Tam and Chan, 2017, Dunlap, 2008, Martinez-Alier, 2014, Gifford and Nilsson, 2014, Pisano and Lubell, 2017). This pattern is echoed in studies from Africa and Latin America, where economic development concerns and cultural factors shape environmental attitudes among university students (Ogunbode, 2013, Evert et al., 2021, dos Reis Neto et al., 2021, Corral-Verdugo and Armendariz, 2000).

The revised NEP scale demonstrated moderate internal consistency (Cronbach's alpha = 0.659), which, while slightly below the conventional threshold, is comparable to other cross-cultural studies. Similar reliability coefficients have been documented in Nigeria (α = 0.61; Ogunbode, 2013) and rural China (α = 0.65; Wu, 2012), with an even lower value (α = 0.53) reported in a Turkish sample (Erdoğan, 2009). This finding, therefore, indicates that the NEP scale did not function as a single, coherent measure of environmental worldview.

Based on the factor loading matrix and the unique aggregation of items on certain factors, the research findings summarise the dimensionality of the NEP scale and its corresponding interpretation in Table 7.

Factor 1: General Ecological Concerns: This factor explains 14.01% of the variance and emerged as the strongest dimension, characterized by substantial loadings from items representing multiple theoretical constructs, encompassing three pro-NEP and one anti-NEP items. The convergence of items from limits to growth, eco-crisis, balance of nature, and anti-anthropocentrism suggests that these distinct theoretical constructs form a unified dimension of general ecological concern and environmental awareness in this cultural context.

Factor 2: Rejection of Human Supremacy/Exemptionalism: This factor is anchored by items that directly challenge the core tenets of the Dominant Social Paradigm (DSP) – belief in humans' right to dominate the

natural environment, and philosophical rejection of human exemptionalism. This indicates that Ethiopian student's recognition of human vulnerability to natural laws and concern about impending ecological disasters, thus forming a coherent worldview dimension that captures beliefs about human limitations and the reality of eventual ecological catastrophes.

Table 7. The four empirical dimensions based on the rotated factor loadings.

Factors	Items (with Facet and loadings)	Dimensions Interpretation	% of Variance Explained
FACTOR 1	NEP 6 (Limits): (.704) - Anti-NEP NEP 5 (Eco-Crisis): (.626) - Pro-NEP NEP 3 (Balance): (.611) - Pro-NEP NEP 7 (Anti-Anthro): (.606) - Pro-NEP	General Ecological Concerns	14.005%
FACTOR 2	NEP 9 (Anti-Exempt): (.756) - Pro-NEP NEP 15 (Eco-Crisis): (.707) - Pro-NEP NEP 2 (Anti-Anthro): (.602) - Anti-NEP NEP 10 (Eco-Crisis): (.564) - Anti-NEP	Rejection of Human Supremacy/ Exemptionalism	13.750%
FACTOR 3	NEP 1 (Limits): (.694) - Pro-NEP NEP 8 (Balance): (.663) - Anti-NEP NEP 14 (Anti-Exempt): (.489) - Anti-NEP NEP 12 (Anti-Anthro): (.434) - Anti-NEP	Belief in Limits to Growth and Human-Nature Interdependence	10.807%
FACTOR 4	NEP 4 (Anti-Exempt): (.826) - Anti-NEP NEP 11 (Limits): (.502) - Pro-NEP NEP 13 (Balance): (-.386) - Pro-NEP	Technological Optimism vs. Ecological Skepticism	7.864%

Factor 3: Belief in Limits to Growth and Human-Nature Interdependence: This third factor represents a dimension focused on natural constraints and human-nature interdependence. It is defined by the pro-NEP statement on limits to growth (NEP 1 "We are approaching the limit of the number of people the Earth can support"), and a cluster of reverse-scored anti-NEP items (NEP 8, 14, 12). This grouping shows that for this sample, the belief that there are limits to human expansion is conceptually opposed to the view that human power is strong enough to manage all environmental consequences, suggesting a skepticism toward human ability to overcome natural limits.

Factor 4: Technological Optimism vs. Ecological Skepticism: The final factor is defined by two primary loadings representing contrasting views on human capabilities and ecological constraints. NEP 4 ("Human ingenuity (cleverness, creativity) will ensure that we do not make the Earth unlivable") loaded strongly at .826, while NEP 11 ("The Earth has only limited room and resources for humans to use") loaded at .502. This factor appears to capture a specific tension between faith in technological solutions and recognition of planetary boundaries. This technological optimism functions as an independent, potentially skeptical dimension that can diminish the imperative for deep political or behavioral change (Keary, 2016), and capture the belief that technological fixes can negate ecological constraints (Barry, 2016).

The reorganization of items across these four factors reveals important cultural variation in how environmental concepts are structured cognitively. The emergence of a strong general ecological concern

factor (factor 1) suggests that for Ethiopian university students, concern about resource limits, environmental abuse, nature's fragility, and plants and animals right may form a more unified construct than the discrete dimensions theorized in Western population. This finding aligns with research suggesting that environmental worldview structures may vary significantly across cultural contexts (Amburgey and Thoman, 2012, Amérigo et al., 2007).

The distinct anti-exemptionalism and limits-to-growth awareness factors (Factors 2 and 3) identified in this paper resonate with research emphasizing the human-nature relationship conceptualizations in non-Western environmental thought, and the findings support the argument that environmental worldview structures may reflect fundamental cultural differences in ontological assumptions about humanity's place in nature (Schultz et al., 2004, Kellert, 2012, Palmer et al., 2014).

5. Conclusion

This study provides a nuanced portrait of the environmental worldviews held by university students in Addis Ababa, Ethiopia, which reveal a population that is aware of the ecological limits and environmental crises, reflecting the direct experience of environmental challenges in the region. However, the pro-ecological orientation coexists with persistent anthropocentric and techno-optimistic beliefs, indicating that students' worldview is not simply a mirror of Western post-materialist environmentalism, but rather a hybrid shaped by local realities and development needs.

The factor analysis conducted in this study rejects the notion of the NEP scale as a unidimensional measure in the Ethiopian context. Instead, a four-factor structure emerged, with some distinct cognitive dimensions. The finding echoes research from other developing nations, where faith in human ingenuity and technological solutions often moderates ecological concerns and can act as a psychological barrier to strong climate action (Keary, 2016, Barry, 2016, Hornsey et al., 2016). The coexistence of ecological crisis awareness and techno-optimism underscores the importance of recognizing the multidimensionality of environmental worldview in policy and education.

Methodologically, the study demonstrates that relying on a single, aggregate NEP score risks obscuring critical tensions within respondents' beliefs. The multidimensional approach provides a more accurate and actionable map of the cognitive landscape, allowing researchers and practitioners to target interventions more effectively.

In conclusion, the environmentalism of Ethiopian university students is best understood as "*environmentalism of livelihood*" where ecological concern is deeply intertwined with human development and survival needs (Agrawal, 2020, Guha and Alier, 2013, Bauer, 2015, Martinez-Alier, 2014, Schelhas and Pfeffer, 2009). Unlike the post-materialist ecocentrism often found in the Global North, this perspective centers environmental concerns not on abstract ideals, but on the immediate necessity of protecting natural resources as essential capital for subsistence, economic stability, and poverty alleviation (Agrawal, 2020, Schelhas and Pfeffer, 2009). This orientation centers environmental issues on the pragmatic need for natural resources, such as water, fertile land, and forests as fundamental capital for survival and poverty alleviation, a perspective deeply rooted in the political ecology of resource control, and utilization (Agrawal, 2020, Guha and Alier, 2013, Bauer, 2015, Martinez-Alier, 2014, Schelhas and Pfeffer, 2009). This coexistence of strong ecological concern with anthropocentric and techno-optimistic beliefs is interpreted here as suggestive of a livelihood-oriented environmental worldview and is presented as a theoretically informed hypothesis rather than an empirical finding. Consistent with prior scholarly works emphasizing the close links between environmental concern, development needs, and resource dependence in the Global South, future research should incorporate direct indicators of livelihood dependency and perceived environmental concerns to empirically evaluate this interpretation.

Finally, the NEP scale can be used as a powerful diagnostic tool to assess environmental orientation when its multidimensional nature is embraced. This study highlights the need for culturally sensitive measurement tools and interventions that reflect the complex realities of developing societies.

References

Agrawal, A. (2020), *Environmentality: technologies of government and the making of subjects,* Duke University Press, https://doi.org/10.1515/9780822386421.

Albrecht, D., Bultena, G., Hoiberg, E. and Nowak, P. (1982), "Measuring environmental concern: The new environmental paradigm scale", *The Journal of Environmental Education,* Vol. 13 No. 3, pp. 39-43, https://doi.org/10.1080/00958964.1982.9942647.

Amburgey, J.W. and Thoman, D.B. (2012), "Dimensionality of the new ecological paradigm: Issues of factor structure and measurement", *Environment and Behavior,* Vol. 44 No. 2, pp. 235-256, https://doi.org/10.1177/0013916511402064.

Amérigo, M., Aragonés, J.I., de Frutos, B., Sevillano, V. and Cortés, B. (2007), "Underlying dimensions of ecocentric and anthropocentric environmental beliefs", *The Spanish Journal of Psychology,* Vol. 10 No. 1, pp. 97-103, https://doi.org/10.1017/S1138741600006351.

Barry, J. (2016), "Bio-fuelling the Hummer? Transdisciplinary thoughts on techno-optimism and innovation in the transition from unsustainability", in Byrne, E., Mullally, G. and Sage, C. (Eds.), *Transdisciplinary Perspectives on Transitions to Sustainability*, Routledge, Abingdon, pp. 106-123, https://doi.org/10.4324/9781315550206-6.

Bauer, J.R. (2015), *Forging environmentalism: justice, livelihood, and contested environments,* Routledge, https://doi.org/10.4324/9781315704258.

Berze, I.Z., Varga, A., Mónus, F., Néder, K. and Dúll, A. (2022), "Measuring environmental worldviews: investigating the dimensionality of the new environmental paradigm Scale for children in a large central European sample", *Sustainability,* Vol. 14 No. 8, p. 4595, https://doi.org/10.3390/su14084595.

Carson, R. (1962), *Silent spring,* Houghton Mifflin.

Clayton, S. and Karazsia, B.T. (2020), "Development and validation of a measure of climate change anxiety", *Journal of Environmental Psychology,* Vol. 69, p. 101434, https://doi.org/10.1016/j.jenvp.2020.101434.

Corral-Verdugo, V. and Armendariz, L.I. (2000), "The "new environmental paradigm" in a Mexican community", *The Journal of Environmental Education,* Vol. 31 No. 3, pp. 25-31, https://doi.org/10.1080/00958960009598642.

Dalelo, A. (2015), "Ecological value orientations of prospective secondary school teachers in Addis Ababa University, Ethiopia", *African Journal of Environmental Science and Technology,* Vol. 9 No. 1, pp. 16-28, https://doi.org/10.5897/AJEST2014.1804.

dos Reis Neto, J.F., de Souza, C.C., Bitencourt, T.D.A., Cupertino, C.M., de Melo Neto, P.L., Soares, D. G. and de Oliveira Rodrigues, I. (2021), "Validating the scale of the new ecological paradigm (NEP) in Brazilian university students", *Research, Society and Development,* Vol. 10 No. 4, pp. e16410413947-e16410413947, https://doi.org/10.33448/rsd-v10i4.13947.

Dunlap, R.E. (2008), "The new environmental paradigm scale: From marginality to worldwide use", *The Journal of Environmental Education,* Vol. 40 No. 1, pp. 3-18, https://doi.org/10.3200/JOEE.40.1.3-18.

Dunlap, R.E. and Catton, W.R. (1979), "Environmental sociology", *Annual Review of Sociology,* Vol. 5, pp. 243-273, https://doi.org/10.1146/annurev.so.05.080179.001331.

Dunlap, R.E. and Van Liere, K.D. (1978), "The “new environmental paradigm”", *The Journal of Environmental Education,* Vol. 9 No. 4, pp. 10-19, https://doi.org/10.1080/00958964.1978.10801875.

Dunlap, R.E., Van Liere, K.D., Mertig, A.G. and Jones, R.E. (2000), “Measuring endorsement of the New Ecological Paradigm: A revised NEP scale”, *Journal of Social Issues*, Vol. 56 No. 3, pp. 425-442, https://doi.org/10.1111/0022-4537.00176.

Dunlap, R.E. and York, R. (2008), "The globalization of environmental concern and the limits of the postmaterialist values explanation: Evidence from four multinational surveys", *The Sociological Quarterly,* Vol. 49 No. 3, pp. 529-563, https://doi.org/10.1111/j.1533-8525.2008.00127.x.

Erdoğan, N. (2009), "Testing the new ecological paradigm scale: Turkish case", *African Journal of Agricultural Research,* Vol. 4 No. 10, pp. 1023-1031.

Evert, M., Coetzee, H. and Nell, W. (2021), "Environmental attitudes among undergraduate students at a South African university", *Interdisciplinary Journal of Environmental and Science Education,* Vol. 18 No. 1, p. e2260, https://doi.org/10.21601/ijese/11330.

Franzen, A. and Vogl, D. (2013), "Two decades of measuring environmental attitudes: A comparative analysis of 33 countries", *Global Environmental Change,* Vol. 23 No. 5, pp. 1001-1008, https://doi.org/10.1016/j.gloenvcha.2013.03.009.

Gifford, R. and Nilsson, A. (2014), "Personal and social factors that influence pro-environmental concern and behaviour: A review", *International Journal of Psychology,* Vol. 49 No. 3, pp. 141-157, https://doi.org/10.1002/ijop.12034.

Guha, R. and Alier, J.M. (2013), *Varieties of environmentalism: essays North and South,* Routledge, https://doi.org/10.4324/9781315070766.

Hawcroft, L.J. and Milfont, T.L. (2010), "The use (and abuse) of the new environmental paradigm scale over the last 30 years: A meta-analysis", *Journal of Environmental Psychology,* Vol. 30 No. 2, pp. 143-158, https://doi.org/10.1016/j.jenvp.2009.10.003.

Hornsey, M.J., Harris, E.A., Bain, P.G. and Fielding, K.S. (2016), "Meta-analyses of the determinants and outcomes of belief in climate change", *Nature Climate Change,* Vol. 6 No. 6, pp. 622-626, https://doi.org/10.1038/nclimate2943.

Keary, M. (2016), "The new Prometheans: Technological optimism in climate change mitigation modelling", *Environmental Values,* Vol. 25 No. 1, pp. 7-28, https://doi.org/10.3197/096327115X14497392134801.

Kellert, S.R. (2012), *Birthright: People and nature in the modern world,* Yale University Press, https://doi.org/10.2307/j.ctt32bq08.

Martinez-Alier, J. (2014), "The environmentalism of the poor", *Geoforum,* Vol. 54, pp. 239-241, https://doi.org/10.1016/j.geoforum.2013.04.019.

Ogunbode, C.A. (2013), "The NEP scale: measuring ecological attitudes/worldviews in an African context", *Environment, Development and Sustainability,* Vol. 15 No. 6, pp. 1477-1494, https://doi.org/10.1007/s10668-013-9446-0.

Palmer, C., McShane, K. and Sandler, R. (2014), "Environmental ethics", *Annual Review of Environment and Resources,* Vol. 39, pp. 419-442, https://doi.org/10.1146/annurev-environ-121112-094434.

Pirages, D.C. and Ehrlich, P.R. (1974), *Ark II: Social response to environmental imperatives,* San Francisco: W. H. Freeman.

Pisano, I. and Lubell, M. (2017), "Environmental behavior in cross-national perspective: A multilevel analysis of 30 countries", *Environment and Behavior,* Vol. 49 No. 1, pp. 31-58, https://doi.org/10.1177/0013916515600494.

Schelhas, J. and Pfeffer, M.J. (2009), "When global environmentalism meets local livelihoods: policy and management lessons", *Conservation Letters,* Vol. 2 No. 6, pp. 278-285, https://doi.org/10.1111/j.1755-263X.2009.00079.x.

Schultz, P.W., Shriver, C., Tabanico, J.J. and Khazian, A.M. (2004), "Implicit connections with nature", *Journal of Environmental Psychology,* Vol. 24 No. 1, pp. 31-42, https://doi.org/10.1016/S0272-4944(03)00022-7.

Shumba, O. (2011), "Commons thinking, ecological intelligence and the ethical and moral framework of Ubuntu: An imperative for sustainable development", *Journal of Media and Communication Studies,* Vol. 3 No. 3, pp. 84-96.

Stern, P.C., Dietz, T., Abel, T., Guagnano, G.A. and Kalof, L. (1999), "A value-belief-norm theory of support for social movements: The case of environmentalism", *Human Ecology Review*, Vol. 6 No. 2, pp. 81-97.

Tam, K.P. and Chan, H.W. (2017), "Environmental concern has a weaker association with pro-environmental behavior in some societies than others: A cross-cultural psychology perspective", *Journal of Environmental Psychology,* Vol. 53, pp. 213-223, https://doi.org/10.1016/j.jenvp.2017.09.001.

Van Petegem, P. and Blieck, A. (2006), "The environmental worldview of children: a cross-cultural perspective", *Environmental Education Research,* Vol. 12 No. 5, pp. 625-635, https://doi.org/10.1080/13504620601053662.

Vikan, A., Camino, C., Biaggio, A. and Nordvik, H. (2007), "Endorsement of the New Ecological Paradigm. A Comparison of Two Brazilian Samples and One Norwegian Sample", *Environment and Behavior,* Vol. 39 No. 2, pp. 217-228, https://doi.org/10.1177/0013916506286946.

Wu, L. (2012), "Exploring the new ecological paradigm scale for gauging children's environmental attitudes in China", *The Journal of Environmental Education,* Vol. 43 No. 2, pp. 107-120, https://doi.org/10.1080/00958964.2011.616554.