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Review article

Hogg Eco-Anxiety Scale (HEAS-13): Adaptation and Validation of the Ecological Anxiety Scale for Indonesia

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Nabila Cahyaningrum[1], Siti Jaro'ah[2], Rizky Putra Santosa[3]

[1,2,3] Faculty of Psychology, Universitas Negeri Surabaya

[*)] Correspondence: sitijaroah@unesa.ac.id

Abstract

This research centres on the adaptation and evaluation of the Hogg Eco-Anxiety Scale (HEAS-13) for the Indonesian cultural context, and on its concurrent validity with the Climate Change Anxiety Scale (CCAS). The adaptation followed the guidelines set by the International Test Commission, which included forward translation, expert assessments from six individuals, and cognitive interviews with five participants to ensure clarity of language, conceptual equivalence, and cultural relevance. The study involved a voluntary online survey with 847 participants from Indonesia aged 17-65 years. Descriptive analysis indicated that the item distribution met acceptable normality standards. An exploratory factor analysis (EFA) identified four primary factors—Affective Symptoms, Rumination, Behavioral Symptoms, and Anxiety about Personal Impact—which accounted for 58.3% of the total variance (Kaiser-Meyer-Olkin = .906; $p < .001$). Confirmatory factor analysis (CFA) demonstrated a well-fitting model (CFI = .982; TLI = .977; RMSEA = .042; SRMR = .028). The scale exhibited high internal consistency based on reliability coefficients (Cronbach's α = .89; McDonald's ω = .89). Additionally, testing for concurrent validity showed a significant positive correlation between HEAS and CCAS (Spearman's rho = .610; $p < .001$), indicating a strong conceptual link between the two scales. In summary, the Indonesian version of the Hogg Eco-Anxiety Scale is valid, reliable, and culturally appropriate for assessing ecological anxiety in the Indonesian population.

Keywords: Eco-anxiety; validity; reliability; instrument adaptation; environmental psychology

1. Introduction

The climate crisis has emerged as a global problem that significantly affects many facets of life (Arohmawati & Sujarwo, 2024; Maslin et al., 2025; Rahmawati & Hamid, 2025), not just on the physical surroundings but also on the societal and psychological circumstances of the community (Ainurrohmah & Sudarti, 2022; Ernyasih et al., 2023). Indonesia's archipelagic structure makes it highly vulnerable to the impacts of climate change (Florissa et al., 2022; Hotmatondini et al., 2025; Vinata et al., 2023), including floods, droughts, and landslides, as well as forest and land fires (Ansar et al., 2024; Rahmawati, 2025). According to data from the Badan Nasional Penanggulangan Bencana (BNPB, 2024), Indonesia experienced 3,472 disasters in 2024. The majority of these were hydrometeorological events associated with climate change (Hanifa & Wiratmo, 2024). Although the number of disasters decreased compared to 2023, which saw 5,400 incidents (BNPB, 2023), this does not indicate a reduction in disaster risk. The decrease was likely influenced by the La Niña phenomenon, the Asian monsoon season, and tropical cyclones (Ardian, 2025).

Damage to infrastructure is just one of the direct impacts of natural disasters triggered by climate change (Ebi et al., 2022) and loss of shelter (B. W. Wang et al., 2025), but also indirect impacts that affect the social and psychological conditions of the community (Ebi et al., 2022; Lawrance et al., 2022). Throughout 2024, more than 8.1 million Indonesians were directly affected by various natural disasters, with 540 people killed and approximately 80,304 homes damaged, ranging from minor to severe damage (BNPB, 2024). This situation not only caused material losses and economic disruptions but also led to emotional distress, feelings of insecurity, and concerns about environmental sustainability. These psychological impacts then give rise to a new form of anxiety about the condition of the earth and the future of the environment (Ágoston et al., 2022), known as eco-anxiety (Laily Mucharomah & Luqman, 2025).

Eco anxiety is anxiety triggered by arises in response to the worsening environmental crisis and climate change (Hickman, 2020; Hogg et al., 2021). This condition can trigger deep concerns about the future of the earth (Pihkala, 2020) and the current state of the planet (BBC, 2021). Eco

anxiety can lead to sleep disorders (Boluda-Verdú et al., 2022; Cianconi et al., 2020; Jain & Jain, 2022), excessive worry (Sciberras & Fernando, 2022; Verplanken et al., 2020), and has the potential to cause PTSD (Patrick et al., 2023), depression and anxiety (Schwartz et al., 2023), and fear of the future (Mento et al., 2023). In addition, eco anxiety is often accompanied by physiological symptoms, including tremors, cold sweats, fatigue, and irregular breathing. (Mento et al., 2023). In the long term, these conditions can impact physical health, causing dehydration, heatstroke, respiratory illness, and chronic kidney injury, and in extreme cases, even death (Ofremu et al., 2025).

Seeing the psychological impact caused by environmental problems and increasing global awareness of environmental issues (Calculli et al., 2021; Franzen & Bahr, 2024), various instruments have been developed to measure the level of anxiety about environmental change, such as the Climate Change Anxiety Scale (CCAS) by Clayton and Karazsia (Clayton & Karazsia, 2020), which emphasizes the emotional and functional symptoms caused by climate change, the Climate Change Distress Scale (Weiss et al., 2024), which measures the emotional distress caused by exposure to information and experiences of climate change, the Climate Change Worry Scale (Stewart, 2021), which focuses on concerns about future consequences, the Environmental Distress Scale (Higginbotham et al., 2006), which assesses environmental stress arising from ecosystem degradation and changes in the residential landscape, and the Hogg Eco Anxiety Scale (HEAS) (Hogg et al., 2021). In this study, HEAS was selected for use and adaptation. The selection of the Hogg Eco Anxiety Scale (HEAS) in this study was based on the consideration that this instrument was designed to explore various forms of anxiety about environmental issues, rather than focusing on a single aspect, such as climate change. HEAS covers various environmental issues, such as ecosystem degradation, pollution, and biodiversity loss, thereby providing a broader picture of the experience of eco-anxiety. This situation is particularly relevant in the context of Indonesian society, which faces various environmental challenges and is increasingly concerned about them.

Several previous studies have adapted and tested the validity and reliability of the Hogg Eco-Anxiety Scale (HEAS) in various countries. In Europe, adaptation to the Spanish-Argentinian population showed a four-dimensional model with good fit ($\Delta\chi^2 = 2275.30$, $p < .001$; RMSEA = .054; SRMR = .042; CFI = .953; TLI = .947) and high reliability ($\alpha = .82–.91$; total = .89) (Quiroga et al., 2024). Similar results were also found in adaptations in Italy (Rocchi et al., 2023), Portugal (Sampaio et al., 2023), France (Mathé et al., 2023), and Germany, showing consistency in the four-factor structure with adequate model fit values (CFI = .95; TLI = .94; RMSEA = .05; SRMR = .04) and strong internal reliability ($\alpha = .80–.90$) (Henschel et al., 2025). In Asia, the validation of HEAS in China showed a four-factor structure with good model fit ($\chi^2/df = 2.20$; RMSEA = .06; CFI = .95; TLI = .94; SRMR = .04) and high reliability ($\alpha = .97$) (D. Wang et al., 2025). In Pakistan, the Urdu version showed good construct validity ($\chi^2 = 95.167$; df = 59; RMSEA = .038; GFI = .962; CFI = .969), with internal reliability ($\alpha = .87$) and strong temporal stability ($r = .936$; $p < .001$) (Nayab et al., 2025). Research in the Middle East, such as in Libya (Ali et al., 2024) and Turkey, also supports the four-factor structure with good model fit ($\chi^2/df = 2.17$; RMSEA = .06; CFI = .95; TLI = .94; SRMR = .05) and high reliability ($\alpha = .89$) (Uzun et al., 2022).

In Indonesia, the adaptation of measurement instruments for environmental anxiety remains very limited. One that has been adapted is the CCAS version by Jaro'ah and Saffana (J2023). However, this instrument covers only specific aspects of climate change and does not address broader environmental issues such as deforestation, pollution, and ecosystem degradation. This limitation creates a scientific need for a more comprehensive, context-sensitive measurement tool appropriate to Indonesia's social and ecological conditions. Signs of environmental damage in Indonesia are becoming increasingly (Aeni & Khoirul Anwar, 2024; Azizah et al., 2022) apparent: hydrometeorological disasters such as floods, droughts, and forest fires are occurring more frequently and with greater severity, while air quality continues to decline, and coastal ecosystems and tropical forests are experiencing degradation (Hendrawan et al., 2025). It is increasingly relevant, given that the Ipsos Global survey (2024) found that 80% of Indonesians have a high level of awareness of climate change issues. This condition can increase vulnerability to eco-anxiety (Ipsos Global, 2024). However, to date, there has been no adaptation or validation of the HEAS in the Indonesian cultural context. The absence of valid and reliable measurement tools hinders the development of environmental psychology research and the formulation of mental health interventions and policies responsive to ecological issues. Therefore, this study aims to translate the Hogg Eco-Anxiety Scale (HEAS) and test its validity and reliability in the Indonesian population. This study is expected to produce an eco-anxiety measurement instrument appropriate for the Indonesian context, support the development of environmental psychology, and provide an empirical basis for formulating mental health policies and intervention programs oriented towards environmental sustainability in Indonesia.

2. Research Methods

This study used a non-experimental, quantitative approach to adapt the Hogg Eco Anxiety Scale (HEAS-13) into Indonesian and to evaluate its psychometric properties, including validity and reliability. A quantitative method was chosen because it enables objective measurement of psychological traits and the use of statistical techniques to assess the quality of the measurement tools. The research involved adapting the instrument, collecting data online, and conducting psychometric analyses to examine construct validity, reliability, and convergent validity.

The study involved 847 Indonesian citizens, with an average age of 20.3 years. Among them, 72.5% identified as female, 23.5% as male, and 4% did not disclose their gender. Eligible participants were Indonesian citizens aged 17 to 65 who could understand and respond to the questionnaire. Participants were recruited through accidental sampling: individuals who met the criteria voluntarily took part after accessing the online survey. This method was selected to address accessibility issues in online data collection and because of the exploratory nature of this psychometric validation study.

This study employed the Indonesian version of the Hogg Eco-Anxiety Scale (HEAS-13), which assesses anxiety related to global environmental issues and climate change. The scale features 13 items covering four key dimensions: affective symptoms, ruminations, behavioral symptoms, and anxiety about personal impact. Participants respond to each item on a four-point Likert scale: 0 = not at all, 1 = a few days, 2 = more than half the week, and 3 = nearly every day. Sample items include: “Merasa gugup, cemas, atau gelisah” (Affective Symptoms), “Tidak mampu berhenti memikirkan peristiwa di masa lalu yang berkaitan dengan perubahan iklim” (Ruminations), “Mengalami kesulitan dalam menikmati situasi sosial dengan keluarga dan teman-teman” (Behavioral Symptoms), and “Merasa cemas akan dampak dari perilaku personal saya terhadap Bumi” (Anxiety about Personal Impact).

The HEAS-13 adaptation adhered to the International Test Commission (ITC) guidelines to ensure semantic, cultural, and psychometric equivalence (International Test Commission, 2017). After obtaining the original author's formal permission, the process consisted of two main stages: language adaptation and psychometric assessment. The language adaptation began with forward translation by two independent bilingual translators, both with IELTS scores above 7. These translations were discussed in coordination meetings involving the translators and researchers to reach a consensus. Next, a panel of experts reviewed the original and translated versions to develop a pre-final version. Content validity was assessed by six specialists in psychology and environmental studies, focusing on clarity, relevance, and cultural appropriateness. Revisions were made based on their feedback, followed by a limited cognitive interview with five respondents to evaluate item clarity and understanding. Cognitive interviews were conducted to assess the clarity, relevance, and readability of the translated items, with a small sample (n=5) deemed sufficient, as they focus on detailed qualitative feedback rather than statistical representation (International Test Commission, 2017).

Following the language adaptation stage, psychometric evaluation was conducted using data collected through an online questionnaire distributed via Google Forms. Participants were recruited through social media platforms, academic communities, and public networks to ensure broad geographic representation across Indonesia. Prior to completing the questionnaire, all participants received an informed consent form outlining the study objectives, data confidentiality, and their right to withdraw at any time without penalty. The questionnaire consisted of demographic questions and the adapted HEAS-13 instrument.

Data analysis involved various statistical procedures to assess the psychometric quality of the Indonesian HEAS-13. Construct validity was assessed through an Exploratory Factor Analysis (EFA) to identify the underlying factor structure, followed by a Confirmatory Factor Analysis (CFA) to evaluate the model's fit to theoretical expectations. Both EFA and CFA were performed sequentially on the same dataset, with a sufficient sample size (N = 847). Model fit was assessed using common indices, including the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Internal consistency was assessed using Cronbach’s Alpha and McDonald’s omega; values of 0.70 or higher were deemed acceptable. Convergent validity was assessed using Spearman’s rank correlation to examine the relationship between HEAS-13 scores

and the Climate Change Anxiety Scale (CCAS). All analyses were run using Jamovi (version 2.7.6). CFA was conducted using the SEM module based on the lavaan package in R.

3. Results and Discussion

3.1. Results

Adaptation of the Eco Anxiety scale into Indonesian

During the initial stage, known as instrument adaptation, several suggestions were made to improve sentence clarity within the Indonesian context. For instance, in the second item, one expert proposed replacing *"tidak mampu menghentikan atau mengendalikan kekhawatiran"* with an alternative phrase *"sulit untuk berhenti atau mengendalikan rasa khawatir."* However, the original version was ultimately retained as it was deemed more concise and still clear. Additionally, for items describing repetitive thinking tendencies, such as items 5-7, experts recommended replacing *"tidak bisa berhenti memikirkan"* with *"terus-menerus memikirkan."* These expert-driven revisions produced the final versions of the items, which are shown in the Item Fix column of Table 1.

Table 1. Example of Initial translation results and results after expert judgment

No	Original item	Initial translation	Item after expert judgment
AS2	Not being able to stop or control worrying.	*Tidak mampu menghentikan atau mengendalikan kekhawatiran.*	*Tidak mampu menghentikan atau mengendalikan kekhawatiran.*
R5	Unable to stop thinking about future climate change and other global environmental problems.	*Tidak mampu berhenti memikirkan perubahan iklim di masa depan dan masalah lingkungan global lainnya.*	*Tidak bisa berhenti memikirkan perubahan iklim di masa depan dan masalah lingkungan global lainnya.*
R6	Unable to stop thinking about past events related to climate change.	*Tidak mampu berhenti memikirkan peristiwa di masa lalu yang berkaitan dengan perubahan iklim.*	*Tidak bisa berhenti memikirkan peristiwa di masa lalu yang berkaitan dengan perubahan iklim.*
BS9	Difficulty enjoying social situations with family and friends	*Mengalami kesulitan dalam menikmati situasi sosial dengan keluarga dan teman-teman.*	*Kesulitan menikmati momen bersama keluarga dan teman-teman.*
API11	Feeling anxious about the impact of your personal behaviours on the earth.	*Merasa cemas akan dampak dari perilaku personal saya terhadap Bumi.*	*Merasa cemas atas dampak perilaku saya terhadap Bumi.*
API12	Feeling anxious about your personal responsibility to help address environmental problems.	*Merasa cemas tentang tanggung jawab pribadi saya untuk membantu mengatasi masalah lingkungan.*	*Merasa cemas atas tanggung jawab saya untuk membantu mengatasi masalah lingkungan.*

As shown in Table 1, several editorial refinements were made to enhance clarity and linguistic suitability. The final version features minor semantic changes while preserving the original conceptual meaning. Subsequently, cognitive interviews were conducted with five respondents who shared characteristics with the research population to evaluate how well each item was understood and whether it was unambiguous. The results indicated that all items were clearly understood. Based on these stages, the final Eco-Anxiety Scale was confirmed to be linguistically, conceptually, and culturally appropriate for validity and reliability testing in the Indonesian context.

Data Exploration

The distribution of data was analyzed by examining the skewness and kurtosis values for each statement item. According to the proposed criteria, data are considered to exhibit a significant distributional deviation if the skewness falls outside the range of -1 to +1 (Hair et al., 2009). Moreover, in large samples (more than 300 respondents), the distribution is deemed abnormal if the absolute skewness exceeds 2 and the absolute kurtosis exceeds 7 (Kim, 2013). The descriptive analysis results show that skewness values for all items ranged from .296 to .793, while kurtosis values ranged from –1.00 to –.252. These values remain within acceptable limits (–1 to +1 for skewness and below 7 for kurtosis), indicating that each item's univariate distribution is close to normal.

Table 2. Descriptive Statistical Analysis.

Item	Mean	Skewness	Kurtosis
AS1	1.15	0.479	-.369
AS2	.928	0.705	-.269
AS3	.946	0.714	-.374
AS4	1.14	0.464	-.510
R1	.998	0.446	-.492
R2	.817	0.671	-.252
R3	1.10	0.344	-.513
BS1	1.11	0.519	-1.00
BS2	.891	0.793	-.461
BS3	1.03	0.528	-.615
API1	1.09	0.369	-.636
API2	1.14	0.338	-.589
API3	1.17	0.296	-.696

As shown in Table 2, all variables exhibit skewness and kurtosis within the recommended limits, indicating that the univariate distributions are approximately normal.

Exploratory factor analysis

Data suitability testing indicates the data is appropriate for factor analysis. The Kaiser-Meyer-Olkin (KMO) value of .906 falls into the excellent category (Kaiser & Rice, 1974), suggesting that the correlations among items are sufficient for factor analysis. Additionally, Bartlett's test of sphericity was significant, $\chi^2(78) = 4976$, $p < .001$, allowing us to reject the null hypothesis and confirm that the correlation matrix is not an identity matrix. This result demonstrates that the data meet the assumptions required for conducting an exploratory factor analysis.

Table 3. Results KMO & Bartlett's test of sphericity

KMO	Bartlett's test of sphericity		
.906	$\chi 2$	df	p
	4976	78	<.001

The analysis was conducted using the Maximum Likelihood method with Direct Oblimin rotation, which allows for factor correlations. These results confirm that the dataset meets the assumptions required for exploratory factor analysis. Based on the extraction results, four main factors were identified, accounting for 58.3% of the explained variance, indicating that these factors explain more than half of the total item variance. Specifically, the first factor explained 18.7%, the second 16.3%, the third 12.8%, and the fourth 10.5% of the total variance (see Table 4). The goodness-of-fit results suggest that the model fits well. The RMSEA value (.027; 90% confidence interval = 0.0126–.0404) and TLI (.990) indicate excellent model fit (RMSEA < 0.05 and TLI close to 1). Although the χ^2 test yielded $\chi^2(32) = 52.3$, $p = .013$, this is acceptable, given that large sample sizes often yield high statistical significance (see Table 5). The first factor includes items AS1–AS4, the second includes API1–API3, with the highest loading on API2 (.871). The third factor comprises items R1–R3, with the highest loading on R1 (.815), while the fourth includes items BS1–BS3, with the highest loading on BS2 (.740). The uniqueness values

for all items were below 0.6, indicating that most of the items' variance is explained by the identified factors (see Table 6).

Table 4. Total Variance Explained

Factor	% of Variance	Cumulative %
1	18.7%	58.3%
2	16.3%	
3	12.8%	
4	10.5%	

Table 5. Model Summary of EFA (Final 4-Factor Solution)

Model	Variance explained(%)	χ 2/df	NNFI	RMSEA (95% CI)
4-Factor Model	58.30	52.3 / 32 = 1.63	.990	**.027** (.013 – .040)

Table 6. Factor loading item

Item	Factor				Uniqueness
	1	2	3	4	
AS1	0.705				0.438
AS2	0.747				0.414
AS3	0.838				0.286
AS4	0.700				0.471
R1			0.815		0.351
R2			0.709		0.398
R3			0.527		0.469
BS1				0.555	0.596
BS2				0.740	0.486
BS3				0.614	0.489
API1		0.764			0.348
API2		0.871			0.279
API3		0.684			0.399

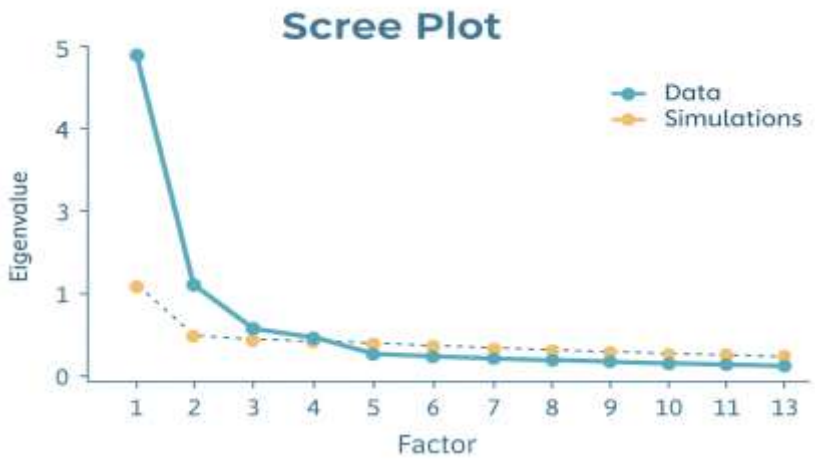

Figure 1. Number of Factor Determinations based on MRFA

Overall, the EFA results support a four-factor structure consistent with the theoretical dimensions of the original scale.

Confirmatory factor analysis

As shown in the CFA output (see Table 7), the exact-fit (global fit) test indicates that the initial model does not meet the fit criteria. The Chi-square value ($\chi^2 = 146$, df = 59, $p < .001$) indicates a significant difference, suggesting that the model does not fully align with the empirical data. A χ^2/df ratio below 2 typically signifies an excellent fit, while a ratio between 2 and 3 denotes a good fit. In this case, a χ^2/df of 2.47 is still considered a good fit. Although the model fails the exact-fit test, the fit indices indicate good local fit. The RMSEA of .042 with a 90% confidence interval (.033–.050) is within acceptable bounds (≤ 0.06), indicating a reasonable approximate fit. Moreover, the CFI = .982 and TLI = .977 exceed the recommended minimum of 0.90 (Hu & Bentler, 1999), demonstrating very good incremental fit. The SRMR of .0279 is also well below the 0.08 threshold, indicating a small difference between the model and data covariances.

Table 7. Summary of the Model Fit Parameters

Model	χ2/df	CFI	TLI	RMSEA (90% CI)	SRMR
4 Factor	146/59	.982	.977	.042 (.033- .050)	.028

As shown in Table 7, the model exhibited good fit across multiple indices, supporting the four-factor structure identified through EFA. All indicators for the four factors exhibit standardized loadings above 0.60, indicating strong item contributions to their respective constructs. Specifically, Factor 1 (Affective Symptoms) ranged from 0.717 to 0.837, Factor 2 (Rumination) from 0.741 to 0.771, Factor 3 (Behavioral Symptoms) from 0.637 to 0.745, and Factor 4 (Anxiety about Personal Impact) from 0.789 to 0.829. All p-values were highly significant ($p < .001$), confirming that each indicator significantly reflects its respective latent construct (see Figure 2).

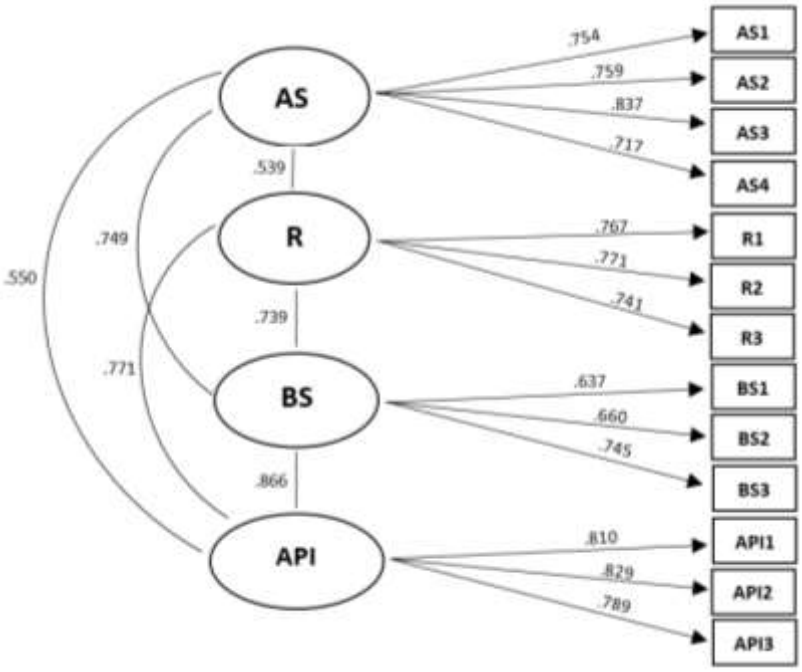

Figure 2. Confirmatory factor analysis diagram of the HEAS scale

Reliability

The split-half method for estimating internal consistency, by correlating odd- and even-numbered item scores, yielded a correlation coefficient of .87, indicating a high level of consistency between test sections. Overall, the analysis results indicate Cronbach's α = .89 and McDonald's ω = .89, both above the minimum threshold of .70, indicating that the reliability criteria are adequate at the initial stage of construct validation (Kline, 1999). Thus, this instrument shows excellent reliability in measuring the intended construct. At the item level, the item-rest correlations indicate that the discrimination indices range from .466 to .649, all of which

exceed the .30 threshold for adequate item discrimination. The items with the highest discrimination power are AS3 (.649) and API1 (.642), while the lowest are BS1 (.466). These results indicate that each item consistently groups individuals by their level of eco-anxiety, so that all items contribute effectively to measuring the same construct.

Convergent Validity

Confirmatory factor analysis of the climate change anxiety scale

Before conducting concurrent validity testing, the CCAS instrument was examined using CFA to verify that the comparison tool had sound construct validity in the research sample. Confirmatory factor analysis assessed whether the two-factor structure of the Climate Change Anxiety Scale (CCAS)—which includes the Cognitive-Emotional Impairment (CEI) and Functional Impairment (FI) dimensions—was appropriate. Results indicated that the two-factor model fit the data well, with a $\chi^2(64)$ value of 472 ($p < .001$) and fit indices CFI = .941, TLI = .928, SRMR = .036, and RMSEA = .086 (90% CI [.078–.094]). These are within acceptable thresholds (CFI and TLI > 0.90; SRMR < 0.08; RMSEA < 0.10). All items showed significant loadings ($p < .001$), ranging from .678 to .846, demonstrating strong contributions to their respective factors. Overall, the CFA supports the two-factor structure of the CCAS, aligning with its theoretical model and confirming its construct validity as a measure of climate change anxiety.

Table 8. Summary of the Model Fit Parameters

Model	χ2/df	CFI	TLI	RMSEA (90% CI)	SRMR
2 Factor	146/59	.941	.928	.086 (.078- .094)	.036

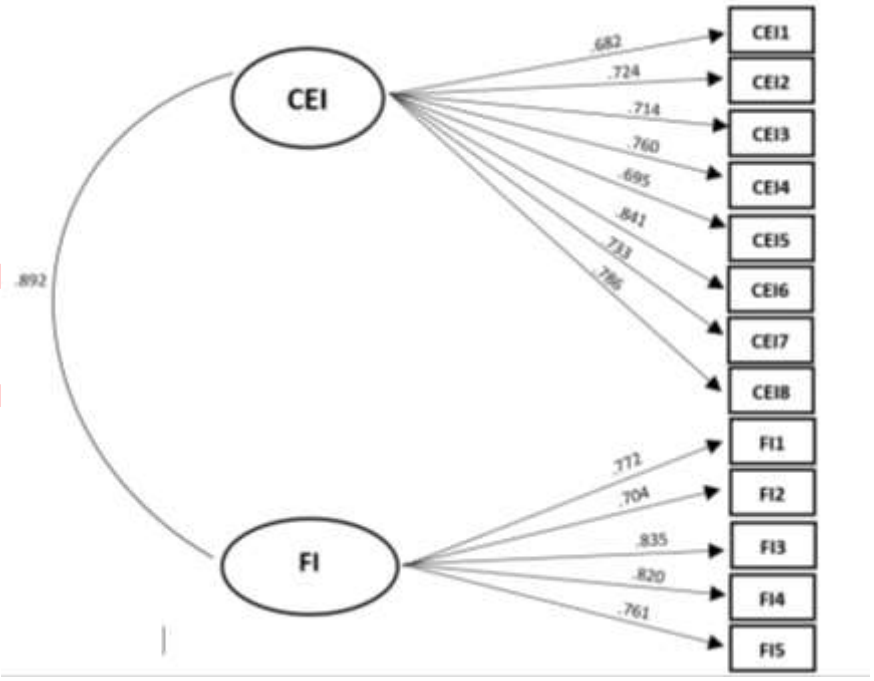

Figure 3. Confirmatory factor analysis diagram of the CCAS scale

Normality test

Normality was assessed by examining residuals from a regression model with CCAS and HEAS variables. The Shapiro–Wilk test produced W = 0.981 and $p < 0.001$, indicating that the residuals were not normally distributed. Because this assumption was violated, Pearson's correlation was deemed unsuitable. Instead, the relationship between the two scales was analyzed using Spearman's rho, a nonparametric test that does not assume normality of the residuals.

Table 9. Test of Regression Residuals

Test	W	p-value	Description

Shapiro–Wilk	.981	< .001	Not normal

Correlation Test HEAS (Hogg Eco Anxiety Scale) & CCAS (Climate Change Anxiety Scale)

A correlation analysis was performed to explore the relationship between CCAS and HEAS. Since the normality test indicated that the data did not follow a normal distribution, Spearman's rho, a nonparametric method, was used. According to the results in Correlation Table 10, a rho coefficient of .610 ($p < .001$) was observed. This result suggests a strong, statistically significant positive correlation between the two types of anxiety. Essentially, individuals with higher climate change anxiety also tend to experience higher ecological anxiety.

Table 10. Spearman correlation test

Variabel	Spearman's rho	p-value
CCAS-HEAS	.610	< .001

This significant positive correlation provides empirical support for the convergent validity of the Indonesian HEAS-13.

3.2. Discussion

This study focuses on adapting and validating the Indonesian version of the Eco-Anxiety Scale, including testing its reliability and validity, and examining its concurrent validity with the Climate Change Anxiety Scale (CCAS). Overall, the findings indicate that the Indonesian EAS exhibits strong psychometric properties and is suitable for assessing ecological anxiety in the Indonesian cultural context. The language adaptation process involved ensuring meaning equivalence, cultural relevance, and language clarity through forward translation, expert evaluation (expert judgment), and cognitive interviews with five respondents. These stages demonstrated that participants easily understand all items and are conceptually aligned with the original scale.

Some items received editorial adjustments to enhance clarity, readability, and stylistic consistency. For example, replacing "tidak mampu berhenti memikirkan" with "tidak bisa berhenti memikirkan" was done to sound more natural without altering the meaning. Similarly, the phrase "mengalami kesulitan dalam menikmati situasi sosial" was simplified to "kesulitan menikmati momen bersama keluarga dan teman-teman" to improve clarity and context. Other modifications were aimed at ensuring consistency in sentence structure and reducing repetition. Overall, the changes were minor and did not impact the psychological constructs evaluated by the instrument.

The descriptive analysis results reveal that responses on each Eco Anxiety Scale item are reasonably distributed, with no extreme deviations. Participants' responses were proportionate, avoiding extreme options. This result suggests that respondents understand the scale items well and that their responses do not exhibit patterns that could hinder further analysis. Additionally, each item shows a positive correlation with the overall scale score, indicating a consistent contribution to measuring ecological anxiety. While some items demonstrate a stronger influence, others have a moderate yet acceptable contribution.

The exploratory factor analysis results indicate that the Indonesian version of the Eco Anxiety Scale has four primary dimensions: affective symptoms, rumination, behavioral symptoms, and anxiety about personal impact. These dimensions capture different facets of ecological anxiety and demonstrate that Indonesian respondents perceive this phenomenon across multiple aspects, consistent with the original scale's theoretical framework (Hogg et al., 2021). The findings also reveal that the scale items reliably cluster into their expected dimensions, with no misclassified items. It suggests that the scale's internal structure functions reliably within the Indonesian cultural setting. Furthermore, the data's appropriateness for further analysis is supported by the correlation patterns among items that reinforce one another.

Confirmatory factor analysis results support the previous conclusion that the four-factor structure of the Eco Anxiety Scale is suitable for Indonesian respondents. The model provides a good fit to the data, indicating that the relationships between items and dimensions accurately reflect the theoretical framework underlying this instrument. It means respondents understand and respond to the items in a way that aligns with their original design. Although some fit indices sensitive to sample size are less than ideal, this does not undermine the model's validity, as large samples can influence these tests. Overall, other measures of model fit confirm that the four-factor structure reliably represents ecological anxiety among Indonesians.

The reliability analysis results demonstrate that the Indonesian version of the Eco Anxiety Scale has excellent internal consistency. Both the inter-item consistency assessment and the overall reliability coefficient indicate that this instrument reliably measures ecological anxiety. This means individuals respond consistently across items, enabling the tool to assess tendencies toward ecological anxiety accurately. At the item level, each question effectively differentiates between respondents with high and low ecological anxiety, capturing key aspects of the construct. Compared with adaptations in other countries, the Indonesian version's reliability aligns with global findings. Studies in diverse cultural contexts—such as in Spain-Argentina (Quiroga et al., 2024), China (Mandarin) (D. Wang et al., 2025), and Pakistan (Urdu) (Nayab et al., 2025)—also reported strong internal reliability. These results indicate that the eco-anxiety scale maintains stability and consistency in the Indonesian cultural context.

The convergent validity test results indicate that the Eco Anxiety Scale (EAS) shows a significant, direct correlation with the Climate Change Anxiety Scale (CCAS). It suggests that individuals experiencing climate change-related anxiety are more likely to demonstrate higher ecological anxiety levels. Specifically, those with elevated climate change anxiety also tend to have increased ecological anxiety (D. Wang et al., 2025). It aligns with prior research indicating that climate change anxiety is a core aspect of the overall experience of ecological anxiety (Clayton & Karazsia, 2020; Hogg et al., 2021; Rocchi et al., 2023). Consequently, the positive link between EAS and CCAS supports the concurrent validity of the Indonesian HEAS and underscores that ecological anxiety reflects emotional and cognitive responses to global environmental threats.

The results of this study show that the Indonesian version of the Eco-Anxiety Scale is both valid and reliable, demonstrating good external validity through correlations with other measures of related constructs. This supports the idea that anxiety about climate change and global environmental issues reflects an emotional and cognitive response related to personal ecological awareness (Pihkala, 2020). Validating the Hogg Eco-Anxiety Scale in Indonesia is especially important given the country's high vulnerability to climate-related disasters, including floods, extreme weather, rising sea levels, and environmental degradation. As an archipelagic nation frequently exposed to environmental crises, Indonesia—particularly its younger generation—may experience more pronounced psychological responses to climate change. The confirmation of the scale's multidimensional structure indicates that ecological concerns in Indonesia involve not only emotional reactions but also recurring thoughts and behavioral responses. This response suggests that ecological anxiety must be viewed within a social and environmental context, in which climate change is more than just a global issue; it is a tangible reality people experience firsthand.

The availability of the Indonesian version of the Hogg Eco-Anxiety Scale offers significant benefits to psychologists, academics, and related organizations. It can be used to assess ecological anxiety levels among individuals or groups, helping inform educational initiatives, prevention efforts, and psychological treatments. Moreover, the findings from this study can guide policymakers in developing more thorough environmental policies that incorporate mental health as a key component of sustainable development. Nevertheless, the study has certain limitations. It has not explored alternative models, such as Item Response Theory (IRT), which could provide additional evidence of item-level validity. Thus, further research combining quantitative and qualitative methods is encouraged to understand ecological anxiety in Indonesia better.

4. Conclusion

This study successfully adapted and psychometrically validated the Hogg Eco Anxiety Scale (HEAS-13) for use in Indonesia. The findings demonstrate that the instrument possesses adequate validity and reliability for assessing ecological anxiety within the Indonesian population. The adaptation process involved translation, expert review, and readability testing to ensure each item was semantically appropriate and easily comprehensible for respondents. Both exploratory and confirmatory factor analyses supported the four-factor structure, consistent with the theoretical framework. Additionally, reliability tests indicated strong internal consistency, and concurrent validity revealed a positive association between ecological anxiety and climate change concerns. Therefore, the Indonesian HEAS serves as a reliable tool for environmental psychology research and can inform policies and interventions addressing ecological mental health issues in Indonesia.

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Author Contributions

Conceptualization: NC, SJ; **methodology**: NC, RPS; **investigation**: NC; **writing—original draft preparation**: NC; **writing—review and editing**: SJ, RPS; **visualization**: NC, SJ, RPS; **data curation:** NC, RPS; **software:** NC, RPS; **project administration:** SJ; **supervision:** SJ, RPS; **validation:** SJ, RPS; **formal analysis:** RPS.

Conflict of interest

There are no conflicts to declare.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request, in accordance with ethical considerations and participant confidentiality.

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