International Journal of Environmental Impacts
Vol. 6, No. 4, December, 2023, pp. 183-196
Journal homepage: http://iieta.org/journals/ijei

The Effectiveness of Carbon Pricing Mechanism in Steering Financial Flows Toward Sustainable Projects

Mukul Bhatnagar [1], Sanjay Taneja [2*], Pawan Kumar [1]

[1] Commerce Department, Chandigarh University, Kharar 140413, India
[2] Department of Management Studies, Graphic Era Deemed to be University, Dehradun 248002, India

Corresponding Author Email: drsanjaytaneja1@gmail.com

https://doi.org/10.18280/ijei.060403

Received: 12 November 2023
Revised: 5 December 2023
Accepted: 14 December 2023
Available online: 28 December 2023

Keywords:
climate change. carbon footprint, sustainable development, green project, finance

ABSTRACT

Climate change and environmental deterioration pose significant threats to the long-term well-being of our planet. The study focuses on measuring the impact of Carbon Pricing Mechanism on financial flows toward sustainable projects. To meet the research objectives, the first questionnaire was developed by conducting the factor analysis of the variables framed after a review of the literature, and then PLS-SEM was applied to a sample size of 363. On running the analysis of SMART-PLS 4, it was found that there is a strong relation between dependent and independent variables but a weak relation of moderation. The analysis covered in this research has important consequences for efficient corporate management. It offers a strategic plan for making well-informed decisions, which is the foundation of effective management. From a managerial perspective, the findings underscore the critical significance of policy interventions, specifically carbon pricing mechanisms, in shaping the flow of financial resources towards sustainability initiatives. Businesses should recognize that these policies possess the capacity to significantly impact public comprehension and perception of climate change.

1. INTRODUCTION

The enduring welfare of our world is greatly threatened by climate change and environmental deterioration [1]. With increasing worldwide awareness of the negative effects of greenhouse gas emissions and resource depletion, there is a rising acknowledgement of the need for significant changes in our economic and industrial systems to prioritize sustainability. An increasingly important tactic in recent years has been the adoption of carbon pricing systems to address climate change and promote investment in sustainable initiatives [2-4].

Carbon pricing is an economic strategy that aims to include the expenses associated with carbon emissions by assigning a specific monetary worth to them. The purpose of this mechanism, which may be implemented via carbon taxes or cap-and-trade systems, is to motivate companies and people to decrease their carbon footprint by assigning a monetary value to carbon emissions. Carbon pricing is widely recognized as a potent mechanism for addressing climate change [5]. However, there is ongoing criticism and disagreement over its ability to effectively direct financial resources towards sustainable initiatives.

The relationship between carbon price and sustainable investments is intricate and complicated. Carbon pricing offers economic incentives for enterprises to decrease emissions, allocate resources to clean technology, and shift towards ecologically sustainable practices. However, the level of financial support for sustainable initiatives resulting from these incentives depends on other aspects, such as the effectiveness and robustness of carbon pricing laws, the responsiveness of industries, public knowledge, and investor attitudes.

This study article aims to thoroughly investigate the effectiveness of carbon pricing schemes in directing financial resources towards sustainable initiatives. In order to tackle this critical matter, we will examine numerous facets pertaining to carbon pricing, including its fundamental principles, the wide range of approaches used worldwide, and the probable ramifications on diverse sectors inside the business. We will also analyze intervening variables, such as the consciousness and interpretation of climate change, which might impact the correlation between carbon price and sustainable investments [6].

The present study provides various advantages to a wide array of readers. Policymakers may get valuable knowledge to enhance the development of more efficient carbon pricing regulations, while investors and companies can maximize their investment and sustainability plans. Environmental activists may use the data to argue for effective carbon pricing regimes, while researchers can add to scholarly debates. The study's findings also aid in the comprehension of the significance of carbon pricing in addressing climate change, contribute to global sustainability dialogues, and provide guidance to companies in adjusting to evolving market dynamics impacted by carbon price. Moreover, it offers resources for financial analysts to evaluate and minimize risks linked to the effects of climate change and regulatory alterations, so fostering environmental stewardship and responsible use of resources.

Several substantial theoretical contributions are included in the present paper. One way it may help improve and broaden sustainability theories is by conducting empirical assessments of the effects of carbon pricing systems on green initiatives. This will add to the growing body of research on the topic. By clarifying the ways in which such processes impact financial flows and investment choices, it also adds to our theoretical knowledge of carbon pricing. Environmental economics and policy researchers may benefit from the study's approach, especially if it uses complicated causal inference models. By delving into the interplay between sustainability programmes and market-based tools like carbon pricing, it might strengthen the theoretical underpinnings of environmental economics. The results may also provide theoretical guidance for optimising and designing policies, which might lead to the creation of efficient carbon pricing systems that accomplish certain environmental objectives. Research that looks at money moving across systems may help advance notions of sustainable investing and finance. Finally, the fact that it spans disciplines might lead to new understandings and theories in fields like public policy, economics, environmental science, and finance, all of which are crucial to sustainability.

The ramifications of this study are extensive, as they have the capacity to influence policy choices, direct investment approaches, and contribute to the wider discussion on attaining sustainability in the context of climate change [7]. Gaining a comprehensive understanding of how carbon pricing systems effectively allocate financial resources to sustainable initiatives is crucial in determining our response to one of the most significant issues of our day.

2. LITERATURE REVIEW

H1: There is no significant impact of the carbon pricing mechanism on awareness and perception of climate change.

Multiple researches have examined the impact of carbon pricing on the level of knowledge regarding climate change. In a study conducted, a comparative survey was carried out in regions that had carbon pricing mechanisms and regions that did not. The results showed that persons living in jurisdictions with established carbon pricing were more inclined to have knowledge about climate change and its consequences [8]. Muhammad conducted a longitudinal study that provided more evidence supporting these findings. The study revealed a consistent and prolonged rise in climate change awareness in areas that have adopted carbon pricing measures [9].

In addition to raising awareness, carbon pricing methods have proven to be effective in influencing public perception of climate change [10]. Alexander conducted a study that demonstrated a positive correlation between the presence of carbon pricing in a region and the likelihood of citizens perceiving climate change as a serious issue and showing more support for climate policy [11]. In addition, the research discovered a direct relationship between the perceived efficacy of carbon price in decreasing emissions and the degree of endorsement for these policies [12].

The existing body of research indicates that carbon pricing schemes have a significant impact on the public's perception of climate change and their understanding of its repercussions. These findings emphasise the capacity of carbon pricing not merely to reduce emissions but also to stimulate more public involvement and endorsement of climate-related initiatives [13]. As governments globally continue to investigate and enforce carbon pricing schemes, it is crucial to monitor and assess their wider effects on societal attitudes and comprehension of climate change [14].

H2: There is no significant impact of carbon pricing mechanism on financial flows towards sustainable projects.

The impact of carbon pricing mechanisms on directing financial resources towards sustainable initiatives has received significant attention in the fields of environmental economics and sustainable development [15]. This literature review aims to examine current research that elucidates the influence, or absence thereof, of carbon pricing systems on finance streams allocated towards sustainable initiatives [16]. The primary principle of carbon pricing methods is to establish economic incentives that encourage the reduction of greenhouse gas emissions. Carbon taxes and cap-and-trade systems impose a financial burden on carbon emissions, forcing companies to reduce their carbon footprint or explore low-carbon alternatives. Advocates contend that these systems incentivize investments in sustainable technologies and projects by enhancing their financial appeal in comparison.

The study conducted by Guo et al. emphasised the capacity of carbon pricing to stimulate private-sector investments in renewable energy projects. Their assessment indicated that the scheme stimulated greater investments in environmentally friendly energy sources, demonstrating the market's reaction to carbon price [17].

The empirical evidence regarding the direct influence of carbon pricing schemes on the allocation of financial resources towards sustainable initiatives is diverse. Several research have shown that there are beneficial connections between the introduction of carbon pricing and the allocation of resources towards sustainable projects [15, 18, 19]. However, other studies have shown varied outcomes or more complex associations.

It is crucial to recognise that the connection between carbon pricing schemes and finance flows towards sustainable initiatives is complex. Various elements, such as the interplay of policies, market forces, and regulatory structures, can have a substantial impact on the result. Moreover, the efficacy of carbon pricing strategies in channelling financial resources towards sustainability can differ among various sectors and geographies.

A study conducted by Blumberg and Sibilla indicated that the impact of carbon pricing on the financing of sustainable projects could vary depending on the particular structure and strictness of the policy. It was discovered that the effectiveness of carbon pricing mechanisms in directing financial resources towards sustainability depended on factors such as the starting point of emissions and the existence of supporting policies [20].

H3: There is no significant impact of awareness and perception of climate change on financial flows towards sustainable project.

The correlation between public awareness and perception of climate change and the allocation of financial resources towards sustainable initiatives is a subject that is gaining more attention in the field of environmental economics and sustainability. This literature review seeks to examine the current corpus of research in order to evaluate the influence, or absence thereof, of awareness and perception of climate change on the allocation of financial resources towards sustainable initiatives.

The importance of public awareness and perception of climate change is widely acknowledged as crucial in influencing legislative initiatives, corporate measures, and individual behaviours that seek to reduce and adapt to climate change. These elements are crucial in determining public support, impacting investor choices, and directing the distribution of cash towards ecologically sustainable ventures.

Multiple studies have established a direct relationship between higher awareness and understanding of climate change and greater financial commitments towards sustainable initiatives [21-23]. Research indicates that an educated and engaged public is more inclined to endorse and financially support endeavours that advance sustainability.

The significance of the psychological dimensions of consciousness and perception should not be overlooked. Perceived risks and efficacy are important psychological elements that significantly influence the willingness of individuals and organisations to provide support and funding for sustainable projects [24].

The research by Nkoana highlighted the significance of perceived threats linked to climate change in shaping pro-environmental behaviour and sustainability investments. When individuals and investors view climate change as a substantial and impending danger, they are more inclined to spend resources towards projects that aim to reduce its effects [25].

Implementing effective communication techniques and policy interventions can enhance the influence of awareness and perception on the direction of financial resources towards sustainable projects [26]. Research has shown that effectively planned climate change communication campaigns [27] and government policies (e.g., subsidies for renewable energy) can increase public knowledge and understanding, leading to increased expenditures in sustainable projects [28].

The extant literature presents ample data substantiating the notion that the understanding and perception of climate change can exert a large influence on the allocation of financial resources towards sustainable initiatives. These elements function as catalysts, exerting influence on the decisions made by individuals, businesses, and policymakers. Nevertheless, it is crucial to acknowledge that the relationship is intricate and diverse, with numerous contextual elements, regulatory contexts, and communication tactics impacting the intensity of this interaction.

H4: There is no significant impact of industry types as a moderator on carbon pricing mechanism awareness and perception of climate change, and financial flows towards sustainable project.

The influence of different industry sectors as mediators in the intricate connection between carbon pricing mechanisms, awareness and perception of climate change, and the distribution of financial resources towards sustainable projects is a topic that is increasingly captivating the attention of scholars and policymakers [29]. This literature analysis seeks to analyse the current corpus of material in order to evaluate if industry types do really reduce the influence of carbon pricing systems on awareness and perception of climate change, as well as money flows towards sustainable projects.

Carbon pricing methods, such as carbon taxes and cap-and-trade systems, are commonly used in many industrial settings. Industries exhibit substantial differences in their emissions profiles, regulatory landscapes, and financial capabilities to address carbon price [30]. Hence, the efficacy of carbon pricing schemes in enhancing consciousness, shaping perspective, and directing financial resources towards sustainability may vary among different sectors [31].

Certain industries exhibit elevated levels of carbon emissions as a result of the inherent nature of their operational processes. Studies indicate that carbon pricing methods can have a greater effect on industries that have a higher level of emissions intensity. Specifically, the energy and heavy manufacturing sectors are expected to have a more immediate financial motivation to decrease emissions as a result of carbon pricing.

The legislative and policy framework under which industries function can greatly impact the correlation between carbon pricing, awareness, perception, and financial transactions. Certain sectors may encounter more rigorous emissions reduction objectives, favourable treatment, or financial assistance as components of governmental measures aimed at fostering sustainability. Complementary policies can enhance the effect of carbon pricing on the distribution of financial resources towards sustainable projects in particular industries.

Moreover, the financial capability and technological advancement particular to the business are of utmost importance. Industries that possess substantial financial resources and have a track record of technical innovation may encounter less difficulty in adjusting to carbon pricing methods and allocating funds towards sustainable initiatives. These characteristics have the potential to either increase or decrease the impact of carbon pricing on awareness, perception, and financial flows.

The literature review emphasises the potential importance of industry types as moderators in the connection between carbon pricing methods, awareness and perception of climate change, and money flows towards sustainable projects. Various industry-specific elements, such as the level of emissions, regulatory frameworks, financial capabilities, and technology advancements, might determine the degree to which carbon pricing methods impact behaviour and the allocation of resources (Figure 1).

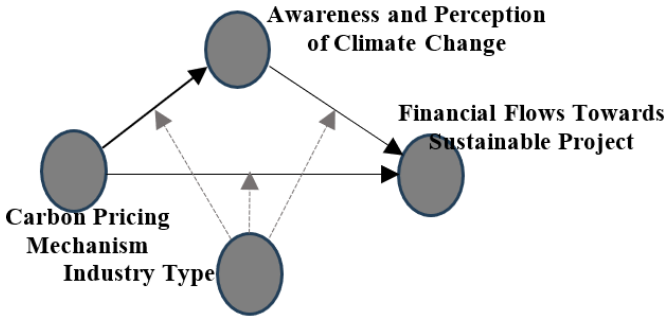

Figure 1. Conceptual model

3. MATERIAL AND RESEARCH METHOD

3.1 Factor analysis

To meet the research objectives, the first questionnaire was developed by conducting the factor analysis of the variable framed after a review of the literature. Considering the first variable, the carbon pricing mechanism, in the first draft, the number of items was 9; 7 remained in the second draft, and 4 were left in the last draft. The second variable, awareness and perception of climate change, was initially concerned with 11

items in the first draft, eight in the second draft, and four in the final draft. Considering the third variable, financial flows towards sustainable project, ten items were there in the first draft, 6 in the second draft and 4 in the last draft. Considering the last moderating variable, that is industry type, eight items were there in the first draft, six in the second draft, and three items were left in the last draft. Once factor analysis was complete, these questions were asked to the larger sample size to meet the research objectives.

3.2 Sample size calculation

For calculating the sample size, the software named G*power is used. In the tab of test family, t-test was selected; in the tab statistical test linear multiple regression was selected; the command of "A priori: Compute required sample size-given alpha power and the effect size was inserted in the tab of type of power analysis." Later, the details shown in Figure 2 were inserted in the following software segment to get a total sample size of 164. It means that depending upon the number of independent variables, the adequate sample size is 164 to make the data normally distributed. To be on the safer side, current research is conducted on 363 respondents, which is almost double the adequate sample size calculated from the software.

We framed the questionnaire in Google form and circulated it to 500 respondents in Mumbai City of India, of which we received 374 responses. The questionnaire is given in appendix. On investigation, 11 responses were removed because they supplied incomplete information. Hence, we obtained a final sample size of 363 respondents on which the PLS algorithm and bootstrapping were applied using the software Smart PLS 4. For the purpose of investigating how carbon pricing systems affect the distribution of funds for environmentally friendly initiatives in urban settings, the highly populated and economically dynamic metropolis of Mumbai offers an ideal case study. Environmental, economic, and regulatory considerations specific to the city may provide light on how other, comparable cities are tackling sustainability and climate change [32]. Researchers can learn a lot about the complexities of carbon pricing mechanisms in relation to financial markets, policies, and sustainable project initiatives in Mumbai if they narrow their focus to that city. This will help with sustainability efforts in Mumbai and with discussions about global carbon pricing strategies more generally.

3.3 Partial least sqaure - structural equation modelling method

Several valid considerations led to the selection of PLS-SEM as the analytical approach. Research in areas such as management and the social sciences may benefit from its strong method for analysing complicated model structures. Given the importance of understanding connections and generating predictions in actual research contexts, its heavy focus on prediction is a good fit. Its adaptability also makes it a good fit for exploratory studies, which may take into account situations in which the literature does not yet support a strong correlation between the variables. The ability of PLS-SEM to manage lower sample sizes is especially advantageous when dealing with limited resources or specialised study subjects. It goes a step further by enabling the estimate of both measurement and structural models at the same time, which is crucial for checking the validity and reliability of measurement instruments and structural connections. Thanks to its capacity to model reflective and formative components, as well as its resilience in the face of data heterogeneity, PLS-SEM finds use in a wide range of research settings. In addition, its adaptability and usefulness to real-world research problems have contributed to its rise to prominence, therefore its acceptance may be in keeping with the norms of that particular area's research history. Because of its flexibility, PLS-SEM is a good fit for a wide range of research purposes, data types, and demands. For meeting research objective a conceptual model is framed based on the variables extracted from review of literature. In the model fintech for egovernance and access to banking services act as independent variable for financial inclusion score and digital literacy act as mediating variable leading to financial inclusion score. Firstly to initiate the calculations to draw conclusion in context of research objectives pls algorithm was run on conceptual model to find path coefficient and correlation as given in Eq. (1) and Eq. (2).

$$\lambda XY=\mathrm{Cov}(X, Y)/\mathrm{Var}(X) \tag{1}$$

$$r_{xy} = \frac{\Sigma(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \Sigma(y_i - \bar{y})^2}} \tag{2}$$

It is necessary to make these 2 calculations to support further analysis which will be based on cronbach alpha, composite reliability, and average variance extracted which were calculated on the basis of Eq. (3), Eq. (4), and Eq. (5) respectively.

$$\alpha = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum_{i=1}^{k} \sigma_{y_i}^2}{\sigma_x^2}\right) \tag{3}$$

$$\frac{\left(\sum_{i=1}^{p} \lambda_i\right)^2}{\left(\sum_{i=1}^{p} \lambda_i\right)^2 + \sum_{i}^{p} \mathrm{V}(\delta)} \tag{4}$$

$$AVE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n} \tag{5}$$

After that discriminant validity of the scale framed was tested with the help of Heterotrait-Monotrait Ratio of Correlations by using the values given in Eq. (6). This equation is applied to the conceptual model for the purpose of confirming discriminant validity among the variables used in research.

$$\begin{aligned} &\mathrm{HTMT}_{ij} \\ &= \frac{1}{K_i K_j} \sum_{g=1}^{K_i} \sum_{h=1}^{K_j} r_{ig,jh} \\ &\div \left(\frac{2}{K_i(K_i-1)} \sum_{g=1}^{K_i-1} \sum_{h=g+1}^{K_i} r_{ig,ih} \; \frac{2}{K_j(K_j-1)} \right. \\ &\left. \cdot \sum_{g=1}^{K_j-1} \sum_{h=g+1}^{K_j} r_{jg,jh} \right)^{\frac{1}{2}} \end{aligned} \tag{6}$$

Sample chosen to respond to the questionnaire frame, their responses then go through the calculation of sample mean to study the nature of respondents. Sample mean is calculated by

the formula given in Eq. (7).

$$\bar{X} = \frac{\sum_{i=1}^{n} x_i}{n} \tag{7}$$

Standard deviation was also calculated as per Eq. (8) to measure the difference amongst the construct.

$$\sigma = \frac{1}{N}\sqrt{N\sum_{i=1}^{n} f_i x_i^2 - \left(\sum_{i=1}^{n} f_i x_i\right)^2} \tag{8}$$

Check the acceptability or rejection of hypothesis, the statistics and P value is used as per Eq. (9) and Eq. (10) respectively.

$$t = \frac{\bar{x}_d - \mu_d}{\left(\frac{s_d}{\sqrt{n}}\right)}, df = n - 1 \tag{9}$$

$$Z = \frac{\hat{p} - p0}{\sqrt{p0(1-p0)}} \tag{10}$$

Hypothesis testing of the conceptual model was done by bootstrapping it on the sample set of 5000 by the application of Eq. (11).

$$\widehat{se}_{boot} = \left\{\sum_{b=1}^{B} [s(\mathbf{x}^{*b}) - s(\cdot)]^2/(B-1)\right\}^{\frac{1}{2}} \tag{11}$$

4. DATA ANALYSIS AND INTERPERTATION

In Table 1, we see the distribution of respondent age, gender, and education level. Participants' ages, educational levels, and gender breakdown are all shown in Table 1. The majority of responders were under 30 years old (30.85), followed by those between 30 and 39 (15.43%), 40 to 49 (39.5%), and 50 and above (41.87%). In terms of academic credentials, over half of respondents (48.48%) had advanced degrees, while 33.61% were graduate students and 17.91% were working professionals. The table also breaks down the respondents based on their profession, providing information about the percentage of government officials and regulators, businesspeople, environmental NGOs, bankers, developers, and researchers. More specifically, the data shows that men made up 52.62% of responses and women 47.38%. Overall, the table provides a helpful snapshot of the demographic features of the study's sample group for getting to know the people who participated in the study.

Table 1. Sample demographics

	Count	Percentage
Age		
Less than 30 years	112	30.85%
Between 30 to 39 years	56	15.43%
Between 40 to 49 years	143	39.39%
50 years and above	164	45.18%
Total	363	100%
Educational Qualification		
Graduate Level	122	33.61%
Post Graduate Level	176	48.48%
Professional	65	17.91%
Total	363	100%
Respondent		
Government Officials and Regulators	59	16.25%
Businessman	88	24.24%
Environmental NGOs	31	8.54%
Professionals from Financial Institutions	37	10.19%
Project Developers	12	3.31%
Academics and Researchers	136	37.47%
Gender		
Male	191	52.62%
Female	172	47.38%
Total	363	100%

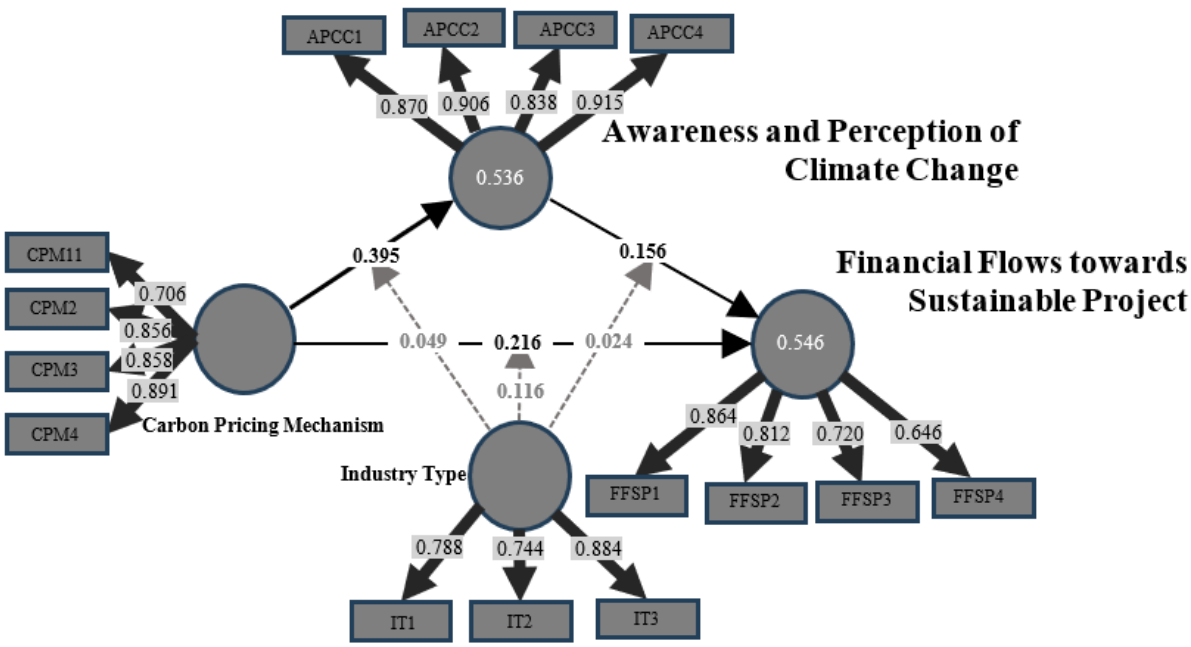

Figure 2. PLS algorithm

Figure 2 contains calculations related to the application of PLS-Algorithm on conceptual model. Arrow going from one construct to another contains path coeffcients and arrows moving out of constructs contaion co-relation.

The studys' numerous dimensions or constructs' construct reliability and validity are detailed in Table 2. These concepts consist of "Awareness and Perception of Climate Change," "Carbon Pricing Mechanism", "Financial Flows towards Sustainable Projects", and with "Industry Type". Several important measures of reliability and validity have been reported for each construct in the Table 2. The items within each construct have a high degree of reliability, as shown by Cronbach's alpha values between 0.73 and 0.905. The reliability of the constructs is further supported by the fact that the composite reliability (rho_a and rho_c) values, which are used to measure the reliability of latent variables, are both more than 0.7. Convergent validity is evaluated using average variance extracted (AVE) values, which vary from 0.586 to 0.779, showing that a significant amount of variation is captured by the items making up each construct. These findings provide strong evidence that the study's measuring tools are valid and reliable for assessing the aforementioned constructs. The mean of the squared loadings of each indicator linked with a construct is used to calculate the average variance extracted (AVE) value in SmartPLS. An AVE of 0.5 is considered significant. When the AVE is bigger than 0.5, it means that the convergent validity is adequate. This indicates that half or more of the indicator variance can be explained by the latent construct. It is indicated that there is more item error than construct-explained variance when the AVE value is less than 0.50. One programme that can be used for structural equation modelling (SEM) that relies on variance is SmartPLS, which has a graphical user interface. For its path modelling, it employs the partial least squares (PLS) technique.

Table 2. Construct reliability and validity

	Cronbach's Alpha	**Composite Reliability (rho_a)**	**Composite Reliability (rho_c)**	**Average Variance Extracted (AVE)**
Awareness and Perception of Climate Change	0.905	0.912	0.934	0.779
Carbon Pricing Mechanism	0.849	0.876	0.899	0.691
Financial Flows towards Sustainable Project	0.761	0.788	0.848	0.586
Industry Type	0.73	0.746	0.848	0.652

Table 3. HTMT inferrence

	Awareness and Perception of Climate Change	**Carbon Pricing Mechanism**	**Financial Flows Towards Sustainable Project**	**Industry Type**	**Industry Type × Carbon Pricing Mechanism**	**Industry Type × Awareness and Perception of Climate Change**
Awareness and Perception of Climate Change						
Carbon Pricing Mechanism	0.697					
Financial Flows towards Sustainable Project	0.699	0.671				
Industry Type	0.787	0.607	0.89			
Industry Type × Carbon Pricing Mechanism	0.081	0.169	0.262	0.217		
Industry Type × Awareness and Perception of Climate Change	0.178	0.093	0.263	0.307	0.722	

Discriminant validity among the constructs is shown in Table 3 via the Heterotrait-Monotrait (HTMT) ratio. The HTMT ratio is an important indicator of whether or not the two constructions may be considered separate entities. Values of the HTMT below 0.85 are suggestive of discriminant validity, indicating that the constructs are measuring distinct underlying ideas, and should be interpreted as such. The square root of the AVE for each build is shown in the diagonal of the Table 3 for easy comparison. The HTMT ratios between sets of constructs are represented by the values off the diagram. The off-diagonal values in the Table 3 range from 0.081 to 0.722, which is much less than the cutoff value of 0.85. These modest HTMT scores are indicative of discriminant validity, suggesting that the study's constructs are genuinely separate from one another and assess various features of the research variables. This result lends credence to the reliability and validity of the study's measuring approach, suggesting that it successfully differentiates across the numerous dimensions. An important metric for drawing conclusions in Smart PLS (Partial Least Squares) structural equation models is the Heterotrait-Monotrait (HTMT) ratio. It compares the PLS model's construct associations to determine discriminant validity. One way HTMT achieves this is by comparing the correlations between different constructs (heterotrait correlations) to those between items that measure the same construct (monotrait correlations). A pair of constructs are considered to have discriminant validity when their HTMT values are less than 1, indicating that they are separate and do not measure the same underlying notion. That is to say, a result below 1 for HTMT lends credence to the notion that the

constructs are separate entities as they are more closely tied to their individual indicators than to one another. Alternatively, if the HTMT is more than 1, it suggests that the constructs may be too similar or overlap, which could lead to problems with discriminant validity. For the purpose of validating the structure of their PLS model and the interpretation of their findings, researchers frequently employ the HTMT as a diagnostic tool to guarantee that their measurement model sufficiently differentiates between components.

Fornell and Larcker Criterion is used to evaluate the discriminant validity of research constructs, and their findings are shown in Table 4. This criteria contrasts the correlations between a given construct and others (shown off-diagonal) with the square root of the average variance extracted (AVE) for that construct (shown on the diagonal). The Fornell and Larcker Criterion helps assess if a construct's AVE is larger than its correlations with other constructs, which is a sign of discriminant validity. All of the diagonal AVE values in this Table 4 are higher than the associated construct's correlations with all other constructs. In contrast to its lower correlations with "Carbon Pricing Mechanism" (0.612), "Financial Flows towards Sustainable Project" (0.59), and "Industry Type" (0.647), "Awareness and Perception of Climate Change" has a higher AVE (0.883). All other structures follow the same pattern. These findings provide credence to the study's measuring model by showing that its constructs are discriminantly valid, or that they are separate and assess separate parts of the research variables. One statistical tool used in structural equation modelling (SEM) to determine how unique a research model's components or latent variables are is the Fornell and Larcker criteria, which is sometimes called the Fornell-Larcker criteria or the discriminant validity test. The program's namesake developers, Donald Fornell and David Larcker, deserve recognition. A construct is considered to explain more variation within itself than it shares with other constructs if the square root of the average variance extracted (AVE) for each variable is less than the correlations between latent variables, as this criteria checks. This test determines, in layman's words, if the variables used to represent various ideas in a study model are really separate or too similar. Important for validating SEM analysis and understanding results, this helps researchers check if their model captures the theoretical differences between constructs and if they are measuring distinct features of the phenomenon they are studying.

Table 4. Fornell and larcker criterion

	Awareness and Perception of Climate Change	**Carbon Pricing Mechanism**	**Financial Flows Towards Sustainable Project**	**Industry Type**
Awareness and Perception of Climate Change	0.883			
Carbon Pricing Mechanism	0.612	0.831		
Financial Flows towards Sustainable Project	0.59	0.557	0.765	
Industry Type	0.647	0.491	0.677	0.808

Table 5. Variance Inflation Factor

	VIF
APCC1	2.332
APCC2	3.795
APCC3	2.14
APCC4	3.816
CPM1	1.503
CPM2	2.231
CPM3	2.327
CPM4	2.4
FFSP1	2.108
FFSP2	1.78
FFSP3	1.54
FFSP4	1.27
IT1	1.532
IT2	1.342
IT3	1.82
Industry Type × Awareness and Perception of Climate Change	1
Industry Type x Carbon Pricing Mechanism	1

In Table 5, we can see the Variance Inflation Factor (VIF) values for the study's main constructions and interaction terms. The degree to which independent variables are associated with one another in a regression study is measured by the (VIF). It might be difficult to separate the effects of different predictors in statistical studies when there is a significant degree of multicollinearity, as indicated by a high VIF score. In this table, most of the VIF values are quite low, often falling below 2.5.

This indicates that the constructs and interaction terms may be included in regression models without a high risk of multicollinearity-related problems since there is low multicollinearity among them. Both "APCC2" and "APCC4" have somewhat higher but still usually acceptable VIF values of 3.795 and 3.816, respectively. Overall, the table shows that the VIF values are low to moderate, suggesting that the variables and interaction terms are not significantly associated with each other and hence are suitable predictors for regression analyses in the study.

Table 6. Model fit

	Saturated Model	Estimated Model
SRMR	0.085	0.085
d_ULS	0.877	0.874
d_G	0.424	0.423
Chi-square	240.116	239.889
NFI	0.751	0.751

In the context of a structural equation modelling (SEM) investigation, Table 6 displays the model fit statistics for two models: the saturated model and the estimated model. These numbers are crucial for gauging how well the estimated model corresponds to the real world. The Standardised Root Mean Square Residual (SRMR) values are 0.085 for both models, which indicates a satisfactory match. Differences of just 0.003 in d_ULS and d_G values (different discrepancy functions) between the saturated and estimated models are very suggestive of a tight approximation. The calculated model is a strong match for the data since the Chi-square values are quite comparable, differing by just 0.227. Finally, both models had NFI (Normed match Index) values of 0.751, suggesting a good match between the estimated model and the data (a number over 0.9 is normally regarded excellent). According to Table 6's model fit statistics, the estimated model seems to be a good match to the observed data, lending credence to its viability for analysing the connections between study variables.

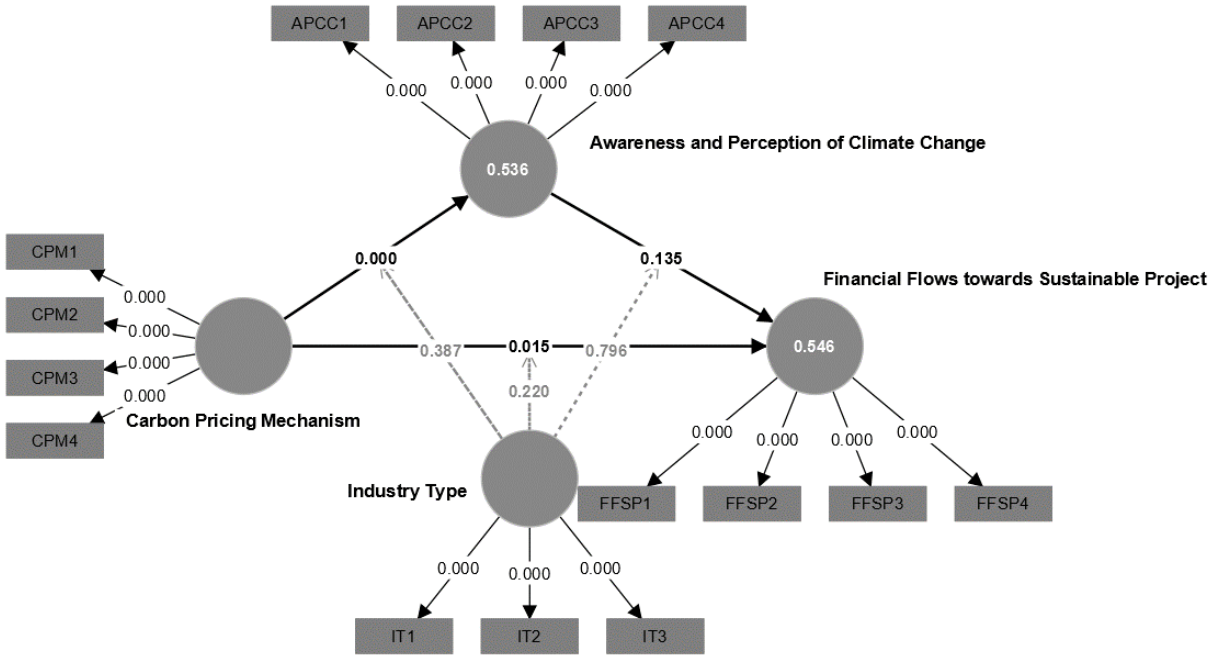

Figure 3. Boot strapping

The results of the hypothesis tests are provided in Table 7, which provides valuable insights into the relationships between the study's variables. With a T statistic of 5.068 and a p-value of 0 indicating a significant association, "Carbon Pricing Mechanism" and "Awareness and Perception of Climate Change" are two concepts that go hand in hand. This exemplifies how carbon pricing schemes affect people's understanding and acceptance of climate change. Strong and substantial correlations between "Carbon Pricing Mechanism" and "Financial Flows towards Sustainable Project" are found in the statistical analysis, as are correlations between "Industry Type" and "Awareness and Perception of Climate Change" and "Financial Flows towards Sustainable Project" (Figure 3). This highlights the significance of these aspects of the research. Conversely, several additional relationships, particularly interactions between constructs, lack statistical significance, suggesting that they may not have a meaningful influence on the phenomenon under research. The first hypothesis looks at how the "Carbon Pricing Mechanism" affects people's "Awareness and Perception of Climate Change." This hypothesis's original sample data has a value of 0.395, which is quite near to the sample mean of 0.397. Nonetheless, this hypothesis is rejected due to the low p-value of 0 ($p<0.001$). It suggests that the theory that carbon pricing mechanisms influence climate change knowledge and perception is strongly refuted. The second hypothesis looks at how "Carbon Pricing Mechanism" pertains to "Financial Flows towards Sustainable Projects." A standard deviation (STDEV) of 0.085 is associated with the original sample data (O) and the sample mean (M), both of which have values of 0.278. The corresponding p-value is 0.001, and the T-statistic is computed as 3.263. A low p-value means that the hypothesis is "Rejected," meaning that there is substantial evidence that carbon pricing schemes do not alter the flow of funds towards sustainable initiatives. In this third hypothesis, we look at how "Awareness and Perception of Climate Change" relates to "Financial Flows towards Sustainable Projects." For this hypothesis, the value of the original sample data (O) is 0.156. The standard deviation (STDEV) is 0.104 and the sample mean (M) is 0.148. A T-statistic of 1.495 is computed as

|O/STDEV|. This hypothesis is supported by a p-value of 0.135. The p-value indicates that this hypothesis is "Accepted," meaning that there is insufficient evidence to reject the idea that climate change consciousness is correlated with donations to environmentally friendly initiatives. All five of these hypotheses (H4a–H4e) rely on the interplay of "Industry Type," "Carbon Pricing Mechanism," "Awareness and Perception of Climate Change," and "Financial Flows towards Sustainable Projects." Both of the "Rejected" hypotheses (H4a and H4b) that test the association between Industry Type and the other variables have very low p-values, suggesting that there is strong evidence that these correlations do not exist. That being said, H4c, H4d, and H4e are marked as "accepted", indicating that there is some statistical evidence for the hypotheses that investigate relationships between Industry Type and other characteristics.

The conclusions from the provided data have important implications for developing strategies for successful communication and involvement in sustainability activities, particularly with awareness and perception. By confirming a positive relationship between "Awareness and Perception of Climate Change" and "Financial Flows towards Sustainable Project," the strong support for H3 highlights the critical importance of increasing public knowledge and understanding of climate change in attracting funding for environmentally friendly initiatives. In light of these results, it is clear that communication strategies need to place an emphasis on efforts to raise awareness among stakeholders on the critical nature of climate change and its bearing on sustainability-related financial investments. Moreover, it seems that carbon pricing does not necessarily lead to increased knowledge or financial commitment, as shown by the rejection of H1 and H2, which establish a connection between the "Carbon Pricing Mechanism" and "Awareness and Perception of Climate Change" and "Financial Flows towards Sustainable Project", respectively. Carbon pricing policies help create a more sustainable future. Thus, efforts should centre on showing how these policies relate to sustainability results. Finally, the complex results for "Industry Type" and its relationships in H4c, H4d, and H4e suggest that targeted communication strategies would be required, taking into account that industry-specific elements can impact financial backing and awareness in various ways. To summarise, these results about awareness and perception highlight the importance of targeted communication strategies that promote sustainability initiatives in Mumbai and beyond, engage stakeholders effectively, and explain the role of carbon pricing. Such strategies should also take into account industry-specific messaging.

Table 7. Hypothesis testing

	Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P values	Accepted/ Rejected
H1	Carbon Pricing Mechanism->Awareness and Perception of Climate Change	0.395	0.397	0.078	5.068	0	Rejected
H2	Carbon Pricing Mechanism->Financial Flows towards Sustainable Project	0.278	0.278	0.085	3.263	0.001	Rejected
H3	Awareness and Perception of Climate Change->Financial Flows towards Sustainable Project	0.156	0.148	0.104	1.495	0.135	Accepted
H4a	Industry Type->Awareness and Perception of Climate Change	0.461	0.464	0.082	5.629	0	Rejected
H4b	Industry Type->Financial Flows towards Sustainable Project	0.53	0.536	0.088	5.996	0	Rejected
H4c	Industry Type × Carbon Pricing Mechanism->Awareness and Perception of Climate Change	0.049	0.053	0.057	0.866	0.387	Accepted
H4d	Industry Type × Carbon Pricing Mechanism->Financial Flows towards Sustainable Project	-0.109	-0.105	0.095	1.144	0.253	Accepted
H4e	Industry Type × Awareness and Perception of Climate Change->Financial Flows towards Sustainable Project	0.024	0.019	0.091	0.259	0.796	Accepted

Practical suggestions for managing risks and allocating resources may be developed from the study's important linkages. In order to raise awareness about the seriousness of climate change, organisations should first direct resources towards programmes that increase people's "Awareness and Perception of Climate Change" and "Financial Flows towards Sustainable Project" (H3). Second, spending money on methods of effective communication is essential since the "Carbon Pricing Mechanism" affects both "Awareness and Perception of Climate Change" (H1) and, indirectly, "Financial Flows towards Sustainable Project". When allocating funds, it is essential to make the connection between carbon price and sustainability results as apparent and convincing as possible. Thirdly, taking into account the interaction effects mentioned in H4c, H4d, and H4e, industry-specific sectors should be targeted with specialised messages. The most efficient use of available resources would be to target certain industries' stakeholders via targeted audience segmentation and individualised messaging. Finally, as the denial of H2 suggests, organisations should handle the risk linked to policy reliance. To make sure projects can weather shifting policy dynamics, resource allocation should look at various financing options and diversify funding sources. As the sustainability environment changes, it is vital to provide resources for continuous monitoring and adaptation and undertake scenario-based risk assessments to manage risks proactively and make modifications to resource allocation. Organisations may benefit from these integrated tactics in navigating complicated relationships, securing funding for sustainable initiatives, and efficiently managing the risks that come with them.

These findings aid researchers in honing their hypotheses and drawing important conclusions on the interplay of factors, which ultimately contributes to a deeper understanding of the topic under investigation.

5. DISCUSSION AND CONCLUSION

5.1 Theoretical contributions

By delving deeply into the complex interplay between climate change knowledge and perception, carbon pricing, industry type, and financial backing for sustainability initiatives, this study provides theoretical insight into the efficacy of carbon pricing mechanisms in directing funding towards such projects. This research contributes to the fields of environmental economics, sustainability, and policy analysis by providing an empirical evaluation of these connections in the Mumbai setting. Addition to the literature on behavioural economics and sustainability decision-making, the results provide empirical evidence of the crucial role of climate change knowledge in motivating financial support for sustainability. In addition, the theory behind industry-specific sustainability plans is enhanced by the detailed insights into how carbon pricing systems interact with different industries, which provide light on the diverse nature of sustainability issues. Theoretically, the research adds to the developing area of sustainable finance by examining how carbon pricing affects both public knowledge and monetary flows in relation to sustainability projects. Environmental economics, policy design, sustainability management, and behavioural science are some of the fields that stand to benefit from the study's extensive theoretical contributions, which shed light on the intricate dynamics of carbon pricing and sustainability.

5.2 Managerial implications

The analysis covered in this research has important consequences for efficient corporate management. It offers a strategic plan for making well-informed decisions, which is the foundation of effective management. The meticulous examination of data, as shown by the diverse tables, equips business managers with the necessary tools and profound understanding to make astute judgements that have the potential to affect the destiny of their organisation.

An important benefit of this research is its capacity to optimise the allocation of resources. By comprehending the connections between variables, as seen in Table 7, organisations may distribute their resources with more efficiency. For example, if there is a statistically significant correlation between a specific policy or practise, such as "Carbon Pricing Mechanism," and a desired outcome, such as "Awareness and Perception of Climate Change," organisations can allocate resources and prioritise efforts in areas where they are most likely to achieve favourable outcomes.

Furthermore, the analysis aids in the reduction of risks. The examination of multicollinearity, as shown in Table 5, allows firms to detect possible dangers linked to variables that have a high degree of correlation. Identifying the interdependencies across variables enables organisations to proactively address risks and prevent important judgements based on deceptive or repetitive data.

This study considerably enhances strategic planning. The knowledge acquired from hypothesis testing, as seen in Table 7, may provide valuable information for strategic planning procedures. When certain variables are shown to have a substantial statistical impact on certain outcomes, organisations may integrate this information into their strategic goals. An example of this is how comprehending the influence of "Industry Type" on "Awareness and Perception of Climate Change" may steer a company's sustainability strategy across many sectors, enabling it to maintain a competitive edge in a dynamic market.

Moreover, this data analysis methodology may be used for consumer data, yielding significant customer insights. Gaining insight into consumer behaviour and preferences is crucial for customising marketing tactics, product development, and customer service operations to effectively cater to the demands and anticipations of certain target demographics.

Continuous improvement is a core tenet of efficient management. Consistent examination of data and evaluation of models, as seen in Table 6, are crucial for ongoing improvement. Through monitoring the adequacy of the model and reassessing assumptions, firms may adjust to evolving market circumstances, make necessary improvements to their plans, and maintain competitiveness in a dynamic business landscape.

With practical insights that will have far-reaching beneficial effects, this study's findings can guide businesses in developing targeted policies, investments, and sustainability programmes. These results may help policymakers fine-tune carbon pricing systems by allowing them to better direct funding towards environmentally friendly initiatives via more efficient price structures and incentives. Companies have the power to use their resources wisely by making well-informed choices and investing in projects that support sustainability

goals. Businesses may use these insights to better understand the financial risks linked to climate change, develop their sustainability reporting practises, and form strategic relationships with governments to boost sustainability initiatives in their regions. Research findings may also drive innovation in sustainable practises and technology, improve investor relations, and entice socially conscious investors. In order to create a more sustainable and economically viable future in Mumbai and throughout the world, organisations may engage their workers and align them with sustainability objectives by showing them the financial benefits of sustainability initiatives.

To summarise, the analysis completed in this talk provides firms with a potent set of tools to improve their management practises. It provides them with the capacity to make decisions based on evidence, optimise resources, implement measures to reduce risk, and link their plans with statistical insights. In the end, using this analytical methodology may provide organisations with a competitive edge and contribute to their sustained prosperity.

5.3 Limitations and future prospects

The results may not be applicable to other situations due to the study's small geographic reach, which includes just respondents from Mumbai. Although this method is appropriate considering the study's regional focus, "The Effectiveness of Carbon Pricing Mechanism in Steering Financial Flows towards Sustainable Projects," it hampers the generalizability of the findings and may fail to account for differences in policy frameworks, economic dynamics, and sustainability efforts in other cities or regions. Caution should be used when extrapolating the study's findings to situations outside of Mumbai due to the study's potential limited application to varied metropolitan environments worldwide. Recognising that the difficulty of sustainable project management and the efficacy of carbon pricing schemes are global issues may help to alleviate the restriction of concentrating just on responses from Mumbai. Despite the limited geographic scope, the study provides a solid framework for understanding these issues in the Mumbai context. It offers valuable insights that other urban areas facing sustainability challenges can use as a reference or a case study. By recognising the wider significance of the research question, this limitation is mitigated. The study adds to our comprehension of sustainable project financing and the effectiveness of carbon pricing on the international level by providing localised knowledge that can guide and motivate future research in varied locations.

Therefore, in future more geographies can be covered by adding more variables like regulatory frameworks, government policies, macroeconomic conditions, role of financial institutions, magnitude and frequency of green bond issuance by government etc.

5.4 Conclusion

From a management standpoint, the results emphasise the crucial importance of policy measures, particularly carbon pricing systems, in influencing the movement of financial resources towards sustainability efforts. Businesses should acknowledge that these policies have the potential to greatly influence public understanding and perception of climate change. Consequently, this awareness may impact consumer inclinations and investment choices. Managers have to contemplate harmonising their company plans with these legislative developments, adopting sustainability practises, and capitalising on the increasing demand in environmentally responsible goods and initiatives. Furthermore, it emphasises the need of rigorous data gathering and analysis methods, guaranteeing that decision-makers possess precise and dependable information to influence their decisions. The study emphasises the interdependence between environmental regulations and public awareness on a societal level [33]. Policymakers should acknowledge that the efficacy of carbon pricing schemes goes beyond economic factors; it influences social perspectives on climate change. A well organised policy framework has the potential to stimulate favourable shifts in public opinion, encouraging a stronger dedication to sustainable actions. The social aspect highlights the need for governments and organisations to actively participate in educational and advocacy initiatives, therefore improving public comprehension of climate-related matters. It further requires open and inclusive systems of policymaking that include many stakeholders to establish agreement and support for sustainability measures. Within the realm of environmental consequences, the research highlights the possible influence of carbon pricing methods on the distribution of financial resources towards sustainable initiatives. This emphasises the need of implementing policy-driven incentives to promote environmental conservation and mitigate climate change. Implementing these regulations effectively may divert money flows towards renewable energy, conservation, and other sustainable initiatives, therefore promoting environmental sustainability. Companies engaging in industries impacted by these rules should actively seek out prospects in sustainable initiatives, ensuring that their operations are in line with the objectives of decreasing carbon emissions and minimising environmental harm. Ultimately, the research's data analysis provides a comprehensive viewpoint that incorporates managerial, societal, and environmental ramifications. It highlights the interaction between legislative initiatives, public awareness, and financial flows towards sustainability. By acknowledging these interrelationships, companies and politicians may enhance their decision-making process, so promoting a more sustainable and ecologically aware future.

REFERENCES

[1] Korkmaz, M. (2018). Public awareness and perceptions of climate change: Differences in concern about climate change in the West Mediterranean region of Turkey. Applied Ecology & Environmental Research, 16(4): 4039-4050. http://doi.org/10.15666/aeer/1604_40394050

[2] Carter, S.D. (2022, April). Synergies Between COVID-19, Supply Chain, Sustainable Development, and Climate Change: Lessons from UNCTAD. Cham: Springer International Publishing, Switzerland, pp. 3-7. http://doi.org/10.1007/978-3-031-26121-3_1

[3] Boukaya, L., Saoud, S. (2022). Environmental attitude and ecological behavior: The key of climate change to win the sustainable development challenge. In E3S Web of Conferences. EDP Sciences, 351: 01097. https://doi.org/10.1051/e3sconf/202235101097

[4] Maran, K., Senthilnathan, C.R., Usha, S., Venkatesh, P. (2022). Impact of solar energy on mitigating climate

changes for a sustainable development in India. In 2022 International Conference on Power, Energy, Control and Transmission Systems, Chennai, India, pp. 1-5.

[5] Abramov, V., Prostakevich, K., Abramova, A., Burlov, V., Shilin, M. (2023). Decision aid expert system for Russian Arctic sustainable development under climate change. In E3S Web of Conferences. 389: 02025. EDP Sciences. https://doi.org/10.1051/e3sconf/202338902025

[6] Gogoleva, V., Kirsanova, N., Zyabkina, T., Dolgopolova, T. (2023). Prospects for the use of Arctic routes in the context of climate change and the implementation of the concept of sustainable development of the Arctic zone. In E3S Web of Conferences. EDP Sciences, 378: 06014. https://doi.org/10.1051/e3sconf/202337806014

[7] Mojid, M.A. (2020). Climate change-induced challenges to sustainable development in Bangladesh. In IOP Conference Series: Earth and Environmental Science. IOP Science, 423(1): 012001. https://doi.org/10.1088/1755-1315/423/1/012001

[8] Yun, P., Liang, X., Jia, L., Yi, J.X., Li, H.W. (2022). Status and trend of global carbon pricing mechanism and its impacts on petroleum industry. China Petroleum Exploration, 27(6): 41-53. https://doi.org/10.3969/j.issn.1672-7703.2022.06.005

[9] Muhammad, I. (2022). Carbon tax as the most appropriate carbon pricing mechanism for developing countries and strategies to design an effective policy. AIMS Environmental Science, 9(2): 145-168. https://doi.org/10.3934/environsci.20220012

[10] Annandale, G.W. (2018). Everlasting abundance of water climate change, reservoir sedimentation management and sustainable development. In Twenty-Sixth International Congress on Large Dams/Vingt-Sixième Congrès International des Grands Barrages. CRC Press, Boca Raton.

[11] Lo, A.Y., Alexander, K.S., Proctor, W., Ryan, A. (2013). Reciprocity as deliberative capacity: Lessons from a citizen's deliberation on carbon pricing mechanisms in Australia. Environment and Planning C: Government and Policy, 31(3): 444-459. https://doi.org/10.1068/c11192

[12] Christensen, S., Duncan, W.D., Phillips, A. (2013). Regulation of emissions under the carbon pricing mechanism: A case study of Australia's coal-fired electricity sector. Asia Pacific Journal of Environmental Law, 15: 17-50. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84878298944&partnerID=40&md5=b7c8d5a7cb6c4cecd9e567ea3ac372f9.

[13] Drews, S., Van den Bergh, J.C. (2016). What explains public support for climate policies? A review of empirical and experimental studies. Climate Policy, 16(7): 855-876. https://doi.org/10.1080/14693062.2015.1058240

[14] Bicket, M., Vanner, R. (2016). Designing policy mixes for resource efficiency: The role of public acceptability. Sustainability, 8(4): 366. https://doi.org/10.3390/su8040366

[15] Babaev, V.Y. (2023). Green financing as a tool to fight climate change. In Current Problems of the Global Environmental Economy Under the Conditions of Climate Change and the Perspectives of Sustainable Development. Cham: Springer International Publishing, Switzerland, pp. 45-50. https://doi.org/10.1007/978-3-031-19979-0_5

[16] Chen, S., Guo, Z., Liu, P., Li, Z. (2017). A low-carbon power generation pathway for China: Scenario analysis with carbon pricing mechanism. In Computer Aided Chemical Engineering. Elsevier, 40: 2599-2604. https://doi.org/10.1016/B978-0-444-63965-3.50435-9

[17] Guo, Y.Y., Gou, X.J., Xu, Z.S., Skare, M. (2022). Carbon pricing mechanism for the energy industry: A bibliometric study of optimal pricing policies. Acta Montanistica Slovaca, 27(1): 49-69. https://doi.org/10.46544/AMS.v27i1.05

[18] Wang, J.Q., Tang, J.L., Guo, K. (2022). Green bond index prediction based on CEEMDAN-LSTM. Frontiers in Energy Research, 9: 793413. https://doi.org/10.3389/fenrg.2021.793413

[19] Jin, J.Y., Han, L.Y., Wu, L., Zeng, H.C. (2020). The hedging effect of green bonds on carbon market risk. International Review of Financial Analysis, 71: 101509. https://doi.org/10.1016/j.irfa.2020.101509

[20] Blumberg, G., Sibilla, M. (2023). A carbon accounting and trading platform for the UK construction industry. Energies, 16(4): 1566. https://doi.org/10.3390/en16041566

[21] Ado, A.M., Leshan, J., Savadogo, P., Bo, L., Shah, A.A. (2019). Farmers' awareness and perception of climate change impacts: Case study of Aguie district in Niger. Environment, Development and Sustainability, 21: 2963-2977. https://doi.org/10.1007/s10668-018-0173-4

[22] Knight, K.W. (2016). Public awareness and perception of climate change: A quantitative cross-national study. Environmental Sociology, 2(1): 101-113. https://doi.org/10.1080/23251042.2015.1128055

[23] Akano, O., Modirwa, S., Oluwasemire, K., Oladele, O. (2023). Awareness and perception of climate change by smallholder farmers in two agroecological zones of Oyo state Southwest Nigeria. GeoJournal, 88(1): 39-68. https://doi.org/10.1007/s10708-022-10590-y

[24] Muchiri, M.K., Erdei-Gally, S., Fekete-Farkas, M., Lakner, Z. (2022). Bibliometric analysis of green finance and climate change in post-Paris agreement era. Journal of Risk and Financial Management, 15(12): 561. https://doi.org/10.3390/jrfm15120561

[25] Nkoana, E.M. (2020). Exploring the effects of an environmental education course on the awareness and perceptions of climate change risks among seventh and eighth grade learners in South Africa. International Research in Geographical and Environmental Education, 29(1), 7-22. https://doi.org/10.1080/10382046.2019.1661126

[26] Bhatnagar, M., Taneja, S., Özen, E. (2022). A wave of green start-ups in India - The study of green finance as a support system for sustainable entrepreneurship. Green Finance, 4(2): 253-273. https://doi.org/10.3934/GF.2022012

[27] Hundera, H., Mpandeli, S., Bantider, A. (2019). Smallholder farmers' awareness and perceptions of climate change in Adama district, central rift valley of Ethiopia. Weather and Climate Extremes, 26: 100230. https://doi.org/10.1016/j.wace.2019.100230

[28] Priyanto, M.W., Mulyo, J.H. (2021). Comparison of awareness and perception of climate change between proklim and non-proklim farmers in sleman district. In E3S Web of Conferences. EDP Sciences, 232: 04007.

https://doi.org/10.1051/e3sconf/202123204007
[29] Hu, Y.F., Tian, Y.X., Zhang, L.P. (2023). Green bond pricing and optimization based on carbon emission trading and subsidies: From the perspective of externalities. Sustainability, 15(10): 8422. https://doi.org/10.3390/su15108422
[30] Hafner, S., Jones, A., Anger-Kraavi, A., Pohl, J. (2020). Closing the green finance gap - A systems perspective. Environmental Innovation and Societal Transitions, 34: 26-60. https://doi.org/10.1016/j.eist.2019.11.007
[31] Wei, R., Ding, D. (2022). Problems and countermeasures of financial risk in project management based on convolutional neural network. Computational Intelligence and Neuroscience, 2022: 1978415. https://doi.org/10.1155/2022/1978415
[32] Heydari, E., Solhi, M., Janani, I., Farzadkia, M. (2021). Determinants of sustainability in recycling of municipal solid waste: Application of community-based social marketing (CBSM). Challenges in Sustainability, 9(1): 16-27. https://doi.org/10.12924/cis2021.09010016
[33] Carron, B., Muys, B., Van Orshoven, J., Leinfelder, H. (2021). Landscape design to meet the societal demand for ecosystem services: A Perspective. Challenges in Sustainability, 9(1): 28-44. https://doi.org/10.12924/cis2021.09010028

NOMENCLATURE

APCC	Awareness and Perception of Climate Change
CPM	Carbon Pricing Mechanism
FFSP	Financial Flows towards Sustainable Project
IT	Industry Type

APPENDIX

Construct	Item	Statement (7-point Likert Scale)		
Carbon Pricing Mechanism	CPM1	If carbon pricing mechanisms (such as carbon taxes or cap-and-trade systems) are implemented, do you think they would successfully incentivize businesses to cut their carbon emissions?	1 Strongly Ineffective	7 Strongly Effective
	CPM2	How familiar are you with the precise carbon pricing systems in place in your industry?	1 Not Familiar at All	7 Very Familiar
	CPM3	If carbon pricing systems were in place, do you think your industry would be more likely to invest in environmentally friendly projects?	1 Not Influential at All	7 Highly Influential
	CPM4	To what extent do you believe carbon pricing schemes are able to effectively address climate change concerns in your sector?	1 Not Effective at All	7 Very Effective
Awareness and Perception of Climate Change	APCC1	In what ways do you fear climate change will affect future generations?	1 Not Concerned at All	7 Extremely Concerned
	APCC2	When compared to other environmental threats, how serious do you think climate change is?	1 Not a Threat at All	7 Very Significant Threat
	APCC3	How well-informed do you consider yourself regarding the science and impacts of climate change?	1 Not Well-Informed at All	7 Very Well-Informed
	APCC4	Is it likely that climate change will have an effect on your business sector in the near future?	1 Not Likely at All	7 Very Likely
Financial Flows towards Sustainable Project	FFSP1	How much of your company's budget goes toward eco-friendly endeavors like renewable energy and carbon offset programs?	1 Very Little Investment	7 Significant Investment
	FFSP2	How much thought does sustainability receive in your company's budgeting processes?	1 Not a Priority at All	7 High Priority
	FFSP3	How likely are you to put money into environmentally friendly projects if you know you'll get some of that money back?	1 Very Unlikely	7 Very Likely
	FFSP4	To what extent do you think sustainable projects can be economically feasible for companies in your field?	1 Not Viable at All	7 Highly Viable
Industry Type	IT1	In terms of carbon emissions and other environmental impacts, how would you classify the industry in which your company operates?	1 Low Carbon Emissions/Environmental Impact	7 High Carbon Emissions/Environmental Impact
	IT2	Is there a noticeable difference in the propensity to invest in sustainable projects amongst industries?	1 No Variation	7 High Variation

	IT3	Regarding carbon emissions and sustainability, how much regulatory pressure do you think various businesses face? 1 7		Low Regulatory Pressure High Regulatory Pressure