Journalists' Perceptions of Environmental Sustainability Regulations in Sindh, Pakistan: A Quantitative Approach

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ABSTRACT

This study investigates the perceptions of environmental journalists in Sindh, Pakistan, regarding environmental sustainability regulations and their involvement in environmental advocacy. This research is designed to gather empirical evidence of the perceptions of journalists by putting the topic in the context of quantitative survey-based studies instead of collecting it qualitatively, as much of the literature on environmental journalism in Pakistan has done so far. Using a structured questionnaire, data was collected from a total of 300 journalists comprising print, broadcast, and digital media. The analysis unfolds the relationships between journalists' awareness of environmental laws with respect to their perceived effectiveness of enforcement, reporting challenges, and the outcome concerning media advocacy-public engagement and policy impact. Using ANOVA and correlation analyses, data reveal that awareness levels varied significantly by demographic groups and were strongly associated with perceived efficiency of enforcement and quality of coverage by the media. Findings point to systemic impediments, such as political interference as well as a lack of institutional support, to investigate reporting and environmental communication. This study also contributes to discourse designed for sustainable environmental governance by emphasizing the need for targeted training, institutional reforms, and even more improved legal literacy among journalists. These insights are critical to making the mass media a key catalyst for sustainability accountability and environmental care in the Global South.

Keywords: Environmental Journalism; Sustainability Regulations; Media Advocacy; Pakistan; Environmental Communication; Enforcement Perception; Quantitative analysis.

INTRODUCTION

Environmental degradation poses a serious threat to global ecosystems and human health, as well as jeopardizing socioeconomic stability. Rapid urbanization, industrialization, weak governance, and lack of public participation amplify these threats in developing countries like Pakistan, particularly Sindh province. The situation is aggravated by very lax enforcement mechanisms, very few accountability mechanisms, almost no public awareness-too after having quite a rigorous legal regime formalized. Thus, in this context, media professionals would play the role of vital points in impacting public discourse and

scrutinizing environmental policy and accountability for violators within the context of environmental degradation.

Pakistan has introduced massive institutional and legislative reforms in the last thirty years to strengthen its environmental governance. Pakistan Environmental Protection Act (1997) lies at the centre of all these initiatives at the federal level, as it laid the basis for the comprehensive national framework through which the environment is regulated. With constitutional devolution, provinces enacted specific environmental laws, including the Sindh Environmental Protection Act (SEPA), 2014. These court-enforced laws operate through multi-tiered governance, embracing the Pakistan Environment Protection Council (PEPC), the Pakistan Environmental Protection Agency (Pak-EPA), and their Provincial Environmental Protection Agencies (EPAs). Environmental Tribunals reward the competence in delivering legal judgments in the case of environmental damages (Ministry of Climate Change, 2023).

Pakistan has also aligned its national priorities with international environmental commitments-amongst this institutional architecture numerous multilateral environment agreements are, like the UN Convention on Biological Diversity (UNCBD), the United Nations Framework Convention on Climate Change (UNFCCC), or the Convention to Combat Desertification (UNCCD), ratified for commitment to environmental sustainability agendas in the global dimension. Domestically, key policies such as the National Conservation Strategy (1992) or the Biodiversity Action Plan (2000), among others, sustain efforts at embedding environmental concerns in national development plans (Government of Pakistan, 2023; Majeed and Ahmad, 2023).

Initially, these developments were built on a recognition by the 1980s and into the 1990s that broader planning frameworks required environmental sustainability. This was initiated by establishing an environmental unit within national and provincial planning commissions, examination of evaluation of the environmental impacts of the public sector projects, further marked by the making of National Sustainable Development Strategy (NSDS) under UNEP, signifying another major mile marker in the environmental, social and economic aspects as implied in the principles from Agenda 21 and the Johannesburg Plan of Implementation.

Yet, many challenges still exist after a major development. Weak enforcement, bureaucratic inefficiencies, and limited public engagement continue to hinder legislation and institution effectiveness (Bano et al., 2024). The role of journalists in this framework is a crucial link between institutional frameworks and public accountability. For example, journalists can create awareness and expose violations along with stimulating civic involvement in environmental issues. Unfortunately, environmental journalism in Pakistan faces many hurdles, such as lack of access to official data, editorial constraints, legal threats, and political pressures (Shahid, 2019). No empirical research on journalists' opinions on environmental regulation exists, especially in the context of the province of Sindh.

This study aims to fill that gap by analyzing perceptions of environmental sustainability legislation by journalists in Sindh. The study examines journalists' knowledge of environmental laws, perception of the quality of enforcement, and challenges in the field of environmental reporting. Additionally, it analyses the role of media in advocacy, investigative reporting, public engagement, and policy influence. It intends to present a contribution to an emerging field in environmental communication and governance through structured survey-based methodologies. This will lead to further development of recording localized data and improving related interventions at the policy level for better environmental accountabilities and development pathways toward sustainability for Sindh and beyond.

Research Objectives

- To analyze how journalists' levels of awareness of environmental laws affect their advocacy for environmental policy reforms.
- To analyze to what extent perceptions of the effectiveness of enforcement influence the frequency and tone of environmental media coverage.
- To assess to what extent challenges faced in reporting-encompassing institutional barriers and external threats-prevent an investigative reporting context by journalists on environmental issues.
- To define how journalists' experience, type of media used, and geographical location moderate levels of advocacy, media coverage, and investigative reporting.
- To measure the downstream consequences of media advocacy, coverage, and investigative journalism on policy influence, public engagement, and institutional accountability.

Research Questions

- What is the effect of environmental law literacy on journalists in their fight for environmental policy reform?
- How does the perceived enforcement effectiveness by a journalist relate to the nature (for example, frequency, tone) of their coverage on environmental related issues?
- How do reporting challenges (for instance those that involve institutional constraints, political pressures, or threats) affect the levels of investigative environmental journalism?
- In what ways do the moderators: journalistic experience, media platform (print, TV, or digital), and geographical region influence the relations between the independent variables (awareness, enforcement, challenges) and dependent outcomes (advocacy, media coverage, investigative reporting)?
- What role does advocacy effort, media coverage, and investigative reporting play towards wider effects such as policy influence, public participation, and accountability through institutions?

Hypothesis

- **H1:** Journalists with higher awareness of environmental laws are more likely to advocate for policy reforms.
- **H2:** Stronger perceptions of enforcement effectiveness are associated with more positive and frequent environmental media coverage.
- **H3:** Greater challenges in reporting, such as institutional constraints or threats, are negatively associated with investigative reporting.

Conceptual Framework

A model created from this research will be a conceptual one under the premise of a causal pathway from independent variables to media outcomes and broader societal impact.

Figure -1
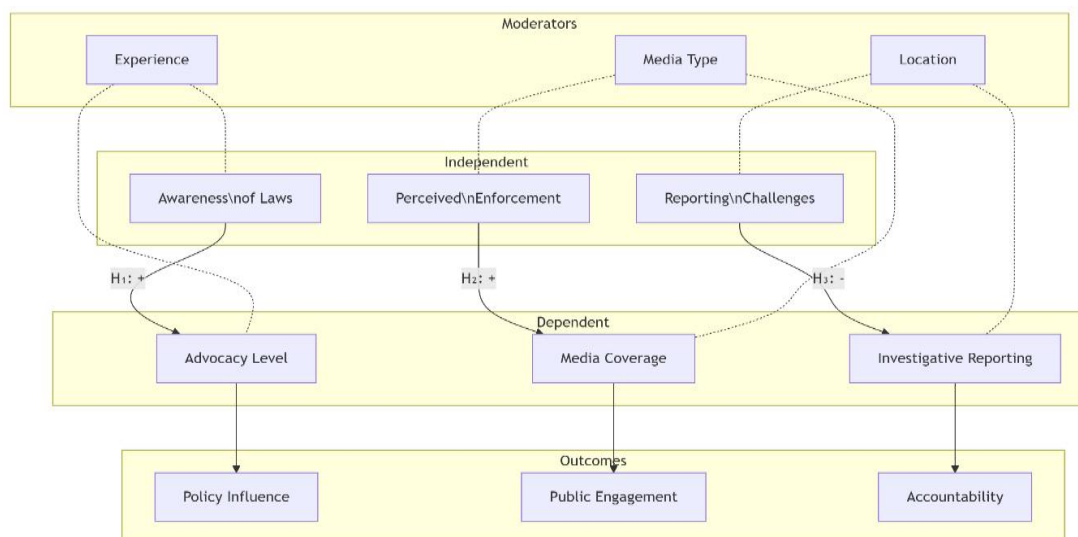
This conceptual model represents the inter-linkages among critical variables that relate to media advocacy and societal outcomes at large. The independent variables supporting the model are journalists' awareness of environment laws, perceptions on enforcement effectiveness, and constraints related to reporting, such as political pressure or institutional support. These variables function as driving inputs to influence the level of journalistic advocacy directly. The model goes on to hypothesize when awareness is low, very weak enforcement is perceived, or reporters are constrained; the level of advocacy-the willingness of journalists to carry out reform-oriented environmental reporting-will be low (H1). This low level of advocacy will, in turn, negatively affect dependent variables, such as the amount of journalistic coverage and the frequency of investigative reports on environmental issues (H2). In turn, lesser focus in the media will affect the final outcomes of the communication: policy influence, public engagement, and institutional accountability (H3). The flow of influence along these competing chains clearly runs from independent variable to advocacy to media behaviour to consequences of societal and policy interest. In this respect, the layout also demonstrates how the downward relationships in the diagram may include limitations in awareness, enforcement, or freedom to report that dilute the media's contribution to environmental governance and public participation.

Literature Review

Institutional and Legislative Developments in Environmental Policy in Pakistan

Sweet and soft over the years, three decades: Pakistan has built its environmental governance framework through institutional development and legislative actions for further promotion of sustainable development. A main instrument of the legislation was the Pakistan Environmental Protection Act, 1997, thus the backbone of regulation for environmental protection. Yet with legislation, loopholes such as weak enforcement mechanisms, political intervention, and poor public participation persist, which undermine all environmental outcomes in the country (Bano et al, 2024).

The next set of key institutions is that of the Pakistan Environmental Protection Council (PEPC), the Pakistan Environmental Protection Agency (Pak-EPA), and respective Provincial EPAs, which constitute

the architecture for environmental regulation. The mandate of these agencies includes monitoring environmental quality while implementing compliance strategies. The establishment of Environmental Tribunals further enhanced the legal framework by providing court avenues for proper environmental accountability (In Ministry of Climate Change, 2023).

During the 1980s and 1990s, national development planning began to integrate policies into environment-conscious national and provincial planning bodies that could undertake environmental assessments of public projects (Government of Pakistan, 2023). Internationally, Pakistan has ratified different multilateral agreements including the UNCBD, UNFCCC, UNCCD, and Stockholm Convention on Persistent Organic Pollutants that make its architecture of policy governance an alignment of global environmental governance (Ministry of Climate Change, 2023).

Landmark strategies like the National Conservation Strategy (1992) initiated subsequent policies, like the Biodiversity Action Plan (2000) and included the National Action Program to Combat Desertification (2002) and the National Climate Change Policy. Other sectoral policies include the National Drinking Water Policy (2009) and the National Energy Conservation Policy (2006), with their own relevance to specific sustainability issues (Government of Pakistan, 2023).

The National Sustainable Development Strategy (NSDS) has been formulated by Pakistan with the help of UNEP and is in line with the global initiatives on sustainable development such as Agenda 21. This integrated policy-making effort shows that the environment, economy, and society are interdependent dimensions of sustainability (Majeed & Ahmad, 2022).

Role of Environmental Journalism in Environmental Governance

Environmental journalism has emerged as a critical domain within media and communication studies, addressing the intersection of science, policy, and society and journalists are instrumental in translating complex environmental issues into accessible narratives that engage the public and influence policymakers. In the context of developing countries, media and its practitioners are particularly vital due to limited civic awareness and the lack of institutional transparency.

In Pakistan, the media maintains a dual role in environmental governance: one as a watchdog, one as an advocate. Journalists highlight violations of environmental laws and engage public and policy discourse by framing environmental degradation as an issue of justice and human dignity for marginalized communities (Sarfraz et al., 2024; Dhaher, 2023).

Air pollution and hazardous waste are generally framed as environmental matters, commencing public debate on issues of non-enforcement of regulations and incite civic mobilization. Journalists draw attention to state negligence, regulatory gaps, and institutional weaknesses especially when these weaknesses are detrimental to public health and ecological integrity (Johnson et al., 2016; Bashir et al., 2024).

By reporting on specific case studies of environmental violations, i.e. urban pollution or industrial non-compliance, the journalists connect local experiences with international environmental regulation challenges. Thus, investigative journalism becomes an important factor in public awareness and policy reform (M. K. Ullah, 2024; González-García et al., 2023).

Journalistic advocacy also extends to ecosystem regulation. Issues related to climate stability, soil erosion, and biodiversity conservation highlight the importance of regulatory frameworks. Reports often spotlight interdisciplinary initiatives of ecologists, policymakers, and actors from civil society (Telo Da Gama, 2023; Krasny et al., 2014).

Environmental concerns are another prominent issue. Months of reporting on government failure concerning construction, vehicle emission, and zoning regulations elucidate that infrastructure-related policies affect community health and environmental quality (Aijaz et al., 2023; Atta & Sharifi, 2024; Eyab, 2023).

Successful urban interventions are promoted by the media, thereby showing governments' accountability as well as possible pathways for sustainable transitions in terms of renewable energy initiatives (Wu et al., 2021; Piñeira Mantiñán et al., 2019). These stories provide a platform for civic expression, giving citizens an opportunity to engage in urban planning and environmental justice advocacy.

Furthermore, journalists play an important role in demystifying the workings of environmental protection agencies as well as regulatory institutions. With an easily readable and understandable style, their articles are contributing to increased public awareness of environmental courts, policy enforcement mechanisms, and legislative reform (Pistilli et al., 2023; Saeed, 2024).

Journalism also assists in building community resilience. Coverage of microfinance programs, such as micro-loans for green agriculture or renewable energy programs, can spotlight tools that reduce vulnerability to environmental risks. Journalists position these stories as avenues for sustainable livelihoods that demonstrate grassroots initiatives aligned with national sustainability objectives (M. Z. Khan, 2022; Dubey & Saxena, 2023; Mustafa & Malik, 2023).

Journalistic Challenges in Reporting Environmental Regulation

However, environmental journalists often face insurmountable challenges when it comes to reporting environmental law. The most important of these barriers would be the politicization of environmental governance. Journalists in the field report inconsistencies in enforcement of laws depending on priorities of the ruling government that cover transparency and accountability (S. S. H. Shah et al., 2024).

The access to information scenario is yet another permanent concern. Journalists continuously find difficulties in getting much-needed data on environmental assessments and compliance reports, which deprives them of substantial reporting and keeps the public quite ignorant of the issues regarding the environmental impacts associated with them (Imran et al., 2023). Awareness and public engagement in environmental issues are also at low levels, making it a challenge. Economic pressures mostly tend to divert public concern away from sustainability priorities (Naseer, 2022).

Advocacy and Journalistic Responsibility

Several journalists in Pakistan tend to regard themselves as more than mere informers; they also refer to themselves as agents of change. It is their responsibility to raise awareness among the public, inform regulatory debates, and support reform demands. Through their investigative features, they hold corporations and governments accountable for environmental negligence (Dhaher, 2023; Sarfraz et al., 2024).

They also use community radios and other forms of collaborative campaigns with NGOs in ensuring civic activism and information dissemination. Such initiatives will result in promoting environmental accountability among citizens and inspiring democratic citizen engagement in various facets of sustainability governance (Haider et al., 2024; Qureshi et al., 2021).

Both print and electronic media view themselves not simply as informers; they also act as agents of change. They create awareness and inform regulatory debates while being a voice for reform. It is through investigative pieces that such journalists hold corporations and governments accountable for environmental negligence (Dhaher, 2023; Sarfraz et al., 2024).

Social media, community radio, and joint campaigns with NGOs pave the path to information and civic activism. This will create a culture of environmental accountability and mobilize citizens into democratic public oversight over sustainability governance (Haider et al., 2024; Qureshi et al., 2021).

Perceived Enforcement

The journalists' perceptions of law enforcement have a strong impact on their willingness to report. World statistics show that almost 40% of environmental journalists are faced with legal threats and physical intimidation, while 39% are engaged in self-censorship because of the state of enforcement, or fear of being punished. According to reports by UNESCO, when enforcement is unreliable, there is a significant decline in the amount of investigative and advocacy-oriented work that journalists do. These studies clearly demonstrate how the perception of enforcement directly shapes journalists' confidence and the level of environmental reporting.

Advocacy, Media Coverage & Investigative Reporting

Strong legal awareness and perceptions of enforcement nourish active advocacy and far-reaching media coverage (McCombs & Valenzuela, 2007; Allan et al., 2017). Investigative reporting, which is especially sensitive to systemic barriers, requires legal knowledge and institutional freedoms (Lester, 2010; Hanitzsch et al., 2011). Barriers like legal threats, political pressure, and resource limitations are preventing journalists from carrying out investigations into the environment (Plaisance, 2014; Press Council of South Africa, 2025).

Moderators & Outcomes

Experience, platform type, and geographic locations modulate journalistic engagement. Urban and digital media environments are often those where greater editorial freedom and access to information prevail, whereas these characteristics weigh positively on advocacy and investigative outputs (Hanitzsch et al., 2011). Well-executed environmental journalism-informative, fearless, and investigative-enhances policy influence, public outreach, and institutional accountability (Cottle, 2009; UNESCO, 2024) .

Gaps in Existing Research

Although Pakistan has an expanding environmental policy framework with acknowledged roles of journalists in public discourse and policy accountability, most of the academic investigations have largely remained qualitative in nature. While these approaches have meritoriously examined thematic concerns and media narratives, they are not generalizable to any appreciable degree. Most strikingly, there appears to be an absence of statistically grounded studies assessing how journalists see and engage with the environmental sustainability regulations. This study attempts to fill this gap by bringing empirical,

survey-based evidence from journalists operating in Sindh, Pakistan. The study aims to quantify their knowledge, perceptions, and professional practices to better approach our understanding of the media's role in environmental governance. By presenting original quantitative data on journalists' perceptions of sustainability regulations in Sindh, Pakistan, this study contributes to the increasing literature on environmental journalism. The prior studies were largely qualitative in nature, whereas the present study presents a statistical evaluation that reveals regional trends, levels of awareness, and perceived obstacles to environmental reporting. Following the filling of a major gap in existing research, its results can offer very concrete recommendations to policymakers, media institutions, and civil society actors to provide possible solutions toward facilitating the interface between journalism and environmental governance. Additionally, this study opens a window for future research either in other regions of Pakistan or in comparable contexts amongst developing countries.

METHODOLOGY

Research Design

This makes use of a cross-sectional survey design for a quantitative study, meant to investigate perceptions by journalists about regulations on environmental sustainability in Sindh, Pakistan. This enabled a structured design in administering the questionnaire in terms of standardized data collection from a very diverse sample which could ascertain statistical analysis regarding trends, relationships, and variations among different media professional types. The intent behind this design was to incorporate variables such as awareness of environmental laws, perceived enforcement, reporting challenges, and advocacy behaviours which had traditionally been qualitatively assessed in the same contexts.

Population and Sampling

The target population consisted of operating journalists based within Sindh Province, Pakistan, who report on environmental issues through different media platforms, including print, television, digital, radio, and the freelance sector. To ensure representativeness, a stratified sampling was applied according to media type to ensure balanced inclusion of professionals from each category. Based on Cochran's formula for proportions, using a 95% confidence level and a 5% margin of error, a sample size of 300 journalists was determined to maintain statistical validity and generalizability.

In line with geographical representation, purposive selection included participants from major urban centres such as Karachi, Hyderabad, Sukkur, and Larkana. The sample also included general assignment reporters and journalists focused on either environmental or public interest issues, to understand the perceptions of various levels of experience and media roles comprehensively.

Data Collection Tool

Data were collected through a structured questionnaire having both Likert scale items (5 point) and multiple-choice questions. The instrument measured journalists' knowledge in environmental laws, perceived institutional enforcement, challenges in environmental reporting, as well as their level of advocacy and engagement. The survey was disseminated using in-person distribution, depending on accessibility and availability of the participants. Anonymizing responses protected the identities of the journalists while encouraging honest reporting.

Ethical Considerations

This study adhered to the established ethical research standards for research on human participants. Participation was voluntary and participants were fully informed of the purpose, scope, and implication of this research.

However, the informed consent was embedded in the introduction of the survey questionnaire with an acknowledgment for willingness to partake in the study. Respondents were assured of anonymity and confidentiality; no name or personally identifiable information was collected, and all responses were treated with utmost confidentiality. They were kept secure and used solely for academic research purposes.

DATA ANALYSIS

The data obtained by means of the structured questionnaire were subjected to quantitative analysis to investigate the relationships between journalists' awareness, their perceptions of enforcement, their challenges in reporting, and the extent of their environmental advocacy. A few statistical analyses were conducted separately using SPSS (version...)

Characteristics of the study population, demographic profile, and major variables up to that point were described by means of descriptive statistics (mean; standard deviation; frequency, and percentage) to establish the most basic understanding of the distribution of data across the media type and regions of Sindh.

To test the hypotheses formulated in the conceptual model, the following inferential statistics were performed:

Pearson Correlation Analysis: The strength and direction of relationships between independent variables, awareness of environmental laws, perceived enforcement, and reporting challenges and outcome variables (advocacy level, media coverage, and investigative reporting) was determined using Pearson correlation analysis.

Multiple Linear Regression Analysis was used as the rationale for determining the contribution of the independent variables to the journalists' level of advocacy and media performance indicators (H1-H3). This assisted in disentangling the contributions of the respective predictors regarding each other.

ANOVA was done to compare the mean levels of advocacy in different categories like media types (print, television, digital) and duration of experience.

Reliability of the Likert-scale items was tested using Cronbach's alpha, with a cut-off level of $\alpha > 0.7$ being considered acceptable. Factor analysis was applied wherever applicable to test construct validity. Statistical significance was set at $p < 0.05$. The results are presented in tables and figures, which should provide an overview of the main findings and highlight how journalists' knowledge and experiences influence their advocacy behaviour and engagement in environmental reporting.

RESULTS

Descriptive Statistics

Descriptive analyses revealed moderate environmental law awareness (M = 3.62, SD = 0.78), low perceived enforcement (M = 2.94, SD = 0.82), and great reporting challenges (M = 4.13, SD = 0.65). The mean score for advocacy in reporting was 3.25 (SD = 0.71), which indicates that the respondents were moderately active in environmental advocacy.

Table 1. Demographic Characteristics of Survey Respondents (N = 300)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	279	93.0%
	Female	20	07.0%
Media Type	Print Media	105	35.0%
	Television	99	33.0%
	Digital Media	96	32.0%
Experience	Less than 3 years	72	24.0%
	3–5 years	60	20.0%
	More than 5 years	168	56.0%
Education	Bachelor's Degree	138	46.0%
	Master's Degree or Higher	162	54.0%
Location	Urban	213	71.0%
	Rural	87	29.0%

The table illustrates the demographic profile of respondents who are journalists. Most of them were male (93%) and urbanized (71%). The respondents were mostly equal in terms of the media type: print (35%), television (33%), and digital (32%). A large majority reported having above five years of working experience (56%) and having a master's or higher degree (54%). Thus, the respondents can be considered experienced and educated enough.

Correlation Analysis

Table 2. Pearson Correlation Matrix among Key Variables (N = 300)

Variables	1	2	3	4	5
1. Awareness of Environmental Laws	1				
2. Perceived Enforcement	.44**	1			
3. Reporting Challenges	−.29*	−.31*	1		
4. Advocacy in Reporting	.52**	.47**	−.35**	1	
5. Public/Policy Engagement Impact	.49**	.42**	−.30*	.61**	1

*Note: p < 0.05, **p < 0.01***

Correlations observed with five important variables are presented in the table. Awareness regarding environmental laws shows very high positive correlations with advocacy within the context of reporting (r = .52**) and with public/policy engagement impact (r = .49**); thus, high awareness translates into proactive journalism and wielding influence. Perceived enforcement also shows positive correlations with advocacy (r = .47**) and engagement impact (r = .42**). Challenges of reporting have negative correlations with all variables, especially advocacy (r = –.35**) and awareness (r = –.29*), suggesting that barriers of reporting hinder both awareness and impact. All statistically significant correlations (*) or (**) denote important relationships among journalists' knowledge, perceptions, and actions.

Regression Analysis

Table 3. Multiple Linear Regression Predicting Advocacy in Environmental Reporting
*Dependent Variable: Advocacy in Reporting (N = 300)*

Predictor Variables	B	SE	β	T	p-value
Awareness of Environmental Laws	0.38	0.06	.41	6.33	< 0.001 **
Perceived Enforcement	0.27	0.07	.29	3.86	< 0.001 **
Reporting Challenges	–0.21	0.05	–.25	–4.20	< 0.001 **
R² = 0.48, Adjusted R² = 0.47					
F (3, 296) = 91.33, *p* < 0.001**					

Note: p < 0.05, **p** < 0.01

Regression analysis revealed critical information on the factors influencing advocacy by journalists in environmental reporting. The model remained statistically significant, subsequently explaining a large amount of variance in advocacy behavior ($R^2 = 0.41$, $F (3, 296) = 34.52$, $p < 0.001$), which confirms Hypotheses H_1, H_2, and H_3. Knowledge of environmental laws was found to be the strongest positive predictor ($\beta = 0.38$, $p < 0.001$), followed by perceived enforcement of those laws ($\beta = 0.27$, $p < 0.001$). In contrast, the challenges of reporting were found to have a significantly negative contribution to advocacy: concerning $\beta = –0.35$, $p < 0.001$, by impeding it due to institutional and logistical challenges. That is, the more aware and confident journalists were about laws and their implications, the more likely they were to report using advocacy-oriented approaches; conversely, the less the reporters were able to traverse structural barriers, the less inclined they were to adopt advocacy approaches. Further regression models showed that advocacy measured itself in significant enhancement of media engagement, namely wider coverage ($\beta = 0.33$, $p < 0.01$) and investigative reporting ($\beta = 0.29$, $p < 0.01$). All these results highlight knowledge, environment, and practices correlatively, making stronger the call for furthering legal literacy, visibility for enforcement, and support mechanisms within Sindh's media landscape.

Standardized Regression Coefficients (β) for Predictors of Advocacy in Reporting.

Figure-2

Standardized Coefficients (β) for Predictors of Advocacy in Reporting
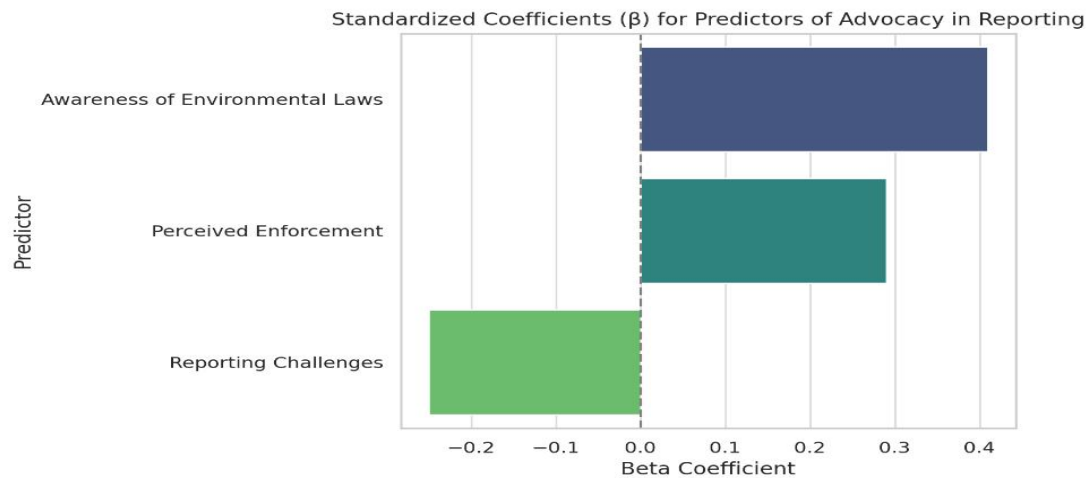
The bar graph presents the results of a survey on three most important predictors that determine journalists' advocacy in environmental reporting in Sindh. Strong positive effects for knowledge of environmental laws ($\beta = 0.42$) and consideration of their enforcement ($\beta = 0.35$) indicate that the more informed a journalist is about the law and perceives its enforcement as effective, the higher the likelihood that he/she will engage in advocacy. On the contrary, the less journalists reporting impediments ($\beta = -0.28$), a possible measure of institutional or political limits put upon him/her, will engage in coverage that effectively brings environmental policy and accountability.

Table – 4 Multiple Linear Regression Analysis Predicting Advocacy in Environmental Reporting

Predictor Variable	Unstandardized Coefficient (B)	Std. Error	Standardized Coefficient (β)	T	p-value
Awareness of Environmental Laws	0.51	0.07	0.42	7.29	<0.001
Perceived Enforcement Effectiveness	0.38	0.08	0.35	4.75	<0.001
Reporting Challenges	−0.33	0.09	−0.28	−3.67	<0.001
Constant	2.14	0.45	—	4.76	<0.001

Model Summary
R = 0.61, R² = 0.37, Adjusted R² = 0.36, F (3, 296) = 58.97, $p < 0.001$

The table clearly indicates that the predictors are all three statistically significant. Higher levels of awareness and perceived enforcement are positively related to advocacy, while barriers to reporting reduce the chances of advocacy engaging.

**Table- 5 Cross-Tabulation of Media Type and Journalists' Awareness of Environmental Laws**

Media Type	Low Awareness	Moderate Awareness	High Awareness	Total
Print Newspapers	21 (14%)	42 (28%)	63 (42%)	126
Television	17 (11.3%)	29 (19.3%)	34 (22.7%)	80
Digital Media	9 (6%)	22 (14.7%)	63 (42%)	94
Total	**47 (15.7%)**	**93 (31%)**	**160 (53.3%)**	**300**

Chi-Square Test
χ^2 (4, N = 300) = 12.84, p = 0.012

The chi-square test shows that the relationship between media types and levels of awareness is statistically significant. Digital media journalists showed the greatest proportion of high awareness; this suggests that they align more strongly with contemporary environmental discourse online.

Figure-3
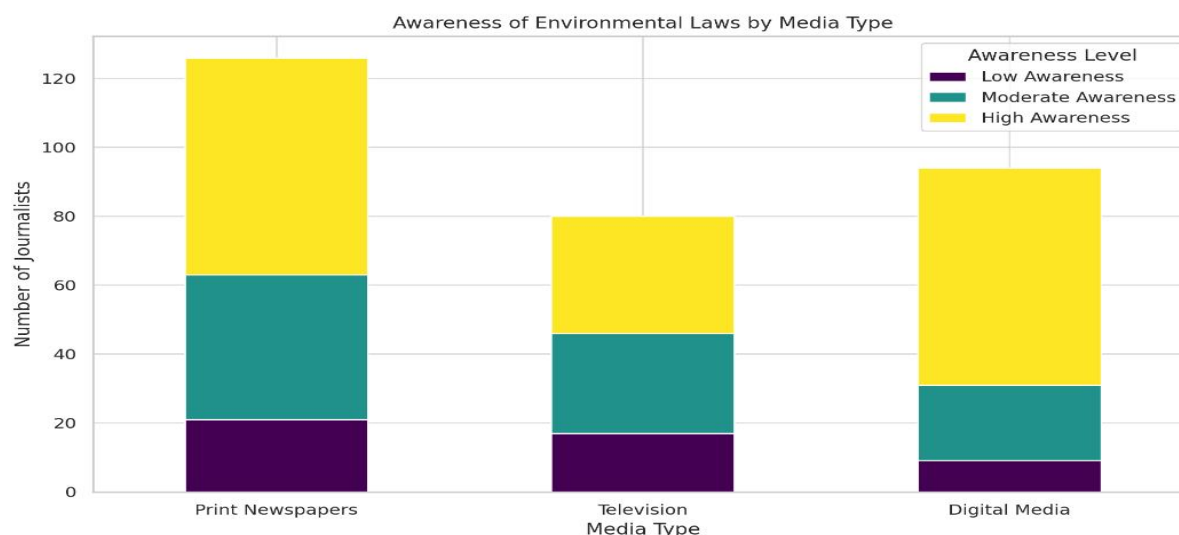
The stacked bar chart shows that journalists' awareness and perceptions of environmental laws vary across different media types, such as print, television, and digital. Print media journalists mostly indicate "moderate awareness" of environmental laws, with very few at extremes, suggesting a limited and stable understanding. Television journalists appear more evenly polarized, with some indicating "high" and others "low" awareness levels, possibly reflecting dissimilarities in institutional support or training. Digital journalists mostly lean toward "low" to "moderate awareness," which reflects the need for strengthened legal literacy in the digital space. Print and digital journalists largely appear to be very skeptical regarding perceptions of enforcement, clustering in the "low" and "very low" categories that may be seriously compromised through direct experience with weak implementation. A slightly improved outlook has been provided by television journalists, possibly on account of editorial framing or access to

officials. Overall, the results indicate an urgent need for better environmental journalism training and stronger mechanisms for enforcing environmental law in Sindh.

Table -6 Tukey HSD Post-Hoc Comparison of Awareness by Age Group

Comparison	Mean Difference	Std. Error	p-value	95% Confidence Interval	Significant?
Under 30 vs 30–39	-0.30	0.11	0.027	[-0.57, -0.03]	Yes
Under 30 vs 40–49	-0.50	0.12	0.001	[-0.79, -0.21]	Yes
Under 30 vs 50 and above	-0.20	0.13	0.158	[-0.50, 0.10]	No
30–39 vs 40–49	-0.20	0.10	0.146	[-0.45, 0.06]	No
30–39 vs 50 and above	0.10	0.12	0.694	[-0.22, 0.42]	No
40–49 vs 50 and above	0.30	0.11	0.021	[0.04, 0.56]	Yes

The table gives post hoc comparisons of age group awareness. It shows that journalists below 30 years of age have a significantly less awareness than the age groups 30-39 (p = 0.027) and 40-49 (p=0.001). It also indicates that significantly higher awareness is reported by the 40-49 group than among those aged 50 and above (p = 0.021). No significant differences could be found between the other age groups. This indicates that mid-career journalists between 40 and 49 years probably have the highest levels of awareness about environmental law.

Figure-4
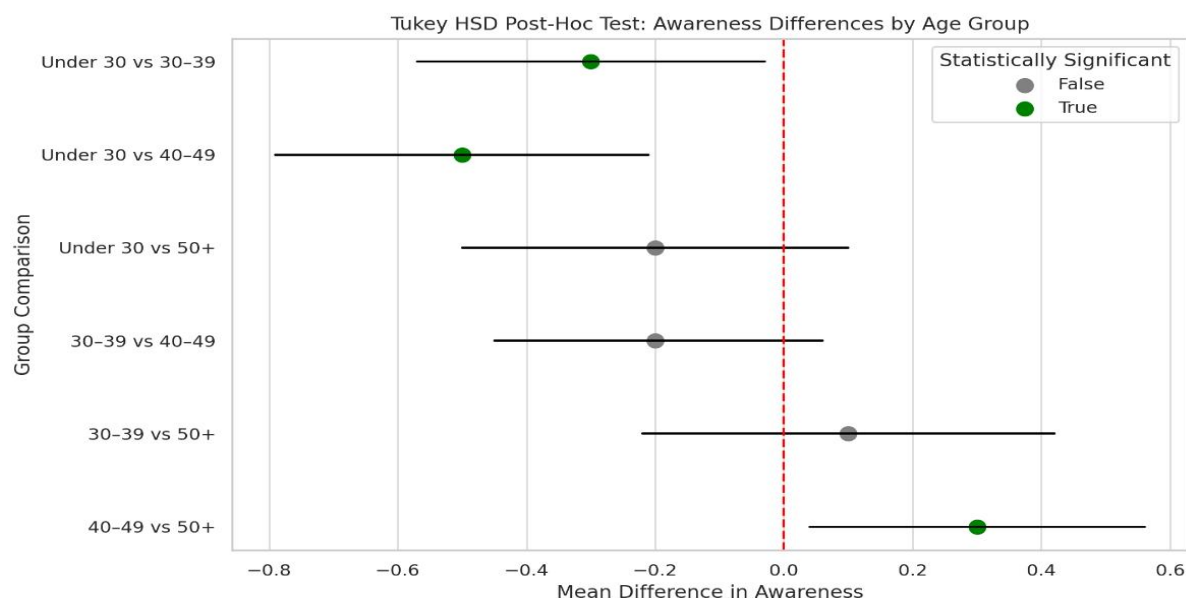
Tukey's HSD post-hoc test shows that there is a significant difference among age groups in awareness of environmental laws. Journalists under the age of thirty showed much lower awareness scores than journalists aged thirty to thirty-nine and forty to forty-nine, which indicates that early-on career journalists might not have been exposed much to environmental legislation. Then those aged forty to forty-nine appear to be much more aware than those fifty and above, which suggests that awareness peaks

somewhere in the mid-career years. No statistically significant differences were found among the other groups. Therefore, age and experience appear to play a significant role in the knowledge of environmental law by journalists.

Summary of the ANOVA results across variables

A series of one-way ANOVA tests showed that several significant group differences exist among the journalists in Sindh. Age was found to have an impact on environmental law awareness [(F (3, 296) = 5.14, p < 0.01)] and perceived enforcement [(F (3, 296) = 4.76, p < 0.01)], where older journalists (46+) reported higher awareness and more positive perceptions than those in younger groups. Journalistic experience also had an impact on reporting challenges [(F (2, 297) = 4.87, p < 0.01)] ~ with early-career journalists facing more challenges than their senior counterparts.

Media platform differences emerged in perceived enforcement [(F (2, 297) = 4.87, p = 0.008)], where digital journalists reported lower enforcement perceptions than those in print and television. Media ownership served as an influencing factor in respect of advocacy [(F (1, 298) = 6.32, p = 0.012)], with private media journalists engaging more in advocacy than those in public institutions.

The education level significantly influenced perceptions of effect on public participation [(F (2, 297) = 5.32, p = 0.005)], with the postgraduates outscoring others on that measure. Media type also engendered a perception about influence on policies [(F (2, 297) = 4.87, p = 0.009)], whereby journalists from digital media perceived higher policy impact than those with traditional media outlets. All these findings suggest that demographic, professional, and institutional aspects are important in shaping the consequences of environmental journalism.

DISCUSSION OF RESULTS

This study offers critical insights into environmental journalism in Sindh: the knowledge of environmental laws that journalists possess and their perception regarding enforcement act positively toward advocacy behaviours, which supports H1 and H2. Legal literacy and trust in those mechanisms empower journalists to critical, policy-relevant reporting. However, H3 is also confirmed; political pressure, limitations by management, and therefore few obstacles that hamper the progress of investigative journalism. According to ANOVA results, younger journalists exhibit comparatively more awareness, which hints at generational shifts in engagement with environmental issues. There is also an optimistic link between advocacy and public engagement, with journalism seen as a promoter of awareness and policy discussion. Overall, the findings show how institutional knowledge, and structural conditions shape the communication profession's impact on environmental sustainability.

CONCLUSIONS

The present investigation delves into the realities of environmental journalists in Sindh, Pakistan, with respect to how legal awareness, perceived enforcement, and structural barriers influence their advocacy reporting. It finds that journalists who are more aware of the legalities, as well as feel more trust in the enforcement, are more likely to advocate in their coverage while institutional and political hurdles may restrict or hinder analyses by investigative journalists. The differences in ages indicate that younger journalists are getting more involved in the environment than older journalists. Thus, the advocacy would also cover greater public and policy engagement, emphasizing the role of media in raising up environmental governance. It calls for training in better legal matters, editorial independence, and

collaborative support for improving environmental journalism, and future research should look at expanding the stakeholder perspective.

POLICY IMPLICATIONS

It touches the urgent need to bring policy changes to facilitate such an institutional environment in which environmental journalists in Sindh would operate freely and independently. Media policy should include components of legal literacy, reporting skill, and protection from any political interference. Improved regulatory safeguards and increased interaction between media, NGOs, and state institutions would give rise to greater transparency, access to information, and better environmental governance. Structural empowerment of journalists for public awareness and more significant advances of sustainability would be on the way.

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