

An Empirical Study on the Role of Alternative Dispute Resolution in Resolving Environmental Disputes

Shrieja S¹ and Mr. S. Abraham²

¹BBALLB (Hons) 5th Year Student, ²Assistant Professor
Hindustan School of Law, Hindustan Institute of Technology and Science, Chennai

Abstract—Alternative dispute resolution (ADR) plays an important role in resolving environmental disputes. Environmental disputes can arise in a variety of contexts, such as land use conflicts, pollution issues, and natural resource management disputes, among others. In environmental disputes, ADR can be particularly effective in resolving disputes involving multiple parties, such as land use disputes or natural resource management issues. This aim of the study is to provide empirical insights into the effectiveness of ADR in addressing environmental disputes in India, contributing to the broader discourse on conflict resolution and environmental governance. A convenient sampling was used in the research. The method was employed to collect data from 204 respondents. The collected data was analysed using SPSS. ADR can be less expensive than going to court, as it can often be resolved through a single mediator or arbitrator rather than multiple attorneys and judges. The findings revealed that ADR provides a forum for these stakeholders to engage in collaborative problem-solving and find mutually beneficial solutions to environmental issues. From the results it is inferred that lack of transparency is the key challenge associated with using ADR in environmental disputes. Using ADR, parties can work together to reach a solution that benefits everyone, rather than engaging in a contentious legal battle that could damage relationships. In conclusion, the use of ADR can be an effective tool in resolving environmental disputes, and can help to promote a more sustainable and collaborative approach to resolving environmental issues.

Index Terms—Resolution, Parties, Environment, Disputes, Solution.

1. INTRODUCTION

Alternative Dispute Resolution (ADR) mechanisms have emerged as pivotal tools in resolving conflicts across various domains, including environmental disputes. In Tamil Nadu, a state with a diverse ecological profile and rapid industrial growth, ADR has gained prominence as a means to address environmental disputes efficiently and amicably. This empirical study delves into the role of ADR in resolving environmental disputes in Tamil Nadu, tracing its evolution, exploring governmental initiatives, identifying influencing factors, analyzing emerging trends, and comparing its application with other states in India.

This study aims to provide empirical insights into the effectiveness of ADR in addressing environmental disputes in India, contributing to the broader discourse on conflict resolution and environmental governance.

Environmental disputes have evolved back to traditional practices of mediation and arbitration prevalent in local communities. However, the formal recognition of ADR mechanisms gained momentum with the enactment of the Arbitration and Conciliation Act, 1996, which aligned with the principles of the UNCITRAL Model Law. Over time, the need for specialized approaches in environmental matters became evident due to the increasing complexity of ecological issues. India, with its industrial zones, coastal belt, and significant biodiversity, witnessed a surge in environmental conflicts, which necessitated the adoption of ADR to resolve disputes without lengthy litigation processes.

The government initiatives in India are proactive in promoting ADR mechanisms for environmental dispute resolution. It applies principles of sustainable development, precautionary principle, and polluter pays principle to resolve disputes. The National Green Tribunal (NGT) was established under the National Green Tribunal Act, 2010, to handle environmental cases efficiently using principles of natural justice and ADR. Notable initiatives include the State Environmental Impact Assessment Authority (SEIAA) established under the Environment Protection Act, 1986, which facilitates discussions and resolves conflicts arising from project approvals. Environmental Lok Adalats have also been organized to address disputes related to pollution, land use, and ecological preservation.

Several factors influence the effectiveness of ADR in resolving environmental disputes in India. Limited understanding of ADR processes among the public often hinders its adoption. The intricate legal framework governing environmental issues necessitates specialized expertise in ADR proceedings. Effective resolution requires the participation of diverse stakeholders, including industries, NGOs, and local communities. Courts in India play a crucial role in endorsing ADR mechanisms as viable alternatives to litigation.

Some emerging trends include the integration of technology, such as online mediation platforms, which has streamlined ADR processes in environmental disputes. Stakeholder collaboration, including public-private partnerships, has gained prominence in resolving large-scale environmental issues. ADR mechanisms are increasingly being utilized to address potential disputes during the planning stages of industrial and infrastructural projects.

Environmental disputes involve conflicts over land use, pollution, conservation, and sustainability. While comparing India with other countries, India has a specialized judicial body, the NGT, which follows quasi-judicial ADR principles such as mediation and negotiation. The Supreme Court and High Courts often encourage mediation before litigation. The Environment Protection Act, 1986 and the Arbitration and Conciliation Act, 1996 provide a legal basis for resolving environmental disputes through ADR. The United States encourages ADR mechanisms like mediation and negotiated rulemaking to resolve disputes, and has an Environmental Dispute Resolution Fund that finances ADR processes for resolving disputes between industries, communities, and governments.

1.2 Literature Review

1. Choquette and Fraser (1983) analysed the role and viability of Alternative Dispute Resolution (ADR) in resolving environmental disputes, particularly as an alternative to traditional litigation. The study

involved an analytical review of early ADR applications in environmental conflict resolution. ADR techniques such as mediation and arbitration were found to be particularly effective in dealing with complex, multi-party environmental issues, often achieving resolutions that were not possible through formal court proceedings. ADR was identified as a promising and efficient alternative to litigation in environmental contexts due to its adaptability, speed, and ability to resolve highly technical and emotionally charged disputes.

2. Napier (1995) aimed to evaluate the use and effectiveness of ADR in environmental disputes handled by the Environmental Protection Agency (EPA). An empirical study of EPA cases involving ADR processes, focusing on usage rate and stakeholder satisfaction, found that ADR was employed in approximately 20% of environmental disputes handled by the EPA. It was found to be timely, cost-effective, and well-received by involved parties. ADR emerged as an effective and efficient tool in the environmental regulatory framework, improving satisfaction among stakeholders while reducing costs and delays.
3. Purdy (2000) investigated the effectiveness of ADR in resolving environmental disputes involving multiple stakeholders, complex issues, and uncertainty. The methodology involved an empirical study based on 250 environmental dispute cases. ADR was particularly useful in multi-party disputes, especially where technical complexity and scientific uncertainty were prominent. ADR offers substantial benefits in managing stakeholder interests and navigating technical complexities, making it highly suitable for environmental conflict resolution.
4. John Barkai and Richard J. Lazarus (2001) aimed to provide a practical guide to various ADR techniques for resolving environmental disputes through case study analysis of multiple ADR applications. The authors detailed the advantages and disadvantages of different ADR techniques, showing overall positive outcomes when appropriately applied. ADR methods generally lead to constructive, successful resolutions in environmental disputes when well-executed.
5. O'Leary and Bingham (2001) examined the effectiveness of negotiation as a method of ADR in natural resource management through case study analysis of environmental negotiations. It was found that negotiation promoted collaboration, relationship-building, and creative problem-solving in complex environmental matters. Negotiation was identified as an effective ADR tool in environmental management, fostering mutually beneficial solutions and stakeholder cooperation.
6. Sohn and Ba (2001) evaluated the use of arbitration in resolving environmental contamination disputes through empirical analysis of arbitration cases related to environmental harm. Arbitration enabled parties to bypass prolonged litigation and achieve high levels of satisfaction with both the process and outcomes. Arbitration is a credible and effective alternative to court proceedings in environmental disputes, offering speed, privacy, and satisfaction.
7. MacNaughton and Martin (2002) assessed the effectiveness of mediation in resolving environmental disputes using a doctrinal research approach analyzing mediation outcomes. An 80% success rate was reported in cases referred to mediation, indicating strong potential for reaching mutually acceptable solutions. Mediation was found to be a highly effective ADR method in environmental conflicts due to its emphasis on cooperation and flexibility.

8. Alogna et al. (2002) assessed the increasing use and impact of ADR in technically complex environmental disputes using qualitative and observational data from the American Bar Association. ADR is seen as a collaborative and efficient mechanism, especially suitable for disputes with complex scientific or technical components, and is increasingly becoming the preferred approach in environmental law.
9. Stephen J. Colarelli et al. (2005) provided a comprehensive overview of various ADR methods—negotiation, mediation, and arbitration—in environmental contexts through literature reviews and analysis of ADR applications. ADR methods were found to be cost-effective, help in preserving relationships, and allow for flexible and tailored solutions, offering distinct advantages over litigation in environmental matters.
10. J. Martin Burke and Katherine J. Daniels (2006) evaluated the role and challenges of ADR in multi-party environmental disputes through a qualitative study of ADR frameworks. ADR was found to provide more creative and flexible solutions compared to traditional litigation but also faced difficulties in managing complex, multi-stakeholder dynamics.
11. Mark A. Behrens and Rochelle D. Johnson (2008) evaluated the success of mediation and arbitration in resolving environmental disputes in the U.S. through qualitative case study analysis. Both mediation and arbitration were found to be effective in addressing environmental issues, with stakeholders expressing satisfaction in terms of process and outcomes.
12. Fisher and Ury (2012) explored the application of ADR in international environmental treaties, focusing on how principled negotiation can foster resolution through case study analysis. ADR, especially principled negotiation, successfully facilitated mutual understanding and common-interest solutions in international environmental conflicts.
13. Kenney and Williams (2015) assessed the effectiveness of ADR mechanisms in environmental and natural resource disputes through case study analysis. ADR was found to offer several benefits over litigation, such as cost-efficiency, flexibility, and preservation of relationships.
14. Setianto and Widianarko (2015) analyzed the global recognition of ADR in environmental dispute resolution through a comprehensive literature review conducted with the International Bar Association. ADR is increasingly recognized worldwide as a viable and effective tool for resolving complex environmental issues.
15. Tyagi (2016) evaluated the effectiveness of arbitration in resolving environmental contamination disputes through an empirical study based on analysis of real arbitration cases. Parties involved reported high satisfaction with arbitration outcomes, indicating effectiveness and acceptance.
16. Gazzini (2018) assessed the overall success of ADR in resolving environmental conflicts with a focus on waste-related disputes using non-doctrinal research based on literature and case studies. ADR is generally effective in environmental matters but is less effective in waste-related disputes due to complexity and regulatory gaps.
17. Bingham (2018) reviewed ADR methods used in environmental dispute resolution in India through qualitative case study analysis. ADR provides flexibility, speed, and a choice of process, making it attractive for resolving disputes compared to litigation.

18. Andrew (2018) evaluated the role of mediation in resolving natural resource management disputes, such as water rights and land use, through qualitative review of international treaties and cases. Mediation was found to be particularly effective, with high satisfaction levels reported by involved parties.
19. Qin (2019) explored how ADR mechanisms can help address delays in environmental justice using a qualitative and analytical approach. ADR mechanisms enhance the efficiency and quality of justice delivery in environmental matters, especially in disputes involving government, corporations, and environmental groups.
20. Mishra, A., & Tripathi, P. (2022) examined the effectiveness of mediation in resolving environmental disputes in India through qualitative analysis of case studies. Mediation was found to help settle disputes between government bodies, corporate entities, and environmental groups, often leading to mutual agreement.

1.3 Methodology

The primary source of data was obtained by conducting an empirical study seeking responses from the general public in and around Chennai. The data was collected through questionnaires and also relied on secondary sources of data such as books, journals, e-sources, articles and newspapers. The research methodology used here is based on empirical research. The sampling size of the paper is 204. SPSS software is used for analysis purposes. The sampling frame is that the respondents belong to all kinds of age groups. The independent variables are age, gender, education qualification, and occupation. The dependent variable is the factors affecting ADR effectiveness in environmental dispute resolution. The research tools used are graphs, percentage analysis, and chi-square tests.

2. ANALYSIS

Figure 1

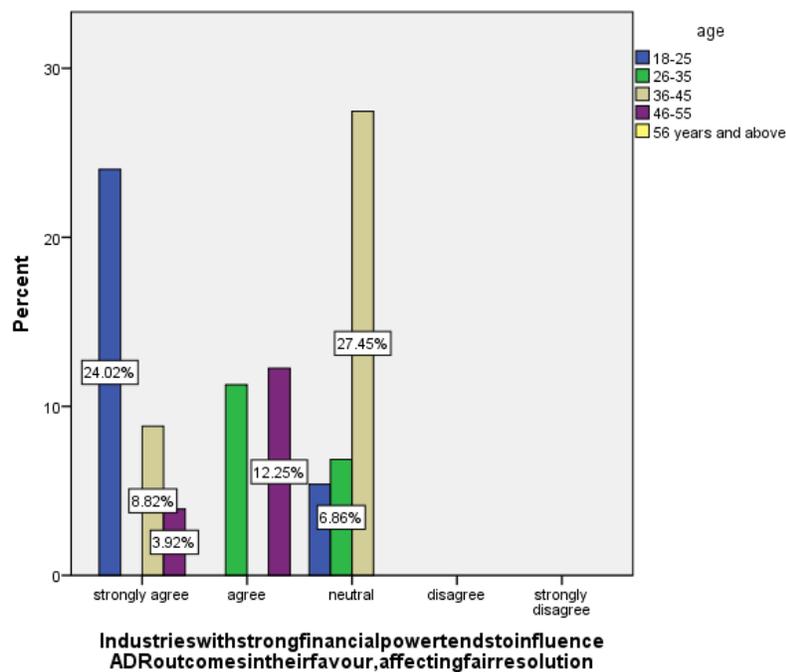


Figure 1: Comparison between age and industries with strong financial power tends to influence ADR outcomes in their favour, affecting fair resolution.

Figure 2

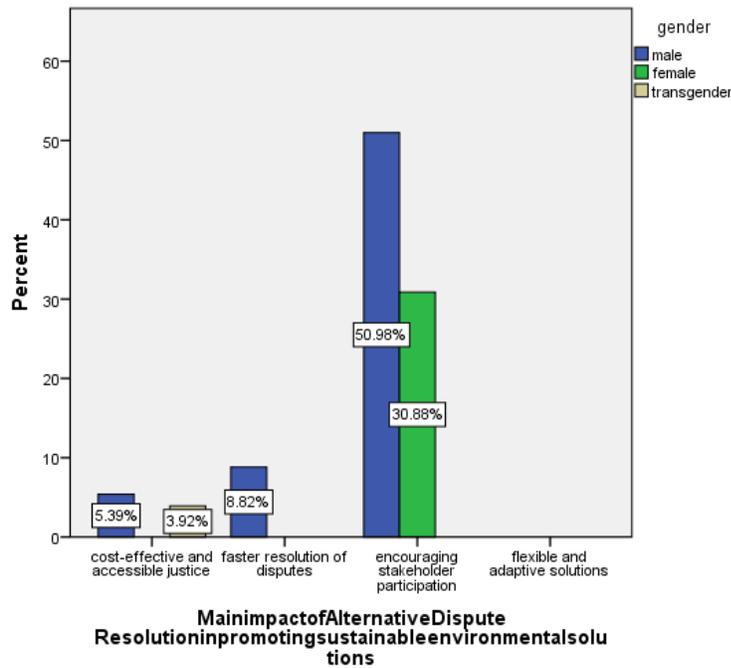


Figure 2: Comparison between gender and main impact of ADR resolution in promoting sustainable environmental solutions.

Figure 3

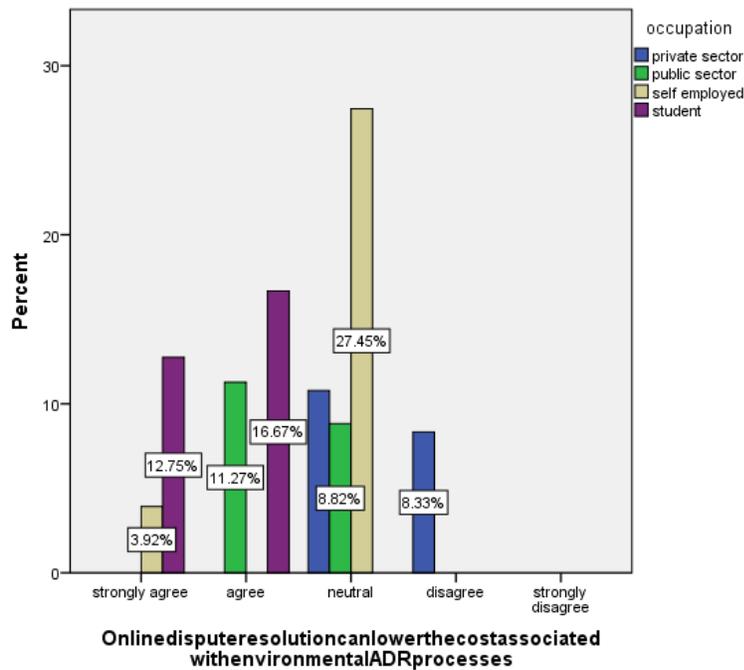


Figure 3: Comparison between occupation and online dispute resolution can lower the cost associated with environmental ADR processes.

Figure 4

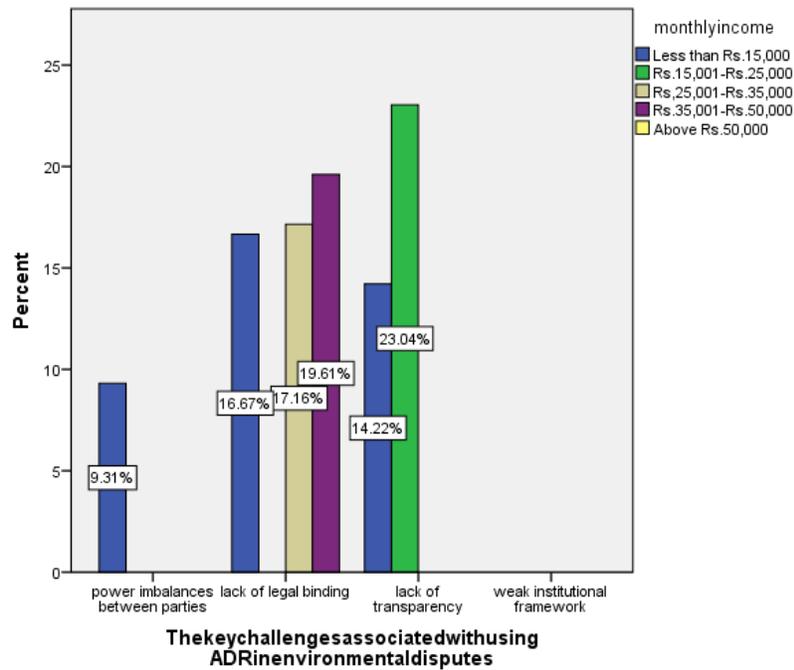


Figure 4: Comparison between monthly income and key challenges associated with using ADR in environmental disputes.

Figure 5

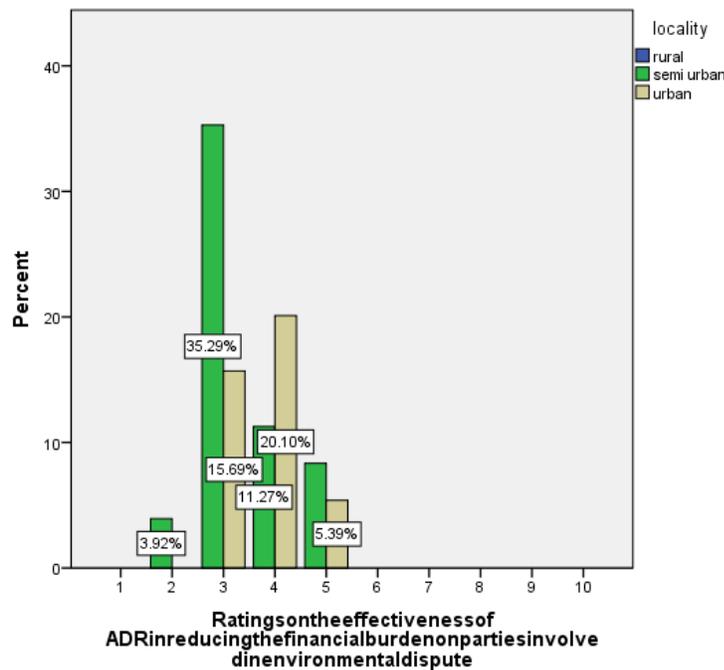


Figure 5: Comparison between locality and ratings on the effectiveness of ADR in reducing the financial burden on parties involved in environmental disputes.

Figure 6

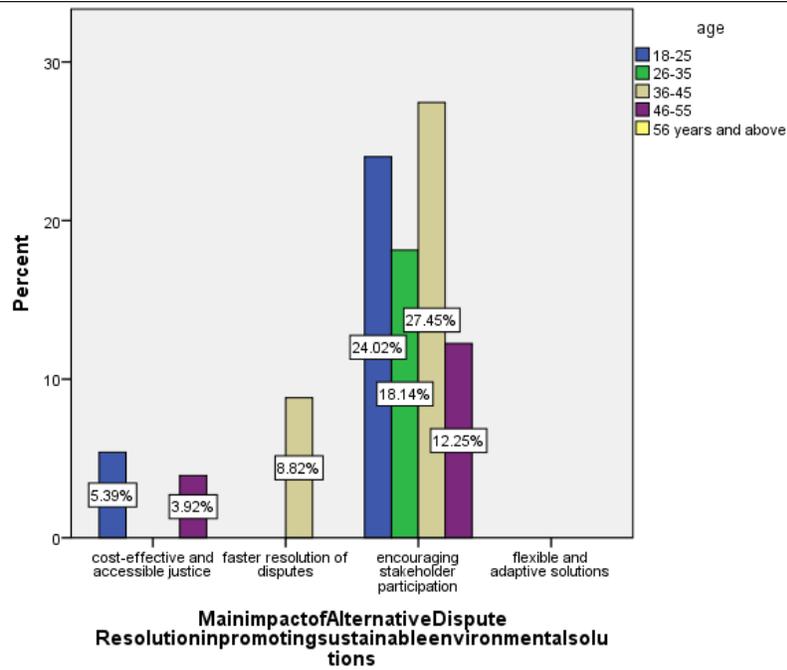


Figure 6: Comparison between age and main impact of ADR resolution in promoting sustainable environmental solutions.

Figure 7

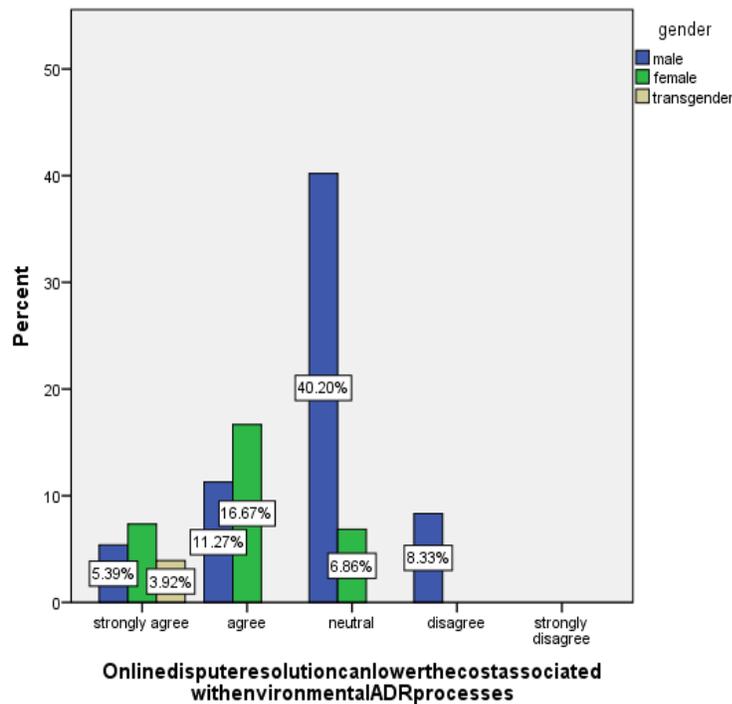


Figure 7: Comparison between gender and online dispute resolution can lower the cost associated with environmental ADR processes.

Figure 8

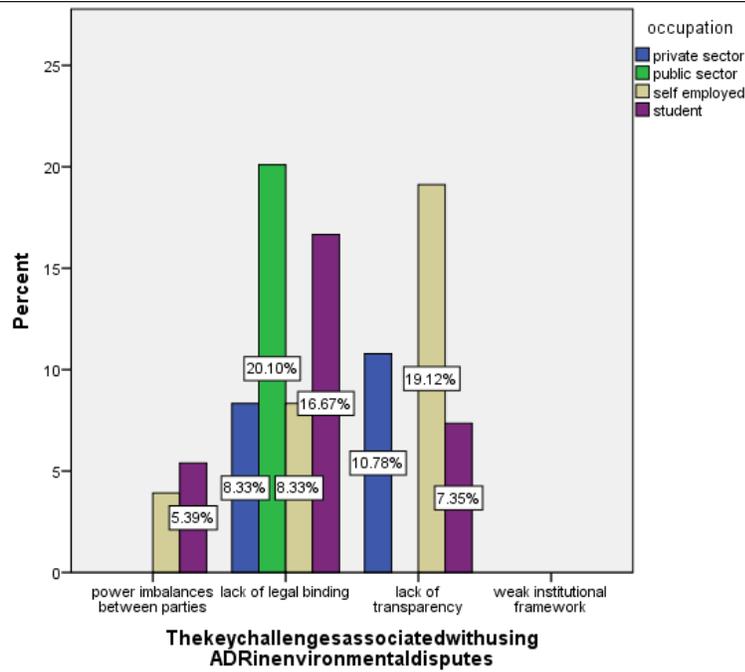


Figure 8: Comparison between occupation and the key challenges associated with using ADR in environmental disputes.

Figure 9

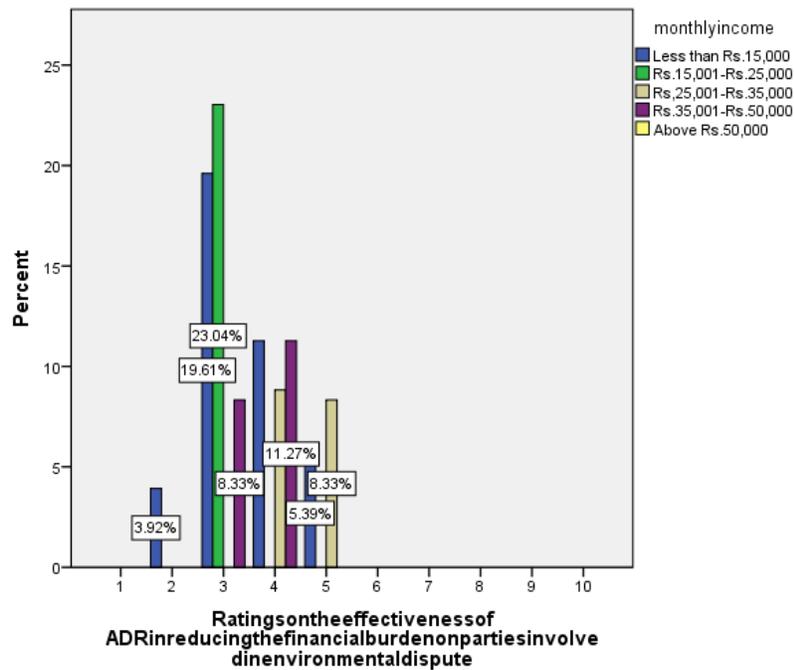


Figure 9: Comparison between monthly income and effectiveness of ADR in reducing the financial burden on parties involved in environmental disputes.

Figure 10

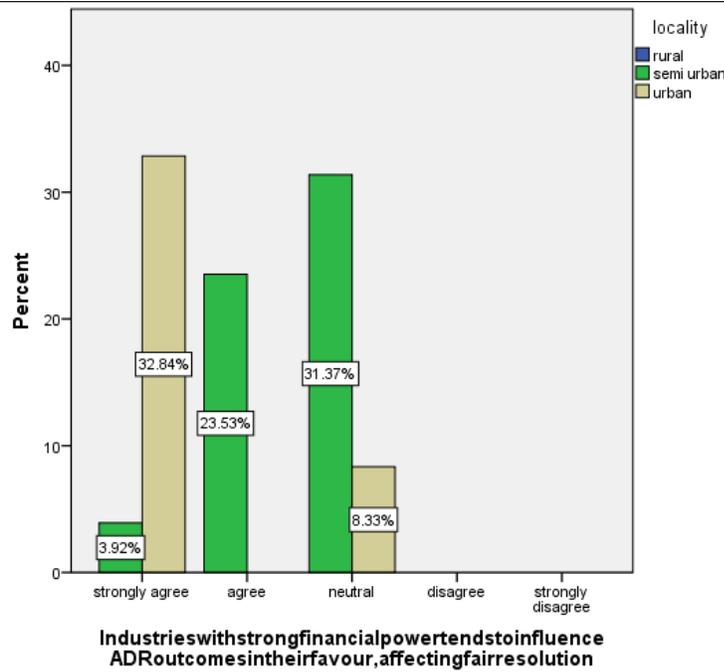


Figure 10: Comparison between locality and industries with strong financial power tends to influence ADR outcomes in their favour, affecting fair resolution.

Figure 11

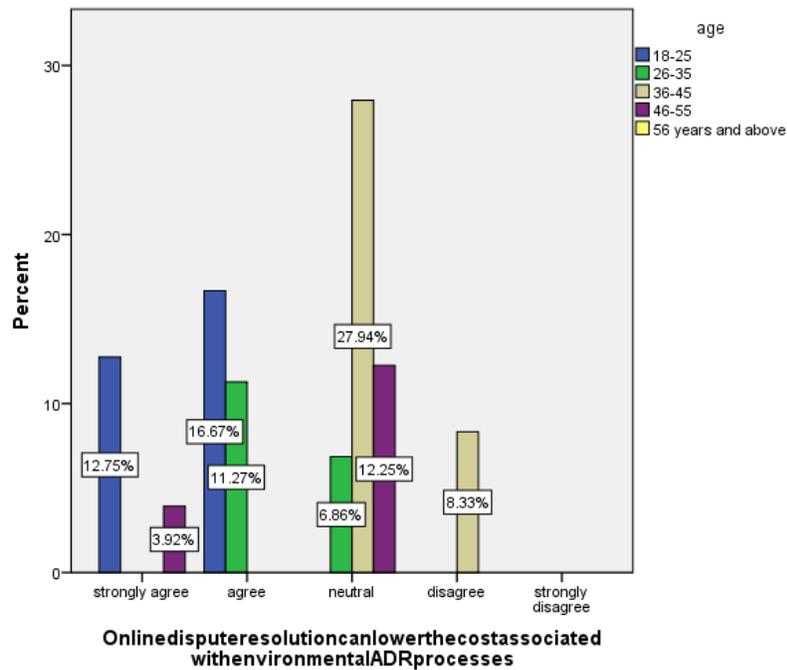


Figure 11: Comparison between age and online dispute resolution can lower the cost associated with environmental ADR processes.

Figure 12

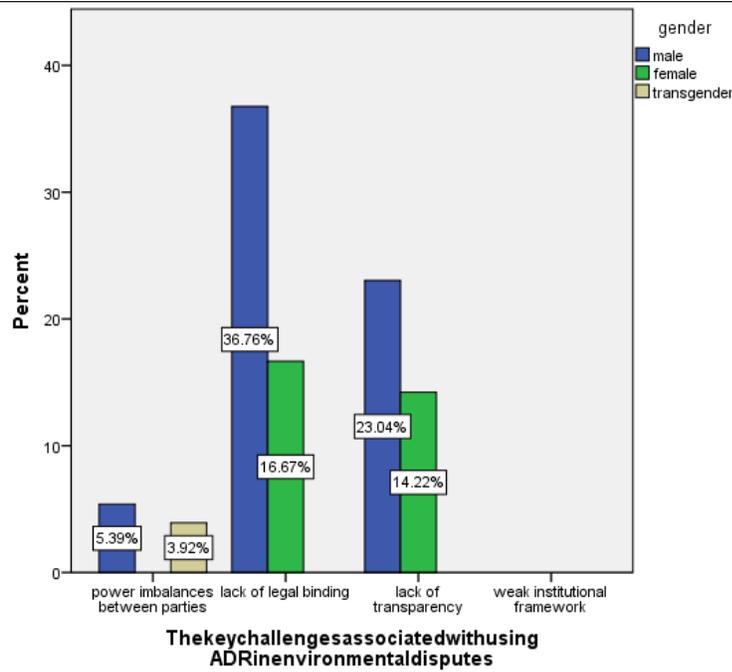


Figure 12: Association between gender and key challenges associated with using ADR in environmental disputes.

Figure 13

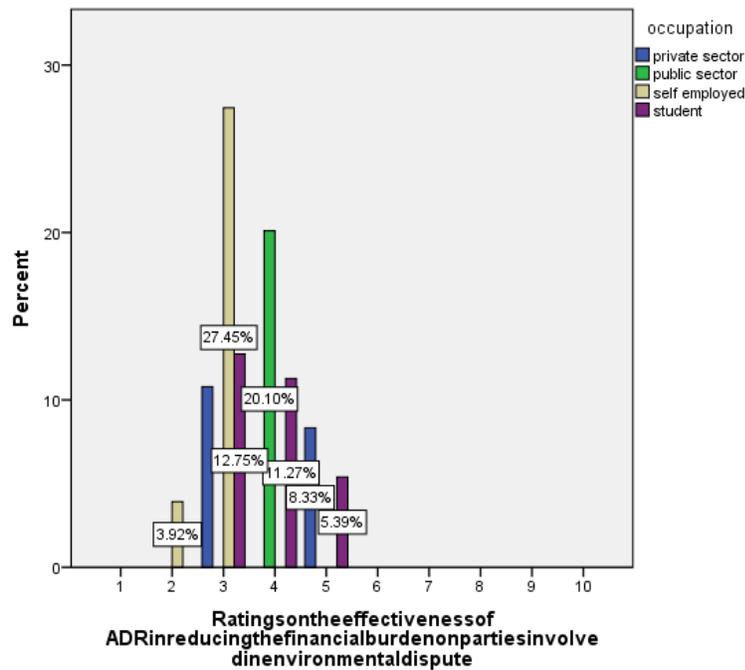


Figure 13: Comparison between occupation and ratings on the effectiveness of ADR in reducing the financial burden on parties involved in environmental disputes.

Figure 14

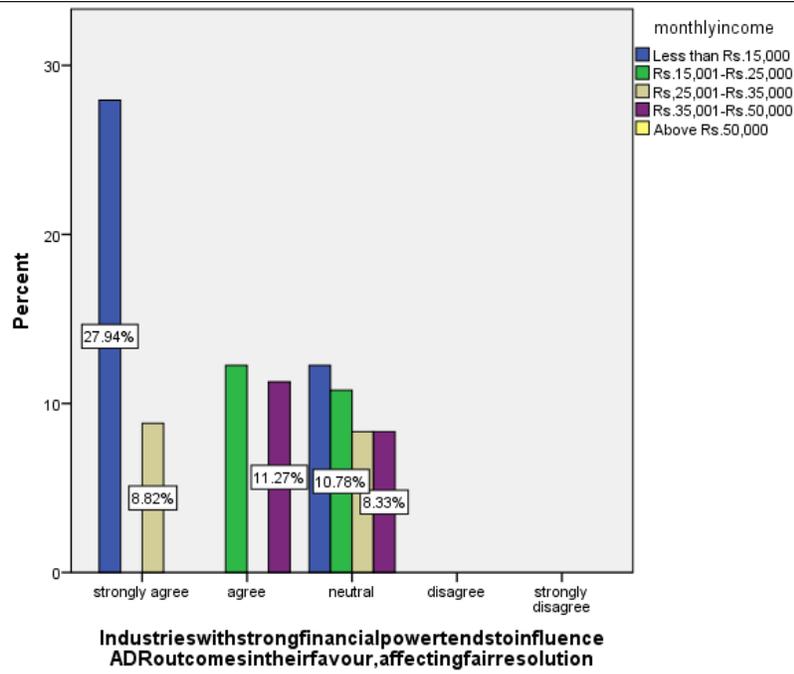


Figure 14: Comparison between monthly income and industries with strong financial power tends to influence ADR outcomes in their favour, affecting fair resolution.

Figure 15

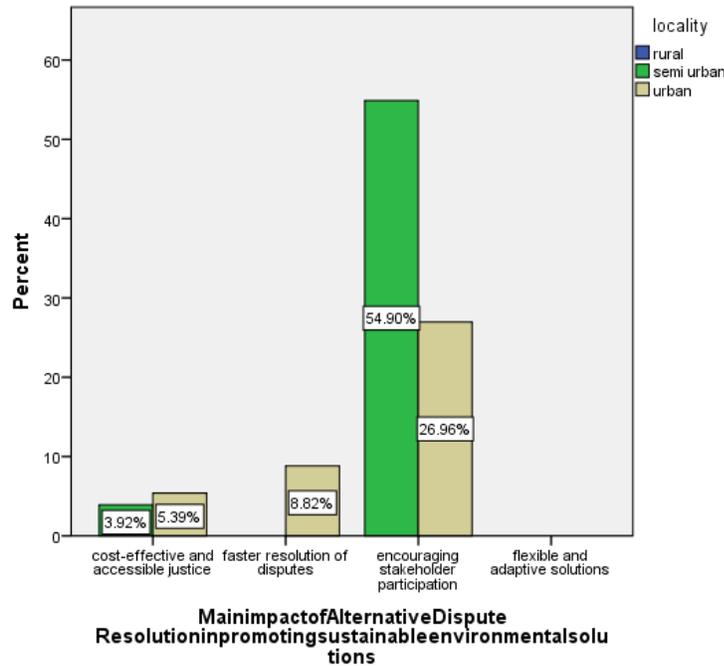


Figure 15: Comparison between locality and main impact of ADR resolution in promoting sustainable environmental solutions.

Figure 16

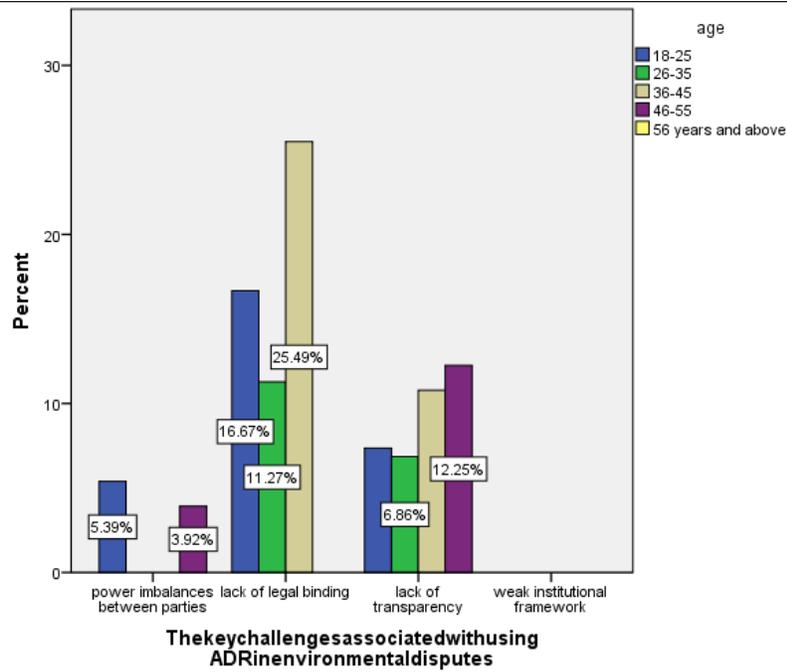


Figure 16: Comparison between age and the key challenges associated with using ADR in environmental disputes.

Table 1: Chi-Square Test — Age and ADR Effectiveness

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
age * Ratings on the effectiveness of ADR in reducing the financial burden on parties involved in environmental dispute	204	100.0%	0	0.0%	204	100.0%

age *
Ratings on the effectiveness of ADR in reducing the financial burden on parties involved in environmental dispute Crosstabulation

Count

		Ratings on the effectiveness of ADR in reducing the financial burden on parties involved in environmental dispute				Total
		2	3	4	5	
age	18-25	0	26	23	11	60
	26-35	0	14	23	0	37
	36-45	0	39	18	17	74
	46-55	8	25	0	0	33
Total		8	104	64	28	204

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	86.192 ^a	9	.000
Likelihood Ratio	90.137	9	.000
Linear-by-Linear Association	19.779	1	.000
N of Valid Cases	204		

a. 5 cells (31.3%) have expected count less than 5. The minimum expected count is 1.29.

Table 1: The chi-square test shows the significant association between age and ratings on the effectiveness of ADR in reducing the financial burden on parties involved in environmental disputes.

Table 2: Chi-Square Test — Gender and Key Challenges

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
gender * ThekeychallengesassociatedwithusingADRinenvironmentaldisputes	204	100.0%	0	0.0%	204	100.0%

**gender * ThekeychallengesassociatedwithusingADRinenvironmentaldisputes
Crosstabulation**

Count

		ThekeychallengesassociatedwithusingADRinenvironmentaldisputes			Total
		power imbalances between parties	lack of legal binding	lack of transparency	
gender	male	11	75	47	133
	female	0	34	29	63
	transgender	8	0	0	8
Total		19	109	76	204

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	85.573 ^a	4	.000
Likelihood Ratio	51.438	4	.000
Linear-by-Linear Association	3.282	1	.070
N of Valid Cases	204		

a. 3 cells (33.3%) have expected count less than 5. The minimum expected count is .75.

Table 2: The chi-square test shows the significant association between gender and key challenges associated with using ADR in environmental disputes.

Table 3: Chi-Square Test — Occupation and Impact of ADR

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
occupation * Main impact of Alternative Dispute Resolution in promoting sustainable environmental solutions	204	100.0%	0	0.0%	204	100.0%

occupation *
Main impact of Alternative Dispute Resolution in promoting sustainable environmental solutions
Crosstabulation

Count

		Main impact of Alternative Dispute Resolution in promoting sustainable environmental solutions			Total
		cost-effective and accessible justice	faster resolution of disputes	encouraging stakeholder participation	
occupation	private sector	0	0	39	39
	public sector	0	18	23	41
	self employed	8	0	56	64
	student	11	0	49	60
Total		19	18	167	204

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	90.091 ^a	6	.000
Likelihood Ratio	82.818	6	.000
Linear-by-Linear Association	4.389	1	.036
N of Valid Cases	204		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is 3.44.

Table 3: The chi-square test shows the significant association between occupation and main impact of ADR resolution in promoting sustainable environmental solutions.

Table 4: Chi-Square Test — Monthly Income and Financial Power Influence

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
monthly income * Industries with strong financial power tend to influence ADR outcomes in their favour, affecting fair resolution	204	100.0%	0	0.0%	204	100.0%

monthlyincome * IndustrieswithstrongfinancialpowertendstoinfluenceADRoutcomesintheirfavour, affectingfairresolution Crosstabulation

Count		IndustrieswithstrongfinancialpowertendstoinfluenceADRoutcomesintheirfavour, affectingfairresolution			Total
		strongly agree	agree	neutral	
monthlyincome	Less than Rs.15,000	57	0	25	82
	Rs.15,001-Rs.25,000	0	25	22	47
	Rs.25,001-Rs.35,000	18	0	17	35
	Rs.35,001-Rs.50,000	0	23	17	40
Total		75	48	81	204

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	125.797 ^a	6	.000
Likelihood Ratio	169.779	6	.000
Linear-by-Linear Association	19.660	1	.000
N of Valid Cases	204		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.24.

Table 4: The chi-square test shows the significant association between monthly income and industries with strong financial power tends to influence ADR outcomes in their favour, affecting fair resolution.

3. RESULT

In Figure 1, the results revealed that 27.45% of the respondents between the age group of 36–45 years opted neutral that industries with strong financial power tends to influence ADR outcomes in their favour, affecting fair resolution. In Figure 2, the results revealed that 50.98% of the male respondents opted encouraging stakeholder participation is the main impact of ADR resolution in promoting sustainable environmental solutions. In Figure 3, the results revealed that 27.45% of the self-employed respondents opted neutral that online dispute resolution can lower the cost associated with environmental ADR processes. In Figure 4, the results revealed that 23.04% of the respondents with monthly income of Rs. 15,001–Rs. 25,000 opted lack of transparency is the key challenge associated with using ADR in environmental disputes. In Figure 5, the results revealed that 35.29% of the semi-urban respondents rated 3 on the scale of 10 on the effectiveness of ADR in reducing the financial burden on parties involved in environmental disputes.

In Figure 6, 27.45% of respondents aged 36–45 years opted encouraging stakeholder participation as the main impact of ADR in promoting sustainable environmental solutions. In Figure 7, 40.20% of male respondents opted neutral that online dispute resolution can lower the cost associated with environmental ADR processes. In Figure 8, 20.10% of public sector respondents opted lack of legal binding as one of the key challenges associated with using ADR in environmental disputes. In Figure 9, 23.04% of respondents with monthly income of Rs. 15,001–Rs. 25,000 rated 3 on the scale of 10 on the effectiveness of ADR in reducing the financial burden. In Figure 10, 32.84% of urban respondents strongly agreed that

industries with strong financial power tend to influence ADR outcomes in their favour, affecting fair resolution.

In Figure 11, 27.94% of respondents aged 36–45 years opted neutral that online dispute resolution can lower the cost associated with environmental ADR processes. In Figure 12, 36.76% of male respondents opted lack of legal binding as one of the key challenges associated with using ADR in environmental disputes. In Figure 13, 27.45% of self-employed respondents rated 3 on the scale of 10 on the effectiveness of ADR in reducing the financial burden. In Figure 14, 27.94% of respondents with monthly income less than Rs. 15,000 strongly agreed that industries with strong financial power influence ADR outcomes in their favour. In Figure 15, 54.90% of semi-urban respondents opted encouraging stakeholder participation as the main impact of ADR resolution in promoting sustainable environmental solutions. In Figure 16, 25.49% of respondents aged 36–45 years opted lack of legal binding as one of the key challenges associated with using ADR in environmental disputes.

In Table 1, the P value is less than 0.05%, and the chi-square test shows a significant association between age and ratings on the effectiveness of ADR in reducing the financial burden on parties involved in environmental disputes. In Table 2, the P value is less than 0.05%, and the chi-square test shows a significant association between gender and key challenges associated with using ADR in environmental disputes. In Table 3, the P value is less than 0.05%, and the chi-square test shows a significant association between occupation and main impact of ADR resolution in promoting sustainable environmental solutions. In Table 4, the P value is less than 0.05%, and the chi-square test shows a significant association between monthly income and industries with strong financial power tending to influence ADR outcomes in their favour.

4. DISCUSSION

From Figure 1, the results indicate that respondents aged 36–45 years opted for a neutral stance regarding the statement that industries with strong financial power influence ADR outcomes in their favor. This suggests that a significant portion of respondents in this age group neither strongly agree nor disagree, indicating a potential uncertainty or mixed perception about the influence of financial power in ADR processes. From Figure 2, a notable number of male respondents identified “encouraging stakeholder participation” as the main impact of ADR in promoting sustainable environmental solutions, suggesting that men largely perceive ADR as an inclusive mechanism that fosters dialogue among all affected parties.

From Figure 3, the data shows that self-employed respondents opted for a neutral stance on whether online dispute resolution (ODR) lowers the cost associated with environmental ADR processes, possibly indicating a lack of strong conviction about ODR’s financial benefits. From Figure 4, respondents with a monthly income of Rs. 15,001–Rs. 25,000 identified “lack of transparency” as a key challenge in using ADR for environmental disputes, suggesting that individuals in this income bracket are particularly concerned about the openness of ADR proceedings. From Figure 5, the majority of semi-urban respondents rated 3 out of 10 on the effectiveness of ADR in reducing the financial burden, suggesting skepticism about the cost-effectiveness of ADR.

From Figure 6, another group of respondents aged 36–45 years identified “encouraging stakeholder participation” as the main impact of ADR resolution in promoting sustainable environmental solutions, reiterating the notion that ADR is widely perceived as a participatory approach. From Figure 7, male

respondents opted for a neutral stance on whether ODR lowers costs in environmental ADR, suggesting that while many men recognize the potential for cost savings through ODR, they may also be aware of challenges such as digital literacy barriers and internet accessibility. From Figure 8, public sector respondents identified “lack of legal binding” as a key challenge in using ADR for environmental disputes, indicating that government employees and officials view ADR as a process that lacks the enforceability of court rulings. This highlights the need for stronger legal frameworks to ensure that ADR outcomes are binding and enforceable.

From Figure 9, respondents earning Rs. 15,001–Rs. 25,000 rated 3 out of 10 on the effectiveness of ADR in reducing the financial burden, possibly due to indirect costs such as hiring experts, legal advisors, or mediators. From Figure 10, most urban respondents strongly agreed that industries with strong financial power influence ADR outcomes in their favor, suggesting greater exposure to cases where corporations use their financial resources to sway ADR outcomes, highlighting concerns about power imbalances in environmental dispute resolution. From Figure 11, respondents aged 36–45 years showed neutrality on whether ODR lowers the cost of environmental ADR, indicating uncertainty about ODR’s cost-saving potential or awareness that it may introduce other challenges.

From Figure 12, a major share of male respondents identified “lack of legal binding” as one of the key challenges in using ADR for environmental disputes, highlighting the need for strengthening legal frameworks to ensure ADR settlements are legally binding. From Figure 13, the majority of self-employed respondents rated 3 out of 10 on the effectiveness of ADR in reducing the financial burden, suggesting skepticism about ADR’s financial relief compared to other dispute resolution mechanisms. From Figure 14, a majority of respondents earning less than Rs. 15,000 strongly agreed that industries with strong financial power influence ADR outcomes, suggesting that lower-income respondents perceive ADR as susceptible to power imbalances. From Figure 15, a significant number of semi-urban respondents identified “encouraging stakeholder participation” as the main impact of ADR, recognizing it as an effective tool for inclusive decision-making. From Figure 16, respondents aged 36–45 years identified “lack of legal binding” as a key challenge, highlighting concerns within this age group regarding the enforceability of ADR outcomes.

From Table 1, the chi-square test shows a significant association between age and ratings on the effectiveness of ADR in reducing the financial burden, suggesting that perceptions of ADR’s cost-effectiveness vary significantly across different age groups due to generational differences in legal knowledge, dispute resolution preferences, or financial priorities. From Table 2, a significant association exists between gender and key challenges associated with using ADR in environmental disputes, with men and women perceiving ADR challenges differently. From Table 3, the chi-square test shows a significant association between occupation and the main impact of ADR in promoting sustainable environmental solutions, indicating that people in different occupations view ADR’s role differently. From Table 4, a significant association is found between monthly income and the belief that industries with strong financial power influence ADR outcomes, with lower-income respondents more likely to feel that corporations manipulate ADR outcomes to their advantage.

5. LIMITATIONS

Environmental disputes often involve powerful corporations or government entities versus marginalized communities or individuals. ADR may fail to provide an equitable platform if one party holds significantly

more resources, influence, or expertise. ADR outcomes typically do not establish legal precedents. This can be problematic in environmental disputes where setting a precedent could help guide future cases and influence environmental policy.

6. SUGGESTIONS

Alternative Dispute Resolution (ADR) can play a significant role in resolving environmental disputes by providing an alternative to litigation that is often faster, less expensive, and less adversarial. Mediation is a form of ADR in which a neutral third party helps the parties in a dispute negotiate a settlement. In environmental disputes, mediation can be particularly useful when there are complex scientific or technical issues that need to be resolved. Parties should be encouraged to engage mediators with domain expertise in environmental science and law to improve the quality of settlements. Stronger legal frameworks should be established to ensure ADR outcomes are binding and enforceable, addressing the concern of 'lack of legal binding' identified across multiple respondent groups. Online dispute resolution platforms should be promoted with adequate digital literacy support to lower costs and increase accessibility, particularly for semi-urban and lower-income communities.

7. CONCLUSION

Alternative Dispute Resolution (ADR) mechanisms have emerged as pivotal tools in resolving conflicts across various domains, including environmental disputes. Environmental disputes can be complex and involve a range of stakeholders, including government agencies, industry, communities, and non-governmental organizations. The major objective of this study was to assess the effectiveness of ADR in resolving environmental disputes and to understand the different types of ADR mechanisms available.

ADR provides a forum for these stakeholders to engage in collaborative problem-solving and find mutually beneficial solutions to environmental issues. Mediation, arbitration, and negotiation are commonly used ADR methods in environmental disputes. These methods can be less costly, less time-consuming, and less adversarial than traditional court litigation. They can also help to preserve relationships between the parties, which can be important in ongoing environmental management and decision-making.

ADR is not always appropriate for all environmental disputes. Some disputes may be too complex or have significant legal or regulatory implications that require court intervention. In addition, some parties may not be willing to engage in ADR or may have a power imbalance that makes it difficult to negotiate effectively. The appropriateness of ADR in environmental disputes should therefore be determined on a case-by-case basis, taking into consideration the nature of the dispute, the interests of the stakeholders involved, and the potential benefits and limitations of ADR. Parties should consider the nature and complexity of the dispute, the stakeholders involved, and their willingness to engage in ADR before deciding on the most appropriate approach to resolving their environmental dispute. In conclusion, ADR can be an effective way to resolve environmental disputes and can help promote a more sustainable and collaborative approach to environmental conflict resolution.

REFERENCES

1. Alogna, Ivano, et al. *Climate Change Litigation: Global Perspectives*. BRILL, 2021.

2. Andrew, John Stewart. *The Role of Alternative Dispute Resolution in Resolving Waste Management Conflicts: A Study of Cases in Ontario and Massachusetts*. National Library of Canada, 1999.
3. Bingham, Gail. *Resolving Environmental Disputes: A Decade of Experience*. 1986.
4. Choquette, Catherine, and Véronique Fraser. *Environmental Mediation: An International Survey*. Routledge, 2017.
5. Forester, John. "Resolving Environmental Regulatory Disputes." *Environmental Impact Assessment Review*, vol. 5, no. 4, 1985, pp. 383–88. [https://doi.org/10.1016/0195-9255\(85\)90033-2](https://doi.org/10.1016/0195-9255(85)90033-2)
6. Gazzini, Isabelle. *Cultural Property Disputes: The Role of Arbitration in Resolving Non Contractual Disputes*. 2004. <https://doi.org/10.1163/9789004478633>
7. Kariuki, Francis, and Vianney Sebayiga. "Evaluating the Role of ADR Mechanisms in Resolving Climate Change Disputes." *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4257643>
8. MacNaughton, Ann L., and Jay G. Martin. *Environmental Dispute Resolution: An Anthology of Practical Solutions*. American Bar Association, 2002.
9. "Mediation and Its Contribution to Resolving Environmental Disputes." *Resolving Environmental Disputes*, 2013, pp. 94–117. <https://doi.org/10.4324/9781849772372-14>
10. Napier, Christopher. *Environmental Conflict Resolution*. Wm Gaunt & Sons, 1998.
11. O'Leary, Rosemary, and Lisa B. Bingham. *The Promise and Performance of Environmental Conflict Resolution*. Resources for the Future, 2003.
12. Olokooba, Saka Muhammed. "Resolving Tax Disputes Through the Alternative Dispute Resolution (ADR) Mechanisms." *Nigerian Taxation*, 2019, pp. 141–146. https://doi.org/10.1007/978-981-13-2607-3_12
13. Pigeon, Nanci R. *The Use of Alternative Dispute Resolution Techniques in United States Air Force Environmental Conflicts*. 2005.
14. Purdy, Jill M. "The Role of Power in Collaborative Governance." *The Challenges of Collaboration in Environmental Governance*, pp. 246–264. <https://doi.org/10.4337/9781785360411.00021>
15. Qin, Huaping. "Beyond Litigation: The Use of ADR in Resolving Disputes Between Air Carriers and Passengers: China's Perspective." *Air and Space Law*, vol. 47, no. 3, 2022, pp. 347–374. <https://doi.org/10.54648/aila2022019>
16. Setianto, Benny D., and Budi Widianarko. "Governance by Accident: The Role of Civil Society in Shaping Urban Environmental Governance." *Environment & Policy*, 2023, pp. 273–287. https://doi.org/10.1007/978-3-031-15904-6_15
17. Sidaway, Roger. *Resolving Environmental Disputes*. 2013. <https://doi.org/10.4324/9781849772372>
18. Sohn, David H., and B. Sonny Bal. "Medical Malpractice Reform: The Role of Alternative Dispute Resolution." *Clinical Orthopaedics and Related Research*, vol. 470, no. 5, May 2012, pp. 1370–1378.
19. Tyagi, Neelam. "ADR Institutions, Role of ADR Practitioners, and Frequency of Resolution of Matrimonial Disputes." *Women, Matrimonial Litigation and Alternative Dispute Resolution (ADR)*, 2021, pp. 117–165. https://doi.org/10.1007/978-981-16-1015-8_4