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Challenges and Prospects of Environmental Compliance and Monitoring in Borno State, Nigeria

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ABSTRACT

The continuous misguided use of the environment and its resources has caused several challenges which continue to grow in size and complexity day by day, threatening man's survival on earth. To tackle environmental issues caused by anthropogenic activities, the government enacted laws at national and international levels aimed at preserving, conserving, and protecting the environment. This paper seeks to assess the challenges and prospects of compliance with environmental laws, policies, and regulations in Borno State, Nigeria. A questionnaire was designed and administered to government environmental law enforcement establishments (NESREA and BOSEPA), cooperate bodies, and civil societies. 152 questionnaires were retrieved and used for the study. Data were analyzed using Statistical Package for Social Sciences (SPSS) and presented in tables and charts. The study reveals a low level of compliance with environmental regulations in the study area. Individuals and cooperative bodies comply with environmental laws, policies, and regulations only when compelled by government agencies. The study proffers the following measures to enhance environmental compliance: legislative empowerment of enforcement agencies to sanction violators, grievous sanctions to violators, proper funding of enforcement agencies, Improvement of staff welfare, development of compliance monitoring feedback systems, employment of qualified staff, and provision of adequate infrastructure.

INTRODUCTION

Man depends on the environment for his source of livelihood and sustenance of life on earth (Singh, 2006; Smithson *et al*., 2008). In the last century, the world has witnessed rapid population growth, industrialization, and urbanization which led to the misuse of the environment and its resources, many developing and even developed countries are threatened by environmental degradation as the result of adverse environmental effects arising from these anthropogenic activities. The continuous misuse of the environment and its resources has caused several environmental issues ranging from human health implications, ecosystem destructions, habitat destructions, death and migration of many species of fauna, and with the skyrocketing number of environmental issues, which has grown in size and complexity day by day, threatening the survival of mankind on earth, must be tackled with all seriousness and sense of urgency at cooperation, national and international levels (Singh, 2006; Syed, 2011; Haruna and Anthony, 2011). To achieve proper environmental governance, environmental laws, policies, and regulations were formed at national and international aimed at preserving, conserving, and protecting the environment (Harry, 2003).

The enforcement of these environmental laws, policies, and regulations requires a constant and well-planned principle such as the "trust and check" and/or "stick and carrot" approach to ensure effective and efficient protection of human health and the environment (Silberman, 2000; OECD, 2004; Juliet, 2013).

An important goal of environmental compliance monitoring is to provide basic ground for public confidence in governmental environmental laws, policies, and regulations aimed at protecting lives, ensuring a healthy society, and conserving and preventing natural resources, which are well established to influence behavioral change of the regulated communities and/or cooperate bodies and ensure that individuals and cooperate bodies comply with environmental laws, policies, and regulations (Silberman, 2000; OECD, 2004). "*Voluntary compliance and reversal of an offense can be considered the main goal of inspection and enforcement. Punishment of the offender should be a secondary purpose* (OECD, 2004)". The implementation of the environmental enactments requires that policies and institutions be strengthened to facilitate adequate follow-up (Syed, 2011; Harris, 2012; Santoshi and Ranjini, 2013). All stakeholders: cooperative bodies, civil societies, government, and individuals influence a very important role in the attainment of environmental compliance goals (Harris, 2012).

Environmental compliance forms part of a comprehensive environmental management cycle, (INECE, 2009; Syed, 2011). Compliance monitoring is a major key component of government environmental agencies in ensuring that communities and/or corporate bodies obey environmental enactments through on-site visits (inspection) by qualified government officials, proper public reporting of levels of violations, and reviewing information (Environmental Audit Reports (EAR), Environmental Management Plan (EMP), Environmental Impact Assessment (EIA) submitted to it by the regulated communities and/or cooperate bodies (Singh, 2006; NECE, 2009; Haruna and Anthony, 2011). Compliance monitoring is generally considered to include both self-monitoring by the regulated entity and governmental inspections and investigations.

Environmental Compliance Monitoring involves the recognition of specific environmental problems and challenges and the government's acceptance of the need to address these challenges (Syed, 2011). To achieve an effective and sustainable Environmental Compliance aimed at achieving sustainable development and use of environmental resources, there is a need to have in place sustainable planning and strategy. Environmental Compliance Strategy comprises is said to involve 4 major stages: on-site inventory, permitting, organizing and documenting the Environmental Compliance Plan, and education and execution (Andrew and Walter, 2005; Harris, 2012; Juliet, 2013). This study aimed at assessing the challenges and prospects of compliance with environmental enactments in Borno State, Nigeria.

MATERIALS AND METHODS

Study Design

The study adopted the survey research design, qualitative and quantitative approach. The design was chosen due to the large number of subjects to be investigated, analyzed, and the objectives of the study. The sample size was obtained using the statistical formulas and procedures of Sample Size (SS) as adopted by Singh & Micah, (2014) and Shao & Wang (2009).

$SS = \frac{Z^2 P(1-P)}{C^2}$ cited in Singh & Micah, (2014); Shao & Wang (2009)

Where:

Z = Z value (1.96 for 95% Confidence level)

P = Sample proportion (0.5)

C = Confidence interval (margin error (5%) = 0.05

Table 1. Population Stratum and their Sample Sizes.

Stakeholders Population	Population	Sample size
NESREA Staff	34	20
BOSEPA Staff	58	34
Environmental firms	60	36
Academics	48	29
NGOs	60	36
Total	**260**	**155**

A questionnaire was distributed to 60% (155) of the total estimated population, 152 were retrieved in a useful form and used for the study. The data collected was analyzed using Statistical Package for Social Sciences (SPSS) and presented in tables, charts, and percentages.

Sectoral Division

Cooperate bodies, individuals, and Civil societies' level of compliance was assessed based on the National Environmental Standards and Regulations Enforcement Agency's (NESREA's) sectoral division. Broadly, NESREA divided the environment into 2 major categories (the brown and green environment) based on the activities carried out and enacted regulations to guide and coordinate the smooth compliance monitoring of both broad sectors. The brown and green environment forms the basis upon which sectors were divided and regulations formulated (NESREA, 2012; 2020)

In the Green Environment, 19 regulations were promulgated those cover areas of the natural environment and its resources.

1. National Environmental (Watershed, Mountains, Hilly and Catchment Areas) Regulations, 2009
2. National Environmental (Wetlands, Riverbanks, and Lakeshores) Regulations, 2009
3. National Environmental (Mining and Processing of Coal, Ores and Industrial Minerals) Regulations, 2009
4. National Environmental (Construction Sector) Regulations, 2009
5. National Environmental (Coastal and Marine Area Protection) Regulations, 2011
6. National Environmental (Soil Erosion and Flooding Control) Regulations, 2011
7. National Environmental (Desertification Control and Drought Mitigation) Regulations, 2011
8. National Environmental (Quarrying and Blasting Operations) Regulations, 2013
9. National Environmental (Noise Standards and Control) Regulations, 2009
10. National Environmental (Ozone Layer Protection) Regulations, 2009
11. National Environmental (Surface and Ground Water Quality Control) Regulations, 2011
12. National Environmental (Control of Vehicular Emissions from Petrol and Diesel Engines) Regulations, 2011
13. National Environmental (Access to Genetic Resources and Benefit Sharing) Regulations, 2009
14. National Environmental (Control of Bush/Forest Fire and Open Burning) Regulations, 2011
15. National Environmental (Protection of Endangered Species in International Trade) Regulations, 2011
16. National Environmental (Control of Alien and Invasive Species) Regulations, 2013
17. National Environmental (Control of Charcoal Production and Export) Regulations, 2014
18. National Environmental (Dams and Reservoirs) Regulations, 2014
19. National Environmental (Air Quality Control) Regulations, 2014

In the Brown Environment, 13 Sectoral Environmental Regulations were also promulgated which deal with areas that have been impacted by anthropogenic industrial activities.

1. National Environmental (Sanitation and Waste Control) Regulations, 2009. S.I. No. 28;
2. National Environmental (Food, Beverages and Tobacco Sector) Regulations, 2009. S.I. No. 33;
3. National Environmental (Textile, Wearing Apparel, Leather and Footwear Industry) Regulations, 2009. S.I. No. 34;
4. National Environmental (Chemicals, Pharmaceuticals, Soap and Detergent Manufacturing Industries) Regulations, 2009. S.I. No. 36;
5. National Environmental (Standards for Telecommunications/Broadcasting Facilities) Regulations, 2011. S.I. No. 11;
6. National Environmental (Base Metals, Iron and Steel Manufacturing/Recycling Industries) Regulations, 2011. S.I. No. 14;
7. National Environmental (Domestic and Industrial Plastic, Rubber, and Foam Sector) Regulations, 2011. S.I. No. 17;
8. National Environmental (Non-Metallic Minerals Manufacturing Industries Sector) Regulations, 2011. S.I. No. 21;
9. National Environmental (Electrical/Electronic Sector) Regulations, 2011. S.I. No. 23;
10. National Environmental (Pulp and Paper, Wood and Wood Products Sector) Regulations, 2012. S.I. No. 35;

11. National Environmental (Motor Vehicle and Miscellaneous Assembly Sector) Regulations, 2013. S.I. No. 35;
12. National Environmental (Energy Sector) Regulations, 2014. S.I. No. 63; and
13. National Environmental (Hazardous Chemicals and Pesticides) Regulations, 2014. S.I. No. 65

Data Analysis

Data were analyzed using SPSS where descriptive statistics of frequency and percentages were used and discussion was done using tables and graphs for easy understanding.

RESULTS AND DISCUSSION

Section A: Demographic Characteristics of the Respondents

Table 2 indicates the demographic composition of the respondents in the study area. The result indicates that the majority of environmental stakeholders were within the age group of 31 – 40 years old, 34.21% (52), composed of mostly male 64.47% (98), 54.61% (83) attended tertiary school.

Table 2. The demographic composition of the respondents

	Socio-economic Composition of the Study Area		
	Variables	**Frequency**	**Percentage (%)**
1.	**Age**		
A	<20	13	8.55
B	21-30	39	25.66
C	31-40	52	34.21
D	41-50	39	25.66
E	>50	9	5.92
	Total	**152**	**100.00%**
2.	**Gender**		
A	Male	98	64.47
B	Female	54	35.53
	Total	**152**	**100.00%**
3.	**Educational Status**		
A	Primary	14	9.21
B	Secondary	55	36.18
C	Tertiary	83	54.61
	Total	**152**	**100.00%**
4.	**Occupation**		
A	Civil Servant	81	53.29
B	Cooperate Environmental firm Worker	36	23.68
C	Community-Based Environmental Advocate	10	6.58
	Environmental NGO worker	25	16.45
	Total	**152**	**100.00%**

Section B: Level of Compliance with Environmental Laws, Policies, and Regulations

The sectoral level of compliance in the study area in Table 3 reveals a low level of compliance in the Food and Beverages Sector 46.71% (71), Noise Standards and Control, Motor Vehicle and Miscellaneous Assembly Sector 55.26% (84), Chemicals, Pharmaceutical, Ozone Layers Protection Sector 48.02% (73), Domestic Plastic, Industrial Rubber, and Foam Sector 39.48% (60),

Quarries and Construction Sector 55.26% (84), Desertification and Drought Mitigation, Bush Burning and Open Burning, Ports and Borders Sectors 55.92% (85), Wood and Wood Products, Pulp and Paper Printing and Publishing Sector 46.71% (71), Base Metal, Iron Steel, Fabrication Metals, Production Sector 55.26% (84) and finally in Surface and Ground Water Quality, Riverbank and Lake Shore, Flood and Erosion Control Sector 39.48% (60).

Furthermore, the result indicates that the Electric and Electronics, Telecommunication Sector 34.21% (52), Foot Wear and Leather, Textiles Wearing Apparel Sector 48.02% (73), and Access to Genetic Resources Sector 49.34 (75) recorded moderate levels of environmental compliance in the period of the studies.

None of the sectoral divisions shows a high level of compliance within the study period. The low level of sectoral compliance to environmental regulations and policies in the study area agrees with the findings of Elenwo and Urho, (2017) who also discovered low levels of compliance with environmental laws in Port Harcourt, Nigeria.

Table 3. Sectoral Level of Compliance

S/n	Sectoral Division	Level of Environmental Compliance			
		High	**Moderate**	**Low**	**Total**
1	Food and Beverages	45	36	71	152
		29.61	23.68	46.71	100.00%
2	Noise Standards and Control, Motor Vehicle and Miscellaneous Assembly	12	56	84	152
		7.90	36.84	55.26	100.00%
3	Chemicals, Pharmaceuticals, Ozone Layers Protection	26	53	73	152
		17.11	34.87	48.02	100.00%
4	Domestic Plastic, Industrial Rubber, and Foam	36	56	60	152
		23.68	36.84	39.48	100.00%
5	Electric and Electronics, Telecommunication	51	52	49	152
		33.55	34.21	32.24	100.00%
6	Foot Wear and Leather, Textiles Wearing Apparel	22	73	57	152
		14.48	48.02	37.50	100.00%
7	Quarries and Construction	12	56	84	152
		7.90	36.84	55.26	100.00%
8	Desertification and Drought Mitigation, Bush Burning and Open Burning, Ports and Borders	7	60	85	152
		4.60	39.48	55.92	100.00%
9	Wood and Wood Products, Pulp and Paper Printing and Publishing	45	36	71	152
		29.61	23.68	46.71	100.00%
10	Base Metal, Iron Steel, Fabrication Metals, Production	12	56	84	152
		7.90	36.84	55.26	100.00%
11	Surface and Ground Water Quality, Riverbank and Lake Shore, Flood and Erosion Control	36	56	60	152
		23.68	36.84	39.48	100.00%
12	Access to Genetic Resources	20	75	57	152
		13.16	49.34	37.50	100.00%

Table 4 presents the level of compliance of 124 facilities across the different sectoral divisions. The results indicate that facilities comply with Environmental Regulations only when enforced by government agencies 90.32% (112) and only 9.68% (12) comply voluntarily with environmental enactments in the study area.

Table 4. Level of Compliance of 124 Cooperate Bodies in the Study Area

S/n	Type of Compliance	Frequency	Percentage (%)
1	Voluntary Compliance	12	9.68
2	Enforced Compliance	112	90.32
	Total	124	100

Table 5 shows respondents' responses to the level of enforcement of environmental enactments in the study area by government environmental agencies. The survey reveals that there is generally a low level of 36.16% (58) of enforcement of environmental enactments by government agencies in the study area. A moderate level of enforcement has 55 (36.18%) responses while a high level of enforcement of environmental enactments has (39) 25.65% responses. This indicates that though the environmental enforcement agencies in the study area are working around the clock to ensure compliance, yet several factors may have acted together to halt and silence their activities aimed at enforcing statutory environmental enactments in the study area (Cunningham *et* al., 2005; Elenwo & Urho, 2017).

The Borno State Environmental Protection Agency (BOSEPA) and the National Environmental Standards and Regulations Enforcement Agency (NESREA) are the two principal environmental law enforcement outfits in the study area.

Table 5. Level of Enforcement of Environmental Enactments

S/n	Level of Enforcement of Environmental Enactments	Frequency	Percentage (%)
1	High	39	25.66
2	Moderate	55	36.18
3	Low	58	38.16
		152	Percentage (%)

Section C: Challenges of effective environmental Compliance and Enforcement

Table 6. Factors influencing facilities' level of compliance with environmental enactments

S/n	**Factors influencing facilities' level of compliance**	**Frequency**	**Percentages (%)**
1	No Sanction for Non – Compliance	94	64.47
2	Government Agencies/bodies not complying	81	53.29
3	Lack of Awareness	60	39.48
4	Poor public Image of Enforcement Agencies and their officials	39	25.66
5	Corruption	10	6.58
6	Laws, Policies, and Regulations too vague	88	55.26

The result of the study on Factors influencing facilities' level of compliance to environmental enactments presented in Table 6 indicates that No Sanctioning/Penalties for Violators 64.47% (94) has the highest responses, followed by Laws, Policies and Regulations too Vague 55.26% (88), Government Agencies/bodies not complying 53.29% (81), Lack of Awareness on the existence of the environmental enactments 39.48% (60), Poor public Image of Enforcement Agencies and their officials 25.66% (39) and Corruption 6.58% (10).

No sanctioning of violators has led to a deliberate high rate of non – compliance in the study area. Additionally, government agencies/bodies violating the statutory environmental regulations are also a major concern in the study area. Environmental enactments being vague to comprehend and lack of awareness of the existence of statutory environmental regulations calls for a review of the processes and manner in which enforcement agencies (NESREA and BOSEPA) carry out their sensitization campaigns.

Surprisingly, against the general notion of a high level of corruption by government agencies and their officials in the country, the enforcement agencies (NESREA and BOSEPA) were said to have low levels of corruption 6.58% (10) in regards

to ensuring and influencing compliance to environmental enactments.

Table 7. Factors influencing enforcement of environmental enactments

S/n	Factors influencing facilities' level of compliance	Frequency	Percentages (%)
1	Lack of proper funding	75	49.34
2	Lack of adequate infrastructure	64	42.11
3	Lack of motivation/incentive	88	57.90
4	Lack of adequate staff/personnel	52	34.21
5	Bureaucratic bottle-neck	81	53.29
6	Legislations rendering the enforcement agencies toothless bulldogs (ineffective in enforcing regulations)	101	66.45

Table 7 reveals the factors influencing the enforcement of enacted environmental legislation in the study area. The survey indicates that legislation rendering the enforcement agencies themselves ineffective 66.45% (101) is the most contributing factor to poor enforcement activities in the study area. Poor personnel motivation/incentives 57.90% (88), Bureaucratic bottleneck slowing enforcement activities 53.29% (81), Poor funding 49.34% (75), inadequate infrastructure 42.11% (64), and lack of adequate personnel 34.21% (52) all acted together to contribute to the poor rate of enforcement of environmental enactments and its subsequent compliance in the study area.

The environmental legislation must empower the enforcing agencies (NESREA and BOSEPA) to properly sanction violators for effective enforcement. The line of command in the enforcing agencies might be too much causing some avoidable bureaucratic bottlenecks and delays.

Section D: Measures to Improve Level of Compliance with Environmental Enactments

Table 8. Measures to Enhance Level of Compliance with Environmental Regulations in the Study Area

S/n	Measures to enhance to Environmental Compliance	Frequency	Percentages (%)
1	Proper funding	100	65.79
2	Provision of adequate infrastructure	54	35.53
3	Improve staff welfare, motivation/incentive	89	58.55
4	Adequate staff/personnel	72	47.37
5	Compliance Monitoring feedbacks	78	51.32
6	Sanction violators heavily	102	67.11
7	Improve Legislation to empower agencies to sanction	108	71.05

The result of the measures that might help to enhance the level of compliance with environmental regulations in the study area presented in Table 8, indicates that there is a need for a review of the legislation aimed at empowering enforcement agencies to sanction violators 71.05% (108), sanction violators heavily 67.11% (102), proper funding 65.79% (100), Improve and focus on staff welfare 58.55% (89), develop compliance monitoring feedback systems 51.32% (78), employ more qualify staff 47.37% (72) and provide adequate infrastructure 35.53% (54).

The study suggests that the government must ensure legislative backing to its establishments, grant them the power to sanction violators, develop compliance feedback systems and improve the welfare of the enforcement officers.

The government can, therefore, communicate the statutory environmental enactments in a comprehensive, comprehensible, and transparent manner and also, create an avenue for public participation. Effective environmental compliance and enforcement are reported to be a factor of good governance, which is built upon an open, participatory, accountable, predictable, and transparent process. Good governance requires consistent, visible, and transparent efforts against (Cunningham *et al*., 2005; INECE, 2009).

CONCLUSION

In conclusion, the study reveals a low level of compliance with environmental regulations based on sectoral divisions. Individuals and cooperative bodies comply with environmental enactments only when enforced by government agencies and only a negligible number of entities comply voluntarily in the study area.

The study further reveals that non – sanctioning of violators has led to a deliberate high rate of non – compliance in the study area. Additionally, government agencies/bodies violating the statutory environmental regulations are also a major concern in the study area. Environmental enactments being vague to comprehend and lack of awareness of the existence of statutory environmental regulations, again surprisingly, an encouraging result is the low levels of corruption by the officials of the enforcing agencies (NESREA and BOSEPA) in discharging their duties, against the general notion of the high level of corruption by government agencies and their officials in the country.

Furthermore, the survey reveals that the factors influencing enforcement of enacted environmental legislations in the study area include poor legislation rendering the enforcement agencies themselves ineffective, poor personnel welfare and motivation/incentives, bureaucratic bottleneck slowing enforcement activities, poor funding, and inadequate infrastructure, and lack of adequate personnel.

To improve and enhance compliance with environmental enactments, the study proffers the following measures: a review of the legislation aimed at empowering enforcement agencies to sanction violators, grievous sanctions to violators, proper funding of enforcement agencies, Improvement of staff welfare, development of compliance monitoring feedback systems, employment of qualify staff and provision of adequate infrastructure.

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