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The effects of Environmental Disclosure on Financial Performance : Special Reference to Odisha Power Industries

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ABSTRACT

The issue of environmental degradation has received considerable research attention in the environmental science literature, but much work remains to be done in terms of how reporting captures environmental degradation costs in annual reports in relation to the effects it has on the long-term financial performance of firms in developing countries, particularly India. As a result, this article investigates the critical problem of environmental reporting in the context of how it affects the long-term financial success of Indian enterprises. The amount spent on environmental costs is considered as an independent variable, where return on capital employed, return on assets, and return on equity taken as dependent variables. Panel data from five power sector industries operating in Odisha from 2019 to 2023 were evaluated using the ordinary least square regression method, descriptive statistics, and correlation analysis. Our finding shows that environmental protection cost has significant impact on Return on Assets, Return on Equity & Return on Capital Employed of the sample companies.

Key Words: *Sustainable, financial performance, Environmental reporting*

INTRODUCTION:

Global warming has recently gained international attention as a result of fast utilisation of natural resources and fierce industrial competitiveness caused by globalisation. As per the observation of (UNEPFI, 2007; Guillen, 2001) greenhouse gases (GHG) are the primary cause of changes in the natural environment's equilibrium. (World Bank, 2013) although manufacturing institutions are generally blamed for greenhouse gas emissions, service organisations such as the electricity sector, banking sectors, and other financial institutions also contribute because they fund a country's key industries. (Hossain *et. al.* 2016) said that, Stakeholders want to know about financial and non-financial data so that they can make sound investment decisions. The accounting profession and authority entities had raised the problem of effective environmental performance recording since the business community regarded the issue as of great importance to them. Rezaee et.al. (1995) observed that the need of disclosing environmental information

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was becoming well understood in industry. Onyekwelu & Ugwu, (2017), Babatunde (2016) stated that there is a serious problem that has to be solved with the lack of awareness of environmental costing principles and methodologies. Financial statements cannot be regarded as accurately reflecting the state of things if significant environmental issues and activities are not disclosed.

Environmental accounting assists in disclosing to the outer world a company's potential to be environmentally friendly. The poor uptake is predicted to have an impact on the level of disclosure. Ali et.al. (2004) noticed that emerging-nation government regulatory agencies and the accounting profession are plagued by structural issues and commonly tolerate accounting rule infractions. Because of the lack of transparency, private and institutional investors, both domestic and foreign are hesitant to invest in such emerging markets. The incorrect use of International Accounting Standards impedes business financial reporting transparency. Babatunde (2016). As a result, financial statement frequently fails to deliver relevant information in a timely manner. Because the current need for reporting on environmental issues is voluntary, most business financial statements contain disclosures of information that completely ignore environmental issues.

Banerjee (2001) argued that corporate environmental accounting assists management in determining if the organisation is performing its duties for sustainable development while meeting business objectives. Environmental accounting includes meeting legal requirements, operating a factory to prevent environmental damage, promoting an attitude of environmentally safe working conditions among employees, telling shareholders how much and what kind of preventive measures have been taken by management, and ensuring the safe handling and disposal of hazardous waste. Rezaee & Elam (2000) & as per the SEEA's progress report (2009), Business, governmental, and international levels are all included in the vast scope of environmental accounting. Environmental accounting incorporates the direct investment made by a corporation to minimise environmental damages. It comprises investments in technology or systems that aid in decreasing potential environmental losses. Clarkson, Li, Richardson and Vasvari (2008) A robust corporate governance system must include disclosure and openness because they enable stakeholders and potential investors to make cleared decisions about capital allocation, business operations, and performance evaluation. By influencing investors and lenders who must weigh risks and rewards and choose where to best invest their money, high-quality disclosure influences capital allocation efficiency and provides the benefit of lower capital costs. High-quality corporate disclosure also makes it clear to what extent firms adhere to moral and legal obligations. The complexity of a company's surroundings may have a greater impact on its success or failure than just the goods or services it provides. It is frequently accepted that businesses with an environmental reporting culture are ecologically conscious and live in more peaceful environmen (Utile, 2016). Some significant environmental reporting disclosures in Indian power industry businesses' annual reports

Director's report or discloses separately:

1) Environmental costs associated with recent and historical actions.
2) Information showing a decline in toxicity.
3) Waste management system.
4) Capital investments made for pollution prevention and control.
5) Projected environmental benefits and expenses.

FINANCIAL PERFORMANCE

A subjective indicator of how well a company can use its resources to conduct its primary business and create money is called financial performance. The phrase is also used as a broad indicator of a company's long-term financial stability. "It is the process of calculating the monetary value of the outcomes of a firm's policies and operations. It can also be used to compare other industries or sectors or to assess similar businesses from the same industry" (Chaturvedi A.). In order to determine the relationship between environmental disclosures and the financial performance of some of the largest corporations in India, this study compared businesses from several industries. The ROA, ROE and ROCE of the chosen organisations are the financial performance indicators used for this study.

LITERATURE REVIEW

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(Prakash, 2016) This study selected 16 indicators to evaluate whether Indian businesses in the oil, textile, and shipping industries adhere to environmental regulations. It was determined that although while there is no legal requirement for businesses to account for and disclose environmental issues, they nonetheless choose to do so because they recognise the significance of the environment for long-term sustainability. (Khandelwal 2012) emphasised the need to regularise social activities like protecting the environment by passing laws, and later it was added to the rules that corporations in India must follow. (Pramanik A.K.et.al. (2008) This document acknowledges that environmental accounting and reporting practises ought to be mandated in every nation, but that most nations have not yet done so. The report makes the urgent case that national and international environmental accounting and disclosure regulations must be formulated. Makori & Jagongo (2013) It was advised that in order to promote reporting and compliance, the government should provide provisions for tax credits for businesses that respect environmental rules and make environmental reporting mandatory in India.

Pahuja (2009) In order to determine whether a particular type of company follows a specific pattern in its environmental disclosures, the paper that examines the relationship between environmental disclosures and corporate characteristics in India's manufacturing sector was able to analyse the companies on 23 environmental informational items. Omnamasivaya (2017) this research actually investigated the opposite of what the current seeks to discover, but it provided an excellent opportunity to comprehend the fundamental idea in environmental accounting. The impact of improved financial performance on the environmental accounting disclosure practises of the companies listed on the NSE during a five-year period was examined in this study. The study will take into account the following variables: NPM, ROCE, EPS, DPS, ROA, ROE, P/E, DPR, ROS, and MPS. The study found a favourable correlation between the two. Omnamasivaya (2016). Nor N.M (2016). The study, which was conducted in 2011 on 100 Malaysian companies, produced conflicting findings regarding the relationship between environmental disclosure practises in Malaysia and subsequent financial performance. The article advises that authorities establish specific guidelines that corporations must adhere to in order to make environmental accounting more meaningful, which is currently lacking. Malarvizhi (2008) In view of rising awareness of sustainable development, this research emphasises the need for environmental disclosures. Khandelwal (2015) emphasises the benefits and drawbacks of Indian corporations disclosing data on a variety of topics, including environmental considerations. Batra (2013). The purpose of this study was to examine the environmental disclosure and management practises used by the various business enterprises in the three nations of Singapore, Malaysia, and India. The result was that in all the countries under examination, people have grown more conscious of environmental issues. Che-Ahmad (2015) concluded that accounting disclosures have typically only been made on a voluntary basis in developing economies, although state regulation is necessary for effective adherence.

OBJECTIVES OF THE STUDY

- To investigate the connection between the expense of environmental protection and the company's performance parameters.
- To ascertain the impact of environmental protection costs on the company's performance indices.

HYPOTHESIS OF THE STUDY

- H1: Environmental cost has a positive association with return on Assets.
- H2: Environmental cost has a positive association with return on Equity.
- H3: Environmental cost has a positive association with return on Capital Employed.

METHODOLOGY

The study only used secondary data for its analysis. For this study, the information was gathered from the annual reports of the power sector industries in Odisha for the five years period from 2019 to 2023. It was also retrieved from other relevant websites including the ministry of electricity, the Odisha Electricity

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Regulatory Commission, articles, journals, etc. The dependent variables are viewed as business sector performance indicators in the current study. The dependent variables include things like Return on Equity, Return on Assets, and Return on Capital Employed. Environmental costs are the independent variable, whereas size (SIZ), operating cash flow (OCF), and leverage (LEV) are the controlled factors. Both functional and econometric models are used in the current investigation. The regression model is represented as:

$Y = \alpha + \beta1X1 + \beta1X2 + \beta1X3 + \beta1X4 + \ldots\ldots + e$ (1)

Where:

Y = Dependent variable

α0 = Constant

β= coefficients

X1 = Independent Variable

X2, X3, X4 = Control Variables

e = Error

The Regression Equation can be restated in econometric form as:

$ROA = \alpha0 + \beta1ENVPC + \beta2SIZ + \beta3OCF + \beta4LEV + \varepsilon$ - - (1)

$ROE = \alpha0 + \beta1ENVPC + \beta2SIZ + \beta3OCF + \beta4LEV + \varepsilon$ - - (2)

$ROCE = \alpha0 + \beta1ENVPC + \beta2SIZ + \beta3OCF + \beta4LEV + \varepsilon$ - - (3)

Table 1
Variables Description

Sl.No.		Variables	Formulas
1	**Independent variable**	Environment Protection Cost	Total expenses for protection of environment
2	**Dependent variables**	Return on assets (ROA)	$\frac{\text{Net profit}}{\text{Total Assets}}$
3		Return on Equity (ROE)	$\frac{\text{Net profit}}{\text{sharehoder's Equity}}$
4		Return on Capital Employed (ROCE)	$\frac{\text{Profit before Interest and tax}}{\text{Capital Employed}}$
5	**Control variables**	Size (siz)	Total Assets
6		Operating cash flow (OCF)	Total Cash flow from operating activity
7		Leverage (Lev.)	Total Debt/Equity

Source: self-compiled

The table highlights the formula on which we can measure and calculate the total sustainability of the companies in different years .

DATA ANALYSIS AND INTERPRETATIONS:

Table 2
Descriptive Statistics

	ROA	ROCE	ROE	ENVC	SIZ	LEV	OCF
Mean	0.018182	0.035678	0.605883	1.588400	5.481743	1.962000	5.031600
Median	0.016030	0.026950	0.054920	1.670000	5.629093	2.020000	5.000000
Maximum	0.075570	0.142830	4.752910	2.540000	6.073797	3.470000	5.270000

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Minimum	-0.018390	-0.023290	-0.105560	0.510000	4.484048	0.590000	4.820000
Std. Dev.	0.025242	0.046306	1.534014	0.742185	0.570228	0.849186	0.104948
Skewness	0.491472	0.539825	2.325081	-0.056246	-0.695382	-0.277621	0.976827
Kurtosis	2.489755	2.324404	6.443068	1.294333	2.051805	2.058654	3.901411
Probability	0.527917	0.429630	0.000000	0.218307	0.228624	0.536818	0.089717
Sum	0.454540	0.891950	15.14707	39.71000	137.0436	49.05000	125.7900
Sum Sq. Dev.	0.015291	0.051461	56.47675	13.22014	7.803826	17.30680	0.264336
Observations	25	25	25	25	25	25	25

Source: self-compiled

Interpretation:

Table 2 reports the descriptive statistics of the dependent, independent variables as well as controls. The mean and median of all dependent and explanatory variables that are close to their central value, such as ROA, ROCE, ROE, ENVC, SIZ, LEV, and OCF. It denotes that the data are dispersed symmetrically. It is also discovered that the standard deviation value is relatively low, indicating that the variables are reliable and consistent. The kurtosis values in the preceding table are less than 3, indicating that the variables are flatter and platykurtic, with the exception of ROE and OCF, which are highly peaked and leptokurtic. Except for ENVC, SIZ, and LEV, all of the variables are favourably skewed in the present study.

Table 3
Correlation Matrix

	ROA	ROCE	ROE	ENVC	SIZ	LEV	OCF
L	1.000000	0.974376	0.182265	-0.143916	-0.321160	-0.700891	-0.221120
II	0.974376	1.000000	0.206919	-0.184303	-0.391490	-0.715814	-0.204641
III	0.182265	0.206919	1.000000	-0.385421	-0.635420	-0.227350	-0.218844
IV	-0.143916	-0.184303	-0.385421	1.000000	0.745267	-0.286374	0.173889
V	-0.321160	-0.391490	-0.635420	0.745267	1.000000	0.271442	0.270794
VI	-0.700891	-0.715814	-0.227350	-0.286374	0.271442	1.000000	0.158644
VII	-0.221120	-0.204641	-0.218844	0.173889	0.270794	0.158644	1.000000

Source: self-compiled

Interpretation:

Table no-3 reveals that there is low negative correlation between all of the dependent variables and the environmental cost independent variable indicates that there is a less correlation between rising environmental cost and declining ROA, ROE, and ROCE. However, there is a positive correlation between environmental cost and the controls SIZ and OCF, indicating that increasing environmental cost causes a substantial increase in SIZ and a very low increase in OCF, and vice versa. This indicates that the environmental cost varies according to the sample enterprises' large or small business sizes and high or low operating cash flows.

Table 4
Regression Results of ROA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003086	0.129301	0.023868	0.0812
ENVC	-0.041382	0.008024	-5.157128	0.0000
SIZ	0.042274	0.010417	4.058074	0.0006
LEV	-0.038604	0.004875	-7.919395	0.0000
OCF	-0.014939	0.025585	-0.583895	0.5658
R-squared	0.792397	Mean dependent var		0.018182

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Adjusted R-squared	0.750876	S.D. dependent var	0.025242
S.E. of regression	0.012599	Akaike info criterion	-5.733597
Sum squared resid	0.003175	Schwarz criterion	-5.489822
Log likelihood	76.66996	Hannan-Quinn criter.	-5.665984
F-statistic	19.08443	Durbin-Watson stat	1.294542
Prob(F-statistic)	0.000001		

Source: self-compiled

Interpretation:

The results in table 4 show that the environmental cost has a negative impact on the dependent variable i.e. ROA. This suggests that a small reduction in the dependent variable will result from an increase in the independent variables. The dependent variable ROA's sample variance is 79% explained by the explanatory variables, according to the coefficient of determination R-square of 0.79, while 21% is unaccounted for. The remaining 21% may result from additional variables or factors that were not included in this model. The adjusted R2 has a value of 0.750. This demonstrates that less than 25% of the overall variation in profitability produced by variation in the explanatory variables stated in the equation is accounted for by the error term and that the regression line captures more than 75% of that variance. F statistics' probability value is 0.000001, which is less than the critical value i.e. 0.05. It suggests that the cost to the environment is statistically significant at the 5% level. As a result, Hypothesis 1 is confirmed. It has been found that the D.W value, which ranges between 0 and 4, is 1.29, indicating that there is no autocorrelation among the residual value.

Table 5
Regression Results of ROE

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.08019	13.04144	1.233008	0.2319
ENVC	0.664642	0.809330	0.821224	0.0212
SIZ	-2.400750	1.050691	-2.284926	0.0334
LEV	0.207969	0.491653	0.423000	0.6768
OCF	-0.750809	2.580557	-0.290948	0.7741
R-squared	0.428186	Mean dependent var		0.605883
Adjusted R-squared	0.313823	S.D. dependent var		1.534014
S.E. of regression	1.270713	Akaike info criterion		3.493889
Sum squared resid	32.29421	Schwarz criterion		3.737664
Log likelihood	-38.67361	Hannan-Quinn criter.		3.561502
F-statistic	3.744098	Durbin-Watson stat		0.774230
Prob(F-statistic)	0.019740			

Source: self-compiled

Interpretation:

Table no-5 demonstrates that environmental cost has a favourable influence on the dependent variable, or ROE. It shows that, a rise in the independent variables will result in a fall in the dependent variable. The coefficient of determination R-square is 0.42, the explanatory factors can explain for 42% of the sample variation in the dependent variable ROE. The adjusted R2 value is 0.313. This indicates that the regression line captures, with less than 69% of the error term, more than 31% of the overall variation in profitability caused by variation in the explanatory variables stated in the equation. F statistics' probability value is 0.019, which is below the critical value i.e. 0.05. It suggests that the cost to the environment is statistically significant at the 5% level. As a result, Hypothesis 2 is confirmed. Here the D.W value, which ranges between 0 and 4, is 0.77, indicating that there is no autocorrelation among the residual value.

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Table 6
Regression Results of ROCE

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.020689	0.232610	-0.088942	0.2300
ENVC	-0.071372	0.014435	-4.944256	0.0001
SIZ	0.065751	0.018740	3.508528	0.0022
LEV	-0.068663	0.008769	-7.830028	0.0000
OCF	-0.011125	0.046027	-0.241712	0.8115
R-squared	0.800359	Mean dependent var		0.035678
Adjusted R-squared	0.760431	S.D. dependent var		0.046306
S.E. of regression	0.022665	Akaike info criterion		-4.559161
Sum squared resid	0.010274	Schwarz criterion		-4.315386
Log likelihood	61.98951	Hannan-Quinn criter.		-4.491548
F-statistic	20.04497	Durbin-Watson stat		1.263788
Prob(F-statistic)	0.000001			

Source: Author-compiled

Interpretation:

The results in table no.-6 show that the environmental cost has a negative impact on the dependent variable i.e. ROCE. A rise in the independent variables will result in a fall in the dependent variable. The dependent variable ROCE's sample variance is explained by the explanatory factors to an extent of 80%, according to the coefficient of determination R-square's value of 0.80. A favourable relationship between the dependent and independent variables is indicated by a high R-square value. The adjusted R^2 value is 0.760. This shows that the regression line, with less than 24% of the error term, captures more than 76% of the overall variation in profitability caused by fluctuation in the explanatory variables stated in the equation. The probability value for F statistics is 0.000001, which is less than the critical limit i.e. 0.05. It implies that the environmental cost is statistically significant at the 5% level. As a result, Hypothesis 3 is proven. The D.W value, which ranges between 0 and 4, was discovered to be 1.26, with no autocorrelation in the residual value.

CONCLUSION:

From the above study we came to know that environmental protection cost has significant impact on ROA, ROE & ROCE of the sample companies. There is a strong relationship between environmental protection cost and return on capital employed (E.S Nandini), whereas operating cash flow does not determine ROA, ROE and ROCE of the sample companies. Leverage and size of the firm is significantly related with ROA and ROCE however ROE is not significantly associated with Leverage. The size of companies in this study has no influence on ESG ratings or financial performance. In contrast to the findings of Charlo et al. (2017), Since the variable size exhibits a negative trend in both the ROA and ROE regressions, big size enterprises do not have superior financial performance or higher ESG ratings. The relationship between ESG ratings and financial success is weak yet significant. As per the reviewed by Alareeni and Hamdan (2020), Buallay (2019), and Mądra-Sawicka & Paliszkiewicz (2020), that ESG has a positive correlation with both ROA and ROE. Organization should give more focus on management of investment for environment restoration process as well as disclose the activities. In order to draw investors and satisfy stakeholder demands, businesses should promote the disclosure of their dedication to environmental actions. Additionally, it provides information on the value of natural resources to economic prosperity as well as the expenses associated with pollution and resource degradation. As more Indian businesses are becoming aware of environmental issues and regulatory regulations, environmental disclosure is expanding in India. Companies must stay up with the regulatory framework established by the government and other regulatory agencies. As a result, the businesses will make investments to improve their track records for environmental performance.

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Firstly, this study has considered only three variables for tapping financial performance namely ROA, ROE, and ROCE. Thus, it would be suggested to use other metrics, such as cash flow and operational profit, to assess financial performance in order to add more contexts to the future research. Secondly the study has conducted for 05 companies which is listed in BSE, further study can be conducted for more number of companies concentrating on different type of industries. Finally this study consider only five years data, there is a scope for longitudinal research in future.

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