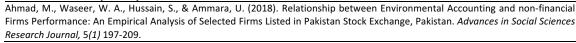
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# Relationship between Environmental Accounting and nonfinancial Firms Performance: An Empirical Analysis of Selected Firms Listed in Pakistan Stock Exchange, Pakistan

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### **ABSTRACT**

Environmental accounting provides a framework through measure present, past and future environment cost for decision-making and public communication. Environment awareness has made people concerned over the world in green accounting to observed ecological performance of their surroundings. The purpose of this study is to investigate relationship between environmental accounting and non-financial firm's performance listed in Pakistan stock exchange, Pakistan. Present study used regression analysis technique (REM), using companies' annual data from 2006-2016. The empirical analysis showed a significant positive relationship between environmental accounting and firm's size. While, earning per share and return on capital employed statistically turned out to be insignificant. Therefore, those companies, which have huge size, spend more resources for social welfare in term of environment pollution protection. On the Contrary, the limitation of this research is small sample size of listed companies in Pakistan stock exchange. Hence, outcomes cannot be generalized for entire population. Based on the results, it is suggested that government must give some tax relief to those firms, which work for the environment protection and environmental reporting should be compulsory in Pakistan to have clean homeland. This study has contributed to literature by adding data from Pakistan. By the researcher's best knowledge, the data on Pakistan is currently limited and this study contributes a better understanding on environmental reporting practices.

#### **INTRODUCTION**

Earth is wonderful gift for human beings and for all creations; indeed, we did not pay even a single penny for the earth where we live, and not for space, where we breathe. No doubt, when human beings were not highly developed, universe was too peaceful and relaxed, fresh air, foods are commonly available and lives were safe from hazards disease. Even though ,today we have introduced hundreds of innovation in the world, but we are not secure now, industrial revolution was great for men's ,societies changed, very fast technology introduced ,services boost but one thing also produced from this revolution that was pollution, pollutants emitted in the air ,that are harmful today for health (Dockery and Pope 1996). In many last decades, corporations and peoples highly ignored environmental issues (Murphy, 2003).

Today world has been changed, companies are concerned with the protection of environmental pollution, now companies are positively providing environmental performance as well as environmental costs reports in annual reports(Jaleel) and these reports are provided by the oil and gas sectors, which are major sectors to affect the environment (Anifowose, Lawler, Van Der Horst, & Chapman, 2016). Environmental safety occupies a momentous place in the economic policy of several states and creates a main concern for the worldwide community. This is concern spoken at global level, demonstrated at various global meetings and symposiums: two Nobel Peace Prizes were given to the personalities who upraised public consciousness on environmental issues while safety of nature is 8th Millennium Development Goals (MDG) accepted by the United Nations in 2000 (Drabo, 2010). Moreover, we are today more concerned with environmental protection, so in various countries; it is compulsory to publish environmental performance reports. While, in developed countries; companies are publishing their environmental performance information voluntarily without any restriction (Bhattarai, 2014). Anyway, environmental problems are worldwide phenomena, and these problems have negative effect on humans lives as well as other living bodies, so different techniques are using at national and international level to decrease its impact on economic ,social and political sphere (GRI, 2000).

In current era profitability is not only factor through performance of organization is measured, people quantity firms' performance on the base of environmental protection also (Escrig-Olmedo, Muñoz-Torres, Fernández-Izquierdo, & Rivera-Lirio, 2017). It is very important for companies to measure environmental issues and report them in financial statement or in other medium (Gupta, 2013). There are many studies conducted worldwide to measure environment performance and firms profitability(Galani, Gravas et al. 2011; Babalola 2012; Tapang, Bassey et al. 2012; Bassey, Effiok et al. 2013; Makori and Jagongo 2013; Bhattarai 2014; Juhmani 2014; Quader, Kamal, & Hassan, 2017). Further, it is investigated that, 450 companies that have huge size, listed in UK issued voluntarily environmental reports. This trend is showing that companies are extreme interested in disclosing environmental information for investors, customers, employees, regulator and government (Brammer & Pavelin, 2008). In near future, companies will provide environmental information on website: in Thailand 96% listed companies provide environment performance information on websites and 88% sampled companies disclose information in annual reports (Suttipun & Stanton 2012). Further, an international survey opined that companies are increasing, which issue environmental performance report on internet (Isenmann, Rünzi et al. 2004).

A wild influence is happened from industrial doings on natural atmosphere in the last few years, which have created serious natural anxiety (Burritt, Hahn et al. 2002). The phenomena of environmental issues like ozone reduction, decrease of natural resources, air pollution and extraction of different harmful gases are alarming for the sustainable development of this earth (Harper & Snowden, 2017). Even though, companies have reasonable financial resources, approximately fully awareness about modern technology, and most important authority of definitive solution of environmental issues. But unluckily, firms attention is look to be lazy (Shrivastava, 1995). To secure environment from pollution, companies have to face different costs, which effect management decisions and these costs may lead organizations toward success or loss (Adams, 1997; Chen et al., 2014). Hence, it is very important to investigate that why not all companies step forward for developing a healthy environment; either, is it costly for organizations or, it enhance firms performance to be environment friendly.

Literature exposed that most of the studies conducted in developed countries to analyze relationship between environmental accounting and non-financial firm's performance. While, finding of studies vary in different cultures; therefore, there is no perfect universally accepted direction of these results. Pakistan's environmental protection act was promulgated in 1997, that explained about responsibilities of peoples as well as companies regarding environmental protection. Unfortunately, in Pakistani companies, there is no trend of disclosing environmental performance information (Rafique, Malik, Waheed, & Khan, 2017). There is no specific law in Pakistan for companies to disclose environmental accounting statistics. However; there are few companies in Pakistan, which voluntarily disclose their information in annual reports or online (Hassan & Batool, 2016). Hence, it is extreme need to examine relationship between environmental accounting and non-financial firm's performance, which pay for environment protection in Pakistan.

The significance of this research article is that, this study is conducted particularly in Pakistani context, which analyzed relationship between environmental accounting and non-financial firm's performance. Pakistanis considered in developing countries; therefore, not all of the companies follow regularly environmental policies, while few companies are working according the demand of healthy environment. Thus, it is interesting to investigate relationship between projected variables in Pakistani context.

Present study is structured in different sections: the second section involves literature review on the relationships between environmental accounting and non-financial firm's performance; while third segment defines data source and methodology whereas fourth part discuss data and analysis. The fifth section reveals main finding and finally, last section elaborate conclusion, recommendation, limitation, and future scope of research.

# LITERATURE REVIEW

This part of study examined different studies, conducted by various researchers, in different countries or context. The Prior studies investigated relationship between environmental accounting or disclosure and firms' performance. The relevant literature indicated that different researchers' groups used different approaches to measure dependent variables i.e. environmental accounting (Bennett & James, 2017; Perchoux, Chaix, Cummins, & Kestens, 2014). For Instance, the first group, which measured dependent variable, through content analysis, this group, included sentences to calculate environmental accounting. However, second group measured environmental accounting by using words. Third group measured environmental accounting through information available regarding environmental performance and some of the researcher used GRI guidelines. Moreover, many researchers used number of pages, number of paragraph, picture and graph count, soft and hard copy etc.to examine environmental accounting. Since, the present study is different from all above mentioned approaches because of this study examined the relationship between environmental accounting and non-financial firms' performance of Selected Firms Listed in Pakistan Stock Exchange, Pakistan through regression models.

Environmental reporting trend is increasing in developed and developing countries (Albertini, 2014; Plumlee, Brown, Hayes, & Marshall, 2015; Malarvizhi & Matta, 2016; D'Amico, Coluccia, Fontana, & Solimene, 2016) , literature revealed that now people are much interested regarding protection of environment (Brinkmann, Scholles et al. 2008). Further, it is analyzed that environmental protection activities improve customers trust and attracts investors (McGuire, Sundgren et al. 1988). Healthy environment is a need of all livings bodies ,that's why different concerned groups forced multinational companies to perform environment friendly activities (Stanwick and Stanwick 2005). However, there are few countries where ; it is

obligatory for firms to disclose environmental performance information, but nowadays from worldwide, companies started voluntarily disclose information (Bhattarai 2014).

Environmental accounting is a broad term, that have many meanings and practices. It is inclusive field of accounting, which provide information for internal and external stakeholder of the organizations. The function of Environmental accounting is to measures environmental performance(Ván 2012). Environmental accounting defined as a process through companies disclose information relating to environmental performance for evidence that these are accountable for their activities (Uwuigbe 2011). Furthermore, Environmental accounting provide a frame work through we measure present, past and future environment cost for decision making and public communication (KPMG 2006). Indeed, The prime objective of green accounting or environmental accounting is measure organizational activities' effect on environment and report this effect (Crowther 2002). The term environmental accounting relates to provide information about environmental performance within and outside of the company to its stakeholders. Finally, Environmental accounting simply refer accounting practice in firms and its impact of natural environment (Gray and Bebbington 2001). Environmental cost is an amount, which is companies pay for the purpose of environment protection. Many researchers used environmental cost(a cost that is companies paid for the protection of the environment) as a proxy of environmental accounting. For instance, The researchers used environmental cost as a proxy of environmental accounting[(Bhattarai)2014);(Makori and Jagongo 2013);(Adams 1997);(Bagur, Perramon et al. 2013)]

Firm's performance can be measure by applying different techniques. Meanwhile, profitability ratios are one of them, because it is easiest way of financial analysis to measure overall firms performance and efficiency. However, there are many other proxies available to measure firms performance but profitability is most popular (Stavins and Whitehead 1992). Profit is the main purpose of business . Profitability means the ability of an investment to give back money as return. The word profitability is the combination of two world first one is the profit and the second one the ability, in simple it is the ability of any organizations to earn money that may be any form (Nimalathasan 2009). A study was conducted in Tehran , which measured financial performance of organization through return on assets and return on equity(Stanwick and Stanwick 2005). Furthermore, firms performance also measure in India through return on assets, return on equity return on capital employed, net profit margin, dividend per share and earning per share(Sarumpaet 2006). Return on Capital Employed (ROCE) calculates income from operating activities by using shareholder's wealth, moreover, incomes, and expenses from financing activities exclude(Speckbacher, Bischof et al. 2003).ROCE is a financial ratio which is commonly used in accounting, finance and valuation, concerned peoples can easily compare profitability of different firms by using amount of capital employed (Stanwick and Stanwick 2005).

Firms size can be defining as firm's production capacity or a variety of services, which firms deliver to its customers. Firms size is a primary indicator of firms performance while ,different proxies can be used to measure firms size ,for example total revenue of firms ,total assets, total number of employees etc. (Stavins and Whitehead 1992). In addition, Earnings per share also is a performance index, through stakeholders can compare performance of different organizations, for good decision-making. Earnings per share is obtained by; dividing total earnings, after interest, tax, and preferred dividend by total numbers of ordinary shares outstanding.

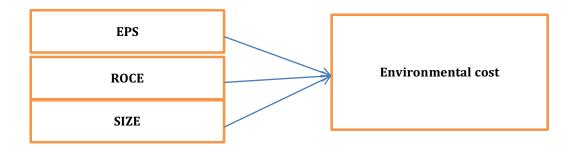
Environment management and economoc advantages have significant relationship (Bagur, Perramon et al. 2013). There is a significant relationship between financial performance and environmental performance (Sarumpaet 2006). Environmental activities effect firms profitability; a Nigerian research concluded a positive significant relationship between environmental actions and organizational profitability (Adams 1997). Furthermore ,it is also investigated in Nigeria that environmental cost significantly affect firms profitability (Awan and Shahzad Bukhari 2011). It is a common thought that ,Japanese companies follow regularly environmental regulation and research findings opined that environmental sustainability impacts on revenue and minimize risk of Japanese companies (Bagur, Perramon et al. 2013). Although ,peoples are more concerned about environmental issues but still, environmental accounting trend is very low, anyway , those companies which have larger size spend more amount on environmental practices (Bhattarai 2014). A better environmental performance significantly effect on economic performance (Dockery and Pope 1996) .

In addition ,environmental disclosure is good because it provide information about the environmental performance that attract capital markets(Egan, Yang et al. 2004). Its pay to be green ,an environmental study showed that environmental performance and firms profitability highly linked with each other (OGUNDELE and JEGEDE). Environmental performance and firms size are significantly associated (Frances 1995). A comparative study results revealed that firm's with great environmental regulation, steps having more positive return as compare to ,firms having poor environmental regulation (Gómez-Mejía, Haynes et al. 2007). Green environmental practices increase firm's profitability and firms growth, Konar argued that 10% decrease in toxic chemicals increase \$34 Million market value (Konar and Cohen 2001).

On the contrary, there are few studies, which concluded that there is a negative relation between environmental accounting and firm's performance. Environmetal accounting negatively associate with return on capital employed , earning per share, dividend per share , however, profit margin have positivie association with environmetal accounting (Makori and Jagongo (2013).Futher analyzed that environmental accounting and firm's profitability has no strong relationship (Brammer and Pavelin 2008; Brinkmann, Scholles et al. 2008).It is observed that environmental accounting doesn't affects firms profitability (Dechezleprêtre and Sato 2014).

A Korean based research study explored the relationship between environmental discourse and firms performance ,the results of study investigated that there is no significant link between environmental accounting and firms profitability (Suttipun and Stanton 2012). Finally Companies listed in U.S do not have relationship between environmental accounting and firms profitability (Tapang, Bassey et al. 2012). Hence, above-mentioned studies are conducted in different countries, to investigate relationship between environmental accounting and firms performance, while no one depth study directed toward a conform direction in context of Pakistan. In different cultures, finding of studies varies, thus, we cannot generalize universally results of previous finding of relationship between purposed variables. Therefore, the intention behind this study is to verify previous theories of relationship between environmental accounting and firm performance.

### **CONCEPTUAL FRAMEWORK**



DATA SOURCE AND METHODOLOGY

### Sample section and Data source

The present study carried out with help of four variables; Environmental cost of companies (ENC), Earning per share (EPS), Return on capital employed (ROCE) and Firms size. All the Variables are consistent from priors' studies (Makoriand Jagongo 2013; Tiesieh et al 2012). The study is majorly depending on secondary data of certain profitable firms listed in Pakistan stock exchange, Pakistan. Annual reports of selected firms are used to collect secondary data on annual base from 2006-2016. In this research study, nine companies are select on the base of random sampling technique and availability of data, from Pakistan stock exchange, Pakistan. These are the selected companies from different selectors Fuji Fertilizer, Oil and Gas Development, Uniliver Pakistan, Lotte Chemical, Pakistan Refinery, Honda Pakistan, Lucky Cement, GlaxoSmithKline and Nestle Pakistan. Corporations are disclosing social and environmental information in corporate annual reports and this trend has increased over years (Rajnikant & A 2014). Further, Many previous researchers, used data from annual reports and financial statements to find out relationship between variables (Wiklund, Davidsson et al. 2003).

### **Method of Analysis**

This study is based on positivism research paradigm because of; present study is deductive nature, which only verified findings of the prior's research studies. The relationship investigated between environmental accounting and firm's performance through a statically software E-views version 5. To avoid from spurious results study employed Unit Root tests, further study used descriptive statistics to check normality of data. Last but not least, present study employed regression analysis technique (Random Effect Model) to examine the relationship between dependent and exploratory variables, because this technique is easy and data requirements are not much concessive.

### Measurement of variables and research hypothesis

This study examined relationship between environmental accounting and non-financial firm's performance, to draw a conclusion of the present study; different proxies are used for dependent variable and independent variables, which are following.

# Dependent variable:

The dependent variable for this study is environmental accounting and proxy to measure environmental accounting is total annual environmental cost a cost that companies suffer for environmental protection.

# Independent variables:

Non-financial firm's performance is use as independent variable. There are many proxies to measure firm's performance but present study has used few one of them like earning per share, return on capital employed and firm's size.

Variables	Formula	
Environmental cost	Annual amount spend by companies for	
	environmental protection	
Earnings per share	Net Income – Preferred Dividends /	
	Weighted Average Common Shares	
	Outstanding	
Return on capital employed	Net Operating Profit / Total Assets - Current	
	Liability	
Firm Size	Annual Revenue of firms	

# **Model specification**

Present study examined association between environmental accounting and non-financial firm's performance in Pakistan, while for formulating regression model study employed econometric method. It is better to use multiple regression model for Multi-dimensional problem because it give real-time inspection of effect of variables.it is also important to mention here that present model is adopted from previous research(Adams 1997) namely "environmental activities and its implications on the profitability of oil companies in Nigeria" model is as;

ENC = f (EPS, ROCE, and SIZE)

Mathematically specified as:

ENC= $\beta_0+\beta_1$  (EPS) +  $\beta_2$  (ROCE) +  $\beta_3$  (SIZE) + $\mu$ t

#### While:

ENC = Environmental cost (which cost companies pay for environmental protection)

EPS = Earnings per share

ROCE = Return on capital employed

Size = Annual sale of selected companies

 $\beta$  o = Constant

 $\beta$ 1,  $\beta$ 2,  $\beta$ 3 = Slop of coefficients

μt =Error term

# **Criteria for Decision Making**

Study conform the validity of the research analysis on the base of these few tests:

#### Standard Error Test:

If value of standard error falls near to 0 (zero), then it is considering that data points are close to means, while large standard error deviation indicate high dispersion in data. Alternatively, if standard errors are less than the half of coefficients, this specifies that estimation is perfect.

# T -Test:

A t-test is a statistical hypothesis statics which is use to determines significance of parameters. Analysis can be concluding through calculated and critical value of t-test, hence if calculated value exceed as compare to critical value then we reject HO and accept alternative hypothesis.

# R<sup>2</sup> Coefficient of Determination:

R-square also known as coefficient of determination, it is a statistical test which is use to know how much data is close to fitted regression line. R- Square values fall between 0-1, higher the value of R -square show more significant beta values. Furthermore, R-square revealed that how much dependent variable effect due to explanatory variables.

#### F- Test:

F-statistic also known as fixation indices, which is used to support or reject the null hypothesis. F-statistics is statistically much significant test, because significant value of F-statistics results means outcomes are not by chance. For the decision making about F-statistic, if calculated value exceed as compare to critical value of F-statistics, it can be concluded that model is good fit, otherwise model is not good fit.

#### **Durbin-Watson:**

Durbin-Watson is a test which is used to check serial autocorrelation in errors from regression analysis. The valued of D-W fall in range of 0-4, if values exist near 2, this indicate that there is no autocorrelation, while values near 0 represent positive autocorrelation(Jaleel).

#### **RESULTS AND ANALYSIS**

The Results from environmental accounting and firm's performance consisting on Environmental cost, earning per share, return on capital employed, and firms size while outcomes presented in the succeeding Section. First, the descriptive analysis is present, and then unit root tests and finally regression analysis results are present.

**Table 4.1 Descriptive Analysis** 

variables	Mean	Median	Maximum	Minimum	Jarque-
					Bera.prob
ENC	39069648	17296000	2.20E+08	420000	0.6251
EPS	37.91	15.000	410.77	-159.64	0.95644
ROCE	40.025	35.20	140.59	-122.39	0.6943
SIZE	5.85+E10	4.09+E10	1.98+E11	1.08E+10	0.7103

Table 4.1 is demonstrating results of descriptive statistic concerning with dependent and independent variables of the present study. Basic feature of data define trough Descriptive statistics, in simple words ,this technique is use to understand what is going on with data (Tett and Meyer 1993). Results mentioned in above table representing that performance is measure through earning per share, return on capital employed and size average values 37.9%, 40.025%, and 5.85+E11 respectively. Jarque-Bera probability values are indicating that data is normally distributed because of probability values of all variables are more than 5%, hence we will accept null hypothesis that is residual follow normal distribution.

Table 4.2Unit root test

Variables	Statistics values		Sig.	Conclusion
ENC				
	Levin, Lin & Chu t	-9.1878	0.0000	I(1)
	Im, Pesaran and Shin W-			
	stat	-3.0409	0.0012	I(1)
EPS	Levin, Lin & Chu t	-29.913	0.0000	1(1)
	Im, Pesaran and Shin W-			
	stat	-8.5298	0.0000	I(1)

ROCE	Levin, Lin & Chu t	-2.5298	0.0000	I(1)
	Im, Pesaran and Shin W-			
	stat	-2.6230	0.0044	I(1)
SIZE	Levin, Lin & Chu t	-3.6366	0.0001	I(1)
	Im, Pesaran and Shin W-			
	stat	-1.2398	0.0027	I(1)

**Table 4.2** is expressing results of unit root tests. Present study has employed unit root test before regression analysis, Unit root test is applied to check whither data is stationary or not. Stationary in data is very important, because of, if trend exist in data, spurious results produce which is very harmful. Hence, to avoid spurious results study have applied unit root tests. The output file of results indicating, that all the variables are stationary at 1st difference, So, null hypothesis is rejected because there is no trend in the analyzed data so that's why I accepted alternative hypothesis because of data is stationary. Now we can further move to explore relationship between environmental accounting and non-financial firm's performance.

**Table 4.3 Hausman Test** 

Correlated Random Effects - Hausman Test			
	Correlated Nandom E	neces mausinan rese	
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Cross-section	4.972777	3	0.1738
random			

**Table4.3** elaborating the results of Hausman test, this test is can be apply to decide either fixed effect model is good or random effect model. The null hypothesis of this test is that random effect model is appropriate. In the above table, probability value is more than 5%, therefore null hypothesis is accepted, and that is why present study employed random effect model.

Table 4.4 Regression Analysis (Random effect model)

Regress	Coefficient	Standard error	T values	Sig
С	3197651	18891339	0.169265	0.8663
EPS	-23516.47	125656.6	-0.187147	0.8523
ROCE	184368.3	227906.4	0.80895	0.4224
SIZE	0.000502	0.000232	2.16790	0.0350
Adj. R square	Standard Error	F-Statistics	Durbin- Watson	
0.102737	46562673	1.908347	1.5	071

**Table 4.4** showing the summary of multiple regression results of environmental accounting and non-financial firms' performance of listed companies in Pakistan stock exchange of Pakistan. The above table is presenting Coefficient beta, standard error, significant level, adjusted R square, F- statistics and Durbin Watson values. There is only one variable, which is Firms size, showing positive effect on dependent variable; its means positive increase in independent variable will be a Couse of positive increase in dependent variable. The remaining independent variables earning per share, return on capital employed have a statically insignificant effect on dependent variable. The coefficient value of adjusted R- Square explains variation in dependent variable due to explanatory variables, results explaining that 10 percent change will be in dependent variable due to independent variables.

To examination above hypothesis, present study checks tests significant through F-statistic. To explore overall combined significance of (independent) explanatory variables on (dependent) explained variables F-statistic is very useful tool. The calculated value of F-statistics is 1.9082

which is greater than table value of F-statistic at 5% level of significance is 0.14022. It is thumb rule that, if calculated value increase as compare to critical value then reject null hypothesis, Hence ,results accept alternative hypothesis , which means explanatory variables are jointly causing much variation in dependent variable. The rejection of null hypothesis means environmental accounting has significant association with the firm's performance. It is also important to note here that this relationship may be negative or positive.

To check autocorrelation in explanatory variables Durbin- Watson test is applied, the results showed value of D.W that is 1.5071, this value fall within the inclusive region of Durbin – Watson divider curve. Hence, we can conclude that there is no autocorrelation among variables.

It is important to report, that the results of this study are agreeable with the previous studies' findings on the same topic of relationship between environmental accounting and firm's profitability [(Bhattarai; Frances 1995; Bagur, Perramon et al. 2013)].

#### CONCLUSION

Environment conscious has made peoples across the world interested in green accounting to measure environmental performance of their surroundings. The study added in existing literature of environmental accounting and non-financial firm's performance in Pakistani context. The study examined that environmental cost includes all cost, which companies suffer for the protection of environment. Environmental cost may be including use of modern technology, use of pollution free material, services or production procedures. Present study investigates about the relationship between environmental accounting and firm's performance in Pakistan. The finding of the study examined that there is strong positive relationship between environmental accounting and firm's size. The results of study are consisted with the previous studies [(Bhattarai ; Frances 1995; Bagur, Perramon et al. 2013), while other firms performance indicators (earning per share, return on capital employed) are found to have irrelevant association with environmental coast.

### LIMITATION OF THE STUDY

There are few limitations of this study;

The first limitation of the present study is small sample size there are more than 450 non-financial companies listed in Pakistan stock exchange and study has selected only nine companies. Furthermore, the results are generating from the data available from 2006 to 2016 that is not fresh and enough data because of companies going rapidly towards green economy; due to lack of data these years' data is select for analysis.

### RECOMMENDATION

For the pollution free environment, government must enforce law regarding environmental performance and must impose penalties on those firms that do not follow environment protection policies. Finding of the study examined that, environmental cost negatively affects with earning per share because of companies suffer different cost to protect environment, Government must give some relief to those companies which follow environment protection policies.

# **FUTURE OF RESEARCH**

Good environment performance is now basic need of human beings, so every country is concerned with the pollution free environment. Environmental accounting and firms profitability is major topic, whereas research work is minor, students and practical researcher can further research through increasing more companies to analysis for generalizing results of the study universally.

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