

# Motivations for Implementing Cleaner Production Principles: A Case Study of Saudi Plastic Manufacturers

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## Abstract

The rapid economic, cultural and industrial development, and population growth in Saudi Arabia has created environmental challenges, threat of energy, resource crisis, and climate change. One of the contributing factors is the increasing number of manufacturers and lack of green practices. Therefore, this study aims to investigate the aspects that influence implementation of Cleaner Production Principles by Saudi Plastic Manufacturers. A conceptual model that was based on technological, environmental, and organizational theory was used to present the primary motivating factors of manufacturers in Jeddah for pollution reduction and also to the achievement of sustainable development goals according to Saudi Vision 2030. The research model provides motivations for the environmental and economic consequence of Cleaner Production Principles Implementation. This work is grounded in hypothesis; such as, regulatory and customer pressures having a positive influence on the implementation of CP principles in the Saudi plastic manufacturer industries. A questionnaire on the implementation of CP principles was provided to the manufacturers. 127 samples were analyzed through SPSS to investigate the relationship between the independent (CP Principles implementation) and dependent variables (motivational factors for implementation). The results have indicated that Regulatory Pressure and Customer Pressure has significant positive influences on the implementation of CP Principles for Saudi manufacturers. The quality of HR, SM support, governmental support, and environmental uncertainty have significant negative influences on the implementation of CP principles. The lack of previous research about CP implementation in KSA will make the results of this research beneficial for future researchers and practitioners.

**Keywords:** cleaner production, sustainable development, technological, organizational, and environmental theory, Saudi Plastic Manufacturers

## 1. Introduction

The economic situations have drastically changed as well as scientific developments have been escalating rapidly since the beginning of the 21<sup>st</sup> century. The world is facing environmental challenges, threats of resource and energy crisis, climate change, and environmental pollution (Pandey, 2005). Currently, the accomplishment of Sustainable Development (SD) goals cannot be ensured due to the environmental restrictions and paucity of resources. Maintaining SD would become increasingly difficult, if the manufacturers still keep their traditional ways in processes and productions, which cause the high-consumption of raw materials and high-pollution in the environment (Green, K. 1995).

The presence of negative consequences on the environment has already been discussed by recent studies, who enlightened the emission of wastes and toxic gases as profound causes. According to WCED (1987), increasing demands have been placed on ecological goods and services due to the increasing growth rate for meeting the needs of future generations. Subsequently, many countries have enacted a series of legislation to control toxic emissions and wastes, which can be addressed by the development of sustainability. A critical issue that stakeholders have been required to consider for improving organizational performance is to focus on sustainability. According to Hynes, W & Wang, S., (2012), the controllable of environmental emissions, maintaining market competitiveness and maintaining the economic growth are major concerns for achieving SD goals. One of the most profound way to excel these challenges is to accelerate the use of green environmental practices. The efficiency of input and raw materials is increased from the integration of technological, organizational, environmental, societal and economic strategies, which are termed as Cleaner Production (CP)

principles. These aspects include endowing economic growth, minimizing or recycling generated waste, reducing waste and environmental benefits (Guimarães, 2013; Porter, 1995). According to Yusup, M & Mahmood, W., (2015), the improvisation made in the use of raw materials is achieved through CP principles, allowing pollutant wastes and toxic emissions of resources to be decreased. In contrast, CP is defined as an enduring application that escalate the entire efficiency and mitigate risks to humans and the environment by means of preventive environmental strategy accepted for different processes, services and products (UNEP, 2002, 2011).

According to Dangelico & Pujari, (2010), CP is therefore considered as an environmental management strategy as it is relied on a socio-technical approach. The costs of conservation, enhancement to the efficiency of resource usage, advertising environmentally friendly practices and reducing the wastefulness of natural materials are ensured with the integration of CP (Yusup et al., 2015). Thereby, the industrial manufacturing sectors are supported by the government, providing every means of facilities and tools due to its attached significance to the economic development. Consequently, the Saudi industry has made significant progress. This progress displayed the growth of industrial investment and helped to attract investors (Hassan, M., 2017) which as a result increased the number of different types of manufacturers (SIDF, 2016).

The national transformation programs 2020 has been initiated with its initial planning in Vision 2030 by the Kingdom of Saudi Arabia (KSA). The collective efforts of these efforts would turn the far-reaching goals to accomplish environmental sustainability by escalating the waste management efficiency, ascertaining comprehensive recycling projects, fighting desertification and reducing all kinds of pollution. Additionally, it also contained measures to encourage the optimal use of water resources by reducing consumption and renewable water (SPA, 2016).

There are approximately 7007 manufacturers in Saudi Arabia. Furthermore, there are around 1076 manufacturers (PME, 2016) in Jeddah city. The industries emit toxic matter and wastes causing pollution of air and water. To achieve the Sustainable Development Goals, the Saudi government launched the 'Achieving Environmental Sustainability Plan' in the Saudi Vision 2030 and the 10th Saudi strategic plan goals (PME, 2016). Some of the obligations that were to be adhered to were that, the manufacturers must guarantee that its operations and processes will not cause unnecessary hazards which damage the environment or the public health. Apart from this, it also emphasized the protection of the air, water, and land from harmful pollution. Each department of every organization is responsible for guaranteeing their design and operation in compliance with this plan, and ensuring that they will not cause unnecessary hazards to the environment through implementation the green practices and CP principles in order to achieve environmental sustainability (Govindan, 2016).

The purpose of this paper is to investigate the main motivations, namely; Organizational Factors (OF) and the Environmental Factors (EF) that influence Saudi Plastic manufacturers in implementing CP principles. The contribution of this research is to increase the knowledge of CP principle's implementation in the KSA society. Furthermore, the study examines the organizational and environmental factors to implement CP and to achieve sustainable development goals according to 2030 Saudi vision targets.

## **2. Theoretical Background**

### *2.1 Cleaner Production (CP). Definition and Benefits*

Cleaner Production (CP) is an environmental management strategy that is based on a socio-technical approach (Yusup & Mahmood, 2015). The United Nations Environmental Programme (UNEP, 2002), defines CP as "*the continuous application of an integrated preventive environmental strategy applied to processes, products, and services to increase overall efficiency and reduce risks to humans and the environment*" (Yusp & Mamood, 2015). This is accomplished through improving the use of raw materials (including water and energy), which decrease pollutant wastes and the toxic emissions of resources (Dangelico & Pujari, 2010). The implementation of CP has successfully provided promising benefits with a wide range of implications to the manufacturing firms, employees, and the environment (Getzner, 2002).

### *2.2 Cleaner Production Requirements*

The development of SD requires the demand for the implementation of CP principles among the manufacturers and the capacity to meet that demand through the following stages:

- First, integration of CP principles can give economic support and enhance environmental performance by supporting and motivating industrial manufacturers (Marcotte and Weaver, 2004).

- Second, different factors are used to evaluate the awareness and preference for improving the industrial environmental performance. Specifically, the commitment will be higher of any company leader, when external pressures are higher (Epstein, 2009).
- Third, the potential of executing eco-efficiency projects, which include access to a group of technical specialists, financing schemes and qualified consultants for CP integration, is achieved through the CP technology (Hicks & Dietmar, 2007).
- Fourth, CP implementation in the industrial areas requires how raw emissions can be made less harmful to both humans and the environment through identifying the hazardous substances to be phased out (Cobut & Beauregard, 2013).
- Finally, implementation of CP reduces environmental risks and liabilities, and leads to higher competitiveness. It also improves public image and gains the confidence of consumers (Hwang and Wu, 2016).

### *2.3 Key Drivers of Green Practices through Implementation CP Principles*

Delmas (2004) points out the drivers that motivate organizations to implement green practices in their processes. These drivers come from pressures of external and internal stakeholders such as government, investors, customers, suppliers, community groups, and employees (Delmas & Toffel, 2004). Additionally, it improves organizational culture; by inculcating moral values to do the right thing and to be socially responsible (Carter & Jennings, 2002). It also appears most appropriate for explicating the effect of the drivers of green practices and how they might influence specific environmental initiatives. The following four constructs collectively measure the drivers of green practices initiatives (Hoffman, 2001):

- Regulatory measures (REG). The ability of the government to formulate and implement sound policies and regulations that encourage the implementation of green practices (Bansal and Roth, 2000).
- Competitor pressures (COMPRES). Extensive and successful firms in the industrial sector usually face high pressure from competitors and external environmental activists (Zhu and Sarkis, 2007). This leads them to work in environmental management through implementing green practices and CP principle initiatives to gain competitive advantage (Canning & Hanmer-Lloyd, 2001; Carter and Ellram, 1998).
- Customer pressures (CUSTPRES). This is the pressure coming from the consumers when they are beginning to question the environmental effects of the products that they buy. In addition, they expect firms to implement the green standard in their products and process designs (Tate et al., 2010). This kind of pressure causes the organizations to be more legitimate and trustworthy to the environmental issues (Sarkis et al., 2011).
- Socio-cultural responsibility (SOCCUL). This is the ability of organizations in the industrial sectors, to use business to inspire solutions to the environmental crisis. It is an organization's obligation to society, to achieve harmony with social expectations, norms, and codes of conduct that dictate acceptable business behaviors (Jones, 1999).

As a result, organizations around the world want to paint a positive image, due to intense global competition. They are forced to consider socio-cultural responsibility in all of their processes, production, and practices by switching to environmentally friendly components to minimize environmental impact (Chin-Chun & Keah, 2012).

### *2.4 The Benefits of CP Implementation*

The integration of CP principles has given an in-depth amount of benefits to the manufacturing companies (Hicks & Dietmar, 2007). The economic, manufacturing and environmental competency of manufacturing companies will positively have influenced by the adoption of CP principles. Number of organizations are affected by the sustainability and environmental pollution globally. The industrial sector is enforced to change their operations and tactics due to the increase in the global issues and to merge environmental concerns into their organizational responsibility (Hsu & Tan, 2012). Thereby, devastating environmental, social and economic outcomes will be prevented through the adoption of CP principles and green practices operations (Moffatt, 2004). According to UNEP (2002), CP is based on social responsibility aspects; thereby, acknowledged as a SD tool. Implementation, development and support of CP, pollution prevention and green strategies assist in the protection of the global environment (Maria Gavrilescu, 2004). According to UNEP (1998), CP is an enduring application of a preventive and integrated strategy, which is accepted for products, services and processes to seek the social, health, safety, environmental and economic benefits. The three dimensions of SD in a strategic manner is advanced by the Organization for Economic Co-operation and Development (OECD) by asserting following points;

- The productive use of natural resources is optimized through productive efficiency of organizations.
- The impact of environment and nature is minimized through environmental management aspects that generate waste and emissions, enhance productive use of organizational chemicals and stimulate the management.
- By minimizing risks, people and communities can be supported by organizations to raise human development.

### 2.5 The Organizational Factors

The difference in internal resource foundations and processes is affirmatively seen among organizations that react to internal and external challenges due to such abilities. Internal organizational stakeholders, organizational resources and assets are profound organizational factors. The decision-making powers of these individuals and groups allowed them to be called stakeholders. In addition, environmental sustainability is achieved through the organizational adoption of green practices. Organizations are profoundly affected by these factors to enhance their competitive advantage (Florida, 2001). Therefore, this study develops two constructs on the basis of TOE theory. The quality of human resource, the senior management support are the organizational factors used in the study.

#### 2.5.1 Senior Management Support

Technical innovation will be influenced by the extent to which a company stimulates by means of new system or technology. The acceptance and integration of technical innovation has been positively affected through the provision of motivation for technical and financial resources (Jeyaraj, 2006). The implementation of green behavior is supported by organization for the employees. In general, an active role has been played by the senior management to provide organizational support (Organizational Behavior, 2017).

G/CP production principles require the collaboration and coordination of different departments and divisions to ensure successful implementation. Moreover, these green principles are usually initiated from the top management. The central task of senior management is to gain resources and allocate them efficiently to implement green principles in order to achieve competitive environmental advantage (Gonzalez, 2005). The organizational support will positively affect the implementation of (G/CP) production principles' practices for Plastic Saudi manufacturers and propose the following hypothesis:

**H1:** Organizational support has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.

#### 2.5.2 Quality of Human Resources

In any organization, the implementation of (G/CP) production principles require qualified employees with high skills, competencies, and capabilities (Tornatzky & Fleischer, 1990). Implementation of (G/CP) production principles is a complicated process which requires correction, significant changes and coordination in the existing operation process (Russo & Fouts, 1997). G/CP depends on the training and development of tacit skills through the involvement of employees (Del Brio & Junquera, 2003).

The implementation of production principles will be essentially utilized through competent learning capabilities in training programs. Furthermore, firms will motivate strongly to integrate these principles as they enhance innovative and learning capabilities of employees (Frambach & Schillewaert, 2002). According to Christmann (2000), the strategy of environmental management is plausibly implemented with the higher innovative capacity of an organization. In certain, the implementation of production principles for Saudi manufacturers will be positively affected by the current human resources quality. The following hypothesis is proposed:

**H2:** The quality of human resources has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.

#### 2.5.3 Environmental Factors

The acceptable behaviors and practices are reviewed by the organization, considering the moral, cultural and legal boundaries (Scott, 1997). According to Krishnan (2004), survival capabilities, increased legality and reduced uncertainty are used to reward the employees within organization-setting. This study draws four constructs from prior studies based on the TOE theory of environmental factors which are: The regulatory pressure, customer pressure, government support and the environmental uncertainty.

#### 2.5.4 Regulatory Pressures

The activities of organization are affected by the stakeholders, who usually are considered to be the regulators of the organization. The decisions made by the stakeholders are essentially characterized in addressing environmental issues (Etzion, 2007). According to Christmann, (2004), primary stakeholders are satisfied by the

activities of the organization. Thereby, the implementation of (G/CP) production principles will be affected positively by the regulatory pressure in the context of Saudi manufacturing companies. The following hypothesis is proposed:

**H3:** The regulatory pressure has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.

#### 2.5.5 Customer Pressures

The implementation of particular behaviors is ensured due to the organizational pressures. For instance, external stakeholders are the ones who exercise such pressures within the organization-setting in the pursuit of the organization (Vachon, 2009). Thereby, the steps taken by the organization towards the products, services and processes are entirely based to address the environmental issues with increase in customers' awareness (Wolf, 2011). In certain, the implementation of (G/CP) production principles will be positively affected by the customer pressure for Saudi manufacturers. The following hypothesis has been proposed:

**H4:** The customer's pressure has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.

#### 2.5.6 Governmental Support

The availability of external resources allows the adoption of G/CP principles based on the green practices. The green practices are improved by stimulating the processes, which include training programs, technical resources, and provision of financial motivation (Scupola, 2003 & Tornatzk, 1990). In certain, the implementation of G/CP practices in any organization is influenced by the accessibility of external resources (Rothenberg & Zyglidopoulos, 2007; Aragon-Correa & Sharma, 2003). According to Aragon-Correa & Sharma (2003), bank financing at lower charges, lower insurance premiums and governmental subsidies are included in the government support. The implementation of production principles is positively influenced by governmental support. Thereby, this study has expected that the implementation of green practices for Saudi plastic manufacturers will be positively affected by the governmental support and propose the following hypothesis:

**H5:** Governmental support has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.

#### 2.5.7 Environmental Uncertainty

Environmental uncertainty has been observed as the environmental factors that affect an organization's decision making (Li & Gima, 2002). It refers to the unpredictable changes in technological development, customer preferences, and competitive behavior. A manager who is facing uncertain business environments is active in creating innovative strategies compare with a manager who is working in a stable environment. High environmental uncertainty push the organizations to gather and process information frequently and rapidly to address environmental changes (Gupta & Govindrajan, 1991). In addition, they tend to implement green practices and increase the rate of technical, environmental issues that are faced to maintain a competitive advantage (Zhu & Weyant, 2003; Damanpour,1991; Kimberly,1981).

As implementation (G/CP) production principles can be regarded as a technical process that can improve an organization's environmental performance, green practices implementation is expected to be positively associated with environmental uncertainty. Organizations are more likely to implement green practices, to generate the capacity which improves environmental performance in uncertain environments (Aragon-Correa & Sharma, 2003 and Rothenberg & Zyglidopoulos, 2007). Therefore, we expect that environmental uncertainty will positively affect the implementation of (G/CP) production principles for Saudi plastic manufacturers and propose the following hypothesis:

**H6:** The environmental uncertainty has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.

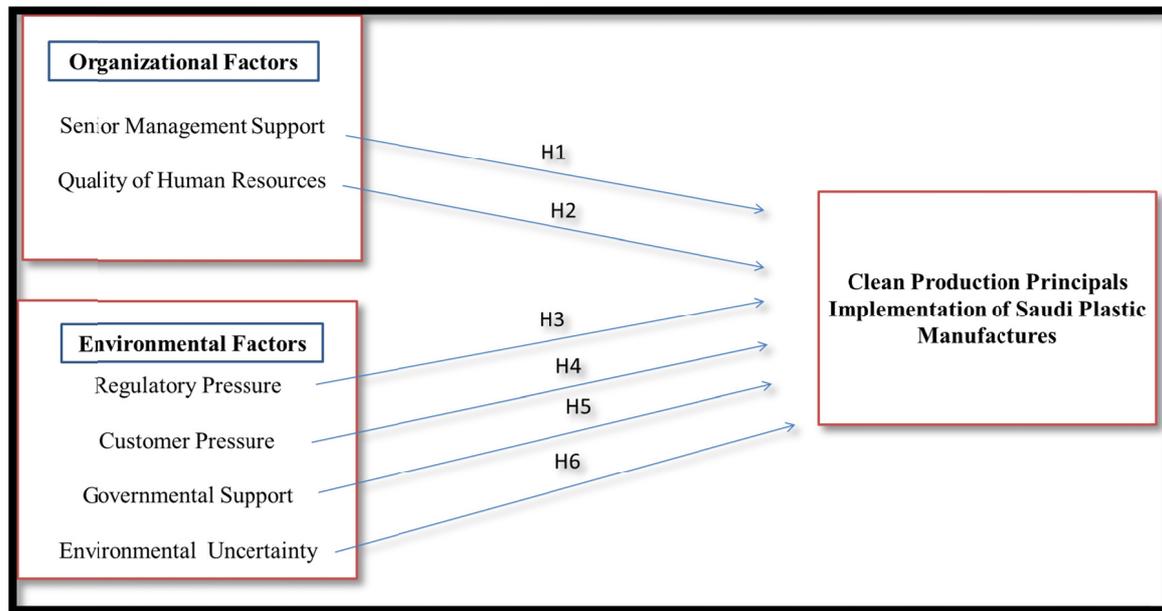


Figure 1. The Organizational and Environmental Factors influence the implementation of CP Principles

### 3. Research Methodology

The research methodology is based on appropriate steps to collect the data and to investigate the hypotheses. Moreover, the definition of the constructs, data collection procedures, the sampling strategy, and unit of analysis are described. The questionnaire comprised of closed-ended questions that limit the answers options (Sincero, 2012). The questionnaire was adopted for this study to test the research model to examine factors affecting the stakeholders in the implementation of CP principles in the Saudi Plastic Manufacturing industry. The main industrial cities in KSA are Riyadh, Jeddah, and Dammam. In this research; the plastic manufacturers in Jeddah are the sample population. Jeddah has a strategic location due to its proximity to the city center and Jeddah Islamic Port, which is the largest port in Saudi Arabia (MODON, 2017). In Jeddah, the number of existing manufacturers is 1779 (MCI, 2015). Our sample is limited to approximately 130 plastic manufacturing industries.

150 questionnaires were distributed to these manufacturer's, namely; the stakeholders and the senior managers who make the decisions to implement the environmental activities. A total of 135 questionnaires were returned. Of these respondents, eight questionnaires were excluded. So, the complete questionnaires which were usable were 127. Thus, the overall response rate is approximately 84 %. The study sample consisted of 127 questionnaires. The key of these respondents is summarized in the table 1. The categories shown are Gender, Education Level, Work Position, Work Experience, and Manufacturers Size.

Table 1. Descriptive statistics of respondent's general information

Variables	Category	Frequency (n)	Percentage (%)
<b>1. Gender</b>	Male	127	100.0
	Female	0	0
<b>2. Education Level</b>	Secondary	1	0.8
	Bachelor	96	75.6
	Master	14	11.0
	Doctorate	0	0
	Other	16	12.6
<b>3. Work Position</b>	Operation Manager	30	23.6
	Production Manager	15	11.8
	Planning Manager	6	4.7
	Maintenance Manager	12	9.4
	Product Manager	11	8.7
	Other	53	41.7
<b>4. Work Experience</b>	Less than one year	1	0.8
	1-3 years	30	23.6
	3-5 Years	4	3.1
	5-7 Years	36	28.3
	7-10 Years	24	18.9
	Other	32	25.2
<b>5. Manufacturer's Size</b>	Less than 100 Employees	3	2.4
	100 – 1,000 Employees	77	60.6
	1,000 – 10,000 Employees	46	36.2
	10,000 – 50,000 Employees	1	0.8
	More than 50,000 Employees	0	0

The dependent variable has been the CP principles' implementation, while the two organizational factors and four environmental factors are the independent variables. Table (2) presents the Cronbach's Alpha values which is used to check the reliability and validity of the questionnaire construct and items; the assessment was calculated using SPSS software (Version 21) to analyze the collected data. The majority of constructs show satisfying results for Cronbach's alpha and are close to 1 (Philippsen, 2015). Cronbach's alpha coefficient higher than or equal to 0.70 was taken as an acceptable standard for reliability of the scale (Al-Rubaish. et al, 2010). The observed alpha coefficients ranged from (0.728) to (0.959), indicating an exceptionally excellent to high reliability. This implies that the sampling results are reliable.

Table 2. Cronbach's Alpha ( $\alpha$ ) reliability test for the study

Construct	Cronbach's Alpha	Number of items	Number of cases
1. The implementation of the CP / GRE principles.	0.737	5	127
2. The senior management support in the implementation of CP / GRE practices.	0.959	13	127
3. The quality of the human element in accepting CP / GRE production practices.	0.776	6	127
4. The regulatory pressures towards implementing CP / GRE practices.	0.872	3	127
5. The customer pressure towards implementing CP / GRE practices.	0.866	2	127
6. The government support for implementing CP / GRE practices.	0.728	3	127
7. The environmental changes (uncertain) towards the implementation of CP / GRE practices.	0.817	4	127

Table (2) has shown that SM support is essential in advancing CP initiatives adoption; it has been shown to have an excellent internal consistency with a Cronbach alpha of 0.959 (well above the recommended level of 0.70). Subsequently, the quality of HR has become a key business strategy for organizations where Human Resource Departments play an active part in going green practices. It has shown acceptable internal consistency reliability, with Cronbach's alpha coefficients of 0.776. The regulatory pressures are associated with the likelihood of companies concern with the environmental policies and activities while the government support with agreed to general principles and priority encourages areas which will guide implementation of the green practices. Both have a good consistency ( $\alpha > 0.8$ ). Finally, the environmental uncertainty lacks factual or competent information concerning the internal and external environmental issues for the organization. This has acceptable internal consistency reliability with a Cronbach's alpha of 0.817.

#### 4. Results

The SM support and quality of HR were used to capture the organizational context. The SM support was measured by the degree to which the implementation of CP could increase environmental and economic performance (Rogers, 2003). In table 3, the correlation of SM support with implementation is ( $r = 0.160$ ), which suggests very weak positive correlation (higher than 0). The correlation of quality of HR with the implementation is ( $r = 0.076$ ), which displays very weak positive correlation. Since (0.160 and 0.076) isn't close to 1, this implies that the correlation between SM support, quality of HR with G/CP implementation is weak.

The correlation of customers' pressures with implementation is ( $r = -0.200^*$ ). Which is based on 127 pairs of numbers (N) and implies ( $r$ ) is a weak negative correlation, while the regulatory pressure, governmental support and environmental uncertainty have a very weak correlation with the implementation. The correlation between the SM support, and both quality of HR is a weak positive correlation. While the correlation between the regulatory pressure and customers pressure is a positive weak correlation with ( $r = 0.244^{**}$ ). Moreover, the government support has a very weak negative correlation with both regulatory and customers pressure. The environmental uncertainty has a positive weak correlation with government support ( $r = 0.318^{**}$ ).

Table 3. Correlation analysis

Variables	Means	Description Correlations						
		1	2	3	4	5	6	7
1. Implementation	4.03	1						
2. SM support	4.21	0.160	1					
3. Quality of the HR	3.71	0.079	.382**	1				
4. Regulatory Pressure	4.32	0.187*	0.359**	0.099	1			
5. Customers Pressure	3.74	-0.200*	0.041	0.073	0.244**	1		
6. Government Support	2.64	0.125	0.046	0.206*	-0.017	-0.025	1	
7. Environmental Uncertainty	3.38	0.158	-0.004	0.054	0.048	0.020	0.318**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

#### 4.1 Standardized Regression Results

The next step after testing measurement model is to ensure that it has acceptable psychometric properties and subsequently test the structural model. Regression analysis is used in the study, to verify whether the proposed organizational, and environmental factors will affect the implementation of CP for Saudi Plastic Manufacturers. It takes the ten determinant factors as independent variables and the implementation of CP as the dependent variable. The structural model can be tested by examining R square ( $R^2$ ) and the structural path coefficient beta weight (B) which express the relative importance of independent variables (Logistic Regression).

Table 4. Standardized regression results of Saudi Plastic Manufactures CP implementation 4 represents the result of the structural model and the hypotheses path, significance of the path coefficient and the influence of the structural model and the hypotheses path. In addition, it represents the significance of the path coefficient and the influence of the independent variable.

Table 4. Standardized regression results of Saudi Plastic Manufactures CP implementation

Dependent Variables: CP principles' Implementation (N=127)					
Predictors	Standardized Coefficient ( $\beta$ )	t	R-Square	Sig	
Organizational Factors					
H1 Senior Management support	0.16	1.81	0.026	0.073	
H2 Quality of the human resources	0.079	0.886	0.006	0.377	
Environmental Factors					
H3 Regulatory Pressure	0.187*	2.129*	0.035	0.035	
H4 Customer Pressure	-0.2*	-2.283*	0.04	0.024	
H5 Governmental Support	0.125	1.413	0.016	0.16	
H6 Environmental Uncertainty	0.158+	1.787+	0.025	0.076	

+p<0.1, \*p<0.05, \*\*p<0.01

The standardized path coefficient indicates the strength of the relationships between the dependent and independent variables (Field & Miles, 2012).

Path coefficient and R-Square indicates how well the model is performing. Table (4) illustrates P-Value for each hypothesis is less than 0.01. Thus; there is statistically significant motivation to implement CP, and the table showed the standardized result of the regression analysis. The result reveals that the hypotheses H3 and H4 are supported; all the other hypotheses aren't supported.

5. Discussion

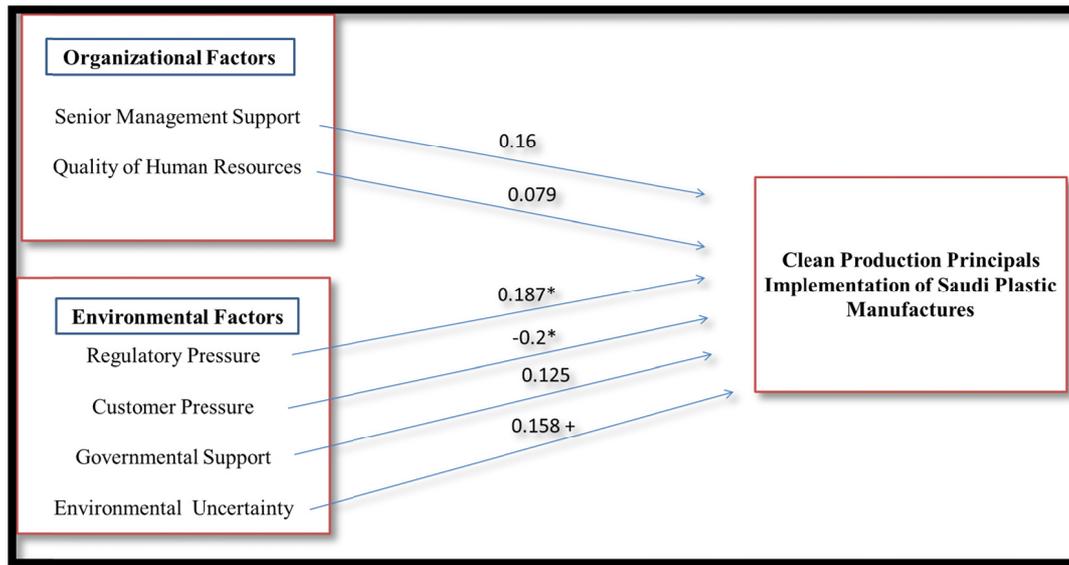


Figure 2. The Investigating of the Motivation Factors to Implementation CP principles Structural Model

In order to verify whether the proposed technological factors will affect the implementation of CP principles for Saudi plastic manufacturers, the regression analysis is used in the study which takes the determinant factors as independent variables and the implementation of CP as the dependent variable. In the present regression analysis, the regression assumption of linearity, normality, independent of residuals and the absence of multilinearity are all satisfied. Figure (2) shows the standardized result of the regression analysis. The result revealed that the hypothesis H3 and H4 are supported and all the other hypotheses are not supported.

5.1 Influences of Organizational Factors

Based on the result of the questionnaire, the hypotheses are related to the organizational factors

*H1: Senior Management support has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.*

Organizational factors are essential in environmental management and influence the implementation the CP principles (Zhu et al. , 2008). The Senior managers and employees need to have a shared vision and a shared understanding of the organization's mission. The strategies can translate into organizational goals and objectives (Yrk, 2010). If one of the missions of the organization is to protect the natural environment, it is important to involve employees by implementing the appropriate HRM practices at different strategic levels which contribute to the SD (Molina-Azorn, 2009). In this study of Saudi Plastic Manufacturers, we found that Senior Management support does not influence the implementation of CP. Here, the hypotheses related to organizational factors. H4 is not supported, the influencing effect is not statistically significant (b=0.160, t= 1.810, p >0.01), which suggest that SM support will not affect CP implementation behavior for plastic manufacturers. The top management support is not essential in advancing CP implementation unless the organization's resource supports leader's attitudes toward environmental issues (Tornatzky & Fleischer, 1990).

*H2: The quality of human resources has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.*

The hypotheses H2 is not supported and the influencing effect is not statistically significant (b=0.079, t= 0.886, p >0.01), which suggests that the use of CP principles may add complexity to manufacturers processes and require learning, capabilities and training programs. Subsequently, it is essential to provide education and training for employees in managing environmental issues and dealing with these issues in active ways (Wolf & Seuring, 2010). By improving organizational learning capabilities; plastic manufacturers should recruit qualified employees, provide educating programs, and build knowledge management systems.

### 5.2 Influences of Environmental Factors

The hypotheses related to the environmental factors based on the results of the questionnaire:

*H3: The regulatory pressure has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.*

*H4: The customer's pressure has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.*

*H5: The governmental support has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.*

*H6: The environmental uncertainty has a positive influence on the implementation of CP principles in the Saudi plastic manufacturing industry.*

Regarding the influences of environmental factors, only hypotheses H3 ( $b=0.187$ ,  $t=2.129$ ,  $p<0.01$ ), about regulatory pressure, and H4 ( $b=-0.200$ ,  $t=-2.283$ ,  $p<0.01$ ), about customer pressure, are supported. However, the hypotheses H5 ( $b=0.125$ ,  $t=1.413$ ,  $p>0.01$ ), about governmental support, and H6 ( $b=0.158$ ,  $t=1.787$ ,  $p>0.01$ ), about environmental uncertainty is not supported.

The supported hypotheses H3, and H4 emphasized that the regulatory and customer pressures affect the implementation of CP principles' in plastic manufacturing industry. CP is driven by both regulatory push and pull effect, both regulatory, and customer pressure will affect the implementation of CP principles and green practice implementation behavior. In manufacturing sectors, which address that customers are important stakeholders for organizations; their pressure significantly affects the organization's environmental activities (Etzioni, 2007; Lin & Ho, 2011).

Regarding the research hypotheses H5, the regression shows that governmental pressure has a non-significant result. However, the influencing effect is not statistically significant ( $b=0.125$ ,  $t=1.413$ ,  $p>0.01$ ). Although the Saudi government provides financial and technical support for implementing CP, they do not influence the CP implementation (Lee, 2008), since most of the Saudi manufacturers suffer from the lack of financial and technical resources and qualified professionals.

Saudi Governmental support is essential in environmental management through developing environmental policies that can offer an economic incentive, reduce long-term uncertainties, and provide the required resources for the manufacturers to implement CP (Lee, 2008).

Regarding the research hypotheses H6, the regression shows that the environmental uncertainty has a present non-significant result. The influencing effect is not statistically significant ( $b=0.158$ ,  $t=1.787$ ,  $p>0.01$ ). Based on the changes, the environmental uncertainty was tested for evaluating the changes specified in the development of new technologies, innovative abilities and customers' requirement (Zhu & Weyant, 2003). Thereby, Saudi plastic manufacturers put additional resources to improve their primary business activities as compared to improve their environmental performance when they possess a high extent of uncertainty in business environment. Investments in CP will be delayed until other productive process changes are made.

### 5.3 In General

Hypotheses (H3 and H4) are supported, which suggest that Regulatory Pressure, and Customer Pressure, will significantly affect CP principles' implementation for Saudi plastic manufacturers. Note the Regulatory Pressure ( $\beta=0.187$ ), and Customer Pressure ( $\beta=-0.200$ ). While, (H1, H2, H5, and H6) aren't supported, which implies that the quality of HR, SM support, governmental support and environmental uncertainty will not significantly affect CP principles' implementation for Saudi Plastic Manufacturers. Note the quality of the human resources ( $\beta=0.079$ ), Senior Management support ( $\beta=0.16$ ), Governmental Support ( $\beta=0.125$ ), and Environmental Uncertainty ( $\beta=0.158$ ).

The following section provides discussion on the results of the study, as follow:

This study conducts a questionnaire on the motivations factors affecting CP implementation for plastic manufacturers in KSA. The determinant motivating factors have been classified into Organizational, and Environmental factors. The research findings reveal that regulatory and Customer Pressures towards the implementation of CP have significant positive influences on CP implementation for Plastic Manufacturers. While, quality of HR, SM Support, Governmental Support and Environmental Uncertainty exhibit significant negative influences which are related to:

*H1: Senior Management support has a negative influence on the implementation of CP principles in the Saudi*

*plastic manufacturing industry*

*H2: The quality of human resource has a negative influence on the implementation of CP principles in the Saudi plastic manufacturing industry.*

Taking the above hypotheses into consideration, the managers of the manufacturers themselves need to sustain more organizational support, to implement the green practices in their manufacturing industries. Besides, encouraging their employees' to implement green practices, learning, training programs and the availability of resources are relevant for the implementation of CP. While making organizational green resources readily available for their employees, improving their quality of HR and accumulating environmental knowledge is equally essential.

*H5: The governmental support has a negative influence on the implementation of CP principles in the Saudi plastic manufacturing industry.*

Second, from the negative influence of Government Support to implement CP Principles' in manufacturing industry, it can be safely suggested that to guarantee that the manufactures will implement the CP in their processes and products, the Saudi government has to provide them with more of the financial, technical and educational resources to implement CP practices.

*H6: The environmental uncertainty has a negative influence on the implementation of CP principles in the Saudi plastic manufacturing industry.*

It has been stated that high degree of uncertainty is possessed by Saudi plastic manufacturers in their business environment when environmental uncertainty is negatively influenced toward CP principles. In certain, primary business activities are improved by utilizing additional resources as compared to improve environmental performance. Subsequently, until additional productive process changes are made, investments in green practices and processes will be delayed. The Saudi manufacturers in highly uncertain environments may allocate fewer resources to environmental initiatives, indicating negative relationship with CP implementation (Del Brio & Junquera, 2007). Lin & Ho (2011) in their study also suggested the negative relationship between environmental uncertainty and green adoption practices in Chinese logistics companies. When the logistic companies perceive a high degree of uncertainty in their business environment, they put more resources in improving their primary business activities rather than in improving their environmental performance. This research has certain limitations; firstly, there are lack of previous studies in CP principles in KSA. Moreover, the research findings obtained from data collected in KSA (Jeddah) may be limited in their generalizability. Different cities in KSA may lead to conclusions that are different from the present study. Other studies can use the proposed model in other cities in KSA. Similarly, the unavailability of objective measurements of CP principles' implementation for the manufacturers in KSA resulted in reliance on subjective responses of the samples. This study may suffer from respondent bias. Participants may modify their responses to be socially acceptable or rational.

## **6. Conclusion**

This study highlights the influence of the motivational factors towards the implementation of CP principles, through the questionnaire distributed among the Saudi plastic manufacturers. The results have shown that Regulatory Pressure and Customer Pressure are the main motivating factors towards the implementation of CP in Saudi manufacturers. While, the quality of HR, SM Support, Governmental Support, and environmental uncertainty do not significantly support the implementation of CP in the Saudi manufacturing industry. In KSA, the rules and regulations from the Ministry of Commerce and Industry have still been weak and unclear. Besides, the lack of support from the Saudi government and the limited knowledge from the stakeholders about both environmental and financial benefits from the implementation of environmental principles make them the neglected investment in the environmental practices. The ministry of Commerce and Industry should formulate environmentally strong rules and regulations for the manufacturers to improve their operations and processes in favor of greener practices. Additionally, there must be imposition of taxes for the pollution that the manufacturers cause. The lack of previous research about CP implementation in KSA would make the results useful for other researchers to study variable and data collection in the same subject on more extensive samples.

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