E-WASTE MANAGEMENT STRATEGY IN ORGANIZATIONS - A CONCEPTUAL FRAMEWORK

1JAPNEET DHILLON, 2Dr. VIKRAM SANDHU

1Research Scholar, University Business School, Guru Nanak Dev University, Amritsar
2Assistant Professor, University Business School, Guru Nanak Dev University, Amritsar

Abstract

Existing studies on consumer response to e-waste management mainly focus on the household consumers and little attention has been given to study the role of bulk consumers, despite the fact that they create majority of e-waste. The aim of the present study is to build a proposed conceptual framework of the key factors shaping the organizational e-waste strategy as well as the organizational challenges related to its implementation through a review of the current literature. The proposed model takes into consideration studies previously carried out by the authors in the areas of e-waste and environmental management in general. An extensive literature survey has been carried out to derive the constructs of the conceptual framework as a basis for further empirical research. Based on the review of existing literature, a conceptual framework of determinants of e-waste strategy and organizational challenges related to strategy implementation are identified. The model depicts that various internal and external factors served as key strategic drivers for e-waste management in the organizations and the hurdles faced to implement it. The proposed conceptual e-waste management strategy developed through literature review is yet to be empirically tested and validated using appropriate tools and techniques. Future research can be carried out to test the applicability of the proposed framework to a wider spectrum of organizations in varying contexts. The study proposes a novel framework of strategy for e-waste management in the organizational context.

Keywords: Corporate Strategy, E-waste management, Consumer Electronics, Business and the Environment.

INTRODUCTION

In an information technology era, electrical and electronic devices are essential to business operations for their capability to increase both efficiency and productivity at work, irrespective of the nature of the business. As technology changes at a fast pace, many companies modernize their old piece of equipment quite frequently to sharpen their competitive edge. The rapid production and planned obsolescence, practiced by manufacturers of electrical and electronic equipment, has further shortened the useful life of consumer electronics contributing to rapidly rising e-waste quantities. E-waste is defined as "a term used to cover items of all types of electrical and electronic equipment (EEE) and its parts that have been discarded by the owner as waste without the intention of re-use"[STEP, 2014]. It has attracted the attention of business, academicians and policy makers increasingly as one of the most crucial waste disposal issues of the twenty-first century (Heeks et al., 2015).

E-waste is generated at a global rate of approximately 50 million tonnes annually which is worth 62.5 billion dollars, according to a joint report by United Nations University, 2019. Ironically, only 20 per cent of the total e-waste is formally recycled and the remaining 80 per cent remains undocumented. E-waste contains high-value as well as rare materials such as platinum, gold, beryllium, silver, gallium, and many others that have economic value when recycled. As per the joint UN report, a tonne of e-waste contains hundred times more gold than that present in a tonne of gold ore. However, it is also packed with potentially hazardous materials like lead, mercury, cadmium, Polybrominated Flame Retardants, Lithium, Barium and others that create environmental risks and occupational health hazards. Unfortunately, the major portion of e-waste is recycled illegally in the unregulated informal sector which rely on rudimentary methods to extract valuables from e-waste and thus poses a threat to the environment and human health.

The existing literature on e-waste has mainly concentrated on the generation and quantification of e-waste (Miller et al.,2016; Kumar et al, 2017), legislation on e-waste (Kumar et al.,2017), e-waste recycling (Cucchiella et al.,2015; Kumar et al, 2017), resource extraction from e-waste (Tuncuk,2012; Cucchiella et al.,2015; Tesfaye, 2017), environmental impacts of e-waste (Balde et al.,2015) and an international trade in e-waste (Shiannopkao & Wong, 2013; Khan,2016). However, the studies focusing on the underlying factors that may either support or inhibit an implementation of e-waste strategy in an organization is nascent.

Although e-waste management has received an increasing attention over the years, the practical implementation of e-waste management practices has been somewhat modest (Khetriwal, 2009; Osibanjo and Norom, 2007). Only few organizations have a proactive e-waste management practices since others adopt a passive or reactive approach to e-waste management. Therefore, it is important to identify the key drivers that can help organizations progress towards more environmentally proactive strategies of e-waste management. These drivers are usually accompanied by the barriers that can hinder progress towards advanced or proactive strategic positions. A number of studies have analyzed barriers hindering the implementation of e-waste management practices in organizations (Delgado-Ceballos et al., 2012; Murillo-Luna et al., 2011), however, a holistic perspective incorporating factors that may either drive or inhibit an organization's implementation of e-waste strategy has been less studied. In addition to it, prior studies on consumer response to e-waste management mainly focus on the household consumers and little attention has been given to study the role of organizational consumers of electrical and electronic equipment (also called bulk consumers), despite the fact that they create majority of e-waste (Rajya Sabha, 2011). The aim of the present study, therefore, is to build a proposed conceptual framework of the key factors shaping the choice of organizational e-waste management.
strategy as well as the challenges related to its implementation, through review of the current literature.

The paper is structured as follows: Section 2 presents a theoretical framework build around the literature that studies the driving factors and barriers determining the implementation of e-waste strategy in general as well as organizational context, followed by research design/methodology in Section 3. Section 4 present the relevant results and discussions as well as their implications, limitations, avenues for further research before closing with conclusions in Section 5.

CURRENT STATE OF KNOWLEDGE
Since there have been relatively limited literature to date on e-waste in the organizational context, the studies related to environmental management, organizational response to environmental management, Green IT, corporate sustainability, corporate greening have been incorporated.

Corporate Environmental strategy
Corporate environmentalism refers to the recognition and integration of environmental issues into an organization’s strategic planning process. There are two dimensions of corporate environmentalism: corporate environmental orientation and corporate environmental strategy (Banerjee et al., 2003). Environmental orientation denotes the importance of recognizing the impact an organization has on the environment and the need to minimize such impact and environmental strategy refers to the extent to which environmental concerns are integrated into strategic planning process (Banerjee, 2002).

An organization exhibits a broad range of strategic responses while responding to environmental issues (Banerjee, 2001). Some organizations consider it sufficient to adhere to laws and regulations and react to environmental concerns when it is required, whereas others arrive at the subject more strategically and adopt more proactive environmental strategies. Environmental strategies have been classified along a continuum that ranges from passive or reactive to proactive strategies (Hunt and Auster, 1990; Hart, 1995; Sharma and Sharma, 2011; Fraj-Andrés et al. 2009; Kim 2018). Buyse and Verbeke (2003) discovered empirical support for existence of the continuum.

The literature classifies various drivers of environmental management as internal and external to the organization. (Zhu and Sarkis, 2007; Walker et al., 2008; Gonzalez and Gonzalez, 2008; Harms, Hansen and Schaltegger, 2013; Schottle, et al., 2014)

Key Internal Drivers identified from literature
A growing body of research has identified economic opportunities, organizational culture and ethical influences as key antecedents driving organizations to develop environmental strategies (Bansal & Roth, 2000; Lynes & Dredge, 2006; Lynes and Andrachuk, 2008). It has been argued that reducing the environmental footprint results in resource saving and bring cost advantage to organizations (Hart, 1995; Christmann & Taylor, 2001; Ring and Lenox, 2002). Revenues can be enhanced through selling recycled products, increased demand from environmentally sensitive customers (Gordano, 1993; Elkindon, 1994). Moreover, an organization that adopts sound environmental initiatives will probably acquire a high ecological reputation (Miles and Govin, 2000).

The importance of Organizational culture and leadership in inducing corporate ecological responsiveness has been widely recognized (Hanfield et al., 2011; Fraj et al., 2011; Lynes and Andrachuk, 2008). Organizational culture has been regarded as a strategic asset that allows organizations to translate their environmental strategies into better performance (Fraj et al., 2011). Researchers also agree on the point that leadership involvement is a prerequisite in order to diffuse and implement environmental practices within the organization (Stoughton and Ludema, 2012).

Managers’ attitude and motivation towards the corporate environment have a significant impact on the outcomes of implementation of environmental practice (Bansal & Roth, 2000; Vithessonthi, 2009; Ervin et al., 2013). Managers’ attitude towards sustainable development is found to be positively linked with proactive environmental strategies (Fraj-Andrés et al., 2009; Ervin et al., 2013). Organizations are likely to implement proactive environmental strategy if the managers pay high concern to the environment and its protection (Ashford 1993; Bansal 2003; Eldat et al., 2008.) The selection of a more proactive environmental strategy in an organization is determined by the manager’s interpretation of environmental issues as opportunities rather than threats (Sharma, 2000).

Key External Drivers identified from literature
Pressures from regulatory stakeholders has been identified as one of the key driver affecting an organization’s environmental response (Walton et al., 1998; Beamon, 1999; Zhu & Sarkis, 2007; Marshall et al., 2005; Eldat et al., 2008; Huang et al., 2009; Arnold and Hockerts, 2011; Paraschiv et al., 2012; Berrone et al., 2013). Rising legal costs, penalties and fines further accentuate the importance of abiding by legislation (Gordano, 1993).

Some studies have shown that firms adopting environmental management practices were motivated by green customers’ concerns (Henriques & Sadowsky 1996; Christmann & Taylor 2001; Khanna & Antón 2002; Marshall et al., 2005; Zhu & Sarkis, 2007; Eldat et al.; Huang et al.; Arnold and Hockerts, 2011). Kagan et al. (2003), Buyse and Verbeke (2003) and Guoyou et al. (2013) observed that pressures from customers motivate organizations to incorporate environmental management practices.

Several authors have identified that competitive factors may play a significant role in corporate environmental response (Kagan et al. 2003; Christmann 2004; Zhu & Sarkis, 2007; Lynes and Andrachuk, 2008; Huang et al. 2009; Arnold and Hockerts, 2011). Bergh (2002) observed that organizations response to environmental issues were greatly influenced not from their own experiences or regulatory coercive pressures, but by paying close attention to actions of other organizations such as their competitors.

Dummett, 2006 in his study found protecting or enhancing corporate reputation as the second most important driver for corporate environmental responsibility after legislation. According to Hart, (1995), Porter and Linde (1996), Khanna & Antón (2002). Hu and Wall (2005), Chen (2008), Lynes & Dredge (2006), Lynes and Andrachuk (2008), Chang & Feng (2010), enhanced environmental performance adds to the corporate reputation and brand image and provides competitive advantage to the organizations.

Key Barriers identified from literature
Previous studies suggest that a lack of resources to implement environmental protection measures, environmental awareness among consumers, lack of top management commitment and dominance of unorganized sector negatively affects the development of proactive environment strategies in an organization.

Lack of resources is remarked as one of the most significant barriers to implementing environmental policies in an organization (Ravi and Shankar, 2005; Murillo-Luna et al., 2007; Shi et al., 2008; Dahlmann et al., 2008; Hung Lau and Wang, 2009; Wath et al., 2010; Chan, 2011; Delgado-Ceballos et al., 2012; Kumar et al., 2016; Kumar & Dixit, 2018).

Implementation of an environmental practices are hindered by adequate knowledge, lack of environmental awareness among organizational members, lack of knowledge and skills, Lack of environmental training of the employees, lack of sense of urgency
Owing to the lack of stringent government regulations and framework in the adoption of environmental policies, the growing unorganized sector is of vital concern (Chi et al., 2011; Qu et al., 2013; Chaturvedi & Arora, 2013; Milovantseva and Fitzpatrick, 2015; Heeks et al., 2015; Kumar & Dixit, 2018). Lack of leadership and support, particularly from top management, lack of commitment and attitude of employees limited the implementation of an environment management system (Post, 1994; Murillo-Luna et al., 2007; Setthasakko, 2009; Ralph & Stubbs, 2014; Delgado-Geballos et al. 2012; McEwen, 2013; Berroa et al., 2013).

### Control variables

The size of organization affects the development of corporate environmental practices (Sharma and Henriques, 2005; Chen, 2008; De Marchi, 2012; Demirel and Kesidiou, 2011; Bosse et al., 2016; Kim, 2018). The literature revealed that large organizations are in a better position as compared to small organizations to implement environmental practices (Wagner and Schaltegger, 2004).

Each industrial sector has different polluting potential and may adopt a different level of environmental management practices to avoid environmental risks associated with their operations (Gonzalez and Gonzalez, 2006; Gonzalez-Benito, 2008; Elkayat and Paton, 2009; Ervin, 2013; Singh et al., 2014).

### Table 1: Variables identified from the various sources

| Variables | Description | References |
|-----------|-------------|------------|
| **Internal Drivers** | | |
| Economic opportunities (Financial benefits) | Financial implications are seen as a key driver of corporate environmental strategies. | Cordano, 1993; Elkington, 1994; Hart, 1995; Miles and Covin, 2000; Christmann & Taylor, 2001; King and Lenox, 2002; Marshall et al., 2005; Lynes & Dredge, 2006; Eiadat et al., 2008; Tseng et al., 2013; Heeks et al., 2015 |
| Environmental culture and leadership | An organization’s leaders shape its culture - a strategic asset that translate environmental strategies into better performance. | Hanfield et al., 2001; Huang et al., 2009; Lynes and Andrachuk, 2008; Fraj et al., 2011; Paraschiv et al., 2012; Stoughton and Ludema, 2012; Heeks et al., 2015 |
| Managerial Attitude and Motivations | Managers’ Attitude and Motivation is positively linked with proactive environmental strategies. | Williamson et al., 2006; Kasim, 2007; Banes & Roth, 2000; Sharma, 2000; Marshall et al., 2005; Lynes & Dredge, 2006; Lynes and Andrachuk, 2008; Eiadat et al., 2008; Carballo-Penela & Castromán-Díaz, 2015; Vithessonthi, 2009; Ervin et al., 2013; Hunt and Auster, 1990; Liu et al., 2012 |
| **External Drivers** | | |
| Regulatory pressures | Pressure exerted by government agencies, local, regional and international regulators, certifications (e.g., ISO), compliance with current regulations, preemption of future regulations. | Cordano, 1993; Walton et al., 1998; Beamon, 1999; Marshall et al., 2005; Zhu & Sarkis, 2007; Eiadat et al., 2008; Berrone et al., 2013; Huang et al., 2009; Arnold and Hockerts, 2011; Paraschiv et al., 2012; Heeks et al., 2015 |
| Customer demand | End-users’ concern for environmentally friendly products, requirements for environmental actions or standards motivate organizations to incorporate environmental practices. | Henriques & Sadorsky, 1996; Christmann & Taylor, 2001; Khanna & Anton, 2002; Kagan et al., 2003; Buyssse and Verbeke, 2003; Marshall et al., 2005; Zhu & Sarkis, 2007; Eiadat et al., 2008; Huang et al., 2009; Arnold and Hockerts, 2011; Guoyou et al., 2013 |
| Peer Pressure | Related to the issue of legitimacy – organizations compare themselves to their peers and try to behave in accordance with standards or norms prevalent in the same institutional field. | Bergh, 2002; Kagan et al., 2003; Christmann 2004; Zhu & Sarkis, 2007; Lynes and Andrachuk, 2008; Huang et al., 2009; Arnold and Hockerts, 2011 |
| Reputation | To enhance a positive public perception of organization in the marketplace as being a good corporate citizen. | Hart, 1995; Porter and Linde, 1996; Khanna & Anton, 2002; Hu and Wall, 2005; Lynes & Dredge, 2006; Dummett, 2006; Lynes and Andrachuk, 2008; Chen, 2008; Chang & Fong, 2010; Heeks et al., 2015 |

### Barriers

- **Lack of resources**
  - Lack of technology and expertise for e-waste recycling, Financial constraints.
  - Ravi and Shankar, 2005; Shi et al., 2008; Hung Lau and Wang, 2009; Wath et al., 2010; Chan, 2011; Delgado-Geballos et al. 2012; Kumar et al., 2017.

- **Lack of awareness among consumers**
  - Limited interest in environmental issues
  - Chauranga et al., 2015; Wath et al., 2010; Mudgal et al., 2010; Garlapati, 2016; Hung Lau and Wang, 2009; Nnorom et al., 2009; Wellens et al., 2016; Kumar et al., 2017; Kumar & Dixit, 2018.

- **Competition from informal sector**
  - Dominance of unorganized sector
  - Medina, 2000; Chaturvedi et al., 2007; Williams et al., 2008; Chi et al., 2011; Qu et al., 2013;
E-WASTE MANAGEMENT STRATEGY IN ORGANIZATIONS - A CONCEPTUAL FRAMEWORK

| Lack of leadership and support | Level of involvement with environmental issues, Resistance to change, Limited understanding and skills, poor communication. | Chaturvedi & Arora, 2013; Milovantseva and Fitzpatrick, 2015; Heeks et al., 2015; Kumar & Dixit, 2018. |

Control Variables

| Organization Size | Structural characteristic that affects strategic choices in an organization. | Sharma and Henriques, 2005; 2013; Chen, 2008; Lee, 2008; Demirel and Kesidou, 2011; De Marchi, 2012; Liu et al., 2012; Berrone et al., 2013; Bossle et al., 2016; Kim, 2018; Tang, 2018 |

| Industry sector | Each sector differ in their polluting potential and adopt varying degrees of environmental management practices to avoid environmental risks. | Gonzalez and Gonzalez, 2006; Gonzalez and Gonzalez, 2008; Elsayed and Paton, 2009; Ervin, 2013; Singh et al., 2014 |

METHODOLOGY

The data was gathered from the multidisciplinary review of existing body of literature. In order to be considered for the study, publications had to meet the following criteria for inclusion:

1. Studies in the area of environmental management in general as well as in an organizational setting.
2. Studies explaining corporate environmental strategy approaches and factors influencing it.
3. E-waste management frameworks
4. Relevance with regard to research objectives
5. No limitation with respect to publication date of studies

The study selection was based upon the following exclusion criteria: [1] “Environment” is viewed as system environment, not nature; [2] Studies that examine households’ e-waste recycling behavior and practices; [3] Studies not meeting the objectives of the study.

The data was gathered from multiple databases such as Springer Link, Science Direct, Web of Science, IEEEXplore, ResearchGate, Jstor. All titles and abstracts of the studies from different disciplines were reviewed and the inclusion and exclusion criteria is checked for each entry.

Abstracts identified through database searching are 278 including observational studies, case reports and reviews. Abstracts screened after removing the irrelevant and duplicate studies are 253, Full text papers assessed for eligibility are 99, papers included in the final study are 34.

CONCEPTUALIZING THE POSPOSED FRAMEWORK

As a result of review of literature, the following conceptual framework of antecedents of E-waste strategy in an organization was proposed and is illustrated in Figure

![Conceptual Framework](link-to-figure)

Figure 1: Conceptual Framework depicting antecedents of implementing E-waste strategy in an organization

Drivers

| (Independent variables) | (Dependent variable) |
|-------------------------|----------------------|
| Economic Opportunities  | Organizational E-waste strategy |
| (financial benefits)    | (Proactive, Reactive, Indifferent) |
| Organizational Culture  |                  |
| and Leadership          |                  |
| Managerial Attitude &  |                  |
| Motivations             |                  |
| External                |                  |
| Regulatory Pressures    |                  |
| Customer Demand         |                  |
| Peer Pressure           |                  |
| Reputation              |                  |

Barriers

| (Independent variables) |
|-------------------------|
| Lack of resources       |
| Lack of awareness among consumers |
| Competition from informal sector |
| Lack of employee commitment |

Control variables

| Size |
|------|
| Industry Sector |

P1a, P1b, P1c, P1d, P2a, P2b, P2c, P2d, P3a, P3b, P3c, P3d, P4.
The framework identifies two group of key factors that determine the organizational response to the issue of e-waste, as independent variables. First, Internal and External factors that serve as key strategic drivers for e-waste management in an organization. Economic opportunities, organizational culture and leadership, managerial attitude and motivations are the factors that foster the adoption of e-waste strategy in an organization. External factors include regulatory pressures, customer demand, peer pressure and reputation. A second group of factors called barriers, are those variables that hinder the implementation of organizational e-waste strategy. These are lack of resources, lack of awareness among consumers, competition from informal sector and lack of employee commitment. Referring to the prior studies, firm size and industry sector have been incorporated as control variables in the study (Lee, 2008; Liu et al., 2012; Tang, 2018; Gonzalez and Gonzalez, 2008; Ervin, 2015; Singh et al., 2014). Organizational e-waste strategy is taken as dependent variable.

The conceptual framework (Figure 1) is supported with the following propositions which further needs to be empirically tested:

Proposition 1: Internal factors: (a) Economic Opportunities, (b) Organizational Culture and Leadership, (c) Managerial Attitude and Motivations foster the adoption of e-waste strategy in an organization.

Proposition 2: Factors external to the company, that is (a) Regulatory Pressures, (b) Customer Demand, (c) Peer Pressure and (d) Reputation, foster the adoption of e-waste strategy in an organization.

Proposition 3. Hindering factors, that is (a) Lack of resources, (b) Lack of awareness among consumers, (c) Competition from informal sector, (d) Lack of employee commitment, limit the implementation of organizational e-waste strategy.

Proposition 4: Factors such as (a) Firm Size, (b) Industry Sector, moderate the adoption of e-waste strategy in an organization.

Theoretical & Managerial Implications

The study contributes to the literature on e-waste management in the organizational context that has received little attention from researchers. The framework provides managers and policy makers with a list of drivers and barriers that can provide directions for setting up appropriate policies that encourage organizations to adopt proactive E-waste strategy. Understanding the drivers and barriers in implementing e-waste strategy could help organizations in developing more specific interventions to improve the e-waste initiatives. Further, the study raises the level of awareness of E-waste issues to those organizations who earlier may not be aware of it to a significant level.

Study Limitations & Future Research

The findings of the study are subject to some limitations that can be addressed in future research. First, the proposed framework of organizational e-waste strategy is conceptual in nature and solely based on the review of existing literature. However, the framework can be empirically tested and validated using appropriate statistical tools and techniques in any organization within different industries. Further, it can also be applied in practice in an organization, after empirical testing, by incorporating the results of the tests in the model. Therefore, the basic limitation of the proposed framework is that the framework lacks validation from extensive empirical evidence. Second, it is likely that the factors influencing the implementation of organizational e-waste strategy chosen in this study are not exhaustive. Hence, there may be other key variables influencing the organizational strategy of e-waste management which are not covered in the present study.

CONCLUSION

The related literature on e-waste, environment management, organizational environment strategy, corporate sustainability, corporate greening was reviewed to explore organizational response to e-waste management. Inferring from the previous related studies, the paper proposes a conceptual framework of the key factors driving the organizational response of bulk consumers to the e-waste issue as well as factors which may hinder the implementation of the e-waste strategy in an organization. The framework comprises of internal drivers, external drivers and barriers to the organizational e-waste strategy. Further development of the proposed framework by way of testing and refining using empirical evidence through survey will be undertaken. The framework proposed in this paper is likely to support organizations developing E-waste initiatives and stimulate further research in the domain of e-waste management.

ACKNOWLEDGEMENTS

This work was financially supported by the Ministry of Minority Affairs (MOMA), India and University Grant Commission (UGC), India [MANF-2017-18-PUN-81486].

REFERENCES

1. Arnold, M. G., & Hockerts, K. (2011). The greening dutchman: Philips’ process of green flagging to drive sustainable innovations. Business Strategy and the Environment, 20(6), 394-407.
2. Balde, C. P., Kuehr, R., Blumenhal, K., Gill, S. F., Kern, M., Micheli, P., Magnantay, E., & Huisman, J. (2015). E-waste statistics: Guidelines on classifications, reporting and indicators. United Nations University, IAS-SCYCLE, Bonn, Germany.
3. Banerjee, S. B. (2003). Managerial perceptions of corporate environmentalism: Interpretations from industry and strategic implications for organizations. Journal of management studies, 38(4), 489-513.
4. Banerjee, S. B. (2002). Corporate environmentalism: The construct and its measurement. Journal of business research, 55(3), 177-191.
5. Banerjee, S. B., Iyer, E. S., & Kashyap, R. K. (2003). Corporate environmentalism: Antecedents and influence of industry type. Journal of marketing, 67(2), 106-122.
6. Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. Academy of management journal, 43(4), 717-736.
7. Beamon, B. M. (1999). Designing the green supply chain. Logistics information management, 12(4), 332-342.
8. Bergh, J. (2002). Do social movements matter to organizations? An institutional theory perspective on corporate responses to the contemporary environmental movement.
9. Berrone, P., Fosfuri, A., Gelabert, L., & Gomez-Mejia, L. R. (2013). Necessity as the mother of ‘green’inventions: Institutional pressures and environmental innovations. Strategic Management Journal, 34(8), 891-909.
10. Boeske, M. B., de Barcellos, M. D., Vieira, L. M., & Sauvée, L. (2016). The drivers for adoption of eco-innovation. Journal of Cleaner production, 113, 861-872.
11. Buyse, K., & Verbeke, A. (2003). Proactive environmental strategies: A stakeholder management perspective. Strategic management journal, 24(5), 453-470.
12. Carballo-Penela, A., & Castronóm-Díz, J. L. (2015). Environmental policies for sustainable development: an analysis of the drivers of proactive environmental strategies in the service sector. Business Strategy and the Environment, 24(8), 802-818.
13. Chan, E. S. (2011). Implementing environmental management systems in small-and medium-sized hotels.
Obstacles. Journal of Hospitality & Tourism Research, 35(1), 3-23.
14. Chang, N. J., & Fong, C. M. (2010). Green product quality, green corporate image, green customer satisfaction, and green customer loyalty. African Journal of Business Management, 4(13), 2836-2844.
15. Chaturvedi, A., & Arora, R. (2013). E-waste recycling in India: bridging the formal-informal divide. In Environmental Scenario in India (pp. 227-240). Routledge.
16. Chen, Y. S. (2008). The driver of green innovation and green image-green core competence. Journal of Business Ethics, 81(3), 531-543.
17. Chi, X., Streicher-Porte, M., Wang, M. Y., & Reuter, M. A. (2011). Informal electronic waste recycling: a sector review with special focus on China. Waste Management, 31(4), 731-742.
18. Christmann, P. (2004). Multinational companies and the natural environment: Determinants of global environmental policy. Academy of Management Journal, 47(5), 747-760.
19. Christmann, P., & Taylor, G. (2001). Globalization and the environment: Determinants of firm self-regulation in China. Journal of international business studies, 32(3), 439-458.
20. Cordano, M. (1993, July). Making the natural connection: Justifying investment in environmental innovation. In Proceedings of the International Association for Business and Society (Vol. 4, pp. 1049-1061).
21. Cordano, M., & Friese, I. H. (2000). Pollution reduction preferences of US environmental managers: Applying Ajzen’s theory of planned behavior. Academy of Management journal, 43(4), 627-641.
22. Cucciarella, F., D’Adamo, I., Koh, S. L., & Rosa, P. (2015). Recycling of WEEE: An economic assessment of present and future e-waste streams. Renewable and sustainable energy reviews, 51, 263-272.
23. De Marchi, V. (2012). Environmental innovation and R&D cooperation: Empirical evidence from Spanish manufacturing firms. Research policy, 41(3), 614-623.
24. Delgado-Ceballos, J., Aragón-Correa, J. A., Ortiz-de-Mandojana, N., & Rueda-Manzanares, A. (2012). The effect of internal barriers on the connection between stakeholder integration and proactive environmental strategies. Journal of Business Ethics, 107(3), 281-293.
25. Demirel, P., & Keskin, E. (2011). Stimulating different types of eco-innovation in the UK: Government policies and firm motivations. Ecological Economics, 70(8), 1546-1557.
26. Dummett, K. (2006). Drivers for corporate environmental responsibility (CER). Environment, Development and Sustainability, 8(3), 375-389.
27. Eiadat, Y., Kelly, A., Roche, F., & Eyadat, H. (2008). Green and competitive? An empirical test of the mediating role of environmental innovation strategy. Journal of World Business, 43(2), 131-145.
28. Ellington, J. (1994). Towards the sustainable corporation: Win-win-win business strategies for sustainable development. California management review, 36(2), 90-100.
29. Elsayed, K., & Paton, D. (2009). The impact of financial performance on environmental policy: does firm life cycle matter?. Business Strategy and the Environment, 18(6), 397-413.
30. Ervin, D., Wu, J., Khanna, M., Jones, C., & Wirtzka, T. (2013). Motivations and barriers to corporate environmental management. Business Strategy and the Environment, 22(6), 390-409.
31. Fraj, E., Martínez, E., & Matute, J. (2011). Green marketing strategy and the firm’s performance: The moderating role of environmental culture. Journal of Strategic Marketing, 19(4), 339-355.
32. Fraj-Andrés, E., Martínez-Salinas, E., & Matute-Vallejo, J. (2009). Factors affecting corporate environmental strategy in Spanish industrial firms. Business strategy and the Environment, 18(8), 500-514.
33. Garlapati, V. K. (2016). E-waste in India and developed countries: Management, recycling, business and biotechnological initiatives. Renewable and Sustainable Energy Reviews, 54, 874-881.
34. González-Benito, J., & González-Benito, Ó. (2006). A review of determinant factors of environmental proactivity. Business Strategy and the environment, 15(2), 87-102.
35. González-Benito, Ó., & González-Benito, J. (2008). Implications of market orientation on the environmental transformation of industrial firms. Ecological Economics, 64(4), 752-762.
36. Guoqiu, Q., Saixing, Z., Chiming, T., Haitao, Y., & Haifiang, Z. (2013). Stakeholders’ influences on corporate green innovation strategy: a case study of manufacturing firms in China. Corporate Social Responsibility and Environmental Management, 20(1), 1-14.
37. Handfield, R. B., Mehnyk, S. A., Calantone, R. J., & Curić, S. (2001). Integrating environmental concerns into the design process: the gap between theory and practice. IEEE transactions on Engineering Management, 48(2), 189-208.
38. Hart, S. L. (1995). A natural-resource-based view of the firm. Academy of management review, 20(4), 986-1014.
39. Hart, S. L. (1997). Beyond greening: strategies for a sustainable world. Harvard business review, 75(1), 66-77.
40. Heeks, R., Subramanian, L., & Jones, C. (2015). Understanding e-waste management in developing countries: Strategies, determinants, and policy implications in the Indian ICT sector. Information Technology for Development, 21(4), 653-667.
41. Henriques, I., & Sadowsky, P. (1996). The determinants of an environmentally responsive firm: An empirical approach. Journal of environmental economics and management, 30(3), 381-395.
42. Hu, W., & Wall, G. (2005). Environmental management, environmental image and the competitive tourist attraction. Journal of sustainable tourism, 13(6), 617-635.
43. Huang, Y. C., Ding, H. B., & Kao, M. R. (2009). Salient stakeholder voices: Family business and green innovation adoption. Journal of Management & Organization, 15(3), 309-326.
44. Hung Lau, K., & Wang, Y. (2009). Reverse logistics in the electronic industry of China: a case study. Supply Chain Management: An International Journal, 14(6), 447-465.
45. Hunt, C. B., & Auster, E. R. (1990). Proactive environmental management: avoiding the toxic trap MIT Sloan Management Review, 31(2), 7.
46. Kagan, R. A., Gunningham, N., & Thornton, D. (2003). Explaining corporate environmental performance: how does regulation matter?. Law & Society Review, 37(1), 51-90.
47. Kasim, A. (2007). Towards a wider adoption of environmental responsibility in the hotel sector. International Journal of Hospitality & Tourism Administration, 8(2), 25-49.
48. Khan, S. A. (2016). E-products, E-waste and the Basel Convention: Regulatory Challenges and Impossibilities of International Environmental Law. Review of European, Comparative & International Environmental Law, 25(2), 240-260.
49. Khanna, M., & Anton, W. R. Q. (2002). What is driving corporate environmentalism: Opportunity or threat?. Corporate Environmental Strategy, 9(4), 409-417.
50. Khetriwal, D. S., Kraeu, P., & Widmer, R. (2009). Producer responsibility for e-waste management: key issues for consideration- learning from the Swiss experience. Journal of Environmental Management, 90(1), 153-165.
51. Kim, K. (2018). Proactive versus reactive corporate environmental performance: A conceptual framework. *Sustainability*, 10(1), 97.

52. King, A., & Lenox, M. (2002). Exploring the locus of profitable pollution reduction. *Management Science*, 48(2), 289-299.

53. Kumar, A., & Dixit, G. (2018). An analysis of barriers affecting the implementation of e-waste management practices in India: A novel ISM-DEMATEL approach. *Sustainable Production and Consumption*, 14, 36-52.

54. Kumar, A., & Dixit, G. (2018). Evaluating critical barriers to implementation of WEEE management using DEMATEL approach. *Resources, Conservation and Recycling*, 122, 101-121.

55. Kumar, A., Holuszko, M., & Espinosa, D. C. R. (2017). E-waste: an overview on generation, collection, legislation and recycling practices. *Resources, Conservation and Recycling*, 122, 32-42.

56. Lee, S. Y. (2008). Drivers for the participation of small and medium-sized suppliers in green supply chain initiatives. *Supply Chain Management: An International Journal*, 13(3), 185-198.

57. Liu, X., Yang, J., Qu, S., Wang, L., Shishime, T., & Bao, C. (2012). Sustainable production: practices and determinant factors of green supply chain management of Chinese companies. *Business Strategy and the Environment*, 21(1), 1-16.

58. Lynes, J. K., & Andrahukh, M. (2008). Motivations for corporate social and environmental responsibility: A case study of Scandinavian Airlines. *Journal of International Management*, 14(4), 377-390.

59. Lynes, J. K., & Dredge, D. (2006). Going green: Motivations for environmental commitment in the airline industry. A case study of Scandinavian Airlines. *Journal of Sustainable Tourism*, 14(2), 116-138.

60. Marshall, R. S., Cordano, M., & Silverman, M. (2005). Exploring individual and institutional drivers of proactive environmentalism in the US wine industry. *Business Strategy and the Environment*, 14(2), 92-109.

61. McEwen, T. (2013). An examination of the barriers that impact the implementation of environmental sustainability practices in small businesses. *Journal of Business and Entrepreneurship*, 25(1), 117.

62. Medina, M. (2000). Scavenger cooperatives in Asia and Latin America. *Resources, conservation and recycling*, 31(1), 51-69.

63. Miles, M. P., & Covin, J. G. (2000). Environmental marketing: A source of reputational, competitive, and financial advantage. *Journal of Business Ethics*, 23(3), 299-311.

64. Miller, T. R., Duan, H., Gregory, J., Kahhat, R., & Kirchain, R. (2016). Quantifying domestic used electronics flows using a combination of material flow methodologies: A US case study. *Environmental science & technology*, 50(11), 5711-5719.

65. Milovantseva, N., & Fitzpatrick, C. (2015). Barriers to electronics reuse of transboundary e-waste shipment regulations: An evaluation based on industry experiences. *Resources, Conservation and Recycling*, 102, 170-177.

66. Milovantseva, N., & Fitzpatrick, C. (2015). Barriers to electronics reuse of transboundary e-waste shipment regulations: An evaluation based on industry experiences. *Resources, Conservation and Recycling*, 102, 170-177.

67. Mudgal, R. K., Shankar, R., Talib, P., & Raj, T. (2010). Modelling the barriers of green supply chain practices: an Indian perspective. *International Journal of Logistics Systems and Management*, 7(1), 81-107.

68. Murillo-Luna, J. L., García-Ayerbe, C., & Rivera-Torres, P. (2007). What prevents firms from advancing in their environmental strategy? *International Advances in Economic Research*, 13(1), 35-46.

69. Murillo-Luna, J. L., García-Ayerbe, C., & Rivera-Torres, P. (2011). Barriers to the adoption of proactive environmental strategies. *Journal of Cleaner Production*, 19(13), 1417-1425.

70. Nnorom, I. C., Olakwe, J., & Osibanjo, O. (2009). Survey of willingness of residents to participate in electronic waste recycling in Nigeria—A case study of mobile phone recycling. *Journal of Cleaner production*, 17(18), 1629-1637.

71. Osibanjo, O., & Nnorom, I. C. (2007). The challenge of electronic waste (e-waste) management in developing countries. *Waste Management & Research*, 25(6), 489-501.

72. Parashiv, D. M., Nemoianu, E. L., Langă, C. A., & Szabó, T. (2012). Eco-innovation, responsible leadership and organizational change for corporate sustainability. *Amfiteatra Economic Journal*, 14(32), 404-419.

73. Porter, M. E., & Van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. *Journal of Economic perspectives*, 9(4), 97-118.

74. Post, J. E., & Altma, B. W. (1994). Managing the environmental change process: barriers and opportunities. *Journal of Organizational Change Management*, 7(4), 64-81.

75. Qu, Y., Zhu, Q., Sarkis, J., Geng, Y., & Zhong, Y. (2013). A review of developing an e-wastes collection system in Dalian, China. *Journal of Cleaner Production*, 52, 176-184.

76. Ralph, M., & Stubbs, W. (2014). Integrating environmental sustainability into universities. *Higher Education*, 67(1), 71-90.

77. Ravi, V., & Shankar, R. (2005). Analysis of interactions among the barriers of reverse logistics. *Technological Forecasting and Social Change*, 72(9), 1011-1029.

78. Secretariat, R. S. (2011). E-waste in India. *New Delhi, India Research Unit (Larrdis): Rajya Sabha Secretariat*.

79. Sethasakko, W. (2009). Barriers to implementing corporate environmental responsibility in Thailand: A qualitative approach. *International journal of organizational analysis*, 17(3), 169-183.

80. Sharma, P., & Sharma, S. (2011). Drivers of proactive environmental strategy in family firms. *Business Ethics Quarterly*, 21(2), 309-334.

81. Sharma, S. (2000). Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal*, 43(4), 681-697.

82. Sharma, S., & Henriches, I. (2005). Stakeholder influences on sustainability practices in the Canadian forest products industry. *Strategic Management Journal*, 26(2), 159-180.

83. Shi, H., Peng, S. Z., Liu, Y., & Zhong, P. (2008). Barriers to the implementation of cleaner production in Chinese SMEs: government, industry and expert stakeholders’ perspectives. *Journal of Cleaner production*, 16(7), 842-852.

84. Singh, N., Jain, S., & Sharma, P. (2014). Determinants of proactive environmental management practices in Indian firms: an empirical study. *Journal of Cleaner Production*, 66, 469-478.

85. Solving the E-Waste Problem (Step) White Paper. (2014). One Global Definition of E-waste. Retrieved from http://www.step-initiative.org/files/step_documents/STEP_WP_One%20Global%20Definition%20of%20E-waste_20140603_amended.pdf

86. Sthiannopkao, S., & Wong, M. H. (2013). Handling e-waste in developed and developing countries: Initiatives, practices,
and consequences. *Science of the Total Environment, 463*, 1147-1153.

88. Stoughton, A. M., & Ludema, J. (2012). The driving forces of sustainability. *Journal of Organizational Change Management, 25*(4), 501-517.

89. Tang, M., Walsh, G., Lerner, D., Fitz, M. A., & Li, Q. (2018). Green innovation, managerial concern and firm performance: An empirical study. *Business Strategy and the Environment, 27*(1), 39-51.

90. Tesfaye, F., Lindberg, D., Hamuyuni, J., Taskinen, P., & Hupa, L. (2017). Improving urban mining practices for optimal recovery of resources from e-waste. *Minerals Engineering, 111*, 209-221.

91. Tseng, M. L., Wang, R., Chi, A. S., Geng, Y., & Lin, Y. H. (2013). Improving performance of green innovation practices under uncertainty. *Journal of cleaner production, 40*, 71-82.

92. Tuncuk, A., Stazi, V., Akcil, A., Yazici, E. Y., & Deveci, H. (2012). Aqueous metal recovery techniques from e-scrap: hydrometallurgy in recycling. *Minerals engineering, 25*(1), 28-37.

93. United Nations. (2019), A New Circular Vision for Electronics Time for a Global Reboot, Retrieved from: http://www3.weforum.org/docs/WEF_A_New_Circular_Vision_for_Electronics.pdf

94. Vithessonthi, C. (2009). Corporate ecological sustainability strategy decisions: the role of attitude towards sustainable development. *Journal of Organisational Transformation & Social Change, 6*(1), 49-64.

95. Walker, H., Di Sisto, L., & McBain, D. (2008). Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. *Journal of purchasing and supply management, 14*(1), 69-85.

96. Walton, S. V., Handfield, R. B., & Melnyk, S. A. (1998). The green supply chain: integrating suppliers into environmental management processes. *International journal of purchasing and materials management, 34*(1), 2-11.

97. Wath, S. B., Vaidya, A. N., Dutt, P. S., & Chakrabarti, T. (2010). A roadmap for development of sustainable E-waste management system in India. *Science of the Total Environment, 409*(1), 19-32.

98. Welfens, M. J., Nordmann, J., & Seibt, A. (2016). Drivers and barriers to return and recycling of mobile phones. Case studies of communication and collection campaigns. *Journal of cleaner production, 132*, 108-121.

99. Williams, E., Kahhat, R., Allenby, B., Kavazanjian, E., Kim, J., & Xu, M. (2008). Environmental, social, and economic implications of global reuse and recycling of personal computers. *Environmental science & technology, 42*(17), 6446-6454.

100. Williamson, D., Lynch-Wood, G., & Ramsay, J. (2006). Drivers of environmental behaviour in manufacturing SMEs and the implications for CSR. *Journal of Business Ethics, 67*(3), 317-330.

101. Zhu, Q., & Sarkis, J. (2007). The moderating effects of institutional pressures on emergent green supply chain practices and performance. *International journal of production research, 45*(18-19), 4333-4355.

102. Prateek Kanade, Deepali Gupta, Mahesh Radhakrishnan, Visakh Prabhakar. "Role of Serotonin Type-1A/B (Hydroxytryptamine) Receptors in Depression Revisited." *Systematic Reviews in Pharmacy, 4* (1) (2013), 7-13. Print. doi:10.4103/0975-8453.135831

103. Surendar, A. Short communication: Role of microbiology in the pharmaceutical & medical device(2018) *International Journal of Pharmaceutical Research, 10* (3), p. 433.