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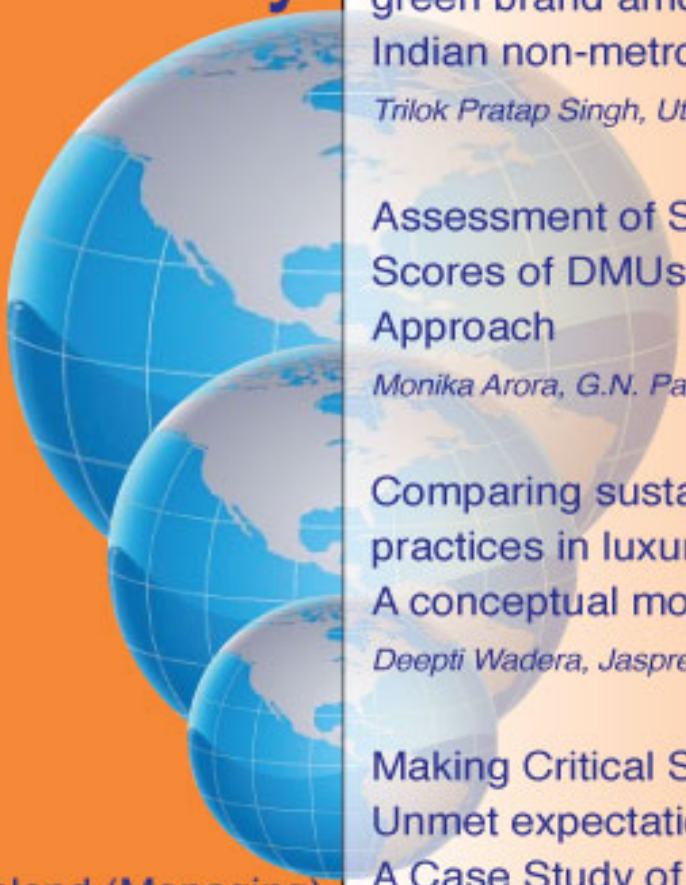

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Empirical Assessment of Sustainable Banking Issues in the Indian Banking Sector

Kishore Kumar, Krishanveer Singh
Institute of Business Management, GLA University, Mathura, India
+91-7017234831. akishore001@gmail.com

Ajai Prakash
Department of Business Administration, Univ. of Lucknow, Uttar Pradesh, 226007, India

Abstract

Purpose

This study aims to identify the factors influencing adoption of sustainable banking practices in Indian banking sector and examines the most pertinent issues related to sustainable banking in India.

Design/Methodology/Approach

The constructs of the study were identified through two sequential phases involving a review of literature and semi-structured interviews with the senior management official of public and private sectors banks operating in India. Further, exploratory factor analysis was used to determine the underlying factors. Data were collected from 110 senior management officials of banks operating in India using self-administered questionnaire.

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Findings

Twenty four attributes emerged as significantly influencing the adoption of sustainable banking practices in banks which have branched out of five factors. Further, it was found that huge adoption cost and lack of uniform sustainable banking policy are the major issues in Indian banking sector.

Practical Implications

The identification of factors influencing adoption of sustainable baking in India can serve as a guiding tool for the regulators and banks to promote adoption of sustainable banking practices in India and developing country's banking sector. The examination of pertinent issues with the focus on major support required, bottlenecks in adoption, key benefits of sustainable banking and most common sustainable banking practices is expected to provide new understanding about the sustainable banking issues in India.

Originality/Value

This study is one of the first efforts on assessing sustainability in banking in Indian context. The findings provide insight into the factors that influence adoption of sustainable banking practices by the banks in India.

Keywords: Sustainable banking, Responsible business conduct, Sustainable development, Green banking, CSR

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1. Introduction

Today the issues related to sustainable development is an important agenda in the corporate world. Therefore, the integration of a mantra of sustainability into corporate strategy has become imperative across businesses and industries (Dyllick and Hockerts, 2002; Baumgartner and Rauter, 2017). The implementation of principles of sustainability into corporate practices is the key in measuring stakeholders and society expectations (Asif et al., 2013). Banks are considered as a powerful agent for achieving sustainable development due to their key role in the development of economy (Jeucken and Bouma, 1999). The discernible shift in the banks strategies to address environmental and social impact of banking operations is an important step for moving towards sustainable development (van Gelder, 2006; Rebai, 2014). The banking sector is increasingly adopting sustainable banking practices as an important tool to integrate sustainable development into banking strategy (IFC, 2007; Raut, 2007; Care, 2018). The developments of innovative sustainable products & services have experienced tremendous growth in recent years, representing the path towards a sustainable future (Krosinsky and Robins, 2008). Various international standards and principles on sustainable development like UNEP FI, UNGC principles, GRI standards, ISO 14000, ISO 26000, and Equator Principles have been widely

adopted by the banking institutions around the world to address sustainability issues through banking (Scholtens, 2009). Even individual countries especially in emerging market economies have established specific policies and guidelines either voluntary or mandatory to embed sustainability in the banking system, for example China adopted green credit guidelines in 2007, Nigeria launched Nigeria Sustainable banking Principles (NSBP) in 2012 and Columbia launched Green protocol in 2012. Similarly, countries like Bangladesh, Peru, Indonesia, Kenya, Vietnam, Turkey, and Mongolia have established guidelines, roadmaps or principles focussed on sustainable banking (Oyegunle and Weber, 2015). India is yet to come up with any such uniform policy to promote sustainable banking practices in the banking sector however, the Government of India has taken a few notable steps to promote sustainability in corporate practices. With the establishment of national voluntary guidelines (NVGs) by the Ministry of Corporate Affairs, Government of India (July, 2011) and Securities Exchange Board of India Regulation (2012) for mandatory disclosure of CSR initiatives by top 100 BSE and NSE listed companies, followed by the enactment of mandatory CSR expenditure by businesses under section 135 of India Companies Act 2013, the disclosure of non financial performance through business responsibility report(BRR), corporate social responsibility report, sustainability report by the banks has witnessed a rising trend (Prakash et al., 2018). Rajput et al., (2013)

argues that although the adoption of sustainable banking practices by the banks in India is in a nascent stage and banks are increasingly engaged in addressing sustainability development issues through diverse, uncoordinated initiatives and self-regulatory policies.

Despite ample amount of studies has been conducted on sustainable banking in developed countries; there is a dearth of empirical researches on sustainable banking in the Indian context. Sustainable banking practices of banks vary with the different geographical region, socio-economic development, and regulatory environment in the country (UNEP FI, 2016). Most of the studies in India are focused on CSR disclosure (Narwal, 2007; Sharma and Mani, 2013; Kulkarni, 2014) and the green banking strategies adopted by the banks (Bihari, 2010; Biswas, 2011; Bahl, 2012; Jha and Bhome, 2013; Tara and Singh, 2014). The empirical researches on the understanding and the adoption of sustainable banking in India could not be traced. It is in this backdrop, the present study addresses the following research questions; what are the different sets of factors influencing adoption of sustainable banking practices in India? Further, this study also examines what are the most pertinent issues with regard to sustainable banking in India. Based on the review of literature and interviews with the senior management officials of the banks in India, this study attempts to provide a

framework which illustrates the process of identification of factors influencing the adoption of sustainable banking in Indian banking sector.

The paper is structured as follows: Section 2 review of the literature on sustainable banking and various issues influencing the adoption of sustainable banking by the banks. Section 3 is on research methodology. The research results are discussed in section 4 and section 5 concludes the research. The last section provides implications and limitations of the study.

2. Literature review

2.1 Background

The concept of sustainability in banking has been continuously evolving; a) Initially it was regarded as the social responsibility- community welfare programme and philanthropy were the major practices adopted by the banking institutions to contribute in the society. b) Banking operations integrated environmental considerations in the form of green banking practices, c) Ethical value to promote responsible business conduct of the banks, d) finally, the concept of sustainable banking which involve carrying out banking business by integrating environment, social & governance (ESG) issues to promote sustainable development (Weber and Feltmate, 2016). The concept of social banking, ethical banking, and green banking falls within the ambit of sustainable

banking (Prakash et al., 2018). Sustainable banking can be defined as a business strategy to incorporate ESG issues and subscribe to the international standards on sustainable development to assess and manage the environmental and social performance of the banking activities (UNEP and World Bank, 2017). The adoption of sustainable banking in the banking has two dimensions; first incorporation and implementation of environmental & social considerations into routine affairs of the banking operations like energy efficient techniques, green buildings, environmental management system, community involvement, and social welfare programs etc. The second dimension focuses on integrating environmental, social, ethical issues into banks core strategy i.e. sustainable fund, green mortgage, financial inclusion, business ethics policy etc. (UNEP FI, 2016a). The disclosure of sustainability report, CSR report, and business responsibility report is another crucial dimension of sustainable banking aimed at improvement of ESG performance of the banks and disclosure of the same to the various stakeholders. The profiling of innovative sustainable products & services has a significant strategic and commercial dimension for the banks (Care, 2018). Banks are increasingly realigning their existing products & services as well as creating new ones to transit towards sustainable banking (Lehner, 2016). The adoption of sustainable banking practice is perceived as commitment of banks towards

sustainability and plays a crucial role in improving brand image and reputation of the banks (Oyegunle and Weber, 2015; IFC, 2007).

2.2.1 Regulatory compliance

Regulatory environment & outside pressure is one of the most important factor influencing the adoption of sustainable banking practices in banking (Valentina et al., 2010). The expectation of the various stakeholders for transparency and greater responsibility in business conduct has been the major reasons for increased thrust to sustainability issues by the corporate world. The civil society has always been at the forefront in advocating sustainability in the financial system and played a crucial role in the development of various international standards & guidelines on sustainability like Equator Principles (EPs), UNEP FI, PRI (O'Sullivan and O'Dwyer, 2015). Hoepner and Wilson (2011) also highlighted the increased emphasis on social, ethical, environmental and trust (SEET) issues in banking in the past decades due to the development of these global initiatives to promote sustainable banking. The new trend of country specific standards and guidelines has been a key driver to promote sustainability in banking (Oyegunle and Weber, 2015). Although India does not have any specific policy mandating adoption of sustainable banking practices, few notable steps certainly have been taken by the government and regulators to promote corporate sustainability in general. The establishment of NVGs in 2011, SEBI

(2012) regulation of mandatory disclosure of NVGs through BRR and CSR rule of Section 135 and Schedule VII of the Companies Act 2013 has resulted in improved environmental and social performance of companies in India (Yadava, 2016; Subramaniam et al., 2017; Kumar and Nigam, 2017; Prakash et al., 2018).

2.2.2 Environmental readiness

Although banking operations do not directly contribute to the carbon emission as against other industries, indirectly they significantly influence the negative impact on the environment (Jeucken, 2001). The concept of green banking specifically addresses the environmental dimension of sustainability in banking (Dewi and Dewi, 2017). There is ample amount of literature on the practices adopted by banks for integrating environmental considerations i.e. environmental credit risk management framework and sustainable financing (Jeucken, 2001; Thompson and Cowton, 2004; Weber et al., 2008; Weber et al., 2010; Ziolo et al., 2017), environmental management system (Scholtens, 2009; Campos et al., 2015; Schaltegger et al., 2017), energy efficient technology, paperless banking (Sahoo and Nayak, 2007; Biswas, 2011; Bahl, 2012; Ullah, 2013).

2.2.3 Sustaining competition

Care (2018) emphasised that sustainable competitive advantage and increased profitability is one of the most important triggers in the adoption of sustainable banking practices by the banks. There is a growing body of research on the implementation and practices of sustainability principle into business process resulting in long-term sustainable value creation for the business (Jeucken, 2001; Scholtens, 2009). The pursuance of innovative sustainable products & services and socially responsible business conduct results in wide range of benefits for the banks from new market opportunities to enhanced market value and improved image in the community (UNEP FI, 2016).

2.2.4 Socio-ethical responsibilities

To address the responsibility of banks towards the needs of the society and positive social impact, the adoption of sustainable banking has been the major thrust area in banking activities (Benedikter, 2011). There are many studies emphasising the need for social banking for equitable growth in the society and well being of the people (Narwal, 2007; Carroll and Shabana, 2010; Goyal and Jhosi, 2011; Weber and Remer, 2011). The banks should not only be compliant to the regulation pertaining to business operations but also undertake a strong commitment to the well being of the society in which it operates (IFC, 2007). The expectations of the society especially, in developing countries towards the role and responsibilities of the banks and challenges that they face are pushing banks

to develop innovative sustainable products & services i.e. financial inclusion (BSBD) initiatives, branchless banking, and microcredit (Sarma and Pais, 2011; Kumar, 2013; Chakravarty and Pal, 2013). The banks in developing economies can play a crucial role to reduce poverty and fill in a gap in sustainable finance discourse by addressing the challenge of financial exclusion of deprived section of the society (Chibba, 2009). Dare et al., (2014) noted that socially responsible and ethical business conduct is the social license to operate for corporate. IFC (2007) stressed high anti-corruption and governance standards should be taken into consideration by the banks before financing in order to bring transparency and promote sustainability in banking. Banks are increasingly engaged in the pursuit of strong governance and sound business ethics to integrate sustainability in banking (Goyal and Joshi, 2011; Jeuken, 2001; de Clerck, 2009).

2.2.5 Aligning with sustainable finance

The comprehensive assessment of environmental and social risk to mitigate the adverse impact of banking operations is critical for aligning with sustainable financing (Weber et al., 2008; Mengze and Wei, 2015). The pursuit of sustainable financing provides new avenues for a potential new market with new clients to the banks (Bouma et al., 2001; Care, 218). Sustainable banking practices help to maintain better asset quality and promotes a sustainable business (Aras and Crowther, 2010). Weber and Remer (2011) stressed on the paradigm shift in

banking strategy that has positive social and ecological impact to deal with the rising challenges that sustainability presents. Weber (2010) also highlighted the need for socially responsible investment and sustainable financing by the banks based on the Kyoto Protocol mechanism to promote sustainability in banking. The Indian banking system is beleaguered with non-performing assets that require sustainable structuring of stressed assets through effective integration of sustainability principles into credit-risk management framework (Das, 2013). This induces banks to adopt sustainable policies, systems and lending practices that could reduce the adverse impact of doing business.

3. Research Methodology

The study has been conducted in two sequential phases; initially qualitative method was used to determine and verify construct identified through literature review and framework was proposed based on a review of the literature and semi-structured interviews with senior management of public and private sector banks in India. These constructs were empirically investigated through survey research using questionnaire. Following are the details of each phase.

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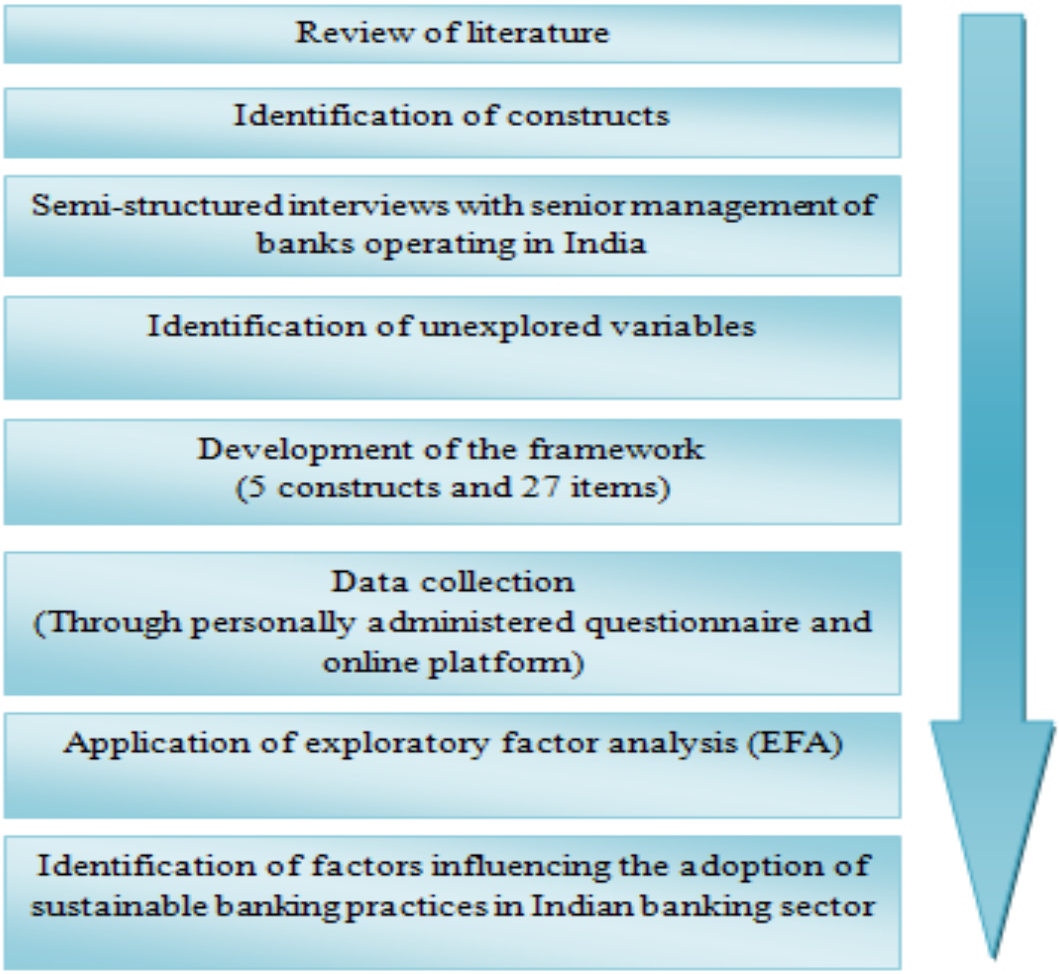

Figure 1. Research process framework

Phase 1. After the identification of construct through the review of literature, semi-structured interviews were conducted with the objective to validate construct and identify new variables influencing the adoption of sustainable

banking in Indian banking sector. Purposive sampling method was used to select the respondent based on their role in the organisation and in consistent with the objective of the study. A total of eleven interviews were conducted with the senior management (i.e. business responsibility head, general manager, assistant general managers) of public sector banks (PSBs) & private sector banks to develop understanding and verify various sources that influence adoption of sustainable banking practices in Indian banking sector.

Semi-structured interviews included the questions related to the issues that influence the adoption and growth of sustainable banking practices in the Indian banking sector. Participants validated the crucial role of constructs identified through the review of literature. The participant also proposed three new issues that have emerged as significant reasons for adoption of sustainable banking practices by banks in India. These are; to deal with the mounting challenge of rising NPAs in banks, RBI directives for the banks to promote sustainable development and increased stress in the business environment.

Phase 2. This phase involves instrument development, pre-test, and research survey through a questionnaire for the empirical validation of the construct.

3.1 Instrument development

Twenty-seven variables representing five constructs were administered to eight experts (five general managers and three academicians). The pre-test was conducted to evaluate the meaningfulness of the questions and whether any item needed to weeded out or added. The exercise resulted in a rephrasing of some of the construct names and variables.

After the pre-test, the questionnaire was reviewed by three academicians and five officials of banks to determine the face validity and content validity of the questionnaire. Content validity requires review of the questionnaire from seven or more experts (DeVon et al., 2007). The survey instrument measure five latent constructs and their associated twenty-seven attributes through self-reporting questionnaire. A cover page was also included in the questionnaire to provide general information about the objectives and proposed implications of the study. The participants were requested to rate on seven point Likert scale (1 strongly disagree to 7 strongly agree).

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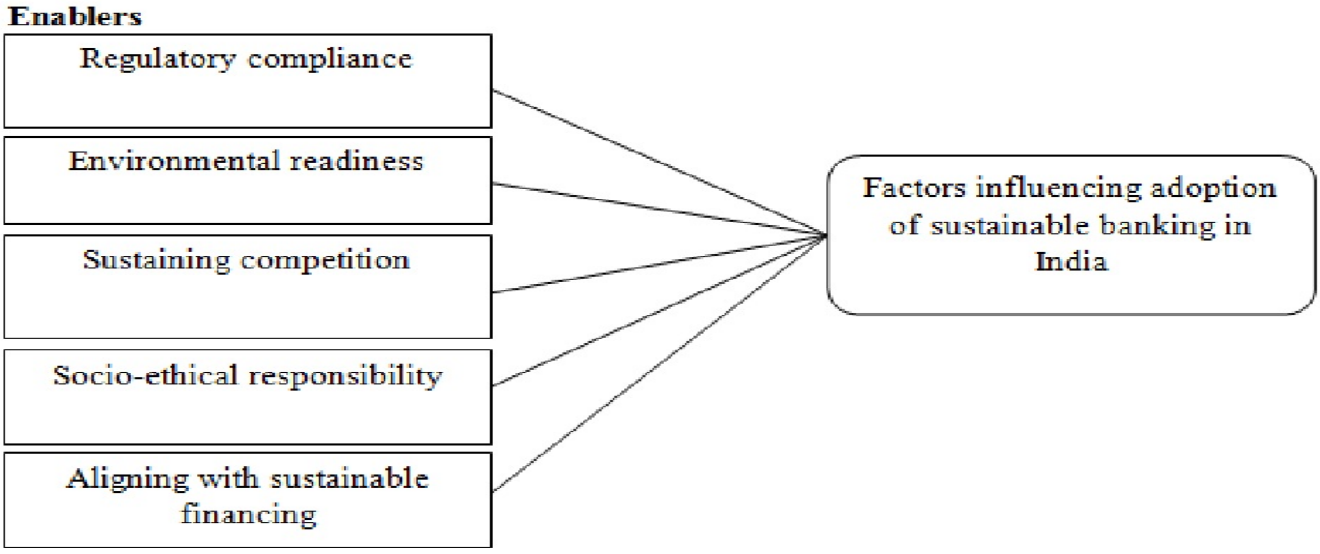

Figure 2. Framework of factors influencing adoption of sustainable banking in Indian banking sector.

3.2 The sample and data collection

All forty-two PSBs and private sector banks in India was considered as the sample for the study. The ownership in the Indian banking sector in terms of market share and total banking activity predominantly remains with PSBs and private sector banks. The PSBs and private sector banks in India accounted for more than 90 percent of the total banking assets (RBI, 2017). Therefore, senior management officials (i.e. business responsibility head, sustainability heads,

general manager, assistant general managers) of public sector banks (PSBs) and private sector banks were selected as the sample of the study. Purposive sampling was used to select the sample as sample was involved in planning and implementation of sustainable banking strategy in their respective banks therefore, deemed appropriate for the study. For data collection, self-administered questionnaire was sent online via email, LinkedIn (professional networking site) and questionnaire were also personally administered at different head offices of banks in Delhi NCR region and Lucknow. A total of 37 questionnaires were personally administered and out of total 192 online distributed questionnaires, only 73 complete questionnaires were received (response rate of 38.42%). Hence, 110 questionnaires were used in the study for final analysis. Further, it was ensured that respondent must have the experience in planning and implementation of sustainable banking strategy and at least two complete questionnaires must be included from each of the PSBs and private sector banks. Total 110 usable questionnaires represent 33 PSBs & private sector banks (78.6% of total PSBs and private banks in India).

4. Results and discussion

4.1 Descriptive statistics

The respondent in this study were 110 senior management officials of public and private sector banks in India. Majority of the respondent (67%) were working in PSBs in India and rest of the respondent were from private sector banks. The sample represents 85.71% and 71.42% of the total PSBs and private sector banks in India respectively.

4.2 Principle component analysis

Principle component analysis was used to determine the underlying factors that accounts for maximum variance in the data set (Hair et al., 2009; Mahlotra, 2010). The data set was analysed using SPSS Version 20. One of the assumption of conducting PCA and extracting underlying factors is there should be existence of correlation greater than .30 between the variables (Hair et al., 2009). It was found that all the variable have correlation greater than 0.30. PCA was further conducted to identify the items having factor loading of less than .05 or cross loadings (Hair et al., 2009; Mahlotra, 2010). Three items were removed as they failed to meet the established criteria of cross loading or loading <.50. PCA was again carried out with 24 items scale. Varimax (orthogonal factor rotation) was undertaken to minimise the complexities of factors by maximizing variance of factor loadings on each factors and to improve the interpretability of the solution loadings on each factor (Tabachnick and Fidell, 2007). The result shows five

factors exhibited eigenvalue greater than 1. These five factors captured 66.66 percent of the total variance. Factor loadings for each items in their respective factor ranged from 0.664 to 0.880, considered as very good (Comrey and lee, 1992). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.714, sufficiently higher than .60 (Hair et al., 2009). The Bartlett's test of spherecity was found to be significant (chi-square=1420.971; $p<.005$). Thus, sample size of 110 was considered to be adequate and satisfactory for conducting the study.

4.3 Validity and reliability

Content validity indicates whether the content of the questionnaire was relevant for the purpose of the study and reflects the complete range of attributes under the study, undertaken by at least seven or more experts (DeVon et al., 2007). To establish the content validity the questionnaire was reviewed by three academicians and five officials of banks. To determine the face validity, the questionnaire was properly assessed in terms of clarity of wording, readability, layout, style and formatting (Haladyna, 1999; DeVon et al., 2007). Convergent validity is the extent to which items in the particular constructs correlate with each other. As rule of thumb, average variance extracted (AVE) must be greater than .50 and factor loading of higher than .70 (Hair et al., 2009). All AVE values

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were greater than .50 and factor loadings were greater than .70 except for one item which was 'comply government policies/regulations with regards to sustainable development like NVGs, the disclosure of BRR'. However, this item contributed significantly to the content validity and its removal does not resulted in a significant increase in Cronbach coeffiecient alpha, therefore it was retained. The discriminant validity was established with the help of cross loadings (Hair and Lukas, 2014). The sample represents both PSBs & private sector banks in Ind

Factors and their related attributes	Factor loadings	Communalities
Factor 1 Regulatory compliance		
Variance extracted= 16.130		
Cronbach's Coefficient Alpha= 0.877		
There is a pressure from NGO's movement for incorporating sustainability in banking	0.880	0.784
To adhere to the international sustainability code of conduct like EPs, UNEP FI, UNGC, CDP etc.	0.824	0.703
There is a pressure from environmental groups to incorporate sustainability in banking	0.818	0.695
To meet the RBI instructions advocating sustainable development.	0.773	0.623
Increased awareness among the customers with regards to sustainable banking practices.	0.771	0.602
To comply government policies/regulations with regards to sustainable development like NVGs and the disclosure of BRR.	0.664	0.455
Factor 2 Environmental readiness		
Variance extracted= 8.269		
Cronbach's Coefficient Alpha= 0.713		
To fosters clean energy	0.810	0.674
Sustainable banking practices results in energy efficiency in operations.	0.793	0.635
To deal with climate change and global warming issues.	0.774	0.607
Factor 3 Sustaining competition		
Variance extracted= 14.463		
Cronbach's Coefficient Alpha= 0.877		
To improve brand image	0.860	0.746
Reduction in transaction cost through paperless banking.	0.853	0.742
To gain competitive advantage	0.803	0.656
Higher profits in longer run	0.785	0.628
Sustainable banking practices result in lower credit risk	0.780	0.612
Factor 4 Socio ethical responsibility		
Variance extracted= 13.654		
Cronbach's Coefficient Alpha= 0.859		
To address the issue of financial exclusion of deprived section of the society.	0.853	0.753
To address anti-corruption & human rights issues	0.804	0.692
Community relations can be improved through SB practices	0.792	0.638
Need to incorporate business ethics and corporate governance issues in banking business	0.777	0.634
To incorporate social responsibility considerations and promote equitable growth in the society.	0.766	0.613
Factor 5 Aligning with sustainable financing		
Variance extracted= 14.145		
Cronbach's Coefficient Alpha= 0.876		
To strengthen risk management framework through environment & social risk management.	0.853	0.758
Increased stress in the business environment driving banks towards adoption of sustainable banking	0.836	0.723
To tap new market opportunities and attract new client	0.834	0.724
To improve non-financial performance of the bank	0.800	0.708
To deal with the challenge of rising NPAs	0.749	0.594

Table 1. Factors influencing adoption of sustainable banking practices in Indian banking sector and their related attributes.

4.4.1 Regulatory compliance

The first factor 'regulatory requirement' comprised six items with factor loading ranging from 0.880 to 0.664 and accounted for 16.13% of total variance. The items were related to external pressure like pressure from NGOs, environmental groups, awareness among the customers, international sustainability code of conducts, government regulation and RBI directive for promoting sustainable development. This implies that adoption of sustainable banking in Indian banking sector is largely driven by outside pressure from various stakeholders either mandatory or voluntary. This has been highlighted in the previous researches also (Jeucken, 2001; Valentina et al., 2010; O'Sullivan and O'Dwyer, 2015; Islam and Hasan, 2015; Oyegunle and Weber, 2015). However, it was found that one item, government policy/regulation for promoting to sustainable development showed low loading (less than .70). But it was retained in the factor solution because it showed very high content validity as participants of the interviews emphasised that the role of NVGs and disclosure of BRR in driving banks towards sustainable banking is high.

4.4.2 Environmental readiness

The second factor 'environmental readiness' has been found to be an important component in the adoption of sustainable banking. This factor comprised of three items with factor loading ranging from 0.810 to 0.774 and accounted for 8.269% of the total variance. It represents the understanding of how banking institutions address the environmental dimension of sustainability. The challenge of global warming, climate change and financing opportunities in clean energy provides new avenues to banking institutions. The adoption of sustainable banking practices to incorporate the environmental considerations has been extensively studied in the previous studies also (Thompson and Cowton, 2004; Weber et al., 2008; Bahl , 2012; Ziolo et al., 2017). Environment management system, eco-friendly technology, paperless banking is aimed at integrating environmental concerns in banks routine operations (Sahoo and Nayak, 2007; Ullah, 2013). Banks are also developing sustainable products and services like sustainable financing and environment loans to address the issues of global warming and clean energy (Scholtens, 2009; Weber et al., 2010; Campos et al., 2015; Schaltegger et al., 2017).

4.4.3 Sustaining competition

The third factor 'sustaining competition' comprised of five items with factor loading ranging from 0.860 to 0.780 and accounted for 14.463% of the total

variance. The adoption of sustainable banking practices resulting in increased brand value, improved image in community and competitive advantage for the banks has been well documented in the previous researches (Jeucken, 2001; IFC, 2007; UNEP FI, 2016). The reduction in transaction cost through digital banking, paperless banking, lower credit risk on sustainable products & services and potential of higher profitability in longer run are also supported by earlier literature (Sahoo and Nayak, 2007; Ullah, 2013; Care, 2018). This implies that sustainable banking practice has been crucial for sustaining competition and gaining competitive advantage in the banking industry.

4.4.4 Socio-ethical responsibility

The fourth factor 'socio-ethical responsibility' captured by five items with factor loading ranging from 0.853 to 0.766. The results supported the strong correlation between the items of social development goals & socio-ethical conduct of the business. This factor implies the need for socially responsible business conduct within and outside the organisation is driving banks towards the adoption of sustainable banking practices. The results supported earlier researches on the role for banks in mainstreaming financially deprived section of the society and contributing to social development goals (Chibba, 2009; Sarma and Pais, 2011; Kumar, 2013). The result also supports the role of business ethics, corporate

governance issues, decent labour practices and human rights for incorporating sustainability in banking and promoting adoption of sustainable banking practices (de Clerck, 2009; Goyal and Joshi, 2011; Dare et al., 2014).

4.4.5 Aligning with sustainable financing

The fifth factor 'Aligning with sustainable financing' comprised of the items related to environmental and social risk management framework, improvement of non financial performance, challenges of rising NPAs, increased stress in the business environment and tapping potential new market. It represents the shift towards sustainable financing helps in the robust risk management system and improving business performance by reducing stressed assets and foray into the potential new market. In general, these attributes have been highlighted in previous studies (Weber et al., 2008; Aras and Crowther, 2010; Das, 2013; Mengze and Wei, 2015; Bouma et al., 2001).

4.5 Mann-Whitney U test (Type of banks)

The nonparametric, Mann-Whitney U test was performed in order to understand the difference in response pattern of respondents of PSBs and private sector banks vis-à-vis to the factors determined and inferences were drawn. As is clear from table 2, differences between respondent of PSBs and private sector banks were

statistically insignificant on the five factors namely regulatory compliance, environmental readiness, sustaining competition, socio-ethical responsibility and aligning with sustainable financing.

Factors	Mann-Whitney U	Z	Sig. (2-tailed)
Regulatory compliance	1357.00	3373.00	.450
Environmental readiness	1428.00	3444.00	.744
Sustaining competition	1393.00	2521.00	.594
Socio-ethical responsibility	1422.50	2550.50	.722
Aligning with sustainable financing	1353.00	2481.00	.435

Table 2. Mann-Whitney U test (Types of banks).

4.6 Various issues pertaining to a current state of sustainable banking in India

This section of the study examines the various issues pertaining to a current state of sustainable banking in India. The respondents were asked to view their opinion on the key bottlenecks in adoption of sustainable banking, kind of support required for adoption and growth of sustainable banking, most common sustainable banking practices undertaken by banks and what are the most important benefits of adopting sustainable banking practices. Following are the detailed findings and discussion:

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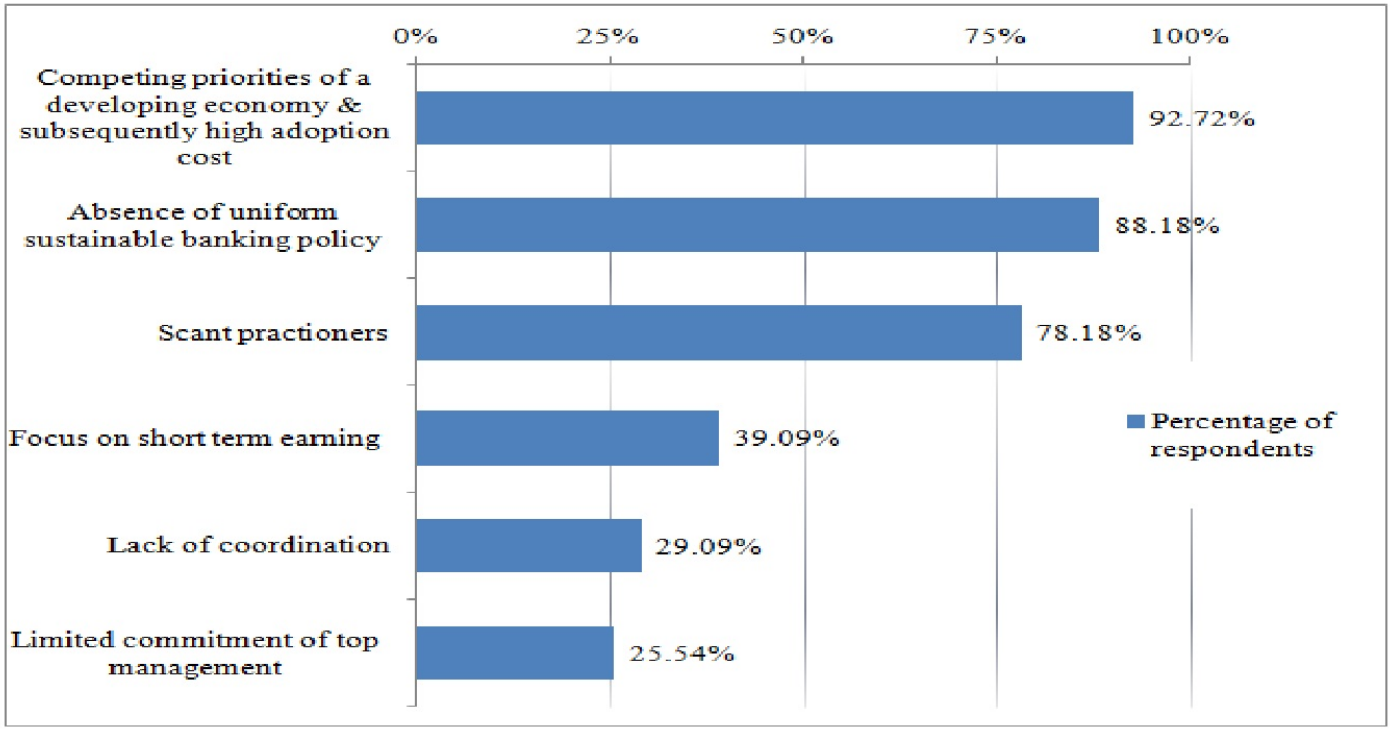

Figure 3. Key bottlenecks in planning and implementation of sustainable banking strategies.

This part was specifically designed to understand the bottlenecks that hinder the planning and implementation of sustainable banking strategies in Indian banking sector. The respondents were asked to identify the most pertinent issues that act as a bottleneck in the planning and implementation of sustainable banking strategies. The majority (92.72%) of respondents identified competing priorities and subsequent high adoption cost as a major bottleneck in the adoption of sustainable banking practices. This suggests that the adoption of sustainable banking

practices is still regarded as the costly affair, even though respondents agreed that adoption of sustainable banking practices provides returns in the longer run. The second biggest bottleneck is the absence of uniform sustainable banking policy in the Indian banking sector. There is no sustainable banking policy or guidelines formulated by RBI in India and respondents reported that lack of sector-specific guidelines for financing creates a possibility of risk of losing business to peers. The absence of experts and advisors in the field of sustainable banking as the major limitation in adopting sustainable banking practices was reported by 78.18% of the total respondent. The focus on short-term earning delaying incorporation of sustainable development in banking was reported by 39.09% respondents. However, lack of co-ordination and limited support of top management appeared to be a minor issue as meagre 29.09% and 25.54% of the total respondents respectively reported it as a bottleneck in planning and implementation of sustainable banking strategies. These findings provide insight into critical issues that must be addressed by the banks along with the regulators in India to facilitate the advancement of sustainable banking in Indian banking sector.

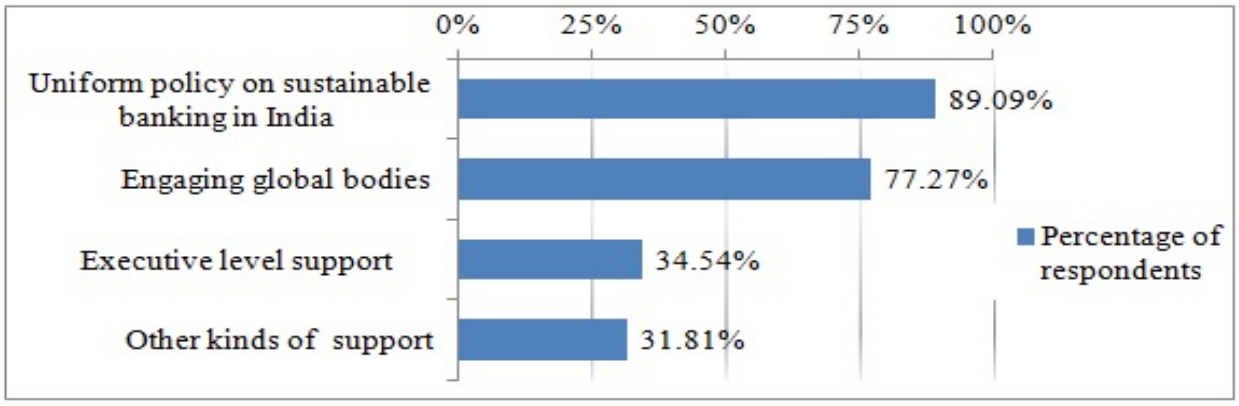

Figure 4. Kind of support required to bolster sustainable banking efforts in India.

Majority of respondents (89.09%) reported uniform sustainable banking policy by RBI or government is the main support that banks required to bolster sustainable banking efforts in the Indian banking sector. This is in consistent with the above mentioned major bottlenecks. This suggests that banks are conscious towards advancement of sustainable banking but respondents considered self-regulatory policy of the bank alone is not the way forward. The total of 77.27% respondents reported that the engagements with UNEP FI, GRI, EPs etc. in the form of expertise, training, seminars or funding will serve as an enabling environment to promote sustainable banking in Indian banking industry. Total of 34.54% of the respondents considered executive level support is also important for sustainable banking in banks in India whereas, 31.81 % of the respondents think other kinds of support in the form of advisory services, special incentives from the state or

education & training are required for promoting sustainable banking in Indian banking sector.

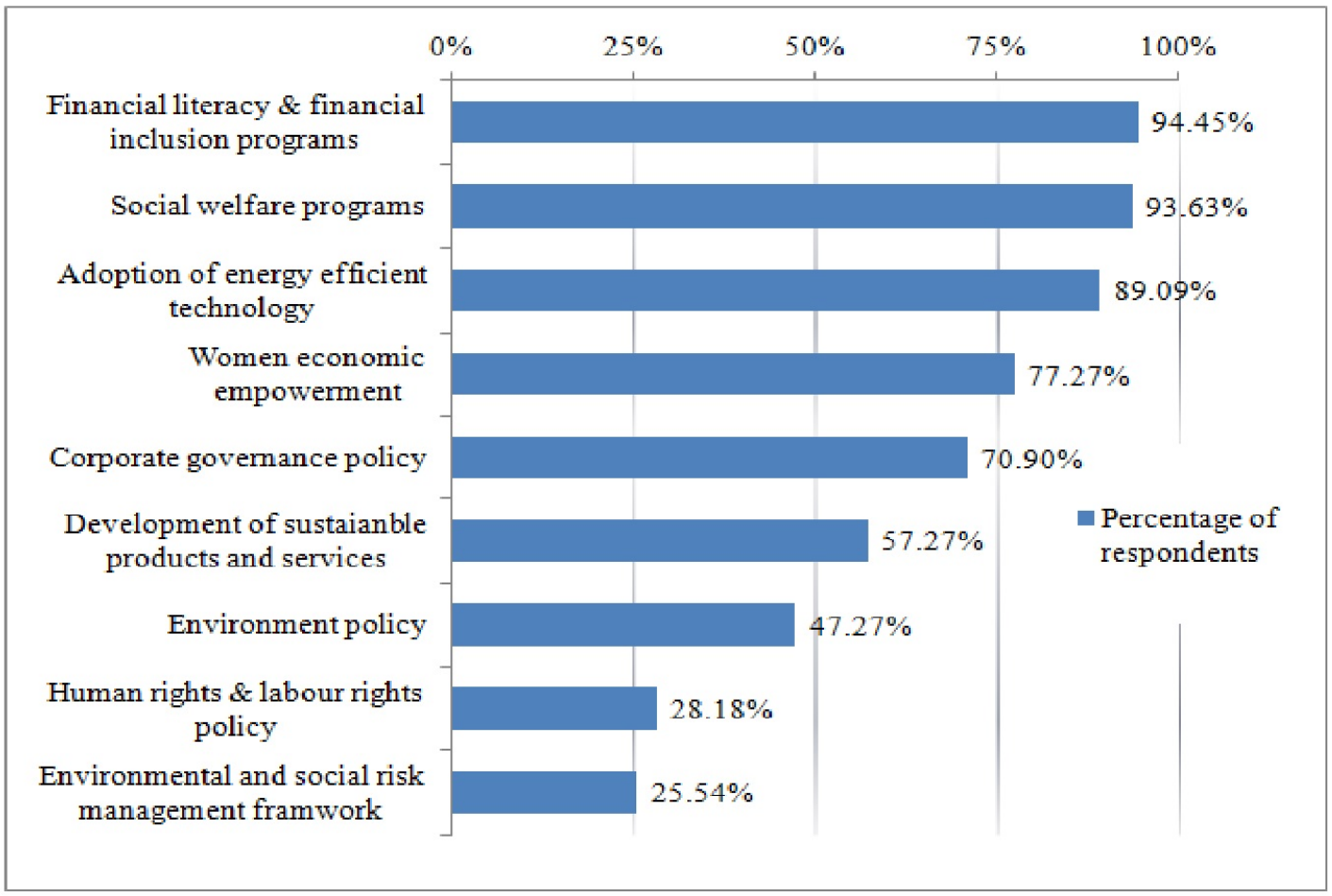

Figure 5. Most common sustainable baking initiative carried out by the banks in India.

Figure 5 provides the overview of most common sustainable banking practices undertaken by banks in India. Majority of respondents (96.36%) reported financial inclusion and financial literacy program are the most common initiative undertaken by the banks in India. Followed by social welfare programs and adoption of energy efficient technology (through eco-friendly technology, paperless banking, digital banking) undertaken by the banks. The adoption of these initiatives is in line with the increased thrust of government to shove corporate to contribute to social development goals and less carbon emission (Rajput et al. 2010). Various schemes to promote women economic empowerment especially in rural areas was reported by 77.27% of the respondents. The development of innovative sustainable products & services and formulation of environmental policy was considered as the common practice by 57.27% and 47.27 % of the respondents respectively. It is interesting to note that less than 30 percent of the respondents reported human rights policy, labour rights policy and environmental & social risk management framework has been adopted by the banks. The above findings show that banks in India are more proactive in addressing the social development goals to fill in a social disparity in the country whereas other crucial dimensions of sustainability leave more to be desired for example environment risk management framework, formulation of ethical policy, corporate governance and sustainable financing.

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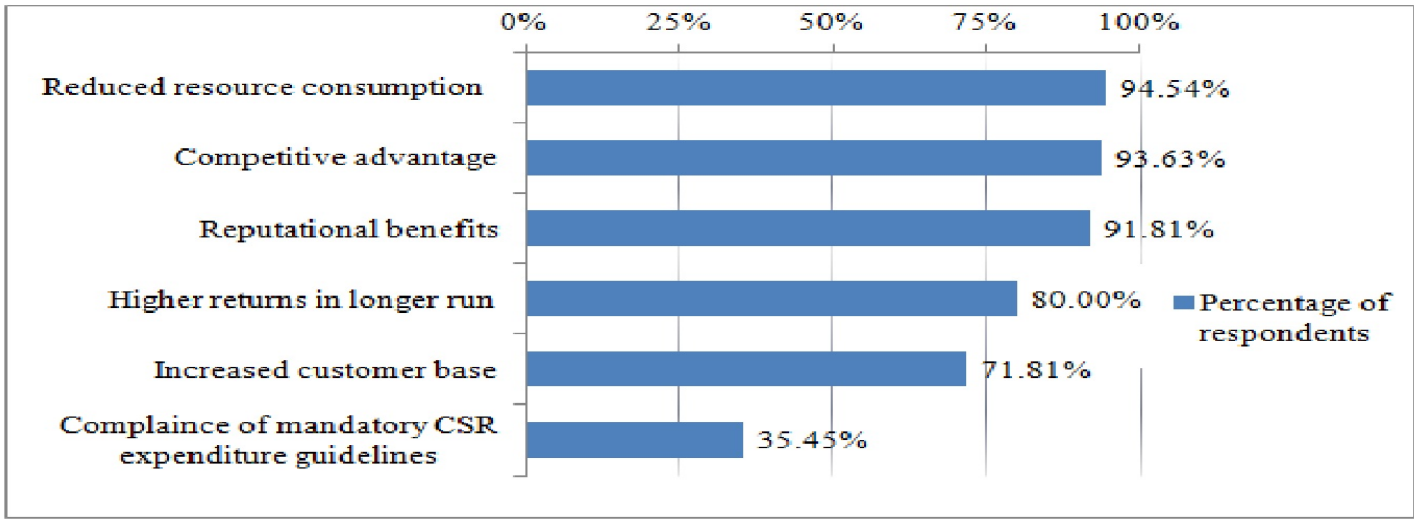

Figure 6.Most important benefits of adopting sustainable banking practices for the banks

The respondents were also asked to view their opinion on the benefits of the adoption of sustainable banking. Majority of respondents (94.54%) reported reduced resource consumption as the most important benefits of adoption of sustainable banking practices, followed by gaining competitive advantage and reputational benefits of adopting sustainable banking practices. It must be noted that although adoption of sustainable banking practices leads to fulfilment of mandatory CSR expenditure norms of Companies act 2013 but only 35.45 % of the respondents reported it as the biggest benefit of adoption of sustainable banking practices. This suggests that there is a conscious effort in Indian banking sector to promote sustainable banking by moving beyond from compliance of regulatory requirement.

5. Conclusion

The novelty of the present study lies in the identification of the factors that influence the adoption of sustainable banking and examining the various issues pertaining to sustainable banking in Indian banking context. Through the review of literature and semi-structured interview with banking officials revealed five constructs with twenty-seven attributes. These constructs were further purified through the process of repetitive iterations where three items with cross loading and low loadings were removed. The first part of the discussion involved the identification of five factors that influence the adoption of sustainable banking in India namely; regulatory compliance, environmental readiness, sustaining competition, socio-ethical responsibility and aligning with sustainable financing. It also provides perspectives on how these factors influence the adoption of sustainable banking practices in the Indian banking sector. Further results empirically establish that significant differences did not exist between the PSBs and private sector banks on all five underlying factors; indicating equal importance has been attached to these factors. The latter part of the study examines the current state of sustainable banking with the focus on key bottlenecks in adoption of sustainable banking, kind of support required to bolster sustainable banking efforts, most common sustainable banking initiatives adopted

by banks, and most important benefit of adoption of sustainable banking practices by the banks. The result shows that huge adoption cost and absence of uniform sustainable banking policy has been regarded as the major bottleneck in planning and implementing sustainable banking strategies by the banks. Similarly, engagement with regulator through the formulation of uniform sustainable banking policy for the banking sector was reported by the majority of respondents when it comes to the kind of support required to bolster the sustainable banking practices in Indian banking sector. Almost all respondents reported financial inclusion and financial literacy program are the most common sustainable banking practices followed by social welfare programs and adoption of energy-efficient technology adopted by the banks in India. More than 90 % of the total respondents considered reduced resource consumption, competitive advantage and reputational benefits are the most common benefit of adopting sustainable banking practices. The prognosis for sustainable banking in India looks positive; banks are actively engaged in social development efforts and sustainable banking practices have been the result of self-regulatory policies of banks. However other crucial dimensions of sustainable banking like environmental considerations and ethical conduct leave more to be desired in Indian banks.

6. Implications and limitations

This study is the first to assess sustainable banking issues in the Indian banking sector. The results of this empirical study have two novel contributions. First, identification of factors contributing to the adoption of sustainable baking in India will serve as a guiding tool for the banks and regulator to promote the adoption of sustainable banking in Indian banking sector. Secondly, examination of pertinent issues with focus on major bottlenecks in adoption, support required, key benefits and most common sustainable banking practices will also provide new understanding about the sustainable banking approach of the banks in India. The results are expected to provide valuable insights to the academicians into the various constructs of adoption of sustainable banking especially in developing economies and also significantly contribute the extant research dearth in the field of sustainable banking in Indian context. This study also suffers from certain limitations. The sample size of the study is relatively small and foreign banks operating in India has not been taken into consideration in this study. Thus, the future research may try to validate these results by including the representatives from foreign banks and large sample size.

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Consumer preference towards green brand among Indian non-metros cities

Trilok Pratap Singh
Assistant Professor, Institute of Business Management,
GLA University, Mathura-Delhi Road,
Chaumuha, Mathura-281406 (U.P). India
+91-8474901787. trilok.pratap@gla.ac.in

Utkal Khandelwal
Associate Professor, Institute of Business Management,
GLA University, 17 Km. stone, NH#2 Mathura-Delhi Road,
Chaumuha, Mathura-281406 (U.P). India

Abstract

Introduction: Green branding is very important in marketing, helping companies and offering unique market power and competitive edge. This paper focuses on consumer preference and explores how Indian consumers respond, attract and explore green products in non-metro cities.

Methods: The methodology can broadly explain by formulation of the theoretical model; framing hypothesis; sample and sample profile; tool and design of the

study. The sample for this research study was directed through non-probability convenience sampling. Every factor is assessed utilizing a five-point likert scale.

Analysis: In this part we do the reliability analysis of each variable and then do the multi-collinearity test, state that the variables are not inter-correlated and finally we adopt linear regression followed by stepwise regression.

Results: According to the results of the research, we can say that different income, age, education group has a different significance level for green brand preference in the Non-metro cities of India.

Conclusions: In the present, a large portion of the Indians are similarly stressed over the environment and related elements that cause harm to the world, and the vast majority of the Indians are exceedingly worried about the earth and give the concept of green branding their full support.

Introduction

Awareness towards environment is now rapidly increasing because environmental pollution affect on the various aspects of our life. In order to save our life and humankind peoples are gradually adopt environmental friendly practices. This

kind of shifting trend is also seen in business world. Due to this increasing awareness of society now number of companies are desire to fulfill its responsibility towards environment. Green marketing is very important for certain types of goods, such as electronics and data products (Chen and Chang, 2012).) Because of the world's safe environment, demand for environmentally friendly commodities is the like anything else, which is why customers are willing to buy green products at higher prices (Chen, 2008). This raises the green branding phenomenon in the marketing world. Green brand is a brand that not only offers a product of quality, but also offers a product that does not harm the environment. The company's main aim is to gain a market and consumer position and this can only happen now when the company provides green products and follows the steps that will preserve the ecosystem (Khandelwal and Bajpai, 2011).

While concentrating on profits, companies are actually searching for and discovering new solutions, creating new concepts and making new tactics to place their renewable products on the minds of customers and remaining competitive on the market to achieve sustainable business growth. A green brand "is an eco-friendly brand compared to its rivals and is able to attract high-priority buyers looking for green goods" (Grant, 2008). Hartmann and Apaolaza (2006), identified and reduced negative environmental impacts by increasing

environmental concerns and creating a positive impression on clients. Green customers are referred to as people who invest money in the purchase of green products and are highly sensitive to the environment (Norazah and Norbayah, 2015). Consumers are channeling their growing environmental focus to the demand for environmentally friendly products and, as a result of increased awareness of healthier lives, this ' green-going ' movement has grown worldwide (Norazah 2013; Soyez *et.al.,* 2012 Thøgersen et al., 2015). Previous scholars including Juwaheer et al. (2012), Yadav and Pathak (2016) , Konuk (2015) and have documented comprehensive green marketing studies in western countries, while little work has been done on green branding and green procurement in developing countries, including India.

The industry accepts environmental responsibility because the issue of pollution is raised by society on all labels. The main objective behind the world picture is to encourage such green-friendly systems and techniques and to advise ordinary citizens to do so. Most organizations around the world understand this idea and have worked to make their work eco-friendly (Pritchard and Wilson, 2018). New rules that opened up new opportunities for organizations and ideal conditions, on the other hand, opens up the cutting-edge concept of green brand rehearsals(Braun *et.al*., 2016). Indian companies are also drawn to the changing

landscape of this green brand and understand that, if these Indian companies want to increase their market share and please their consumers, they are using the green brand method (Jain & Kaur, 2004). One trend has been found since the last two decades is that businesses at all levels are attempting to provide safety and security for the environment at all levels by developing a new strategies and procedure for their activities to protect the natural environment and customer satisfaction (Baker and Sinkula, 2005). These strategies for green branding practices are fruitful to Indian firms in a number of ways and provide different types of benefits to the society (Kumar, 2014). In previous studies, however, we discussed the consumer advantages of green brands and their effects on green brand images without using integrative relationship advantage typology and measuring relatively fractured impact on related buildings (Hartmann and Apaolaza-Ibanez 2012).Consequently, the question of the benefits that help to create and strengthen the relationship between the customer and the green product remains largely unanswered (Butt et.al., 2017).

The paper focuses and examines the consumer preference towards green brand among Indian non-metros cities. This is the first research to be carried out to the best of our knowledge on the main issue of consumer preference towards green brand among Indian non-metros cities. Non metro consumer s have their own

challenges in terms of green brand availability, purchasing power and other economic issues. One of the serious problems facing India's economy is the sharp and growing regional imbalances among India's metro and non-metro regions in terms of per capita income, poverty, availability of infrastructure and socio-economic development (Datt & Sundharam, 1990; Khandelwal and Bajpai, 2012). This perception will help people to gain knowledge how to reinforce and track the consumer-green products connection. The rest of this article is organized as follows: the literature review an, experimental framework development and conclusions are presented in the following section. A description of the methods used for this analysis shall be followed. First, quantitative findings and empirical data analysis will be further developed. The findings of the research are then discussed.

Literature Review

When comparing high-quality brands, it is difficult to compare them (Mudambi et al. 1997; Anwar et al. 2011), Green plays an important role in distinguishing a brand from its rivals. Recent studies have found contradictory definitions of a green brand (Nagar, 2015), but most researchers favor consumer perceptions of a green brand as a product created by different consumer brand associations (Keller, 1993). Otherwise, a green brand is produced by a global customer feeling

that can be generated from practical, symbolic or moral aspects by a number of brand-related connections. Due to the related effects of green image (Chen 2010; Grimmer and Woolley 2014, Jeong et al. 2014; lee et al. 2013; Yusof et al. 2012), green brand drive theory has been developed in green product research. Green brand image, for example, affects consumer thinking and decision-making (Jeong et al., 2014). Significant results were also identified (Chen, 2010), including Green Trust, Green Satisfaction and Green Brand Share. The need for change, positive feed from other parties and willingness to pay premiums all influenced the Green brand (Lee et al. 2013).

In the minds of consumers, green branding strategies should be acceptable based entirely on trust developed by Indian firms in order to be honest, impartial and clear (Zimmer and Stafford, 1994). Green marketing practices discussed can be a partnership between a brand and an eco-friendly environment that is well-focused ; it should have the characteristic to demonstrate an eco-friendly lifestyle and to explore corporate social responsibility (Finisterra and Filho, 2009) Indian companies have a pivotal role to play in the economy and the nation.

Green branding procedures build trust that offers both an item of value and a product that will not destroy the planet (Cohen, 2014). The main aim of the

business is to create a situation on the market and in the minds of consumers, and this can happen now, especially in the case of greenery and the effects that nature can protect. (Mourad and Serag, 2012). Green Branding is all about customer satisfaction in terms of sustainability, development and the prevention of natural resources. (Borin and Krishnan, 2013). Green branding in India is primarily aimed at reducing pollution, reducing waste from natural resources, maximizing resource utilization and increasing productivity with significant output. (Hartmann and Sainz, 2005). Green branding applies from the generation of ideas to the after-sales service in the current scenario (Chang and Wu, 2015). Green branding focuses on product development and design to reduce the harmful impact of production, logistics and end-use pollution (Cai and Zhou, 2014). Indian companies with a green branding concept are trying to promote sustainable development with good performance to meet customer expectations (Mathur and Mathur, 2000).

Research in these countries on the impact of environmental awareness on green procurement has been proposed by Joshi and Rahman (2015). Green branding has attracted considerable attention in the last decade due to the general public's environmental awareness (Mostafa 2007). Consumers are increasingly aware that green products are affordable, and some are even willing to pay more. The result

is a four-fold increase, from $845 billion in 2015 to $1565 billion in 2018, in three years, in global prices for green products and services (Davies et.al., 2018). Many companies are trying to incorporate environmental issues into their priorities and strategies in order to comply with environmental protection legislation and legislation. Our products or services are also recognized as being sustainable or environmentally friendly (Singh et al., 2016). Green Marketing therefore acts as an important strategy for achieving significant environmental benefits compared to other competitors (Delgado-Ballester and Munüra German, 2005) as a result of advertising campaigns (Chen, 2008).

Green branding practices are something that enables Indian firms to survive with customer satisfaction and environmental protection (Davari and Strutton, 2014). Because we know that companies have limited resources, these Indian firms are developing their green branding mix so that they perform much better than the rich organization (Davies *et.al*., 2018). Green branding practices involve the use of green brands, green trusts, green advertisements and green labels in all ways to modify and develop products to increase customer satisfaction in their market demands. (Ghobadian and Regan, 2005). In India, the role of green branding practices is based on long-term and short-term approaches at all market levels to meet all consumer requirements.

Increased market penetration of green products has made academics and professionals focus on developing strong and sustainable customer-green relationships from initial purchases to regular transactions. Emphasis on relationship-building includes shifting from the green product concept to the green brand, which includes a number of features and benefits related to the reduced environmental impact of the product resulting in its brand equity, providing a significant environmental advantage over its opponents (Devi, 2012).

However, the development of a consumer-green product link is a particularly difficult task, in line with the difficulties of the specific green market. Second, a number of barriers to green customers prevent brand purchases, such as price increases, increased time and effort to identify and locate the product, and a comprehensive data analysis (Ahmad and Thyagaraj, 2015) raises the perception that it is too difficult to be green. On the other hand, environmentally friendly anti-consumption is a way of turning green goods into more environmentally friendly goods that is widely accepted (Alwi and Kitchen 2014). Various context-related features generate important criteria for assessing factors that may influence the use of the environment and the structure of renewable and sustainable advertising (An et al., 2019).

Researchers called for contextual work on consumer benefits and customer-friendly brand partnerships in the context of this green market, as traditional alternatives complement the use of environmentally friendly goods (Environmental Goods: Hartmann and Apaolaza-Ibanez, 2012). Green brands offer particular values or a set of consumer motivations based on the design, quality and altruism of their environmental products that improve consumer behavior towards the company (Ahmad & Thyagaraj, 2015; Chen, 2010). Green Brand includes all kinds of innovative strategies in all aspects supported by technology and management decisions to increase their overall efficiency (Barbarossa and Pelsmacker, 2016). At a time when consumers are extremely vigilant towards the environment and are looking for new things than in that situation, this concept of green growth promotion is taking place as a tool for the survival of business organizations. Green-brand is a combination of a symbol, a picture, a project and a name that distinguishes items from the competitor and is less harmful to the consumer. There is a certain group of goods in most of the world's industries that customers want to use at any cost for sustainable and non-hazardous products, so that the customer most trusts certain green things in such classrooms with items such as plastics and pesticides (Braun et.al.,2016). In contrast to the Asian economies, western markets are also evolving and attractive for green things (Brown and Ennew 1995).

Need for the study

Green-brand product is different from the ordinary product. In the present scenario, the customer is attracted by those products and services which are safe and having good quality to attract the customer. In this study, we coordinate the current structure and build up the model to comprehend the impression of the client towards the green brand inclination.

Exploratory Work

To provide a conceptual framework to this analysis, we use the coding system in an immersive way and perform three interviews with experts. All of these three experts have been interested with responsible progress for more than eight years and are taking a shot at different undertakings with the ultimate aim of reducing the impact of business activities on society. A similar example has been provided by the Miles and Huberman, 1994. Such study data is collected from supervisors and then the same data is divided into Indian parts according to the field of interaction and value. Finally, the results are tested and decided on the logical and analytical coherence. The conclusion of this study is that the positioning of the green product strengthens the brand; after targeting high-end customers you can concentrate on green consumer preferences, demographics are relevant in each

category, the green identity is very important and social differences sometimes even affect the use of green technologies. The purpose of these interviews with a skilled person is to provide a person with good Green Brand experience with real information.

Problem Definition

Green branding practices in an innovative way are possible when the marketer focuses on the marketing mix (4Ps) and the marketing mix concept is developed and communicated in a very eco-friendly manner, trying to cover all marketing issues for customer satisfaction. There are different ways to implement green branding practices that new Indian firms use to improve their branding practices. In some of the research studies, it is explained that it is difficult and costly for firms to give importance to green branding practices because of lack of resources. Nonetheless, there is a lack of knowledge among Indian corporate houses about the needs and factors affecting green product preferences. In this research study, we try to address all those important factors that improve brand image, brand value and brand image throughout Indian corporate homes and try to study the effect of these factors.

Conceptual Framework

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In this research work, we use Keller's (1993) conceptual model which relies on brand knowledge and brand equity. This model explains green brand positioning, satisfaction, trust and green brand knowledge. This conceptual model also shows the relationship between these four variables and demographic factors

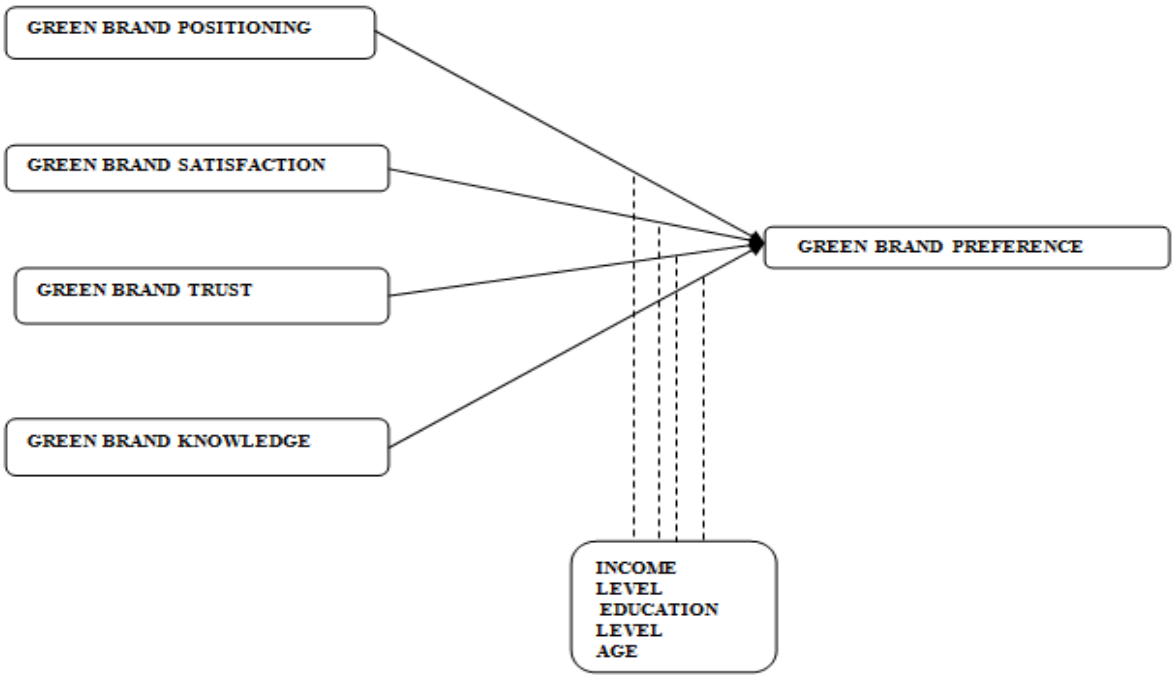

Figure 1: Proposed Theoretical Model

Green Brand Preference

It refers to the value added and subtracted by the firm to the product and services. The choice of the consumer is affected by the perception of the brand (Gunasti and Ross, 2010). According to research conducted by the Mackay (2001), the level of perception also affects the consumer preference.

Green Positioning

Green brand situating is characterized as the framing the picture in the brain of the client, as the situating enhances from the collaboration between the gatherings, workers, customers, and affiliations which are being identified with eco-accommodating guarantees and responsibilities (Polonsky, 1994).

H_1: Green brand preference is emphatically connected with green positioning.

Green Satisfaction

This research helps to understand the customer's will to purchase green trust by introducing six drivers into the image of green trust picture, green trust satisfaction, green trust devotion, green trust, reference assembling, and green advertisement. Through previous inquiries, the closeness of two shopper-intact and combination of transferred approaches had been identified (Aaker, 1991).

H_2: Green brand preference is emphatically connected with green satisfaction

Green Trusts

Past looks into characterized green trust unwaveringness to carry and keeping up associations with the gatherings who are worried about the green condition and eco-accommodating concerns and guarantees to re-purchase particular things all the time later on. It was the reason to re-purchase, the intention is to affirm, indicate the tolerance for an excellent rate and purchase some different things from an organization.

H_3: Green brand preference is emphatically connected with green trust.

Green Knowledge

Green marketing and promotion and development of a product which is safe and secure for the society (Charter and Polonsky 1999). In the second half of the eighties out of the blue, the expression "green showcasing" started in the market (Crane, 2000). Large number of marketers takes this as a opportunity for enhancing their market share and goodwill from the different green activities which they are performing in the market in different forms (Vandermerwe and Oliff, 1990)

H_4: Green brand preference is emphatically connected with green knowledge.

Moderating Variables

Moderating variables can be studied through the demographic factors. Consumer attitude will be affected by the demographic factors and finally, put the impact on the green brand preference.

Income Level

Ecological concern is indicated more by the individual with higher wage level when contrasted with the individual with low-wage level (Woodruff and Gardial, 1996). As per the Henion (1972), green brand inclination is managed by the purchaser with higher salary and the connection between the two is positive.

H_5: Green brand preference is emphatically connected with income.

Education Level

According to Granzin and Olsen(1991) green brand preference is directly related to the level of education, the reason is that the educated person is more aware and learning towards the environmental implication.

H_6: Green brand preference is emphatically connected with education.

Age

As indicated by buyer look into directed by Woodruff and Gardial, (1996), it is contended that the variable age is decidedly connected to natural concern. Some other studies give the outcome that as the age increase then the people became more cautious and concern about environmental factors. Age is the important factor which affects the response of the consumer (Davari and Strutton, 2014).

H_7: Green brand preference is emphatically connected with age.

Gender

Fetscherin and Heinrich (2015) state in his study the gender play an important role and affect the brand preference and they respond and think quickly towards the environment. Female show more environmental concern as compared to the males (Mainieri and Barnett, 1997).

H_8: ***Green brand preference is emphatically connected with sexual gender.***

Research Methodology

The methodology can broadly explain by formulation of the theoretical model; framing hypothesis; sample and sample profile; tool and design of the study as described in the following research. In this part, we first discuss the objective of

the research. This research is descriptive deductive and applied research to discover the arrangement of corporate marking point by point depiction of all these are as per the following Research design means a complete blueprint of an investigation and it includes all the information regarding the data collection, an instrument to be employed, and how this information is used and analyzed the impact of green marketing tools on customers buying behavior of Indian consumers. The sample for this research study was directed through non-probability convenience sampling design structure and the test is the gathering of individuals was browsed numerous stores and shops and shopping centers by the analyst. 295 subjects were picked and a similar survey was given to them. The study led to know the purchasing propensities for the client when they buy items the amount they think about green in them. The above is assessed from a self-designed questionnaire which depends on the four factors: green trust, green satisfaction, green awareness, green positioning. Every factor is assessed utilizing a five-point likert scale. For doing any examination, it's extremely exceptionally important to envision about the thoughts. For checking the reliability of the considerable number of segments, Cronbach alpha was utilized.

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Data Analysis and Interpretation

This part is started with the reliability analysis of each variable and reliability is shown by the Table 1 for each variable. Table 1 shows the reliability value of each variable, Table 2 represent the multi-collinearity test

Table 1: Shows The Reliability Value Of Each Variable.

Variables	Cronbach's Alpha	No, of items	Comments
Green Brand Preference	0.785	5	Good
Green Brand Positioning	0.871	4	Good
Green Brand Satisfaction	0.849	5	Good
Green Brand Trust	0.879	4	Good
Green Brand knowledge	0.807	4	Good
Over All Reliability Of Independent Factors	0.931	18	Good

Table 2: Represent The Multi-Collinearity Test

Variables		Green Brand Preference	Comments
Green Brand Positioning	Correlation Coefficient	0.241	Significant
	(two tailed)	0.003	
Green Brand Satisfaction	Correlation Coefficient	0.242	Significant
	(two tailed)	0.002	
Green Brand Trust	Correlation Coefficient	0.258	Significant
	(two tailed)	0.001	
Green Brand Knowledge	Correlation Coefficient	0.136	Insignificant
	(two tailed)	0.095	
Note:- Correlation is significant at the 0.05 level (two-tailed)			

To check the considered level of reliability of each variable the value of cronbach alpha is above 0.6. Table 1 represents the value of Cronbach alpha of each variable. Table 2 represents the multi-collinearity test, which state that the variables are not inter-correlated. In Table 2 the level of tolerance is < 20 and variance inflation factor is 5.After analyzing the result of Table 3 is observed that green knowledge has the highest mean score which means that the sample is

unaware of most of the concept of green marketing. In Table 3 the lowest score of the mean is of green satisfaction on a 5 point likert scale which shows the lowest level of disagreement. In the study, all the variables are covered in five points likert scale.

Table 3: Descriptive Statistics.

Variables	N	Minimum	Maximum	Mean	SD
Green Brand Preference	295	1.00	5.00	2.3863	0.77436
Green Brand positioning	295	1.00	5.00	2.6512	0.75072
GreenBrand Satisfaction	295	1.00	5.00	2.4632	0.83659
Green Brand Trust	295	1.00	5.00	2.5236	0.71235
Green Brand knowledge	295	1.00	5.00	2.7235	0.95563

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Table 4: Normality Test Results.

Variables	Kolmogorov Smirnov (a)			Shapiro Wilk		
	Statistics	df	Significance	Statistics.	df	Significance
Green Brand Preference	0.193	295	0.000	0.928	295	0.000
Green Brand positioning	0.142	295	0.000	0.962	295	0.000
GreenBrand Satisfaction	0.121	295	0.000	0.944	295	0.000
Green Brand Trust	0.104	295	0.000	0.960	295	0.000
Green Brand knowledge	0.180	295	0.000	0.941	295	0.000

Table 5: Showing The Correlation Between The Independent Variables And Green Brand Preference

Variables	Correlation Coefficient	Green Brand Preference	Comments
Green Brand Positioning	Correlation Coefficient	0.241	Significant
	(two tailed)	0.003	
Green Brand Satisfaction	Correlation Coefficient	0.242	Significant
	(two tailed)	0.002	
Green Brand Trust	Correlation Coefficient	0.258	Significant
	(two tailed)	0.001	
Green Brand Knowledge	Correlation Coefficient	0.136	Insignificant
	(two tailed)	0.095	
Note:- Correlation is significant at the 0.05 level (two-tailed)			

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Table 6: Step Wise Regression For The Green Brand Preference

Independent variables	B	T	Significance	Effect	R^2	Anova
Constant	1.428	6.015	0	Significant	R^2 =0.365	F-statistics=5.660 Significance=0.000 Significant model
Green Brand Positioning	0.16	2.055	0.028	Significant		
Green Brand Satisfaction	0.16	2.491	0.036	Significant		
Green Brand Trust	0.162	2.011	0.012	Significant		
Green Brand Knowledge	0.102	1.106	0.26	Insignificant		
Constant	1.368	5.907	0	Significant	R^2 = 0.355	F-statistics=7.128 Significance=0.000 Significant model
GreenBrand Positioning	0.101	2.711	0.046	Significant		
GreenBrand Satisfaction	0.142	3.348	0.016	Significant		
X3:Green Brand Trust	0.151	2.941	0.033	Significant		

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Table 7: Step Wise Regression For Gender.

		F	Significance				
				Constant	1.516	5.271	0
Male	0.302	2.831	0.028	Green Brand positioning	0.079	0.464	0.041
				Green Brand Satisfaction	0.135	1.113	0.024
				Green Brand Trust	0.165	0.865	0.037
				Green Brand Knowledge	-0.05	-0.49	0.061
				Constant	1.271	2.938	0.005
Female	0.555	3.308	0.025	Green Brand Positioning	0.36	1.051	0.029
				Green Brand Satisfaction	0.268	1.133	0.025
				Green Brand Trust	0.17	0.542	0.033
				Green Brand knowledge	-0.308	1.477	0.149

TABLE 8: Step Wise Regression For Age Groups.

		F	Significance				
				Constant	1.448	5.174	0
18-36 Years	0.36	2.83	0.003	Green Brand positioning	0.294	0.454	0.098
				Green Brand Satisfaction	0.127	2.011	0.026
				Green Brand Trust	0.134	2.68	0.037
				Green Brand Knowledge	-0.05	-1.525	0.13
				Constant	1.271	2.937	0.006
37 Years or Above	0.461	3.308	0.137	Green Brand Positioning	0.527	2.608	0.008
				Green Brand Satisfaction	0.237	0.871	0.38
				Green Brand Trust	0.284	2.271	0.028
				Green Brand knowledge	0.449	1.661	0.1

For the whole sample of 295, we adopt linear regression followed by stepwise regression. The 74.8 percent of the sample population is between 18 to 36 and 25.5 percent of the sample population is 37 or above. In the study 71 percent are male and 29 percent of the populations are the female respondent. 51.7 percent of the sample population earns between twenty thousand to fifty thousand and 48.3 percent of the population is above fifty thousand.72.5 percent of the population are graduate and 27.5 percent of the populations are postgraduate. In Table 6 we represent the stepwise regression for sample study. The value of R^2 is 36.5

percent which means that the 36.5 variations are explained by the model. F–Statistic is < 0.05 which means that the variation in the model is not because of chance. On the basis of the above reading, we conclude that the green brand positioning, green brand satisfaction and green brand trust are the variables which significantly affects the green brand preference. In this, we adopt the stepwise regression method to check that the gender of the population plays any role in influencing the brand reference. Table 7 shows that the factors influencing the green brand reference are not significantly different in male and female. However, according to the analysis, these factors affect 58 percent female than males 42 percent. Then after this, we do the analysis of age group in Table 8 by using stepwise regression model. According to the results of the research, this model is significant for the younger group. So we can say that different age group has a different significance level for different brand preference. Green brand trust and green brand satisfaction are the different variables in this case. Then after this, we do the analysis of the income group in

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Table 9: Step Wise Regression For Income Groups.

		F	Significance				
				Constant	1.408	4.107	0
Low Income	0.452	4.572	0.001	X1:Green Brand positioning	0.468	2.11	0.036
				X2:GreenBrand Satisfaction	0.118	0.786	0.032
				X3:Green Brand Trust	0.174	0.71	0.476
				X4:Green Brand Knowledge	-0.311	-2.426	0.017
				Constant	1.357	4.173	0
High Income	0.367	2.752	0.034	X1:Green Brand Positioning	-0.056	-0.282	0.777
				X2:GreenBrand Satisfaction	0.196	1.296	0.018
				X3:Green Brand Trust	0.196	0.942	0.036
				X4:Green Brand knowledge	0.032	0.0242	0.806

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Table 10: Step Wise Regression For Education Level.

		F	Significance				
				Constant	1.4	4.912	0.000
Under graduate degree	0.374	3.962	0.04	X1:Green Brand positioning	0.257	2.32	0.018
				X2:GreenBrand Satisfaction	0.156	2.154	0.023
				X3:Green Brand Trust	0.101	0.471	0.637
				X4:Green Brand Knowledge	-0.135	1.091	0.264
				Constant	1.516	3.211	0.002
Post graduate degree	0.363	1.642	0.171	X1:Green Brand Positioning	-0.054	-0.215	0.831
				X2:GreenBrand Satisfaction	0.224	1.152	0.252
				X3:Green Brand Trust	0.244	2.973	0.032
				X4:Green Brand knowledge	0.251	2.329	0.042

Table 9 by using the stepwise regression model. According to the results of the research, this model is significant for the different group. So we can say that different income group has a different significance level for green brand preference. Green brand trust and green brand satisfaction are the different variables in this case. Then after this, we do the analysis of education level in Table 10 by using stepwise regression model. According to the results of the

research, this model is significant for the different education group. So we can say that different education level group has a different significance level for green brand preference. Green brand trust and green brand satisfaction are the different variables in this case.

Conclusion

Toward the finish of this exploratory research, it is inferred that in the general public on account of absence of mindfulness we couldn't utilize the word green as a limited time device in the market, in view of absence of information about the factor in the imaginative market. In this exploration work, we utilize Keller's (1993) applied model which depends on brand information and brand value. After the examination consider, one thing is researched that the Indian shopper is more mindful and impacted by the green brand and industrially this idea is more valuable for the advertiser for making inspirational situating and upgrading the piece of the pie. In the present, the a large portion of the Indians are likewise stress over the earth and related elements which cause harm to the earth so in the wake of doing the information investigation plainly that the vast majority of the Indians are exceptionally wary for the earth and they give the full help to the idea of green promoting. After the examination work, one thing additionally turned out to be certain that this sort of beginning and endeavors are likewise propelling the clients to buy the green item and administrations and increment the picture in the

Indian market. One essential thing additionally turned out that the client the individuals who are not acquiring the green item in India the reason is that they don't know about the green advertising advantages and results. For the correct persuading and fulfillment of the client, it is seen that the green brand situating is the apparatuses ought to fulfill the client all around what roughage need for their fulfillment and the advertiser ought to build up the approach so that makes the entire condition green agreeable. Aside from the ventures the administration of India is likewise focusing towards the idea of green brand and offering significance to the green assembling process and making the green condition. Government is likewise beginning the new program with the end goal to advance open consideration towards the green promoting and green item. This will help in expanding the interest for green brands in the market and which give the certainty to the advertiser so they perform all the more truly later on. At last, we can state that green brand instruments assume an essential job in the buy choice of the Indian buyer.

Limitations of the study

Every step has been taken to give the findings in a very standard way, but there is always a phenomenon that every study has a few limitations. Time constraint is one of the main limitations. The literature review for this study focused on the

theoretical fields of green brand preference. Convenient sampling is used, which is non-probability sampling technique and fail to provide real scene of the society. Based on the sampling another limitation is that research was conducted on a limited size and his research was bounded to the Indian Consumers. This research covers only general green brands and not specific green brands and Customer is less aware about the concept of green marketing, so they are confused while responding.

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Assessment of Sustainability Scores of DMUs: A DEA Approach

Monika Arora
Apeejay School of Management
Dwarka, New Delhi, India
Email: marora.asm@gmail.com

G.N. Patel
Birla Institute of Management Technology
Greater Noida, India
E-mail: gn.patel@bimtech.ac.in

Abstract: This research article presents a case study on how the use of data envelopment analysis (DEA) technique on to produce the rankings for a 24 companies. The sustainable scores are calculated based on the weights with paramaters i.e number of employees, R&D investment, operating profit. capital expenditure, and net sales. The weights for these parameters are calculated by using Analytical Hierarchical Process(AHP) technique. This paper uses the DEA approach to find the efficiency of decision making unit (DMU). The 24 DMU are used for the study on the basis of their sustainability score more than 70%. The

identified DMUs were further considered for the dataset from the European Union (EU) which are on Industrial R&D Investment Scoreboard i.e European Commission, 2017-18 data, which consists as the top EU companies actively involved in the R&D and Innovations.

Five criteria are considered for the analysis they are number of employees, R&D investment, operating profit. Capital expenditure, and net sales, were used for defining rankings and where the priority can be used for this listed companies. The case study identifies for application that indicates the efficiency DEA model could be employed for ranking the companies at an initial stage which is identified by using the ranking of the sustainable efficient scored companies. Further, the relationship between the different parameters and sustainability scores were also examined.

INTRODUCTION

Sustainability

The idea of Sustainability has been discussed for several decades. It was discussed in World Commission on Environment and Development (Our Common Future, 1987). It claimed the Sustainable Development (SD) Strategy is divided into the various sectors such as economic, social and environmental

policies and plans can be used for operating in the country. The aim is to ensure the social responsible for economic development and also protect the environment and resource base for the benefit of future generations (Kwatra, P. et , 2014). This can be only possible when all the citizens of the country contribute for sustainable development". Since 1987, there have been many different definitions for SD and a most commonly used and illustrative one is "balance on the social, economic and environmental developments" which is often expressed in the following diagram refer to Figure 1 :

These are the three pillars of sustainability development. They are:

1. Economic Growth (profit)
2. Environmental Protection(Planet)
3. Social Development (People)

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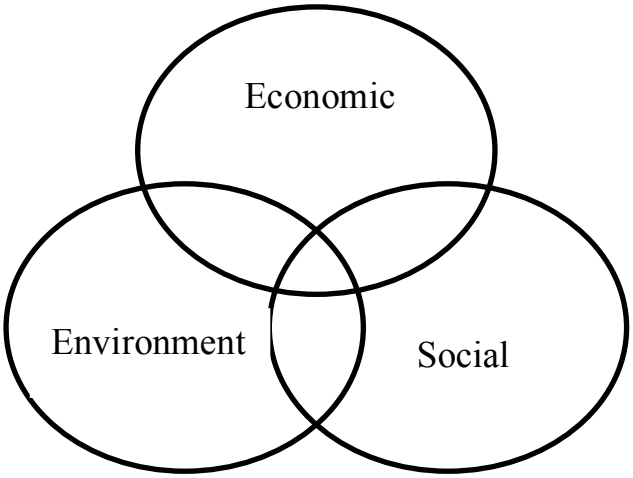


Figure 1: pillars of sustainability development

However, most treatments on Sustainability Development are based on subjective, descriptive, conceptual and qualitative analysis. There are too many intangible considerations and too many pitfalls in the conventional wisdom of economics. Therefore after some thirty years since the term Sustainable Development has been coined, it is still very much a concept instead of quantitative practice.

Business sustainability also called as corporate sustainability, is defined as "Coordination of environmental, social, management and financial demands and concerns to ensure responsible, ethical and ongoing success." In a wider context of sustainability the environmental, social and economic demands are considered the three dimensions of sustainability. They are considered to be the main pillar to be considered for the development of sustainability. Triple bottom line is a terminology used mostly in businesses. This will help in evaluating the short term effects of profit.

In traditional corporate social, cultures and environmental considered it with financial goals. For them the depletion of non-renewable resources is not a sustainable practice.

This paper discusses the indicators for sustainable development which has changed over time. The study was based on Scotland for a period 198-1993 (Hanley et al,1999). This measures and enforces policy makers to improve sustainability in an economy. The classification of sustainability types and its parameters over the period is examined as follows: Environmental/ Ecological types single and aggregate, Economic Single and Aggregate and social-political single and aggregate includes various parameters which it has examined the

increasing sustainable to unsustainable, Worsening, where Approximate Environmentally-Adjusted Net national is considered to increasing sustainability and Index of sustainable economic welfare and Genuine Progress Indicator are unsustainable, Worsening.

There is a shift in sustainability performance in regard of social and environmental performance. Sustainability has become important and even with a supplier selection decision can also help the organization to select the supplier as they maintained a strategically competitive position. The tangible and intangible factors are the bases of selection of suppliers. Earlier price, quality flexibility is the bases but now the complicated environmental and social factors. This will measure the effectiveness of resulting in sustainability (Govindan et al, 2013). The fuzzy MCDM approach for supplier selection was considered for sustainability criteria.

The formulation of strategy on corporate social responsibility is based upon corporate performance and action on corporate social and financial performance. The framework for drivers of sustainability and financial performance for sustainable performance and stakeholders reactions was discussed (Epstein, M. J. & Roy, M. J., 2001). Sustainable can also be studied in terms of quality

management to improve and to extend the theory to achieve best practices of Quality management as well. This will be another dimension of sustainability (Svensson, G. ,2006). The other alternative requires the investments in infrastructure and fossil fuels, which is the least expensive short-term option. Based on the present scenario the problem statement is defined under.

Problem Statement

The present study helps to understand the concept of sustainable development. The top sustainable companies takes various initiatives in their processes were discussed. This will help you to understand the importance of sustainable development and its benefits. The aim of this paper is to calculate the efficiency of the various selected companies. The factors identified as input and output. Check the efficiency based on that. Finally find out the correlation a) between the sustainability scored and efficiency and b) between the factors identified and input and output.

The main objectives covered in this paper are listed below:

- Identification of five factors for efficiency calculation of companies
- Applied AHP to calculate the weights of these parameters.
- Calculate the sustainability score
- Calculate the efficiency of companies
- Identification of correlation between sustainability score and factors

Structure of Paper

In this paper, Section II refers to the identification of parameters for the calculation of sustainability scores of the companies. The companies/DMUs are chosen randomly where the sustainability score is more than 70%. There are 24 DMU choosen. Section-III gives the introduction of the methodology in the literature review. Section -IV is based on data collection and analysis. Section-V defines the conclusion and the further scope of the study has been drawn.

Sustainability Score

There are different components that give the input to sustainability score calculations. The economic component used in development of sustainability involves in value creation. In the todays scenario, every new business model has to be grounded on sustainable practices and efficiency in practices. The economic

environment can be contributed in organistion by using less mineral resources, energy and water and it should also diminution of the polluting emissions, waste management (Zott et al., 2011). The operational efficiency involves the enterprise's activities which will raise the efficiency by applying to its production factors which will create the interrelations between the stakeholders. To achieve operational efficiency one needs to minimise wastage and redundancy. This will also leverage the resources that will contribute to success and utilising the best of its technology, workforce and business processes. The ecological and social dimensions have become the important objectives in managing the economic processes in companies. The innovation driver connects all the components with its key elements. The profit formula and customer value proposition are linked with key processes and resources which grows and helps in accomplishment of the rules and norms, and finally helping in developing the success in businesses (Johnson, 2010). Thus, sustainability factors in any enterprise's van be influenced by innovative competitive development and this will lead to a standard business model (Asheim and Isaksen, 2002). This approach will be interesting and will became popular soon.

Hoepner (2016) find similar results. Studying a sample of 470 loan agreements from 28 countries between 2005 and 2012, the researchers document an

economically and statistically significant relationship between country-level sustainability and cost of bank debt: a one-unit increase in a country's sustainability score will decreases cost of debt by 64 basis points on average (Hoepner et al., 2016).

The effect is driven by environmental performance is twice impactful as the social dimension. The researchers fail to find support for the impact of firm-level sustainability on the bank loans cost. The researchers suggest that firm-level sustainability may only be priced through country-level sustainability. It should be noted, however, that the sustainability measure used in this study, from Oekom research, provides only a single rating and does lend itself to separating positive and negative performance.

Furthermore, the sample consists mostly of financially robust European and North American firms. Since previous research has shown that the relationship between nonfinancial disclosure and cost of capital is less important for investment grade companies. It is possible that the lack of company-level sustainability effect on cost of debt is driven by the financial robustness of the sample companies. The details of three companies involved in the different types of sustainability development activities as shown in Table 1:

Company Name	Involvement in	Action Pts
Dassault Systemes,	It's a French firm that uses the engineering software for making designs that can be used in waste reduction.	-No. 1 company in sustainability ranking have female representation on its board. they are fair in terms of the salary of CEO and its average workers. They are taxpayers and paying 26% of its earnings in taxes.
Neste	It's a Finnish firm that deals in other petroleum/ diesel products which are renewable.	they are into bio-material. and saving from renewable fuel. The company is having three times as many female top executives than males.They are taxpayers and paying 27% of its earnings in taxes.

Valeo	Based in France a manufactures automotive parts.	It is at top three position and also its products helps auto makers to reduce emissions.

Table 1: Companies having High Sustainability Scores

The report was compiled by Canada-based financial information company i.e Corporate Knights, in their magazine they are focusing on the business, societal and ecological benefits together. They identify the gap of measuring sustainable development (SD) companies in their research. The objectives of this research paper were considered are as under:

1. To identify the indicators that can measure processes of companies and can be used as a tool for the same.
2. To assess the performance of multinational companies from the European Union (EU) dataset.
3. To analyse the relationship between the indicators of SD scores companies and parameters identified companies for the calculation

A considerable amount of attention received by the efficiency research is in the area of cost efficiency evaluation. This is because companies are always eager to

enquire their resources effectively and efficiently to incur huge costs being utilized. The contribution of the paper in retailing research is based on the application of "allocation models" it shows the DEA implementation to identify the technical efficiency and allocative efficiency and also the overall performance of the companies(Patel, G. N., and Smiti Pande, 2012). Many researchers use the DEA approach is used to find the performance and efficiency of the company.

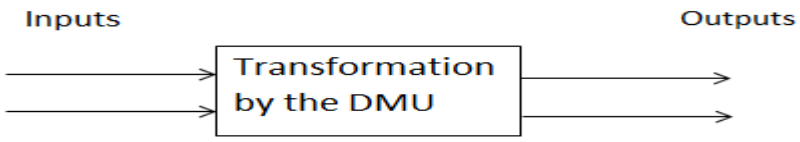
Literature Review

Analytical Hierarchical Process (AHP) is a Multiple-Criteria Decision Making (MCDM), considers to find out the weights of the parameters for the identification of sustainability scores. There are many research studies has been carried out of which the decision models are created for selection of supplier vendor etc (ChenTung, Ching-Torng & Huanget, 2006). MCDM techniques also support the decision-makers (DMs) in evaluating a set of alternatives for taking any decision. The AHP approach has found widespread application tool for a decision making problems. It decides the weights for the parameter as well. That weights can be further used for the calculation of sustainability scores for DMUs. Another technique used for the calculation of the efficiency of the DMUs i.e. Data Envelopment Analysis (DEA).

DEA is based on linear Programming model for assessing efficiency of anything. It "envelops" the several input and output vectors tightly as possible. The advantage of DEA is that it takes care of input and output factors at the same time. So, input and Output can be calculated along with a ray of origin (Adler, N., & Raveh, A., 2008). The various variable work differently, the manager and the decision maker find it very difficult to interpret the result and graphically examined the efficiency. One can always in decomposed into more sales and more profit to increase the efficiency with lower in cost involved in the processes in companies. The cost minimization problem and its decomposition can be diagrammatically represented as-

In DEA, there is an economic agent called as decision making unit (DMU) to grant the entries that have a control to process. This will have control over the process and convert the inputs to outputs.

Figure 2: A DMU transforms inputs into outputs



Thus, we can depict a DMU as in Figure 2. DMU transforms input into output. The identification of the inputs and the outputs for the present problem of study is important in assessment of DMU in real life assessments is difficult but it is important. The inputs should take cares all resources that are there to influence the outputs. The purpose of choosing the output is to reflect all pertinent consequences on which we wish to consider the DMUs. There are many environmental factors which are also impacting directly to the transformation that will be reflected on input and outputs directly impact the transformation of inputs into outputs should also be reflected in the inputs or outputs. DEA can be used to address the relationship between input and output. It shows the relative efficiency of the DMU. Using DEA the following questions were addressed:

1. Identification of 'suitable' efficient peers to consider for DMU to follow;
2. Estimate of input-output levels that would reduce a DMU
3. Evaluating the change in the productivity of a DMU over the time;
4. Identifying the type of returns to scale holding for efficient DMU

The assumptions were considered on implementation DEA. (Charnes et al. (1978) are Convexity, Monotonicity or Strong free disposability of inputs and outputs,

Inclusion of observations Each observed DMU and No output can be produced without some input, Constant returns to scale and Minimum extrapolation .

To evaluate the performance of A we can use Farrell measure of technical efficiency (Hu, C. K et al.,2017) which is represented in the ratio form, in the following manner-

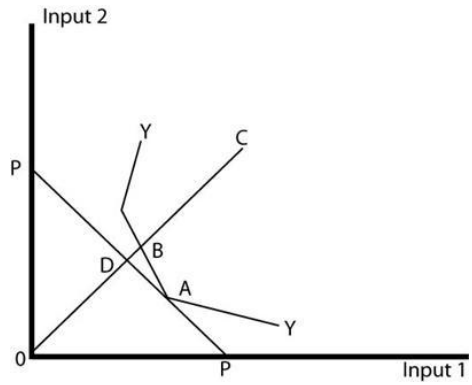


Figure 3: Cost efficiency and its decomposition

DEA is a nonparametric approach and belong to frontier efficiency management approach. It is used to measure the performances. The DMUs are different companies that are considered irrespective of industry. Accordingly, the DEA can be used for multiple criteria problems analysis. It can be used to measure relative

efficiency of number of DMU. As shown in figure 3, A,B,C,D are the four DMU and relatively they can be assessed for the problem identified. It utilises the set of input to produce the outputs(Kwatra, P., 2013). Its aim is to identify the efficient DMUs. One can calculate the rank in terms of their efficiency. The ability to convert multiple inputs into multiple outputs can be possible through DEA. It is a quality based study not work for any assumptions. The variables in a DEA model considers the weights of inputs and outputs, the model is able to find the optimum weights to maximise the efficiency of the unit under evaluation. There are four DEA basic models are as follows(Cooper et al., 2007):

	Charnes, Cooper, and Rhodes (CCR) model	Banker, Charnes, and Cooper (BCC) model
based on	minimization or maximisation of radial of all inputs or outputs	a proportional increase in all inputs results in an increase of the output, but not at the same proportion.
Uses	constant returns to scale (CRS)	variable returns to scale (VRS),
Result	There will be increase and decrease in proportion	adds a convexity constraint to the constraints of the linear programming problem

References	(Kwatra, P et al, 2017)	

Table 2: Difference between CCR and BCC

Additive model: based on models that combine CCR and BCC using a single approach. It deals with the input excesses and output shortfalls simultaneously in that situation it can be an example of independent of the coordinate system.

Slacks-based measure (SBM) model: It provides a scalar measure of efficiency that the additive model can identify. It is based on the unit of measurement of each input and output item. It does not have invariant in coordinates of the dataset.

The basic DEA models do not always provide good discriminating characteristics among DMUs, especially in situations where a significant number of DMUs are efficient. The Banker, Chames and Cooper (1984) model is used in this paper. This model measures Sustainability Efficiency as the relationship constraint and

safeguards it into the composite score using the parameters identified for the sustainability score. This technique uses a similar scale size of all units. In the case of CCR the measuring efficiency is at least one, but in case of BCC model, it allows the variable returns to scale that was popularized in the operations research literature by Banker et al. (1984). Banker et al. (1984), BCC provides a decomposition of CCR Farrell efficiency into scale and technical parts. DEA model is always possible, when convexity constraints are to be dealt with (VRS) . DEA always provide using efficiency measures even for the not feasible solution in the linear programming (Emrouznejad, A., & Yang, G. L. ,2018). The efficiency calculated by BCC for DMUs is always efficient as comparison to CCR. The Model used in BCC is as follows:

$$\text{Min } \theta$$

$$\sum xi * xj \leq \theta\, x0$$

$$\sum xi * yj \geq y0$$

$$\sum \lambda j = 1$$

$$\lambda j \geq 1$$

The recent years many of the interesting and challenging issues concerning appropriate behavioral objectives and constraints were discussed. The applications and the specification of relevant variables and their measurement, arises and will give the new edge to the researchers for the new development to

make efficient model and productivity comparisons. It is not possible to discuss all the areas where the study is made. Let's consider the few areas where the efficiency is noted and examined. The table denotes the details of the research in some of the areas.

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Table 3 Empirical Applications of Efficiency and Productivity Analysis	
Pharmacy Retail Stores	(Patel G N & Pande S, 2012)
Airports	(Wanke, P., Barros, C. P., & Nwaogbe, O. R. ,2016).
Brand Equity In Sportswear Industry	(Patel, G. N et al,2012)
Construction Industry	(Wang, H., Ye, G., & Yuan, H. ,2010, August).
Pharmacy stores	(Patel, G. N., & Pande, S. ,2013).
Manufacturing Drugs	(Das, S., & Patel, G. N. ,2014).
Mexicon University	(Altamirano-Corro, A., & Peniche Vera, R. 2014).
Supplier selection	(Wu, D. ,2009)
Hospitals	(Staat, M. ,2006)
ICT Industry	(Stiakakis, E., & Sifaleras, A. ,2013)

Customer Statisfaction and Loyaty	(Faed, A et al, 2014)

Based on the study data is collected from the website and data is prepared for this research paper only.

DATA SELECTION AND ANALYSIS

The steps followed for the data selection are as follows:

Step-1: Identification of 5 parameters for list of DMUs

Step-2: Applied AHP to find the weights of this parameter (Table 4 & Table 5)

Step-3: Calculate the sustainability scores for the companies (having sustainability score more than 70% dataset used- Table 6).

Step-4: Applied DEA to find the efficiencies of DMU's

a) The companies matching with the relevant data from the European Union (EU) Industrial R&D Investment Scoreboard (European Commission, 2018) was considered.
b) Five criteria considered for study are input (R&D investment, number of employees, capital expenditure) and output (net sales, and operating profit)
c) Apply DEA for defining priority rankings of these companies

Step-5- Correlation between sustainability scores and parameters

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The application of the DMU's indicates that the efficiency DEA model it also provide the ranking the companies.

There are many researches based on the calculation of sustainability scores based on the parameters as Economic Growth (profit), Environmental Protection(Planet) and Social Development (People). The parameters also identified in the same lines as follows:

- Economic Growth (profit) uses parameters as Net Sales and Operating Profit
- Environmental Protection (Planet) uses parameter as R&D investment
- Social Development (People) uses parameters as number of employees and capital expenditure

AHP is used for the weighted scores and then this will help for the calculation of score of sustainability. The normalized matrix is as follows:

		No of Empl	Operational		Avera	Weighted Sc

			oyees	Cost		ge	ore
R&D			0.246	0.036		0.167	0.186
Capex			0.376	0.075		0.110	0.123
No of Employees			0.075	0.225		0.0	0.076

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						68	
Operational Cost			0.0025	0.075		0.155	0.173
Net sales			0.676	0.025		0.396	0.442

Table 4: Normalized weights for parameters

Table 5: Weights for sustainability score	
R&D	0.186
Capex	0.123
No of Employees	0.076

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Operational Cost	0.173
Net sales	0.442

The weights for the parameters as R& D is 18.6%,Capital Expenditure is 12.3%, No of employees is 7.6%, Operation cost is 17.3% and Net sales as 44.2%.

Table 6: The Top 24 Most Sustainable score Companies having scores more than 70%

Company	Country	Industry	Sustainability Scores
DASSAULT SYSTEMES	France	Software & Computer Services	86.10%
NESTE	Finla	Oil & Gas Producers	85.20%

	n d		
VALEO	Fr a n ce	Automobiles & Parts	83.60%
UCB	B el gi u m	Pharmaceuticals & Biotechnology	79.50%
OUTOTEC	Fi nl a n d	Industrial Engineering	78.30%
CISCO SYSTEMS	U S	Technology Hardware & Equipment	77.00%

AUTODESK	US	Software & Computer Services	76.90%
SIEMENS	Germany	Electronic & Electrical Equipment	76.70%
SAMSUNG SDI	South Korea	Electronic & Electrical Equipment	75.80%
MERCK US	US	Pharmaceuticals & Biotechnology	74.30%

PEARSON	UK	Media	73.90%
AMADEUS	Spain	Software & Computer Services	73.20%
PHILIPS	Netherlands	General Industrials	72.50%
ALLERGAN	Ireland	Pharmaceuticals & Biotechnology	72.20%
HONDA	Jap	Automobiles & Parts	71.90%

MOTOR	an		
SANOFI	France	Pharmaceuticals & Biotechnology	71.90%
MCCORMICK	US	Food Producers	71.50%
COMMONWEALTH BANK OF AUSTRALIA	Australia	Banks	71.50%
VIVENDI	France	Media	71.10%

INTEL	US	Technology Hardware & Equipment	71.10%
ITRON	US	Electronic & Electrical Equipment	71.10%
ERICSSON	Sweden	Technology Hardware & Equipment	70.80%
HALMA	UK	Electronic & Electrical Equipment	70.70%
DEUTSCHE BORSE	Germa	Financial Services	70.60%

	n y		

https://www.forbes.com/sites/karstenstrauss/2018/01/23/the-worlds-most-sustainable-companies-2018/#6292456e32b0

CASE STUDY

The dataset

The dataset of European Union (EU) Industrial published by the Institute for Prospective Technological Studies of the Joint Research Centre (JRC/IPTS) on behalf of the European Commission (2019) is used. The data have been drawn from the list defined in table 4 for the fiscal year 2018. The scoreboard provides data concerning the R&D ranking of the top 1,000 EU companies, as well as the top 1,000 non-EU companies. European Union (EU) means companies whose ultimate parent has its registered office in a member state of the EU (or outside the EU).

A spreadsheet format, presenting the R&D investments of above stated companies, An interesting point is that, out of 24 companies with sustainability

score greater than 70% the top three in R&D investment, accounting for more than 53% of the total investment, are:

For the purposes of ranking the sampled companies, the five criteria have been used for 3 and input and two as output. The inputs were considered as Number of Employees, Capital Expenditure and R&D investments and output as Net Sales and Operating Profit.

Table 7: Data of the DMUs

DMU	Net sales (€mn)	Op.profits (€mn)	R&D 2017/18 (€mn)	Capex (€mn)	Employees

			m n)		
	O 1	O2	I1	I2	I3
D M U 1	5 7 6. 6	3228 .0	6 4. 9	5 7 2 9. 0	16140
D M U 2	4 4. 0	1321 7.0	4 4 7. 0	6 1 6 8. 0	5339
D M U 3	1 4 4 0. 0	1855 0.0	1 1 5 8. 0	6 4 2 4. 0	11160 0

				6	
D	9		1	0	
M	8		0	8	
U	0.	4182	0.	8.	
4	0	.0	0	0	7478
				5	
D				0	
M	4			2	
U	0.	1139	9.	4.	
5	9	.2	1	4	4146
				1	
	5			5	
D	0		8	6	
M	5		0	2	
U	2.	4002	3.	2.	
6	1	7.5	8	0	72900
D	6				
M	3		4	4	
U	0.	1714	2.	6	
7	0	.8	3	5	8800

				4.0	
DMU8	55380	83049.0	2406.0	1251160	372000
DMU9	40949	4923.9	7751	50911	9429
DMU10	84741	33454.5	1574.3	11257.0	69000

DMU 11	149.18	5084.4	924	5508.1	30339
DMU 12	763.20	4852.7	116.4	632.2	14963
DMU 13	170.00	24903.0	420.0	756.0	73951
DMU 14	171.68	13291.7	291.8	103.3	17800

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D M U 15	5 3 9 6. 8	1134 49.3	3 0 6 9. 1	1 1 1 5 6. 2	21563 8
D M U 16	5 4 5 0. 0	3505 5.0	1 9 5 6. 0	1 0 8 0 3. 0	10656 6
D M U 17	6 5. 8	4030 .8	1 5 2. 1	5 6 4 2. 0	11700
D M U	2 8	1647 8.7	3 1	1 3 7	45733

18	4.9		0.2	28.1	
DMU19	154.0	12444.0	261.0	603.0	41743
DMU20	1094.1	5233	982.0	195.7	102700
DMU21	147.1	1682.8	4 1.3	513.1.6	7800

DMU 22	3 2 6 0. 7	2044 9.6	3 9 3. 8	1 1 2 9. 7	10073 5
DMU 23	6 3. 6	1212 .5	2 2. 8	5 2 0 6. 6	6113
DMU 24	1 5 4. 4	2920 .6	4 3. 1	6 2 8 8. 9	5640

Source :

https://iri.jrc.ec.europa.eu/documents/10180/1771724/R%26D%20ranking%20of%20EU%20top%201000%20companies

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The first three are minimising criteria (cost-input), while the latter two maximising ones (benefit-output). A brief description of these criteria follows:

- Number of employees: the average no of employees i.e Human resource working in the organisation.
- Capital expenditure: used by the company in the investment of capital e.g cost of building etc
- R&D investment investment of company on research and development.
- Net sales: the amount of sales excluding sales taxes after the deduction(i.e any discounts allowed, returns, allowances for damaged or missing goods.
- Operating profit: the profit earned by the company.

The sustainability scores are calculated by using the weights calculated by AHP as shown in table 8

	Net sales	Op. pprofits	I& I2(17	Capex (€	Employees
IU					

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	s (€mn)	(€mn)	/1 8(€r r)	mn)		
	O1	O2	I1	I2	I3	Sustainability Scores
IMU1	576.6	322 8.0	64.9	572 9.0	16 140	275 0.89

		1		6		
		3	4	1		
I	4	2	4	6		
N	4	1	7	8		355
U	.	7.	.	.	53	5.0
2	0	0	0	0	39	0
	1	1	1	6		
	4	8	1	4		
I	4	5	5	2		
N	0	5	8	4	11	133
U	.	0.	.	.	16	03.
3	0	0	0	0	00	12
				6		
	9	4	1	0		
I	8	1	0	8		
N	0	8	0	8		248
U	.	2.	.	.	74	9.4
4	0	0	0	0	78	9

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				5		
		1		0		
I	4	1		2		
N	0	3	9	4		114
U	.	9.	.	.	41	7.4
5	9	2	1	4	46	1
				1		
	5	4		5		
	0	0	8	6		
I	5	0	0	2		
N	2	2	3	2	72	167
U	.	7.	.	.	90	55.
6	1	5	8	0	0	85
				4		
	6	1		6		
I	3	7	4	5		
N	0	1	2	4		182
U	.	4.	.	.	88	0.4
7	0	8	3	0	00	7

				1		
	5	8	2	2		
	5	3	4	5		
I	3	0	0	1		
N	8	4	6	6	37	469
U	.	9.	.	.	20	85.
8	0	0	0	0	00	58
				5		
	4	4	7	0		
I	0	9	7	9		
N	9	2	5	1		251
U	.	3.	.	.	94	7.2
9	4	9	1	1	29	5
				1		
	8	3	1	1		
I	4	3	5	2		
N	7	4	7	5		
U	4	5	4	7	69	164
1	.	4.	.	.	00	41.
0	1	5	3	0	0	19

				5		
I	1	5		5		
N	4	0	9	0		
U	9	8	2	8	30	393
1	.	4.	.	.	33	6.9
1	8	4	4	1	9	3
				6		
I	7	4	1	3		
N	6	8	1	2		
U	3	5	6	3	14	310
1	.	2.	.	.	96	8.3
2	0	7	4	2	3	4
	1	2		7		
I	7	4	4	5		
N	4	9	2	5		
U	0	0	0	6	73	116
1	.	3.	.	.	95	88.
3	0	0	0	0	1	79

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I N U 1 4	1 7 1 6 . 8	1 3 2 9 1. 7	2 9 1 . 8	1 0 3 . 3	17 80 0	447 7.2 9
I N U 1 5	5 3 9 6 . 8	1 1 3 4 4 9. 3	3 0 6 9 . 1	1 1 1 5 6 . 2	21 56 38	403 15. 88
I N U 1 6	5 4 5 0 . 0	3 5 0 5 5. 0	1 9 5 6 . 0	1 0 8 0 3 . 0	10 65 66	182 41. 34

I N U 1 7	6 5 . 8	4 0 3 0. 8	1 5 2 . 1	5 6 4 2 . 0	11 70 0	233 3.9 0
I N U 1 8	2 8 4 . 9	1 6 4 7 8. 7	3 1 0 . 2	1 3 7 2 8 . 1	45 73 3	818 6.1 7
I N U 1 9	1 5 4 . 0	1 2 4 4 4. 0	2 6 1 . 0	6 0 3 6 . 0	41 74 3	617 4.0 8

	1			1		
	0	5	9	9		
I	9	2	8	5		
N	2	3	2	4		
U	1	3	0	7	10	259
2	.	1.	.	.	27	00.
0	4	4	7	7	00	42
				5		
I	1	1		1		
N	4	6	4	3		
U	1	8	1	1		158
2	.	2.	.	.	78	1.9
1	7	8	3	6	00	3
	3	2		1		
I	2	0	3	1		
N	6	4	9	2		
U	0	4	3	9	10	128
2	.	9.	.	.	07	22.
2	7	6	8	7	35	64

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I		1		5		
N	6	2	2	0		
U	3	1	2	6		134
2	.	2.	.	.	61	3.9
3	6	5	8	6	13	3
I	1	2		6		
N	5	9	4	8		
U	4	2	3	8		178
2	.	0.	.	.	56	0.9
4	4	6	1	9	40	4
V	0			0		
e	.	0.	(	.		
i	4	1	.	1		
g	4	7	1	2	0.	
h	1	3	8	2	07	
t	8	3	6	6	56	
s	2	7	4	6	88	
	8	6	4	8	7	

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Table : 8 Sustainability Scores using AHP scores

The calculation of Efficiency scores using BCC Model through DEA approach for 24 DMUs depicted in Table 9. The Analysis uses 3 inputs and 2 outputs in the various DMU. Out of 24 DMUs where 12 are Efficient DMU are as under:

DMU	BCC
DMU 2	1
DMU 4	1
DM	1

No of DMU	24.00
No. of Efficient DMUs	12.00
No. of Inefficient DMUs	12.00
Average Efficiency Result	0.90
Standard Deviation	0.16
Maximum Efficiency Result	1.00

U 5	
DMU 6	1
DMU 7	1
DMU 10	1
DMU 13	1

DMU14	1
DMU15	1
DMU20	1
DMU22	1

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DMU24	1
DMU8	0.93346 9
DMU18	0.93145

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DMU23	0.925032
DMU1	0.914382
DMU	0.888

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1 1	8 0 7 3
D M U 2 1	0 . 8 8 5 9 3 4
D M U 1 9	0 . 8 3 4 9 4 6

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DMU12	0.829175
DMU9	0.783006
DMU17	0.6661

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	2 0 4
D M U 1 6	0 . 6 3 4 6 3 5
D M U 3	0 . 3 3 6 2 5 3

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Table 9:DEA CCR-I results with sustainability scores (basic DEA input model)

Correlation between all the parameters with the sustainability scores as shown in Table 11

Correlation		With Efficient DMU	Difference
Net sales (		0.748	0.006

€mn)			
Op. profits (€mn)		0.978	0.014
R&D		0.635	0.0

017/18 (€mn)			32
Capex (€m		0.632	.010

n)			
Employees		0.966	0.011

Table11: Correlation with sustainability Scores

The correlation between Output and Input parameters as interpreted in terms of correlation coefficient, as the Operation profits and Number of employees are very strongly correlated with sustainability score. Net sales are strongly correlated with sustainability score and R&D and Capital Expenditure is moderately

correlated with sustainability score. This means the selections of parameter are significant.

CONCLUSIONS

In this paper, DEA methodology can be used for defining the priority rankings is a very important task; Eurostat publishes R&D ranking of companies which belong to several industries considering the criteria. R&D and Innovation in companies leads to the sustainability scores A list of priority rankings based on a number of criteria and helpful for the efficiency of the companies.

The dataset of this study consists of the top EU companies activating in sustainability. Although we selected one of the most important factors in industries. Our primary target was based on the sustainable companies that take care of assets may be financial and environmental for the coming generations. We explicitly focused on describing an integrated methodology for ranking companies based on a number of minimizing and maximizing criteria. The correlation between the factors is identified to find out the relationships between them. The parameters considered for the study are the significant in the calculation of sustainability and also for the calculation of the efficiency of the DMUs

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Comparing sustainability practices in luxury brands: A conceptual model

Deepti Wadera,
Associate Professor, GD Goenka University, Sohna Road
Gurgaon, Haryana, India
deepvaidya@gmail.com,
Phone: +91-9818886677

Jaspreet Kaur
Associate Professor, Pearl Academy,New Delhi, India

Introduction

The world around luxury brands is changing with sustainability becoming key components of luxury fashion's landscape. In 2007, luxury brands faced criticism for their lack of transparency in Deeper Luxury report (Bendell and Kleanthous,2007). Luxury brands faced issues with respect to their contribution towards Sustainable development (Gardetti and Torres, 2014).

Leather goods, deforestation, animal testing, etc. serve to remind us that every

purchase of luxury goods deprives the mother earth of precious natural resources and thus hurt the prospects of sustainable development.

In the 1990s corporations like the Bodyshop declared to the public that their products were not tested on animal in response to criticism by the international NGOs. Apart from the NGOs, the media and consumer activism have from time to time questioned marketing ethics of companies whose produce encourages conspicuous consumption. Therefore in any stakeholder analysis it is asked whether a company has sustainability as a part of their business model.

François-Henri Pinault, CEO of Kering, world N°2 luxury group, supported the argument that an approach based on sustainability would also give a competitive advantage to the group and add to the revenues. Hence with these changes in the environment, luxury sector has started contributing towards sustainable development and companies have begun to understand that fashion while highly aspirational, does involve ethical controversies (Aspers and Skov 2006).

Luxury sector is now conscious about the reputational risks which are crucial for their monetary worth and pricing (Kapferer and Bastien, 2012; Fombrun and Shanley, 1990), especially with the economic downturn in 2009 and again

in 2015, when the world also pivoted in a historic way toward sustainability and countries adopted the stringent agenda towards the sustainable development goals as listed in The Paris Agreement, 2016, where businesses tried to integrate sustainability at the strategy level with all the stakeholders and the United Nations making efforts to attain Sustainable Development Agenda by 2030.

UN Sustainable Development Goals laid out a charter for the companies and countries with respect to seventeen of the SDG goals. The 17 SDGs are adopted for each country and is being imbibed in planning processes and is reviewed by central UN platform. This paper has also considered the Goal 12 (Ensure sustainable consumption and production patterns) since it encourages companies to adopt sustainable practices and to report their advancements towards sustainability. Also SDG-8 (Decent work and economic growth) has been considered in this paper as it aims to promote sustainable economic growth and decent work for all (United Nations, 2015).

Luxury brands are trying to incorporate sustainability initiatives in their company strategy and actions (Cervellon and Shammas 2013).Reasons for incorporating these are also because of threat of getting low ranks on

sustainability by regulatory bodies and nonprofit organizations (Bendell and Kleanthous 2007; Moore 2011).

However the question is how many of these luxury brands are actually contributing towards

Sustainable development and to what extent? Hence the paper identifies the same with respect to carbon emissions, labor conditions and environment policies.

Literature Review

Luxury brands and sustainability

Luxury goods as a term is generally associated with premium prices, exclusive high quality, good aesthetics, excellent craftsmanship and continuous innovation leading to rarity (Dubois and Czellar, 2002). However, a luxury brand isn't always represented by its exclusiveness and rarity but it is also a function of the emotional value in the eyes of its consumers (Catry, 2003; Hanna, 2004). Reputational risk is an important concern for luxury brands. Especially with criticism now not being confined to a single consumer but getting viral because of social networks. Hence consumers now are demanding transparency.

Sustainability is gaining significance and new business models are being crafted to generate sustainable supply proposals which are an important dimension for luxury brands markets working on a “sustainable luxury” concept (Kapferer, 2012).

According to EPA (United States Environmental Protection Agency), sustainability is defined on the basis of a ground principle that whatever we need for our well-being and survival depends on our natural environment. If there is sustainability then that lets the nature and human coexist in a harmonious way and allows the fulfilment of social, economic, and environmental requirements. Sustainability represents the availability of natural resources like water and greenery to protect the environment and human health.

Sustainability and luxury can go hand in hand as this will result in appreciation to the brand’s ethical policies, which is evaluated through its environmental sustainability; and this in turn can become an important differentiation driver. Hence new business models should focus on sustainable supply which can act as a change agent for brand perception and can convey a concept of "sustainable luxury" (Guercini and Ranfagni 2012; 2013).This can be taken as ecological sustainability or a social one (Kapferer2012).

Sustainability is an essential aspect for the luxury companies, as these are in the society, and respect for the environment and community should be important for every stage of these luxury brands and their value chain, right from suppliers to the logistics (Plannthin,Cervellón and Wernerfelt,2012).

Sustainable development

Sustainable development together comprises of terms such as collectivity, ethic, conservation of natural resources, respect and durability etc. World Commission on Environment and Development defines it as "fulfilling the needs of today without compromising on the scope for future generations to fulfil their own needs" and pays emphasis on the resource consumption while preserving them. Hence representing the foundation of sustainable development: luxury industry along with other industries need to follow sustainable development by preserving valuable materials, following safe manufacturing of their products, avoid environmental pollution and follow dignity of workers.

People, Planet, Profit

Three parameters for sustainability were given by (Slaper and Hall,2012) in triple bottom line

accounting framework which was introduced in the mid-1990s. These three dimensions were social, environmental, and financial or 3 P's—People, Planet, and Profits. These act as a good base to judge the priorities given by any business to sustainability. If we observe sustainability in any business through these three dimensions then mostly the focus is on Planet which is done by taking care of our environment by careful production of the related goods. When it comes to luxury brands we assume that they are of high quality as well as durable because of their use of raw materials which are rare and hence they also argue that the same are sustainable. However luxury brands and their contribution towards these 3 Ps still remain under researched. Hence Planet and people aspects are researched upon, while the profit aspect is yet not covered in this study.

Positive Luxury

Diana Verde Nieto and Karen Hanton in 2011, conceptualized and established

Positive Luxury

(About Us) which is an award winning membership program ,globally and it changes the way consumers and brands look to each other .The brands which feature on Positive luxury ensures that they are involved in positive practices like their activities of raw material sourcing, manufacturing and marketing of

services. Few of the luxury brands who act as a member are DKNY, Fendi, Gucci, Louis Vuitton, Burberry, Dior, and Marc Jacobs, to name a few (Brands to Trust) .The research here aims to find about the same for select luxury brands.

Carbon Emissions

Change in climate and environmental degradation has impacted the manufacturing industry to imbibe sustainable initiatives (e.g., limited used of chemicals and recycled materials) to decrease carbon emission, environmental pollution and energy waste (Caniato et al.,2012;Fiksel.,2013).

Carbon emissions are related to carbon dioxide emissions into the atmosphere which are often associated with the burning of fossil fuels, crude oil, natural gas and coal. This lead to harmful effects in climate change which can be lowered by carbon emissions.

To limit a business's carbon emissions one can reduce its business's carbon footprint by making changes to the business activities, including using less raw materials and using recycled products where feasible ,also to reduce waste and producing eco-friendly goods and services.

The same has been researched about the select luxury brands which depicts their sustainability initiatives.

Environmental Policy

The policy revolves around the commitment of an organization to the regulations and law regarding environmental issues such as use of environmentally friendly raw materials and avoiding usage of leather from cattle farms, also minimizing pollution due to leather tanning process. Minimizing production of hazardous chemicals and use of solvent based chemicals.

Labour conditions comprises of respecting and complying with labor laws and regulations where in use of child labor is prohibited and labor condition policies in production chains are taken care of.

Literature has indicated that sustainable practices like use of environmentally preferred materials and application of work welfare practices like labour conditions policy when adopted in businesses help in attaining efficiency in operations and result in improved employee relationship as well as good brand reputation. It also makes the voluntary associations connect to the organisations

effectively and fosters better relationships with investors. (Bendell et al., 2013; Dangelico et al.,2010;Gunasekaran et al.,2012).The same has been studied with respect to select luxury brands.

One of the reasons for the select luxury brands to practice sustainability is successful brand differentiation which leads to completive advantage as it helps in building brand reputation which leads to favorable disposition of consumers (Maclnnis and deMello, 2005). Sustainability initiatives depict responsible behavior of organizations (Kakabadse, Rouzel and Lee-Davies,2005) and consumers form an emotional connection with the brand which follows sustainable practices.

Luxury brands have been faltering with respect to the hidden parts of supply chain (Kapferer 2013):

- Sourcing of raw materials (skins from some of the animal species from Bangladesh, India or China can't be traced) (Bastien and Kapferer : 2014)
- Treatments of animals
- Working conditions of humans
- Methods of manufacturing like leading to the local environment pollution (ex. Chromium being discharged by illegal tanneries.)

- Environment destruction,

and once they cover these loopholes they need to actively communicate about the same.

Communication about Sustainability Practices

Communication with the customer regarding the sustainability initiatives of the luxury companies is now becoming important. Griskevicius et al. (2010) stated that consumers tend to buy those products which indicate their sustainability initiatives, though such products may be costlier yet the consumers buy to reflect their higher status. Hence purchasing sustainable luxury brands in public can reflect altruism. This is often the case in countries where the norm is that consumption is directly equated with the status, Like in India as well as China where imitative tendencies and word of mouth play a crucial role in the marketing of luxury products (Ramchandani and Coste-Maniere 2012). Cervellon and Shammas (2013) explained that consumers choose the sustainable luxury values based on their sociocultural background which reflects their need for belongingness, guilt-free attitude and their concern for environment. However the luxury brands which are undertaking sustainability initiatives, need to communicate with the consumers

through various strategies like, Eco labels etc. Therefore the classification of luxury brands' sustainability initiatives should also be based on their policy of communication about the same.

Communication about their sustainability practices also leads to branding as sustainable brand performance comprises of the development of a brand with respect to sustainability criteria. In the product's life cycle' various stages, numerous standards of social and environmental compatibility are adhered to. The product's life cycle comprises of value creation (e.g. procurement, production and service). Hence to develop and design sustainable products and services, even luxury brands considered the consequences of production and consumption on natural environment (e.g. environmental pollution)

Hence luxury segment can attain sustainability by working on areas in value chain like that of sourcing, making, selling and reusing (Table1 indicates the same)

Based on the above literature, we have identified the gaps in the researches done on sustainability initiatives of luxury brands.
And a conceptual model is presented with respect to sustainability

practices of luxury brands around carbon emissions, environmental policy and labor conditions

A schematic depicting this analysis is shown in Figure 1.

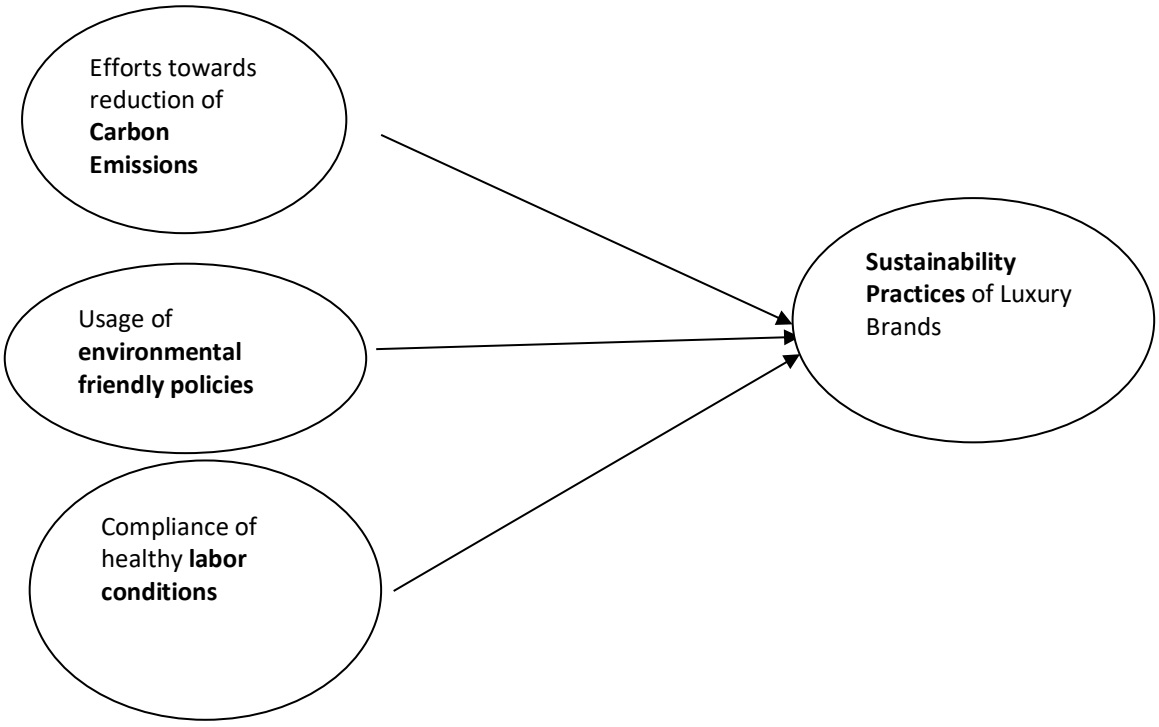

Figure1: Conceptual Model

Research Methodology

Based on the literature review and identified research gaps, the ways in which luxury brands have been contributing towards sustainability is yet unclear. Hence the aim of this paper is to examine and compare the ways in which luxury brands have been contributing towards sustainability. Thus the main two identified research questions are:

RQ1. How do luxury brands contribute towards sustainability?

RQ2. How does their sustainability practices differ with respect to carbon emissions, environment policy and labor conditions?

The methodology is qualitative data collected from published sources .Firstly, literature sources have been consulted from journals, industry reports and luxury brands magazines. Reports on sustainability and luxury in the public domain have also been referenced. Certain published sources like "Global brands ranking" retrieved from rankabrand.org were also referred to.

The websites of the brands or the company groups were the units of analysis for

this study. Content from websites of these select luxury brands were downloaded and printed. To extract the latent meaning of the narratives, the textual data was segmented per sentence. Sentences were chosen as a unit of code since the other forms of units like words, paragraphs or pages have contextual meanings only (Milne and Adler, 1999)

Case studies of 10 brands were identified amongst luxury brands for both men and women and to avoid certain sectorial biases effects, the research focused on brands belonging to" premium personal luxury goods " and “Star brands”.
As methodology is based on qualitative data collection, a sample size of ten brands has been taken.

Luxury brands can be differentiated by their brand awareness into a category classified as star brands (Nueono & Quelch ,1998).

Star brands, are the ones which aspire for maximum brand awareness also beyond their actual target group. These brands though bought by relatively few people, are known by mostly everyone. Examples cover a brand like Louis Vuitton which is also known by non-target group consumers to fulfill the need for demonstrative consumption.

This sector includes handbags, apparels, accessories, perfumes, jewelry so as to understand the nature of sustainability practices in such luxury brands. The action points suggested through case studies reinforced the proposed CEL model for sustainability practices.

Sustainability parameters of these brands were assessed based on their economic, environmental and social contribution with respect to Carbon emissions, Environment policy and labor condition and a conceptual model as CEL model was developed and used for analysis. Issues like the reduction of carbon emissions, hazardous and toxic chemicals and child labor and fair wages for workers were researched upon.

Sustainable brand performance for these brands were also analyzed, unit of analysis for the same were the case studies, brands websites, press releases and annual reports.

Ten luxury brands chosen are: Gucci, LVMH, Burberry, DKNY, Calvin Klein, Chanel, Dior, Versace, Jimmychoo, Dolce& Gabbana.
Overview of chosen luxury brands are given in Table 2.

Discussion and Analysis

Comparison of Luxury brands orientation towards sustainability practices was done based on CEL Model (their policies towards carbon emission, environment and labor conditions) as elicited in table 3.

Ten luxury brands discussed are: Gucci, LVMH, Burberry, DKNY, Calvin Klein, Chanel, Dior, Versace, Jimmychoo, Dolce&Gabbana.

Carbon Emissions

Contribution to sustainability around carbon emissions was judged based on various parameters like carbon emission reduction, disclosure of carbon foot prints, carbon emission reduction target setting and product supply chain emission reduction. It was observed that out of the taken luxury brands, Gucci, Louis Vuitton, Burberry, DKNY and Calvin Klein are having clear policies around all these parameters and are working towards sustainability practices around carbon emission reduction. However DKNY and Calvin Klein need to have more specific policies around these.

For example Gucci which is the highest-selling Italian luxury brand of fashion and leather goods and was founded by Guccio Gucci in Florence in 1921.

Gucci is found to be making use of 100% recyclable packaging with respect to their glamorous goods. Gucci has also been the first mover amongst luxury brands in signing an agreement with ministry of environment, promising to keep a track of C02 emissions omitted through its supply chain. This step is aimed at calculating Eco costs of some of the Gucci's signature products.

Chanel S.A. which is a French brand which is into high fashion house that specializes in women's haute couture and ready-to-wear clothes, luxury goods, and fashion accessories. Chanel tried to adopt the UN Sustainable Development Goals (SDGs) in 2015 and also collaborated with a long-standing glass manufacturer on a lighter Gabrielle fragrance bottle that Chanel claims has a 40% lower carbon footprint than a 50-milliliter perfume bottle made by the same manufacturer. However other sustainability practices were not communicated about.

Environmental Policy

Contribution to sustainability around environmental policy was judged based on various parameters like usage of environmentally preferred raw materials, avoiding use of leather from cattle farms, policy to minimize environmental pollution from leather tanning process, policy to eliminate hazardous chemicals during

production,PVC phase out level achievement and minimizing use of solvent based chemicals.

For example, LVMH, Burberry, Calvin Klein and Gucci are discussed as below:

LVMH which is a renowned French multinational luxury brand organization headquartered in Paris and in 1987 the company was formed under the merger of fashion house Louis Vuitton with Moët Hennessy.

Brands in the product category of perfumes and cosmetics is found to be following code of ethics and has also communicated about it to its suppliers, with a letter from the CEO.

-LVMH undertakes environmental policy programs, like LVMH Indicators for the Environment

(LIFE) program aligned with the objectives below:

1. Integrate environmental performance since the design stage
2. Secure access to strategic raw materials
3. Material and product traceability and compliance
4. Environmental and social responsibility of suppliers

5. Protection of critical know how
6. CO2 impact of activities
7. Environment excellence of production process activities
8. Sustainable and repairable products
9. Well handed client's request in relation with environment

Recently new objectives were charted by the group as LIFE 2020 program (LVMH Initiatives for the Environment).

Four pillars are the focus that engages all the business sectors and activities of LVMH group like products, supply chain, CO2 and sites. Objectives have been set as following:

- Product objective: To work on the environmental footprint of product, the Group aims to enhance the environmental performance of its products, with respect to the entire lifecycle.

- Supply Chain objective: Traceability and conformity of the raw materials will be monitored by the group and highest standards would be maintained across 70% of procurement chains.

- CO2 objective: CO2 emissions will be reduced by 25% by 2020.In 2015 LVMH created an in-house Carbon Fund.

- Site objective: The target for all sites would be an improvement of minimum 10% environmental performance indicators with respect to water and energy consumption and waste production.

Burberry Group which is a luxury fashion house headquartered in London, England. Its main focus is on trench coats and ready-to-wear wear, fragrances, sunglasses, fashion accessories and cosmetics.

.In a formal response released on January 24, 2014 the company Burberry claimed that

“All Burberry products completely follow safety standards that are international. Burberry undertakes a programme to reduce the environmental impact of their supply chain by collaborating with their suppliers and NGOs like Greenpeace, which includes the commitment to eliminate from their supply chain the release of chemicals elicits an environmental impact by signing onto Greenpeace's

Detox Solution Commitment.

Burberry's corporate responsibility report 2017 also depicts their policy towards reducing the impact of chemicals in supply chain, responsible sourcing and packaging, as well as reducing use of PVC.

Calvin Klein which is named after the founder's name who was an American fashion designer who launched the company that later become Calvin Klein Inc., in 1968. Along with clothing, the name was also given to a range of perfumes, watches, and jewelry.

CK group works towards the environmental concerns by addressing three principle areas that are: Printing and Packaging, Procurement of paper and usage, Pollution reduction recycling in workplace and community.

They do so through their various steps like being environmentally responsible in their advertisement designing and printing. Also reduce toxicity of materials and encourage responsible use of forest resources. There are also other initiatives which shows their commitment towards sustainability.

The brand Gucci also uses informative product labelling about their sustainable

use of resources and the group follows principles of sustainability and the company performs regular audits for its suppliers and subcontractors.

Gucci recently launched Gucci Equilibrium, which is an online platform to connect planet, people and purpose. Equilibrium.gucci.com is planned to be used as a tool for communication to help every staff member to use their one percent of working time to contribute in local communities.

Labor Conditions

Contribution to sustainability around labor conditions was judged based on various parameters like brand does not uses child labor,CoC (Code Of Conduct)includes worker rights like formally registered employee relationship, rights to facilitate parallel means of independent association and bargaining are given, application of labor conditions in production chains is followed, brand has a published list of direct suppliers contributing to 90% of purchase volume, brand purchase its supplies from accredited factories with improved labor conditions, Clarification on independent civil society organization's contribution towards labor conditions decision, Reporting of labor conditions policy annually, brand's labor condition policy resulting in a compliance level of 30 % of the purchase volume.

For example, DKNY and LVMH were found working towards better labor conditions:

DKNY which is a fashion house from New York and is specializing in fashion goods for men and women, founded in 1984 by Donna Karan.it is said about DKNY that it brings out a business model which the fashion industry should take inspiration from, Like with its Urban Zen collection it has created a clothing line which is also aiming at a philanthropic initiative by contribution of 10% of its sales to Karan's Urban Zen foundation which works to bring out the awareness and shape up the cultural preservation and empowerment of children.

LVMH also trains all its new employees about the code of ethics as it was found in countries like Ukraine and Russia

-LVMH Group is also involved in various initiatives for humanitarian causes. It does addresses the issues of public health and provides continuous support for medical research in France and other areas in the world.

Brands which have not been found having any clear policy towards sustainability contribution in terms of Carbon emissions, environment policy and labor

conditions are following:

Dior

Christian Dior SE, also known as Dior, is a luxury goods company from Europe and is chaired by Bernard Arnault, who is a French businessman and also heads LVMH.

Founded by the designer Christian Dior, and the company is into the designing and retailing of leather goods and fashion accessories, also includes footwear, jewelry, fragrance, timepieces and makeup, along with skincare products .Christian Dior label is mainly for women's offerings, the company is also in the Dior Homme division for men as well as the baby Dior label for children's wear. However nothing much has been reported about the brand's sustainability practices.

Versace

Versace, is a luxury fashion brand from Italy and its trade name was founded by Gianni Versace in 1978. It produces premium ready-to-wear and leather accessories along with other lines .The brand is famous for its innovative designs with symbolic flashy prints in bright colors. The company recently announced about not using fur in its collections. Also to be more sustainable they are

empowering each employee and collaborator to be a change-maker. Recycling and water-saving are gradually being implemented across Versace's headquarter offices. The employees are planning to save energy and follow greener practices at production facilities. Still the brand needs more efforts towards implementing the same.

Jimmy Choo

Datuk Jimmy Choo Yeang Keat was the cofounder of Jimmy Choo Ltd and was a Malaysian fashion designer who was based in the United Kingdom. The brand is which famous for its handmade women's shoes. Jimmy Choo, also recently took a decision to completely stop the use of animal fur in all its products ,however more efforts are needed on other fronts.

Dolce & Gabbana

Dolce & Gabbana is a luxury fashion house from Italy and was founded by Italian designers Domenico Dolce and Stefano Gabbana.

Dolce & Gabbana started with the product lines like swimming costumes and inner wears and also exported the same to Japan and other countries .They also launched their men's collection and first perfume Dolce & Gabbana.

It is said that the Dolce and Gabbana need to maintain corporate transparency by revealing about their supply chain and the place from where they source their leather products.

Hence comparison of Luxury brands orientation towards sustainability practices was done based on the CEL Model (their policies towards carbon emission, environment and labor conditions) as also elicited in table 3.

The ways in which these brands are adding to the sustainability are different and even the degree of contribution is also differing and is analyzed.

Hence out of the ten luxury brands studied, it was found that 5 brands which were studied: CHANEL,DIOR,VERSACE,JIMMYCHOO,DOLCE&GABBANA did not communicate about the policies for environment, carbon emissions and labour conditions in low-wages countries. Hence consumers can't understand if these brands are contributing to sustainability or not.

While rest 5 brands which were studied like GUCCI,LVMH,BURBERRY,DKNY,CALVIN KLEIN were found contributing and communicating towards sustainable development by being sensitive towards

environmental, economic and social causes. These brands were found to have been working towards carbon emissions, environmental policy and labour conditions.

Why these few are found to be more responsive towards sustainability practices while others are not is a matter of concern.

Conclusion

Research of luxury brands and their initiatives towards sustainability was hitherto an under researched area. This research was an attempt to fulfil the gap in this subject area.

Study indicated that luxury brands are now understanding the importance of sustainability initiatives and though some of them have started working on the same, they are yet to communicate these to stakeholders.

Communication mediums used by luxury brands are the websites, press releases and annual reports. Others who are communicating their initiatives, need to work on other areas of sustainable development.

Findings of the study depict that only select luxury brands are contributing as well as communicating about their sustainability practices based on CEL model i.e. towards carbon emissions, environment policy and labor conditions. While others are yet to have properly laid out policies for the same and communicate about them clearly.

Limitations of this research is that the sample of brands is belonging to only limited sectors. It is understood that once applied to several other sectors, the study could lead to the creation of additional categories. It should also be noted that websites must be considered units of research and are in constant flux. Therefore, the results provided are time restrained.

However these initiatives should not be used to mislead consumers regarding the environmental, social and economic benefits of these practices. To avoid any misconception, it is important for companies to work on sustainability practices and to create a truly responsible public image, it is necessary for entities to address the issue holistically and realize how these strategies have many positive benefits.

This study also emphasizes on the importance of communication by the luxury

brands about their sustainability initiatives. Hence the luxury brands can focus on their communication about their unique sustainability initiatives to consumers today who are being increasingly concerned about the same and prefer green and ethically made products that do not harm the environment.

Communication can easily be done around CEL model and even business models in future can be towards a more sustainable development perspective.

With the strict agenda towards the sustainable development goals listed in The Paris Agreement, 2016, where businesses tried to integrate sustainability at the strategy level with all the stakeholders and the United Nations making efforts to attain Sustainable Development Agenda by 2030, even the luxury brands can orient themselves for the same in a structured fashion and this paper can give them inputs on the same, thus enabling the luxury brands to differentiate themselves by working towards sustainability, also giving rise to long-term financial stability and satisfaction of stakeholders.

Further research could reproduce this study several times to get a longitudinal perspective of the results and with respect to luxury brands in other sectors. Research can be done on the intentions of luxury brands behind such

sustainability practices. Further efforts can be made in researching upon as to how different performance outcomes related to sustainability can impact the various elements of a business including: image within the community, financial bottom-line creating a competitive advantage and degree of impact on stakeholder satisfaction.

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Tables

Table 1

A Value chain perspective on Sustainability

SOURCE: Ethical and responsible purchasing and production.
MAKE: The design, labour and manufacturing processes required to turn raw materials
SELL: Marketing, packaging transportation and sale of products are done with respect to
REUSE: The ways in which their customers care for, maintain and reuse, recycle or dispose their products can be taken care of.

Source: Author's compilation

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Table2

Selected Luxury Brands Details

DIOR	
Origin:	Christian Dior S.A
Corporate office:	Paris, France
Segments :	Female, male and kids
Product categories:	Jackets, Jeans ,Shirts
BURBERRY	
Origin:	Burberry Group plc
Corporate office:	London,UK
Segments :	Female, male and kids
Product categories:	Pullover, Suits, Jeans,
Dress, Bags, Caps, Shirts, Jackets	
CALVIN KLEIN	
Origin:	Phillips-Van Heusen Corporation
Corporate office:	New York, NY,
USA Segments :	Female, male and
kids Product categories:	Caps, Suits, Bags,
Pullover, Shirts, Jeans, Shoes, Jackets, Dress	
4. DOLCE&GABBANA	

Founders:	Stefano Gabbana& Domenico Dolce
Corporate office:	Milan, Italy
Segments:	Female, male and kids
Product categories:	Handbags, clothing, footwear, jewellery, perfumes, cosmetics sunglasses, watches
5. DKNY	
Origin:	LVMH
Corporate office:	Paris, France
Segments :	Female, males
Product categories	Dress, Shoes, Boots, Shirts, Pullover, Bags, Suits, Jackets, Jeans
6. CHANEL	
Founder:	Chanel S.A.
Corporate office:	Paris, France
Segments:	Female
Product categories	Jackets, Bags, Shirts, Pullover, Suits, , Shoes, Boots
7. JIMMY CHOO	

Origin:	J. Choo Limited
Corporate office:	London, United Kingdom
Segments :	Female, males
Product categories	Shoes, Bags, Boots,Perfumes

8 LVMH

Origin:	LVMH
Corporate office :	Paris, France
Segments :	Female, males
Product categories	Shoes, Boots, Bags, Pullover,
Shirts, Suits, Jackets, Dress	

9. GUCCI

Origin:	Kering SA
Corporate office:	Paris, France
Segments :	Female, males,baby,kids
Product categories	
Bags, Caps, Shirts, Pullover,Suits, Jackets, Jeans, Dress, Shoes, Boots	

10. VERSACE	
Origin:	The Versace Group
Corporate office:	Milan, Italy
Segments :	Female, male ,kids
Product categories	Jeans, Dress, Bags, Shoes, Shirts, Pullover, Suits, Jackets

Source: Author's compilation

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Table 3

Comparison of Luxury brands orientation towards sustainability practices

PARAMETERS	CHANEL	DIOR	GUCCI	LOUIS VUITTON	BURBERRY	VERSACE	JIMMY CHOO	DOLCE&GABBANA	DKNY	CALVIN KLEIN
CARBON EMISSIONS										
Carbon emission reduction	NCP	NCP	Yes	Yes	Yes	NCP	NCP	NCP	Yes	Yes
Disclosure of carbon footprints	NCP	NCP	Yes	Yes	Yes	NCP	NCP	NCP	YBNS	Yes
Carbon emission reduction target	NCP	NCP	Yes	Yes	Yes	NCP	NCP	NCP	YBNS	YBNS
Product supply chain emission reduction	NCP	NCP	Yes	Yes	Yes	NCP	NCP	NCP	YBNS	YBNS
ENVIRONMENTAL POLICY										
Usage of environmentally preferred rawmaterials	NCP	NCP	Yes	NCP	YBNS	NCP	NCP	NCP	NCP	NCP
Usage of environmentally preferred rawmaterials(more than 25% of volume)	NCP	NCP	NCP	NCP	YBNS	NCP	NCP	NCP	NCP	NCP
Usage of environmentally preferred rawmaterials(more than 50% of volume)	NCP	NCP	NCP	NCP	YBNS	NCP	NCP	NCP	NCP	NCP
Avoid usage of leather from cattle farms	NCP	NCP	Yes	NCP	YBNS	NCP	NCP	NCP	NCP	NCP
Policy to minimise environmental pollution from leather tanning process	NCP	NCP	Yes	NCP	YBNS	NCP	NCP	NCP	NCP	NCP
Policy to eliminate hazardous chemicals during production	NCP	NCP	Yes	NCP	Yes	NCP	NCP	NCP	NCP	Yes
PVC phase out level achievment of more than 90%	NCP	NCP	YBNS	NCP	YBNS	NCP	NCP	NCP	NCP	NCP
Minimise use of solvent based chemicals	NCP	NCP	NCP	YBNS	YBNS	NCP	NCP	NCP	YBNS	NCP
LABOUR CONDITIONS										
Brand has a supplier code of conduct-no child labour	NCP	NCP	Yes	Yes	Yes	NCP	NCP	NCP	Yes	Yes
CoC includes worker rights like formally registered employee relationship	NCP	NCP	Yes	YBNS	Yes	NCP	NCP	NCP	NCP	NCP
Right to facilitate parallel means of independent association and bargaining	NCP	NCP	Yes	NCP	Yes	NCP	NCP	NCP	YBNS	YBNS
Application of labour condition policy in production chains	NCP	NCP	YBNS	NCP	YBNS	NCP	NCP	NCP	NCP	NCP
Brand has a published list of direct suppliers contributing to 90% purchase volume	NCP	NCP	YBNS	NCP	YBNS	NCP	NCP	NCP	NCP	NCP
Brand purchase its supplies from accredited factories with improved labor conditions	NCP	NCP	Yes	NCP	Yes	NCP	NCP	NCP	NCP	Yes
Do independent civil society organizations have a decisive voice in this collective initiative	NCP	NCP	Yes	NCP	Yes	NCP	NCP	NCP	NCP	Yes
Does the brand annually report on the results of its labor conditions policy	NCP	NCP	Yes	NCP	YBNS	NCP	NCP	NCP	NCP	Yes
Brand's labor conditions policy resulted in a 'compliance level' of 30% of the purchase volume	NCP	NCP	Yes	NCP	YBNS	NCP	NCP	NCP	NCP	Yes
NCP-No Clear Policy										
YBNS-Yes But Not Specific										

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Making Critical Sense Through Unmet expectations: A Case Study of an Accelerator Program

Outi-Maaria Palo-oja, Päivi Eriksson, Tero Montonen
outi-maaria.palo-oja@uef.fi

Business School, University of Eastern Finland, P.O. Box 1627, FI-70211 Kuopio, FINLAND

Abstract

This article focuses on the critical sensemaking of start-up entrepreneurs and their mentors in an accelerator program, illustrating how the participants' sense of the nature of acceleration was informed by the better-known incubation model and how their critical sense of the situation developed through their unmet expectations of the acceleration program. The article is based on empirical data collected from a 6-month study of a pilot accelerator program in which six start-ups participated. The contribution of the article is two-fold: It draws attention to the experiences and sensemaking of accelerator program participants, both start-

ups and mentors, and it demonstrates how the critical aspects of sensemaking were intensified through unmet expectations concerning the program.

1. Introduction

This article examines critical sensemaking (CSM) within accelerator programs, which are a relatively new model for supporting start-up companies (Cohen & Hochberg, 2014). Prior research on accelerator programs has addressed their characteristics, operation and success (e.g., Hoffman & Radojevich-Kelley, 2012; Pauwels, Clarysse, Wright, & van Hove, 2016; Frimodig & Torkkeli, 2017). While start-ups and mentors are the key actors in accelerators, surprisingly little research can be found on their experiences and sensemaking processes. This paper uses material and ideas drawn from a case study of one start-up accelerator program to analyse the sensemaking of the start-up entrepreneurs and mentors who participated in the program. The article pays particular attention to the critical aspects of sensemaking, i.e., how formative context, rules and power shape sensemaking. We define CSM as 'a framework for understanding how individuals make sense of their environments at a local level while acknowledging power relations in the broader societal context' (Helms Mills, Thurlow, & Mills, 2010, p. 190). Thus, CSM enables one to explore the development of socially constructed understanding as a temporal and contextual

process in which various external and self-created structures allow or, by contrast, prevent the emergence of diverse understandings.

Some researchers have suggested that accelerators are 'a new generation incubator model' (Pauwels et al., 2016, p. 14). Others point out that accelerators clearly differ from incubators because of their fixed duration (about three months), intensity, emphasis on cohorts (e.g., health tech) rather than individual start-ups, the nature of the mentoring and educational services provided and the culmination of the program in a public pitch event or demo day (e.g., Cohen, 2013; Cohen & Hochberg, 2014; Hochberg, 2016). Compared to the widely used and better-known incubator model, accelerator programs are fairly recent (DaSilva & Gabrielsson, 2018; Pauwels et al., 2016). With the increasing popularity of both incubator and accelerator programs, both start-ups and mentors usually have at least some prior knowledge of them when they enter a program. Despite this, there is always some novelty in every program and its circumstances, which intensifies the sensemaking process of participants.

This article investigates mentors' and start-ups' experiences of a pilot accelerator program and pays attention to the critical aspects of these participants' sensemaking. In the program examined, start-up teams worked together with their

mentors, took part in educational on-site events and had the opportunity to participate in a pitching competition. The data for the case comprises 25 interviews, project documents and feedback material from the on-site events. The findings illustrate how, through ongoing sensemaking, initial confusion about the program was turned into cohesion. The incubation model served as a point of comparison for evaluation and seemed to be preferred to the acceleration model by the participants.

The paper proceeds to outline the theoretical approach of the study, its methodology and its empirical findings. These findings show how the unmet expectations of the accelerator program intensified the participants' CSM. Criticism of the program triggered their sensemaking, and, even though the program was called an accelerator, its underlying formative context, practices, rules and roles allowed the participants to agree to conduct work that was closer in its nature to the incubator model.

2. Theoretical Approach: Critical Sensemaking

While typical models exist, accelerator programs are rarely identical in their content (DaSilva & Gabrielsson, 2018; Pauwels et al., 2016). When start-up entrepreneurs, teams and mentors participate in a new accelerator program, they

try to understand what is going on in that particular program. They do this retrospectively through their past experiences with similar programs or their previous knowledge and assumptions about them (Weick, 1993). Their need to understand is based on individual and collective identity (Weick, 1995), which enables the emergence of diverse understandings of the event by people in the same situation (Helms Mills et al., 2010). In other words, people establish, maintain and reframe their identity by acting and then observing the consequences (Helms Mills, 2003, p. 55; Weick, 1995, pp. 18, 20). When actions and responses by others reflect the sensemaker's understanding of reality, there is no need to actively try to make sense of what is going on, but when behaviour, feedback and one's sense of self disconnect, sensemaking emerges.

Weick (1988, p. 305) claims that 'people think by acting', meaning that, as we act and try to make sense of our actions, we enact the reality in which we take those actions. Action in certain events precedes the understanding of those events, which makes sensemaking retrospective. Their identities and their retrospectively constructed sense of a situation influence what people notice in a given reality (Mills & Helms Mills, 2004, p. 122), and people tend to ignore cues that do not seem plausible within their existing understanding. This preference for plausibility over accuracy reflects 'a feeling that something makes sense, feels

right' (Helms Mills, 2003, p. 67) under current circumstances and according to our sense of that time.

Extracted cues are often familiar from the past (Helms Mills et al., 2010), and they serve as elements of individual attempts to understand novel events (Weick, 1995, p. 50). Sensemaking does not happen in a vacuum, however, but is integrally linked to the sensemaking of others. Thus, the presence of others makes sensemaking a social process (Weick, 2001, p. 460) in which sensemakers may privilege confirmative behaviour (Mills & Helms Mills, 2004, p. 123).

In addition to the Weickian approach that focuses on the social-psychological properties of sensemaking (Aromaa et al., 2018), such as identity construction, retrospection, ongoing, extracted cues, enactment, social and plausibility over accuracy, Mills and Helms Mills (2004) have introduced the formative context (Unger, 1987), organisational rules (Mills, 1988; Mills & Murgatroyd, 1991) and power (Helms Mills et al., 2010) to what they call the CSM heuristics.

The notion of the formative context of CSM has its roots in the social theory of Unger (1987), who studied social structures and how they shape and formalise

social interactions. The formative context serves as a socially constructed scene in which individuals and organisations express their assumptions, behaviours and actions for others to react to and make sense of. In practice, the formative context explains why members of an organization often work in a fairly uniform manner (Mills & Helms Mills, 2004), as the formative context maintains the social construction of a situation, enabling sensemakers to act routinely without active attempts to understand every detail. In the formative context, organisational rules define expected roles and provide options for socially acceptable action (Helms Mills & Weatherbee, 2006; Thurlow & Helms Mills, 2015). Actors continuously create and recreate sense through negotiation and social interaction. The rules are grounded on expectations of acting in a particular way that is established by the formative context. These socially formed rules help actors to develop a socially accepted (plausible) sense of novel situations (Mills & Murgatroyd, 1991, p. 19; Rostis, 2010, p. 402), such as accelerator programs.

Formative context and organisational rules provide structure and predictability for social situations but also limit action and agency in the sensemaking process (Helms Mills & Weatherbee, 2006; Thurlow & Helms Mills, 2015). For Weick, sensemaking is a rather democratic process, but, in CSM, power relations are important. Power can be manifested as status, authority and privilege over others

(Helms Mills et al., 2010; Helms Mills & Weatherbee, 2006), but it can also be a socially negotiated agreement that becomes visible in organizational rules and practices (Thurlow & Helms Mills, 2009; Thurlow & Helms Mills, 2015) and in goals and plans (Gioia & Chittipeddi, 1991).

Accelerator programs are usually more focused on growth than incubators, which help early-stage start-ups in their economic development. Still, as Isabelle (2013) notes, the difference between them is sometimes unclear. After start-ups are accepted into an accelerator program, it provides funding from and networking with investors, advice for product and business development, peer support, deadlines, a basic framework for getting things done and validation of the business's potential (Miller & Bound, 2011, p. 26–28). Because the definitions and goals of accelerator programs vary, finding the best option for a start-up business requires a good understanding of the mission and goals of the program. At best, the program matches the needs of local businesses (Isabelle, 2013). The accelerator program investigated in this case study attempted to identify an acceleration model that exactly met those regional needs.

3. Methods

The data for the intensive case study (Eriksson & Kovalainen, 2010; 2016, p. 134) included 25 semi-structured interviews with start-up entrepreneurs and their mentors. The interviews were conducted and audio- or video-recorded in two rounds. The first round of interviews focused on start-ups' and mentors' expectations of the program. Another aim was to elicit more information on how the mentors would organize their activities during the program. After the pitching event, the mentors and start-ups were re-interviewed about their experiences and their evaluations of their progress during the program. Additionally, the start-up entrepreneurs and some of their mentors participated in on-site days, during which they had the opportunity to listen to keynote speeches by various experts and to get feedback on their pitching. The video-recordings and feedback forms from these events as well as a documentary on the project, field notes, photos, and video-recordings from the pitching event and other meetings provided background data for this study.

The interview recordings were transcribed, with the exception of two interviews for which notes were used due to failed recording. Qualitative content analysis of the interview data was performed with Atlas.ti software in which the CSM framework was used as a sensitizing heuristic. In practice, the interviews were

coded in the software according to the properties of CSM (i.e., sensemaking, formative context, organisational rules and power). Each property was then analysed to find differences, similarities and peculiar interpretations of start-up mentoring. The findings of this analysis, together with a thorough reading of the other material, such as fieldnotes, feedback and the documentary of the project, served as the basis for constructing the case narrative.

4. The Pilot Accelerator Program

The health-tech accelerator program studied in this article was part of a project that sought to compare distinct accelerating models, get feedback from the trials and, based on the findings, identify a model that would best meet local requirements. The accelerator program for health-tech start-ups studied in this article (hereafter 'the Program') was piloted in the spring of 2018. The Program design included 4 on-site educational days for all the start-ups and mentors and 10 face-to-face meetings between each start-up and its mentor. The culmination of the Program was a pitching competition for which all the start-ups could apply, with the best ones being selected.

The Program was collaboratively organised by three actors. One of two universities was the program coordinator, responsible for practical matters, and

the other was responsible for collecting and analysing the data. The third participant – a health-tech consulting company – played an external role that is excluded from this study.

Seven experts from local and nearby cities were asked to work in the Program pro bono (i.e., without any financial compensation). These experts, called mentors in the Program, were asked to follow the routine practices of interaction that they employed when advising start-ups. The mentors had previous experience of either mentoring, incubation or coaching start-ups, and some had backgrounds as entrepreneurs in various fields.

About two months before the start of the Program, the coordinating university made a call for applications for health-tech start-ups to apply to the Program. Six of 12 start-up applicants were selected based on the quality of their business plans, the credibility of the start-up teams and the potential to attract investors and grow their businesses. The start-ups selected for the Program ranged from unregistered teams to companies less than two years old. Despite their youth, five out of six participants had prior experience of accelerator programs. Most of the start-ups had either a research-based business idea or other connections to universities.

Mentors were assigned to all the start-ups, with one team being appointed two mentors. A few of the start-ups asked for a particular mentor, and some mentors expressed their preferences for start-ups.

The Program's call for applications consisted mainly of a figure with arrows pointing from 'Idea coaching for meeting with mentor' to 'Ten meetings with mentor' and finally to 'The Pitching Event'. The pitching event acted as a kind of finish line for the Program, but it employed a separate call for applications (although it was recommended to all the start-ups in the Program). All but one start-up applied, and three were chosen. The Program also included 4 appointed on-site coaching days. Their specific content was emailed to the participants about a week before each event.

5. Findings

5.1. Criticism of Start-ups' Lack of Maturity

In their previous work, the mentors had learned that matters of team building, financial knowledge, company narratives, business models and business growth were common problems for young companies. When the Program began, however, they recognized that the start-ups in the Program were in their very

early phases and therefore not yet ready for discussions about these matters. Thus, the start-ups in the Program only somewhat met the mentors' expectations. Although young, many of the start-ups had prior experiences of participating in accelerator programs. Despite this, they had difficulties in expressing expectations of this Program other than 'getting all kinds of information about that [the business] side'.

The mentors, however, had assumed that the start-ups would actively identify their specific needs for advice. The fact that they did not caused some confusion among the mentors concerning what should and should not be done in the face-to-face meetings with the start-ups. During the Program, the start-ups noticed that there was no guidance in the Program about what they could ask for from their mentors, especially regarding the number of working hours and face-to-face meetings with them (e.g., when and where meetings could be held).

The Program provided little guidance for the mentors other than indicating that they should follow their own practices and have 10 meetings with the start-ups. During the Program, the mentors met with their start-ups in person three to five times. Additional contact was made by email and phone.

5.2. Criticism of the Tight Schedule

The Program lasted for less than four months, and the mentors found the schedule to be very tight. One of the mentors summarized their common feeling by stating that ‘four months is enough for developing a good pitch, but not for developing [a] good business’.

The Program had been organised rapidly, and many start-ups had been asked by the organisers to send in applications. The start-ups selected for the Program were informed of their acceptance only 1 week before the first on-site event. Almost every start-up entrepreneur held a full-time job and did start-up work in evenings and on weekends. Thus, their business operations, other events that they participated in and the main jobs of these part-time entrepreneurs kept the start-ups busy during the Program. Some of them experienced difficulties in having meetings with the mentors and participating in the on-site events. The main criticism provided by the start-ups at the end of the Program concerned its limited time frame and tight schedule.

5.3. Criticism of Content

The start-ups appreciated the nearby geographical location of the Program. Some of them had participated in accelerator programs in other cities and had found the

geographical distance between them and the accelerator challenging. For one of the more experienced start-ups, this marked the first time that they had received support as a team. One of their team members described this as a 'giant step for me mentally' and expressed the feeling of becoming more committed to the team.

The start-ups were critical of the fact that the on-site events offered little that was new to them, partly because of the strong emphasis on pitching. Much time was spent on learning to pitch the business idea to investors, as applying for a pitching competition was the culmination of the Program. A question posed by one of the start-up entrepreneurs reflects this: 'Is pitching so important? The focus should be shifted to the right things'. The on-site events' emphasis on pitching sometimes continued in face-to-face meetings, and the start-ups felt that they needed more time to focus on 'more important business issues'.

The start-ups agreed with the mentors that the pitch was an important means of attracting investors when the business idea was clear. However, the start-ups would have preferred less emphasis on pitching in the face-to-face meetings with their mentors: 'The mentor was more interested in pitching, but we … had more issues with the financial statements'.

Some of the start-ups wished that there had been a thematic structure to the Program. They were pleased, however, that no pre-defined structure guided their cooperation with the mentors. The open structure and tailored content of the meetings with the mentors offered them broad and well-targeted business knowledge. One of the start-up entrepreneurs noted that the flexibility and freedom had enabled him 'to shape his business thinking'. The most valuable content for the start-ups on the on-site days were the presentations by more mature health-tech entrepreneurs, who shared experiences with which they could identify.

5.4. Developing a Sense of Acceleration

The willingness of the start-up entrepreneurs to participate in one more start-up support program reflected their collective identity as 'start-ups'. In other words, applying for and taking part in these kinds of programs and events is what successful start-ups are supposed to do to develop their business. This willingness is part of the game in the Finnish context, the home of the world's largest start-up event, Slush.

Because of the pro bono spirit of the Program, the start-ups hesitated to ask for their mentors' help in all matters of importance to them. The start-ups did not

want to cause extra trouble for their mentors, who did not receive any compensation for their work in the Program. Also, some of the mentors had difficulties with the pro bono requirement of the Program. While pro bono behaviour has become popular among successful mentoring globally, it is exceptional in Finland because of the strong tradition of government-provided support for start-ups and other companies (Autio & Rannikko, 2016).

The guidelines of the Program and the hesitation of the start-ups to ask for help gave the mentors an opportunity to stay in the same roles that they had in their other jobs. This meant that the mentors were not forced out of their comfort zones to determine what mentoring in the context of a health-tech accelerator could entail. The mentors based their assumptions about the start-ups' needs on their own previous experiences, but only a few of them had worked with accelerators and health-tech start-ups before. It seemed, for example, that some of the mentors were not familiar with the specifics of accelerators as compared to incubators

Therefore, some of the mentors acted more like business advisors than mentors. They had business backgrounds or solid experience of advising start-ups but less experience of mentoring as a key activity in accelerators. Lacking the 'accelerator-mentor' identity, they experienced difficulty in describing their

routine practices with start-ups and in planning what to concentrate on when 'mentoring' these start-ups. One of the mentors summarized their problem by saying that the Program was 'a side project', the real objectives of which were left unclear.

Both mentors and start-ups had difficulty in describing their expectations and needs at the beginning of the Program, but they were better able to express their views towards the end. This finding supports Weick's (1988) notion of acting first and then making sense of it. The on-site educational events, meetings of mentors and start-ups and activities performed by each start-up gave their mentors an opportunity for ongoing sensemaking during the Program. Through their ongoing and socially constructed sensemaking (Weick, 2001), mentors and start-ups were able to turn their confusion to cohesion regarding their understanding of accelerating. The cohesion among the mentors and start-ups was based on their experience of the lack of sufficient time, too much of which was spent on pitching.

The coordinator of the Program hesitated to restrict or guide the cooperation between the mentors and start-ups. The only structure was provided by the call for applications, which was not returned during the Program.

6. Discussion

The case study presented in this article focused on the CSM of mentors and start-ups who participated in a health-tech accelerator program that was being piloted for the first time. The theoretical CSM heuristic enabled us to focus on the socially constructed and gradually emerging understanding of the Program and of the collaboration between mentors and start-ups.

The accelerator program served as a formative context that was expected to include certain kinds of activities and specific roles. In the accelerator-program setting, where experienced mentors are expected to help their novice mentees, the degree of structure and formalisation varies from formal guidance to free discussion. Mentors operate as sense givers and their mentees as sense receivers, but this arrangement can also be questioned without a need for active sensemaking. Yet, in this case, the mentors waited for an appropriate schedule and more precise instructions as to how close a relationship should develop and what form of mentoring should be provided to the start-ups. The start-ups, on the other hand, hoped for certain content in the Program on the on-site days as well as more precise information about what they could require from their mentor in the Program. Because the Program coordinator did not provide this information –

probably because of the Program's nature as a pilot for gathering information and experiences regarding how to design an accelerating model that would fit the local circumstances – the participants were uncertain and confused. This led to criticism of the Program and further triggered the sensemaking process.

Broadly, the Program followed the definition of accelerators introduced in the literature, the main point of which is to differentiate accelerators from incubators (Cohen, 2013; Cohen & Hochberg, 2014; Hochberg, 2016). Accordingly, an accelerator may be defined as a 'fixed-term, cohort-based program, including mentorship and educational components, that culminates in a public pitch event or demo-day' (Cohen & Hochberg, 2014, p. 4). Even though the 4-month period adopted for the Program was a little longer than that of typical accelerator programs of 3 months, the mentors' criticism of the too-tight schedule for business development reflects their confusion about the purposes of the Program, on the one hand, and their unmet expectations regarding the chosen start-ups' maturity on the other. Hence, the case study showed that, despite the Program's name – accelerator program – the longer-term incubation model served as an implicit point of reference for both mentors and start-ups. Also, this finding of a blurry understanding of the differences between accelerators and incubators is

similar to what Isabelle (2013) found among Canadian accelerators and incubators.

In the beginning, the nature of the Program and the lack of information about the adopted accelerator model caused confusion for both the mentors and the start-ups. This confusion was articulated as criticism of the Program and its unclear structure. This reflects Pollner's (1991) conception of reflexivity as 'an "unsettling," i.e., an insecurity regarding the basic assumptions, discourse and practices used in describing reality' (p. 370). The participants assumed that the Program was an accelerator program because of its title, but the practical action more closely followed the incubation model. This criticism triggered the individual and collective sensemaking of the mentors and start-ups, which continued throughout the Program.

According to Carroll, Helms Mills and Mills (2008), the plausibility in a certain context explains why some actors and their sensemaking remain more powerful. Despite the fact that the start-ups had been involved in accelerators before, in the case of the Program they yielded to their mentors in doing incubation types of work. The Program's context allowed mentors and start-ups to agree jointly on practices. In this sense, however, a permissive context prevented open criticism of

the focus on pitching on on-site days. This may reflect the gratitude of the start-up companies for the fact that they were given the opportunity to participate in an accelerating program in their own community.

At the end of the Program, the sensemaking of the mentors and the start-ups had developed some cohesion regarding their understanding of the Program. They were in agreement in suggesting that two of the key characteristics of the accelerator Program be changed: its limited time frame and its primary emphasis on pitching. Thus, despite the Program's many positive elements and outcomes, especially for the start-ups, many mentors and start-ups felt that a longer, less intensive program with less emphasis on pitching might have served them better.

7. Conclusion

The conclusion that can be drawn from the case study is that piloting a new type of start-up support program is challenging for the many reasons that have been elaborated in this paper. From a CSM perspective, the case study has illustrated how the formative context (in which start-ups are appreciated and get support and in which incubation is a well-established model for that) and existing rules (that mentors should be paid for their services) guided both the start-ups' and the mentors' sensemaking. Furthermore, the context and rules influenced identity

formation (with the start-up identity being based on and maintained via participation in support programs) or the lack of it (in that entrepreneur and business-advisor identities do not necessarily turn into mentor identities).

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