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Corporate Social Responsibility and Climate Change: Some Insights for Mitigation in Transport Sector

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Abstract:

Corporate Social Responsibility (CSR) is now a widely accepted concept. It has augmented to include Environment Sustainability as one of its key component and has received attention both the governments and private players. One of the important aspects of CSR receiving attention is reduction of greenhouse gases anthropogenic origin in the atmosphere in key sectors of economy. The urban transport systems constitute an important area which is a significant driver of global warming. Transport sector contributes nearly eighteen percent of global carbon dioxide emissions. In India more than fifty percent of the total liquid fuel is consumed by India's transport system contributing nearly ten percent of the carbon dioxide emissions from energy sector. The sector is projected to grow rapidly and significantly over the next few decades due to increasing industrialisation and urbanisation. Contribution of Corporate entities in the sustainable utilisation of energy resources has potential in mitigating the carbon dioxide emissions. The paper explores and analyses CSR activities in minimising the carbon footprints of transport sector. It also discusses the possible mitigation actions in related sectors which will help addressing the threats and challenges of climate change.

Key words: Global Warming, Greenhouse gas, transportation systems, mitigation, Climate Change

1. Introduction

Corporate Social Responsibility (CSR) is now a widely accepted concept, both nationally and internationally. Increasingly its presence can be felt by inclusion in the concept of Environmental, Social and Governance (ESG) issues in the realm of Responsible Investment. The inclusion of CSR as a mandatory requirement for qualifying companies recognises environment sustainability as one of the broad areas where the company can invest in its CSR activity, as per the schedule VII of Company's Act, 2013 displays the importance attached by the Government and the regulatory authorities to the concept and an indication of being responsible towards the environment. For investors, impact of a corporate on environment is now paramount. Carbon footprints are a way of measuring the impact of a corporation on climate change. Transportation sector can play a critical role in mitigating carbon footprints especially in the cities, where fuel, primarily in the form of petroleum products along is major contributor of carbon dioxide to the earth's atmosphere. This is imperative keeping in mind the excessive urbanisation in cities where people are heavily dependent on transportation. The compulsion of projecting oneself as responsible incorporation along with the pressing demand of the urban cities, transport sector needs to maintain a delicate balance of meeting investor's demands along with adhering to the social concerns. The paper attempts to analyse some of these issues in presenting possible solutions and alternatives for making transportation sector a key link in mitigating the carbon footprints of companies eventually making them more desirable for investment as well as a true steward of the nation's resources.

2. Corporate Responsibility and Environment Sustainability

Corporate responsibility is a term which has evolved over the years and has its roots in the stewardship theory. It primarily promotes the notion that since corporations are consuming the societal resources for the purpose of creating profits for their owners (shareholders), it should also compensate the society by being more conscious of its actions gauging the impact it can have on the society at large and rationalising its activities. This put the obligation for companies to follow norms for encouraging sustainable development. A corporate entity cannot exist in isolation. Its interdependence on other organisations is obvious. Hence the responsibility as a part of the society needs to be recognised and accounted for. Many organisations do it by undertaking sporadic philanthropic activities. However, recently, inclusion of the compulsory CSR activities by specific companies has been mandated by the Companies Act, 2013.¹ This fixation of responsibility is a clear indication that isolated philanthropy acts once in a while are not enough and organisations need to set aside certain percentage of profits for the purpose of socially responsible activities. Its reporting in the annual reports is also mandated making it inescapable for business houses ascertain their social responsibility. Corporate Social responsibility is a multi-dimensional concept as observed by Dahlsrud (2008). He includes social, economic, stakeholders, voluntariness and environmental factors determining the boundaries of CSR. Judicious use of natural resources is the fundamental necessity, especially when the common pool of resources is being shared by households, Industry

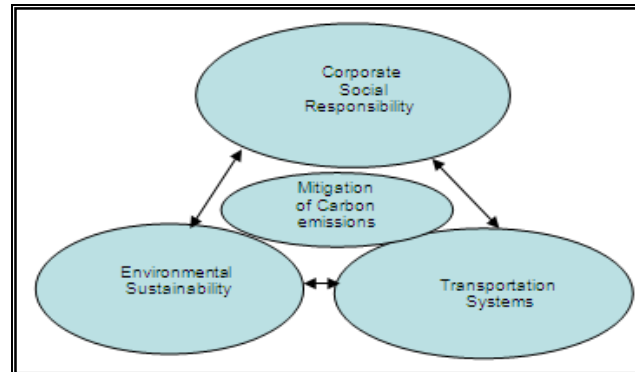
and government. Both nationally and internationally environment sustainability is increasingly its presence can be felt by inclusion in the concept of Environmental, Social and Governance (ESG) issues in the realm of Responsible Investment. For investors, impact of a corporate on environment is now paramount. Ditlev-Simonsen and Midttun (2011) have classified sustainable development environmental sensitivity as amenable areas where increased reception of the managers has been observed. Wagner (2007) deliberated upon the importance of including environmental concerns into the management's organisational strategy leading to better market returns. Sangle(2010) concludes in his study that social issues does contributes towards successful CSR strategy. The concept also has its implication in context of the stage of development the economy is at. An underdeveloped country on being path of becoming a developed one undergoes a specific pattern of demographic transition. This transition is a well-established and widely accepted theory which evolved as a result of the study of the growth trajectory of the developed nations such as US and UK. Urbanisation is recognised as the direct fallout of such a transition where gradually the number of towns and cities increase with reduced dependence on agriculture and increased contribution of industry and service sectors to the nation's Gross domestic Product (GDP). However, this theory cannot be generalised to all developing countries. . For an economy like India the growth pattern identified is somewhat different where the Industry/ Secondary sector has stagnated much earlier than expected. The contribution of Agriculture sector is lesser in terms of production, but number of people employed in the agriculture sector is proportionally more than industry. This shows disguised/ under employment problems. Additionally, the challenges of the third world countries have being identified by Bairoch(1988) and Todaro(1979) (as observed by Moomaw and Shatter ,1996) where they term increased population in the city as 'excessive' attributed to reduced mortality rates in the rural sector, causing rural crowding accompanied by underemployment and unemployment problems and the attraction of higher urban wages. Todaro(1979) terms this as 'inefficient migration'. This can be identified as excessive urbanisation which leads to a increased pressure on the scarce resources in the cities. As pointed out by Mukul Sanwal (2013). "Urbanisation is the major driving force for increased demand for materials and energy. This shifts the focus from production to consumption patterns." According to Blowfield and Murray (2011), economic growth has been historically associated with increased energy usage which eventually contributes towards unintended global warming . Households and the Industry are the major energy consuming sectors and transportation sector is the connecting link. Harmonisation of these three sectors is the one of the essentials in mitigating the palpable crunch on the natural resources of the metros. As construed by Dhar, Pathak and Shulka (2013) there are various indicators by which city emissions can be gauged. Urban transport sector emissions majorly consists of the petrol consumption/person and energy consumptions per '000 pkm. The annual energy consumption per person has been predicted to increase from 34.1 litres in the year 2010 to 65.9 litres in 2050. As, observed by Dhar, Pathak and Shulka (2013) the increased consumption, especially in the cities can be attributed to the notable peculiarities of urban form and structure. Aspects such as population density, road networks along with supportive infrastructure are all contributory towards how the development of the city progresses. Dhar et al (2013) quotes "Urban sprawl is a major challenge for cities. As cities spread out, work related trip distances and other travel activities increase. This often leads to a higher reliance on personal motorised transport." Along with this, the authors also cite impervious surfaces as stimulating floods. The Utrakhand mishap can be largely attributed to the inefficient city sprawling around Ganga Ghats. The plausible mitigation actions should be a collective initiative of the transport sector and the related industry counterpart coming together and building a cohesive system which can mitigate carbon emissions by judicious planning, incorporating changes making city life in tandem of the goal of reduced carbon footprint. Cumulative Carbon Dioxide emission in the atmosphere leads to rise in global mean surface temperature. The global goal of the negotiations under the climate change convention is to limit this increase in the temperature below 2 degree Celsius as compared to preindustrial times by the end of 21st century. The recent assessment report of Inter Governmental Panel of Climate Change report (IPCC) on climate change: The Physical Science Basis(2013) provides current cumulative carbon dioxide emissions in the atmosphere and also projects the concentrations of cumulative carbon dioxide at the end of this century using modelling studies and representative concentration pathways. These carbon dioxide emissions are often referred to carbon budget which has heightened the discussion in the climate change negotiation for development of a new treaty in 2015.

3. Transportation sector and global warming

As cited by the *report Transportation's Role in Reducing U.S. Greenhouse Gas Emissions: Volume 1(2010)*, the transportation sector emits broadly three types of Greenhouse gases namely, nitrous oxide, methane and carbon dioxide. Additionally, hydrofluorocarbon is also a by-product as a result of the combustion of the fossil fuels. Transport sector is an inseparable part of the development of the economy. Transportation sector, a lifeline of the metropolitan can play a critical role in mitigating carbon footprints especially in the cities, where fuel, primarily in the form of petroleum products is major contributor of carbon dioxide to the earth's atmosphere. . The urban transport systems constitute an important area which is a significant driver of global warming. Transport sector contributes nearly eighteen percent of global carbon dioxide emissions. In India more than fifty percent of the total liquid fuel is consumed by India's transport system contributing nearly ten percent of the carbon dioxide emissions from energy sector.ⁱⁱ The sector is projected to grow rapidly and significantly over the next few decades due to increasing industrialisation and urbanisation. Mukul Sawan (2013) cites that transport emissions are expected to equal half of global emissions in 2050, and that they are the world's fastest growing emissions linked to economic growth and wealth. He puts this in the context of the increased demands of the urban population in terms of land holdings, lifestyle and transportation choices. Infrastructure and technology plays a crucial role in such a scenario which can play a pivotal role in accommodating this increased urban population and efficiently utilise limited supplies particularly land and energy. From this, it can be easily construed that industrialisation has been a major contributing factor in global warming. Hence, Corporatist must take the responsibility to contain their rampant use of energy resources aiding sustainable development.

4. Conceptual Framework

Transportation sector, is amongst the largest consumer of the non renewable source of energy, especially, in a country like India where the economy is on its growth path. According Ramachandra and Shwetmala(2009), as observed by Jun Li(2011), the transport sector accounts for nearly 17% of total energy consumption in India which primarily consists of petroleum, diesel, coal and electricity. As the progression is made from under-developed to developed country and increase in urban culture the demand for private vehicles is ought to rise. Efficiency in public transportation plays a huge role in imparting fuel efficiency measures. The contribution of road transportation is immense in connecting one city to another. However, mobility of human capital makes it a considerable factor on how efficiently intra and intercity movements takes place, It is indeed a major contributor the GHG emissions by cities. This partially depends on the supportive roadways structure of the city. More Highways are a sign of encouraging smoother small car travel. According to JunLi(2011), this rise is mainly amalgam of factors including urban development policies and changing lifestyle patterns. It also depends on the fuel efficiency norms followed by a country and environment protection intent and consciousness in the society as large.



5. India's position

According to Corporate Social and Environmental Responsibility in India – Assessing the UN Global Compact's Role by Chahoud et al (2007) India has moved from a phase of philanthropy to a phase where corporate have an obligation to self-regulate themselves and be sensitive towards environment related factors. The reason can partially be attributed to the fact that Globalisation has forced developing and developed nations alike to align their business practices. The concept of CSR is being discussed more than ever, and therefore to be competitive it is more of a necessity rather than choice to be environment conscious. The concepts such as Socially Responsible Investing (SRI) and Environment, Social and Governance (ESG) are gaining importance in the investor's perspective. The clear preferences of those corporations which are proactive in the field of environment management clearly have an edge over others. Chahoud et al (2007) observes there is a growing acceptance of the CSR reporting as a part of sustainability reports drawn according to Global report initiatives guidelines. Wide variety of certifications is a symbol of intentiveness of mitigation of climate change caused due to the organisation. Honest reporting and disclosure on carbon emissions of a company with steps taken to diminish global warming impact is appreciated by today's investors. However, Chahoud et al (2007) notes lesser stakeholder involvement in India. However, India would not remain untouched keeping in mind the role played by foreign investments in the country's economic growth. The inclusion of CSR as a mandatory requirement for qualifying companies recognises environment sustainability as one of the broad areas where the company can invest in its CSR activity, as per the schedule VII of Company's Act, 2013 displays the importance attached by the Government and the regulatory authorities to the concept of being responsible towards the environment. .

Being developing nations, historically India carbon emission has been low, but surely it will rise keeping in mind the population density amongst other factors. According to India Second National Communication to the United Nations Framework Convention on Climate Change published by Ministry of Environment and Forests, Government of India, 2012, "India's Transport system is one of the largest, handling, on an average, 800 billion tonne-km of freight and 2300 billion passenger-km. It consumes more than 50% of the total liquid fuel consumed in the country (as reported in Planning Commission, 2002)."

According to the Press Note released by Centre for Science and Environment International Workshop Series on Transport and Climate released in July, 2013, "Vehicular fuel consumption is nearly 40% of total oil consumption in India. The press note cites MoEF report and identifies that transportation sector discharges are ranked as the fourth highest GHG contributor in India. Fuel efficiency standards are one way of curbing these CO₂ emissions. However, India has failed to adopt the approved Corporate Average Fuel Consumption Standards. The CSE indicate India's failure in implementing the target of 18.15 km/litre (or 129.8 gm of CO₂/km) in 2015 and 20.79 km/litre (or 113 gm of CO₂/km) in 2020, after adjusting for increase in the average weight of the car fleet. The report India Second National Communication to the United Nations Framework Convention on Climate Change published by Ministry of Environment and Forests, Government of India, 2012 reveal that road transport contributes 88.6% of the CO₂ emissions from the total transport sector emissions. Other than petrol, the most used vehicular fuel used in India is Diesel. Diesel has more carbon content and hence contributes more towards GHG emission. Therefore, CSE emphasise technology alternative which would reduce per unit consumption of diesel per kilometre. Another alternate they present is near-zero sulphur diesel and particulate traps to eliminate toxic and heat-trapping black carbon. Another problem compounding the carbon emission by road transport is the preference of roadways as compared to railways. Rising preference of automobile as compared to trains

for interstate travelling is a rising trend observed which has driven passenger transport, share of rail is as low as 15 per cent. Aviation sector, an integral part of the transportation sector, consumes turbine fuel combustion of which trebled since 1994. THE CSE press report (2013) indicates that the International Energy Agency IEA (2010) recorded an increase in emissions of 165.7 per cent between 1990 and 2008, compared to the world average of 76.1 per cent⁸. The Research project initiated by United Nations Environment Programme (UNEP) called the Low Carbon Project (LCT) project enlists the various areas in which India can contribute to reduce the carbon footprints.

It recognises the core areas of contemplation as Infrastructure choices, National emissions pathways, National energy and emission indicators CO₂ intensity of electricity and Fuels for transport. The authors emphasise on the fact that a comprehensive strategy should be formulated which will be beneficial in achieving energy efficiency targets inclusive of national challenges of a developing country resources.

The National Action Plan for Climate Change (2008) emphasises on the need for energy efficiency.^{iv} Better urban planning with an added emphasis on the greater penetration of public transport cohesively embedded in the urban planning is on the agenda list of the plan. The initiatives planned to be undertaken included incorporation of energy efficient technology in related sectors encouraging judicious use. It also propagates financial assistance for projects promoting energy efficiency.⁴ Urban planning and urban renewal is one of the key focus areas. It includes building of an Energy conservation building code which will regulate energy consumption of commercial buildings in the cities. It also mentions recycling of urban waste by promoting R&D for greater and widespread reach.

6. Role of Corporate Social Responsibility and Transport Systems in cities: Mitigation of Climate Change

In order to meet the international standards in this era of globalisation, many corporations are voluntarily adopting the ISO 14000 certifications^v which help them to project an environmentally responsible and true steward of the nation's resources. This is also a step towards complying with the Environmental, Social and Governance (ESG) issues in the realm of Responsible Investment and facilitates comparisons among companies internationally and nationally. Recognition of environment management as an integral part of good corporate governance measure has further increased the attention of the most entrepreneurs including India. Globally, the need to curb excessive natural resources is palpable. INTERNATIONAL ORGANIZATION FOR STANDARDIZATION in its draft report on INTERNATIONAL STANDARD ISO/DIS 26000 released in 2009^{vi} identifies the environment and community involvement and development as the one the guiding principles in the realm of social responsibility. However, these standards serve merely as guidelines trying to bring together the corporate communities on the common issue of social responsibility. Adoption of these guidelines is voluntary and is not certified by ISO. According to the Environmental report of ISO standards various other standards will be introduced in the near future. Specifically for manufacturing and distribution processes ISO 14051 is the prescribed norm gauging the consumption of resources and material cost. ISO 14067 will help detect carbon footprint by tracking Gas (GHGs) as well as reporting the emissions.

Transport companies, in addition to voluntarily adopting ISO 26000 and ISO 14000 guidelines can make fuel efficient automobiles. CSR activities by companies in the transportation sector can be majorly in areas which would help regulate the emission. This can be done by focussing on manufacturing energy efficient vehicles. The heavy duty vehicle which include diesel run trucks technological breakthrough would reduce the dependence on fossil fuels. Martinuzzi et al. (2011) cites Willander (2007)

Who observes the Ford Volvo and Toyota's approach towards finding traditional fuel sources and better performance car requiring lesser fuel consumption. Now a days with more sensitised consumers, becoming more efficient payoffs well. Martinuzzi et al. (2011) cites Wackerbauer (2008) who did a study in Munich and provides evidence in support of first mover advantage in the fuel efficiency initiatives. India has also taken initiatives in this area. Second National Communication to the United Nations Framework Convention on Climate Change cites (2012) implementation of Bharat 2000 norms which ensured restricted vehicular emission was a huge success. The emission regulation was implemented in several phases which consisted of Bharat stage II, Bharat stage III and finally Bharat stage IV effective from April 2010 onwards. Also, mass conversion of petrol and diesel vehicles to CNG in Delhi was a scheme which drastically reduced the carbon emission of the city. The laws in amalgam with consumer's preference for the environment conscious give a competitive advantage to the auto industry players adding to their profits as well as goodwill. As noted by the India Second National Communication to the United Nations Framework Convention on Climate Change another government initiative mentionable here is by the Ministry of Petroleum and Natural Gas (MoPNG) has set up a Hydrogen Corpus Fund with a corpus of Rs100 crore, with contribution from five major oil companies and Oil Industry Development Board (OIDB), for supporting R&D for finding alternative to natural gas as a fuel for vehicles.

In order to make an energy efficient transport system in place, it is necessary that an integrated approach is adopted where transport sector in tandem with the related sectors can adopt environment friendly technology along with supportive policy formulation and implementation by the government and other industry counterparts. in April-December 2012. According to the ET 500 List¹⁰ on the basis of revenues generated Tata motors and Maruti Suzuki, are the prominent automotives producing companies. Tata motors CSR reports includes community sensitisation initiatives for promotion and adoption of green practices. Specific activities Maruti Suzuki adopts fuel efficient technology by providing factory fitted CNG passenger vehicles. Environment friendly technologies like Idle stop feature following meeting stringent Euro 5 norms and European ELV norms are followed in manufacturing all Maruti Suzuki Vehicles. GPI engine technology is also worth mentioning^{vii}. Central Statistics Office (CSO), Ministry of Statistics and Programme Implementation^{viii} has released the advance estimates of national income The sectors which registered growth rate of over 5 percent includes trade, hotels, transport and communication. The study also mentions that the sales of commercial vehicles witnessed an increase of 0.74 per cent per cent.

CSR can also be implemented in supply chain management. Sánchez,Pérez,(2005) found that firm performance is enhanced by adopting flexible supply chain by automotive firms. This in fact contributes to CSR goals of reducing energy consumption and contributes to higher returns for the investors. Suppliers and subcontractors do for an integral part of the organisational setup and therefore adoption environment friendly production processes and preference of energy efficient ancillary products can be beneficial in the long run. Aiming for synergies with suppliers and adopting Just in Time techniques can reduce the travel cost delivery of raw material making the process cost effective.

In addition to these, other steps which can be taken by the players in the transportation system of the country are discussed as follows:

Firstly, an efficient public transportation system must be put in place which will give an alternative commuting facility which is less costly as compared to the cost of maintaining private vehicle. JunLi(2011) observes that since most of the bus transit services(88%) are run by private players, government needs to take initiative to introduce public transport transit facilities at affordable prices and aim for a deeper penetration of public transportation by providing quality service. Secondly, JunLi observes that India's GDP is highly affected by its dependence on oil imports. It can also affect the price situation in the country leading to inflation and heightened volatility in the market. Therefore, discouraging excessive or rampant personal use will restrict GHG emissions. Steps like introducing restriction on number of vehicles per family, higher road taxes, de-regularising oil prices and incentivising use of public transport can play a huge role in negating the climate change impacts in the country. Providing alternative to traditional fuel resources by collaborating in requisite R&D and inventing supportive vehicles, development of better infrastructural support (distribution and delivery routes), help increase sensitisation towards working towards larger goal of mitigating the impact of transport and related companies emissions on climate change are all within the bound of a responsible corporate entity to promote environment friendly culture. Another aspect which requires equal attention is the land use planning and city sprawling trends. Dhar, Pathak and Shukla (2013) state that passenger transport is largely dependent on the travel pattern of the city and cost of setting infrastructure. City specific characteristics like places of offices spaces situated, the income of the average commuter, traffic management policies, integrated land usage policies all need to be in tandem. The authors argue that investment in mass transit systems like bus systems, metro instead of roads only can decrease car ownership. Steps taken by metro have led to increase in metro ridership. Car parking facility available at metro stations, e-ticket facility, more security are some reason for success of metro railways model. International and National collaboration for more integrated approach for reduced carbon emissions by adopting newer technologies by in cashing the economies of scale and utilising it in R&D for production of alternative fuel for passenger vehicles, judicious use of commercial vehicles are some examples. Adoption of environmental friendly techniques considering the entire product life can include. adoption of innovative techniques in assembly process(extraction of raw material, work in progress, air pollution controls, car delivery mechanisms, fuelling facilities and dismantling of unusable vehicles ,reuse and recycle of vehicular components) and gauging the impact of each is can also be adopted.

Following are some suggestions which Govt, and PSUs and corporate entities can take, in order to reduce the impact of industrial emission climate change.

7. Conclusion

Corporate should be taking a leadership role in environment sustainability by adopting responsible investment model and compensating the society proportionately as duty bound stewards of environmental resources. Separate department responsible for management of CSR activities and coordination with Production, Marketing and Investor relations department, will be helpful in working cohesively for the pre-defined CSR initiatives. Attempt should be made to make senior management environment conscious while formulating company strategy for future endeavours. making CSR as part of the organisation cultural, including it in the company's mission statement and investment are policy can help change the mindset of the business fraternity towards conserving environment and promoting sustainable development.

8. Endnotes

- THE COMPANIES BILL, 2012 CLAUSE 135(1) Every company having net worth of rupees five hundred crore or more, or turnover of rupees one thousand crore or more or a net profit of rupees five crore or more during any financial year shall constitute a Corporate Social Responsibility Committee...The Board of every company referred to in sub-section (1), shall ensure that the company spends, in every financial year, at least two per cent. of the average net profits of the company made during the three immediately preceding financial years, in pursuance of its Corporate Social Responsibility Policy. http://www.mca.gov.in/Ministry/pdf/The_Companies_Bill_2012.pdf
- India Second National Communication to the United Nations Framework Convention on Climate Change Published by Ministry of Environment and Forests, Government of India, 2012
- Press Note released by Centre for Science and Environment International Workshop Series on Transport and Climate <http://www.cseindia.org/content/press-note-centre-science-and-environment-international-workshop-series-transport-and-climat>
- National Action Plan for Climate Change released in 2008<http://envfor.nic.in/downloads/home/Pg01-52.pdf>
- The ISO 14000 family of International Standards http://www.iso.org/iso/theiso14000family_2009.pdf
- ORGANIZATION FOR STANDARDIZATION draft report (2009) http://www.lsd.lt/typo_new/fileadmin/Failai/N172_ISO_DIS_26000__E_.pdf
- <http://marutistorage.blob.core.windows.net/marutisuzukipdf/MARUTICOMLOWRESS.pdf>

- Press Information Bureau Government Of India 7 February, 2013 Advance Estimates Of National Income, 2012-13 <http://pib.nic.in/newsite/erelease.aspx?relid=92062>

9. References

1. Todaro, M. P. (1980). Urbanization in developing nations: Trends, prospects, and policies. *Journal of Geography*, 79(5), 164-174.
2. P. Bairoch, (1988). "Cities and Economic Development," Univ. of Chicago Press, Chicago
3. Moomaw, R. L., & Shatter, A. M. (1996). Urbanization and economic development: a bias toward large cities? *Journal of Urban Economics*, 40(1), 13-37.
4. Planning Commission, (2002). Tenth Five Year Plan: 2002–2007. Planning Commission, Government of India, New Delhi
5. Sánchez, A. M., & Pérez, M. P. (2005). Supply chain flexibility and firm performance: a conceptual model and empirical study in the automotive industry. *International Journal of Operations & Production Management*, 25(7), 681-700.
6. Chahoud, Dr. Tatjana; Johannes Emmerling, Dorothea Kolb, Iris Kubina, Gordon Repinski, Catarina Schläger (2007). Corporate Social and Environmental Responsibility in India - Assessing the UN Global Compact's Role. [http://www.die-gdi.de/CMS-Homepage/openwebcms3.nsf/\(yNDK_contentByKey\)/ENTR-7BMDUB/\\$FILE/Studies%2026.pdf](http://www.die-gdi.de/CMS-Homepage/openwebcms3.nsf/(yNDK_contentByKey)/ENTR-7BMDUB/$FILE/Studies%2026.pdf)
7. Wagner M. (2007). Integration of environmental management with other managerial functions of the firm: empirical effects on drivers of economic performance. *Long Range Planning* 40: 611–628.
8. Willander, M. (2007) Absorptive capacity and interpretation system's impact when going green: an empirical study of Ford, Volvo Cars and Toyota. *Business Strategy and the Environment*, Vol. 16, pp. 202-213.
9. Dahlsrud A. (2008). How corporate social responsibility is defined: An analysis of 37 definitions. *Corporate Social Responsibility and Environmental Management* Vol 15 No. 1 DOI: 10.1002/csr.132
10. Triebswetter, U., Wackerbauer, J. (2008) Integrated environmental product innovation and impacts on company competitiveness: a case study of the automotive industry in the region of Munich. *European Environment*, Vol. 18, No. 1, pp. 30-44.
11. National Action Plan for Climate Change released in 2008 <http://envfor.nic.in/downloads/home/Pg01-52.pdf>
12. Ramachandra, T. and Shwetmala. (2009). Emissions from India's transport sector: State wise synthesis. *Atmospheric Environment*. Volume 43, Issue 34, November 2009, Pages 5510-5517
13. Sangle, Shirish. Critical Success Factors for Corporate Social Responsibility: a Public Sector Perspective, *Corporate Social Responsibility and Environmental Management* Vol. 17, 205–214 (2010) Published online 15 June 2009 in Wiley InterScience) DOI: 10.1002/csr.200
14. Transportation's Role in Reducing U.S. Greenhouse Gas Emissions: Volume , synthesis report, Report to congress by Department of Transportation, Washington D.C. April 2010
15. Ditlev-Simonsen CD, Midttun A. (2011). What motivates managers to pursue corporate responsibility? A survey among key stakeholders. *Corporate Social Responsibility and Environmental Management* 18(1): 25–38. DOI: 10.1002/csr.237
16. Blowfield, M. (2011), *Corporate Responsibility By*, Alan Murray oxford university press , pp 5 <http://books.google.co.in/books?id=afE2iwKnLxkC&printsec=frontcover&dq=corporate+responsibility&hl=en&sa=X&ei=LxmKUobiJ5GsrAf7sYHoDA&ved=0CC8Q6AEwAA#v=onepage&q=corporate%20responsibility&f=false>
17. Li, J. (2011). Decoupling urban transport from GHG emissions in Indian cities—A critical review and perspectives. *Energy Policy*, 39(6), 3503-3514.
18. India Second National Communication to the United Nations Framework Convention on Climate Change Published by Ministry of Environment and Forests, Government of India, 2012
19. Maruti Suzuki, Sustainability Report, 2012-2013 <http://marutistorage.blob.core.windows.net/marutisuzukipdf/MARUTICOMLOWRESS.pdf>
20. PRESS INFORMATION BUREAU GOVERNMENT OF INDIA ADVANCE ESTIMATES OF NATIONAL INCOME, 2012-13 <http://pib.nic.in/newsite/erelease.aspx?relid=92062>
21. Dhar, Pathak and Shulka (2013) Promoting low carbon transport in India Low Carbon City: A Guidebook for City Planners and Practitioners. A Guidebook for City Planners and Practitioners.
22. Inter-Governmental Panel of Climate Change report (IPCC) on climate change: The Physical Science Basis (2013) <http://www.climatechange2013.org/>
23. Martinuzzi, Kudlak, Faber and Wiman, CSR Activities and Impacts of the Automotive Sector, retrieved from http://www.sustainability.eu/pdf/csr/impact/IMPACT_Sector_Profile_AUTOMOTIVE.pdf
24. Mukul Sanwal, We should now prepare a carbon budget Oct 4, 2013, Economic times, Editorial page
25. Press Note released by Centre for Science and Environment International Workshop Series on Transport and Climate <http://www.cseindia.org/content/press-note-centre-science-and-environment-international-workshop-series-transport-and-climat>
26. Dhar, S., Pathak, M., & Shukla, P. R. (2013). Low carbon city: A guidebook for city planners and practitioners: Promoting low carbon transport in India.
27. The ISO 14000 family of International Standards http://www.iso.org/iso/theiso14000family_2009.pdf