

# **INTERNATIONAL CLIMATE CHANGE: CAUSES AND INNOVATIVE WAYS TO DEAL**

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## **ABSTRACT**

*The new Indian government has launched several programmes like “Make-in-India”. The key focus of the government is to improve the manufacturing sector growth in India. The growth of manufacturing sector will bring more industrialization in the coming years. International climate change is a big problem addressed by all the countries around the world. We need to grow our manufacturing sector but at the same time the problem of global warming needs to be addressed properly. The companies and managers need to understand their environmental responsibility towards the society. In this literature based papers the authors will talk about global warming, its causes and innovative ways to deal.*

**Keywords: Global Warming, Greenhouse gas emission, Globalization, Carbon lock-in, Waste-reduction**

## **I INTRODUCTION**

International climate change has been the most complex problem for the societies and business houses. It is true that business has made a significant progress around the world in 21<sup>st</sup> century but some serious environmental challenges are also emerging along with the growth of the business. The multinational corporations are facing tough competition in the market and they are leaving no stones unturned to counter the competition. Some of the business activities are negatively affecting the green environmental practices. In this report the author will discuss various environmental challenges societies are facing at present and the role of government, citizens and corporations in dealing with those environmental challenges. The authors will also discuss the methods and techniques to deal with environmental changes and the roadblocks affecting them.

## **II GLOBAL WARMING PROBLEM**

In the last decade the most discussed environmental problem is global warming. The researchers are busy in finding the causes of global warming and after 20 years of extensive research normal citizens, business leaders

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and political leaders have accepted the fact that mankind is mainly responsible for global warming problem with the emission of greenhouse gases. What is global warming? The global warming refers to an unexpected increase in the average surface of temperature of earth over past two centuries (Mann, 2009). The climate change is not only restricted to increase in surface temperature but there has been a precipitation pattern to winds, ocean currents which are equally responsible for global warming. People are busy in finding scientific reasons of global warming but in author's opinion the true cause of global warming is our careless attitude towards the nature. The individual, governments, corporations and business houses have totally neglected the issue of global warming at the time of its emergence. We took twenty long years to understand the gravity of this problem and still many people don't want to understand the problem of earth's atmosphere. The roles of managers have been changed in last decade. Previously the key objectives of business leaders and managers were to think about the financial profits of the business houses but now their priorities have been changed. The business managers have been thinking about adopting sustainable and green manufacturing practices to save the environment (Fauzi, Svensson, & Rahman, 2010). The green and clean environment is top most priority of many business houses and government.

### III CAUSES OF GLOBAL WARMING

As the population and business is increasing so the energy demand of the people are also increasing. The energy demands of the people and factories have been fulfilled by fossil fuel, coal and gas. The drastic increase in carbon dioxide by burning of fossil fuel has been detected as the primary cause of global warming which leads to change in atmosphere. Another cause of global warming is related to the business expansion. The big multinational companies are doing deforestation on large scale for acquiring more land for their business (WWF, 2015). The plant absorbs carbon dioxide and release oxygen but the number of plants and trees have been decreased over the years which is a concern for the society. The flow of industrial wastage on the banks of river and paper dumping in landfills are also major cause of global warming. There is need to adopt the approach of reduce, recycle and reuse by the business organizations. Prior to 1990 the media coverage on the global warming problem was almost negligible (McCright & Dunlap, 2000). The researchers and environmental activists have stated studying the causes of global warming since 1980. After 1990s or early 2000 media also took the global warming issue seriously as shown in their coverage. The awareness about global warming issue provides a new momentum to the efforts of environmental activist, policy makers and social scientists.

There is need to address the global warming issue otherwise it can be extremely dangerous for human life and well-being. Carbon dioxide is not collecting in the atmosphere from last twenty years; instead it has been in the atmosphere up-to long time or from many centuries. The heat-trapping effects of carbon dioxide have been compounded over time. There will be more irreversible changes in the atmosphere if the carbon dioxide will remain unabated in the atmosphere. The overdependence on fossil fuel for energy and increased carbon dioxide in atmosphere is not safe for future generations as well. Between the years 2001-2010 the global average temperature has been increased by one degree Fahrenheit (Climatehot, 2015). The increase in average global temperature will lead to decrease the number of cold days and nights around the world. The 21<sup>st</sup> century has been recognised as the century of globalization. Globalization has been very helpful in reducing trade barriers,

increased production, reducing the difference between developed and developing economies. Many companies from developed countries have shifted their base in the developing and emerging countries like India and China to reduce their production cost. There are some winners and losers of both economic globalization and environmental challenges (O'Brien & Leichenko, 2000). Some countries have gained a lot by this economic globalization and environmental challenges are also favourable for them. Those countries are referred as winners at international level while other countries are referred as losers.

## **IV ECONOMIC GLOBALIZATION AND GLOBAL WARMING**

We can't argue that increased economic globalization is wholly responsible for environmental challenges but globalization is partly responsible for environmental damage. The increased trading has been seen as a positive outcome of economic globalization. The road transport has been primarily used for trading. The carbon dioxide gas emissions from trucks and Lorries are very high and that carbon dioxide gas is mainly responsible for global warming. As per records the greenhouse gas emission from aviation has been increased by 86% between the years 1990 to 2004. We have seen that companies are shifting their base to the developing economies. Previously United States was responsible for 20% of global greenhouse gas emissions. But now the scenario is changing. India and China are also contributing to the GHG emissions. There is more requirement of electricity in the industries shifting their base to developing economies. The generation of electricity has been done by burning of fossil fuel and oil at large scale which is deteriorating the atmosphere. Second major problem is industrial wastage. There is no-doubt in the fact that India is attracting a large number of foreign direct investments but both the domestic and international companies are flowing their wastage of the banks of river in India which leads to environmental degradation. China is opening new coal fired plant every week. Coal is the most polluting fossil fuel among all. China was ahead of United States in greenhouse gas emissions in 2007. In this era of globalization, deforestation is also increasing. The people are cutting trees and plants to use that land for agricultural and industrial purposes. On the basis of data it can be said that between the years 1990 to 2005 the world has lost 3% of its forest (Huwart & Verdier, 2013). Brazil is also an emerging economy. The most of the agriculture in Brazil is export oriented. There is no-doubt in the fact that agriculture export has been increased between China and Brazil after 2000 but the deforestation also increased at rapid pace in Brazil to convert that land into agriculture land. The purchasing power of individuals has also been increased in the developing countries which is also a cause for increase in greenhouse gases.

## **V INNOVATIVE WAYS TO DEAL WITH GLOBAL WARMING**

### **5.1 Role of Government in Reducing the Impact of Global Warming**

Many governments have also not shown their keen interests to deal with the environmental challenges. In last decade we have witnessed awareness among political leaders to reduce the impact of global warming. The government officials of many countries have adopted Kyoto protocol to deal with the issue of global warming. Kyoto protocol is an international treaty, which is an extension of 1992 United Nations Framework convention on climate change to reduce greenhouse gas emission (Baliunas, 2002). The Kyoto protocol was implemented from 2005 onwards and there are total 192 parties in Kyoto protocol. The main objective of Kyoto Protocol is to

reduce the emission of greenhouse gases to a desired level mainly in developed countries because they are most responsible for emission of harmful gases. But one Kyoto protocol is not enough to combat the problem of global warming in the whole world. There is a significant difference in the commitment level of the countries. The policymakers in one country are successful in reducing the greenhouse gas emissions but there has been an increased emission of GHG in other countries (Dolsak, 2001). We need to deal the environmental change problem at global level.

The governments, societies and corporations need to look at the solution of climate change problem. One can't stop industrialization or population. The population of the World is constantly increasing and to fulfil the needs of that population more production is required. The economic power is shifting from developed countries to developing countries like India and China. China and India are also the most populous countries of the world. There will be more foreign and domestic industries in these two countries in near future. The societies, corporations and governments should use renewable energy resources for climate change mitigation. European Union has set a target that by 2020, 20% of EU's energy consumption will be provided by renewable energy resources (Lehmann, Creutzig, Ehlers, Friedrichsen, & Pietzcker, 2012). The companies are facing the challenges of carbon lock-in while using other renewable energy resources and technologies.

## 5.2. Carbon Lock-In

*“Carbon Lock-in refers to the self-perpetuating inertia created by large fossil fuel based energy systems that inhibits public and private efforts to introduce alternative energy technologies.”*(Unruh, 2000)

It means the industries now-a-days are very much fossil fuel based energy system and if they use any other alternative means for fossil fuel than their scale of returns will be affected. Due to the over dependence on fossil fuel and carbon lock-in conditions, the corporations are avoiding the use other carbon saving technologies. The carbon saving technologies have various environmental are helpful in protecting the environment but those technologies can't give better returns of scale. There is need to lock-out the carbon lock-in conditions so that other renewable sources can be used. The technical innovations can also help the corporation in reducing the impact of environmental problems (Pogutz & Tyteca, 2010). The governments of many countries as well as the reputed institutions like United Nations and European Union are allocating funds for research on the various environmental issues. The technological innovations are helpful in development of new production sector whose exclusive aim is to protect the natural environment. The various activities included in the production sector are waste processing and disposal, clean-up operations etc. Many firms are using the concept of 3Rs for minimising the environmental damage. The 3Rs belong to reduce, reuse and recycle. Recycling process allows reduced depletion of natural resources and energy which will decrease the hazardous impact on environmental system (WorldBank, 2015). The producer and the industries need to understand the problem produced by their packaging material once the product has been used by the consumer. The producers need to develop frameworks and methodologies which will be helpful in recycling of waste material. Once again the corporations can use technical innovations for developing the methods of recycling and waste reduction. The governments also need to encourage technological advancements for waste recycling. The governments also need to develop market for recyclable products.

## 5.3 Reuse, Reduce and Recycle

The organizations also face barriers while adopting 3Rs method of waste reduction. The cost of the entire recycle, reuse and reduce program is a major challenge for the organizations. The waste materials contains both hazardous and non-hazardous substance. It is impossible to recycle the entire waste materials during the recycling process (Goh, Goh, Seow, Said, & Ang, 2015). The people involved in recycling process should be very careful about the waste material to be recycled. The 3R concept is a time consuming process and the people have less knowledge about this process. The organizations need to train their people on 3R process of waste management. There are certain roadblocks which are restraining governments for taking action against global warming. First roadblock is vulnerability of comprehensive agreements to deal with the problem of global warming. It is well-known fact that the two nations U.S. and China are producing 43% of world's carbon dioxide emission. Still there is no international agreement or policies which will expect these two countries to curb their carbon dioxide emissions. Second roadblock is political and economic interests associated with fossil fuels. Those unnecessary political and economic interests are curbing the use of alternative strategies.

## 5.4 Reduction of Green House Gas Emission

The societies also need to understand their responsibilities towards the environment. The individuals need to avoid unnecessary use of cars because it produces GHG emissions. Similarly the organizations need to rethink the strategies to use trucks and Lorries for trading and transportations. The effective technique to deal with global warming problem is to unite the environmental community and bring new partners from various sections of society. The environmental communities should educate and develop coalitions with people who are not environmentalists. There is need to develop campaigns for clean energy and sustainability for the benefits of societies in longer run. The announcements of policies and signing Kyoto Protocol will not help in dealing with climate change problem. The governments and the corporations need to implement those policies inside the countries. Only global level strategy can't address the global warming problem. There is need of proper synchronization and collaboration in policies at federal level, state level and global level. The organizations also need to monitor the outcome of those policies and made significant changes in them as required. There is need to generate public awareness about climate change problem and proper education of people is necessary. Still lakh of individuals in developing countries are unaware about the harmful effects of GHG emissions on future generations.

## 5.5 Usage of Renewable Energy Resources

America is adapting various changes to deal with climate change problem. The new objectives of America are to look for renewable electricity standards. The use of wind power photovoltaic power has been increased. There is more demand for light-duty vehicles in California and other states because light-duty vehicles protects environment from pollution (Sargent, 2011). All the developed and developing countries need to focus on their transportation to deal with this climate change problem. The fuel-efficient electric cars should be used. The car manufacturers should look to produce electric vehicles and the countries should adopt the policies which will

encourage the use of those electric vehicles over next two decades. The heavy-duty trucks should also use fuel efficient methods. The people should use energy efficient methods in their household appliances and commercial equipment. Deforestation is the major cause of 20% of world's GHG emission (ASB, 2015). The United Nations Framework Convention on Climate Change also stated that developing countries should avoid deforestation. Those emerging countries need to understand that deforestation and progress can't go together. The strategies to avoid deforestation are reduction in population growth, reduce emission from forest degradation, increase the area and standard of management of protected areas and increase the actual value of forests. China and India need to curb their population growth rates and the per capita income of the people should be increased so that there will less pressure of cutting trees and using the lands. The global organizations like United Nations and World Bank should develop programmes and policies which will avoid deforestation and direct industries about the role of forests in reducing GHG gas emissions. There is need of proper management of forests. As per data only 89% of forests in industrialized countries are properly managed out of which merely 6% are managed in developing countries (Chakravarty, Ghosh, Suresh, Dey, & Shukla, 2011). The forests can be used for timber production. By adopting small changes in our daily lifestyle we can protect trees and forests. The misuse of papers should be avoided in organizations, schools, colleges and other places.

## 5.6 Green Manufacturing Practices and Sustainability

The organizations can adopt green manufacturing practices and eco-innovations to become environment friendlier. In the last decade the firms have faced pressure from governments and local communities to improve their production process. In fact many organizations have adopted eco-innovations and they are also making their supply chains more sustainable. The green manufacturing and green supply chain management are helping organizations in differentiating their products and services in the market. The eco-innovations are providing them competitive advantage. Eco innovation process consist of three stages which are eco-product innovation, eco-process innovation and green managerial innovation (Sezena & Çankayab, 2013). The organizations need to restructure their product as per environmental conditions and the manufacturing process should also needs improvement. Green manufacturing is again related with waste reduction which we have already discussed above in 3Rs concept. The main barriers organizations are facing in eco-innovation process is poor knowledge of employees and suppliers, costly process and resistance to change from existing practices of production. The proper education of employees and suppliers can help in eco-innovation process.

## VI CONCLUSION

On the basis of entire discussion it can be concluded that the major environmental challenge is global warming. The causes of global warming are GHG emissions, excessive use of transportation, over dependence on fossil fuels and deforestation. The government, societies and organizations should come collectively to deal with those environmental challenges. Kyoto Protocol is a good initiative in that direction. The organizations, media and political leaders have started taking environmental change problem seriously from last two decades. Still the knowledge of people is very limited on climate change problem. Both developed and developing countries should focus on the effective implementation of policies. The eco-innovation, green manufacturing and 3Rs

waste management techniques can control the environmental degradation. The societies and organizations need to look for better alternative for fossil fuels based energy requirements. The problem of carbon lock-in should be avoided. A combined effort at global level, state level and federal level can be helpful in dealing the problem of environmental change otherwise future generations need to pay for it.

## REFERENCES

- 1) Mann, M. E., 2009. Do Global Warming and climate change represent a serious threat to our welfare and environment?. *Social Philosophy & Policy Foundation*, pp. 193-230.
- 2) Fauzi, H., Svensson, G. & Rahman, A. A., 2010. "Triple Bottom Line" as "Sustainable Corporate Performance": A Proposition for the Future. *Sustainability*, Volume 2, pp. 1345-1360.
- 3) WWF, 2015. *What causes global warming?*. [Online]  
Available at:  
[http://www.wwf.org.au/our\\_work/people\\_and\\_the\\_environment/global\\_warming\\_and\\_climate\\_change/science/global\\_warming\\_causes/](http://www.wwf.org.au/our_work/people_and_the_environment/global_warming_and_climate_change/science/global_warming_causes/) [Accessed 27 October 2015].
- 4) McCright, A. M. & Dunlap, R. E., 2000. Challenging Global Warming as a Social Problem: An Analysis of the Conservative Movement's Counter-Claims. *Social Problems*, 47(4), pp. 499-522.
- 5) Climatehot, 2015. *Global Warming Causes*. [Online]  
Available at: <http://www.climatehotmap.org/about/global-warming-causes.html>  
[Accessed 27 October 2015].
- 6) O'Brien, K. L. & Leichenko, R. M., 2000. Double exposure: assessing the impacts of climate change within the context of economic globalization. *Global Environmental Change*, Volume 10, pp. 221-232.
- 7) Huwart, J.-Y. & Verdier, L., 2013. What is the impact of globalisation on the environment?. *Economic Globalisation: Origins and consequences*, OECD Publishing.
- 8) Baliunas, S., 2002. *The Kyoto Protocol*, s.l.: The Lavoisier Group .
- 9) Dolsak, N., 2001. Mitigating Global Climate Change: Why Are Some Countries More Committed Than Others?. *Policy Studies Journal*, 29(3), pp. 414-436.
- 10) Lehmann, P. et al., 2012. Carbon Lock-Out: Advancing Renewable Energy Policy in Europe. *Energies*, pp. 323-354.
- 11) Unruh, G. C., 2000. Understanding carbon lock-in. *Energy Policy*, 28(12), p. 817-830.
- 12) Pogutz, S. & Tyteca, D., 2010. Business organisational response to environmental challenges : innovation1. In: *Environmental Challenges of Business Management in Europe* . s.l.:s.n.
- 13) WorldBank, 2015. *Reduce, Reuse and Recycling Reduce, Reuse and Recycling*. [Online]  
Available at: <http://siteresources.worldbank.org/ENR/RRP/Resources/460956-1163449042857/RRR.pdf>  
[Accessed 27 October 2015].
- 14) Goh, H. H. et al., 2015. Challenges in Adopting 3R Concept in the Heritage Building Restoration. *International Journal of Civil, Environmental, Structural, Construction and Architectural Engineering*, 9(2).

- 15) Sargent, R., 2011. *The Way Forward on Global Warming: Reducing Carbon Pollution Today and Restoring Momentum for Tomorrow by Promoting Clean Energy*, s.l.: Environment America Research & Policy Center.
- 16) ASB, 2015. *Avoided Deforestation with Sustainable Benefits*. [Online]  
Available at: <http://www.asb.cgiar.org/pdfwebdocs/Avoided-Deforestation-with-Sustainable-Benefits-flyer.pdf> [Accessed 28 October 2015].
- 17) Chakravarty, S. et al., 2011. Deforestation: Causes, Effects and Control Strategies. *INTECH*.
- 18) Sezena, B. & Çankayab, S. Y., 2013. Effects of green manufacturing and eco-innovation on sustainability performance. *Procedia - Social and Behavioral Sciences*, Volume 99, pp. 154-163.