

Carbon Finance: Its Implication Against the Untoward Effect of Climate Change Due to Industrialization and Urbanization

Rana-Al-Mosharafa^{1*} and Naila-Al-Mahmuda²

1. Department of Business Administration, Prime University, Mirpur-1, Dhaka 1216, Bangladesh

2. Department of Computational Science, Graduate School of Natural Science and Technology,
Kanazawa University, Kanazawa, Ishikawa 920-1192, Japan

* E-mail of the corresponding author: mosharrafa74@yahoo.com

Abstract

Climate change has become the most important issue across the globe now-a-days. It creates a major risk to the global economy, affecting the wealth of societies, the availability of resources, the price of energy, and the value of financial sectors. It has become one of the most financially significant environmental concerns that the present world is facing. Carbon finance is a new branch of environmental finance which explores the financial propositions of carbon controlled world. Emissions of green house gases due to industrialization and urbanization bring a significant impact in the environmental issues and environmental consciousness is taking its shape in various dimensions in today's complex business world. Realizing the importance and extent of carbon finance in the present world, in this study, we focused on the mechanisms that help the countries meet their emission reduction obligations in the context of environmental risk mitigation, likely, clean development mechanism, reducing emissions from deforestation and forest degradation, adaptation to adverse and severe weather etc. At the same time we have discussed about the importance of financial services and role of financial sectors to combat the unwanted effect of climate change as well as to support the society to meet the challenge of climate change.

Keywords: Carbon finance, climate change, green house gas, clean development mechanism, reducing emissions from deforestation etc.

1. Introduction

Carbon finance is the term applied to the resources provided to a project to purchase greenhouse gas emissions reductions (World Bank 2006). It explores the financial implications of living in a carbon-constrained world, a world in which emissions of carbon dioxide (CO₂) and other greenhouse gases (CH₄, N₂O etc.) carry a price. It explores the financial risks and opportunities associated with a carbon-constrained society, anticipates the availability and use of market-based instruments that are capable of transferring environmental risk and achieving environmental objectives (Labatt and White, 2007). Change of climate has become one of the most financially significant environmental concerns which is being faced by the present world today (Labatt and White, 2007; Hoornweg et al., 2011). Industrialization and urbanization are the main causes of transmission of greenhouse gases as well as climate change. Putting a price on greenhouse gas emissions will have a significant effect on global economy. While other environmental issues, such as contaminated land and acid rain are either sector or regionally specific, climate risk is a global phenomenon that has the potential to affect all companies, all sectors, and whole economies (Labatt and White, 2007). Levels of carbon dioxide in the atmosphere have grown by more than 30 percent since Industrial Revolution as a result of burning fossil fuels, land use change, and other man-made emissions. This human behavior has amplified the natural greenhouse effect, leading to an average surface temperature increase of 0.6°C during the twentieth century (Keeling and Whorf, 2001). Fifty percent of the increase in emissions has been released in the 30-year period from 1974 to 2004, with the largest increase in CO₂ emissions occurring in 2004, in both absolute and relative terms (Baumert et al., 2005).

2. Historical Development of Political Context of Climate Change

Intergovernmental Panel on Climate Change (IPCC) was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to examine the scientific and policy implications of global warming. Their research projected that, if left unchecked, atmospheric warming would increase by 1.4°C to 5.8°C by the end of the twenty-first century, leading to regional and global changes in climate and climate-related parameters such as temperature, precipitation, soil moisture, and sea level (IPCC, 2001). Diverse countries of the world met in 1992 under the auspices of the United Nations at the 'Earth Summit' in Rio de Janeiro, and agreed on the United Nation Framework Convention on Climate Change (UNFCCC, 2001) which came into force in 1994. The key objectives of the Convention are to reduce emissions from economic activity and to lessen the impact of unavoidable climatic changes. Mitigation policies of the

convention have drawn the most attention, because they affect the global economy and often feature unfamiliar regulations. However, adaptation is directed at vulnerable activities, and may only represent an extension of current measures (Dlugolecki and Lafeld, 2005). As the voluntary commitments could do a little in meeting the targets, Kyoto Protocol was established with 39 of the industrialist countries in 1997 with a vision of mandatory reduction of emission of greenhouse gases, totaling 5.2 percent, from 1990 levels by the end of the First Commitment Period of 2008 to 2012. Other countries, such as India and China, have joined the Protocol, but without binding targets (Baumert et al., 2005). In order to be legally binding, the Protocol required ratification by at least 55 countries that account for 55 percent of developed countries emissions. Although the United States and Australia opted out of the agreement, Russia's decision to ratify the Protocol finally brought it into force in February 2005. Pledges of targets are scheduled to come into effect in the First Commitment Period of 2008 to 2012. Negotiations for the second period started in late 2005 in Montreal, Canada (Labatt and White, 2007). In Doha in 2012, the Conference of the Parties (COP 18) serving as the meeting of the Parties to the Kyoto Protocol adopted an amendment to the Kyoto Protocol, which establishes the second commitment period under the Protocol. The ultimate objective of both treaties was to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system.

As a consequence, World Climate Ltd and the World Business Council for Sustainable Development collaborated to provide a complementary series of activities over two days alongside the 19th annual UN Climate Change Conference (COP 19) and create the largest business platform for debate and action, being CLIMATE SOLUTIONS 2013. Key decisions adopted at this conference held in November 2013 include decisions on further advancing the Durban Platform, the Green Climate Fund and Long-Term Finance, the Warsaw Framework for REDD+ (Reducing Emissions from Deforestation and Forest Degradation), the Warsaw International Mechanism for Loss and Damage and other decisions. COP 19 also decided to establish an international mechanism to provide most vulnerable populations with better protection against loss and damage caused by extreme weather events and slow onset events such as rising sea levels. In addition, governments provided more clarity on mobilizing finance to support developing country actions to curb emissions and adapt to climate change. This includes requesting developed countries to prepare biennial submissions on their updated strategies and approaches for scaling up finance between 2014 and 2020. The agreements included a significant set of decisions on ways to help developing countries reduce greenhouse gas emissions from deforestation and the degradation of forests, which account for around one fifth of all human-generated emissions (www.cop19.gov.pl).

3. Clean Development Mechanism (CDM)

Kyoto Protocol proposed three flexible mechanisms that are designed to help the countries meet their emission reduction obligations: namely emissions trading schemes (ETS), Joint Implementation (JI), and the Clean Development Mechanism (CDM). At present, the possibilities to gain carbon credits from forestry activities under the clean development mechanism (CDM) remain limited to afforestation and reforestation projects (UNFCCC, 2001). The CDM allows 38 industrialized countries and countries in transition (Annex B countries) to meet their emission reduction targets by purchasing certified emission reduction (CER) from greenhouse gas emission reduction projects in developing countries. To prevent that the CDM dilutes the environmental effectiveness of the Kyoto Protocol regime, CDM projects have to be additional, that means they would not have occurred without the funds generated by selling the CERs (Sippel and Michaelowa, 2009). The objective of CDM is to assist developing countries in achieving sustainable development and to mitigate the greenhouse gas emissions that cause climate change. In addition, the CDM aims to assist industrialized countries in achieving compliance with their quantified emission limitation (e.g. under the EU Emission Trading Scheme) (UNEP, 2012). Despite its great success, with more than 3,300 CDM projects registered within many countries and within many sectors, some important emission sources, sectors and countries are still underrepresented within the CDM. In recent years, it has become apparent that the CDM concept mainly promotes large-scale projects and processes, e.g. industrial manufacturing or power generation projects where the application of underlying baseline and monitoring methodologies is relatively straightforward and where the yield of carbon emission reductions is expected to be quite high.

4. Reducing Emissions from Deforestation (RED)

The debate has recently gained new momentum, however, with proposals to compensate developing countries that succeed in reducing emissions from deforestation (RED) with financial incentives, such as tradable carbon credits (Laurance, 2007). Crediting emission reductions on a national rather than on a project level would have the major advantage of accounting for in-country 'carbon leakage' which occurs when deforesting activities are

simply displaced rather than avoided (Aukland et al. 2003). The concept would most likely involve countries lowering deforestation rates below a national historical baseline, and a novel mechanism could be included in a post-2012 Kyoto regime (Santilli et al. 2005). Globally, the Amazon stands out as the region with the greatest potential to contribute to climate change mitigation through RED. Reducing deforestation would significantly reduce global greenhouse gas emissions and markets for RED carbon credits could be substantial. However, in order to translate this potential into actual climate benefits, several critical issues must be addressed by a future policy framework (Ebeling and Yasue, 2008). Several decades of experience already exist in tackling tropical deforestation, identifying and protecting biodiversity-rich areas, and promoting rural development (Kramer et al. 1997; Peres and Zimmerman 2001) and there may now be a chance to implement many lessons in a more supportive political environment and with more financial resources. Governance may become a formidable challenge for RED because some countries with the highest RED potentials score poorly on governance indices. In addition to climate mitigation, RED funds could help achieve substantial co-benefits for biodiversity conservation and human development. However, this will probably require targeted additional support because the highest biodiversity threats and human development needs may exist in countries that have limited income potentials from RED (Ebeling and Yasue, 2008).

Linking RED to international carbon markets could create a real opportunity to tackle an important source of greenhouse gas emissions at comparably low costs and could overcome the funding constraints that have hampered forest conservation for many years (Balmford and Whitten, 2003; Laurance, 2007). International funding for forestry totalled approximately US\$1.1 billion annually during the last decade with expenditures for forest protection probably being much lower (Tomaselli, 2006). In comparison, international carbon markets transacted US\$14.1 billion in 2005, the year when the Kyoto Protocol entered into force, a figure that soared to US\$33.3 billion in 2006 and is projected to continue to increase (Røine and Hasselknippe, 2007).

Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. It is a mechanism to create an incentive for developing countries to protect, better manage and wisely use their forest resources, contributing to the global fight against climate change. REDD strategies aim to make forests more valuable standing than they would be cut down, by creating a financial value for the carbon stored in trees. Once this carbon is assessed and quantified, the final phase of REDD involves developed countries paying developing countries carbon offsets for their standing forests (www.un-red.org). REDD+ goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. REDD is a set of steps designed to use market and financial incentives in order to reduce the emissions of greenhouse gas from deforestation and forest degradation (Karsenty, 2009).

5. Adaptation to Adverse and Severe Weather

Climate change puts pressure on corporations to adapt to both adverse and severe weather as the climate warms and the weather becomes less predictable. In the last 15 years we have seen the development of new financial products designed to transfer some of the risks we will encounter in a world which is now carbon constrained. The changing climate and attempts of countries to reduce green housing gas emissions will constrain more than the price of carbon. They will influence the price of many other financial products, like weather derivatives, catastrophe bonds, conventional indemnity products etc. Numerous industries are exposed to the risk of adverse weather, although not catastrophic. For instance, mild summers reduce the demand for air conditioning, while mild winters reduce the demand for space heating. Weather derivatives are mainly designed for energy producers and are based on the concept of heating degree days and cooling degree days. Other products are linked to weather parameters such as frost and precipitation, which have adverse consequences for specific business operations. Weather derivatives have developed slowly due to their novelty, lack of corporate awareness of weather risk, and the scarcity of weather data in which the buyer and the seller of the derivative share confidence. Adverse weather similarly affects agriculture, hydroelectric and wind power generation, construction schedules, demand for certain clothing and beverage products, and outdoor entertainment etc. Weather risk provides the financial markets with a new class of underlying assets for which markets can be designed. Insurance has traditionally covered the major part of a company's risk transfer strategy. However, there are situations that conventional insurance markets are unwilling or unable to absorb (Labatt and White, 2007).

Catastrophe bonds have developed in parallel with weather derivatives to transfer some of the risk associated with extreme weather events which have become significant enough to threaten the stability of the global insurance industry. Catastrophe bonds are securities which transfer part of the risk of major losses from the potentially affected party to an investor. They are part of the larger market of insurance-linked securities, which

cover life and non-life insurance sectors, credit card risk, and potentially any combination of risks that can be bundled into a large enough product to be of interest to major investors (Swiss Re, 2006).

6. Importance of Financial Sectors

Climate change has become the most important issue now-a-days. It creates a major risk to the global economy, affecting the wealth of societies, the availability of resources, the price of energy, and the value of companies. Carbon risk management is expected to increasingly affect shareholder value, due to higher energy prices, restrictive GHG targets, and increased losses due to severe and adverse weather events. In this way, global warming has become the environmental issue that has the most potential to affect the profitability—and in extreme cases the actual existence—of a number of companies. Climate change has become an important factor for the financial sector in its banking, insurance and investment activities. Regulations that are designed to limit green house gas emissions, physical changes that take place due to climate change impacts, legal challenges to be brought on by inadequate governance, reputational fallout for companies due to corporate positions on climate change, and competitive pressures in the marketplace as production costs shift and products are substituted in response to the new reality of a carbon-constrained world (Labatt and White, 2007). Reports have been published warning of the potential exposures in all segments of the sector (ACF, 2006; Lloyd's, 2006). Companies in the financial services sector have a dual responsibility: the first is to prepare themselves for the negative effects that climate change may have on both their clients and their own business. The second role of the financial sector is to provide products and services that will help mitigate the economic risks of a carbon-constrained society. Roles and levels of responsibility that exist within different groups of the financial services sector include a) trustees of institutional investors investigating the linkages between climate change and their fiduciary duty, b) institutional investors actively engaging within the climate policy process, c) investment consultants integrate climate change into advice they provide institutional investors, as well as their evaluation of asset managers and d) fund managers evaluating how climate change affects investment decision making (Mercer Investment Consulting 2005).

7. Financial Services

To avoid dangerous climate change and adverse weather conditions involvement of financial institution is mandatory. The financial service industry needs to adapt its internal processes, policies, products and services to meet the challenges its clients face as well as to uphold its own viability. The carbon financial services can make a technological leap to best-available solutions, through e.g. gas conversions, utilization of biofuels or associated gas and introduction of high-efficiency greenfield capacity. Under a unique industry approach the carbon financing service can be an integrated part of technical project development and financial services. The new risks of climate change can be battled by each of the three branches of financial services – insurance, banking, and asset management. Beyond the compliance trading market and so-called pure play carbon companies lay a growing body of support services, ranging from investment banking and equity research to credit ratings and insurance. In particular, the potential for carbon regulation to influence the future market valuation of publicly listed companies has required mainstream financial analysts and bond rating agencies to devote research resources to understanding the implications of carbon finance more thoroughly.

Climate change and climate policy affect insurers through the risks they accept from clients. Insurers need to adapt to climate change by assessing how changing weather patterns will influence their clients' exposure. They must adapt their risk assessment and review their underwriting (pricing, contract conditions and risk acceptance procedures) with a view to their specific risk exposure (line of business, geography, etc.), and business opportunities as well as the type of customer (private, commercial, industrial) they are focused on. Adapting to climate change is a huge challenge for insurance. Insured weather losses from property damage in 2004 hit a record 32 billion euros because of severe storms in Japan and USA (Munich Re, 2005). However, new technologies are ultimately more efficient and represent better risks. Therefore there is a natural interest for insurance companies to benchmark new technologies and thereby steer technical innovation to effective implementation through risk-assessment techniques as well as consider concessionary conditions for environmentally-friendly technologies (Dlugolecki and Lafeld, 2005).

Banks can play an important role in society's adjustments to climate change. They do this through financing and investment decisions, credit risk management policies and lending practices, and the development of risk-mitigation products. With the exception of a few early pioneers, the commercial banking sector has been a relative latecomer to the carbon finance market. Climate change policies create new risks and offer new opportunities to banks. The biggest risk to banks is credit risk. This is related to new climate change mitigation policies. Climate change not only creates new risks, costs and liabilities for banks, it also generates economic

opportunities such as investments in renewable energy technologies, energy efficiency projects, emissions trading and weather markets, and climate change related microfinance. Climate change-related microfinance offers innovative business opportunities for banks. Microfinance money is often used for climate protection projects such as installing solar power (Dlugolecki and Lafeld, 2005). In what follows, carbon financing can be used to improve the profitability and bankability of clean and efficient power solutions.

The extent of the impact from climate change will vary sector by sector. It is clear that overall it will have a significant direct impact on the global economy, financial markets and ultimately shareholder value. Companies have begun to look at climate change risk and its impacts on their businesses to varying degrees, but the level of sophistication varies from company to company. The financial markets and investors are starting to recognize the potential opportunities arising from climate change, for example, the launch of and investment in various carbon or environmental technology funds. Institutional investors or pension fund trustees have a fiduciary duty to their pension fund beneficiaries to ensure that they act in the best, long-term interests of plan members and beneficiaries by maximizing the returns of the pension fund assets entrusted to them. In fulfilling this responsibility, trustees must maintain maximum diversification and have an understanding of the risks their assets are exposed to and manage them accordingly. If investment consultants and actuaries are to take climate change into account when advising clients, this needs to be supported by increased awareness and knowledge building as well as an understanding of the approaches that fund managers are taking towards climate change in their investment processes (Dlugolecki and Lafeld, 2005).

8. Conclusion

The accurate impacts of climate change are yet unknown. But it is possible to know that climate change presents society and the economy with an increasing level of uncertainty as it seeks to manage its risk. It is believed that this is time for the insurance industry to take a more important role in understanding and managing the impact of climate change. Official aid is inconstant and limited. The European Union put forward the idea of attributing some of the revenue generated by the auction of emissions allowances planned for the post-2013 period to combating deforestation; but even if this materialized, it would still not be enough. Carbon finance is still in its infancy, lacking many characteristics of a mature market. There have been many attempts to encourage responsible use of resources through pricing, most notably for water in the past 20 years. Based on the fact of climate change problem and to reduce green house gas emission, a number of initiatives have been adopted and, as a result, the field of carbon finance is evolving rapidly. To the extent that carbon finance issues are also affecting power generation economics, corporate operating and finance departments are now incorporating carbon finance into strategic decision making.

Carbon finance operations of the banks have confirmed many opportunities for collaborating across sectors, and have served as a channel in bringing climate issues to bear in projects relating to rural electrification, renewable energy, energy efficiency, urban infrastructure, waste management, pollution abatement, forestry, and water resource management. Carbon finance initiatives of the World Bank are an integral part of the bank's operation to lessen poverty through its environment and energy policies. The danger climate change creates to long-term development and the ability of the poor to run away from poverty is of important concern to the World Bank. The impacts of climate change threaten to loosen many of the development gains of the last several decades. Thus the banks are making every attempt to ensure that developing countries can take advantage from international efforts to address climate change.

Climate change, its implications and uncertainty around policy and regulation remain complex, acting as a barrier to entry to institutional investors and consultants in understanding the related financial risks. There is increasing evidence to indicate a positive link between good corporate environmental governance, including climate change, and good financial performance, but it is still insufficient at the corporate level in particular. An accountable finance sector must be familiar with excessive indebtedness as a social ill affecting a few individuals with an unusually low degree of financial sophistication or self-control, and also as a deep social and ecological problem, for which the marketing and product design practices of the finance sector bear partial responsibility. Carbon finance will help us to find a way to meet the climate change challenge only when all elements of the economy- investors, consumers, producers, and regulators—have to factor green house gases into their bottom line.

References

- Australian Conservation Foundation (ACF). (2006). False Profits. Australian Conservation Foundation, Carlton, Vic 3053. Available at: www.acfonline.org.au.
- Aukland, L., Moura-Costa, P. & Brown, S. (2003). A conceptual framework and its application for

- addressing leakage: the case of avoided deforestation. *Climate Policy*, 3, 123–136. [http://dx.doi.org/10.1016/S1469-3062\(02\)00065-7](http://dx.doi.org/10.1016/S1469-3062(02)00065-7).
- Balmford, A. & Whitten, T. (2003). Who should pay for tropical conservation, and how could the costs be met? *Oryx*, 37, 238–250. <http://dx.doi.org/10.1017/S0030605303000413>.
 - Baumert, K.A., Herzog, T. & Pershing, J. (2005). *Navigating the Numbers*, Greenhouse Gas Data and International Climate Policy, Washington, DC: World Resources Institute. Available at: <http://www.wri.org/publication/navigating-numbers>.
 - Dlugolecki, A. & Lafeld, S. (2005). *Climate Change & the Financial Sector: An Agenda for Action*. Gland: Allianz AG Munich and WWF International, Germany & Switzerland. pp 25. Available at: <http://wwf.panda.org/?21491/Climate-Change-the-Financial-Sector-An-Agenda-for-Action>.
 - Ebeling, J. & Yasue, M. (2008). Generating carbon finance through avoided deforestation and its potential to create climatic, conservation and human development benefits. *Philosophical Transactions of the Royal Society of Britain*, 363, 1917–1924. <http://dx.doi.org/10.1098/rstb.2007.0029>.
 - Hoornweg, D., Sugar, L. & Gomez C.L.T. (2011). Cities and greenhouse gas emissions: moving forward. *Environment and Urbanization*, 20(10), 1-21. DOI: 10.1177/0956247810392270.
 - Intergovernmental Panel on Climate Change (IPCC). (2001). *Third Assessment Report*. Intergovernmental Panel on Climate Change United National Environment Programme and World Meteorological Organization, Geneva. Available at: www.ipcc.ch/organization/organization.shtml.
 - Karsenty, A. (2009). What the (carbon) market cannot do... Deforestation and climate change: acting on the causes. *Perspective (CIRAD)*, 1, 1-4. Available at: <http://www.cirad.fr/en/news/all-news-items/articles/2009/just-out/deforestation-and-climate-change>.
 - Kramer, R.A., Schaik, C.V. & Johnson, J. (1997). *Last stand: Protected areas and the defense of tropical biodiversity*. New York, NY: Oxford University Press. Available at: http://books.google.com.bd/books/about/Last_Stand_Protected_Areas_and_the_Defen.html?id=9a_BziHYLJwC.
 - Keeling, C.D. & Whorf, T.P. (2001). Atmospheric CO₂ records from sites in the SIO air sampling network, in *Trends Online: a Compendium of Data on Global Change*. Oak Ridge, TN: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy. Available at: <http://forestportal.afi.int/view.php?id=1755&pl=07.10>.
 - Labatt, S. & White R.R. (2007). The Financial Implications of Climate Change: In *Carbon Finance*. John Wiley & Sons, Inc. Hoboken, New Jersey, pp 1. Available at: <http://as.wiley.com/WileyCDA/WileyTitle/productCd-0471794678.html>.
 - Laurance, W.F. (2007). A new initiative to use carbon trading for tropical forest conservation. *Biotropica*, 39, 20–24. DOI: 10.1111/j.1744-7429.2006.00229.x.
 - Lloyds. (2006). Report #1: Catastrophe Trends Climate change—adapt or bust: 360 Degree Risk Project. Lloyds, London, p8. Available at: www.lloyds.com.
 - Mercer Investment Consulting. (2005). A climate for change: A trustee’s guide to understanding and addressing climate risk. Available at: www.mercerIC.com.
 - Munich Re. (2005). Annual Review of Natural Catastrophes 2004. Available at: www.munichre.com.
 - Peres, C.A. & Zimmerman, B. (2001). Perils in parks or parks in peril? Reconciling conservation in Amazonian reserves with and without use. *Conservation Biology*, 15, 793–797. DOI: 10.1046/j.1523-1739.2001.015003793.x.
 - Røine, K. & Hasselknippe, H. (2007). *Carbon 2007 – A new climate for carbon trading*. Point Carbon, 4th annual conference, Copenhagen. Available at: <http://www.pointcarbon.com/research/carbonmarketresearch/analyst/1.189>.
 - Santilli, M., Moutinho, P., Schwartzman, S., Nepstad, D., Curran, L. & Nobre, C. (2005). Tropical deforestation and the Kyoto Protocol. *Climate Change*, 71, 267–276. DOI: 10.1007/s10584-005-8074-6.
 - Sippel, M. & Michaelowa, A. (2009). Does Global Climate Policy Promote Low-Carbon Cities? Lessons Learnt From The CDM. CIS Working Paper, Zurich, Switzerland, pp 3, 2009. Available at: <http://mpira.ub.uni-muenchen.de/20986/>.
 - Swiss Re. (2006). Natural catastrophes and man-made disasters 2005: high earthquake casualties new dimension in windstorm losses. Swiss Re, Sigma No. 2. Available at: <http://www.swissre.com>.
 - Tomaselli, I. (2006). *Brief study on funding and finance for forestry and forest-based sector*. New York, NY: United Nations Forum on Forests. Available at: www.un.org/esa/forests/pdf/publications/brief_funding_tomaselli.
 - UNEP. (2012). *Cities and Carbon Finance: A feasibility study on an Urban CDM*. UNEP, Korea, pp 7.

- Available at: www.unep.org.
- UNFCCC. (2001). The Marrakesh Accords, The Marrakesh Declaration. Geneva. Available at: <http://unfccc.int/methods/lulucf/items/3063.php>.
 - World Bank. (2006). *Carbon Finance at the World Bank*. Frequently Asked Questions: What Is Carbon Finance? Available at: www.carbonfinance.org.
 - <http://www.cop19.gov.pl/>. Accessed at 10:00 pm on December 4, 2013.
 - <http://www.un-redd.org/AboutREDD/tabid/102614/Default.aspx>. Accessed at 1:00 am on December 5, 2013.