CLIMATE CHANGE AND INSURANCE INDUSTRY: AN APPRAISAL OF THE PRESENT SITUATION AND THE CHALLENGES AHEAD

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I. Introduction

Internationally, there is growing concern about the rising trend in reported economic losses from natural disasters. The Third Assessment Report of the IPCC (Intergovernmental Panel on Climate Change) predicts an increase in climate variability with more hot days, heat waves, and heavy precipitation events, leading to intensified droughts, floods, and tropical cyclones.[2] Developing countries suffer 97% of natural disaster- related deaths occurring each year, and also face much larger economic losses than developed countries in terms of percentage of gross national product.[3] India with its large and growing population, densely populated and low lying coastline, and an economy that is closely tied to its natural resource base, is highly vulnerable to climate change. Two-thirds of the total sown area of the country is drought-prone, with monsoon rains showing high inter-annual, intra-seasonal, and spatial variability. Forty million hectares of land is liable to floods, with 8 million hectares and 30 million people affected each year on average. In the pre-monsoon and post-monsoon seasons, the coastline, particularly the east coast, is vulnerable to tropical cyclones. Over the period 1971-2000, India has been among the top four countries in terms of number of people killed in natural disasters.[4] Climate change is expected to lead to increase in frequency and severity of catastrophic events, freak and aberrant weather conditions. This would result in increased loss to the industry, solvency threat to insurers, and a supply demand inequilibrium where in the demand outstripping the supply of insurance. There is growing acknowledgement among insurers that the impact of climate change on future insured losses is likely to be profound. As the question of affordability and availability of insurance arises the insurance industry needs to revisit the insurance for catastrophe perils and take appropriate actions.[5]

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[2] The Energy and Resources Institute, *Insuring climate risk in India: are we prepared?* New Delhi, 1(2005)

[3] *Ibid*

[4] *Ibid*

[5] Susannah Fisher and Swenja Surminski, Climate change in India: what role for insurance and the private sector? Read full article at *http://www2.lse.ac.uk/GranthamInstitute/Media/Commentary/2012/July/climate-change-india-insurance-private-sector.aspx*, last accessed on 4.4.2013

Climate change, by exacerbating current stresses, clearly presents a grave threat to humankind. However, climate change as an issue remains relatively of low priority in India, both for policy-makers and for the general public, as it is perceived as being a distant concern relative to the more pressing developmental needs. Recent reports for the UK (United Kingdom) and the US reveal that the insurance sector is becoming aware of the need to address climate variability and the effects of natural disasters. However, this tends to take the form of forwarding the increasing losses to customers, through increased premiums and deductibles or even withdrawal of coverage in some regions for some hazards. While addressing current climate variability, most insurance companies have not yet factored in climate change- related risks into underwriting premiums and deductibles.[6] But what has been less explored is the fact that insurance can be a powerful tool for reducing vulnerability to climate change by transferring or sharing risk, particularly with recent initiatives like catastrophe bonds, weather derivatives, and micro-insurance. Climate change can potentially impact various economic sectors and human activities, and thereby affect several classes of insurance. This paper seeks to analyze the need of insurance vis-à-vis climate change, the necessity of devising a plan to combat the situation, our unpreparedness to deal with the challenge and how it may be handled. The discussion shall take into account both the international scenario as well as India's position in this regard.

II. Climate Change and Insurance

Climate change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which in addition to natural climate variability observed over comparable time periods.[7] Climate change owing to global warming leads to increase in global mean temperatures and which in turn would intensify the water cycle, reinforcing existing patterns of water scarcity and abundance and increasing the risk of droughts and floods. The changes in the distribution of heat around the world are likely to disrupt ocean and atmospheric circulations, leading to large and possibly abrupt shifts in regional weather patterns. Coastal areas are affected by sea level increase and there is a probability that some of the coastal cities may become submerged. Increase in precipitation would result in floods and flashfloods become recurrent.

The impact of all this is

i) Rising Global Mean Surface Temperatures (GMT)
ii) Rising sea levels

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6 *Ibid*
7 Convention on Climate Change, 1992, Article 1

iii) Changes in rainfall variability and seasonality
iv) Changing patterns of natural climate variability
v) Melting of ice sheets, sea-ice and land glaciers

The net result is increase in number of storms and landfall of hurricane and other wind related perils. These changes affect the insurers profitability by way of increase in frequency and severity of catastrophe losses. [8]

The Fourth Assessment Report from the Intergovernmental Panel on Climate Change has highlighted that 'Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level.' What the report highlights is that, 'Global atmospheric concentrations of CO2, methane (CH4) and nitrous oxide (N2O) have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years' and therefore comes to the conclusion that, 'Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations. It is likely that there has been significant anthropogenic warming over the past 50 years averaged over each continent (except Antarctica).' All aspects of life, e.g. the ecosystem (e.g. flooding, drought, wildfire, insects), food (e.g. crop production), settlements (raising see levels) and health (e.g. increase in malnutrition, diseases and deaths) are expected to be impacted. In Asia, strains on the availability of fresh water, increased flooding from the sea and rivers and increased morbidity and mortality due to diarrhoeal disease associated with flooding and droughts are expected1. The mega deltas in Asia are considered to be particularly at risk. As a consequence, competition for scarce resources such as food, fresh water and land will increase, the displacement of populations suffering under the above-mentioned factors and flows of refugee will occur and migration and political unrest is likely to occur.

The effects of adverse weather events, exacerbated by climate change, are serious for all countries, but even more so for developing countries, where availability and affordability of insurance is limited and governments lack the necessary funds to provide adequate protection to their citizens. In many cases, the adverse consequences persist over the long term.[9]

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[8] See n. 4

[9] Arvind Gupta**,** *Climate Change and Insurance Markets*, Development Outreach, World Bank Institute, 30 (April 2008)

The insurance industry plays a pivotal role in coping with the consequences of adverse weather events. It is a form of adaptation as it can assist in dealing with the impacts of climate change. Typically, insurance policies have been the primary instruments used to protect against weather-related losses. While insurance does not provide explicit coverage for climate change risk, policies do exist, which cover the types of damage that may be associated with it, such as floods and wind. Insurance does not decrease the losses from an adverse event; it spreads the financial impact by enabling those at risk to pay a relatively small premium so they can be protected against a large loss that has a small chance of occurring. In addition to insurance policies that directly compensate policy holders, there are also insurance-related products such as derivatives and catastrophe bonds, which spread risk geographically, and savings, reserve funds and contingent credit arrangements, which spread risk over time. Insurers underwrite weather-related catastrophes by calculating, pricing and spreading the risk and then meeting claims when they arise. Risks must be insurable, however, and a set of conditions and criteria must be met before insurers will be willing to issue an insurance policy. These are generally referred to as *"Standards of Insurability,"* and are based on basic ideas of risk management. They include: predictable and diversifiable risks; identifiable and quantifiable chances of the event occurring and extent of losses likely to be incurred; setting of prices via actuarial processes; estimable and manageable, yet random, risks; and infrequent occurrence of a risk. In addition, losses associated with a particular risk ideally would be independent of each other. For example, correlation between different types of risks must be low and sufficiently spread broadly among the insured populations. The insurer must have the ability to set affordable premiums for each potential customer or class of customers.[10]

In developing countries, governments, households and businesses cannot afford the premiums demanded by commercial insurance to cover their disaster risks. In addition, the insurance sector in general is underdeveloped and use of insurance, even basic standard insurance products, is limited. Insurance coverage for weather-related risks is even lower. in developing countries, people will continue to cope with catastrophic risks by relying on family and community support systems or on government or international donor relief efforts, which will prove inadequate if weather-related catastrophic events were to increase in frequency and intensity.[11]

[10] *Ibid*
[11] *Ibid*

III. International Developments

The Convention on Climate Change was the first step towards recognition of global warming as a major issue involving the world environment. Twenty years after the 1992 Earth Summit in Rio de Janeiro, where countries adopted Agenda 21 - a blueprint to rethink economic growth, advance social equity and ensure environmental protection - the UN is again bringing together governments, international institutions and major groups to agree on a range of smart measures that can reduce poverty while promoting decent jobs, clean energy and a more sustainable and fair use of resources. Rio+20 is a chance to move away from business-as-usual and to act to end poverty, address environmental destruction and build a bridge to the future.Rio+20 - the short name for the UN Conference on Sustainable Development taking place in Rio de Janeiro, Brazil, in June 2012 - is a historic opportunity to define pathways to a safer, more equitable, cleaner, greener and more prosperous world for all. The United Nations Environment Programme Finance Initiative (UNEP FI) is a strategic public-private partnership between UNEP and the global financial sector. UNEP works with nearly 200 insurers and reinsurers, banks and investment firms, and a range of partner organisations, to understand the impacts of environmental, social and governance issues on financial performance and sustainable development. Through a global programme encompassing research, training, events and regional activities, UNEP FI identifies, promotes and realises the adoption of best environmental and sustainability practice at all levels of institutional operations.

Recently, close to 30 leading companies from the insurance industry, together with insurance associations from different regions around the world, have joined a UN-backed process to promote a set of *Principles for Sustainable Insurance* that aim to green the sector and provide insurance tools for risk management in support of environmental, social and economic sustainability. *The Principles* provide a holistic approach to managing a wide range of global and emerging risks in the insurance business, from climate change and natural disasters to water scarcity, food insecurity and pandemics. They represent the first-ever global sustainability framework tailored for the insurance industry that takes into account the fundamental economic value of natural capital, social capital and good governance. *The Principles* also aim to position the insurance industry as a lever for a green economy and sustainable development. Signatory companies will publicly disclose their progress in implementing the *Principles for Sustainable Insurance* on an annual basis. *The Principles* are a result of a six-year global development process carried out by the UN Environment Programme's Finance Initiative (UNEP FI), a strategic initiative involving the UN Environment Programme (UNEP) and financial institutions worldwide.

Apart from the abovementioned the role of the following cannot be denied in defining the climate change and insurance debate.

ClimateWise is the global collaboration of leading insurers focused on reducing the risks of climate change. Launched in 2007 by HRH The Prince of Wales, and facilitated by the University of Cambridge Programme for Sustainability Leadership, ClimateWise brings together over 40 international members from Europe, North America, Asia and Southern Africa all of whom abide by the ClimateWise Principles.

The Geneva Association is the leading international insurance economics "think tank" on insurance and risk management issues. Its members are 90 CEOs of the world's leading re/insurers. The objectives of the Association's climate-linked research have been to identify and analyse issues of specific relevance to the insurance industry, such as the likely range of future claims costs, and external challenges to be addressed at the political, educational and social levels.

The Munich Climate Insurance Initiative (MCII) was initiated by Munich Re in April 2005 in response to the growing realisation that insurance solutions can play a role in adaptation to climate change, as suggested in the Framework Convention, the Kyoto Protocol and the Bali Action Plan. This initiative is formed by insurers, climate change and adaptation experts, NGOs, and policy researchers intent on finding solutions to the risks posed by climate change – both on the negotiating floor and on-the-ground in developing countries.

IV. India and Climate Change Vis-À-Vis Insurance

India is highly vulnerable to the effects of climate change due to its long coastline, dependence on agriculture and reliance on the annual monsoon, and is in need of comprehensive climate change adaptation planning. Climate change adaptation, often regarded as the poor relative of climate mitigation, is now an accepted part of climate policy. Developing a response to actual or expected impacts of climatic change has so far largely involved public actors such as governments and international agencies. However, there is an increasing focus on the potential role of private sector organisations both as implementers of climate change adaptation policies but also as funders of adaptation measures. [12]

The potential impact of climate change on the Indian insurance industry can be severe, given the country's history of disaster losses, which is compounded by growth in population concentrations and burgeoning development in coastal and flood-prone areas. Noting that official numbers tend to underestimate true economic losses, the World Bank (2003)

[12] See n. 4

estimates that direct natural disaster losses amount to 2% of India's gross domestic product. It also observed a rising trend in reported monetary losses.[13] However, climate change as an issue remains relatively of low priority in India, both for policy-makers and for the general public, as it is perceived as being a distant concern relative to the more pressing developmental needs of reducing poverty, generating employment, and providing basic services and infrastructure. Indian industry, while being exempt from mandatory requirements to reduce GHG (greenhouse gas) emissions, has taken the lead in developing CDM (Carbon Development Mechanism) projects, particularly in small-scale renewable energy.[14] Until 2012, only developed countries have targets for GHG reduction, but these issues may be of concern to Indian branches of foreign insurance companies.[15]

So far, the insurance industry has played a very small role in dealing with the impacts of either climate variability or extreme events like droughts, floods, and cyclones. Traditionally, this has been tackled through government assistance or informal risk sharing at the community level. Insurance products available in property, motor, and life insurance do cover loss or injury/death arising out of natural perils. But except personal accident policies, where this cover is in-built, both motor and property insurance provide the insured with the option of deleting the coverage and thus reducing premium. For commercial property, a basic fire policy covers both fire and special perils like lightning, explosion, implosion, aircraft damage, etc. It automatically covers STFI—storm, tempest, flood, and inundation. The insured has the option to exclude STFI. This policy can also be extended to cover other perils like earthquake. Property remains a tariffed area, so that insurance companies cannot factor in climate change risks. As regards motor vehicle insurance too, the insured can choose between liability-only policies or package policies. Package policies provide earthquake and flood cover automatically. But, as discussed above, these covers are not generally taken by many and penetration remains low. Property in cyclone- and flood-prone coastal areas is mostly insured by large industrialists – and not by individuals – because they have made large investments or because it is demanded by their financiers. Some public sector utilities may undertake self-insurance (such as that for a fleet of vehicles). But, public assets like roads and bridges are generally not insured.[16]

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[13] See (n. 1), 6, 7
[14] *Ibid*
[15] *Ibid*
[16] *Ibid*

There are also health insurance, disaster relief, crop insurance[17], reinsurances, and weather indexed contracts available. The insurance market in India, both life and non-life, has very low penetration levels. However in the present scenario CDM is the most promising bet of the insurance industry. Unfortunately, the Indian insurance industry remains largely uniformed about CDM. Although the private insurance companies in India are piloting various insurance products that can help improve the capacity to cope with climate variability and change. More sophisticated alternative risk transfer instruments like cat bonds and tradeable weather derivatives have not yet been tried out, although they have been discussed by the National Insurance Academy and private insurance companies. At this nascent stage, there is very little realistic planning for a situation where insurance claims may increase with climate change. At present, the key challenge is to improve penetration of the available insurance products and to develop innovative delivery mechanisms to improve the access of the most vulnerable communities.[18]

There is much scope for thinking ahead about the challenges that climate change presents for the Indian insurance sector. The Indian insurance industry should help its customers identify how risks can be managed. It should start planning for a situation where insurance claims may increase with climate change, and at the same time, it should proactively gear up for the potential opportunities. However, it should also be recognized that insurance can only be part of the solution, and must be combined with genuine preparedness and adaptation activities.[19]

V. The Challenges

Climate change poses two serious threats for the insurance companies – affordability and availability. As correlated risk strikes, the foundation of insurance which is risk sharing mechanism is affected. The insurers can adopt loss minimization initiatives, loss prevention initiatives and if both of these are not feasible it would make insuring the risk a costly proposition. In the longrun this would result in insurers walking away from insuring the risk which brings in the question of availability. In such a scenario the risk has to be borne by the government or society. This in the

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[17] Crop insurance in India has existed in some form since the 1970s. The National Agricultural Insurance Scheme (NAIS) is currently the largest crop insurance scheme in the world, insuring 25 million farmers. Crop insurance schemes are subsidised for small and marginal farmers and are usually compulsory if the farmer takes out a loan to buy seeds etc. The main public schemes running today are NAIS, modified NAIS, and the Weather-Based Crop Insurance Scheme (WBCIS).

[18] See n.1, p. 27

[19] *Ibid*

ultimately lead to shrinkage in the insurers portfolio. Combined with reduction in volume of business and increase in frequency and severity of claims triggered by climate change leading to supply side deficiency the cost of insurance has to go up and as a result would lead to affordability problem. The repeating cycle of non availability and affordability and one leading to the other presents serious threat to solvency of the insurance industry.

In short, climate change has presented the insurance industry with these challenges,:

- adaptation to changing weather patterns and other environmental effects; and
- mitigation policies to reduce emissions of greenhouse gases (GHGs).

Safeguarding the economy is of the utmost urgency and to do this a slowdown of the emission of GHGs must be a priority. The insurance industry has a responsibility, but more significantly, a vested interest, in facilitating environmentally friendly change.

VI. The Solution

i) Managing risks and controlling losses is central to the insurance business, and is evident in the industry's history as founders of fire departments and advocates for building codes. While the primary focus in recent years has been on financially managing risks, physical risk management is receiving renewed attention and could play a large role in helping to preserve the insurability of coastal and other high risk areas. Improved building codes and land use management are important starting points. Beyond that, innovations include a whole genre of energy efficient and renewable energy technologies that also make infrastructure less vulnerable to insured losses. Improved management of forests, agriculture and wetlands also offers dual benefits: withdrawal of carbon from the atmosphere and storage in biomass and soils coupled with increased resilience to drought, coastal erosion and other products of weather extremes.[20]

ii) New kinds of insurance terms and policy exclusions designed to instill behaviours that reduce greenhouse gas (GHG) emissions, as well as appropriate efforts to prepare for the impacts are beginning to emerge.

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[20] Dr Evan Mills, Responding to climate change – The Insurance Industry Perspective. Full article at *http://evanmills.lbl.gov/pubs/pdf/climate-action-insurance.pdf*, last accessed on 3.11.2017

iii) New industries such as carbon capture and storing (CCS), carbon transportation, carbon management, pollution control, alternative fuel development, clean development initiatives and other R & D initiatives to produce sustainable and clean energy using materials other than fossil fuel are the potential market for the insurance companies. Already some of the manufacturing companies have started capturing CO_2 by physical and chemical actions in the production points or the transformation of energy and its subsequent storage in depleted or productive oil wells which would help in oil extraction. Some industries are diverting the CO_2 thus captured into storage points in the deep earth or in deep sea. This is a potential business opportunity for insurance industry.

iv) As the awareness on climate related risk increases self insured and captives would look for the opportunity to transfer the risk to insurance/reinsurance companies. The existing insureds would revisit their insurance portfolio and might increase the coverage to have adequate protection.

v) Considering the fact that in the absence of insurance protection against catastrophe perils the responsibility will be on Government agencies, Governments might make catastrophe insurance compulsory for property owners.

vi) Insurers can also tap their core competencies to offer new services to assess and mitigate climate risks. Such activities would naturally develop into new business lines in energy auditing, retrofit evaluation, installation and management, as well as a host of quality assurance services that manage the performance risks of energy saving and carbon offset projects.

vii) Combined expertise in risk analysis and finance makes insurers natural participants in emerging markets for carbon offsets and trading.

viii) The process of assessing and disclosing climate risks contributes to insurers' ability to evaluate the impacts of climate change on their business. Disclosure also enables consumers and investors to gauge whether to purchase a policy from, or invest in, a particular insurance company, and it helps regulators to monitor the financial condition of insurance companies and the progress they are making towards addressing climate change risks.

VII. Concluding Remarks

Without some sort of public sector intervention, climate insurance is unlikely to become widely available. Governments in developing countries will have to assume a considerable share of the exposures to the costs of

weather related events as is the case in developed countries. This will require developing country governments to rethink their public expenditure priorities, as well as the public sector's role. Allocating more fiscal resources to managing weather risks and climate change would require governments to exit more rapidly from direct engagement in economic activities such as manufacturing, trading, financial services and infrastructure services, where the private sector is willing and able to engage. The prospect for insurers' involvement in the development and promotion of climate change mitigation and adaptation strategies stands as an immense but as yet largely untapped opportunity. The mandating of environmental liability insurance would benefit both insurance companies and contribute towards resolving the climate change problem. the ongoing reporting of the world's worst industrial disaster, the lethal leakage of toxic gases from Union Carbide's plant in Bhopal, which caused between 3,787 and 15,000 deaths according to various government agencies and seriously affected a further 500,000. India should demonstrate that the legal framework and standards – and their implementation – are more robust as it moves toward being a leading economy on the world stage and provide a platform for the debate of such topical and practical concerns.