Crossing the Border: International Journal of Interdisciplinary Studies
Volume 2; Number 1; 15 July 2014
ISSN 2350-8752 (Print); ISSN 2350-8922 (Online)

THE IMPACTS OF CLIMATE CHANGE ON BUSINESSES

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ABSTRACT
Demands are increasing on businesses to do their part to respond to the threat of climate change based on their influential position within the global community. If companies can effectively integrate strategy, people, processes and technology in the pursuit of initiatives that respond to climate change, the result can be a powerful tool of long-term value creation. But what exactly are the impacts of climate change on businesses is the focus of the study? Varying levels of appreciation of the effects of climate change on business operations are rooted in the difference between direct and indirect impacts of climate change. So, the question is how business gets impacted by direct and indirect differences? Some of these effects are potentially threatening to sustainable high performance changing climatic conditions. What are some specific steps businesses can take to respond to both the threats and opportunities presented by climate change? To support a fact-based discussion of the business impact of climate change, primary qualitative survey conducted to Nepalese business houses and as secondary of a global context. Business initiatives in response to climate change are generally spread across a broad range of activities, risking fragmentation. Climate change may transform parts of our planet, the context and presumptions by which businesses typically operate today. This transformation is a result of both the direct impacts of climate change on business operations, as well as its indirect effects. Many business leaders feel a profound responsibility to do their part to respond to the pressing global challenge represented by climate change. But apart from this sense of societal obligation, business leaders must also be attuned to how climate change is altering the dynamics of markets, competition and profitability.

KEYWORDS: Climate change, businesses, global issues, strategy, opportunity and risk

BACKGROUND

Traditionally, business has supported 'market-enabling' or 'constitutive' regimes, such as those for international trade, investment, and finance, while opposing 'regulatory' or 'distributive' regimes, which constrain corporate behavior and address social impacts (Levy & Prakesh, 2003b; Lipschutz, 2005). Nevertheless, business has increasingly been drawn into the structures and processes of international environmental governance, even when the goal has been to defeat a particular initiative. The financial repercussions of weather variability and extremes have significantly impacted the US economy by affecting both supply and demand for the products and services of almost every industry. According to the US Chamber, lacking access to the capital and resources of large corporations, small business as a result of a single extreme weather event. Direct damage from

extreme weather events such as flooding, sea level rise, storm surge and drought will impact small businesses are severely than a larger business with more financial and human capital.

INTRODUCTION

Climate change is a significant and lasting change in the statistical distribution of weather pattern over the period, ranging from decades to millions of years. The climate extremes like floods, hurricanes, earthquake, etc. greatly affect almost every business. Firms' reputations, legal responsibilities, regulatory obligations, financial reporting, operations and supply chains can be affected. Global and local changes in temperature, the frequency and severity of extreme weather conditions and the availability of water can have a direct bearing on firms' risk profiles and, in some cases, strategic positioning. Basically, climate change means fluctuation in atmospheric temperature. While considering about climate change that is of two types: 1) Natural changes like flood, soil erosion, landslide, hailstone, rainfall and 2) Artificial changes like pollution from manufacturing industries and wastages from various industries. Extreme weather events, water scarcity, biodiversity, loss and other global warming related changes in the environment will increasingly affect business (Nepal Tourism Board 2011/12).

Businesses that are dependent on long-term investment are likely to have larger impacts as the consequences of climate change increase over time. So, the industries of construction such as real estates are likely to be the most effected by climate change impacts. In case of Nepal, temperature and humidity cause discomfort to individual and employees who go for vacation, have minimum disturbances and effect (Martin, 2005 as cited in Neupane & Chhetri, 2009). How businesses can meet the challenge of climate change and position themselves to achieve high performance? Risk is the combination of the likelihood of an impact and magnitude of its consequence, and a risk assessment can be used to identify significant climate impacts. Corporate executives were asked why adaptation to a changing climate should be on their radar. Many reasons were given climate adaptation that can have immediate benefits and help with long-term positioning.

SIGNIFICANCE OF THE STUDY

Climate change is relatively new challenge of global scale but have strong local effects. The most critical areas are developing countries like Nepal which are first to face this calamity yet helpless to implement climate change is an ongoing, long-term phenomenon with a degree of uncertainty attached to it and as such it is often difficult to see how its effects can be managed within the short planning horizons of a commercial organization. Therefore, it is tempting to wait for changes to take effect and respond to them as they happen. Business has stepped into this breach with various degrees of enthusiasm. Businesses are already managing a range of business risks and opportunities and climate change adds a new dimension for executives to consider. Executives can build on existing tools and frameworks to identify the material climate adaptation risks and opportunities for their firms. Weather disasters costing occurred in 2011, resulting in total

economy losses of $ 60.6 billion and 11 weather disaster occurred in 2012, causing more than $110 billion in damages (Chaulagain, N. P. 2006). In this study, such major challenges for firms include estimating the costs and benefits associated with risks and opportunities and understanding which of these are priorities for action can be re-evaluated over time.

According to Cruz, R.V. et al. (2007), the 2011 report by the NRT suggests that climate change could cost Canada roughly $5 billion per year by 2020, rising to between $21 billion and $43 billion per year by mid-century and adaptation is one key way to drive down the costs. What changes must we adapt to? What risks and opportunities does your organization face? Because the range of climate and physical effects, organizations should first aim to understand how a changing climate affects them. Finally, synergies occur when different concerns work towards the same end and conflicts occur when different concerns seek different outcomes. This study attempted to identify where these synergies and views occur. Simply, this study will solve the problem related to climate change and brings ideas to convert problem into opportunity.

STATEMENT OF THE PROBLEM

As business becomes more engaged in the governance of global issues, it has begun to assert its voice more enthusiastically as a legitimate actor in global environmental governance. In the case of climate change, industry's involvement is a critical factor in the policy deliberations relating to climate change. It is the industry that meets the growing demands of consumers for goods and services, develops and disseminates most of the world's technology, and calls upon to implement and finance a substantial part of governments' climate change policies (Nepal Tourism Board, 2011/12).

How businesses can meet the challenge of climate change and position themselves to achieve high performance? Will we be on the way to solving climate change, or will the challenges are too much for us? What tools will be used for solutions to business problems? Consider looking backward to identify the business impacts of past climate-related events: Has your company taken a hit due to a storm, drought, unusually hot or cold season or different precipitation levels? To assess and prioritize actions to manage risks and opportunities, businesses need to understand the impact on the bottom line. Investments in managing current business risks from weather, water, and environmental shifts become even more justified in a changing climate.

OBJECTIVES

The basic aim of this study was to identify, list, and describe on climate change influenced on selected sector. The focus was on the manufacturing, cloth shops, academic institution, tour and travel, real estate and hotels. For each area, I made a brief study done to different people of different disciplines, different types of impact on them, challenges and risks different organizations bear, different opportunities and strategies organizations have. I examined issues, such as, to what extend organizations will be influenced by the climate change? Since it is

very dangerous and risky, it is important to know how organizations convert such challenges produce by climate change into opportunities? The objectives of the study are:

1. To find-out the types of climate change impacts in business locally (in Pokhara) and globally.
2. To determine the strategies that businesses follow to prevent from disaster.
3. To assess and prioritize actions to manage opportunities and risks locally.

LITERATURE REVIEW

In practice, business decisions are driven by government policy, change in consumer demand and technology innovation that enable. A firm's vulnerability to these risks depends on the probability of an effect occurring and the magnitude of the impact if it does happen. Vulnerability can be reduced by managing risk, transferring risk, mitigating risk, or avoiding risk. SEEDA (2003) Sustainable Business Awards Study Slough Estates plc, using a risk-based approach is a good way of responding to potential future climate impacts in the face of uncertainty and in the context of all the other business risks that companies face (source: NACM, 2008). Disasters in February 2013, the Government Accountability Office (GAO) made a decision that climate changes possess significant financial risks to the federal government and consequently added climate change to its "high risk" list in 2013; a list that is released at the start of each new congress to identify vulnerabilities of the federal government. It is generally accepted that earth's climate is changing due to emissions of green house gasses into the atmosphere, caused by human activity. If resulting temperature increase is more than 2°c any damage will be irreversible, the scientists believe (Nepal Tourism Board, 2011/12). Although the main policy instrument has been the introduction of carbon emission market, many other policies are in place including eco-taxes, building regulation, tax credits, technology specific incentives (for instance, technology-dependents feed in tariffs), or laws on recycling. Nepal is one of the ten most vulnerable developing countries because of its geography, poor physical infrastructure and the low level of development of its social sector (Agrawala et al., 2003).

According to IPCC (2007), "learning lessons from the 2007 floods, interim report, cabinet office, London". In the summer 2007 floods, many businesses were unable to operate normally. Flooded sales premises or loss of power and communications resulted in lost orders and enquiries. Where businesses were out of action for sometime, there was a serious effect on trade, particularly in small businesses. Delays were increased by paperwork which had been lost or damaged in the flooding, resulting in problems making insurance claims, tracing orders and fitting in tax returns. According to Chartered Management Institute survey 2009; 29% of UK businesses reported experiencing some kind of disruption as a result of extreme weather in 2008. Though its emission level is lowest in the world measuring only 0.025% of global greenhouse gas (GHG) emissions, like other GHG gas non-emitting countries, Nepal is extremely vulnerable to climate change (Dhungel, 2009). In 2010, 38 percent of firms also identified opportunities resulting from climate impacts (Source: Carbon Disclosure Project 2010).

Tools like Enterprise Risk Management (ERM) provide a robust foundation for a systematic analysis of risks and opportunities. ERM suggests companies can be exposed to material risks in several categories (Table 1). In addition to areas of risk, there are also areas of opportunity.

Table 1. ERM risk and opportunity management categories and examples

S.N	Category of risk/ opportunity	Type	Climate-related example
1.	Hazard	Fire and property damage Storms / other natural perils Disease and disability Liability claims	Poorer air quality leads to higher incidence of disease among employees.
2.	Financial	Credit (e.g. Default, downgrade) Liquidity (e.g. Cashflow, call risk, opportunity cost) Hedging/basis risk	Creditworthiness is eroded and interest rates rise as lenders consider escalating business risks. A firm that relocated away from a flood zone is rewarded with lower insurance premiums.
3.	Operational	Business operations (e.g. HR, product development, capacity, efficiency, product/service failure, supply chains) Information/business reporting (eg. Budgeting/ planning, accounting info)	Supply chain disruptions occur because of droughts or extreme weather impacts in supplier regions. Companies incorporate climate change into capital assets planning, resulting in more efficient investments.
4.	Strategic	Reputational damage (e.g. Brand erosion, bad publicity) Competition Customer wants Technological innovation Capital availability Regulatory/ political trends	A company's reputation takes a hit following negative publicity from a climate-related accident. Firms in different parts of the world can now compete for tourist dollars An agile firm responds more efficiently than competitors when policies are adjusted or new ones created.*

Source: Risk management committee. 2003. Overview of Enterprise Risk Management. Casualty Actuarial Society.
**Denotes possible areas of opportunity for business.*

EFFECT OF CLIMATE CHANGE IN NEPAL

Climate change has been alarming in the world by global warming which caused by increasing concentration of green house gases (GHGs), physical impacts of climate change and deforestation. In Nepal, 95% of GHGs emissions from agriculture and forestry sectors where 77% from forestry sector only.[3] The

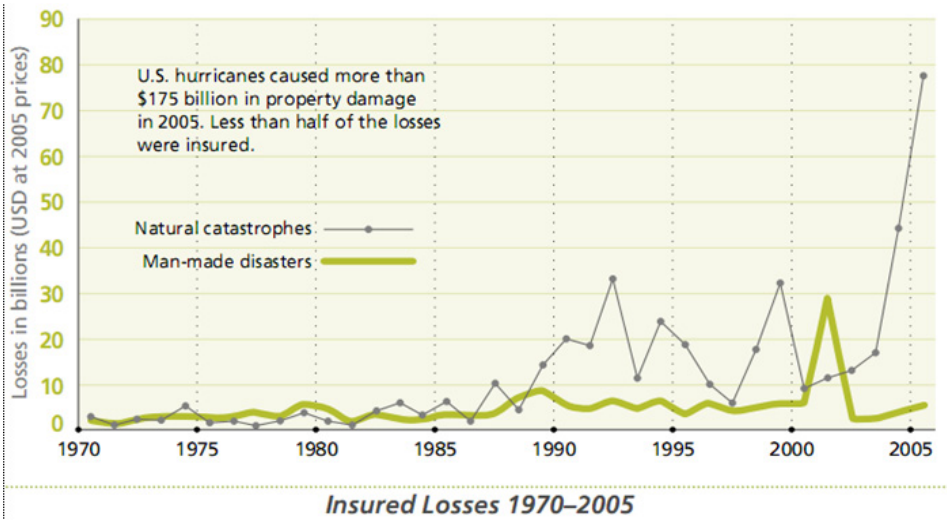
consequences of global warming have seemed globally to specifically in developing and into mountainous countries like Nepal has high intensity rainfall during rainy season. It resulted in heavy floods, landslides and soil erosion. It also common to find drought in many parts of Nepal that comes out the impacts of climate change are evidences on sectors like forests, water resources, agriculture, human health and biodiversity in Nepal.[4] Likewise, altogether 14 glacial lake outburst floods (GLOFs)[5] have happened between 1935 and 1991 in Nepal. In total, 21 GLOFs [6] have been identified as being potentially dangerous at present. Response to climate change in Nepal has been growing in recent years with an effort to cope with the changing situation and build resilience capacity into adaptation to climate change. In climate induced vulnerability context, Nepal developed policy level provision regarding to adaptation policy called National Adaptation Programme of Action to climate change (NAPA).[7] In 2010, the Government of Nepal approved National Adaptation Programme of Action (NAPA). The NAPA developed as a requirement under the UNFCCC to access funding for the most urgent and immediate adaptation needs from the Least Developed Countries Fund (LDCF).

The NAPA document opened the door to act adaptation activities into country. Under the provision of national level policy, Local Adaptation Plan of Action (LAPA) national framework [8] devised out by government. It only mentioned the provision of the implementation mechanism at district or village development committee level to act climate change adaptation. However, this document is still silent to provision of implementation mechanism at community level. In Nepal, NAPA developed with the three components: Preparation and dissemination of NAPA document, development and maintenance of Nepal Climate Change Knowledge Management Centre (NCCKMC) and development of Multi-Stakeholder Climate Change Initiative Coordination Committee (MCCICC). In Europe, a cap-and-trade program went into effect that requires more than 11,000 industrial facilities to achieve greenhouse gas (GHG) emission reductions. More than 230 million tons of carbon dioxide was traded in the initial year, with a value of over $5 billion.

COST ASSOCIATED WITH CLIMATE CHANGE

In identifying the business impacts of past climate-related events, has your company taken a hit due to a storm, drought, unusually hot or cold season or different precipitation levels? Keep in mind that this is a starting point and is not predictive of future impacts. For instance, by September of 2011, the U.S. had already tied its previous annual record from 2008 for the number of billion dollar weather/climate disasters. Hurricane Irene alone resulted in US$7 billion in damages (National Climatic Data Center. 2011).

Figure 1: In some parts of Canada, weather events that used to happen every 20 years are happening every six years, with significant implications for insurance (Gregor Robinson, personal communication).

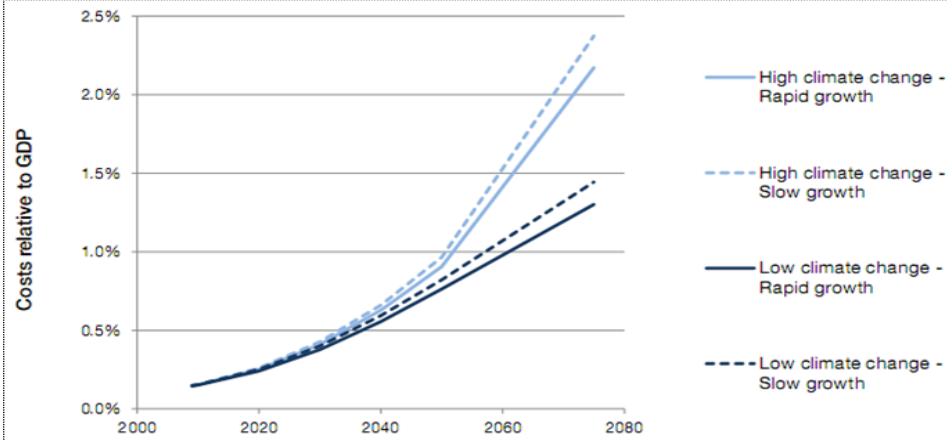


Source: Swiss Re

Rising costs of natural disasters: The cost of natural disasters exceeded $225 billion in 2005, up from the previous record of $118 billion in 2004, according to reinsurance giant Swiss Re. A 2005 Ceres report reveals a 15-fold increase in insured losses globally from catastrophic weather events in the past three decades – losses that have far outstripped increases in premiums, inflation and population growth. Swiss Re's chief claims strategist now says that, "Global warming has accelerated from a problem that might affect our grandchildren, to one that could significantly disturb the social and economic conditions of our lifetime."

A 2011 report by the NRT suggests climate change could cost Canada roughly $5 billion per year by 2020, rising to between $21 billion and $43 billion per year by mid-century (Figure 1) and adaptation is one key way to drive down the costs (National Round Table on the Environment and the Economy. 2011)

Figure 2: Average annual costs of climate change for Canada relative to GDP



Source: Paying the Price, National Round Table on the Environment and the Economy, 2011

WHAT CEOS ARE SAYING

At the January 2005 World Economic Forum, the then British Prime Minister Tony Blair exhorted corporate and political leaders to acknowledge the serious threat posed by global warming and hasten their support for clean energy solutions. "Businesses and the global economy need to know this isn't an issue that is going away," said Blair, who has set an ambitious policy to reduce the United Kingdom's carbon dioxide emissions by 60 percent in the next half-century.

General Electric CEO Jeffrey Immelt echoed Blair's thoughts a few months later, saying "the time is now" to confront climate change and that it should be viewed as an opportunity, not a liability. Duke Energy CEO Paul Anderson came out in favor of a federal tax on carbon emissions in 2005, even though his company is merging with Cinergy to become one of the nation's largest carbon-emitting companies.

Ford Motor's CEO Bill Ford said in 2005: "We see climate change as a business issue … and we're accelerating our efforts to find out solutions." In Ford's recent climate risk disclosure report, the company made clear that "it is in the interest of society and business to reduce the uncertainty and increase the predictability of policy frameworks and market conditions around the issue of climate change."

METHODOLOGY

Review articles and reports: The review involved an analysis of 10 reports and approximately 40 articles that address the business risks and economic impacts of climate change. After thorough analysis and comparison of abstracts, some 25 articles were selected were selected for further study. Many articles focused on agricultural, tourism, ICT and e-health and since this was not the focus of the present study, they are excluded. I combined this analysis with 5 experts in the field, who were asked to describe, define and say how businesses will be directly ad indirectly impacted by it. Each expert has extensive knowledge in a selected sector in telling the types of factors related to climate change and strategies that selected sector can take.

A report was selected that meets the criteria like it must addresses the business risks of climate change and/or its economic impact on the sector or company; it assesses the business risks on expert opinion, and has been published by a credible organizations.

Respondents: For the purpose of this research, 50 respondents were selected through snow-ball sampling method. Snow-ball sampling method was used as a fixed number of lodge owners. From among 50 samples, only 40 send their reply including experts of 5 numbers. There were no lists or other obvious sources to locate the stake holders and hence snow-ball sampling method would be a very effective method to identify the respondents. All respondents had influence on (had some responsibility for implementing) the corporate strategy of their organizations this is a survey based study.

Data Collection: Unstructured checklist open questions were asked to 35 individual with 5 experts. On the basis of that, qualitative and descriptive study was done. The responses given by the respondent are considered to be the main focus for the study as it will count as major findings.

Study Site: I could be able to complete this article with the help of different sources like reports, articles and views from experts and selected sectors as a sample of my study like banks, business associations, insurance companies, real estate, manufacturing, cloth shops, academic institution, lodge-owners, trekking trail. The fieldwork for this study took place in the month of April half and May 2014. The researcher spent 20 days to get response and views.

Analysis: Frequency distribution is done with the help of Microsoft Excel. Whatever respondents replied and gave information that is taken to represent the study. No modification was done on the responses.

What Academicians as a Expert Are Saying?

S.N	Varieties	Expert Views
1.	Adverse effect	Climate change can have adverse effect on business. While positive effect needs to be explored more, a negative effect is becoming visible at least in certain industries example hydropower, rice, wheat, maize, sugarcane, etc. Like in the absence of rain, during winter season, electricity load shedding has increased. Similarly, in the absence of rain during July, rice plantation has been affected adversely. Prof. Dr. Radheshayam Pradhan, Central Department, Tribhuvan University, Kritipur
3.	Change the management strategy	Weather largely affects the business especially manufacturing and agricultural however it ultimately affects to the trading and service sectors that we can see a recent example of heavy landslides in Mt. Everest and highly affected the mountaineering business for which there is need to change the management strategy to address its effect. Those organizations will only succeed to operate business in long run that is able to make adjustment over the impact. - PhD Scholar Bharat Ram Dhungana, Banaras Hindu University (BHU), Varanasi, India.
4.	High temperature and low performance	If your office is a meat locker in the summer and a sauna in the winter, your employees' productivity and collaboration suffer probably more than you think. It seems obvious that the temperature of a restaurant or theater can alter our experience. So why do we continue to neglect it in the workplace?
5.	Increase absenteeism	Business and home offices use a significant amount of electricity for heating and cooling, lighting, and operating equipment. Here are a number of easy ways to protect the environment, fight climate change, and help make the air cleaner. If environment is not as expected then there will be increase in absenteeism due to sickness. – Prof. Dev Raj Adhikari
6.	Changing interest in choosing workplace	Private banking are more in choice as there is AC inside the working environment that makes employees feel refresh and so relax even they are working in pressure. Associate Professor, Dr. Deepak Shakya, Thakuram Multiple College, Birgunj.

Impacts of climate change to businesses: From the survey of question, "What have you experienced with the climate change?", I found that the response is

based on two parts positive and negative. Organizations are highly influenced by the climate change; the response is directly touched organizational performances that include organizational, employee and job level activities. Climate encourages extra expenses in business as it is uncertain and damages create investment. Because of the reason especially small businesses have high operating cost and due to social pressure also company is in problem. Due to load shedding problem in Nepal, organizations have to buy generator, inverter, batteries and wireless electronic devices.

POSITIVE IMPACTS

Portfolio possibility, new inventions, portfolio possibility like company can produce things as per seasonal change, more liberalization possibility between countries (exchange of resources) is possible. While a larger percentage said that climate change has no positive impact on the trail, some 10 percent of the lodge-owners and guides believed that there were positive impacts of climate change. One is that people who come from sea-level can also trek as temperatures are rising; it won't be as cold as before, making trekking experience more pleasant. Technological advancement, competitive advantage, more liberalization possibility, the opportunities of business, skin care products are encouraged to produce.

New investment opportunities: Companies seek specific market opportunities, often backed by venture capital, in developing new technologies. Other investors seek specific opportunities in renewable energy assets such as solar and wind farms, promising more stable cash flow. Climate change leaders develop new offerings based on their core capabilities and infrastructure to pursue new revenue streams. HSBC created a number of climate change indices (e.g. Low carbon Energy Production Index, Energy efficiency Index) that can be invested in through the bank. In extremely hot areas, fans and AC will be more in demand so that business can be enhanced. Sustainable infrastructure and building, storm damage repair and reconstruction, energy efficiency technologies will be in demand. Cola, cooler, fan, ice-cream, skin care products like anti-UV cream as herbs and medicine, agriculture like production of sugarcane, almonds, coconut could increase, animal husbandry like camel, Ostrich turkey could increase.

NEGATIVE IMPACTS TO BUSINESS

Contractual relationships that do not adequately foresee and manage risks driven by climate change may damage the company's reputation with stakeholders as the risk of parties turning to litigation increases. Operating costs at refineries could increase in response to changes in asset efficiency and resilience with higher ambient air temperatures. Operational costs could increase in response to changes in design standards for offshore platforms. In 2003, U.S. auto companies relied on sales of big sport utility vehicles with low gas mileage as their main source of profits. In 2004, Ford introduced the first American-built hybrid SUV, and now plans to increase hybrid vehicle production tenfold, to 250,000 annually, by 2010. In 2003, American equipment manufacturers were largely silent about their plans to develop GHG-saving technologies. In 2005, General Electric

launched its "ecomagination" campaign, a plan to double investments in climate-friendly technologies and reach $20 billion in annual sales by 2010.

Impact in supply chain: Nike, which has more than 700 factories in 49 countries, many in Southeast Asia, was speaking out because of extreme climate that is disrupting its supply chain. In 2008, floods temporarily shut down four Nike factories in Thailand. (Source: The New York Times, Jan 23, 2014). Depending on the location and micro-climate building can be affected by flood wild gives and landslides. Other building near the waterway is vulnerable to flooding and storms. This could affect the value of building and real estate and make it more difficult to obtain adequate insurance. So, the new standard and prevention measures must be adopted.

Lack of capacity: The lack of capacity may also be a factor due to increased demand under extremes of temperature. Drought could reduce water supplies and hydroelectric generation. Roads rails will need to be resealed more often due to the heat.

Damage to property and infrastructure: Sea level rise, floods, wildfire, or extreme stream may require extensive repair of essential infrastructure such as home, roads, bridges, railroad tracks, airport runways, power lines.

Lost productivity: Disruptions in daily life related to climate change mean lost work and school days and harm trade, transportation, agriculture, energy production and tourism. It can delay planting and harvesting, delay air travel, and make it difficult for people to run their daily business.

Mass migration and scarcity threats: Global warming increases a number of climate refugees who are forced to leave their homes because of floods, wildfire and other climate related disasters. Mass movement of people's social disruption may lead to civil unrest.

Changing prices for goods and services: Even companies that do not produce much pollution may be indirectly affected by climate change laws their suppliers or customers may be affected. It is quite possible that there could be wide ranging changes in prices caused by things like increased transportation costs or higher electric rates.

Changing demand for goods: The combination of changing prices and changing weather patterns would likely cause charging demand for goods. If global temperature rises, demand for cold weather product such as heating oil will decline.

Changing public perceptions of the firm: Reputation is supremely important to many businesses. More and more public opinion seems to be turning against firms who are perceived to be over polluting. Many firms today are working hard to promote a green image.

Climate for safety and security: Climate change brings a great risk for safety and security. For example, tsunami in 2004 brought a lot of damage for many organizations' businesses.

Climate for loss and effect on organizational performance: According to "Engine of US jobs", employing 60 million Americans face major challenges and need for increased resilience like tourism, landscape architecture, agriculture, roofing and small scale manufacturing. Hurricane sandy in New Jersey in 2012 caused economic losses of $ 30 billion; small businesses were affected. 60000 to

100000 small businesses were negatively affected by the storm and up to 30% are estimated to have failed as a direct result of the storm. Similar is the case of businesses in Pokhara. Some sectors such as insurance, tourism, and real estate faced potential risks from the physical impacts of climate change, such as rising sea levels and more frequent and intense storms. Recent experience with extreme weather highlights our economic exposure to these changes: in 2010, 950 natural catastrophes caused global losses totaling US$ 130 billion in the U.S., of which US$ 37 billion was insured. Serve floods in Australia in 2010 to 2011 resulted in more than $ 350 million in claim to re-insurer Munich Re, which contributed to a 38% quarterly drop in profit for the company (Cruz, R.V. et al. 2007). Insurance company may bear a great loss when there are immediate changes which bring disaster and pay to the loss may ruin the organization.

As the effects of climate change play out globally, demand for products and services to manage climate risks will also rise. Several groups such as the Investor Network on Climate Risk and the Climate Group, have played an important role recently in highlighting the financial risks and opportunities facing various sectors and encourage companies to assess and manage these risks rather than ignore them (The Climate Group, 2004). Investments in research and development is highly risky, as low-emission technologies, such as those for renewable energy, frequently require radically new capabilities that threaten to undermine the position of existing companies and open the industries to new entrants (Anderson & Tushman, 1990; Christensen, 1997).

Climate impact on employee performance: It is also a major problem which occurs due to changes in climate due to global warming caused by high concentration of green houses gases like carbon dioxide, methane, nitrous oxide, etc. The presence of high concentration of these gases create problems on health of the manpower, working in the organization due to the fact that these gases have high tendency of absorbing ultraviolet radiation coming from sun and creating ecological imbalance in the ecosystem. These ultraviolet radiations are very harmful for the human being. In the summer, different types of disease attack and employees get suffered with absenteeism, low turnover and irritation, reduce productivity. In an academic institution, performance of students is something that they are not concentrating on their studies, feel very sleepy and tired. Literature shows that 75 percent of MBA students from top schools would be willing to accept a pay cut of between 10 and 20 percent in order to work for a company they regarded as socially responsible a perception that is linked at least in part to a company's attitudes and actions with regard to climate change and other environmental issues.

Impact in the locality: In the cases of Nepal, people of Terai were suffered from Jaundice because of the pollution and infection in the water; among them, many people die. As a result, many industries and companies were closed for certain period.

OPPORTUNITIES

Local companies can sell the out-dated or off season products to their customers. For example, in winter season if people come from Toronto, Canada, shops in Pokhara can sell winter wear dresses that are in stock. Analysis of this

study match with the literature that many companies also see potential market opportunities in new high-margin, low-emission products and technologies, as well as cost savings from lower energy use (Begg, van der Woerd, & Levy, 2005; Margolick & Russell, 2004; Reinhardt, 2000; Romm, 1999). People migrating from one place to other will be high and that will encourage market for the business and supply of employment and will also be high which results into low rate of employment. Chances of diverse people to come to our place is high that may lead some to establish industries and factories. This may even lead us to learn and become more dynamics from each other.

Such disaster will encourage scientists and engineers to discover new technology that consume low energy and may not harm society. Business is the main cause of climate change because an organization produces effective gases like c3, etc, which affect the whole society. As we know business is the one that influence climate and is influenced by climate change has to be studied. The most significant discovery of my study is to find and will encourage manufacturing and industries to discover opportunities to develop new technologies that position their firm advantageously and/or generate new revenues. Yet these effects may also drive new forms of innovation for example, drought resistant crops in agriculture and food processing, and the indirect impacts of climate change that will have the greatest influence over future business strategy. The following are the most significant stakeholders whose actions in light of climate change are likely to have most influence on the business community.

Some of the responses of the lodge owners and guides about the relation of the changing climate to their business are as follows:

Findings: Sixty percent of the respondents said that it was warmer than before. The finding is consistent with other findings by (Oxfam 2009, Practical Action 2010) in other regions of Nepal which shows a warming trend. These people actually said that rainfall pattern has been erratic in recent years. Executives forecast climate change to be increasingly important over time. In the resources industries, where environmental impact is more a part of everyone's consciousness, half (50%) of the executives surveyed cited climate change as a major issue for their businesses. That number grows to 70 percent when looking ahead five years (Chaulagain, N. P. 2006). Financial services executives also demonstrated a relatively high awareness of climate change as a major issue for them. This finding may reflect awareness among these executives of the future financial risks and opportunities for sectors such as the insurance industry stemming from more

"Due to bad weather and heavy rainfall my crops get destroyed and I have to buy all my vegetables from the nearby city which is very expensive"- President of Organic Krishi Sahakari Santha Limited.

Winter season has lessened because snow has decreased. Earlier because of the snow the trails used to be blocked for days but now it is not the case." – Lodge-owner at Almond

severe weather conditions direct impacts a rise in average global temperatures can lead to clear cause and effect relationships in many industries of agriculture, food, products, tourism and many others. Some of these effects are potentially threatening to sustainable high performance: changing climatic conditions, for example, may directly influence patterns of future costs and benefits.

All these aspects affect the business sector, either directly or indirectly, since more and more asset managers now consider climate change into their investment decisions. In a survey of asset managers with $14 trillion in assets, 53% said that climate change data drove their decisions on whether to divest or not invest in listed equities up from 23% in 2012, and just 9% in 2011. Over two in three asset owners (69%) added that climate change data had already influenced their fund manager decisions in 2012. The selected sector are not confident with their ability to cope with the challenge climate change bring, they can only take some major role to be less impacted by it. However, if we see the literature, we found Indian companies feel relatively confident about their ability to act on climate change, possibly an indication of the pervasive entrepreneurial spirit and optimism in today's dynamic Indian economy. Chinese companies feel the least well positioned to deal with it.

STRATEGIES

From the survey conducted on the issues mentioned above, this study is able to bring some strategies that organizations can apply to relatively overcome or decrease the higher influence of climate change. Some of the strategies are neat and clean environment, one man one tree concept, recycling process, paperless work in the office, and restrict to use black color plastics bags. Following are the remaining strategies that organization must adopt:

1) Reducing or managing carbon related activities "create a culture of carbon consciousness" including: Deploying technologies such as smart metering or energy-efficient buildings to improve energy efficiency. Measuring an organization's carbon usage its "carbon footprint".
2) Increasing the use of renewable energy sources. A smaller proportion of companies report initiatives in the area of internal policy formulation and employee training and communication.
3) Business leaders believe that climate change will be tackled most effectively through a combination of market-driven and regulatory measures although the degree of preference varies by country and sector.
4) Develop environmentally conscious, or "green," products and services: Assess how existing and new products can be tailored to meet consumer and potentially regulatory demands for reduced environmental impact. For example in Pokhara green new public bus is giving service to public that is the concept of "see green". As it is the belief to control the climate change due to pollution is "see green, eat green and wear green". According to UNFCCCC (2011), IBM has launched the IBM Big Green project to reduce data center energy consumption with the help of IBM products and services. This study match the literature that as a part of a wider plan to reduce energy consump-

tion, the UK retailer Marks & Spencer is selling a line of clothes manufactured with polyester from recycled bottles.

5) Deploy smart technologies: Investments in new, more environmentally conscious technologies such as green data centers (which use less energy) are increasingly a source of cost reduction as well as competitive advantage. These technologies offer the promise of both enhanced reputation and more efficient delivery of services. In the utilities sector literature shows that smart meters can provide real-time information to domestic consumers about the cost of their energy use and about areas of wastage. This technology can help to reduce overall energy consumption as well as provide a significant business opportunity to appropriately incentivized service providers.
6) Employees should be empowered. Environmental stewardship is an increasingly powerful motivator behind recruitment decisions and subsequent employee performance. High levels of engagement among employees regarding environmental issues should be harnessed, so that climate change issues become an integral way of doing business, rather than a corporate overhead undertaken by a discrete element within the organization.
7) Higher stretch goals should be set. Businesses are already falling into the trap of under appreciating the business opportunities presented by climate change. Undertaking more forward-looking and wide-ranging innovations could help businesses examine a broader range of strategic opportunities open to them. The journey toward high performance in an era of climate change is unlikely to be straightforward. Shifting regulation, changing consumer behaviors and new technologies are just some of the factors that are changing the environment in which businesses are operating. Being able to track and preempt these developments will give businesses significant competitive advantage.
8) Businesses need to be proactive in developing the capabilities needed to succeed in an era of climate change. If they can develop the right cultural mindsets strengthened by organizational processes and approaches they will be well placed to achieve high performance in the carbon-constrained world of the future. Though generating and sharing of area specific climate change related information may come as a top priority agenda, ensuring proper use of information in planning and implementing policy processes is even more important. Such information is vital for project planning and development (to enhance resilience capacity of community and development infrastructures), capacity building of national and local institutions and upgrading negotiation skills, planning and implementing innovative research and development schemes.
9) A recent report from the environmental group CERES typifies the optimistic view that there has been a sea-change in corporate responses to climate change since the turn of the century: Companies at the vanguard no longer question how much it will cost to reduce greenhouse gas emissions, but how much money they can make doing it. Financial markets are starting to reward companies that are moving ahead on climate change, while those

lagging behind are being assigned more risk.

10) Shareholders and financial analysts will increasingly assign value to companies that prepare for and capitalize on business opportunities posed by climate change (Cogan, 2006: 1). Markets for associated electronics, materials, construction, and services will also experience rapid growth. It can be noted that the tourists placed a very high importance on 'mountain and glaciers' and 'nice weather' to be an important aspect of their holiday. There is a possibility that tourists will opt for alternative places if negative impacts of climate change are high in a destination.
11) The pressure on corporations, investors and governments to act continues. One explores how corporations influence public policy on climate change both positively and negatively. Some corporations are still acting – both directly and through trade associations to prevent the inevitable: nations need sensible climate regulation that protects the public interest over the long term. Increases in extreme weather events, water shortages, pollution, loss of biodiversity and deforestation are among the environmental issues that must be confronted. Projected increases in atmospheric CO levels would lead to climate change that would inflict suffering on humanity and costs to the global economy on a fundamentally different level than that of any financial crisis we have ever experienced. These issues are now well known and broadly accepted. However, the collective response from governments to date has been disappointing in their focus on short term political desires rather than longer term mutual necessity.
12) For there to be a meaningful movement towards absolute emissions reductions, companies must test the concept of a trade-off between economic performance and environmental responsibility. Top performing companies demonstrate that improving environmental performance can add to the bottom line. These are business issues that the investor community can clearly engage with companies on.
13) The companies we invest to achieve and maintain high standards of corporate responsibility which includes the measurement and management of environmental impacts. This suggests that businesses are not even well adapted to the current climate. Therefore, even if the climate were not changing, it would be worth building resilience to extreme weather. This will help to protect business and jobs, reduce the costs of disruption and maximize any opportunities arising from weather and climate.
    - Business premises will be affected through impacts on building fabric, structure and the comfort conditions of the internal environment. This will have implications for the design, construction, and maintenance and facilities management of both existing and new business premises. Designing buildings that are both low carbon and resilient to the future climate presents a significant challenge.
    - People are affected by the weather. Heat has physiological effects, inclement weather can affect concentration and weather patterns influence behavior and lifestyles. Businesses will therefore be affected by climate

change as their employees and customers are affected and respond in different ways.

- Some industrial processes and business activities are temperature or climate sensitive. Therefore, productivity in some sectors will be affected. There may also be business opportunities if a new process becomes economically viable in the new climate.
- Company finances will be affected by climate change through the cost of damage, disruption and lost sales driven by all of the above.
- Find out what external organisations (trade associations, etc.) are doing to help build the adaptive capacity of your sector.

SUMMARY AND CONCLUSION

In summary, climate change now playing out across a range of dimensions from political and social to economic and technological. In this way, climate change is emerging as a key determinant of the potential of today's companies to create long-term value and sustain high performance. A number of important stakeholders are shaping the business landscape because of climate change issues. The exact science of climate change should matter less to businesses than the perceptions and behavior of these increasingly powerful stakeholders especially the regulatory responses of legislators and the purchasing patterns of consumers. Companies that are attuned to these shifts and that respond in a timely and proactive manner will advance toward sustained high performance faster than their competitors. Climate change is already affecting the business world significantly, and its impact is likely to grow, however, the impact varies from sector to sector. 83% of the world's top 500 companies now see climate change as a business risk. Two in three utility companies say extreme precipitation and extreme temperatures are a significant risk for their production, and hence for their customers.

Climate-related investments, such as renewable energies, are an attractive growth market as they contribute to greater portfolio diversification, which spreads risks. They also provide sound and stable long-term returns that are generally not linked to the ups and downs of the financial markets. This fits well with our investment strategy for insurance premiums, which calls for manageable risks and attractive returns for durations of 20 years or more. We see clear benefits to these investments and Allianz is one of the world's largest financial investors in wind and solar power, with more than € 1.7 billion invested since 2005. Currently, Allianz owns a portfolio of wind and solar farms in France, Germany, Italy and Sweden that generate enough electricity for over 500,000 households in Europe.

Trading houses that also produce oil are upgrading their machine, continuing securing investment for new exploration, production and manufacturing. Fluctuating temperatures can affect efficiency and performance of physical assets leading to transport disruption, damaged buildings and increased operational delays and costs. Potential investors and stakeholders are placing greater importance on the business impacts of climate change as the risks impact cost and revenue drivers. Insurance costs could potentially rise because of greater chances of physical plant damage due to weather events so the policy will be revised.

Respondents believed that government must play a critical role in shaping the business environment relating to climate change. Government policies and regulations introduced in response to concerns about climate change have the potential to radically alter market incentives and opportunities for profit. Lenders, investors, insurers, and regulators are increasingly interested in climate change, expecting more information and action from firms. Companies demonstrating leadership may benefit from enhanced reputation. For instance, travelers and insurance firms feel proud of themselves on providing industry leadership on climate issues to educate customers, employees and society. If you don't act, others will act. There are competitive opportunities associated with a changing climate opportunity to access new markets, develop new technologies and products, and stay ahead of regulation. These can be a source of competitive advantage or disadvantage, if a competitor gets there first.

REFERENCES

Agrawala, S., Raksakulthai, V., Aalst, M. v., Larsen, P., Smith, J., and Reynolds, J. (2003). *Development and climate change in Nepal: Focus on water resources and hydropower.* Paris: Organisation for Economic Co-operation and Development (OECD).

Anderson, P., & Tushman, M. L. 1990. Technological discontinuities and dominant designs: A cyclical model of technological change. *Administrative Science Quarterly*, 35: 604-633.

Begg, K. G., van der Woerd, F., & Levy, D. L. 2005. *The business of climate change*. Sheffield, UK: Greenleaf.

Chaulagain, N. P. (2006). *Impacts of climate change on water resources of Nepal: The physical and socioeconomic dimensions*. Universität Flensburg.

Chaulagain, N. P. (2006). *Impacts of climate change on water resources of Nepal: The physical and socioeconomic dimensions.* Universität Flensburg.

Christensen, C. M. 1997. *The innovator's dilemma: when new technologies cause great firms to fail.* Boston: Harvard Business School Press.Clean Energy Nepal from http://www.cen.org.np/index.php?page=news_detail&nid=283#.USe-4wR2LDgs

Cogan, D. G. 2006. *Corporate governance and climate change: Making the connection*. Boston, MA: CERES.

Cruz, R.V. et al. (2007). In M. L. Parry et al. (eds.), Climate change 2007: *Impacts, adaptation and vulnerability* (pp. 469-506). Cambridge: Cambridge University Press.

Cruz, R.V. et al. (2007). In M. L. Parry et al. (eds.), Climate change 2007: *Impacts, adaptation and vulnerability* (pp. 469-506). Cambridge: Cambridge University Press.

Department of Forest/GoN from http://www.dof.gov.np/division/community-forest-division/community-forestry.

Dhungel, K. R. (2009). Nepal and climate change. Retrieved March 6, 2011 from http://www.nepalnews.com/home/index.php/guest-column/1354-nepal-and-climate-change.html.

Hibiba, Gitay, et al. 2002 Climate Change and Biodiversity. IPCC Technical Paper IV. ICIMOD

http://climatechange.cbi.org.uk
http://en.wikipedia.org/wiki/Air_pollution
http://www.anglianwater.co.uk/corporate-responsibility/our-strategy/mitigate/ and personal contact with Anglian Water's Climate Change Scientist.
http://www.anglianwater.co.uk/corporate-responsibility/our-strategy/mitigate/ and personal contact with Anglian Water's Climate Change Scientist.
International Chamber of Commerce. 1995. Statement by the International Chamber of Commerce before COP1 March 29 Berlin.
IPCC (Intergovernmental Panel on Climate Change). 2007. *Climate change 2007: The physical science basis.* Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Solomon, S.; Qin, D.; Manning, M.; Chen, Z.; Marquis, M.; Averyt, K. B.; Tignor, M.; Miller, H. L., eds. Cambridge and
IPCC. (2007). *Climate change 2007: Synthesis report.* Geneva: Intergovernmental Panel on Climate Change.
LAPA Nov 2011 Local Adaptation Plan of Action National Framework: Ministry of Science, Technology & Environment, Government of Nepal http://www.moste.gov.np/elibrary?page=3#.USZNYR3Is1I
Levy, D. L., & Newell, P. J. 2005. *The business of global environmental governance.* Cambridge, MA: MIT Press.
Levy, D. L., & Prakesh, A. 2003b. Bargains old and new: Multinationals in international governance. *Business and Politics*, 5(2): 131-151.
Lipschutz, R.2005. *Regulation for the rest of us: globalization, governmentality and global politics.* London: Routledge.
Margolick, M., & Russell, D. 2004. Corporate greenhouse gas reduction targets. Arlington, VA: Pew Center on Global Climate Change/Global Change Strategies International.
Martin, G. (2005). Weather, climate and tourism: A geographical perspective. *Annals of Tourism Research*, 32 (3), 571–591.
Mool, PK; Bajracharya, SR; Joshi, SP (2001)Inventory of Glaciers, glacial lakes, glacial lake outburst floods monitoring and early warning system in the Hindu-Kush Himalayan region, Nepal. Kathmandu, Nepal: ICIMOD
MoST 2004 Initial National Communication Report on Climate Change.: Ministry of Science and Technology, Government of Nepal, submitted to UNFCCC.
NACM., (2008). A Changing Climate for Cider.
NAPA 2010 National Adaptation Programmes of Actions: Ministry of Environment/GoN, http://www.moste.gov.np/elibrary?page=3#.USZNYR3Is1I
National Academy of Sciences. (2010). Climate Stabilization Targets: Emissions, Concentrations, and Impacts over Decades to Millenia. National Climatic Data Center. 2011. Billion Dollar U.S. Weather/Climate Disasters. Available from http://ncdc.noaa.gov/oa/reports/
National Round Table on the Environment and the Economy. 2011. Paying the Price: The Economic Impacts of Climate Change for Canada. Available from http://nrtee-trnee.ca/wp-content/uploads/2011/09/paying-the-price.pdf.
Nepal Tourism Board. (2011/12). Annual Operational Plan. Retrieved May 8, 2011

from http://www.welcomenepal.com/corporate/images/AOP-2011-12.pdf.
Neupane, G., and Chhetri, N. (2009). Vulnerabilityto climate change of nature-based tourism in the Nepalese Himalayas. *Tourism Geographies*, 95-119.
New York: Cambridge University Press.
Oxfam International. (2009). Even the Himalayas have stopped laughing. Climate change, poverty and adaptation in Nepal.
Practical Action. (2010). *Impacts of climate change: Voices of the people*.
Reinhardt, F.L. 2000. *Down to earth: applying business principles to environmental management*. Boston: Harvard Business School Press.
Robinson, Gregor. NRTEE-NBS Climate Change Adaptation Forum. Presented at "The Bottom line on managing climate change risks and opportunities: A form for financial executives", Toronto, October 27, 2011.
Romm, J. R. 1999. *Cool companies: how the best businesses boost profits and productivity by cutting greenhouse gas emissions*. Washington D.C.: Island Press.
SEEDA., (2003). *Sustainable Business Awards Case Study*. Shepherd Neame.
SEEDA., (2003). *Sustainable Business Awards Case Study*. Slough Estates plc.
The Climate Group. 2004. Carbon down, profits up. Weybridge, Surrey, UK: The Climate Group.
UNFCCC, Investment and financial flows relevant to the development of an effective and appropriate international response to Climate Change, 2008, http://unfccc.int/cooperation_and_support/financial_mechanism/items/4053.php
UNFCCC, Investment and financial flows relevant to the development of an effective and appropriate international response to Climate Change, 2008, http://unfccc.int/cooperation_and_support/financial_mechanism/items/4053.php
UNFCCCC. (2011). Official website. http://unfccc.int/essential_background/items/6031.php
www.bitc.org.uk/north_east/programmes/business_resilience_and_climate_change_adaptation/

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