

BUSINESS ENGAGEMENT IN ADAPTATION TO CLIMATE CHANGE IN DEVELOPING COUNTRIES: A CASE STUDY BASED ON BEHAVIORAL PERSPECTIVE

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ABSTRACT

Objectives of the paper are to explore the current state of business engagement in adaptation to climate change, identify hidden drivers and barriers of adaptation, and to find ways to accelerate the engagement process in a highly climate vulnerable developing country. Based on behavioral perspective, the authors deployed a qualitative multiple case study research to investigate three significant business sectors in Bangladesh namely telecom, real estate and garments manufacturing. Findings show that their overall perception of climate change impacts on businesses is still unclear. Their present engagements in adaptation can be termed as co-adaptation with other regular organizational changes. Majority of adaptation decisions are reactive. Businesses show more sensitivity to non-climatic factors (e.g. regulation, market-force) than direct climatic factors like extreme weather events. They follow 'wait and see' or 'deferred' adaptation approaches, and in some cases, also absorb risks or shift the risks to other businesses. There exist a number of internal and external drivers and barriers that are directly or indirectly determine adaptation decision. Lack of awareness and wrong perception are the main barriers. However, unavailability of information and adaptation finance, costly adaptation technology, poor organizational leadership, corruption, political unrest, and unfavorable policy are significantly hampering their adaptation process.

Keywords: Business Engagement; Adaptation; Climate Change; Developing Countries.

1. INTRODUCTION

The discourse of business engagement in adaptation to climate change revolves around three main concepts: business risks, business opportunities, and social responsibility of business. While climate change poses significant business risks like extreme weather events, shortage of raw materials, stricter regulation and so on (Nyberg and Wright, 2015; Pattberg, 2012), it also brings some business opportunities for new investments in climate proofing products/ infrastructures, and help organizations to gain increased reputation and competitive advantage (Biagini and Miller, 2013; WBCSD, 2008). Business, as a social organization, always tries to adapt to the environment. However, traditional risk management approach will not be sufficient to deal with climate change for the peculiarity of physical impacts in terms of severity and spatial and temporal scale (Linnenleucke et al., 2012, Winn et al., 2011). In addition, most developing countries are suffering from limited resource and inadequate technical and institutional capacity for adaptation (Milner

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and Dietz, 2015; Metz, Halsnae, Olsen, & Rasmussen, 2009). As adaptation finance (as per commitment of Cancun Accord in 2010) received by those developing countries from international donors is insufficient to meet future adaptation cost (Pauw et al, 2016; OECD, 2015; UNEP, 2014), private sector's involvement as alternative source of finance and collaboration is necessary. Therefore, private sector or business engagement in adaptation to climate change in developing countries does not simply imply the corporate efforts to protect their own business but also helping government to build resiliency of climate-affected community (Biagini and Miller, 2013; Pauw and Pegels, 2013).

Though the new discourse of private sector engagement in adaptation to climate change has been getting attention among developed countries, the literature is still scarce (Linnenleucke et al., 2013). There are very little evidence that private sector in developing countries are responding to it (Sovacool et al. 2017; Nurunnabi, 2016; Pauw, 2015; Belal et al., 2010). Though Bangladesh is considered one of the most climate vulnerable countries of the world and occasional cyclones, floods, erratic rainfall, draughts, salinity, diseases and decreasing crops production are significantly impeding the social and economic development (Kreft and Eckstein, 2013; ADB, 2011), businesses in Bangladesh are visibly less concern in adaptation to climate change. Literature review reveals that business adaptation is a complex process and depends on dynamic interaction among a wide range of influencing factors or drivers internal and external to business. Different authors derived different adaptation responses considering locations, types of production, apparent sizes, and capabilities of business (see Table-1).

Table-1: List of adaptation measures as per different authors

Authors	Gasbarro & Pinkse (2016)	Agrawala et al. (2011)	Hoffmann et al. (2009)	Berkhout, Hertin & Gann (2006)
Adaptation measures	Pre-emptive Reactive Continuous Deferred	No adaptation Soft adaptation Hard adaptation	Protect affected business, Expand beyond affected business, Share risks	Wait and see Risk assessment and options appraisal, Bearing and managing risk Sharing and shifting risks

We are yet not clear about what adaptation measures local businesses of Bangladesh have taken to protect their own businesses and to increase societal resilience to face climate change, and what are the barriers that prevent themselves to be engaged in adaptation. The main objectives of the paper are to explore the current state of business engagement in adaptation to climate change in Bangladesh, identify hidden drivers or barriers of adaptation, and ways to accelerate the engagement process. Therefore, the authors pose the following research questions:

- Q1:** How the local businesses in Bangladesh are adapting to climate change?
Q2: Why private sector or business organizations in Bangladesh are showing less concern in adaptation to climate change?
Q3: How private sector or business organizations in Bangladesh can be engaged more effectively in adaptation to climate change?

Existing literatures are not sufficient to give answers to the above-mentioned questions for two reasons. Firstly, they are not contextual, and secondly, they are incomprehensive. Literature

suggests that both climate change and adaptation are highly location specific due to variation of negative impacts, social and governance structure of the locality (IPCC, 2007). Therefore, studies based on organizations owned in developed countries like UNFCCC (2017) and Busch (2011) may not provide appropriate solution in the context of developing countries. Some literatures on private sector engagement in adaptation to climate change focus on specific business sectors such as Gasbarro and Pinkse (2016) on oil and gas industries; Galbreath (2014) on wine production, Scott, McBoyle and Minogue (2007) on tourism, Arnell and Delaney (2006) on water utility service and Hertin, Berkhout, Gann, & Barlow (2003) on construction. Moreover, some studies like Biagini and Millers (2013) and Pauw (2015) discussed the concept of private sector engagement in adaptation too broadly and lack detail consideration for any particular country. Among them, many literatures have methodological limitation. For example, research conducted by Gasbarro, Rizzi and Frey (2016), and Agarawala et al. (2011) collected data from CDP (Carbon Disclosure Project). Organizations participating in CDP are already aware of potential climate risks and opportunities in some extent and their voluntary disclosure may hide important strategic information of businesses. Therefore, the authors deployed a qualitative multiple case study research closely examining three different business organizations in Bangladesh to have a generalized subjective understanding of the phenomenon in real life context.

The findings of the study have significant theoretical contribution in both business management and climate adaptation literature. The conceptual framework adopted from Berkhout (2012) has been formulated on findings from many conceptual and empirical studies conducted in the context of developed countries. In our empirical research, we tested the very theoretical framework in different context (developing country). The practical implication of the study can be two folds. Firstly, the findings will give insights to business leaders and managers to device appropriate adaptation strategies in Bangladesh and other similar countries. Secondly, government of Bangladesh or other similar countries can easily recognize and remove potential barriers and develop enabling policy to engage private sector in adaptation to climate

2. LITERATURE REVIEW

Based on the theoretical approaches, existing literature on business engagement in adaptation to climate change can be grouped in three distinct but overlapping perspectives, where each perspective has its own basic assumptions but share many common facts with others.

2.1. Risk Management Perspective

Intergovernmental Panel for Climate Change defined adaptation as “adjustments in natural or human system in response to actual or expected climate stimuli or their effects, which moderate harm or exploit beneficial opportunities” (IPCC, 2001, p: 982). Literatures based on this perspective believe that climate change offers both business risks (i.e., Infrastructure damage and supply chain disruption due to cyclone or flood, new energy regulation, productivity loss for disease and heat stress) and opportunities (i.e., new climate proofing products) and successful organization must manage those risks and utilize the arising opportunities to sustain future operation. This approach refers that adaptation decisions can be both proactive (anticipatory) and reactive in response of previous experiences. However, manager’s prediction of risks and possibilities can be inappropriate due to high level of uncertainty of climate change, and analysis

of future cost and benefits of adaptation may be faulty in some extent. Gasbarro et al. (2016), Weinhofer and Busch (2013), Agrawala et al. (2011) and many more authors suggest that climate change will bring a number of direct or indirect business risks -physical risk, regulatory risk, reputational risk, market risk, financial risks, and litigation risk. They also mentioned opportunities for cost reduction by resource efficiency, increased reputation for doing business in socially responsible ways and expanded market share for new climate proofing products/services.

2.2. Behavioural Perspective

Views of behavioral perspective base on self-motivated actions of organization depending on previous experience of climate change or recognizing indirect signals from external environment of business. Behavioral responses of adaptation is gradual and comprehensive considering the organization's own interpretation of risks, opportunities, capabilities, available resources, actions of other actors and impacts of market forces on business performance.

For this research, the authors selected the behavioral perspective for two reasons. Firstly, behavioral perspective is context oriented and can explain the dynamic relationship of different external and internal actors and factors of organizational environment (Linnenluecke et al., 2013, Berkhout, 2102). Secondly, it supports the idea that climate change is not the only drivers for organizational change (Smit and Wandel, 2006; Kandiklar and Risebay, 2000) rather other environmental factors like technology, regulation, demand shift can force organization to change or adapt (Berkhout, Hertin, & Gann, 2006; Hertin, Berkhout, Gann, & Barlow, 2003).

2.3. Institutional Perspective

Institutional approach of adaptation refers to forced adaptation through policy by regulatory bodies or institutions in the context of business environment. It is often called normative approach, as the main intention of this approach is to highlight business's social responsibility to increase the resiliency of the community to fight the battle of climate change. Basic assumption of this discourse is that private sector with its expertise, resources, and capacity for innovation and management can play significant role to develop societal resilience side-by-side government.

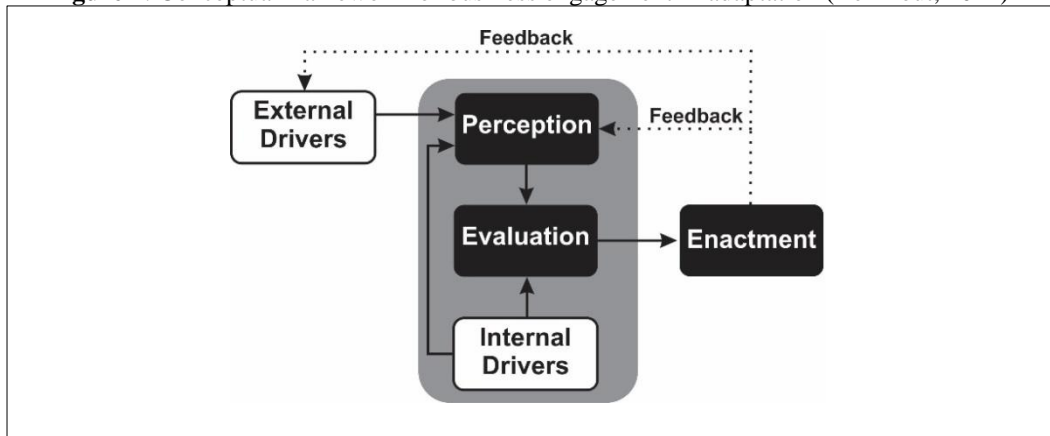
Literatures in this group, as if Biagini and Miller (2013), IFC (2013), Mendelsohn (2006), Pauw (2015), Pauw and Pegeles (2013), and so on show that business engagement in adaptation is co-beneficial for both business and society. They put stresses on the government's role for creating 'enabling environment' by enacting appropriate policy like tax rebate for importing low-emission technology, opening investment opportunities with government in climate proofing projects, or by removing barriers like raising awareness, supplying business related climatic data and providing supporting infrastructures to engage private sector in adaptation to climate change in developing countries.

2.4. Conceptual Framework

Different authors describe adaptation process into different phases: *perception- evaluation-enactment* (Berkhout, 2012), *risk awareness-risk evaluation-risk management* (Agrawala et al., 2011), *awareness-analytic capability-action* (Moser and Luers, 2008), *awareness and concern-adaptation strategy-selection of options* (Arnell and Delaney, 2006). However, all the concepts are

similar in contents. Following Berkhout (2012), we assumed that by the influence of different external factor or drivers like physical risks of climate change, actions of stakeholders, organization perceives of or detects different threats and opportunities on daily organizational routines. Then, manager evaluates them and decides on developing possible adaptation options by considering different internal drivers/factors like capacity, experience, resources and so on. Finally, organization enacts those strategies as new routines or practical actions that are visible as adaptation practices. After adaptation actions come into effect, feedback from internal and external environment influences organization to improve or revise the adaptation strategies. Therefore, in our conceptual framework (Figure-1) there are six concepts: (A) Perception (B) External drivers (C) Evaluation (D) Internal drivers (E) Enactment (F) Feedback.

Figure 1: Conceptual framework for business engagement in adaptation (Berkhout, 2012)



The major concept in our theoretical framework is ‘*perception*’ referring to the deeper understanding and strongly held subjective believes of business managers and their stakeholders like partners, regulators, investors, customers, community people and others. These perceptions are shaped by socio-economic context and can be best understood by detail observation and qualitative interpretation of business practice, communications, interactions, and behavioral pattern in real life situation. Therefore, this conceptual framework is a right choice for proposed qualitative investigation.

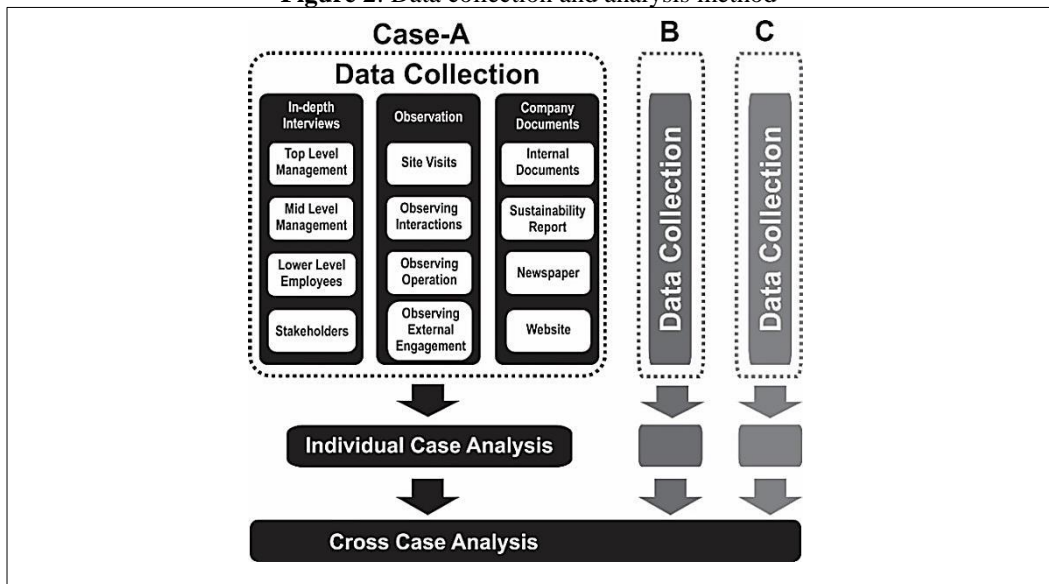
3. METHOD

Following Yin (2009) and Gerring (2004), the authors selected qualitative case study method. The study is explanatory in nature as it contains why and how research questions. One case runs the high risk of being considered as subjective or non-scientific (Yin, 2009; Burns, 2000). So, three cases had been selected from three business sectors in Bangladesh: Case-A (Telecom company), Case-B (Real-estate company) and Case-C (Garments manufacturer). Cases had been selected based on their apparent size of operations, age, and accessibility of the researchers. Multiple cases from different contexts help compare findings and ensure the generalizability of theory (Drake, Shanks, & Broadbent, 1998; Stake, 1995; Yin, 2009).

In this research, three different techniques have been used for data collection: (1). Semi structured interviews, (2). Non-participant observation, (3). Review of company documents and website (Please see Figure-2 for data collections and analysis method). Primary data has been collected through 21 (twenty one) in-depth interviews with the top managers, middle managers, lower level employees, suppliers, customers and other stakeholders of respective business organization. The interviews were conducted in informal settings and supplemented by open-ended questions. All interview responses were written down and translated. Non-participant observations (site visits and day-to-day activities related to adaptation) by researchers also recorded through field notes and photograph. Secondary data have been collected from company's sustainability report, newspapers, and websites.

Firstly, data were interpreted to identify direct and indirect impacts of climate change on different business process of each case organization (as in Table-3). Secondly, using content analysis, data were categorized according to six themes of conceptual framework to have an understanding of adaptation process and possible drivers or barriers of adaptation in each case. Then cross-case analysis, mainly comparing findings from individual cases, was carried out to summarize findings and draw conclusion. Data triangulation, crosschecking, and participant's feedback were rigorously followed.

Figure 2: Data collection and analysis method



4. FINDINGS

Table 2: Adaptation process of case organizations

Perception	→ Evaluation →	Enactment
<p>From the analysis it is evident that business perception on the impact of climate change is very weak in Bangladesh.</p> <p>--Though all managers mentioned different external risks as drivers of adaptation, they did not strongly believe that climate change may bring any opportunity.</p> <p>--Most lower employees at recognized different climate stimuli but failed to relate it with business.</p>	<p>Every case mentioned that based on the capacity and available resources of the organization they decides on adaptation actions.</p> <p>--While exploring adaptation options, managers give priority to issues that are experinced and need immediate actions. So, adaptation is reactive.</p> <p>--As companies, except Case- A, have no separate unit or person to assesses climate risks, they, with limited information, capacity, take actions only short term basis and lack well planned long-term strategies to creat societal resilience.</p>	<p>From cross case analysis the authors identified primarily three types of adaptation practices: climate proofing own operation, providing climate proofing products, engaging with external bodies.</p> <p>--From the Table-4, it is clear that organizations in Bangladesh have very limited visible adaptation practices. Though Case-B and Case-C have some activities for climate proofing their operations, none of them provides any climate proofing products or engages themselves with govt./NGOs in adaptation activities to increase the resilience of the community. They do some CSR activities on voluntary basis, but those activities are not well organized or perfectly aligned with adaptation needs of the community. Examples of Public-Private-Partnership Projects are also very few.</p>

Table 3: Direct and Indirect impacts of climate change on case organizations

Bus. Process			Direct Impacts		Indirect Impacts				
Case-A (Telecom)	Case-B (Real estate)	Case-C (Garments)	Extreme events: cyclone, flood, rainfall,	Gradual change: Increasing Temp., Water Scarcity	By Regu-lation	By Techn-ology	By Supply chain	By CustomerDe-mand	By Market /Social force
Procuring land for infrastructures			Climate affected lands are avoided for infrastructures.				Low demand for flats.	High land price	
Designing and building permit			Both design cost & time increased as more environ. Parameters are considered.		Land use policy & building code are become hard.				
Market-ing Plan			Reduced talk-time/ revenue in cyclone/ flood affected locality.				New climate proofing services: health line, early warning system.		
Market-ing plan			Reduced price of apartments/ flats in floods /cyclones prone areas.		-Longer time is necessary to get building permit & utility connection.		Difficulty in Export/ Import / Shipment at port for bad road network/ weather.	Investor'/Cus-tomer' preference for environment friendly plants and buildings.	Media/ social activists protest Environ. sensitive develop--ment.
Market-ing plan					-Imported green materials are costly for high Taxation.				

Infrastructure building	Construction	Production	Extreme events hamper construction works/production and increase cost-time.	-Salinity decreases quality of sand, brick. -Heat stress /diseases decrease productivity	-Tougher regulations for utility connection increase fuel cost. -Adaptation technology (recycling waste, renewable energy) is costly.	Difficulty to deliver raw materials to site. -Scarce water hampers operation.
Transmission			Towers & equipment at stations are damaged by flood/cyclones.	-Equipment malfunctions in high temperature. -Higher energy cost for cooling.		Customer's confidence decreased due to hampered network
Maintenance			Gradual damage of infrastructures causes high maintenance cost			Delay in maintenance for staff/supplies.

Table 4: List of adaptation practices taken by case organizations.

Objectives		Types of activities	CaseA	CaseB	CaseC
Reducing risks	Climate proofing own operation	Energy efficient equipment	✓	✓	✓
		Green building/climate proof infrastructures	✓	Partial	Partial
		Green Supply Chain	✓	x	x
		Green Transportation	x	x	x
		Sources of Renewable Energy	✓	Partial	Partial
		Water Management	✓	x	Partial
		Recycling Waste	✓	x	Partial
		Communication by			
		Training to employees, suppliers/customers	✓	Partial	Partial
Siezing opportunities	Climate Products	Advertisement, packaging, website, CSR report	✓	x	x
		Climate proofing products	✓	x	x
	Engaging with external bodies	Climate proofing services	✓	x	x
		With other businesses	✓	x	x
		With Government	✓	x	x
		With NGOs/Communities	✓	✓	✓
		With international bodies	✓	x	x
Bearing risks		Energy and water crisis	x	✓	✓
		Green Supply Chain	x	✓	✓
		Waste management	x	✓	✓
Diversification		Investment in new business	✓	✓	✓

Table 5: List of drivers or barriers of adaptation.

	External	Internal	Enabler	Barrier
Climate	Direct climatic risks		Physical impacts (Cyclone, flood, rise of temperatura) on infrastructures and supply chain influence business to adapt.	
	Uncertainty		For uncertain or unpredictable nature of climate variables, organization's perception is not clear.	
Social		Employee Awareness	Low awareness among employees about climate change prevents adaptation.	
	Stakeholders' Awareness		Customer, business partners, investors, media & social acitvists have less influences on adaptation	
	Political unrest		Lack of political stability make mangers afraid of further investment in adaptation.	
	Corruption		Corruption both in corporations and govt agencies discourage business to adaptation.	
		Leadership	Lack of corporate leadership to consider climate agenda in business decsion	
Techno		CSR	CSR is not directed at adaptation needs of society.	
	Information		Due to lack of information & research, organizations fail to relate climate impacts on businesses.	
Economic	Technology		Higher initial cost of adaptation technology and skill manpower to operate them	
	Regulation		Unfriendly regulation & disintegrated poilcy fail to attract and incentivize priavte sector .	
	Market force		Oppotunity to invest in climate proofing products/infrastructures.	
		Resource	Lack of easy access to adaptation finance	
		Capacity	Lack of expertise to asses climate risks/opportunity	
		Size of Org.	Larger businesses adapt more.	
		Security	Organizations do not want to disclose strategies	

5. DISCUSSION

Private sector's perception and belief of climate change is still very hazy, that is why organizations, except Case-A, fail to recognize business opportunities or to develop new climate proofing products. Their engagement with government or communities is also very limited (see Table-4). In spite of having a number of opportunities to invest in urban or rural climate resiliency projects like slum upgradation, water desalination, community healthcare, still now any organization did not invests in such projects. Their limited CSR activities are not properly directed towards actual adaptation needs of the vulnerable community. Most of the interviewees from lower management fail to relate impacts of climate change on their business. Moreover, business partners, competitors, customers, and civil society fail to exert considerable pressure on organizations to be engaged in adaptation. These are due to lack of proper awareness among business community and general people as well. Supporting the fact previous authors like Agrawala et al. (2011), Arnell and Delaney (2006), and Hoffmann et al. (2009) state that before going to take any adaptation measures organization must be aware of potential risks and possible solutions for it. From Table-4, we can see that Case-A is more active and takes diverse range of adaptation activities. This is because of several reasons. First, Case-A is the largest company and has more financial and managerial capacity than other two. Second, it has a foreign shareholder and rich corporate leadership and culture including employee awareness programs and dedicated 'Climate Champion' post to deal

with climate change. So, we can infer that firm's capacity (Bleda and Shakley, 2008), apparent size and leadership (Carol et al, 2011; Berkhout, 2012) can positively influence the engagement in adaptation. Table-5 lists all the possible external and internal (climatic or non-climatic) factors or drivers that motivate organization in adaptation. We can see that in context of Bangladesh most drivers are acting as barriers due to incompleteness. Except political unrest, all other barriers like corruption, resource constraints, information gap, unfriendly regulations, inadequate infrastructures, and technology are considered essential characteristics of business environment in any developing countries like Bangladesh. Those barriers not only hamper business engagement in adaptation but also stand as obstacles for overall development of private sector. We also notice that Case-B and Case-C selected flood free lands for their buildings. However, in spite of facing sever energy and water crisis, they did not take any precautionary measures like having plants for renewable energy, rainwater harvesting to meet future demand. Case-B is aware that demand for green building is increasing, but they did not take any initiative to produce full green buildings. They are still waiting for strong market forces or regulatory change come in to effect. Therefore, we can say that their adaptation strategies are reactive in nature. They follow 'wait and see' (Berkhout et al., 2006) or 'deferred' (Gasbarro & Pinkse, 2016) adaptation strategies or they do not have financial capacity to adapt.

6. CONCLUSION

To conclude we can say that the overall scenario of private sector engagement in adaptation to climate change in Bangladesh is fully unsatisfactory. Having extreme desire for profit maximization, disregard for social and environmental responsibility, weak leadership and corporate self-regulation, businesses in Bangladesh fail to engage in adaptation to climate change as desired. The government, of course, has significant lacking to allocate resources and provide enabling policy. Though companies recognize some climate change related threats or opportunities, they do not engage in adaptation with full potential due to many barriers that are beyond their control. Engaging academia to do more research, communicating proper information through media & academic curriculum, giving training to corporate managers, making access to adaptation finance easy, enforcing proper laws and regulations, and providing incentives and supporting infrastructures government can expedite the engagement of private sector in adaptation to climate change in Bangladesh.

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