

Analysis of Adaptation and Mitigation Strategy of Bangladesh in Relation to Sustainable Built Environment

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Abstract

This article introduces adaptation and mitigation strategy of Bangladesh as the national policy framework, assesses the strength and weakness and proposes some key ideas in relation to sustainable built environment. Government emphasizes on adaptation considering rural necessity rather than mitigation as opposed to present international focus. Secondly, there is lack of coordination in adaptation and mitigation activities. However, Bangladesh was placed *first* position in NAPA documentation in 2005 among the LDCs though NAPA ignored community's observation and experiences. Formulation of BCCSAP in 2009 was another 'living document' to properly address the adaptation and mitigation strategies through technological innovation and financing. Adaptation and mitigation comes hand in hand with some opportunities and threats. In addition, preventive adaptation always prevails on last moment emergency mitigation. Therefore, adapt and mitigate 'NOW', ensure a strong link to adaptation and mitigation with sustainable development, incentives on renewable energy and electricity generation, integrated urban solution, research & development and establishment of the code of sustainable built environment can make differences and can help in achieving national objectives.

Keywords: Adaptation, Mitigation, Sustainable, Built environment.

Introduction

Adaptation can be defined as adjustment in ecological, social, or economical systems in response to actual or expected climatic stimuli and their effects or impacts - either beneficial or adverse (Smit and Olga, 2001, 881). Assessments of Impacts and Adaptations to Climate Change (2007) demonstrated that the adjustment process refers to learning about risk, evaluating alternatives response, revising suitable conditions for adaptation, and utilizing resources. A worker shifting from one business to another which is well suited to the respective environment is an example of adaptive process. Adaptation programs sometimes lead to sound mitigation and, successively, many mitigation options can promote adaptation also. On the other hand, IPCC (2001) defines mitigation as "anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases." According to Danga, Michaelowaa and Tuanb (2003, 81-96),

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adaptation is used as a substitute for mitigation. Both of these are closely associated with each other-the more mitigation earlier adopts, the less adaptation later (Ayers and Huq, 2008). There is a growing trend of policy formulation in adaptation cost but mitigation research remained still in its initial state (Fankhauser, 2009, 3-4).

It is well recognized that Bangladesh is one of the most climate vulnerable countries in the world. Loss of life, infrastructure and economic assets, and severely impact on lives and livelihood are very regular phenomena of this territory. Adaptation and mitigation strategy in relation to policy issues are closely linked in areas of sustainable development (Figure:1). Due to proper adaptation and mitigation strategy; problems of sustainable built environment issues will exacerbate day by day. The challenge of Bangladesh now is to scale up the investments to create a sustainable built environment for the economic and social development of the country in the face of climate change.

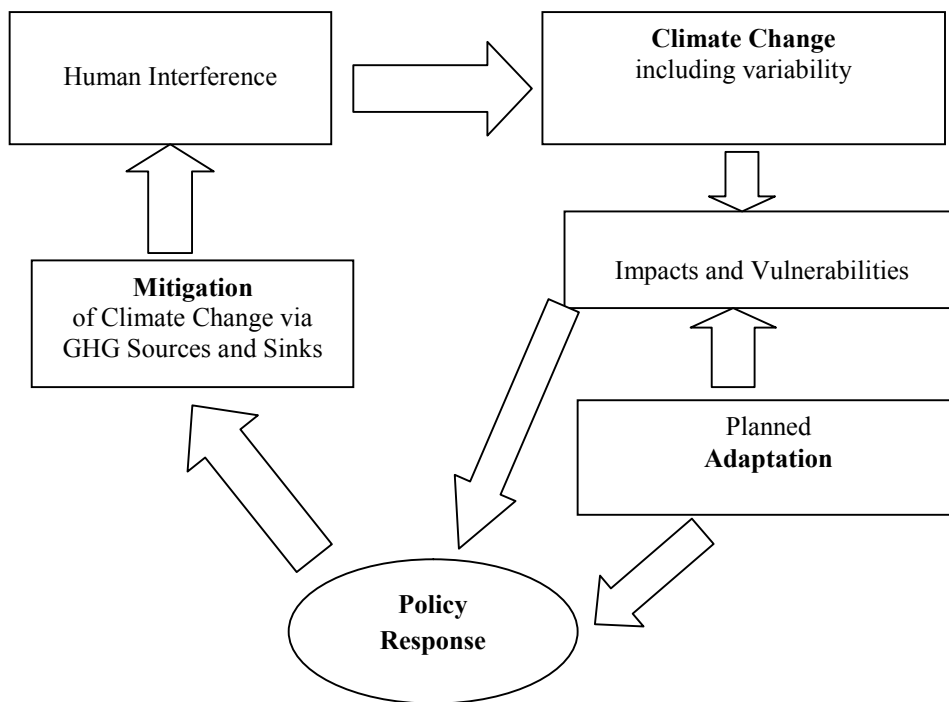


Figure 1: Adaptation and mitigation to climate change in sustainable development (Smit and Olga, 2001, 881-882).

For Bangladesh case, the National Adaptation Program of Action (NAPA) was prepared according to the guidelines of the Conference of the Parties (CoP7) of the United Nations Framework Convention on Climate Change (UNFCCC) (MoEF, 2005, 3). Bangladesh is one of the most vulnerable LDCs to climate change due to its natural geographical settings, lack of institutional capacity, low investment, and excessive dependency on natural resources. All development policies of our country are greatly affected by climate change. Climate change is inevitable and challenges are also enormous but not unconquerable. However, much research on adaptation and mitigation policy issues in the light of Bangladesh has been done in segregated way and they failed to find out the crucial need of the challenge of climate change. To diminish those crucial challenges, strategy and policy are urgently needed in adaptation, mitigation and sustainable environmental development area. This paper represents a new approach in existing policy framework and critical analysis of the framework of that policy in relation to the strategy is taken.

Literature review

Adaptation and mitigation offer a window of opportunities to revisit sustainable development strategies from a new perspective. Ayers and Huq (2008) revealed that mitigation and adaptation can bestow on sustainable development achievement in climate policy and practice issues. Mitigation study mainly concentrated on technological and economic issues through 'top-down' approach to limit 'greenhouse gases for a long time. However, adaptation research focused on local and situation based analysis is done to keep down immediate and short-term effects in most vulnerable countries. People, property, economic activities and environmental resources are at risk due to climate change (Fankhauser, 2009). It is evident from the study of Danga, Michaelowaa and Tuanb (2003, 81-96) that put into action of adaptation side by side with mitigation is a debatable issue from political, environmental and economical point of view. They also found that higher the aspiring target of adaptation and mitigation, higher the cost of implementation. Several other studies manifested that till today, mitigation and adaptation have been given little attention in planning process of national sustainable development agenda in many developing countries. However, some important benefits have been imparted, if mitigation and adaptation are implemented and integrated. These two strategies are deemed as mutually exclusive at worst and parallel at best.

IPCC (2014, 6-7) emphasized that climate change risk is reduced and managed through complementary strategies of adaptation and mitigation activities for sustainable environment. IPCC (2007) revealed that more extensive adaptation is badly needed to curb vulnerability to climate change because of

unknown barriers and limiting factors. In addition, integrated approaches link to adaptation and mitigation with other societal objectives largely contribute in effective implementation of proper policies and cooperation in all scales. IPCC (2007) also disclosed that vulnerability to climate change, green house gas emissions, and magnitude of adaptation and mitigation are strongly influenced by livelihood, lifestyles behavior and culture.

According to International Finance Corporation (IFC, 2010, 3) it is divulged that globally adaptation is more a public sector focused issue than mitigation. It is a crying need to fulfill adaptation and mitigation priorities of developing countries even by the private sector expertise in technology and service delivery arena.

Aim of study

The aim of the study is to develop a policy framework in relation to the delivery of sustainable built environment for Bangladesh with special reference to ‘Adaptation and Mitigation’.

Objectives of the study

The specific objectives of the study are as follows:

- a) To understand the current policy framework of adaptation and mitigation perspective in sustainable built environment for Bangladesh.
- b) To critically analyze and review the current policy framework of adaptation and mitigation strategy in sustainable built environment.
- c) To recommend some priority policy issues of adaptation and mitigation in response to upcoming challenges and to formulate a high-vision, well-suited policy framework from local, national and international perspective.

Limitation and scope of the study

The study on ‘Analysis of Adaptation and Mitigation Strategy in Sustainable built Environment’ for more often natural calamity stricken developing country like Bangladesh was not easy. Notwithstanding the continuous efforts, this particular research has few limitations to review. Lack of available data on sustainable built environment in relation to adaptation and mitigation aspects restrained the selection of factors and indicators involved. No previous comprehensive study outcome was found to analyze for Bangladesh case. In addition, time and pertinent information constraints may affect the validity of the study findings, though expert interviewees were badly needed on the relevant issues.

Future study covering comprehensive data collection survey from different Government and Non-government departments/institutions, financial and regulatory body, commercial private organizations, academicians, researchers, policy takers and policy makers are recommended. Widening the factors involved and expand analysis domain of those factors and their relevant strength and weakness may be considered for further study. Scope of research can be extended through conducting econometric and financial impact on sustainable built environment in relation to adaptation & mitigation strategy with or without encompassing other developing country perspectives.

Methodology

This study was carried out on the basis of secondary data such as published books, magazines, journals and newspapers, newsletters, official directories, manuals and adaptation & mitigation reports and brochures, archival records of government and private sector organization. Relevant Acts, Rules and Regulations of Bangladesh, articles and reports on climate change adaptation and mitigation were also taken into consideration. Internet was very important secondary sources of information for this research work. Original information was taken through utmost care with sincerity. For ensuring authenticity and reliability, Portable Document Format (PDF) articles for data and information were taken into consideration and editable documents and spam sites were avoided carefully. As proofs of evidences, exact URL along with date were noted down to retrace the same documents for proper referencing. Relevant information and data would be analyzed by a combined approach of content analysis and descriptive statistics. Quantitative and qualitative data from secondary sources were utilized for analysis of descriptive statistics.

Outline of existing adaptation and mitigation policy

Bangladesh, like other LDCs, is least responsible for cause of climate change (Venema and Cisse, 2004, 47-63) but severely affected by it. Increasing awareness is the first and foremost initiative by national drive to climate change with a focus on adaptation rather than mitigation. During mid 1980s, these awareness programs were found in civil society groups and some NGOs (e.g. Bangladesh Centre of Advance Studies, BCAS) activities but not seen as government policy or programs. Bangladesh Centre of Advance Studies (BCAS) acts as a bridge between government and other NGOs in climate change efforts. Government has formulated two important documents such as Comprehensive Disaster Management Program (CDMP) in 2003 and National Adaptation Plan of Action (NAPA) in 2005. CDMP was adopted to lessen the vulnerability of natural and anthropogenic problems along with climate change impacts. Likewise, NAPA was designed to pay attention to the adverse impacts of climate change and to boost sustainable development of the country (MoEF, 2005, 4). The NAPA document covered 6 sectors: a) Water, coastal area, natural disaster

and health b) Agriculture, fisheries and livestock c) Biodiversity, forestry and land use d) Industry and infrastructure e) Food security, livelihood, gender and local governance and f) policies and institutions. Identification and analysis of problems of adaptation, preparation of framework for those and find out the adaptation necessities are the core task of NAPA document (MoEF, 2005, 5).

Bangladesh Climate Change Strategy and Action Plan (BCCSAP) has been formulated in 2009 to overcome the hurdle of climate change effects and impacts (MoEF, 2010, 1- 6). The BCCSAP was considered a 'living document' in implementation of adaptation and mitigation along with in-depth understanding of the phenomenon (MoEF, 2009, xiii). In order to address Climate change adaptation and mitigation through technological innovation, and financing, climate change trust fund (CCTF) was set in 2009. This 10-year Action Plan (2009-2018) has taken many projects in adaptation and mitigation arena such as food security and health, social protection, comprehensive disaster management, infrastructure, low carbon emission, capacity building and institutional empowerment by the financial assistance of CCTF. Bangladesh generate very negligible amount of carbon emission now. However, demand for energy consumption is increasing with increasing trend of economic development. To ensure energy security, government encourages more energy production and utilization of conventional energy sources. In addition, importance is also given on coastal greenbelt, social reforestation and renewable energy such as solar panel, and biogas plant for adaptation and mitigation strategy. Other mechanisms such as Reducing Emission from Deforestation and Forest Degradation (REDD), Clean Development Mechanism (CDM) and needed technology transfer from developed countries can be applied to keep low carbon generation paths. Bangladesh has placed its Initial and Second National Communication report to the UNFCCC secretariat in 2002 and 2012 respectively. The second report has affirmed the ultimate dedication of the government to achieve its goal and objectives in low carbon development (MoEF, 2012, 85-99).

Existing policy framework

The National Adaptation Plan of Action was formulated in Bangladesh to adapt and sustain with the increase in temperature, sea level rise, and other natural and manmade calamities such as flood, salinity and drought. Different climate Models reported that there was a steady increase in temperature along with some seasonal variations. One Model reported that the trend of average increase in temperature would be 1.3⁰C and 2.6⁰C in 2030 and 2070 respectively (MoEF, 2005, 10). In addition, increasing or decreasing precipitation would play a crucial role on climate impacts resulting in water related disaster.

It is observed that country's economic growth is often halted and challenged by climate change. Frequent floods, cyclone, storm, droughts play havoc with the development and economy of the nation and thus jeopardize the future economic well-being and livelihoods of the people (MoEF, 2009, 1-13).

This Action Plan, important segment of overall country development strategy, is based on the four building blocks of Bali Action Plan- adaptation, mitigation, technology transfer and timely and adequate flow of investment fund. As adaptation is the short and medium term priority agenda for Bangladesh; putting the Bali roadmap into action, deep cut of GHGs emissions will be long-term expected agenda for climate resilience. The cornerstone of the Initial National Communication (INC) was on effects and vulnerability of climate change and on emission inventory, whereas the Second National Communication (SNC) emphasized both on INC report plus adaptation and mitigation issues. This document provides ideas, policies and actions on mitigation and its challenges and thus considered as a landmark event for Bangladesh (MoEF, 2012, 96-97). The emission inventory of GHGs was prepared from five major sectors such as energy (biomass burning, transport sector), industry (cement, fertilizer, paper and pulp), agriculture (ruminant livestock, manure management, wet rice cultivation), waste management and changing pattern of land use. It is estimated that in 2005, per capita carbon emission was 0.23 ton per year and total population was 137 million. From 2005 to 2030, total emission including all segments of GHGs measured by using LEAP Model and found that yearly growth was 2.96 percent and among them energy sector was the highest (6.39%) (MoEF, 2012, 90-91). To meet the target of 80% reduction of global emission by 2050, Bangladesh as a signatory of Kyoto Protocol, set a comprehensive carbon emission goal. Since renewable energy in the form of biomass comprises 35-60 of total energy use, government can achieve this target by utilizing renewable energy sources through 5% of total power demand by 2015 and 10% by 2020 (Power Division under MPEMR, 2008, 3-8). Therefore, low carbon development initiative taken by Bangladesh is regarded as a stepping stone for sustainable economic development.

Critical review of existing policy

Integration of adaptation and mitigation plans into national policy approach is badly needed for international negotiations. International efforts in climate change impacts largely concentrate on mitigation issues especially in reduction of emissions of green houses gases (GHGs). Due to lack of political commitment, northern initiative was not available and in some cases, irrelevant for Bangladesh's priority policy agenda (Ayers and Huq, 2008). As government's focal point on adaptation due to rural priority consideration rather than mitigation, international incentives were out of hand in action. Here government's action plan could not meet with national strategy. Likewise, there is absence of concentrated efforts in adaptation along with disaster risk reduction management and mitigation activities in which former was coordinated by Department of Environment and later was organized by a high-powered body and MoEF. Despite this, Bangladesh has made notable achievement in adaptation especially in disaster risk reduction. In case of NAPA documentation, Bangladesh was placed in first position among the LDCs to the UNFCCC.

However, lack of awareness, inappropriate incorporation of climate change effects into development policy, planning and programs and scarcity of sufficient tools, knowledge and ineffective methodology act as barrier in implementation of NAPA.

Some new action areas were included in BCCSAP document such as water resources and its management, low carbon development paths, development of institutional and human capital in addition to adaptation for identifying intervention sector and proper management of investment through research and knowledge sharing (MoEF, 2009,1-13). It is both a core policy, strategy and action thrusts in response to the risk of climate change (MOEF, 2012, 85-99). In addition, this action plan considered the priorities of the poor and vulnerable, including women and children in its all activities. However, NAPA ignored community's observation and experiences.

Government has framed its vision and policy statement – ‘electricity for all by 2020’ in February 2000 in phases because of constitutional obligation (Article 16 of ‘The Constitution of the People’s Republic of Bangladesh’). However, at present national electricity coverage is only 76 percent. So, mitigation activity must be coinciding with energy security. Otherwise, low carbon development is not possible in response to the Kyoto Protocol and UNFCCC guidelines. Though Bangladesh has some success story in adaptation activities among LDCs. Till today, Bangladesh has no carbon emission policy, Rules, Regulation or Act or no binding targets, both now and in the future. On the other hand, UK Climate Change Act, 2008 clearly set some short and long term targets such as 34% cut by 2020 and 80% reduction in GHGs emission from 2009-2050 respectively and to reach these targets, five-year ‘carbon budget’, ‘green deal’ and ‘low-carbon transition plan, 2009 for heavy industry’ were established (Bowen and Rydge, 2011, 17-18). Government of India (2008, 1- 6) identified eight core ‘national mission’ including ‘Green India’ which deals with afforestation of 6 million of degraded forest area and increased new coverage from 23% to 33% inside Indian border.

Conclusion and way out for reforming policy

Adaptation and mitigation activities have appeared and operated independently in Bangladesh (Ayers and Huq, 2008). Without planned adaptation and mitigation program, people will cope up with the changing conditions of sustainable built environment by huge cost and residual damage or harm (Smit and Olga, 2001, 881). These two strategies and comprehensive approaches are significantly important for managing sustainable built environment. It is evident from the study that the more mitigation now, the less adaptation in future. Government emphasizes more on adaption than mitigation due to local needs and priority consideration. In addition, Bangladesh has made significant advancement in NAPA documentation in 2005 and formulation of BCCSAP in 2009.

However, lack of coordination among different government departments, institutions and non-government organizations is frequently observed. There is no magic bullet in mitigation and adaptation policy in solving the adverse impacts of climate change. It can be concluded that the following recommendations may help the policy makers, and researchers to meet the new challenges and to formulate a high-vision, well-suited policy framework from local, national and global perspective.

Adapt and mitigate ‘now!’

Adaptation and mitigation bring about both opportunities and threats. Effect of climate change cannot be completely avoided. Burton’s views on coercive and last-moment emergency is less effective, inappropriate and more costly than preventive adaptation (1996 cited in Smit and Olga, 2001) that supports the proverb ‘ A stitch in time saves nine.’

Link adaptation and mitigation with sustainable development

Threats of adaptation and mitigation activities often force to underscore development goals. Without adaptation and mitigation, development is impossible. However, without development, adaptation and mitigation are useless. Strengthening cooperation among implementation institutions plays vital role in this regard.

Providing conditions for enabling adaptation and mitigation

Scare resources, poor governance, weak institutional arrangement, and lack of relevant knowledge interfere in the path of adaptation and mitigation strategy. Therefore, favourable condition is a must to enable the adaptation and mitigation process.

Increase consciousness and knowledge based society

Both consciousness and knowledge are critical issues for climate change and its potential risks, technical know-how, and vulnerability in adaptation and mitigation. Protection and preservation of natural resources will act as an added advantage.

Strategy should be case sensitive and place-specific

GHGs emission varies with type and nature of environment along with design, construction materials, and other associated factors contributed in the adverse effects of climate change. Therefore, green deal strategy must be compatible with case sensitive and place-specific involving other risk factors in risk.

Incentives on renewable energy and electricity generation

Renewable energy can be utilized as alternative source to meet the challenges of energy security. Strategy should be developed to use 100% renewable energy by 2050. Investment in renewable energy should be exempted from corporate income tax and it will be extended periodically through impact assessment of tax revenue. Enhancing energy efficiency and low carbon emission from electricity generation, at least 10% higher incentive tariff can be imposed.

Technological innovation along with research and development

Technological innovation can make a difference in energy efficiency. There are lots of scope to enhance energy efficiency in air-conditioning, other environment, transport, and industrial plants by investing more in research and development in renewable energy. For example, to reduce emission over the long term, emphasis on solar energy can be one of the cost effective options in this regard.

Establishment of the code for sustainable built environment

This Code will ensure minimum standard for design and construction stage along with energy, and water consumption, waste management and using materials.

Carbon emission reduction target

This target will be reflective with emission inventory and its short and long term projections in the light of climate change effects and impacts.

Development of integrated urban solutions

Promotion of energy efficiency especially in housing, transport and industrial cluster activities can be ensured by development of integrated urban solutions.

Energy efficiency and performance certificate

Establishment of energy efficiency and performance certificate with a label 'A to E' based on some standard criteria is required. Here 'A' for most energy efficient and 'E' for the least especially for environment.

Green investment bank

Free flow of sufficient investment in green deal can be ensured by development of special banking activities with low interest rate and flexible conditions.

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