



# Development of Climate Change Perceptions and Programmes (1980-2020) in Bangladesh: Lessons Learned and Way Forward

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**Abstract** – Climate change related knowledge and activities have been evolved, and Bangladesh tried to figure out appropriate pathways to address climate change challenges sustainably. This paper critically examined the chronological progression of climate change action programs performed in Bangladesh, aiming to identify the factors that created varied forms of confusion in tackling climate change threats. This review based work identified that the concept of climate change has conveyed into the contexts through disaster management discourse in Bangladesh. Climate change understanding and action programs could be divided into three groups (early-stage (1980-2000), mid-stage (2001-2010), and third stage (2011-2020)). While early-stage works related to the basic understanding of ozone layer depletion, greenhouse effect, global warming, and their impacts on natural resources and physical functions, mid-stage reports contain impact narratives on different sectors and outlined action plans. The third stage reports have firm commitments to reduce climate change vulnerabilities of people, processes, and systems. In this stage, climate-resilient development is proposed through mainstreaming climate change investments/expenditures into regular development programs of the government. The roles of actors (both individual and institutional) from the government to non-government entities, varied and conflicting interests (e.g., personal, thematic, and need-based), struggle among the institutions over control over actions/processes. Moreover, local works have little influence on institutional and policy-making processes related to climate change compared to the impact made by global level reports mainly produced by international agencies.

**Keywords** – Bangladesh, climate change, climate change adaptation, climate change policies, climate change research.

## 1. INTRODUCTION

Bangladesh has always been seen and presented as uniquely exposed to environmental risk, which has been and is being amplified by climate change. Moreover, different types of hydro-meteorological are primarily originated from the process and dynamics of climatic elements such as temperature, rainfall, humidity, air pressure, wind direction, sunshine. The genesis of these hazards is started being explained by international scientists as results of ozone layer depletion coupled with global warming in the nineteen hundred eighties. Later, scientists refined their proclamations by stating that climate change is responsible for causing the hazards with magnified magnitude (e.g., the First Assessment Report of IPCC, 1990). This inference about climate change made by IPCC (Intergovernmental Panel on Climate Change) scientists and related guidelines provided by UNFCCC (International Climate Change

Framework Convention on Climate Change) influenced state policies in making climate-sensitive institutional framework and designing adaptation and mitigation programs.

It has been observed that four decades of assessment and trails of climate change activities in Bangladesh did not bring effective outcomes. Based on which the country could figure out appropriate pathways (e.g., developing policy and institutional frameworks) to address climate change challenges that are economically efficient, socially acceptable, physically viable, and ecologically sustainable. In this backdrop, this paper critically examined the chronological progression of climate change action programs performed in Bangladesh, aiming to identify the factors that created different types of confusion in tackling climate change threats. Reviewing literature was the principal method to conduct the assessment.

## 2. CHRONOLOGY OF CLIMATE CHANGE WORKS IN BANGLADESH

Disaster events have been the common challenges for Bangladesh, where people adapt themselves to the situations. However, the institutional makeup, priorities, and actions of the state agencies were strongly influenced by the execution of vulnerability reduction efforts for the people, processes, and systems. Bangladesh disaster history has some significant events such as the Bengal Famine of 1943; consecutive severe floods happened in the years 1953, 1954, 1955; the severe cyclone in 1970; famine in 1974 due to

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Brahmaputra flooding and crop failure; widespread and prolonged floods in 1987, 1988; the cyclone in 1991; cyclone Sidr in 2007 and Aila 2009. These events were generally treated as extremes of hydro-meteorological functions. However, during the late 1980s, with the emergence of the concept 'ozone layer depletion' 'global warming' arguments made by the international scientists that the origin of these disasters are linked with these processes. Climate change related research in Bangladesh was started in 1978 when Ganges, Brahmaputra, and Meghna river systems were studied as a part of the global carbon transport program [1]. From 1994 to 2017, more than five hundred articles have been published in peer-reviewed journals on climate change issues of Bangladesh [2]. Apart from these, dozens of local studies and reports in Bangladesh have been appeared focusing on climate change concepts, sectoral impacts, advocacy strategies, critical appraisals, making commitments to global communities, especially to UNFCCC. Table 1 gives a chronology of local works that shows how climate change understanding and action programs have evolved in Bangladesh during the last forty years. The works could be divided into three groups, as outlined below.

- (i) The early-stage (1980-2000) works aimed to make understanding clear which focused on knowing the facts of ozone layer depletion,

greenhouse effect, and global warming and their impacts on natural resources and physical functions and processes of Bangladesh.

- (ii) The mid-stage (2001-2010) reports contain impact narratives on different sectors and outlined action plans. During this stage, discussions/arguments made a sharp departure from global warming concepts and replaced them with the term climate change.

At the early stage, a group of scientists and researchers writing their reports echoing in a similar way the global institutions did. They commissioned research works (e.g. [3]) aiming to establish the linkage between local natural disasters with global temperature rise (or climate change). Reports developed during these times on Bangladesh conducted by international research institutions such as the Centre for Environmental and Resource Studies (CEARS, New Zealand), Climate Research Unit (CRU, UK), and these have appeared immediately after the publication of the first assessment report of IPCC [4]. At the same time, [5], [6], [7] examined the climate change induced vulnerabilities in Bangladesh, focusing on different dimensions. The first formal response from Bangladesh Government took place in 2002 with the submission of Initial National Communication (INC) to UNFCCC [8].

**Table 1. Chronology of significant works on climate change in Bangladesh undertaken by different agencies.**

No.	The significant works/titles on climate change	Year	Agencies who carried out the work	Impacts/contributions of the work
1.	The greenhouse effect and coastal area of Bangladesh; Part I report and Part II report	1989 [9]	Coastal Area Research Development and Management Association (CARDMA)	Develop board understanding on climate change impacts
2.	Guidelines on disaster management in Bangladesh Volume 1 – Pre-disaster phase activities Volume 2 – An action plan to combat disaster impacts Volume 3 – Disaster response in the first three weeks of disaster occurrence Volume 4 – Communication strategies, information management, and conclusion	1993	Md Saidur Rahman BDPC (Bangladesh Disaster Preparedness Center) with support from PACT Bangladesh	Field level guidelines to manage disaster impacts
3.	The Greenhouse Gas emissions and climate change – Briefing document 1 Sea level changes in the Bay of Bengal – Briefing document 2 Effects of climate change and sea-level rise on natural resources of Bangladesh – Briefing document 3 Socio-economic implications of	1994 [3]	BUP (Bangladesh) CEARS (New Zealand) UEA Norwich (UK)	The initial stage to work to develop a comprehensive understanding of Greenhouse Gas (GHG) emissions, impacts of global warming, and climate change

	climate change for Bangladesh – Briefing document 4			
	Legal implications of global climate change for Bangladesh – Briefing document 5			
	Climate change and sea-level rise: the case of the coast – Briefing document 6			
	The implications of climate change for Bangladesh: A synthesis – Briefing document 7			
4.	Vulnerability and adaptation to climate change for Bangladesh	1999 [6]	S. Huq; Z. Karim; M. Asaduzzaman, F. Mahtab	Climate change vulnerability and adaptation provisions
5.	Living with floods	1999 [5]	Imtiaz Ahmed (Ed.)	Local experts understanding on floods
6.	Bangladesh: Climate change and sustainable development	2001 [7]	World Bank	Efforts to harmonize climate change with development targets
7.	Initial National Communication (INC) report submitted to UNFCCC	2002 [3]	Ministry of Environment and Forest (MoEF), GoB	National report to UNFCCC
8.	Comprehensive Disaster Management Programme, Phase I (2003 – 2008)	2003	Several studies were conducted; the Development of Community Risk Assessment (CRA) instrument is one of the key works.	A five-year program that contributed to developing many knowledge products on climate change
9.	Climate Change impacts and vulnerability: A synthesis	2006 [10]	Ahsan Uddin Ahmed, Climate Change Cell, MoEF	Climate change vulnerability
10.	National Capacity Self-Assessment (NCSA) developed for Global Environmental Management	2007 [11]	UNDP; GEF; IUCN	National study as part of (UNFCCC) global study to examine environmental conditions
12.	Climate change in Bangladesh: A closer look into temperature and rainfall data	2010 [12]	Sheikh Tawhidul Islam; Ananta Neelim; published by UPL	Assessment on climate change focusing on local temperature and rainfall data
13.	National REDD (Reducing Emissions from Degradation and Deforestation) proposal submitted, and Bangladesh become an UN-REDD partner country	2010	MoEF, GoB	GHG emission reduction program along with activities to reduce climate-induced vulnerability
14.	Climate change: Issues and perspectives for Bangladesh	2011 [13]	Rafique Ahmed; S. Dara Shamsuddin, published by Shahitya Prokash	A critical assessment of climate change based on local understandings
	The Political Economy of Climate Resilient Development Planning in Bangladesh	2011 [14]	Khurshid Alam, Md Shamsuddoha, Thomas Tanner, <i>et al.</i> ; Published in IDS Bulletin, Volume 42, Number 3.	The paper suggests that climate change programs taken in Bangladesh must be understood in terms of the interplay of actors, their ideas, and power relations.

15.	Climate Public expenditure and Institutional review (CPEIR)	2012 [15]	Planning Commission, GoB	Strategy paper to identify the scope of mainstream climate change interventions into development programs
16.	Second National Communication (SNC) report submitted to UNFCCC	2012 [16]	Ministry of Environment and Forest (MoEF), GoB	National report to UNFCCC
17.	Climate change sea-level rise and development in Bangladesh	2014 [17]	H. Brammer; published by UPL	Critical examination about climate change impacts in different sectors
18.	Climate Fiscal Framework (CFF) strategy paper aiming to make a pathway to mainstream climate change expenditures into regular development programs	2014 (updated in 2018) [19], [20]		Strategy to devise instruments to allocate budget codes in the IBAS ++ system of Ministry of Finance by which the CAG (Comptroller and Auditor General) and CGA (Controller General Accounts) office could play roles in the allocation of climate change funds and foresee the expenditures
19.	Climate variability: Issues and perspectives for Bangladesh	2015 [21]	S. Dara Shamsuddin, Rafique Ahmed; published by Shahitya Prokash	A critical assessment of climate change based on local understandings
20.	Climate Change Education for Sustainable Development (CCESD)	2015 [22]	BANBEIS, Ministry of Education, GOB	Census level database development (in 12 hot spots) on climate change and disaster impacts on students, teachers, and education learning outcomes
21.	Impacts of climate change on human lives	2015 [23]	Bangladesh Bureau of Statistics (BBS), GoB	Sample survey (on 1800 households) to develop a database on disaster impacts on human lives and properties
22.	Intended Nationally Determined Contributions (INDC)	2015 [24]	Ministry of Environment and Forests (MoEF)	GHG emission reduction (5% from business as usual and 15% conditional by 2030) commitments by taking up different mitigation efforts in power, transport, and industry sectors
22.	Country Investment Plan (CIP) for the environment, forests, and climate change	2017[25]	MoEF, GOB; supported by FAO, USAID	A comprehensive plan developed by MoEF synchronize activities in sectors such as environment, forests, and climate change
23.	The Third National Communication (TNC) to be submitted to UNFCCC	2018 [26]	Ministry of Environment and Forest (MoEF), GoB	National report to UNFCCC

**COLOUR LEGENDS:**

	Studies carried out to develop a better understanding
	Program implementation strategy and action plan
	National report submitted to UNFCCC
	Critical appraisals that provide different opinions about climate change and related impacts
	Policy and institutional preparedness to mainstream climate change interventions into regular development programs

The significant advancement happened from 2000 to 2010 with the implementation of the program titled CDMP (Comprehensive Disaster Management Program, Phase I), where several knowledge products were produced, and field-level interventions took place. The CDMP contributed to merging climate change adaptation (CCA) activities with disaster risk reduction (DRR) approaches. CDMP contributed by the development of the CRA (Community Risk Assessment) tool and increased the capacity of twelve government Ministry officials to align the DPP (Development Project Proposal) instrument of Planning Commission in mainstreaming climate change activities into regular development programs. The Second National Communication (SNC) was prepared by MoEF (Ministry of Environment and Forests) in 2012 for UNFCCC. The National Capacity Self-Assessment (NCSA) report was published in 2007 by MoEF, which expressed climate change challenges through the environmental crisis point of view. Islam and Neelim (2010) [12] critically examined local climate variables (*i.e.*, temperature and rainfall). They argued that local understanding of climate change is a prerequisite to designing climate change interventions to make people, processes, and systems resilient to climate change.

The third stage (2011 onwards) works were more severe and profound in terms of raising questions on the credibility of concepts, generation of data on the climate change impacts, works during this time contributed to formulating policies to mainstream climate change activities into regular development programs. The works such as [13], [17], [21] strongly questioned the way scientists perceive climate change issues. They argued that the hazards and disasters that occurred in Bangladesh are the regular hydro-meteorological phenomenon (*i.e.*, the variabilities and extremes), and change in the climatic parameters does not have any significant influence/relation with that. Even the Department of Environment of Bangladesh assessed Sea Level Rise (SLR) problems in the contexts of sediment deposition, land subsidence, and the compaction of deposited sediments. They were not able to arrive at any conclusive results about the impacts of SLR in coastal resources and the community [27]. Environmental hazards and risk are also increased as a result of climate change [28]. Alam *et al.* (2011) [14] examined the BCCSAP (Bangladesh Climate Change Strategy and Action Plan) formulation process including the contexts of creating BCCTF (Bangladesh Climate Change Trust Fund, managed by MoEF) and BCCRF (Bangladesh Climate Change Resilient Fund, managed by donor consortium). They [14] remarked that formulating climate change policies, program design, investment management, activity priority setting - all are subject to the interplay and interests of powerful actors working on the broader climate change working spheres. BANBEIS (Bangladesh Bureau of Education Information and Statistics) and BBS (Bangladesh Bureau of Statistics) produced reports titled CCESD (Climate Change

Education for Sustainable Development) [22] and ICCHL (Impacts of Climate Change on Human Lives) [23] respectively. These two reports generated data on the impacts of climate change on people's lives and education sectors, such as on students and their learning processes, teachers, and school infrastructure.

Bangladesh Government agencies (*e.g.*, Ministry of Environment, Forests and Climate Changes (MoEFCC), Ministry of Disaster Management and Relief (MoDMR), Ministry of Planning (MoP), Ministry of Finance (MoF)) have been playing significant roles in aligning existing instruments efficient for addressing climate change threats. Several government documents created investment pathways on climate change projects. They are CPEIR (Climate Public Expenditure and Institutional Review) conducted by the Ministry of Planning in 2012, Climate Fiscal Framework (CFF, Volume I and II) conducted in 2014 and 2018 by the Ministry of Finance, INDC (Intended Nationally Determined Contributions) in 2015, Country Investment Plan (CIP) in 2017 for the environment, forests and climate change and Third National Communication (TNC) produced by the MoEFCC in 2018. The INDC report identified a significant climate change impact in Bangladesh and proposed where the adaptation program should focus on (Table 2).

### 3. THE CONTEXT/ROOTS OF CONFUSIONS

The discussions in previous section on chronological developments on climate change aspects in Bangladesh indicate that decisions, actions, and interventions in regard to climate change have gone through turbulence in the conceptualization of the crisis to impact reduction project formulation, finance management, and implementation processes. The roles of actors (both individual and institutional) from the government to non-government entities, varied and conflicting interests (*e.g.*, personal, thematic and need-based), tussle among the institutions over control and over actions/processes, disagreements among the local scientists and researchers on the attribution of hydro-meteorological hazards with a change in the climatic variables, design of adaptation projects with limited understanding all in a collective fashion contributed in creating confusions how the climate change issues and action programs should be taken forward. The concept of climate change has been conveyed into the contexts through disaster management discourse in Bangladesh. The early-stage narratives (the arguments remain the same up till now) argued that the magnitude, intensities and frequencies of disasters like floods, cyclones, droughts (which are common in this lower deltaic and riparian country) have magnified manifold because of change in the climatic pattern. However, after the spending of about 1.5 billion USD per year [15] on climate-sensitive sectors in Bangladesh, the policymakers or the project implementers were not able to provide an effective instrument to discern climate change impacts from other natural disaster

impacts. Even it is not adequately clear whether the ‘community vulnerability’ that are labeled as ‘climate change vulnerability’ is climate change-induced or these are rooted in the degradation in the environmental resources, inequality and varied forms of development gaps. The government agencies such as the Ministry of Environment, Forest and Climate Change (MoEFCC) considers themselves as the lead agency to tackle climate change problems since they submit the national

communication reports on behalf of the government. The works of other agencies such as the Ministry of Planning (carried out CPEIR study in 2012) or the Ministry of Finance (carried out CFF in 2014 and reviewed in 2018) on climate change issues have created tensions over the leadership aspects. Thus, disagreements become noticeable among the institutions working in the climate change sector.

**Table 2. Major climate change impact areas and adaptation priorities in Bangladesh (Source: INDC, 2015).**

Key areas to address the adverse impacts of climate change	Adaptation priorities for Bangladesh
1. Food security, livelihood, and health protection (including water security)	i. Improved Early warning system for a tropical cyclone, flood, flash flood, and drought
2. Comprehensive disaster management	ii. Disaster preparedness and construction of flood and cyclone shelters
3. Coastal zone management including salinity intrusion control	iii. Tropical cyclones and storm surge protection
4. Flood control and erosion protection	iv. Inland monsoon flood-proofing and protection
5. Building climate resilient infrastructure	v. Climate-resilient infrastructure and communication
6. Increased rural electrification	vi. Climate-resilient housing
7. Enhanced urban resilience	vii. Improvement of urban resilience through the improvement of the drainage system to address urban flooding
8. Ecosystem-based adaptation (including forestry co-management)	viii. River training and dredging (including excavation of water bodies, canals, and drains)
9. Community based conservation of wetlands and coastal areas	ix. Stress tolerant (salinity, drought, and flood) variety improvement and cultivation (including livestock and fisheries)
10. Policy and institutional capacity building	x. Research and knowledge management
	xi. Adaptation of local-level perspectives
	xii. Adaptation to climate change impacts on health
	xiii. Biodiversity and ecosystem conservation
	xiv. Capacity building at individual and institutional level to plan and implement adaptation programs and projects in the country

Also, continuous pressure from global institutions like UNFCCC to develop and submit periodic national reports (especially the national communication reports) put stakeholders (e.g., individuals and agencies; government and non-government) in a baffling situation. Individuals/representatives contribute and respond within this state of confusion and limited understanding. Thus the local knowledge and understanding remained left behind. The arguments given in the national reports are instead pulled over by referring to global assessment exercises. For instance, the Third Assessment Report (TAR) of IPCC [29] mentioned (see [12] for more) that about one-third of Bangladesh will be submerged due to a rise in the mean sea level, and the country national reports quoted this argument. This misinterpretation makes an enormous stir among the local experts and members of civil society. After that, several scientific exercises were commissioned by the Government, and reports appeared in the national daily newspapers opposing the submergence-argument (Figure 1). The media reports even argued that Bangladesh, in the opposite, gained vast amounts of land in the mouth of the Meghna River. These newspaper reports and other

related research work as the ‘People’s Plan of Action’ carried out by CEGIS, IWM, and Uttaran in 2013 [30] gave a huge relief to the coastal people who were in psychological trauma developed from the inundation threats.

It is imperative to mention that the British Geographer Hugh Brammer who has been working on Bangladesh issues for about 50 years, expressed strong disagreements with the way climate change challenges are being reported in national documents (<https://www.hughbrammer.me/>). Based on scientific examinations, he indicated that the floods, cyclones, and drought conditions are a regular natural phenomenon of Bangladesh, and climate change did not influence their magnitude, intensity or frequency of occurrence [17]. In his opinion, Bangladesh’s exposure to the growing hazard of sea-level rise in the 21<sup>st</sup> century needs to be seen in the perspective of its exposure to current environmental hazards and its growing development needs [18]. He also mentioned that priority attention needs to be paid to addressing current development and environmental problems: *i.e.*, intensifying agricultural production; expanding economic activities outside

agriculture; reducing exposure to existing levels of drought, floods and cyclones; supplementing dry-season flow in south-western rivers, and minimizing impacts of

arsenic-contaminated groundwater used for drinking and irrigation in large parts of the country [18].



Fig. 1. Lead news in the leading national newspapers (in Bengali) that Bangladesh is not going underwater because of sea-level rise.

Bangladesh’s exposure to the increasing hazard of sea-level rise in the 21st century needs to be seen in the perspective of its exposure to current environmental hazards and its growing development needs priority attention needs to be paid to addressing current development and environmental problems: *i.e.*, intensifying agricultural production; expanding economic activities outside agriculture; reducing exposure to existing levels of drought, floods and cyclones; supplementing dry-season flow in south-western rivers; and minimising impacts of arsenic-contaminated groundwater used for drinking and irrigation in large parts of the country.

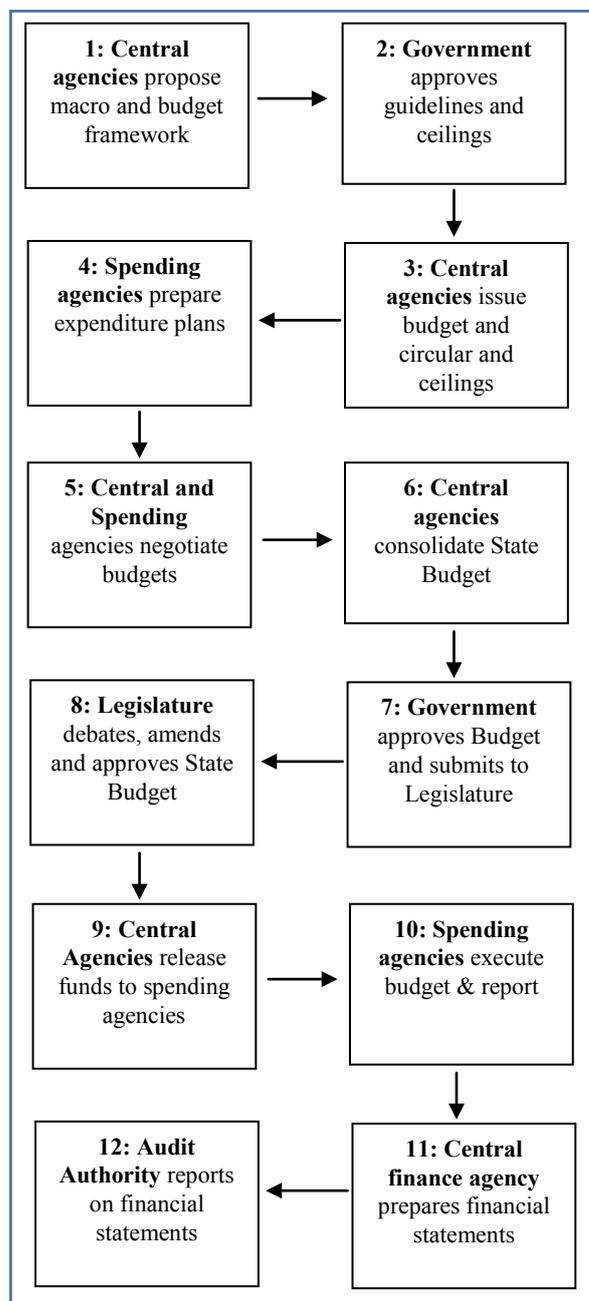
4. CLIMATE PLANNING IN BANGLADESH

The agencies working in climate change sectors in Bangladesh have received a degree of learning from the challenges, as indicated before, and in recent times climate change problems are considered within broader problem domains, not as a standalone crisis.

This outlook and standpoint created opportunities to make the whole state machinery ready and useful to tackle hydro-meteorological disasters (this may come

from climate variabilities or extremes or climate change whatever these are being labeled) through regular development intervention processes. Climate Fiscal Framework (CFF 2014 and 2018) undertaken by the Ministry of Finance hence identified twelve different steps (Figure 2) through which conceptualization of climate change impacts happens, and related budgeting processes receive necessary approvals of the government.

It is important to note that this accounting and tracking system helps the government in reporting climate change activities/progress in different national reporting instruments of the government. BESF reports (Bangladesh Environmental Statistics Framework 2016-2030), SEEA report (System of Environmental-Economic Accounting) to facilitate the integration of environmental and economic statistics, DRSF (Disaster Related Statistical Framework, proposed by UNESCAP), PEI (Poverty-Environment Initiative) integrates poverty and environment). The adoption of these processes allows professionals and different oversight bodies to assess the justification of project planning, budgeting, and fund flow functions (Figure 3).



**Fig. 2.** Twelve steps identified by the Climate Fiscal Framework (CFF, 2018) to allocate financial resources for climate change projects through standard rules of business of the government.

Agencies in Bangladesh responsible for managing disasters before the emergence of climate change concepts (*i.e.*, before the 1980s) used to execute risk reduction projects through normal institutional processes and functions. The current proposition of mainstreaming climate change activities through regular development projects after about four decades of turbulent processes and functions could be considered as a return into the

point of origin (*i.e.*, adopting the before-1980s approach) in managing disaster events. However, this approach is efficient and accountable than the execution of standalone projects. It will also give institutional ownership to the project activities with scope to provide post project support (for ensuring the sustainability of the project results) through other different project interventions.

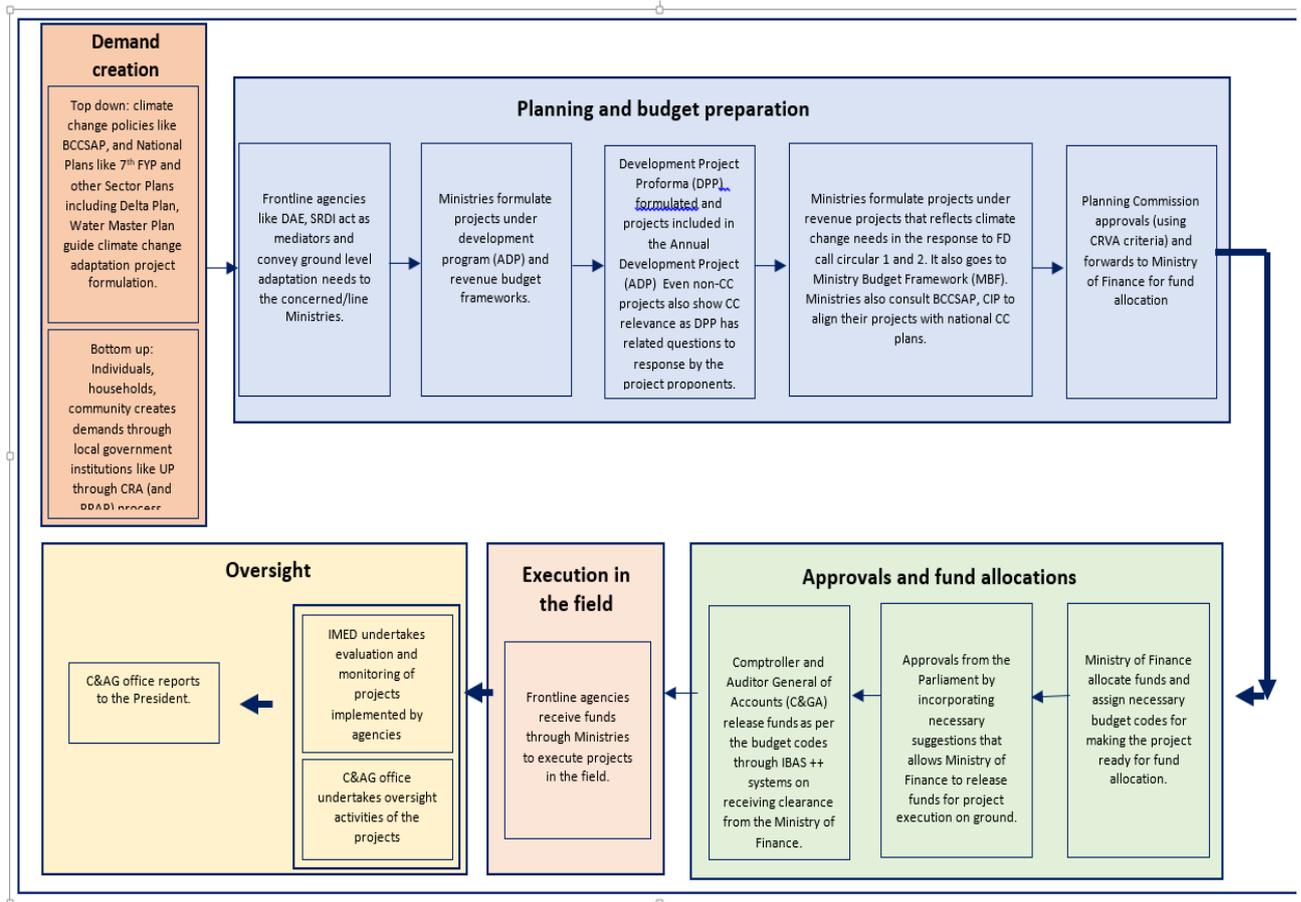


Fig. 3. Funding flow mechanisms of climate change through institutional processes in Bangladesh. (Source: [21]).

## 5. GAPS IN CLIMATE ACTION STRATEGIES IN BANGLADESH

The examination of the climate change activities in Bangladesh during the last four decades (1980-2020) provides opportunities to construct a few concrete observations. Firstly, it is observed that the decisions of different CoPs (Conference of the Parties) of UNFCCC and the IPCC produced estimates, results, and model predictions overwhelm the discussions and action plans held in Bangladesh regarding climate change. Shifts in the IPCC's assessments on global temperature records over time, substantial departures in decisions/results from one report to the other (e.g., Third Assessment Report to Fifth Assessment Report of IPCC) also influenced and baffled the national-level decision-making processes [29], [31]. The government agencies, non-government organizations, members of civil societies, therefore never been settled on apprehending the degree of change in the climate variables. The confusion descended into the lower tiers of decision-making processes and left the whole sector in a puzzling state. Bangladesh still lacks comprehensive scientific knowledge on climate change issues at the sub-national level. The local works such as: [12], [13], [17], [21], [32], [33], [34] and mentioned in [2] provide useful assessments on climate change related aspects and all the works are critical towards the global and local claims

and results. The local works have little influence on institutional and policy-making processes related to climate change compared to the influence made by global level reports mainly produced by international agencies like IPCC. Besides, only temperature and rainfall variables are generally taken into consideration to ascertain climate change. However, other climatic variables like water vapor (or humidity), air pressure, wind speed, and direction, sunshine are not taken into focus in ascertaining the change in the climatic pattern. Rigorous initiatives are rarely taken on how the change in the climatic variables are connected to the enhanced magnitude of disasters like floods, cyclones and droughts in Bangladesh. Besides, no instruments are developed up to now to differentiate commonly held natural disaster impacts from climate change induced phenomenon. This gap in scientific understanding puts the agencies in a dubious position in taking appropriate pathways, whether it should be 'climate finance or development finance', 'climate adaptation or mitigation pathway', 'Disaster risk reduction or climate change adaption'. Resolving these issues is essential while designing and implementing climate change programs as it will ensure more effective use of financial resources, efforts and time of agencies working in both government and non-government domains.

## 6. CONCLUSION

Activities related to climate change have been in practice in Bangladesh for about the last four decades (1980 to 2020). During this time, evolution happened in several ways, firstly in conceptualizing the science, secondly in policy formulation for tackling the threats, and lastly, in designing field-level programs to develop climate-resilient society and systems. The majority of the cases, international scientific exercises, impact narratives developed by agencies working at global levels played vital roles in local-level decision-making processes, *i.e.*, in policy formulation relating to climate change. In the early stages, climate change threats were being addressed through standalone projects. In recent times climate change programs are proposed to the mainstream through regular development interventions so that fiscal spending could be tracked and made accountable.

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