



# CLIMATE PUBLIC FINANCE TRACKING IN BANGLADESH

APPROACH AND METHODOLOGY

December 2018

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Inclusive Budgeting and Financing for Climate Resilience (IBFCR) Project  
Finance Division, Ministry of Finance  
Government of the People's Republic of Bangladesh  
[www.mof.gov.bd](http://www.mof.gov.bd)

# Preface

I am indeed happy that Climate Public Finance Tracking in Bangladesh: Approach and Methodology jointly developed by IBFCR Project team and my colleagues in Finance Division is going to be published for dissemination among the wider audience.

The reliability of data and analyses presented in climate budget reports largely hinges on the robustness of approach and methodology used in tracking climate finance. In our attempt of publishing the first climate budget report, we had to rely on a methodology mostly drawn from the criteria set out in Climate Fiscal Framework (CFF) 2014 to meet our immediate requirements. However, as it was essentially developed to meet the immediate requirements to track climate expenditure subsumed in the total budget allocation of relevant ministries, IBFCR Project team and my colleagues in Finance Division jointly worked out this new methodology and used it for the climate budget report published this year.

The development of new methodology passed through a rigorous process of extensive review of the OECD Rio Markers; relevant policies, plans and strategies of the Government and consultation with the key stakeholders. Moreover, the logic set out in the methodology has already been embedded in Finance Division's IT Platform iBAS++ to make it operational.

Some of the essential features of the new methodology include (i) climate relevance has been aligned with the thematic areas and programmes of Bangladesh Climate Change Strategy and Action Plan (BCCSAP), (ii) all targeted climate projects have been considered 100 percent climate relevant (iii) statistical methods have been used to establish a representative relevance weight and (iv) both development and operating budgets have been considered. These features together speak of the comprehensiveness of the exercise that has been carried out.

Despite being a technical document, all efforts have been made to make it as comprehensible as possible for the general readers. In an evolving context, this publication is essentially a living document and will accommodate changes emerging from new realities. We would, therefore, welcome any suggestions for improvement of the methodology to ensure its continued relevance.

I thank my colleagues in Finance Division, IBFCR Project team led by National Project Director and UNDP for their earnest endeavors to bring out this publication to inform the researchers, academics and peers in the domain of climate finance of the approach and methodology being used while preparing climate budget reports.



(Abdur Rouf Talukder)  
Secretary, Finance Division

# Acknowledgments

This publication is the outcome of combined efforts of a dedicated team working for **Inclusive Budgeting and Financing for Climate Resilience (IBFCR) Project** being implemented by the Finance Division with support from UNDP Bangladesh and my colleagues in the budget wings and **Public Expenditure Management Strengthening Programme (PEMSP)**. I would like to take this opportunity to place on record my sincere thanks and gratitude to the Secretary, Finance Division who welcomed the idea of publishing this document intended to reach the wider audience and inform them of the approach and methodology being followed while preparing the climate budget reports. I would also like to convey my sincere thanks to all members of Technical Advisory Group (TAG) of the project for their comments and feedback on the document and cleared it for use while preparing the climate budget report this year.

I sincerely thank Mr. Habibur Rahman, Additional Secretary, Dr. Krishna Gayen, former Additional Secretary; Shirajun Noor Chowdhury, Joint Secretary; Mr. Md. Yasin, Joint Secretary; PEMSP team comprising Mr.A.K.M. Moinuddin Ahmed, Additional Director, Mr. Saiful Islam, Coordinator (Budget and Accounts Classification System), and Mr. Joynal Abedin, IT Consultant (Team Leader) and the IBFCR project team comprising Mr. Ranjit Kumar Chakraborty, Project Manager; Mr.Mahedi Masuduzzaman, Fiscal Policy Expert; Dr. Shaikh Moniruzzaman, Macroeconomist; and Mr. Bikash Chandra Mitra, Audit Expert for their stellar contribution in developing the contents of the document. My special thanks go to Mr. Abu Sumon, Climate Expert, IBFCR Project who with outstanding tenacity put together the methodology using climate lens to make the system coherent, relevant and credible. Ms. Fazana Ahmed, Deputy Secretary (former Assistant Project Director, IBFCR Project) and Ms. Milia Sharmin, Deputy Secretary (current Assistant Project Director, IBFCR Project) had always been proactive in facilitating the entire process of getting feedback from the key stakeholders. I deeply appreciate their contribution. Finally, I gratefully acknowledge the whole-hearted support and cooperation provided by the desk officers of different wings of Finance Division in accomplishing project activities.



(Dr. Md. Jafar Uddin)

Additional Secretary, Finance Division  
and  
National Project Director, IBFCR Project

# Executive Summary

Climate Public Finance Tracking is one of the set of climate related financial planning and management tools designed to understand a country's resource commitment to address the adverse effects of climate change. It is increasingly important to track and report financial flows that support climate change mitigation and adaptation, to build trust and accountability with regard to climate finance commitments and monitor trends and progress in climate-related investment. However, the current arrangements in place demand more transparency, comparability and comprehensiveness which are very important for the government. The key objectives of this exercise are to: report on climate finance flows aligned with national climate strategies and plans, improve the governance of climate finance, facilitate the assessment of results from climate investments and support better project design.

The benefits that this exercise, as a decision support tool, is expected to deliver include ensuring alignment of climate finance with the BCCSAP (thematic areas and programmes), reporting of climate finances as per the ministry budget allocations, thematic areas and programmes of BCCSAP, reporting on both allocation and expenditure and indicating where further financing is necessary and policy priorities that need to be reviewed and re-adjusted. Moreover, the most significant long-term and sustainable impact of this exercise is the enhanced awareness of the policy makers and planners across the government of the relevance of climate change actions.

Two main technical approaches to weighting relevance have been used by countries - the objectives-based approach and the benefits-based approach. Typically, the former is simpler, while the latter is more complex and time-consuming, but potentially more robust. With lessons from the countries across the globe practising the climate finance tracking and the advantages and disadvantages of different tracking approaches, Bangladesh has adopted a hybrid approach that can be better described as 'Objective-Based Cost Component Approach' to tap maximum advantages from both the approaches. This approach not only classifies the climate relevance of projects and programmes, but also uses scientific bases to weighting of the allocations made for those projects/programmes.

Climate change as a cross-cutting theme runs across the public sector activities relevant to climate change adaptation and mitigation and is typically scattered across a number of ministries - including for example ministries of agriculture, water resources, energy and transportation. This dispersion creates the risk of a lack of ownership and awareness, and poses specific challenges for Public Financial Management (PFM) relating to the difficulty of planning, identifying and reporting climate related expenditures.

This methodology is designed to help address these challenges. It is a tool for identifying, classifying, weighting and marking climate-relevant allocations in the budget system, enabling the estimation, monitoring and tracking of those expenditures. It includes the process of attaching a climate budget marker, such as a tag or account code, to budget lines or groups of budget lines.

The methodology is informed by a study conducted by UNDP in 2018 which captures lessons from several climate budget tracking countries (Ghana, Indonesia Nepal, Kenya and Philippines) and summarizes different frameworks and design principles adopted by the countries in terms of climate relevance weighting and finance tracking.

OECD Rio Markers apart, the relevant policies, plans, strategies and other documents of the country have been extensively reviewed to contextualize the tracking methodology. It follows a step-by-step approach and comprises of five systematic steps: Linking BCCSAP themes and programmes with the climate relevance criteria, assigning climate relevance weight against each of the climate relevance criteria,

relevance of projects and programmes, estimating climate finance for multiple relevance criteria and climate finance weight for operating budget of the ministries/divisions.

Climate public finance tracking is part of a broader package of reforms that is used to help operationalize national climate change policies and action plans. It is one component of Climate Fiscal Framework (CFF) which has the broader scope of providing a comprehensive overview of domestic and international climate finance; linking climate change policies with planning and budgeting; prioritising climate actions; and developing appropriate modalities to manage climate financial flows in an effective and transparent manner.

Successful implementation of climate finance tracking and its continued use call for comprehensive capacity building of the relevant institutions. It is more likely to be sustained, where CC expenditure reports are mainstreamed in the budget cycle and published as part of the budget reporting system; are used to inform parliamentary debate; and made available to the general public and the civil society.

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# Abbreviations & Accronyms

BARI	Bangladesh Agriculture Research Institute
BAU	Business As Usual
BCCRF	Bangladesh Climate Change Resilience Fund
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BMD	Bangladesh Meteorological Department
BRRRI	Bangladesh Rice Research Institute
CBFM	Community Based Fisheries Management
CBO	Community Based Organisation
CC	Climate Change
CCTF	Climate Change Trust Fund
CDM	Clean Development Mechanism
CFF	Climate Fiscal Framework
CFL	Compact Fluorescent Lamp
CNG	Compressed Natural Gas
COA	Chart of Accounts
CPEIR	Climate Public Expenditure and Institutional Review
CV&C	Climate Vulnerability and Change
DEM	Digital Evaluation Model
ECFC	Empowerment of Coastal Fishing Communities
ECOFISH	Enhanced Coastal Fisheries
FFWC	Flood Forecasting and Warning Center
GCF	Green Climate Fund
GCM	Global Circulation Model
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GIS	Geographic Information Systems
GOB	Government of Bangladesh
ICDDR-B	International Centre for Diarrhoeal Disease Research-Bangladesh
IFMIS	Integrated Financial Management Information Systems
LCG	Local Consultative Group
LNG	Liquefied Natural Gas
MoEFCC	Ministry of Environment, Forest and Climate Change
MOF	Ministry of Finance
NARS	National Agricultural Research System
NCCP	National Climate Change Master Plan
NDC	Nationally Determined Contributions
NW	North West
OECD-DAC	Organisation for Economic Co-operation and Development - Development Assistance Committee
PFM	Public Finance Management
PPCR	Pilot Programme for Climate Resilience
REDD	Reducing Emissions from Deforestation and Forest Degradation
SDGs	Sustainable Development Goals
SLR	Sea Level Rise
TA	Technical Assistance
TRM	Tidal River Management



# 1. Background

Bangladesh is known as one of the most climate vulnerable countries in the world because of its geographical location in a low-lying delta ecosystem on the confluence of three river systems. The adverse effects of climate change present a range of development issues and challenges that call for a strong policy response to address them.

The country must cope with an abundance of climate stressors, including extreme temperatures, irregular rainfall, floods, droughts, cyclones, sea level rise, tidal surges, salinity intrusion, and ocean acidification, among others. These climate stressors, paired with non-climate stressors affecting the country such as corruption, pollution, changing population dynamics, urban development, and natural resource extraction, will strain the future economic growth of the country and endanger development gains made over the past 30 years. Without global action to reduce GHG emissions, the costs of adapting to climate change in Bangladesh will be much greater in the future. The annual economic costs of climate change in Bangladesh could amount to 2 percent of gross domestic product by 2050 and 9.4 percent by 2100 (MoEFCC, 2015).

The Government's commitment to address the vulnerabilities arising from climate change are well articulated in its overarching national plans and climate policy framework. Adoption of Bangladesh Climate Change Strategy and Action Plan (BCCSAP) and creation of Climate Change Trust Fund (CCTF) from its own resources to finance projects for implementation of BCCSAP represent the Government's pledge and readiness to reduce climate vulnerabilities. In addition, adoption of a Climate Fiscal Framework (CFF) for Bangladesh in 2014 to provide a roadmap for climate finance in the country's public financial management systems is yet another significant step towards linking climate policies and strategies with the resource allocation process. All these landmark initiatives are mainly attributable to Hon'ble Prime Minister's strong leadership and innovative guidance which brought her the United Nations' highest award on Environment, "Champions of the Earth" in 2015.

The CFF estimated that national expenditures on climate-related activities were 1.0 - 1.4 percent of GDP and 5.3 - 7.5 percent of the combined development and revenue budgets between July 2010 and June 2014 (Bangladesh Ministry of Finance, 2014). During this four-year period, the development budget financed 60 percent of climate activities and the revenue budget financed the remaining 40 percent. According to source-wise analysis, 81 percent of climate-related projects and programs were financed from domestic sources and 19 percent from external sources. Approximately, two-thirds of the external financing came from loans and one third from grants. There were six main sources for climate change-related financing, the (1) revenue budget, (2) development budget, (3) government financed CCTF (4) multilateral climate funds, (5) bilateral and multilateral development bank funds and (6) global climate funds.

The Government of Bangladesh (GOB) has taken significant legal, strategic, and financial actions to respond to climate challenges and capitalize on opportunities. Despite these achievements, Bangladesh must continue to commit to significant and strategic actions for sustainable low emission, climate-resilient development (World Bank, 2014). Overcoming the climate challenges in Bangladesh will be a major undertaking requiring strong political will, operational and transparent institutional structures, sufficient technical capacity, and effective use of domestic and international climate finance.

Climate Public Finance Tracking is one of a set of climate related financial planning and management tool designed to understand a country's resource commitment to address the adverse effects of climate change.

### **Key Objectives of the Tracking**

- To report climate finance flows aligned with national climate strategies and plans
- To improve the governance of climate finance
- To facilitate the assessment of results from climate investments, and
- To support better project design

### **Expected Benefits of Climate Public Finance Tracking**

- Alignment of climate finance with the BCCSAP (thematic areas and programmes)
- Reporting of climate finances as per the ministry budget allocations, thematic areas and programmes of BCCSAP
- Both allocation and expenditures of the climate finances may be tracked and reported
- Indicate where further financing is necessary and policy priorities that need to be reviewed and re-adjusted and will support as a decision support tool. Moreover, the most significant long-term and sustainable impact of this exercise is the enhanced awareness of the policy makers and planners across the government of the relevance of climate change actions.

# 2.

## Conceptual Framework and Rationale for Climate Finance Tracking

OECD DAC established Rio Markers for mitigation in 1998 and for adaptation in 2010 to monitor the development financial flows bearing in mind the objectives of Rio convention on biodiversity, climate change and desertification. These were intended to help members with the preparation of their National Communications to the Rio Conventions. The Handbook on OECD-DAC Rio Markers on climate change defines that an activity "should be classified as climate-change-related" if it "...contributes to the integration of climate change concerns with the recipient countries' development objectives through institution building, capacity development, strengthening the regulatory and policy framework, or research...". It identifies three options: that adaptation/mitigation is a "principal objective", "significant objective", or "not targeted to the policy objective". For an activity to be classified as having adaptation/mitigation as a "principal objective", it must be established that it "would not have been funded but for that [adaptation/mitigation] objective". This is in contrast to activities categorized as having adaptation/mitigation as a "significant objective" which have "other prime objectives, but have been formulated or adjusted to help meet climate concerns." (OECD, 2011a).

The international community recognizes the need for joining forces to avert the risks arising from climate change. This requires mobilizing financial resources from a wide range of sources, public and private, bilateral and multilateral. It is increasingly important to track and report financial flows that support climate change mitigation and adaptation, to build trust and accountability with regard to climate finance commitments and monitor trends and progress in climate-related investment. However, the current arrangements in place demand more transparency, comparability and comprehensiveness which are very important for the government.

### Climate Finance Tracking Approach - global practices

Two main technical approaches to weighting relevance have been used by countries - the objectives-based approach and the benefits-based approach. Typically, the former is simpler, while the latter is more complex and time-consuming, but potentially more robust.

- Objectives-based approach: weighting is determined by an assessment of the relevance of a programme/ activity's stated objectives. One example of the objectives-based approach is use of the CPEIR climate relevance index, where the declared objective of the activity is mapped against the index (from highly relevant to marginally relevant or neutral). Each relevance level corresponds to a weight on the scale of 0-100%, indicating the proportion of the expenditure to be counted as climate relevant. The mapping of objectives against the index is usually based on the judgement of the user performing the tagging using the information contained in the project document / planning template. While reporting on the total climate budget using this approach, only items with larger amounts are captured not those with smaller amounts. As a result, climate relevance is not reflected in its entirety.
- Benefits-based approach: this approach involves applying a benefit cost ratio, where the weight is determined by analysing the benefits when climate change impacts materialise compared to the situation without climate change. The method identifies the "additional" climate change component of an activity on more objective grounds compared to subjective judgement of the declared objectives in the CPEIR climate relevance index method. However, this approach is not always feasible due to data requirements and the complexity of the analysis.

$$CC\% = (B - A) / B$$

where, A = the benefits that would be generated by the action, if there was no CC

B = the benefit that would be generated with CC

The benefits from an action are those conventionally recognised in national planning and include: economic benefits (e.g. incomes, assets), social benefits (e.g. education, health, welfare, gender) and environmental benefits (e.g. biodiversity, reduced pollution). For major investments, the benefits may be estimated as part of an economic analysis (e.g. rates of return for irrigation, roads, new crop varieties, energy investments). For other actions, they may be defined as outcomes in logical frameworks, with associated indicators (e.g. people protected from floods, hectares of forest planted, number of households).<sup>1</sup>

Note that the benefits-based approach typically results in lower estimates of climate relevant expenditure - mainly because the maximum weighting under the objectives-based approach is typically 100%, while under the benefits-based approach it is typically 33%.

Given the potential complexity of developing a weighting methodology, countries have taken different approaches to facilitate national implementation. Two examples are shown in the table below along with their advantages and disadvantages.

**Table- 1: Examples of different approaches to introducing weighting methods**

Country example	Advantages	Disadvantages
<b>Nepal's</b> climate relevance index (highly relevant; relevant; medium) is assigned to a programme based on the sum of budgets of its relevant activities expressed as proportion of the programme's total budget.	The relatively simple method made it possible to roll out the budget tracking to line ministries within a short period of time.	Lack of flexibility at present. For example, the size of highly relevant climate budget appeared over-stated in 2017/18 as block grant transfers to the newly established local governments were marked as relevant. These large, unanalyzed transfers distorted the overall picture.
<b>Indonesia</b> decided to implement budget tracking with the weighting component to be introduced only at a later stage recognizing the complexity of developing a robust cost-effectiveness methodology and the consensus-building it entails.	Delaying the introduction of the weighting component allows time to build a consensus around the methodology.  More complex methods can produce more objective results that links spending to its outcome.	The accuracy of complex methods depends on the availability and reliability of data and capacity to conduct the analysis. The investment of time and effort to develop and periodically update the method needs to be balanced with potential gains in the accuracy of estimates.  Until very recently Indonesia has only tagged mitigation expenditure, where it may be more feasible to defer weighting.

<sup>1</sup>UNDP 2015 CPEIR Methodological Guidebook, pp. 54-55

With lessons from the countries across the globe practicing the climate finance tracking and the advantages and disadvantages of different tracking approaches, Bangladesh has adopted a hybrid approach that can be better described as '**Objective-Based Cost Component Approach**' to tap maximum advantages from both the approaches discussed above. This approach not only classifies the climate relevance of projects and programmes, but also uses scientific bases to weighting of the allocations made for those projects/programmes. Although a fully functional benefits based approach should be ideal, given the existing planning and financing process, it must go through a reform process until such approach can be adopted.

## **Climate Change - a cross cutting theme**

Climate change is a cross-cutting theme, and is rarely if ever a separate sector or complete programme in government financial management and reporting. Public sector activities relevant to climate change adaptation and mitigation are typically scattered across a number of ministries - including for example ministries of agriculture, water resources, energy and transportation. This dispersion creates the risk of a lack of ownership and awareness, and poses specific challenges for Public Financial Management (PFM) relating to the difficulty of planning, identifying and reporting climate related expenditures.

This methodology is designed to help address these challenges. It is a tool for identifying, classifying, weighting and marking climate-relevant allocations in the budget system, enabling the estimation, monitoring and tracking of those expenditures. It includes the process of attaching a climate budget marker, such as a tag or account code, to budget lines or groups of budget lines.

## **Adaptation - Conceptual Framework**

Adaptation implies reduction in the vulnerability of human or natural systems to the impacts of climate change and climate variability related risks by maintaining or enhancing adaptive capacity and resilience. In general, an activity is considered as an adaptation activity if it:

- Reduces the risk, exposure or sensitivity of human or natural systems to climate change and climate variability;
- Increases the potential or capability of a system to adapt to effects and impact of climate stimuli;
- Builds problem solving capacity to develop responses to climate variability and change;
- Incorporates climate risk information into decision-making.

## **Mitigation- Conceptual Framework**

Mitigation implies either reduction in emissions of Greenhouse Gases (GHG) into the atmosphere or absorption of them from the atmosphere. An activity is considered mitigation if it:

- Contributes to the reduction of GHG intensity per unit of output;
- Limits the burning of fossil fuels for energy and uses lower carbon or renewable sources;
- Uses energy more efficiently in agriculture, homes, offices and industries;
- Plans transport systems and urban development appropriately;
- Reduces emissions from poor forest and land use practices; or
- Stores carbon in the soil through conserving forests and managing land more sustainably.

# 3.

## Global Experience

### Countries adopted Climate Budget Tracking

The study conducted by UNDP in 2018 captures lessons from several climate budget tracking countries across the globe.<sup>2</sup> Table below has summarized the different frameworks and design principles adopted by the countries in terms of climate relevance weighting and finance tracking.

Table- 2: Countries adopted Climate Budget Tracking - key design issues

Country	Framework and Typology	Weighting	Weighting Tracking
Ghana	<p>Framework: National Climate Change Policy Master Plan 2015-2020</p> <p>Typology: adaptation/ mitigation only</p>	<p>Policy objectives are grouped into high, medium and low relevance according to direct relevance to NCCP Master Plan and to mention of "climate change" in policy objective description in Ghana medium term development plan.</p> <p>Weightings are 100% for high, 50% for medium and 20% for low - so for example all low relevant policy objectives have 20% of the funding classified as being climate change relevant.</p>	<p>Two COA segments are tagged - policy objective and activity/ operation segments - but not in the IFMIS. Tagging is done in an offline system ("Climatronic").</p>
Indonesia	<p>Framework: Mitigation - National Action Plan to Reduce GHG Emissions; activities with (a) direct impacts and (b) indirect impact contributing to GHG emission reduction, GHG emissions absorption, carbon stock stabilization. Adaptation (from 2018/19): guidance being developed from National Action Plan for Climate Change Adaptation.</p> <p>Typology: Adaptation and Mitigation. While direct and indirect impacts are separately identified in the classification, this distinction does not appear to be recorded for the national budget tracking system. Note: one Ministry (Ministry of Public Works and Housing) is using an internal budget system to distinguish direct and indirect impacts, and also to tag below output level, to component level.</p>	<p>No weighting process as yet - 100% of all expenditures tagged as adaptation or mitigation related are reported as CC expenditures.</p>	<p>The Government's budgeting and performance reporting system ("Krishna") has a series of (currently) seven budget tags of which one is CC adaptation and one is CC mitigation (others include gender, infrastructure, health and education).</p> <p>Tagging is at the output level - which is level 3 of the programme budget hierarchy (1. Programme, 2. Activity, 3. Output, 4. Component, 5. Detailed expenditure).</p>

<sup>2</sup> Unpublished study titled "Climate Budget Tagging: Introductory Guidance Note and Experience from Seven Countries - Bangladesh, Ghana, Indonesia, Kenya, Nepal, Pakistan, Philippines"

Country	Framework and Typology	Weighting	Weighting Tracking
Kenya	<p>Framework: Guidelines based on CPEIR. For an activity to qualify to be categorized as climate relevant expenditure, funds incurred or invested must:</p> <p>a. address one or all of adaptation, mitigation or enabling environment (climate awareness, training, policy and capacity building) as per the definition given by OECD</p> <p>b. more than 25% of the funding must go to one or all the above climate risk mitigation or proofing category</p> <p>c. actual incremental or additional financing need not be demonstrated but there must be certainty that funds have been used for a) above.</p> <p>d. outcome/output must be increased resilience, reduced emissions or more awareness on climate change.</p> <p>Typology: Mitigation, Adaptation and Enabling Environment.</p>	<p>Weighting of each programme according to three levels of objective - principal, significant, low as follows:</p> <p>- "Principal objective" should cover adaptation dimension explicitly in the objective... or should have most of the activities (and the budget) as adaptation/ mitigation-related. 100% of the budget/ expenditure is allocated as climate relevant.</p> <p>- "Significant objective" should specify adaptation/ mitigation dimension as a secondary objective (of a programme module) or at least one indicator on activity or outcome level. 50% of the budget/ expenditure is allocated as climate relevant.</p> <p>- No climate related objective is treated as low relevance. No budget/ expenditure is allocated as climate relevant.</p> <p>- Note that percentages may be varied to follow real values if the information is available.</p>	<p>The climate tag is linked to the programmatic segment of the COA, and details are provided in an additional, 8th segment of the COA that has been (or is being?) created in GOK's IFMIS to capture cross-cutting issues, such as climate change.</p> <p>The 8th segments is made up of 4 digits. For CC the first two digits mark CC (01); the third digit adaptation/mitigation; and the fourth digit principal/ significant/low.</p>
Nepal	<p>Framework: CPEIR 2011 identified 83 climate-relevant programmes, following which a list of 11 climate relevant categories of programmes was developed to guide future identification. [note: currently developing a sector-specific guideline with the Ministry of Agriculture, and other sectors may follow].</p> <p>Typology: highly relevant, relevant and neutral. Currently climate change expenditures are not classified into adaptation and mitigation.</p>	<p>The budgets of climate relevant programmes are reviewed; each underlying activity budget line is marked as climate relevant or not. The budgets for the relevant activities are summed and calculated as a percentage of the total budget for that programme. If the climate relevant percentage of the total budget is &gt;60%, the programme is marked as "highly relevant"; if between 20% to 60%, marked as "relevant"; below 20% "neutral". The whole of the budget for the programme is then entered into the category computed above.</p>	<p>A single digit climate budget tag with 3 settings is attached to each programme both in the budget and accounting systems - 1= highly relevant, 2 = relevant, 3 = neutral.</p>

Country	Framework and Typology	Weighting	Weighting Tracking
Philippines	<p>Framework: National Climate Change Action Plan.</p> <p>Typology: the CC typology defines 247 activities structured into the following 5 level hierarchy, starting at top:</p> <ul style="list-style-type: none"> <li>- Adaptation/ mitigation;</li> <li>- NCCAP strategic priority;</li> <li>- NCCAP sub-priority;</li> <li>- Type of intervention;</li> <li>- Activity.</li> </ul> <p>[note: this typology is used for analysing the budget, but expenditure is not captured in same level of detail]</p>	<p>No weighting as such - 100% of all expenditure identified as climate relevant is booked. For Programs, Activities, and Projects (PAPs) identified as CC adaptation-related or CC mitigation-related, the entire budget is tagged as CC expenditure if the main objective, or one of the main objectives, of the PAP is to address climate change. If the PAP's main objective does not explicitly articulate addressing climate change, identify only the components of the PAP that directly address climate change based on the CC typology, and include only the expenditure of the identified CC component.</p>	<p>Climate Change Expenditure Tagging (CCET) uses a 6-character typology code (1 character for the first 4 levels of hierarchy, and 2 characters for level 5 - activity) for each of the 247 CC activities. This code is integrated with the budgeting system (and is part of budget inputting), but not with the expenditure COA (manual mapping is necessary, and at a summarised level).</p>

Figure 1 below shows a model to illustrate the various options, and maps the climate budget tracking countries as examples.

- The complexity of the identification and weighting methodology, and the necessary capacity at implementing ministries;
- The availability of IT systems across all parts and levels of government and the extent of their integration.

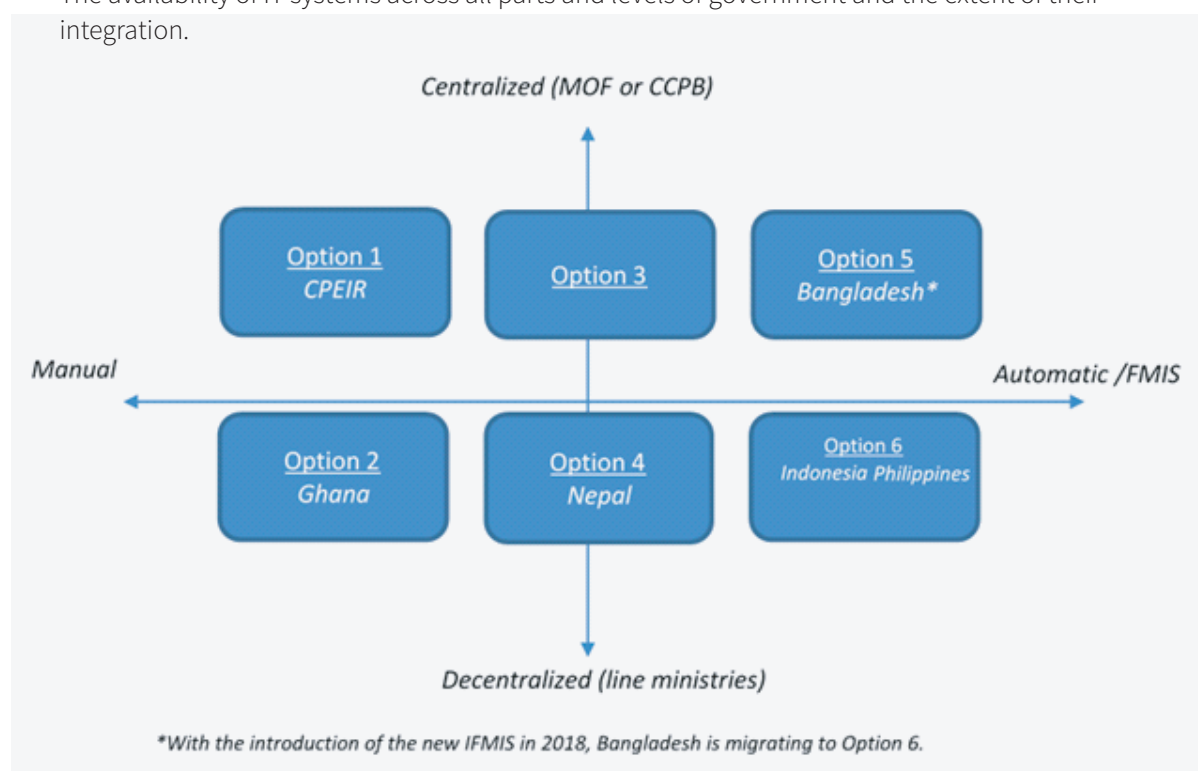


Figure 1 Modalities for climate tagging system



## Lessons from Climate Budget Tagging

More than an expenditure tracking tool, Climate Public Finance Tracking methodology has demonstrated a range of benefits. Those benefits - including potential future benefits - are elaborated and drawn together:

### **i. Raising awareness and understanding of climate change, for example:**

Helping to strengthen planning and budgeting in line ministries. In Indonesia, the Ministry of Finance and the National Planning Agency encourage line ministries to use the climate expenditure data to strengthen their quantitative performance indicators. Giving visibility to government climate change action both within the government, towards state accountability and oversight institutions, and among citizens. In Nepal, the National Planning Commission and the Ministry of Environment and Forestry used the budget tracking data to raise awareness among line ministries of the scale of existing climate change action and motivate further action. To raise public awareness of government action budget tracking data was published as a dedicated "Citizens' Climate Budget" in Nepal and as part of Department of Budget's "People's Budget" in the Philippines..

### **ii. Mobilising resources for climate change, for example:**

Providing evidence on government's existing spending as the basis for estimating the funding gap to inform government engagement with development partners and broader efforts to mobilise additional resources. For example, the Ministry of Finance in Indonesia used the budget tracking data to show the gap between the existing public spending and the estimated cost of the national climate action, and thereby the need to mobilise private financing. Subsequently, the MOF issued Green Bonds and Green Sukuk (Islamic bond) designed to fund climate and biodiversity related programmes. With similar objectives to leverage additional, private financing, the MOF in Kenya is preparing to issue its sovereign Green Bond.

### **iii. Improved monitoring and reporting of climate change policy and progress, for example:**

Facilitating government reporting on international commitments, such as Biennial Update Reports (BURs) on UNFCCC's Nationally Determined Contributions (NDCs), and progress towards the SDGs. For BURs, CBT provides expenditure data routinely collected by the existing financial management system to quantify both the existing spending and the need for additional financing for implementing NDCs.

## 4. Climate Finance Tracking Approach

Following the OECD Rio Markers, the IBFCR project team reviewed the relevant policies, plans, strategies and other documents to contextualize the tracking methodology. These include Bangladesh Climate Change Trust (BCCT) Act, Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2012 Bangladesh Climate Public Expenditure and Institutional Review (CPEIR), 2014 Climate Fiscal Framework (CFF), the Bangladesh Seventh Five-Year Plan, and the Bangladesh Vision 2021 plan. The project also reviewed documents from other sources, such as the Bangladesh Climate Change Resilience Fund (BCCRF) Implementation Manual, BCCRF completion report, the Local Consultative Group (LCG) on Environment and Climate Change's capacity and institutional mapping review, and other policy briefs and assessments by development partners and nongovernmental organizations (NGOs).

The IBFCR team had several meetings with the iBAS++ development team and organized at least 5 workshops with relevant FD and line ministry officials involved in planning and budget preparation while developing this methodology for climate public finance tracking. In addition, comments from the participants of training courses conducted after the issuance of Budget Circular have also been used as inputs for development of the methodology. As many as 200 budget and planning desk officers of the line ministries including those of Finance Division participated in the training courses. The team also took this methodology to the climate vulnerable communities living in coastal polders of Deluti Union, Paikgachha Upazila, Khulna District and conducted two FGDs (one with the UP members and the other with the occupational and religious groups) to check its validity and appropriateness. Several suggestions and observations made by the stakeholders both at the national and the community levels were accommodated. These are as follows:

- Climate Relevance has been aligned with the thematic areas and programmes of Bangladesh Climate Change Strategy and Action Plan (BCCSAP 2009) ;
- All targeted climate projects and programmes have been considered to be 100% climate relevant;
- 51 climate relevance criteria that include '44 programmes of the BCCSAP', a climate criteria for 'Targeted Climate Change Projects/Programme' in each thematic area and a criteria to capture 'non-climate relevant finance' have been introduced;
- Climate relevance weight based on climate dimension and climate sensitivity (based on climate cost component) of the relevance criteria has been assessed;
- The climate relevance categories for the criteria based assessment which are a) Strongly Relevant (81 to 100%), b) Significantly Relevant (61 to 80%), c) Moderately Relevant (41 to 60%), d) Somewhat Relevant (21 to 40%), e) Implicitly Relevant (6 to 20%), and f) Not Relevant (0 to 5%) have been used;
- Projects and programmes are usually complex in nature and may match with more than one climate relevance criteria. They have been selected on a priority basis (criteria with maximum climate allocation comes first). That also includes the non-climate finance criteria;
- Statistical methods (sample distribution, standard deviation, weighted reciprocal ranking) have been used to establish a representative relevance weight. In addition, climate finance in a project with multiple relevance criteria has been distributed as per the weighted reciprocal ranking;
- Both the 'development budget' (projects and programmes) and 'operating budget' (previously known as non-development budget) have been considered for climate finance tracking;
- Climate relevance for Ministry Operating Budget (general, support activities, special activities, and LG transfer) was established on the basis of their 'Allocation of Business', portfolio of projects and

- programmes, citizens charter and contribution to climate change adaptation and mitigation;
- At this stage, only public finance has been considered for tracking of climate finance. As soon the private sector financing is systematically introduced in the updated Climate Fiscal Framework (CFF 2014), this methodology is robust enough to extend its scope beyond public finance.

The cross-cutting nature of climate change can complicate the task of defining a clear scope for climate budget tracking. Even where addressing the impacts of climate change forms one of the core strategic goals of a government, the cross-cutting nature of CC makes it highly unlikely that all CC activities can be grouped and managed as a single policy programme by one line-ministry.

The difficulty of establishing a single climate change programme is illustrated by the structure of the Sustainable Development Goals (SDGs). While climate action is represented by SDG 13 ("Take urgent action to combat climate change and its impacts"), actions under a number of the other SDGs can also be expected to help in climate mitigation and adaptation efforts (e.g. SDG 7 "*Ensure access to affordable, reliable, sustainable and modern energy for all*" and SDG 2 "*End hunger, achieve food security and improved nutrition and promote sustainable agriculture*").

While some activities can be identified as climate action based on their explicit objectives (i.e. they articulate climate change objectives, or are linked to the national climate change policy) there are many other activities across all government sectors that may not have an explicit climate-related objective but their implementation nevertheless has significant impact on climate change (e.g. construction projects that incorporate climate change adaptation solutions). There are two key parameters that define the contour of the CBT:

- (1) Breadth of coverage - The scope of climate budget tracking can cover the national climate change policy, which defines several priority sectors (e.g. in the Philippines), or encompass all government activity (e.g. in Nepal). While the latter option will generate more comprehensive information, it requires significant capacity to undertake consistent assessment of a programme/project's climate change relevance across all sectors, which leads to point (2)
- (2) Depth of coverage - The level of comprehensiveness of the climate relevance analysis ranges from a rapid assessment based on project documents and consultation with government experts to an in-depth climate screening appraisal of whether the implementation brings mitigation and/or adaptation benefits.

# 5.

## Climate Public Finance Tracking Methodology

The tracking methodology follows a step-by-step approach and comprises of five systematic steps:

### Step 1: Linking BCCSAP Themes and Programmes with the Climate Relevance Criteria

First, defining and classifying climate expenditures. This includes developing guidance for identifying what is and what is not climate relevant, typically drawing on the national climate change policy. And also defining a typology for climate change expenditure - which may for example be simply into two categories, adaptation and mitigation, or may be a more elaborate structure of climate change interventions as in BCCSAP 2009.

The tracking will use the Themes and Programmes identified under the BCCSAP (44 Programmes under 6 Thematic Areas) as the Climate Relevance Criteria for tracking climate public finance. The relevance criteria proposed in the Climate Fiscal Framework (CFF 2014) was also aligned with the BCCSAP thematic areas and programmes for harmonized climate finance reporting. Alignment of the criteria used for CFF 2014 and the new criteria is presented in Appendix-4.

### Step 2: Assigning climate relevance weight against each of the Climate Relevance Criteria

Second, assessing and "weighting" the climate relevance of those expenditures is critical. Categorizing fully targeted climate relevant activities are fairly easy but the methodology is designed in such a way that a lower proportion of the allocation on less relevant activities is also captured along with the allocations on more highly relevant activities.

Identify key relevant interventions under each climate relevance criteria and rate each of those in terms of (a) Climate Sensitivity, and (b) climate change Relevance.<sup>3</sup> For multiple interventions under a climate relevance criteria, the climate relevance weight for the interventions is calculated by subtracting the standard deviation of the relevance weights from the maximum relevance weight of the interventions. Statistical formula to find climate relevance weight for a criteria are:

- i) Identify the maximum relevance weight from the selected interventions under a climate relevance criteria

$$\text{MAX}(X_1, X_2, \dots, X_n)$$

- ii) Calculate the Standard Deviation of the relevance weight

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$$

<sup>3</sup> the negative values/allocation, investments causing additional emission and maladaptation was not counted. This will be counted as the system evolves.

The standard deviation is an extremely useful measure of spread in part because it is mathematically tractable.<sup>4</sup> Many formulas in inferential statistics use the standard deviation. More commonly, the outlier affects both results and assumptions. In this situation, it is not legitimate to simply drop the outlier because targeted funds and facilities are established to designed 100% climate relevant projects/programmes, whereas there are number of projects that has no meaningful association with the climate change.

iii) Calculate the climate relevance weight of a 'Climate Relevance Criteria':

$$\text{MAX}(X_1, X_2, \dots, X_n) - s$$

### Step 3: Relevance of Projects and Programmes

If a project or programme addresses only one relevance criteria, the climate relevant finance should be calculated as percentage (of climate relevance) of the annual project allocation for the project/programme. But the projects and programmes are usually complex in nature and may have finances that match with more than one climate relevance criteria. The budget desk officers will be able to select up to three climate relevance criteria (including the 'non-climate finance' criteria, if deemed fit) against a project or programme based on the amount of budget allocation for each relevance area (descending order). The project/programme relevance is then calculated following the same formula of deducting sample standard deviation from the maximum relevance weight percentage, as in Step-2.

### Step 4: Estimating climate finance for multiple relevance criteria for projects/programmes

From the overall project or programme relevance weight worked out in Step-3 should now be distributed among the multiple matching relevance criteria according to the amount of budget allocation for each relevance area. As the criterias are already ranked (descending order) in Step-3, the statistical formula to distribute the climate finance among the relevance criteria:

i) Weighted Reciprocal Rank for multiple relevance criteria

$$WRR_i = \frac{1}{R_i} / \sum_{i=1}^n 1/R_i$$

**Table- 3: Climate Relevance Weight for a Combination of Relevance Criteria**

Relevance	Rank	Reciprocal Rank	Individual Weight: 3 (Three) Relevance	Individual Weight: 2 (Two) Relevance	Individual Weight: 1 (One) Relevance
Relevance-1	1	1.00	0.55	0.67	1
Relevance-2	2	0.50	0.27	0.33	-
Relevance-3	3	0.33	0.18	-	-

The mean reciprocal rank is a statistic measure for evaluating any process that produces a list of possible responses to a sample of queries, ordered by probability of correctness. Therefore, we may say, for projects and programmes with three Relevance the percentages are 55%, 27% and 18% of the climate finance for Relevance-1, Relevance-2, and Relevance-3 respectively. For projects and programmes with two Relevance the percentages are 67% and 33% for Relevance-1 and Relevance-2 respectively. For the projects and

<sup>4</sup> To address the risk of an often-smaller sample size, the coefficient of variation (CV=standard deviation / mean) was calculated. As a rule of thumb, a CV >= 1 indicates a relatively high variation, while a CV < 1 can be considered low. Standard deviations aren't "good" or "bad", they only indicate how spread the data is.

programmes with one Relevance Criteria, 100% of the relevant allocation should go for the criteria. This is to note that part of the allocation may be 'Not Climate Relevant' and the remaining may address up to two more relevance criteria, totaling maximum three criteria for a project or activity. One must take care of the issue that criteria with most climate relevance allocation must come first and so on. Otherwise, the assessment may not provide appropriate assessment of climate allocation.

### Step 5: Climate finance weight for 'Operating Budget' of the ministries/divisions

Tracking operating cost is warranted as they constitute costs (e.g. for 11-functions, 12-support activities, 13-special activities, and LG) that go beyond development allocation (e.g. projects and programmes). The 'Allocation of Business', project and programme portfolio, and contribution to climate change adaptation and mitigation were considered in this regard. An example of the climate relevant finance assessment for Operating Budget is provided in Appendix-3.

A summary of the criteria-based climate weight assessment is provided in Table-4. The weights are estimated based on the analysis and assumptions made in Appendix-1 to 3. The principle for analysis is the additionality of climate allocation over the business as usual development financing towards a climate resilient Bangladesh.

**Table- 4: Climate Relevance Criteria and Relevance Weight**

Code <sup>5</sup>	Climate Relevance Criteria <sup>6</sup>	Relevance (%)
<b>01</b>	<b>Food security, social protection, and health</b>	
0101	Implementation of specific climate policy-strategies or food security, social protection and health related activities funded from the Climate Fund	100
0102	Institutional Capacity for research towards climate resilient cultivars and their resilience	73
0103	Development of climate resilient cropping systems and production technologies	69
0104	Adaptation against drought, salinity, submergence and heat	66
0105	Adaptation in the fisheries sector	62
0106	Adaptation in Livestock Sector	48
0107	Adaptation in Health Sector	40
0108	Water and sanitation programme for climate vulnerable areas	46
0109	Livelihood protection in ecologically fragile and climate vulnerable zones	52
0110	Livelihood protection of vulnerable socio- economic groups (including women)	38
<b>02</b>	<b>Comprehensive disaster management</b>	
0201	Implementation of specific climate policy-strategies or Comprehensive disaster management related activities funded from the Climate Fund	100
0202	Improvement of flood forecasting and early warning systems	61
0203	Improvement of cyclone and storm-surge warning	68
0204	Awareness raising and public education towards climate resilience	46
0205	Risk management against loss of income and property	77
<b>03</b>	<b>Infrastructure</b>	
0301	Implementation of specific climate policy-strategies or Infrastructure related activities funded from the Climate Fund	100
0302	Repair and maintenance of existing flood embankments	68
0303	Repair and maintenance of existing cyclone shelters	70
0304	Repair and maintenance of existing coastal polders	80

<sup>5</sup> The codes have been used in the IT-based climate finance module of the government's Integrated Budgeting and Accounting system (iBAS++) for classification and reporting purposes.

<sup>6</sup> The set of criteria is aligned with the BCCSAP-2009 Thematic and Programme Areas and for which the relevance weight was worked out based on the climate sensitivity comparing with the business as usual development scenario. Details of the assessment is provided in Appendix-1. A detail description of the criteria along with the possible adaptation and mitigation projects/activities are also provided in Appendix-2.

Code <sup>5</sup>	Climate Relevance Criteria <sup>6</sup>	Relevance (%)
0305	Improvement of urban drainage	61
0306	Adaptation against floods	70
0307	Adaptation against future cyclones and storm-surges	72
0308	Planning, design and construction of river training works	48
0309	Planning, design and implementation of resuscitation of the network of rivers and khals through dredging and de-salutations work	68
<b>04</b>	<b>Research and knowledge management</b>	
0401	Implementation of specific climate policy-strategies or Research and knowledge management related activities funded from the Climate Fund	100
0402	Establishment of a centre for research, knowledge management and training on climate change	70
0403	Climate Change Modeling at National and sub-national levels	90
0404	Preparatory studies for Adaptation against sea level rise and its impacts	84
0405	Monitoring of Eco system and Bio- diversity changes and their impacts	40
0406	Macroeconomic and sectoral economic impacts of climate change	83
0407	Monitoring of Internal and External Migration and providing support of capacity building for rehabilitation	48
0408	Monitoring of impact for management of Tourism and improvement of priority action plan	32
<b>05</b>	<b>Mitigation and low-carbon development</b>	
0501	Implementation of specific climate policy-strategies or Mitigation and low-carbon development related activities funded from the Climate Fund	
0502	Improved Energy efficiency	69
0503	Gas Exploration and reservoir management	28
0504	Development of coal mines and coal fired power station	12
0505	Renewable energy development	81
0506	Lower emission from agricultural land	60
0507	Management of urban waste	46
0508	Forestation and reforestation program	69
0509	Rapid expansion of energy saving Devices e.g. CFL	68
0510	Energy and water efficiency in built environment	48
0511	Improving in energy consumption pattern in transport sector and options for mitigation	28
<b>06</b>	<b>Capacity building and institutional strengthening</b>	
0601	Implementation of specific climate policy-strategies or Capacity building and institutional strengthening related activities funded from the Climate Fund	100
0602	Revision of sector policies for climate resilience	68
0603	Mainstreaming climate change in National, Sector and Spatial Development program	77
0604	Strengthening human resource capacity	48
0605	Strengthening Gender consideration in climate change management	26
0606	Strengthening institutional capacity for Climate Risk Management	66
0607	Mainstreaming climate change in the media	30
<b>07</b>	<b>Not Climate Relevant<sup>7</sup></b>	
0701	Not Climate Relevant	0

<sup>7</sup> If a project or activity is not aligned with any of the criteria and sub-criteria mentioned in this table, it should be assessed as 0% i.e. 'Not Climate Relevant' project. However, there will be projects where part of the project allocation is 'Not Climate Relevant' but the remaining allocations have relevance with one or two criteria/sub-criteria above, the project should be assessed as climate relevant along with the 'Not Climate Relevant' criteria. But the 'order' of the criteria-based assessment must follow the amount of climate allocation for each relevant criterion i.e. the criteria with highest climate allocation must come first and so on to a maximum of three criteria for each project/programme.

## 6. Way Forward

Climate public finance tracking is not a standalone initiative but part of a broader package of reforms that is used to help operationalize national climate change policies and action plans.

Bangladesh conducted a Climate Expenditure and Institutional Review (CPEIR) in 2012 to take stock of existing climate change institutional and financial management arrangements and adopted its first Climate Fiscal Framework (CFF) in 2014 as a baseline for designing further reforms.

Climate budget tracking methodology is one component of CFF which has the broader scope of providing a comprehensive overview of domestic and international climate finance; linking climate change policies with planning and budgeting; prioritising climate actions; and developing appropriate modalities to manage climate financial flows in an effective and transparent manner.

Comprehensive capacity building initiatives is also fundamental to successful implementation of climate finance tracking and its continued use.

Climate budget tracking will be most valuable, and more likely to be sustained, where CC expenditure reports are mainstreamed in the budget cycle and published as part of the budget reporting system; are used to inform parliamentary debate; and are published in climate expenditure reports available to the general public and Civil Society.



### Appendix 1: Climate Relevance Weights for Key Interventions for Relevance Criteria

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance C=(b-a) <sup>4</sup>
01	Food security, social protection, and health						
0101	Project/Programme from Targeted Climate Change Funds						
		Projects and programmes from local climate change fund e.g. CCTF	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Projects and programmes from multilateral and bilateral climate change funds e.g. BCCRF, PPCR	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Global climate change funds e.g. GCF, Adaptation Fund	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
0102	Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)						
	Institutional Capacity for Research Towards Climate Resilient Cultivars and their Resilience						
		Collection and preservation of local varieties of robust cultivars and documentation of their characteristics	20	Sometimes done as part of the regular development process	80	In most areas affected by CC to preserve most adaptive crop varieties	60
		Research to develop climate resilient varieties of rice (i.e., heat, drought, salinity and submergence-tolerant varieties)	0	Climate resilient rice varieties were developed once the climate impacts are visible	100	Several resilient varieties are developed and continue to develop as the changes happen.	100
		Research to develop climate resilient cultivars of wheat and other food and nonfood crops, including vegetables	0	Climate resilient cultivars varieties were developed once the climate impacts are visible	100	Several resilient cultivars of wheat, food and non-food crops are developed and continue to develop as the changes happen.	100
		Field trials and dissemination to	40	DAE and NGOs conducts a	80	More field trials based on	40

<sup>1</sup> This is an indicative list of climate relevant projects/activities which are generally undertaken by the ministries and divisions but not exhaustive enough to draw a borderline.

<sup>2</sup> 'Sensitivity' is the random amount of unintended climate financing that is subsumed in the Business as Usual (BAU) development financing.

<sup>3</sup> 'Relevance' is the expected amount of climate finance compared to the BAU development financing for resilience. It is considered that not all the activities are equally relevant as vulnerability varies across the places and production systems.

<sup>4</sup> The difference between the 'Relevance' and 'Sensitivity' percentage determines the required additional financing possibilities for certain activities.

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>
		farmers of the local robust cultivars and the newly developed varieties, in partnership with the extension service and NGOs		number of field trials for robust cultivars		the climate vulnerability and agro ecological zones may be established	
		Strengthening the capacity of key research institutes and scientists to undertake the work	40	Research centers are established and conducting scientific research and trials	100	More research on climate resilient options are necessary to cope with the changes	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0103	Development of climate resilient cropping systems and production technologies						
		Develop climate resilient cropping patterns suited to different regions of the country	20	Developed cropping patterns based on agro ecological zones which has climate components embedded within	100	Need to develop zones for climate resilient cropping patterns to avoid crop loss and decreased production	80
		Field level trials of climate resilient cropping patterns, associated water management (e.g. irrigation) systems, and awareness generation among farmers and consumers	20	Low water hungry cropping is demonstrated and practiced especially, in N-W region	100	Several other dry season crop irrigation options are demonstrated, proven effective, need to be scaled up	80
		Develop organized seed production, storage, supply system and extension mechanisms	40	Seed storage capacity is developed across the country	100	Production of climate resilient seed varieties and expansion of storage and extension capacity is critical to sustain the production	60
		Identify/develop technologies (i.e. mulching, water management, polytunnels, raised beds, etc.) for crop production in the vulnerable areas	20	Several crop production technologies are being practiced by the farmers	80	More effective and ecosystem specific techniques need to be introduced in the climate hotspots	60
		Develop early warning and weather forecasting for crop production against diseases, insects, drought, floods, storms, tidal surges, etc.	20	General weather forecasts are available across the country. NGOs has demonstrated agriculture forecast.	100	Need to develop country wide and location specific agriculture forecasting system aligned with BMD	80

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup> and FFWC forecasts	Relevance c=(b-a) <sup>4</sup>
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0104 Adaptation against drought, salinity, submergence and heat							
		Preparation of adaptation plans and GIS maps of areas vulnerable to droughts, salinity submergence and heat	20	Existing maps does not always consider climate parameters	80	The maps should include climate variables including risks, vulnerabilities, adaptation and mitigation measures	60
		Develop and test adaptive measures in drought, salinity submergence, heat and cold-prone areas by appropriate cultivars, cropping patterns and land and water management practices, and effective dissemination to farmers	20	Existing practices are based on agro ecological zones and disaster vulnerabilities.	100	Cropping practice should be different based on the climate vulnerabilities e.g. saline tolerant varieties in coastal, drought and low water hungry crops in N-W, short duration rice in Haor region	80
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0105 Adaptation in the fisheries sector							
		Assess potential threats to fish spawning and growth of fish in the freshwater fisheries sector and undertake adaptive measures, including pond fisheries, river-based cage aquaculture etc.	60	Most of these options are practiced across the country. National programmes e.g. 3rd and 4th fisheries project, CBFM has promoted this.	100	Several other better options for integrated and adaptive freshwater floodplain management should be adopted across the ecological zones.	40
		Assess potential threats to fish spawning and growth of fish in the coastal zone and brackish water and undertake appropriate adaptive measures and cultural practices	20	Most of these options are practiced across the country. National programmes e.g. ECFC, ECOFISH, HILSA	100	Several other better options for integrated and adaptive brackish water fisheries management should be adopted across the coastal zones.	80
		Assess potential threats to the marine fish sector and undertake adaptive measures	0	Little or no measures have been taken except ban on fishing (closed season) in marine fisheries	80	Several other better options for integrated and adaptive marine fisheries management should be	80

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>
						adopted in the sea.	
		Assess potential impacts on the shrimp sector and undertake appropriate adaptive measures and cultural practices	0	Several measures have been taken so far but none could withstand against the impacts of climate change	80	Adopt regional best practices in shrimp farming and implement a strong extension and market linkage services to the farmers	80
		Assess potential impacts on the migration of fish and Hilsha fish and undertake appropriate adaptive measures	40	Several actions undertaken related to sustainable harvest resulted in production boom in Hilsha	100	Clearing of fish migration routes during the early monsoon, and effective ban on unsustainable harvest	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0106 Adaptation in Livestock Sector							
							62
		Assess potential threats to the poultry sector, develop adaptive measures and disseminate among farmers	40	Several initiatives have been taken to increase the production of poultry sector including improved feed, marketing, processing	80	More adaptive options to mitigate impacts of climate change including heat stroke, new diseases, and establish an effective extension services	40
		Assess potential threats to the livestock sector, develop adaptive measures and disseminate among farmers	20	Some initiatives have been taken to increase the production of poultry sector including improved feed, marketing, processing	80	More adaptive options to mitigate impacts of climate change including heat stroke, new diseases, living with flood and establish an effective extension services	60
		Strengthen veterinary services systems, including animal health measures in light of the likely increase in disease prevalence	40	The country has a strong veterinary service and effectively contributing to mitigate existing animal health threats	100	New diseases is likely to increase in the coming years and the existing system should adapt with the changes	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0107 Adaptation in Health Sector							
		Research on the impact of climate change on health (including the	40	Some research has been done on the prevalence of	80	Intensity and spread of the traditional diseases is likely	40

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>
		incidence of malaria and dengue, diarrheal diseases, heatstroke) and the cost to society of increased mortality, morbidity and consequent fall in productivity		traditional diseases e.g. malaria, diarrheal diseases		to increase and new diseases will come. Research will make a different in mitigating the future risks	
		Develop adaptive strategies and undertake measures against outbreaks of malaria, dengue and other vector borne diseases and invest in preventive and curative measures and facilities	40	Some measures have been undertaken as part of the health safety policy.	80	New diseases are likely to increase in the coming years and the existing system should adapt with the changes	40
		Develop adaptive strategies against diarrheal and other diseases, which may increase due to climate change, and invest in preventive and curative measures and facilities	40	Some measures have been undertaken as part of the health safety policy.	80	New diseases are likely to increase in the coming years and the existing system should adapt with the changes	40
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0108	Water and sanitation programme for climate vulnerable areas						
		Research and monitor changes in water quality and quantity available for drinking and forecast future changes due to climate change	40	Existing monitoring system provides data on water quality but forecast future changes are limited	80	Forecast future changes due to climate change and strengthen monitoring of the water quality	40
		Plan for and invest in additional water supply and sanitation facilities	40	Significant investments are made as part of the development agenda	100	More investment is required to address the new and emerging threats, e.g. the availability of fresh water, imposed by climate change	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0109	Livelihood protection in ecologically fragile and climate vulnerable zones						
		Comprehensive and participatory planning and investment for climate resilience against erosion	40	Often this is the government priority to lagging regions	80	The situation may get worse with the change in climate and extra care must be	40

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>
		in income, employment and human health in coastal, char, hilly and wetland regions.				taken	
		Promotion of adaptive livelihoods for women in the climate vulnerable regions.	20	In some cases, women livelihood is taken care	100	More and more women are becoming vulnerable and needs livelihood protection	80
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation) 52							
0110	Livelihood protection of vulnerable socio- economic groups (including women)						
		Comprehensive and participatory planning and investment to protect the livelihoods (income, employment, health) of groups who will be especially severely impacted by climate change (e.g., marginal and small farmers, fishermen particularly those fishing in estuaries and the seas, the infirm and elderly, people with physical and mental disabilities)	60	This is a general government priority to invest in the social protection of the marginal people	80	The situation may get worse with the change in climate and extra care must be taken	20
		Comprehensive study of the impact of climate change on women and gender relations and measures to address these in all actions under the BCCSAP	0	Without climate change, no such actions are needed	80	We should know the potential impacts of climate change on women for better planning	80
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation) 38							
02	Comprehensive disaster management						
0201	Project/Programme from Targeted Climate Change Funds						
		Projects and programmes from local climate change fund e.g. CCTF	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Projects and programmes from multilateral and bilateral climate change funds e.g. BCCRF, PPCR	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Global climate change funds e.g.	0	These funds are not used for	100	Projects and programmes	100

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0202 Improvement of flood forecasting and early warning systems							
	GCF, Adaptation Fund	Review of the hydro-meteorological data network and the setting up of telemetric stations	20	This is necessary at a limited scale when weather extremes are not so frequent	100	This is a must for improved early warning, crop and property insurance, and disaster preparedness	80
		Improvement in dissemination of warnings by (a) combining river stage and DEM information; and (b) making 10-day forecasts	20	This is necessary at a limited scale when weather extremes are not so frequent	100	A must to reduce the loss of life and assets of the marginal and vulnerable population	80
		Awareness building programmes at community level on warnings produced and released by FFWC	40	This is a regular preparedness agenda for average hazards and disasters	80	This is very important in the context of extreme climatic events and make sure people responds	40
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0203 Improvement of cyclone and storm-surge warning							
		Review of the present cyclone and storm-surge warning systems and make improvements, where necessary	20	This is necessary at a limited scale when weather extremes are not so frequent	100	This is a must for improved early warning, crop and property insurance, and disaster preparedness	80
		Improvement in cyclone and storm-surge warning dissemination to local communities, through awareness campaigns	20	This is necessary at a limited scale when weather extremes are not so frequent	100	A must to reduce the loss of life and assets of the marginal and vulnerable population	80
		Cyclone preparedness programme (CPP) and other volunteer corps for warning dissemination and emergency evaluation	40	This is a regular preparedness agenda for average hazards and disasters	100	This is very important in the context of extreme climatic events and make sure people responds	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0204 Awareness raising and public education towards climate resilience							
		Awareness raising programmes	40	Regular development agenda	100	All the citizens should have	60

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		among local communities about impacts of Climate Change		for disaster preparedness		knowledge of local impacts of climate change	
		Train local communities on shelter management, search and rescue, and health issues related to disaster management	40	Regular development agenda for disaster preparedness	80	Almost all the areas in the country is vulnerable to CC	40
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0205	Risk management against loss of income and property						
		Devise an effective insurance scheme for losses in property due to climate change impacts	0	Currently no such scheme is readily available and popular	80	Very powerful instrument to improve the adaptive capacity of the vulnerable population	80
		Develop an effective insurance scheme for loss of income from various sources to persons, households and enterprises	20	Some local experience (e.g. Proshika Livestock Insurance) and global best practice is available	80	Very powerful instrument to improve the adaptive capacity of the vulnerable population	60
		Pilot the insurance schemes and if successful, establish insurance systems for lowering risk of adverse impact of climate change	20	Some NGOs and Insurance Companies has piloted property insurance options	80	Very powerful instrument to improve the adaptive capacity of the vulnerable population	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
03	Infrastructure						
Project/Programme from Targeted Climate Change Funds							
0301		Projects and programmes from local climate change fund e.g. CCTF	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Projects and programmes from multilateral and bilateral climate change funds e.g. BCCRF, PPCR	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Global climate change funds e.g. GCF, Adaptation Fund	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
							100



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0302	Repair and maintenance of existing flood embankments						
		Assess the condition of all existing flood embankments and prepare GIS maps	20	Regular development agenda for disaster preparedness	100	Floods are becoming erratic with greater flood height and damage potential	80
		Immediate repair and rehabilitation of existing embankments and appurtenant structures taking future forecast flood levels into account	40	Regular development agenda for disaster preparedness	100	Floods are becoming erratic with greater flood height and damage potential	60
		Construction of new and extension of existing embankments	20	Regular development agenda for disaster preparedness	80	More and more areas will be affected by flood in the coming years	60
							68
0303	Repair and maintenance of existing cyclone shelters						
		Survey and prepare GIS based maps showing the location of all cyclone shelters on the coastal belt of Bangladesh and a database describing their present status and repair needs	20	Most of the existing shelters are either very old or not in a state to use in emergencies. Their numbers are also few	100	Distribution of shelters as per the vulnerable population density across the coast is a must to save lives & property	80
		Construction of new cyclone shelters	20	Shelters are built as part of the disaster preparedness measures	100	More areas of the cost is becoming vulnerable to cyclone and greater number of shelters are necessary	80
		Repair and, where necessary, redesign of cyclone shelters, including their approach roads	40	Sometimes the shelters are hardly accessible during emergencies	100	All shelters must be women and child friendly and accessible via road connectivity	60
		Awareness building in communities and establishment of Community Shelter Committees and running of training programmes, including regular rescue and rehabilitation practice	40	Regular practice as per the shelter management guideline, but often not followed	100	Every shelter should have a trained and active shelter management committee	60

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Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)								
0304	Repair and maintenance of existing coastal polders		Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)					68
		Survey of the condition of coastal polders and preparation of GIS maps with present coverage of areas protected by these polders	40	Regular development agenda for disaster preparedness	100	Cyclones are becoming erratic with greater surge height and damage potential	60	
		Plan, design and immediate repairs of existing dykes, based on future projected sea level rises and storm surges	40	Regular development agenda for disaster preparedness	100	Cyclones are becoming erratic with greater surge height and damage potential	60	
		Reconstruction and repair of polders/embankments to design height and section	20	Regular development agenda for disaster preparedness	100	More and more areas will be affected by cyclone and surge in the coming years	80	
		Construction of new and extension of existing coastal polders	20	Regular development agenda for disaster preparedness	100	More and more areas will be affected by cyclone and surge in the coming years	80	
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)								
0305	Improvement of urban drainage		Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)					68
		Assess the drainage capacity of major cities (Dhaka, Chattogram, Rajshahi, Khulna) and investigate structural and non-structural causes of water logging within the cities and their immediate surroundings using hydro-dynamic models	40	Drainage capacity is known but often encroached or blocked causing water logging	80	Need to consider the changing hydrological regime due to climate change. Also strengthen enforcement to remove encroachments	40	
		Assess the drainage capacity of selected old district towns (e.g. Cumilla, Mymensingh, Sylhet, Barisal etc.) and investigate structural and non-structural causes of water logging within cities and immediate surroundings	40	Drainage capacity is known but often encroached or blocked causing water logging	80	Need to consider the changing hydrological regime due to climate change. Also strengthen enforcement to remove encroachments	40	
		Design and invest in improvements	40	Design works are often done	100	Must consider the CC	60	

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		in the drainage capacity of the major cities		without CC considerations		impacts and hydrological changes in medium and long term	
		Design and invest in improvements in the drainage capacity of selected towns	20	Design works are usually done without CC considerations	100	Must consider the CC impacts and hydrological changes in medium and long term	80
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
61							
Adaptation against floods							
0306		Hydrological modelling of the Brahmaputra-Ganges-Meghna Basin against future climate change scenarios to estimate future flood levels and risks in Bangladesh	20	Increased intensity of floods is often considered during design and investment	100	Along with intensity, increased extremes and frequency posed by CC should also be considered	80
		Develop a Flood Vulnerability Map based on future projected climatic parameters	20	If climate change is not prominent, this may not be a high development priority. But regular mapping should be done	100	This mapping is a must for preparedness incl. early warning, evacuation, crop harvesting, saving mobile properties to safer places	80
		Plan, design and construct flood management infrastructure (embankments and/or others as appropriate) in light of likely future flood levels	20	Regular development agenda for disaster preparedness	100	More and more areas will be affected by floods in the coming years	80
		Flood Plain Zoning corresponding to various levels of vulnerability	40	This is a general development agenda and zoning is done regularly for built up areas	100	This must be done in all three greater river catchments (GBM) for better planning and investment decisions	60
		Long term improvement of flood forecasting and warning including installation of a telemetric network and weather and hydrological	40	Weather observatories and field stations were established and maintained regular data flow, but not in greater density	100	Need more weather stations to introduce crop insurance, warning efficiency for livestock, fisheries, and	60

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		RADARS, and development of Digital Elevation Models (DEM)				other production sectors	
		Plan and implement non-structural flood-proofing measures	20	Usually, flood protection is perceived as a structural measure with small component of coping capacity development	100	Non-structural measures play the roles equally with structural ones to reduce damage and loss	80
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
70							
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0307	Adaptation against future cyclones and storm-surges						
		Analysis of meteorological data to improve predictions of changes in the pattern of cyclonic events	0	Early warning dissemination and shelter management remained the only preparedness intervention	100	Long term meteorological data analysis gives us indication of the frequency and intensity of future events	100
		Planning for upgrading the existing coastal polders and appurtenant structures in the coastal region	40	Maintenance of existing polders is a regular development agenda	100	This needs improvement beyond regular maintenance: increase of height, strength	60
		Planning and designing to construct new polders in the coastal belt and islands	0	May not be necessary with as usual development without incremental CC impacts	60	There is need for new polders. But other ecosystem-based interventions may also be implemented e.g. Plantation, dredging, TRM	60
		Plan and develop coastal green belts as a measure against storm surge	60	Green belts remained development priority since 70s but depleted and encroached in many areas	80	There must be a full-scale plantation programme along the coast, esp. across the probable cyclone paths	20
		Repair, maintenance, and construction, as appropriate, of cyclone shelters for protection against storm surge	40	Regular development agenda for disaster preparedness	100	More and more areas will be affected by cyclone and surge in the coming years	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
72							
0308	Planning, design and construction of river training works						

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		Identification of erosion prone areas including monitoring mechanisms and run physical and hydro-dynamic modelling	40	The areas are identified based on the empirical evidences	80	This should consider mainly the river morphology, upstream water discharge for dynamic modelling	40	
		Design of river training programme and projects	40	Designed as per the conventional techniques on a reactive basis	100	This should be done as preparedness option and based on morphological regime of the river	60	
		Execution of river training works	60	Timing is the key. Without proper prediction, response may not bring good results	100	This should be done considering morphology based design, and prediction based preparation	40	
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)								
0309	Planning, design and implementation of resuscitation of the network of rivers and khais through dredging and de-salutations work							48
		Preparation of River Resuscitation Master Plan on the Upazila Development Plan and identification of priority geographic areas	0	The master plan is not prepared yet. The resuscitation works are not done in an integrated way.	80	The works must be implemented based on a master plan for improved navigability. Piecemeal interventions will not deliver optimum results	80	
		Implementation of river de-siltation plan in a phased approach	0	The de-siltation works are not done in an integrated way.	80	The works should be done in a phased approach and as per the master plan.	80	
		Development of a participatory operation and management plan	20	Limited participation is welcome and no comprehensive management plan in place	80	As the people along the river has traditional knowledge, they must be included in the management plan	60	
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)								
04	Research and knowledge management							68
Climate Change Funds								
0401	Project/Programme from Targeted Climate Change Funds							
		Projects and programmes from local climate change fund e.g CCTF	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100	

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		Projects and programmes from multilateral and bilateral climate change funds e.g. BCCRF, PPCR	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Global climate change funds e.g. GCF, Adaptation Fund	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0402	Establishment of a centre for research, knowledge management and training on climate change						
		Establish centers and/or networks for research on climate change and climate change impacts and their management	0	Climate change outfits are established in different nodal organizations. Sustainability beyond project support is in question.	80	The climate change outfits should be internalized within the regular government functions and put in a network of outfits	80
		Establish a virtual technology bank	20	Technologies and best practices are documented in a piecemeal manner through projects and programmes.	80	A national technology bank should be established considering all sectors vulnerable to climate change	60
		Develop and maintain a dynamic web portal	20	Several web pages are developed by different organization on a project basis. Not regularly updated.	80	A national dynamic portal is a must for harmonized information base and intervention mapping	60
		Develop training programmes for high and mid-level officials of the Government, NGOs and private organizations/associations and provide training in collaboration with research centers and universities	20	Trainings are happening across the organizations on disaster preparedness.	80	Climate change training would increase the knowledge and negotiation skills, taking informed investment decisions	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0403	Climate Change Modeling at National and sub-national levels						
		Build capacity for construction of GCM models with small grids	0	No such models and maps were developed until climate change were evident and	80	Internal capacity must be developed to adjust and run the models on a regular	80

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				detrimental for development		basis	
	Construct appropriate GCM models with small grids to obtain regional variations in weather and building capacity to operate and update them	0	No such models and maps were developed until climate change were evident and detrimental for development	100	This is a must to build the models and create internal capacity to run them on a regular basis	100	
	Collect additional field data for effective use of the calibrated models to predict future climate change	0	This was not considered until climate change impacts were evident and detrimental for development	100	Inclusion of localized information will enhance the dynamism and localization of the models	100	
	Link up regional climate change models to generate better boundary conditions	0	This was not considered until climate change impacts were evident and detrimental for development	100	This is important for cross boundary water flow management and negotiation	100	
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0404	Preparatory studies for Adaptation against sea level rise and its impacts						
	Setting up data collection network stations to monitor sea level rises and salinity along with other appropriate hydro-meteorological data	20	Some data was collected on a regular basis but not in a regular basis	100	This is important for model development and building scenarios	80	
	Modelling the inundation and salinity impacts of SLR by specific time lines	0	Impacts of SLR were not known until the model outcomes were delivered	100	The model is very important to get decision supports for the physical and financial planners and investment decisions	100	
	Modelling and predicting the socio-economic and health impacts of SLR	0	Some impacts are addressed through regular development efforts	80	Impacts may be intensified in the coming years if adequate information is not available on impacts and appropriate measures are taken	80	
	Planning industrial relocation, taking account of private and	20	Earlier, only disasters are considered while taking	80	Impacts of SLR must be considered while taking	60	

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		social costs		investment decisions		investment decisions in the coastal areas	
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0405	Monitoring of Eco system and Bio- diversity changes and their impacts						84
		Set up a well-designed monitoring system to evaluate changes in ecosystem and biodiversity, covering all important and sensitive ecosystems	60	Biodiversity and ecosystem monitoring is an ongoing effort by both government and NGOs	80	Measuring future impacts on biodiversity is very important to assess the role of ecosystem-based adaptation	20
		Develop participatory monitoring systems by involving local trained people such as school teachers, communities and academic researchers	40	Some form of participatory monitoring is in place but on a project basis by the NGOs	80	This will involve the direct beneficiaries of the biodiversity and ecosystem change with firsthand information	40
		Report changes in ecosystems and biodiversity and assess the implications, including those for the livelihoods of local people, and recommend adaptation measures	20	Some reporting is being done but not linked with livelihoods and ecosystem-based adaptation	80	Ecosystem based adaptation is going to be the most significant source of adaptation for marginalized people	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0406	Macroeconomic and sectoral economic impacts of climate change						40
		Evaluate the impact of climate change on the macroeconomy of Bangladesh including impacts on growth, employment, trade patterns, inflation, balance of trade (a Bangladesh Stern Report)	0	Current macroeconomic framework of FD is not inclusive of climate change impacts	100	Climate change should be embedded into the existing macroeconomic framework in both medium and long term	100
		Sectoral economic impacts of climate change for major sectors such as agriculture, industry, services, health, transport and financial services such as insurance	40	Impact of disasters on sectors of the economy are somewhat assessed and embedded	100	Climate change should be embedded into the sectoral and financial services in both medium and long term	60
		Assess the impacts of climate	40	Disaster impacts on poverty	100	Macro-economic impact on	60



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		change on poverty and on people living in vulnerable areas such as, coastal plain and islands, low-lying floodplains, upland areas and - prone areas		and vulnerable population are somewhat assessed in macro-economic terms		poverty and marginalized population should be assessed	
		Assessment of climate change and its impacts on out-migration	0	Not done yet	80	Need to be assessed and integrate into the macro-economic framework	80
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation) = 83							
0407	Monitoring of Internal and External Migration and providing support of capacity building for rehabilitation						
		Development of a monitoring mechanism of internal and external migration	40	Monitoring is being done in BAU scenarios in terms of external migration	80	Internal displacement is going to be one of the most difficult challenges as an outcome of climate change	40
		Development of protocol and provide adequate support for their resettlement and rehabilitation	20	Support is being provided to the internal migration due to economic factors e.g. seasonal employment. This need to be made based on climate impacts	80	This must be done on a proactive long-term basis beyond disaster and economic reasons. An internal migration strategy to be prepared.	60
		Building of capacity through education and training to facilitate their re-settlement in new environment	20	No such programmes are undertaken targeting climate change related migration	60	A re-settlement policy including capacity building component should be drafted.	40
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation) = 48							
0408	Monitoring of impact for management of Tourism and improvement of priority action plan						
		Assessment of probable impact of climate change on all types of tourism in Bangladesh	40	Impact of disaster on tourism is somewhat assessed but through study of climate impact is not done	60	Many of the popular tourist destinations may be affected due to climate change impacts	20
		Preparation of climate change response programme for tourism improvement and implementation of priority recommendations.	0	Limited or no response programme was undertaken	60	Planned response programme should be implemented to both protect and introduce new	60

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Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
05	Mitigation and low-carbon development						
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0501	Project/Programme from Targeted Climate Change Funds						
		Projects and programmes from local climate change fund e.g. CCTF	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Projects and programmes from multilateral and bilateral climate change funds e.g. BCCRF, PPCR	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Global climate change funds e.g. GCF, Adaptation Fund	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0502	Improved Energy efficiency						
		Study the future energy needs of the country and find out the least cost energy supply path that satisfies future energy demand based on the desired growth path of the economy	40	National energy strategy identifies diversified sources of energy including renewables	100	A clean development strategy including future energy needs should be developed	60
		Raise energy efficiency in power production, transmission and distribution through appropriate investments	40	Improved technologies are being introduced in different sectors of power generation	100	Climate sensitive technologies emitting less carbon with reliance on renewables will be critical.	60
		Raise energy efficiency in agricultural and industrial processes through appropriate policies and investments	20	Some initiatives as part of regular development agenda is in place in terms of energy security	100	Use of low carbon emitting energy sources and production process should be promoted	80
		Raise energy efficiency in domestic and commercial/service sectors through appropriate policies and investments	20	Some initiatives as part of regular development agenda is in place in terms of energy security	100	Use of low carbon emitting energy sources and production process should be promoted	80
		Raise energy efficiency in transport	20	Some initiatives as part of regular development agenda is in place in terms of energy security	100	Use of low carbon emitting energy sources and production process should be promoted	80

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Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0503	Gas Exploration and reservoir management						69
40		Invest in gas exploration	60	Investment is made for gas exploration	100	More investment in identifying gas in the near/offshore areas may open new sources	40
40		Invest in reservoir management	60	Investment is made for reservoir management	100	Introduction of mass LNG import is a national energy security priority considering low emission energy source	40
20		Use of gas as an efficient energy over fossil fuel	80	Available gas stock is not enough to include new uses	100	Identify new stocks and encourage new users for gas based power generation	20
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0504	Development of coal mines and coal fired power station						28
		Review coal mining methods and undertake a feasibility study to assess the technical, economic, social and environmental feasibility of coal mining for power generation (including factors such as how to capture coal bed methane)	60	Improved technologies for coal based energy generation is a development priority for the government	60	More greener technologies are encouraged although the cost may be higher but good for mitigation	0
		If the feasibility study is positive, invest in coal mining and coal-fired power generation plants using clean coal technology	40	The government is investing in coal based power generation	80	More greener technologies are encouraged although the cost may be higher but good for mitigation	40
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0505	Renewable energy development						12
		Investments to scale up solar power programmes	20	Option for solar power is considered only for off grid	100	When produced in a mass scale can substitute large	80

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				areas		portion of the total energy demand		
		Research and investment to harness wind energy, particularly in coastal areas.	0	So far used on a demonstration case in the near offshore islands. Have potentials for scaling up	100	When produced in a mass scale can substitute large portion of the total energy demand	100	
		Feasibility studies for tidal and wave energy	0	Not feasibility study undertaken and demonstrated yet. Potentials are unknown	100	If feasible, can substitute large portion of the total energy demand	100	
		Study of the techno-economic, social and institutional constraints to adoption of improved biomass stoves and other technologies	40	Development priority in the energy sector. Scaled up in rural areas	100	Country-wide scaling-up should be a priority towards low carbon development and healthy in-house environment	60	
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)								
0506	Lower emission from agricultural land							81
		Support to research and on-farm trials of new water management technology on crop (including rice) land	40	Undertaken research on water usage in agriculture, cultivation of low irrigation requirement crops	100	Continue further research and selection of crops and varieties are necessary	60	
		Support to agricultural extension service to popularize new water management techniques for rice production	60	Extension services for water usage in agriculture, cultivation of low irrigation requirement crops is ongoing	100	More extended support to the extension of water usage in agriculture, cultivation of low irrigation requirement crops is needed	40	
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)								
0507	Management of urban waste							46
		Design of urban waste dumps so that methane can be captured in all major urban areas	20	Waste disposal uses traditional and unsustainable ways	60	Improved ways for waste disposal including energy generation from kitchen waste	40	
		Using CDM mechanism to set up small power plants by capturing the produced methane from waste	0	Small demonstrations are done but scaling up potentials are not assessed yet	60	Scaling up of the energy generation based urban waste disposal will	60	

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		dumps				contribute in climate mitigation and low carbon pathway	
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0508	Forestation and reforestation program						
		Provide support to existing and new coastal afforestation programmes taking into account the future rise in salinity levels due to sea level rise	40	Afforestation programme in the coastal areas undertaken since seventies to reduce cyclone and surge damage	100	More exposed areas left or due to depletion of the existing plantation areas, more plantation is necessary	60
		Develop an extensive wetland afforestation programme to protect settlements against wave erosion	20	This is being done for decades but need more attention and programme based approach	100	This should extend across the north-eastern wetland areas. This plantation has several other co-benefits e.g. fisheries	80
		Study the scope for carbon credits under REDD and invest, if appropriate, in reforestation of degraded reserve forests	20	Forest conservation was done under the framework of environment protection	100	Reforestation of degraded areas will create a large stock for REDD	80
		Provide support to existing and new homestead and social forestry programmes and enhance carbon sequestration	40	Social forestry programme was initially introduced as an income generation activity	100	This has further potential to expand and intensify. Benefits are both environment and climate mitigation	60
		Research the suitability of various tree species for their carbon-locking properties for designing various forestry programmes keeping in mind other environmental and socio-economic functions of forestry	20	Ongoing research by the forest research institute for suitable tree species for specific ecosystems	100	Introduction of more carbon locking species in both social and protected areas forests will help climate mitigation	80
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0509	Rapid expansion of energy saving Devices e.g. CFL						
		A rapid assessment of potential of	40	The assessment was done as	100	Introduction of new energy	60

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>
		modern energy saving appliance and technologies in Bangladesh		part of the energy security policy of the government		saving homestead and industrial appliances	
		Development of a project proposal for obtaining CDM benefits	0	The country is not yet ready to participate in the CDM process	80	This is a market-based approach and has potential to CDM and receive mitigation benefits	80
		Facilitate expansion of energy saving technologies and devices	40	Energy saving technologies are being promoted as part of the energy security policy of the government	100	Energy saving technologies and devices has further potentials for expansion at households and industries	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0510	Energy and water efficiency in built environment						
		Necessary adaptation of existing buildings and additional space in under construction buildings for collection and storage of rainwater	0	Not a binding provision under the building construction act.	60	This has immense potential for saving energy from urban water supply.	60
		Installation of solar thermal power or small windmill at the rooftop or nearby all buildings and infrastructures	20	All new buildings must have solar panels installed to get building permission. Most of those are non-functional after construction	80	This will reduce dependency on the on-grid sources of energy. At the same time these sources are carbon neutral	60
		Revision of building code for inclusion of energy saving devices in all infrastructures and provision of construction works in energy efficient methods	40	All new buildings must have solar panels installed to get building permission. Most of those are non-functional after construction	80	Green buildings will reduce energy consumption and dependency on the on-grid sources of energy. At the same time these sources are carbon neutral	40
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0511	Improving in energy consumption pattern in transport sector and options for mitigation						
		Promotion of low cost public transport modes such as rapid transit	60	The government is investing heavily on MRT run by electricity and city bus service	100	Expansion of the services in other big cities of the country	40
		Reducing the use of fossil fuel by improving the efficiency of energy	40	From 2 strokes to 4 stroke engines and use of CNG, LNG.	80	Introduction of electric and hybrid cars and buses. Also	40

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>
		use				use of modern industrial appliances	
		Substitution of biofuels and fossil fuels as appropriate	0	Biofuel has not yet introduced in the country	20	Potential for the use of biofuel in the country is not known yet.	20
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
06	Capacity building and institutional strengthening						
0601	Project/Programme from Targeted Climate Change Funds						
		Projects and programmes from local climate change fund e.g. CCTF	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Projects and programmes from multilateral and bilateral climate change funds e.g. BCCRF, PPCR	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
		Global climate change funds e.g. GCF, Adaptation Fund	0	These funds are not used for development without climate sensitivity	100	Projects and programmes are scrutinized using climate criteria	100
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)							
0602	Revision of sector policies for climate resilience						
		Draft a consultation paper on the National Climate Change policy, the integration of climate change issues into development planning and sectoral policies and how they should be formulated for discussion with key stakeholders	40	All policies and plans that are either new or updating are now inclusive of climate change impacts.	100	All other policies and strategies should also be reviewed over the time.	60
		Incorporate climate change concerns in all sectoral policies and strategies through appropriate revisions in consultation with relevant stakeholders	40	Some adaptation and mitigation options are spontaneously included in the policies formed without considering climate change	100	All other sectoral policies, plans and strategies should also be reviewed over the time.	60
		Publish the National Climate Change Policy	0	Not drafted yet	100	A new policy to embed climate change into the framework policies and	100

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation) 77							
0603 Mainstreaming climate change in National, Sector and Spatial Development program							
		Establish and build the capacity of climate change cells in ministries and agencies to incorporate climate change considerations in all planning processes	20	Climate cells established in relevant ministries and department are often project driven and unsustainable unless internalized	100	A central coordination outfit of planning and finance should be established as networking entity for all climate related efforts.	80
		Agree design and planning parameters for project design for selected years.	40	The proforma is developed and updated in conformity with the national planning process containing climate related information	80	The proforma should be dynamic to address the requirements of special plans for certain years	40
		Modify the Project Proforma in an appropriate way	40	The project proforma was updated in 2016 containing climate risk and vulnerability information. Lacking climate finance issues.	100	The existing project proforma should include climate finance issues and linking with the BCCSAP and other climate relate plans and strategies	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation) 77							
0604 Strengthening human resource capacity							
		Enhance the capacity of Government staff for policy, programme and project formulation, and implementation, through training and in other ways	20	The government officials are trained on programme and project preparation, implementation	80	The officers will be trained on climate change science and Bangladesh context and how to include this into project and programme development	60
		Enhance capacity of key staff of Government, private sector organizations and NGOs on accessing international and national Carbon and Climate Change Funds	40	Key staff of the government are trained at accessing global funds.	80	Key staffs should be trained on specific climate funds e.g. GCF. However, more importance is given on the effective use of the local funds	40



Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>
		Enhance the human resource capacity within and outside Government for Climate Change negotiations	40	Key staff of the government are trained at negotiating at the global forums	100	Key senior staff should be equipped with the climate change knowledge and discourses for better negotiations	60
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation) 48							
0605 Strengthening Gender consideration in climate change management							
		Development of criteria and approach for inclusion of gender consideration in all climate response activities	40	Gender inclusion criteria and approaches are developed in projects related to poverty, resource management, etc.	80	Specific criteria and approach for inclusion of gender consideration in all climate response activities need to be updated or developed	40
		Build the capacity of gender focal point in all ministries and agencies to incorporate gender issues in all climate response activities	40	All the ministries have identified gender focal point but only some ministries have climate change focal points.	60	All ministries and departments are yet to dedicate climate focal points in their organizations. Organize training and awareness activities is necessary.	20
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation) 26							
0606 Strengthening institutional capacity for Climate Risk Management							
		Setting up of mechanisms for inter-ministerial and inter-institutional coordination at various levels of the government, and for managing new adaptation and planned mitigation funds	40	Inter-ministerial and inter-institutional coordination mechanisms are established and in practice	100	Specific inter-ministerial coordination with global reporting should be developed	60
		Organizational reform and strengthening of key government and other agencies	20	Some reform is ongoing and some are planned in favor of the climate change	100	Major reforms are necessary to access global funds e.g. GCF	80
Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation) 66							
0607 Mainstreaming climate change in the media							
		Capacity Building and Training	20	Media mostly communicates	60	Training and awareness	40

Code	Climate Relevance Criteria	Intended Climate Interventions <sup>1</sup>	Sensitivity- in BAU (a)	Description of Climate Sensitivity <sup>2</sup>	Dimension (b)	Description of Climate Change Dimension <sup>3</sup>	Relevance c=(b-a) <sup>4</sup>	
		print and electronic journalists		disaster preparedness and emergency response related issues		raising events may be organized to raise knowledge and understanding of the reporters.		
		Exposure visits to climate change hot spots across the country and tracking global negotiations	40	Journalists are aware about the vulnerable locations to disasters	60	Journalists may be taken to climate hotspots for cross learning and participating global negotiations regularly	20	
		State of Climate Change Reports, Earth Files, Features, Photo-Features	40	Journalists are contributing to the state of environment reports and photo features	60	Prepare the Journalists to contribute to the state of climate reports	20	
		Media networking	40	Media mostly works in a network basis	60	Organize media to network and report with harmonized information base	20	
07	Not Climate Relevant		Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)					30
0701	Not relevant	Any developmental activities having no direct sensitivity and dimension for climate relevance	0	All non-climate sensitive activities	0	All activities without climate dimension	0	
			Climate Relevance Weight (MAX intervention weight – Sample Standard Deviation)					0

## Appendix 2: Climate Relevance Criteria and Relevance Weight (%)

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant? <sup>6</sup>
01	<p>Food Security Social Protection and Health</p> <p>Climate change is likely to impact most severely on the poorest and most vulnerable in society. Every effort will be made to ensure that they are protected and that all programmes focus on the needs of this group for food security, safe housing, employment and access to basic services, including health. Under this theme the government will:</p> <ul style="list-style-type: none"> <li>- Increase the resilience of vulnerable groups, including women and children, through development of community-level adaptation, livelihood diversification, better access to basic services and social protection (e.g., safety nets, insurance) and scaling up</li> <li>- Develop climate change resilient cropping systems (e.g., agricultural research to develop crop varieties, which are tolerant of flooding, drought and salinity, and based on indigenous and other varieties suited to the needs of resource poor farmers), fisheries and livestock systems to ensure local and national food security</li> <li>- Implement surveillance systems for existing and new disease risks and ensure health systems are geared up to meet future demands</li> <li>- Implement drinking water and sanitation programmes in areas at risk from climate change (e.g., coastal areas, flood-and drought-prone areas)</li> </ul>			
0101	Institutional capacity for research towards climate resilient cultivars and their resilience	73%	<p>Key objective is to build the institutional capacity of research centers and expertise of researchers to develop climate resilient cultivars of food and other crops.</p> <p>The impact of climate change on many food (e.g., potatoes) and non-food crops (e.g., jute) is largely unknown. Research must be initiated to understand these impacts and find out how to minimize adverse changes.</p> <p>It takes 7-8 years to breed new cultivars, certify them and release to the farmers through the extension system. In view of this, indigenous varieties will be screened to identify those that can withstand, at least partially, the adverse impacts of climate change on yields. After participatory field trials, they will be disseminated to farmers.</p>	<ul style="list-style-type: none"> <li>- Collection and preservation of local varieties of robust cultivars and documentation of their characteristics</li> <li>- Research to develop climate resilient varieties of rice (i.e., heat, drought, salinity and submergence- tolerant varieties)</li> <li>- Research to develop climate resilient cultivars of wheat and other food and nonfood crops, including vegetables</li> <li>- Field trials and dissemination to farmers of the local robust cultivars and the newly developed varieties, in partnership with the extension service and NGOs</li> <li>- Strengthening the capacity of key research institutes and scientists to undertake the work</li> <li>- <i>Mostly related to the BRRI, BARI and other NARS organization</i></li> </ul>

<sup>5</sup> Percentages are taken from the previous table.

<sup>6</sup> These are the most relevant organizations for any specific programme as specified in the BCCSAP-2009. However, other ministry or departments not listed may also implement such programmes.

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant? <sup>6</sup>
0102	Development of climate resilient cropping systems and production technologies	69%	Key objective is the development of climate resilient cropping systems appropriate to different agro-climatic regions and sub-regions. It is predicted that climate change will result in increasingly frequent and severe floods in the central part of the country; flash floods in the north-eastern and eastern parts adjacent to Meghalaya and Tripura, drought and erratic rainfall in north western and western Bangladesh. Salinity is likely to increase in the south western and south-central part of the country; rainfall is likely to become more erratic in the CHT, and the coastal islands will face frequent and extreme cyclonic weather. The changes will require farmers to modify their current cropping systems or change to alternative systems. Research is needed to develop and field test alternative systems, adapted to likely future conditions, so that choices are available for farmers as climatic conditions change. The associated seed supply and extension mechanisms also should be developed. Research and development will be undertaken by BRRRI, BARI and other national research institutes and their regional research stations, in partnership with NGOs.	<ul style="list-style-type: none"> <li>- Develop climate resilient cropping patterns suited to different regions of the country</li> <li>- Field level trials of climate resilient cropping patterns, associated water management (e.g. irrigation) systems, and awareness generation among farmers and consumers</li> <li>- Develop organized seed production, storage, supply system and extension mechanisms</li> <li>- Identify/develop technologies (i.e. mulching, water management, polytunnels, raised beds, etc.) for crop production in the vulnerable areas</li> <li>- Develop early warning and weather forecasting for crop production against diseases, insects, drought, floods, storms, tidal surges, etc.</li> <li>- <i>Mostly related to the Ministry of Agriculture, NARS</i></li> </ul>
0103	Adaptation against drought, salinity submergence and heat	66%	Key objective is to develop climatic stress (e.g. drought, salinity submergence, heat) management options for farmers. Climate change is likely to result in increasingly erratic rainfall patterns, droughts, and salinity intrusion. Since Independence, major irrigation projects (e.g., the GK Project and Teesta Barrage) were developed to provide supplementary irrigation in the worst affected parts of the country. With climate change, these conditions are likely to be exacerbated. The development of appropriate adaptive measures combining robust indigenous and new cultivars, new cropping systems and improved water management practices need to be developed, tested and disseminated to farmers.	<ul style="list-style-type: none"> <li>- Preparation of adaptation plans and GIS maps of areas vulnerable to droughts, salinity submergence and heat</li> <li>- Develop and test adaptive measures in drought, salinity submergence, heat and cold-prone areas by appropriate cultivars, cropping patterns and land and water management practices, and effective dissemination to farmers</li> <li>- <i>Mostly related to the Ministry of Agriculture and Ministry of Water Resources, in association with the extension service</i></li> </ul>
0104	Adaptation in the fisheries sector	62%	Key objective is the development of adaptation strategies in the fisheries sector.	<ul style="list-style-type: none"> <li>- Assess potential threats to fish spawning and growth of fish in the freshwater fisheries sector</li> </ul>

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant?
0105	Adaptation in Livestock Sector	48%	<p>Climate change is likely to adversely affect freshwater and marine fisheries in Bangladesh (e.g., the spawning of freshwater species; water temperatures in ponds and inland fisheries are likely to increase; saline water is likely to extend further inland in the south of the country, which will change the aquatic ecosystem and production of fish in this zone; and turbulent and rough weather along the coast may prevail for longer durations adversely impacting on the livelihoods of fishermen). It is important that these potential impacts are identified and research and management strategies developed, tested and made ready, in anticipation of climate-related changes.</p> <p>Key objective is the development of options for adaptation in the livestock sector. Higher ambient temperatures, as well as floods and droughts, are likely to adversely affect poultry and livestock. Higher temperatures will limit the growth of chicken, broilers and other birds such as pigeons and ducks. Grazing lands may no longer be productive due to rising salinity in coastal areas and droughts. Higher temperatures and humidity may affect animal health through the more rapid breeding of parasites and bacteria. These changes are likely to seriously affect the livelihoods of livestock farmers and the availability of livestock products in Bangladesh. It is necessary to understand these processes, develop appropriate adaptive measures, field test them and make them available to livestock and poultry farmers, many of whom are among the poorest and most vulnerable people in the country.</p>	<p>and undertake adaptive measures, including pond fisheries, river-based cage aquaculture etc.</p> <ul style="list-style-type: none"> <li>- Assess potential threats to fish spawning and growth of fish in the coastal zone and brackish water and undertake appropriate adaptive measures and cultural practices</li> <li>- Assess potential threats to the marine fish sector and undertake adaptive measures</li> <li>- Assess potential impacts on the shrimp sector and undertake appropriate adaptive measures and cultural practices</li> <li>- Assess potential impacts on the migration of fish and Hilsa fish and undertake appropriate adaptive measures</li> <li>- <i>Mostly related to the Ministry of Fisheries and Livestock, Department of Fisheries, Fisheries Research Institute, in association with NGOs</i></li> <li>- Assess potential threats to the poultry sector, develop adaptive measures and disseminate among farmers</li> <li>- Assess potential threats to the livestock sector, develop adaptive measures and disseminate among farmers</li> <li>- Strengthen veterinary services systems, including animal health measures in light of the likely increase in disease prevalence</li> <li>- <i>Mostly related to the Ministry of Fisheries and Livestock, Department of Livestock, Bangladesh Livestock Research Centre, in association with the NGOs</i></li> </ul>

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant?
0106	Adaptation in Health Sector	40%	<p>Key objective is to conduct research and monitoring on the impacts of climate change on disease patterns and the social and economic costs of disease. Develop adaptive measures. One of the major impacts of global warming and climate change will be an increase in vector borne diseases (e.g., malaria and dengue fever). Global warming will also raise temperatures in the summer season, increasing the incidence of heat strokes, which could be further aggravated by shortages of drinking water. Possible other threats from other vector borne diseases such as Kala-azar and typhoid have yet to be assessed.</p> <p>It is important that the monitoring of diseases linked to climate change is upgraded and research undertaken to develop adaptive strategies that can be put in place as needs emerge.</p>	<ul style="list-style-type: none"> <li>- Research on the impact of climate change on health (including the incidence of malaria and dengue, diarrheal diseases, heatstroke) and the cost to society of increased mortality, morbidity and consequent fall in productivity</li> <li>- Develop adaptive strategies and undertake measures against outbreaks of malaria, dengue and other vector borne diseases and invest in preventive and curative measures and facilities</li> <li>- Develop adaptive strategies against diarrheal and other diseases, which may increase due to climate change, and invest in preventive and curative measures and facilities</li> <li>- <i>Mostly related to the Ministry of Health and Family Planning, in association with research centres (ICDDR-B) and others</i></li> </ul>
0107	Water and sanitation programme for climate vulnerable areas	46%	<p>Key objective is to ensure adequate water supplies and improved sanitation.</p> <p>The increasing prevalence of droughts will adversely affect availability of surface water and drinking water from and will require investment in deep set ground water technologies, conservation of water and rainfall harvesting, in some regions. Also, in the coastal zone, as sea level rises, salinity will move inland making safe drinking availability a big challenge. Urban areas are likely to be especially vulnerable to reduced surface and groundwater availability.</p> <p>There is a need to monitor the availability of drinking water (both quantity and quality) and to develop strategies to increase supplies of drinking water and to provide improved sanitation services, as climate change becomes evident. In the meantime, every effort should be made to ensure that people currently living in drought-prone and saline affected areas are provided with adequate services.</p>	<ul style="list-style-type: none"> <li>- Research and monitor changes in water quality and quantity available for drinking and forecast future changes due to climate change</li> <li>- Plan for and invest in additional water supply and sanitation facilities</li> <li>- <i>Mostly related to the Ministry of Local Government and various local government bodies and NGOs in rural and urban Bangladesh</i></li> </ul>
0108	Livelihood protection in	52%	<p>Key objective is to address, in a timely and effective way,</p>	<ul style="list-style-type: none"> <li>- Comprehensive and participatory planning and</li> </ul>

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant?
0109	ecologically fragile and climate vulnerable zones		<p>adverse impacts on livelihoods in ecologically vulnerable areas. Climate change will impact upon the regions in Bangladesh in different ways. Those which are already ecologically fragile may become more so due to changes in temperature and more erratic rainfall patterns. Climate related disasters may destroy people's homes, and incomes and employment could be threatened in many areas. Strategies will be needed to help people in these regions become climate resilient and ensure their economic and social well-being. Special attention will be paid to impacts on women and children. Affected regions are likely to include the coastal zone, river chars, hilly areas (e.g., the Hill Tracts) and inland wetland areas.</p> <p>Key objective is to ensure equitable and sustainable development of all vulnerable socio-economic groups. Climate change will impact on different socio-economic groups in Bangladesh in various ways. The poor and the non-poor will be affected differently because of their contrasting asset bases and incomes.</p> <p>Groups that will be considered include: fishing families, who will be affected by changes in freshwater and marine ecosystems; poor and marginal farmers, who will be at greater risk from crop failure than better-off farmers and will need special attention to protect them from income losses due to climate change; people who are physically and mentally challenged who may need special protection. Women and children are generally more vulnerable than men, especially in poor households, and all programmes will thus prioritise the needs of women and children. In some cases, the programme will provide protection against loss of employment and income, in others, health needs may be more acute; and for some social welfare measures through transfer programmes may be necessary.</p>	<p>investment for climate resilience against erosion in income, employment and human health in coastal, char, hilly and wetland regions.</p> <ul style="list-style-type: none"> <li>- Promotion of adaptive livelihoods for women in the climate vulnerable regions.</li> <li>- <i>Mostly related to various line ministries, in collaboration with NGOs</i></li> <li>- Comprehensive and participatory planning and investment to protect the livelihoods (income, employment, health) of groups who will be especially severely impacted by climate change (e.g., marginal and small farmers, fishermen particularly those fishing in estuaries and the seas, the infirm and elderly, people with physical and mental disabilities)</li> <li>- Comprehensive study of the impact of climate change on women and gender relations and measures to address these in all actions under the BCCSAP</li> <li>- <i>Mostly related to the various line ministries, including Agriculture, Food and Disaster Management, Women's Affairs, and Health, in partnership with NGOs</i></li> </ul>
02	Comprehensive Disaster Management			
Comprehensive Disaster Management systems will be further strengthened to deal with the increasingly frequent and severe natural catastrophes as a result of				



Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant?
	<p>climate change. We will build on and extend our proven experience in this area. Under this theme the government will:</p> <ul style="list-style-type: none"> <li>Strengthen the government's capacity and that of civil society partners and communities to manage natural disasters, and ensure that appropriate policies, laws and regulations are in place</li> <li>Strengthen community-based adaptation programmes and establish them in each of the disaster-prone parts of the country</li> <li>Strengthen our cyclone, storm surge and flood early warning systems to enable more accurate short, medium and long-term forecasts</li> </ul>			
0201	Improvement of flood forecasting and early warning systems	61%	<p>Key objective is to improve of the existing flood forecasting and early warning systems by increasing lead times and strengthening dissemination mechanisms.</p> <p>Bangladesh is highly regarded for its competence in flood forecasting and early warning systems. The forecasts are released through e-mails as well as placed on a web-site. However, there is scope for improvement. The current practice of releasing warnings in terms of river stage are not easily understood by local communities, while the absence of digital elevation models (DEM) makes it difficult for flood forecasting modellers to relate river stage to likely flood levels at different locations in the countryside. It would be helpful to communities and the authorities to have longer range forecasts, even though they are not always reliable.</p>	<ul style="list-style-type: none"> <li>Review of the hydro-meteorological data network and the setting up of telemetric stations</li> <li>Improvement in dissemination of warnings by (a) combining river stage and DEM information; and (b) making 10-day forecasts</li> <li>Awareness building programmes at community level on warnings produced and released by FFWC</li> <li>Mostly related to the Ministry of Water Resources and its various agencies; civil society organizations active in disaster management and media</li> </ul>
0202	Improvement of cyclone and storm-surge warning	68%	<p>Key objective is to improve in cyclone and storm surge warnings and dissemination.</p> <p>Dissemination of cyclone and storm-surge warnings is done, at community level, through the Cyclone Preparedness Programme (CPP) Volunteers of the Bangladesh Red Crescent Society (BDRCS). There is thus an urgent need to review the system and make improvements, where necessary.</p> <p>In recent years, the Bay of Bengal has become more turbulent, with Warning No-3 announced more frequently than before. Rough seas adversely affect the fishing practices and livelihoods of fishermen. The entire coastline of Bangladesh is vulnerable to cyclones and associated storm-surges.</p>	<ul style="list-style-type: none"> <li>Review of the present cyclone and storm-surge warning systems and make improvements, where necessary</li> <li>Improvement in cyclone and storm-surge warning dissemination to local communities, through awareness campaigns</li> <li>Cyclone preparedness programme (CPP) and other volunteer corps for warning dissemination and emergency evaluation</li> <li>Mostly related to the Ministry of Disaster Management and Relief, Bangladesh Red Crescent Society, NGOs and CBOs (community based organisations) working in the coastal areas and media</li> </ul>



Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant?
0203	Awareness raising and public education towards climate resilience	46%	Key objective is to strengthen the community-based disaster preparedness and improved resilience. Bangladesh has developed a comprehensive and effective disaster management system. The Standing Order on Disaster provides guidance to local communities and the authorities, at various levels, on their roles and responsibilities during and immediately after a disaster has struck. It also lays out procedures for alerting local communities when a disaster such as a flood, cyclone or storm-surge is likely to occur. Despite this, there is a need to raise awareness among communities and officials at all levels on the likely increased incidence of natural disasters. Some areas where urgent attention may be given include shelter management, search and rescue and health issues during and after disasters.	<ul style="list-style-type: none"> <li>- Awareness raising programmes among local communities about impacts of Climate Change</li> <li>- Train local communities on shelter management, search and rescue, and health issues related to disaster management</li> <li>- <i>Mostly related to the Ministry of Disaster Management and Relief, Bangladesh Red Crescent Society, NGOs, CBOs working in the coastal areas, media (print and electronic)</i></li> </ul>
0204	Risk management against loss of income and property	77%	Key objective is to put in place an effective insurance system for risk management against loss of income and property. Climate change is likely to result in loss of income and property to people, households, enterprises, and infrastructure. Communities and families try to climate proof in several ways (e.g. raising the mounds on which they build their houses to protect them from floods and the use of adapted varieties of crops). In addition, insurance against climate-related losses may also be an effective risk reduction mechanism. The Government will partner with the insurance industry and NGOs to develop new insurance products for people, households and enterprises against climate related losses.	<ul style="list-style-type: none"> <li>- Devise an effective insurance scheme for losses in property due to climate change impacts</li> <li>- Develop an effective insurance scheme for loss of income from various sources to persons, households and enterprises</li> <li>- Pilot the insurance schemes and if successful, establish insurance systems for lowering risk of adverse impact of climate change</li> <li>- <i>Mostly related to the Ministry of Finance and other line ministries, and the insurance sector and NGOs</i></li> </ul>
03	Infrastructure		It is imperative that existing infrastructure (e.g. coastal and river embankments) is well-maintained and fit-for-purpose and that urgently needed infrastructure (e.g. cyclone shelters, urban drainage) is put in place to deal with the likely short and medium-term impacts of climate change. Under this theme the government will:	
			<ul style="list-style-type: none"> <li>- Repair and rehabilitate existing infrastructure (e.g. coastal embankments, river embankments and drainage systems, urban drainage systems) and ensure effective operation and maintenance systems</li> <li>- Plan, design and construct urgently needed new infrastructure (e.g. cyclone shelters, coastal and river embankments and water management systems; urban drainage systems, river erosion control works, flood shelters) to meet the changing conditions expected with climate change</li> </ul>	

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant? <sup>6</sup>
0301	<ul style="list-style-type: none"> <li>Repair and maintenance of existing flood embankments</li> </ul>	68%	<p>Key objective is to ensure continued flood protection by repairing and rehabilitating existing flood embankments. Earthen embankments have been constructed by the Bangladesh Water Development Board (BWDB), along most major and medium-sized rivers in the country and also some minor rivers. The heights of the embankments were designed based on recent major floods and/or statistical analysis of past river stage data. Many of these embankments are in poor shape due to lack of proper maintenance.</p> <p>Embankments have provided security from flooding and, as a result, many people have moved into protected floodplain areas. The traditional approach of building homes on raised mounds has more or less been abandoned. Farmers go for high yielding variety of crops because of the security provided by the embankment and associated drainage systems. Given this, it is very important to rehabilitate existing river flood embankments so that they are fully functional and able to provide the level of security for which these were constructed.</p>	<ul style="list-style-type: none"> <li>Assess the condition of all existing flood embankments and prepare GIS maps</li> <li>Immediate repair and rehabilitation of existing embankments and appurtenant structures taking future forecast flood levels into account</li> <li>Construction of new and extension of existing embankments</li> <li><i>Mostly related to the Ministry of Water Resources and its agencies</i></li> </ul>
0302	<ul style="list-style-type: none"> <li>Repair and maintenance of existing cyclone shelters</li> </ul>	70%	<p>Key objective is to make existing cyclone shelters safe and functional.</p> <p>Some of the major cyclonic storm surges in 1970, 1991 and 2007 exceeded 7 meters. Existing coastal embankments can be overtopped by high storm surges, which are likely to become more frequent with global warming. Most of the cyclone shelters constructed in 1960 and 1970 require urgent repair and maintenance. Many of the shelters built after 1991 cyclone also need repair.</p> <p>The cyclone shelters in Bangladesh are considered a major success among disaster management professionals. However, during Cyclone Sidr, many people who sought refuge in cyclone shelters were scared for their safety because of the poor condition of the structures. As another storm surge may hit the coast of Bangladesh, anytime, and at any location, cyclone</p>	<ul style="list-style-type: none"> <li>Survey and prepare GIS based maps showing the location of all cyclone shelters on the coastal belt of Bangladesh and a database describing their present status and repair needs</li> <li>Construction of new cyclone shelters</li> <li>Repair and, where necessary, redesign of cyclone shelters, including their approach roads</li> <li>Repair and reconstruction of cyclone shelters and approach roads/tracks</li> <li>Awareness building in communities and establishment of Community Shelter Committees and running of training programmes, including regular rescue and</li> </ul>

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0303	Repair and maintenance of existing coastal polders	80%	shelters along the entire coastal belt must be urgently made fully functional and operational.  Key objective is to repair and reconstruct the existing polders in the coastal belt of the Bangladesh. The coastal belt of Bangladesh faces severe cyclonic weather and storm surges at regular intervals. It is predicted that such natural calamities will hit the coastal belt with increasing frequency and intensity. The experience of Cyclone Sidr, in 2007, shows that damage was the greatest in unprotected areas and where the storm surge had breached the dyke (e.g., in Southkhali of Sharankhola Thana). For over 25 years, much of the coastline of Bangladesh has been protected by over 7,000 kms of earthen embankments in the form of polders. A recent study by CEGIS shows that most of the polders need urgent repair. People living behind these embankments enjoy security from high spring tides and have been able to improve their agricultural practices. Although, such dykes cannot protect against high cyclonic storm surges, they are critical to the livelihoods and safety of people in the region.	<ul style="list-style-type: none"> <li>rehabilitation practice - Mostly related to the <i>Ministry of Food and Disaster Management, Red Crescent Society, private sector under their CSR programmes and NGOs</i></li> <li>Survey of the condition of coastal polders and preparation of GIS maps with present coverage of areas protected by these polders</li> <li>Plan, design and cost immediate repairs of existing dykes, based on future projected sea level rises and storm surges</li> <li>Reconstruction and repair of polders/embankments to design height and section</li> <li>Construction of new and extension of existing coastal polders</li> <li>Mostly related to the <i>Ministry of Water Resources and its agencies</i></li> </ul>
0304	Improvement of urban drainage	61%	Key objective is to prevent drainage congestion and water logging that may result from heavy rainfall in urban areas. The current storm drainage systems of the major cities were designed using historical rainfall data. It is likely that these design capacities will be exceeded in future. One of the major impacts of climate change is likely to be an increase in the number of episodes of short duration and heavy rainfall. This will result in water logging due to drainage congestion. Major cities will be increasingly vulnerable. Parts of Dhaka are already waterlogged regularly as the designed drainage capacity of the city's sewer system is not able to cope with the load. This has occurred a number of times in recent years and	<ul style="list-style-type: none"> <li>Assess the drainage capacity of major cities (Dhaka, Chattogram, Rajshahi, Khulna) and investigate structural and non-structural causes of water logging within the cities and their immediate surroundings using hydro-dynamic models</li> <li>Assess the drainage capacity of selected old district towns (e.g. Cumilla, Mymensingh, Sylhet, Barishal etc.) and investigate structural and non-structural causes of water logging within cities and immediate surroundings</li> <li>Design and invest in improvements in the</li> </ul>

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0305	Adaptation against floods	70%	<p>the frequency is increasing. In existing cities, the drainage capacity of the sewer system must be improved to prevent major water logging.</p> <p>Key objective is to make flood prone areas more resilient. One of the main impacts of climate change will be the increased frequency and intensity (duration and level) of floods. The floods in 1995, 1998, 2000, 2004 and 2007 either exceeded the previous highest water level or rose very close to such levels.</p> <p>In view of this, hydrological modelling of the Brahmaputra-Ganges-Meghna basin, for different climate change scenarios is needed to estimate future river flows and flood risks. Based on these data, a plan to upgrade structural measures against likely future floods can be made.</p> <p>Key non-structural measures for flood management include flood proofing and flood plain zoning. Once a new flood vulnerability map and associated Digital Elevation Model is developed, flood proofing measures may be planned, especially in the most vulnerable areas, including chars. Flood plain zoning will also support setting up of high value infrastructure such as power stations and industrial units in safe locations.</p>	<ul style="list-style-type: none"> <li>- drainage capacity of the major cities</li> <li>- Design and invest in improvements in the drainage capacity of selected towns</li> <li>- <i>Mostly related to the Ministry of Local Government and Rural Development with the Local Government Engineering Department, Dhaka WASA, Chattogram WASA</i></li> <li>- Hydrological modelling of the Brahmaputra-Ganges-Meghna Basin against future climate change scenarios to estimate future flood levels and risks in Bangladesh</li> <li>- Develop a Flood Vulnerability Map based on future projected climatic parameters</li> <li>- Plan, design and construct flood management infrastructure (embankments and/or others as appropriate) in light of likely future flood levels</li> <li>- Flood Plain Zoning corresponding to various levels of vulnerability</li> <li>- Long term improvement of flood forecasting and warning including installation of a telemetric network and weather and hydrological RADARS, and development of Digital Elevation Models (DEM)</li> <li>- Plan and implement non-structural flood-proofing measures</li> <li>- <i>Mostly related to the Ministry of Water Resources and its agencies</i></li> </ul>
0306	Adaptation against future cyclones and storm-surges	72%	<p>Key objective is to plan and implement an investment programme to ensure that the coastal area, including all islands, adapts to future cyclones and storm surges. The entire coastal belt of Bangladesh is vulnerable to cyclones and storm surges. To protect the coastal belt, an extensive network of polders has already been constructed in Bangladesh. However, with the sea level rises expected as a result of climate change, the heights of the dykes will need to</p>	<ul style="list-style-type: none"> <li>- Analysis of meteorological data to improve predictions of changes in the pattern of cyclonic events</li> <li>- Planning to upgrade existing coastal polders and appurtenant structures in the coastal region</li> <li>- Planning and designing to construct new polders in the coastal belt and islands</li> </ul>

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0307	Planning, design and construction of river training works	48%	<p>be raised further. Also, there are some additional lands and small islands, which need to be protected through the construction of new polders or extension of existing ones. With sea level rise, drainage congestion may become a major problem in the polders. Also, the capacity of the existing sluices and regulators may be insufficient.</p> <p>The importance of thick belts of mangroves in reducing the destructive capacity of storm surges, was demonstrated during Cyclone Sidr. An expansion of the 'green belts' would afford extra protection and increase livelihoods opportunities for the poor. The possibility of 'building with nature' to increase the rate of accretion will also be tested and implemented, where appropriate.</p> <p>Key objective is to put in place effective river training works to control river bank erosion.</p> <p>As a result of climate change river bank erosion is likely to become more frequent. River bank erosion has severe impacts on the livelihoods of affected people. Farmers lose their agricultural land and can become pauper's over-night due to river erosion. In view of this, river training works should be taken up in an organized and comprehensive fashion, as part of a long term programme.</p> <p>Several components of the Flood Action Plan focused on river training works. Lessons learnt from these activities and experience of river training works at the Hardinge Bridge and the Jamuna Bridge may provide guidelines for effective, durable and sustainable river training works. Hydro-dynamic modelling exercises will assist us in establishing the costs of river training that may result from climate change.</p>	<ul style="list-style-type: none"> <li>Plan and develop coastal green belts as a measure against storm surge</li> <li>Repair, maintenance, and construction, as appropriate, of cyclone shelters for protection against storm surge</li> <li>Mostly related to the <i>Ministry of Water Resources, Ministry of Environment &amp; Forest, Ministry of Food &amp; Disaster Management</i></li> </ul> <ul style="list-style-type: none"> <li>Identification of erosion prone areas including monitoring mechanisms and run physical and hydro-dynamic modelling</li> <li>Design of river training programme and projects</li> <li>Execution of river training works</li> <li>Mostly related to the <i>Ministry of Water Resources with support from IMM, IWFM, CEGIS, WARPO and RRI</i></li> </ul>
0308	Planning, design and implementation of the resuscitation of the network of rivers and khals through dredging and de-salutations work	68%	<p>Key objective is to revive the networks of rivers and canals of the country to improve the natural drainage and water retention capacity during dry season.</p> <p>Due to climate change huge rainfall within short duration are likely to increase. This would result in soil erosion from watersheds. This will add to sediment loads and get deposited</p>	<ul style="list-style-type: none"> <li>Preparation of River Resuscitation Master Plan on the Upazila Development Plan and identification of priority geographic areas</li> <li>Implementation of river de-siltation plan in a phased approach</li> <li>Development of a participatory operation and</li> </ul>

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			<p>into the river and canal beds and silted up. This may be accomplished by commercial dredging work for big rivers. Where the canals are small, manual labour will be a viable alternative.</p> <p>Resuscitation of the rivers will help in effective drainage of the monsoon generated run-off. At the same time surface water will be available as a source of water for supplementary irrigation. This will also support the fish migration during the spawning season, support navigation and assist survival of local ecosystem.</p> <p>The process of de-siltation of small canals can be linked up with vulnerable group feeding and relief type activities that are carried out across the country almost every year.</p>	<p>management plan</p> <ul style="list-style-type: none"> <li>– <i>Mostly related to the Ministry of Water Resources, Bangladesh Water Development Board, Ministry of Local Government, Rural Development and Cooperative through Union Parishad, Ministry of Disaster Management and Relief, and Local Administration</i></li> </ul>
04			<p>Research and knowledge management</p> <p>Research will be undertaken to estimate the likely scale and timing of climate change impacts on different sectors of the economy, to inform planning of future investment strategies. We will also ensure that Bangladesh is effectively linked to regional and national knowledge networks, so that Bangladeshi organizations and the general public are aware of the latest research, lessons and technologies available in other countries. Under this theme the Government will:</p> <ul style="list-style-type: none"> <li>– Model climate change scenarios for Bangladesh by applying global climate change models and methodologies at regional and national levels</li> <li>– Model the likely hydrological impacts of climate change on the Ganges-Brahmaputra-Meghna system to assess likely future system discharges and river levels in order to derive design criteria for flood protection embankments</li> <li>– Monitor and research the impacts of climate change on ecosystems and biodiversity</li> <li>– Research the likely impacts of climate change on the macro-economy of Bangladesh (a Bangladesh 'Stern Report') and key sectors (e.g., livelihoods and food security) and contribute to developing a climate-proof national development plan</li> <li>– Research the linkages between (a) climate change, poverty and vulnerability and (b) climate change, poverty and health (disease incidence, nutrition, water, sanitation) in order to identify possible interventions to increase the resilience of poor and vulnerable households to climate change</li> <li>– Establish a Centre for Research and Knowledge Management on Climate Change (or a network of centres) to ensure Bangladesh has access to the latest ideas and technologies from around the world, and ensure that data is widely and freely available to researchers</li> </ul>	
0401	Establishment of a centre for research, knowledge management and training on climate change	70%	<p>Key objective is to increase institutional and human capacity on research and knowledge management related to climate change, and to train sector professionals.</p> <p>Although Bangladesh has been in the forefront of awareness raising on adaptation and on-the-ground adaptation research, the knowledge and information generated remains scattered. A comprehensive move towards adaptation and mitigation</p>	<ul style="list-style-type: none"> <li>– Establish centers and/or networks for research on climate change and climate change impacts and their management</li> <li>– Establish a virtual technology bank</li> <li>– Develop and maintain a dynamic web portal</li> <li>– Develop training programmes for high and mid-level officials of the Government, NGOs and</li> </ul>



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0402	Climate Change Modeling at National and sub-national levels	90%	<p>supported by technology transfer and financial flows (as envisaged in the BCCSAP) requires an up-graded system of knowledge creation, dissemination and training. a more urgent need is to set up a centre or network of institutions to be (a) a source of all available national information, reports and knowledge, and (b) a virtual technology bank, including on financial mechanisms related to both adaptation and mitigation. It would also track and provide information on the state of climate change negotiations. The Centre would also arrange for training programmes on issues related to adaptation and mitigation and would support activities in collaboration with universities, research centres and other agencies.</p> <p>Key objective is to develop, maintain and update a detailed and operational General Circulation Model (GCM) for Bangladesh. In order to generate more precise climate change scenarios for Bangladesh, it is necessary to develop appropriate GCM models. These models should be calibrated down to district and sub-district levels and teams of specialists should be able to work on selected model/models, to simulate future conditions under different scenarios and assumptions. The models would use small grids to predict climate change scenarios with increasing precision.</p>	<p>private organisations/associations and provide training in collaboration with research centres and universities</p> <ul style="list-style-type: none"> <li>– <i>Mostly related to the Ministry of Environment and Forests, research organisations, universities</i></li> </ul> <ul style="list-style-type: none"> <li>– Build capacity for construction of GCM models with small grids</li> <li>– Construct appropriate GCM models with small grids to obtain regional variations in weather and building capacity to operate and update them</li> <li>– Collect additional field data for effective use of the calibrated models to predict future climate change</li> <li>– Link up regional climate change models to generate better boundary conditions</li> <li>– <i>Mostly related to the Bangladesh Meteorological Department, Universities, research organisations, FFWC</i></li> </ul>
0403	Preparatory studies for Adaptation against sea level rise and its impacts	84%	<p>Key objective is to conduct preparatory studies for adaptation against sea level rise (SLR) and its impacts. The sea level rise threatens the low-lying coastal belt and small islands. Much of our coast is protected with 4 to 5-meter-high dykes and will be further protected with additional planned polders. The main impacts of SLR would be:</p> <ul style="list-style-type: none"> <li>– salinity ingress causing the rivers in the coastal belt to</li> </ul>	<ul style="list-style-type: none"> <li>– Setting up data collection network stations to monitor sea level rises and salinity along with other appropriate hydro-meteorological data</li> <li>– Modelling the inundation and salinity impacts of SLR by specific time lines</li> <li>– Modelling and predicting the socio-economic and health impacts of SLR</li> </ul>

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0404	Monitoring of Eco system and Bio-diversity changes and their impacts	40%	<p>become brackish or saline. This would have serious impacts on production of food grains</p> <ul style="list-style-type: none"> <li>- rises in river levels, which would impede drainage from polders, resulting in water logging, which would also adversely affect agriculture</li> </ul> <p>Currently, there is no data collection programme to monitor SLR. Since water levels in the Meghna estuary can rise due to monsoon winds by more than 1.5 meters, estimating the SLR resulting from global warming will be complex. However, the task should be taken up urgently.</p> <p>Key objective is to enhance understanding ecosystem dynamics and their implications for biodiversity changes, and adaptation strategies.</p> <p>Salinity levels are also likely to increase significantly in the coastal belt. Mangrove ecosystems which are already under serious stress for anthropogenic reasons will suffer heavily due to further increases in salinity. These could alter the entire ecosystem of the Sundarbans and cause the extinction of some species.</p> <p>In view of these expected changes, a systematic monitoring mechanism should be put in place to assess the impact of climate change on ecosystems and bio-diversity. This would involve training of researchers and monitors and develop a monitoring system covering all major ecosystems. A participatory impact monitoring mechanism involving communities and academic experts will be designed. Pertinent physical, chemical and biological data will also be collected. The changes that take place in livelihood patterns due to ecological and biodiversity changes will also be assessed and policy recommendations and appropriate actions suggested.</p> <p>Key objective is to identify likely macroeconomic and sectoral impacts of climate change and plan adaptation and mitigation strategies.</p> <p>Bangladesh has been experiencing strong economic growth in recent years and is on track to become a middle-income</p>	<ul style="list-style-type: none"> <li>- Planning industrial relocation, taking account of private and social costs</li> <li>- <i>Mostly related to the Ministries of Defence, Shipping, Agriculture, Industries and Energy and Power</i></li> </ul> <ul style="list-style-type: none"> <li>- Set up a well-designed monitoring system to evaluate changes in ecosystem and biodiversity, covering all important and sensitive ecosystems</li> <li>- Develop participatory monitoring systems by involving local trained people such as school teachers, communities and academic researchers</li> <li>- Report changes in ecosystems and biodiversity and assess the implications, including those for the livelihoods of local people, and recommend adaptation measures</li> <li>- <i>Mostly related to the Ministry of Environment and Forests, Ministry of Agriculture, Ministry of Health, Ministry of Fisheries and Livestock</i></li> </ul>
0405	Macroeconomic and sectoral economic impacts of climate change	83%		<ul style="list-style-type: none"> <li>- Evaluate the impact of climate change on the macroeconomy of Bangladesh including impacts on growth, employment, trade patterns, inflation, balance of trade (a Bangladesh Stern Report)</li> </ul>



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0406	Monitoring of Internal and External Migration and providing support of capacity building for rehabilitation	48%	<p>country by 2020. It is important that we understand the impacts that climate change will have on (a) macro-economic growth and stability; (b) different sectors of the economy, and (c) different regions and socio-economic groups, in the short, medium and long terms This programme will evaluate the impact of climate change on the macro economy and carry out sector-by-sector analyses. Other studies will assess the economic and social impact on the poor in vulnerable locations and on vulnerable groups in society, including women and children. Women and children are expected to be more adversely affected by climate change than men and the analyses will use gender-disaggregated data where possible.</p>	<ul style="list-style-type: none"> <li>- Sectoral economic impacts of climate change for major sectors such as agriculture, industry, services, health, transport and financial services such as insurance</li> <li>- Assess the impacts of climate change on poverty and on people living in vulnerable areas such as, coastal plain and islands, low-lying floodplains, upland areas and -prone areas</li> <li>- Assessment of climate change and its impacts on out-migration</li> <li>- <i>Mostly related to the Ministry of Finance, sectoral ministries, Ministry of Women Affairs, Ministry of Social Welfare, Ministry of Chattogram Hill Tracts, Universities, Research Organisations</i></li> </ul>
			<p>It is now evident that population in many parts of the country will be so adversely affected that they will have to move out. The areas that will suffer from major impacts of climate change will lose in livelihood opportunities and face reduction in productivity in agriculture sector. The worst affected areas will be the coastal belt of the country. The region would be impacted by sea level rise and could drown unprotected low-lying areas. The water in the whole coastal belt will become saline as the level of sea rises gradually. Increase of frequency of cyclonic weather will impact livelihoods of fishermen. People will be forced to move out to areas in search of safety and livelihood.</p> <p>Another impact of climate change will be in the form of increase in river bank erosion. This will also push people out of their original settlements. The process of migration of climate change affected people need to be monitored closely. Attempt should be made to provide safety against food security and loss of land from submergence. However, soon such efforts may no longer be able to contain people in the vulnerable locations</p>	<ul style="list-style-type: none"> <li>- Development of a monitoring mechanism of internal and external migration</li> <li>- Development of protocol to provide adequate support for their resettlement and rehabilitation</li> <li>- Building of capacity through education and training to facilitate their re-settlement in new environment</li> <li>- <i>Mostly relevant for the Ministry of Environment and Forests, Ministry of Home Affairs, and Ministry of Local Government, Rural Development and Cooperative</i></li> </ul>

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0407	Monitoring of impact for management of Tourism and improvement of priority action plan	32%	and actual movements of affected people will start. Key objective is to improve adaptation to climate change in the tourism sector. Bangladesh has major potential for both commercial tourism and ecotourism. Commercial tourism is not fully developed. Ecotourism is in the growth path. Sundarbans and Cox's Bazaar are the major tourism sites. The natural beauty of the coastal islands, hills, are still not fully explored. But the sea level rise, floods, droughts are likely to impact these sites. Tourism sector must make effort to minimize adverse impacts of climate change through possible reduction in greenhouse gases emission.	<ul style="list-style-type: none"> <li>- Assessment of probable impact of climate change on all types of tourism in Bangladesh</li> <li>- Preparation of climate change response programme for tourism improvement and implementation of priority recommendations.</li> <li>- <i>Mainly related to the Ministry of Civil Aviation and Tourism, Ministry of Environment and Forests, Department of Forests, Parjatan Corporation, Private Organizations</i></li> </ul>
05	Mitigation and Low Carbon Development Even though Bangladesh's contribution to the generation of greenhouse gases is very low, we wish to play our part in reducing emissions now and in the future. Under this theme the government will: <ul style="list-style-type: none"> <li>- Develop a strategic energy plan and investment portfolio to ensure national energy security and lower greenhouse gas emissions</li> <li>- Expand the social forestry programme on government and community lands throughout the country</li> <li>- Expand the 'greenbelt' coastal afforestation programme with mangrove planting along the shoreline</li> <li>- Seek the transfer of state-of-the-art technologies from developed countries to ensure that we follow a low-carbon growth path (e.g., 'clean coal' and other technologies)</li> <li>- Review energy and technology policies and incentives and revise these, where necessary, to promote efficient production, consumption, distribution and use of energy</li> </ul>			
0501	Improved Energy efficiency	69%	Key objective is to improve energy efficiency in production and consumption of energy. Bangladesh is an energy-inefficient country. We should carefully assess how we can become more efficient in producing and consuming energy. This will involve identifying any technical, economic or regulatory/ policy constraints to help improve performance and to learn how these constraints can be overcome. Improving our efficiency may require the use of new technologies which could be costly and will thus need additional financial resources. It will be important to take a medium to long-term view in analyzing alternative investments since, once investments are	<ul style="list-style-type: none"> <li>- Study the future energy needs of the country and find out the least cost energy supply path that satisfies future energy demand based on the desired growth path of the economy</li> <li>- Raise energy efficiency in power production, transmission and distribution through appropriate investments</li> <li>- Raise energy efficiency in agricultural and industrial processes through appropriate policies and investments</li> <li>- Raise energy efficiency in domestic and commercial/service sectors through</li> </ul>

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0502	Gas Exploration and reservoir management	28%	made, it would be expensive to change them.  Key objective is to enhance energy security and ensure low-emission development. Bangladesh has modest reserves of natural gas. Known reserves are expected to be used up in about a decade. Further gas exploration is possible. Finding new gas reserves would increase the country's energy security and may make it possible to remain on a low carbon growth path because natural gas is the cleanest of all fossil fuels in terms of CO2 emission. Although there is currently a gas shortage, reserves in existing gas-fields could be higher than current estimates. There is an urgent need to improve reservoir management, although the data to do this is limited. Collecting and analyzing such data could lead to the discovery of increased reserves of gas in existing wells or in their environs. Therefore, both exploration and reservoir management could lead to substantial increases in supplies of gas.	<ul style="list-style-type: none"> <li>- appropriate policies and investments</li> <li>- Raise energy efficiency in transport sector through appropriate policies and investments</li> <li>- <i>Mostly related to the Ministry of Power &amp; Energy, Ministry of Industry, Ministry of Agriculture, Ministry of Transport, Ministry of Finance, Universities and Research Organizations</i></li> <li>- Invest in gas exploration</li> <li>- Invest in reservoir management</li> <li>- Use of gas as an efficient energy over fossil fuel</li> <li>- <i>Mostly related to the Ministry of Power and Energy</i></li> </ul>
0503	Development of coal mines and coal fired power station	12%	Key objective is to Maximize coal output and managing coal fired power stations in a carbon-neutral way. Bangladesh is geologically one of the least explored countries. However, the exploration that has taken place, indicates that there may be substantial amounts of coal at shallow depths in some parts of the country. There are three considerations related to coal mining and its use for power generation. Firstly, if open pit mining is used, coal bed methane may escape into the atmosphere. To avoid this, the methane should be first captured and liquefied for subsequent consumption. Secondly, to avoid high carbon	<ul style="list-style-type: none"> <li>- Review coal mining methods and undertake a feasibility study to assess the technical, economic, social and environmental feasibility of coal mining for power generation (including factors such as how to capture coal bed methane)</li> <li>- If the feasibility study is positive, invest in coal mining and coal-fired power generation plants using clean coal technology</li> <li>- <i>Mostly related to the Ministry of Power and</i></li> </ul>

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant? <sup>6</sup>
0504	Renewable/Alternate energy development	81%	<p>emissions, Bangladesh would need to invest in 'clean coal technology' for power generation. Such technology is not cheap and would have to be imported. Thirdly, coal mining has environmental and social costs, which would have to be carefully considered.</p> <p>Key objective is to maximize the use of renewable energy sources to lower GHG emission and ensuring energy security. The scope for developing renewable energy supplies (e.g., solar, wind, tidal, geothermal and modern biomass technologies) has not been explored well in Bangladesh. There is some use of solar power for limited domestic purposes. The potential of harvesting wind energy, though recognized for many years, has not produced tangible results so far. The tidal range of the coastal belt is considered to be adequate for the generation of tidal power. However, there has not been any attempt to harvest such energy.</p> <p>Biogas development remains in its infancy. Even the popularization programmes for improved cooking stoves, which save a lot of fuel wood, have had limited success. Since renewable technology for power generation or direct use is carbon-neutral or nearly so, technologies such as these should be considered.</p>	<p>Energy</p> <ul style="list-style-type: none"> <li>- Investments to scale up solar power programmes</li> <li>- Research and investment to harness wind energy, particularly in coastal areas.</li> <li>- Feasibility studies for tidal and wave energy</li> <li>- Study of the techno-economic, social and institutional constraints to adoption of improved biomass stoves and other technologies</li> <li>- <i>Mostly related to the Ministry of Power and Energy; Ministry of Environment and Forests, private entrepreneurs</i></li> </ul>
0505	Lower emission from agricultural land	60%	<p>Key objective is to raise productivity of agricultural land and lower emissions of methane.</p> <p>Emission of greenhouse gases (GHGs) from agricultural land is a major concern. Wet agricultural land produces methane (CH<sub>4</sub>). Nitrogenous (N<sub>2</sub>) fertilizers also contribute to GHG emission. A major reason for methane emissions is that rice fields are kept continuously flooded, which scientists now say is unnecessary. If this is the case, methane emissions could be reduced, water use efficiency could be raised and carbon dioxide emissions from burning diesel, the main fuel for irrigation, could be cut. Such land use practices would need to be supported through further on-farm research and extension activities.</p>	<ul style="list-style-type: none"> <li>- Support to research and on-farm trials of new water management technology on crop (including rice) land</li> <li>- Support to agricultural extension service to popularise new water management techniques for rice production</li> <li>- <i>Mostly related to the Ministry of Agriculture, NARS and Agricultural extension services</i></li> </ul>

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant?
0506	Management of urban waste	46%	Key objective is to ensure livable cities while lowering GHG (methane) emissions. A major portion of the urban waste of Bangladesh is composed of organic materials, which produce methane (CH <sub>4</sub> ) as they decompose. The unit contribution of methane to global warming is much higher than that of carbon dioxide. Methane could be captured for subsequent use or waste could be incinerated to produce electricity. Proper management of urban waste could thus be an important area for mitigation while ensuring a cleaner city. Furthermore, the lowered emissions could be traded in the carbon market.	<ul style="list-style-type: none"> <li>- Design of urban waste dumps so that methane can be captured in all major urban areas</li> <li>- Using CDM mechanism to set up small power plants by capturing the produced methane from waste dumps</li> <li>- <i>Mostly related to the Ministry of Local Government, private entrepreneurs</i></li> </ul>
0507	Forestation and reforestation program	69%	Key objective is to provide support to scale up afforestation and reforestation. Forestry is an important way to sequester carbon. In addition, the afforestation and reforestation of degraded land contributes to food security by providing fruits and other edible products; energy security by providing fuel wood; livelihood security by employing people in forest plantations; harvesting and trade in forest products; and can protect land from soil erosion and landslides, particularly in hilly areas. As salinity is expected to increase with rising sea levels, emphasis should be given to saline tolerant species. For freshwater wetlands, suitable submergence tolerant species such as Hijol and Koroch, which can also protect against wave erosion, could be used. Much of Government owned reserve forest land is largely without trees. Social and homestead forestry has gathered momentum in recent years. It needs to be further encouraged as it supports the livelihoods of the poor and local communities.	<ul style="list-style-type: none"> <li>- Provide support to existing and new coastal afforestation programmes taking into account the future rise in salinity levels due to sea level rise</li> <li>- Develop an extensive wetland afforestation programme to protect settlements against wave erosion</li> <li>- Study the scope for carbon credits under REDD and invest, if appropriate, in reforestation of degraded reserve forests</li> <li>- Provide support to existing and new homestead and social forestry programmes and enhance carbon sequestration</li> <li>- Research the suitability of various tree species for their carbon-locking properties for designing various forestry programmes keeping in mind other environmental and socio-economic functions of forestry</li> <li>- <i>Mostly related to the Ministry of Environment and Forests</i></li> </ul>
0508	Rapid expansion of energy saving Devices e.g. CFL	68%	Key objective is to facilitate rapid expansion in the use of energy saving devices and home appliances. Presently there is shortage of commercial energy in the country	<ul style="list-style-type: none"> <li>- A rapid assessment of potential of modern energy saving appliance and technologies in Bangladesh</li> </ul>

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant? <sup>6</sup>
0509	Energy and water efficiency in built environment	48%	<p>and urgent programmes are being planned for generation of more electricity. Bangladesh should take all out efforts to minimize the use of energy. One such major domain where energy saving mechanism can be pushed is introduction of more and more energy saving lighting in domestic as well as industrial units.</p> <p>Key objective is to put in place effective technological and adaptation options in built environment to improve energy and water efficiency. The water-energy nexus describes the interdependencies between water and energy resources. When considered at the highest levels, it is easy to understand that huge volumes of water are consumed in the energy sector for generating electricity, natural gas, and other fuels used in buildings. At the same time, significant energy is used to pump, treat, and use the water that is consumed in buildings to protect the health of its occupants. The water-energy nexus extends beyond the generation of energy and the distribution of water, and its implications need to be better understood in order to provide guidance to standards developers on beneficial strategies for the efficient management of energy and water in our nation's buildings. A better understanding of water-energy nexus implications on various building systems and products used in buildings would be instructive for standards developers when considering new provisions that address energy- and water-efficient building design.</p>	<ul style="list-style-type: none"> <li>- Development of a project proposal for obtaining CDM benefits</li> <li>- Facilitate expansion of energy saving technologies and devices</li> <li>- <i>Mainly related to the Ministry of Power, Energy and Mineral Resources, Ministry of Environment and Forests</i></li> <li>- Necessary adaptation of existing buildings and additional space in under construction buildings for collection and storage of rainwater</li> <li>- Installation of solar thermal power or small windmill at the rooftop or nearby all buildings and infrastructures</li> <li>- Revision of building code for inclusion of energy saving devices in all infrastructures and provision of construction works in energy efficient methods</li> <li>- <i>Mostly related to the Ministry of Housing and Public Works, City Development Authorities, City Corporations, all private developers</i></li> </ul>
0510	Improving in energy consumption pattern in transport sector and options for mitigation	28%	<p>Key objective is to improve energy use efficiency in transport sector and benefit from CDM process. The transport sector accounts for a large share of global greenhouse gas emissions and this share is expected to grow over the coming decades. Though transport share of emission of Bangladesh is low but energy consumption is growing much</p>	<ul style="list-style-type: none"> <li>- Promotion of low cost public transport modes such as rapid transit</li> <li>- Reducing the use of fossil fuel by improving the efficiency of energy use</li> <li>- Substitution of biofuels and fossil fuels as appropriate</li> </ul>



Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant? <sup>6</sup>
			<p>faster than any other sectors.</p> <p>Many vehicle technologies that have been proposed by developed countries to reduce GHG emissions may not be feasible in Bangladesh because of their high initial cost and lack of infrastructure. Necessary actions need to be taken towards low carbon transport.</p> <p>Globally there is another move towards low carbon development. Biofuels and biomass are being used as substitute of traditional commercial fuels. For a country with limited land resources opportunities for biofuel is considered to be limited.</p>	<ul style="list-style-type: none"> <li>- <i>Mainly related to the Ministry of Power, Energy and Mineral Resources</i></li> </ul>
06	<p>Capacity Building and Institutional Strengthening</p> <p>To meet the challenge of climate change, the capacity of government ministries and agencies, civil society and the private sector will be strengthened. Under this theme the government will:</p> <ul style="list-style-type: none"> <li>- Review and revise, where appropriate, all government policies (sector by sector) to ensure that they take full account of climate change and its impacts</li> <li>- Mainstream climate change in national, sectoral and spatial development planning (in government ministries and agencies, local government, the private sector, civil society and communities), and ensure that impacts on vulnerable groups and women are prioritized in plans</li> <li>- Build the capacity of key government ministries and agencies to take forward climate change adaptation (e.g., Ministry of Food and Disaster Management, Bangladesh Water Development Board, Local Government Engineering Department; National Agricultural Research System, the health system, the Ministry of Women's and Children's Affairs)</li> <li>- Build the capacity of the government to undertake international and regional negotiations on climate change.</li> <li>- Regional and international cooperation is essential in order to build necessary capacity and resilience</li> <li>- Build the capacity of the government, civil society and the private sector on carbon financing to access various global climate funds</li> </ul>			
0601	<p>Revision of sector policies for climate resilience</p>	68%	<p>Key objective is to integrate climate change issues into development policy and action.</p> <p>Climate change management needs to be integrated into the development activities of different sectors. Sectoral policy statements need to be modified to take account of and become consistent with climate change impacts and their management.</p> <p>The National Water Management Plan recognizes the need to make water sector activities resilient to climate change. However, the only sectoral policy that explicitly incorporates climate change considerations is the Coastal Zone Policy of</p>	<ul style="list-style-type: none"> <li>- Draft a consultation paper on the National Climate Change policy, the integration of climate change issues into development planning and sectoral policies and how they should be formulated for discussion with key stakeholders</li> <li>- Incorporate climate change concerns in all sectoral policies and strategies through appropriate revisions in consultation with relevant stakeholders</li> <li>- Publish the National Climate Change Policy</li> </ul>

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant? <sup>6</sup>
0602	Mainstreaming climate change in National, Sector and Spatial Development program	77%	<p>Bangladesh, which was drafted in 2005 when knowledge and understanding about climate change was available. All policy formulation should be carried out in a consultative way by involving key officials of concerned ministries/sectors together with professionals, academics, NGOs and civil society leaders, as well as the general public.</p> <p>Key objective is to integrate Climate Change management in all aspects of development action. This will require: (a) incorporating climate change into policies, plans, programmes and projects; (b) establishment and building the capacity of ministries and agencies; (c) focusing where climate change will be a key issue. The task of guiding and supervising the national development programme rests with the Planning Commission. Two changes are required in the process by which ministries and agencies prepare and submit proposals to the Planning Commission. The Planning Commission should introduce a set of design and planning parameters for projects, for selected target years (e.g. 2030, 2041 and 2050), which take into account likely climate change impacts. The proformas, which the Planning Commission requires for project proposals (TPP, DPP etc.) are designed to ensure that all elements for taking decisions for climate resilience or climate sensitivity are included and correctly reflected.</p>	<ul style="list-style-type: none"> <li>- Mostly related to the Ministry of Environment and Forests, Cabinet Division</li> <li>- Establish and build the capacity of climate change cells in ministries and agencies to incorporate climate change considerations in all planning processes</li> <li>- Agree design and planning parameters for project design for selected years.</li> <li>- Modify the Project Proforma in an appropriate way</li> <li>- All relevant ministries; Planning Commission</li> </ul>
0603	Strengthening human resource capacity	48%	<p>Key objective is to develop adequate human capacity to effectively manage climate resilient development programmes and to take part in international negotiations. Due to lack of expertise, Bangladesh has been unable to grasp opportunities to effectively use new global financial instruments. Also, climate change negotiations have now entered a phase where constant tracking and taking decisions at short notice are required. The AWG-LCA negotiations need expertise of the highest order. Available expertise is neither adequate nor always of the right type. It is therefore necessary to build human resource capacity</p>	<ul style="list-style-type: none"> <li>- Enhance the capacity of Government staff for policy, programme and project formulation, and implementation, through training and in other ways</li> <li>- Enhance capacity of key staff of Government, private sector organizations and NGOs on accessing international and national Carbon and climate Change Funds</li> <li>- Enhance the human resource capacity within and outside Government for Climate Change negotiations</li> </ul>



Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant?
0604	Strengthening Gender consideration in climate change management	26%	<p>in all these relevant areas across Government departments, private business and civil society. Activities should include short and long training at home and abroad, study tours, exchange programmes, and financing for attending negotiations.</p> <p>Key objective is to integrate gender consideration in all climate change management. This programme aims to establish link between gender consideration for their appropriate application in cooperation will all adaptation, mitigation strategies and mainstreaming climate change in national, sectoral and national development plan. However, to pay special attention to gender issues as well as the considerations of disadvantaged communities. Women has a special role in management of natural disasters as risk and vulnerability will increase in future climate change scenarios. All disaster management practices should pay attention to gender considerations.</p>	<ul style="list-style-type: none"> <li>- All relevant sectoral ministries, agencies, private sector, NGOs, universities and research organizations</li> <li>- Development of criteria and approach for inclusion of gender consideration in all climate response activities</li> <li>- Build the capacity of gender focal point in all ministries and agencies to incorporate gender issues in all climate response activities</li> <li>- Mostly related to the Ministry of Women and Children Affairs, Planning Commission, Ministry of Environment and Forests</li> </ul>
0605	Strengthening institutional capacity for Climate Risk Management	66%	<p>Key objective is to develop strong organizations to effectively respond to climate change. Mainstreaming climate change issues in national and sectoral development will require strong organizations and a robust institutional framework to ensure that the activities are sustained over the next several decades and beyond. Some of the organizations will be new, others will have to be reformed and strengthened. In all cases, organizations will need to be provided with adequate logistics and other facilities. There is a pressing need to strengthen a number of existing organizations that are already underperforming in implementing their regular development programme.</p>	<ul style="list-style-type: none"> <li>- Setting up of mechanisms for inter-ministerial and inter-institutional coordination at various levels of the government, and for managing new adaptation and planned mitigation funds</li> <li>- Organizational reform and strengthening of key government and other agencies</li> <li>- All relevant sectoral agencies, private sector, NGOs and others</li> </ul>
0606	Mainstreaming climate change in the media	30%	<p>Key objective is to raise public awareness across the country by mainstreaming climate change issues in the print and electronic media. Bangladesh media has been pro-active in mounting public awareness on climate change issues for last two decades. Journalists have been proactive in sensitizing the country on</p>	<ul style="list-style-type: none"> <li>- Capacity Building and Training print and electronic journalists</li> <li>- Exposure visits to climate change hot spots across the country and tracking global negotiations</li> <li>- State of Climate Change Reports, Earth Files,</li> </ul>

Code	Relevance Criteria	Relevance (%) <sup>5</sup>	Description of the Criteria	What it should include? Who is the most relevant? <sup>6</sup>
			<p>various environmental issues. But, given the scale of climate-induced adverse impacts on the national economy, livelihoods and eco-systems, the people requires to more aware while Bangladesh vibrant print and electronic media can play that effective role in a very comprehensive manner to help bring in positive changes in public opinion to make policy changes. Media can also help take people in a climate-friendly low-carbon development pathway. Bangladesh media can also help raise national negotiation capacity by infusing public debate on climate change issues in both print and electronic media and keep track of ongoing negotiation streets as watchdogs.</p>	<ul style="list-style-type: none"> <li>- Features, Photo-Features</li> <li>- Media networking</li> <li>- <i>Mostly related to the Ministry of Environment and Forests, Ministry of Information, Press Institute of Bangladesh</i></li> </ul>

### Appendix 3: Example of Climate Relevance Finance Tracking in Operating Budget

Ministry and Divisions	Department and Agencies	Climate Related Functions (Allocation of Business, Annual Report, MBF, Citizen Charter)	CC Relevant Weight (%)
Local Government Division	Secretariat	Focus of MBF is on development of rural economy and the development and management of small water resources	5%
Local Government Division	Local Government Engineering Department (LGED)	Many climate relevant projects focused on flood control, tree plantation, cyclone shelter construction etc. as per MBF	20%
Local Government Division	Department of Public Health Engineering (DPHE)	As per citizen charter, relevant activities include services for disaster management, water distribution and WATSAN services	5%
Local Government Division	National Institute of Local Government	Relevant activities include initiatives to improve the environment and development of drainage networks to reduce waterlogging	5%
Local Government Division	Dhaka WASA	Relevant activities as per MBF and citizen charter include granting permission for setting deep wells, improving WATSAN, supplying water during floods, droughts etc.	5%
Local Government Division	Chattogram WASA	All water related activities as per MBF and citizen charter but not specifically focused on addressing climatic risks	5%
Local Government Division	Khulna WASA	All water related activities as per MBF and citizen charter but not specifically focused on addressing climatic risks	5%
Local Government Division	Rajshahi WASA	Relevant activities as per MBF and citizen charter include granting permission for setting deep wells, improving WATSAN, supplying water during floods, droughts etc.	5%
Local Government Division	Khulna City Corporation	According to MBF, their focus is on waste management, roads, drainage etc. and not much climate relevance. No relevant info found on citizen charter or their website:	5%
Local Government Division	Sylhet City Corporation	According to MBF, their focus is on waste management, roads, drainage etc. and not much climate relevance	5%
Local Government Division	Barishal City Corporation	Citizen charter unavailable. According to MBF, their focus is on waste management, roads, drainage etc. and not much climate relevance	5%
Local Government Division	Narayanganj City Corporation	According to MBF, their focus is on waste management, roads, drainage etc. and not much climate relevance	5%
Local Government Division	Cumilla City Corporation	Plantation project included	5%
Local Government Division	Gazipur City Corporation	Citizen charter mentions forest conservation. According to MBF, their focus is on waste management, roads, drainage etc.	5%
Local Government Division	Rangpur City Corporation	According to MBF, their focus is on waste management, roads, drainage etc. and not much climate relevance	5%

Ministry and Divisions	Department and Agencies	Climate Related Functions (Allocation of Business, Annual Report, MBF, Citizen Charter)	CC Relevant Weight (%)
Local Government Division	Dhaka South City Corporation	Relevant activities from citizen charter include sustainable environmental development through city greening projects and development of drainage networks to reduce waterlogging	5%
Local Government Division	Dhaka North City Corporation	Focus on waste management, roads, drainage etc.	5%
Local Government Division	Chattogram City Corporation	No climate relevant information found on citizen charter. Focus of MBF is on waste management, roads, drainage etc.	5%
Local Government Division	Rajshahi City Corporation	No climate relevant information found on citizen charter. Focus of MBF is on waste management, roads, drainage etc.	5%

#### Appendix 4: Realignment of Climate Relevance Criteria and Relevance Weight

Code	New Relevance Criteria (aligned with BCCSAP Programmes)	Relevance Criteria and Relevance Weight (%) in CFF 2014 <sup>7</sup>	Relevance Weight (%)	Rationale for new Relevance Weight
01	Food security, social protection, and health			
0101	Institutional Capacity for research towards climate resilient cultivars and their resilience	Agricultural productivity/ development, etc. – 70% Quality seed supply, storage and modernization – 60% Biotechnology/pesticides/biodiversity – 50% Development of new crop varieties – 50% Agricultural technology – 50% Storage facility expansion – 30%	73	Institutional capacity for research and expertise of researchers to develop climate resilient cultivars of food and other crops is very important to continuously developing new resilient cultivars with the change in the climate. It takes 7-8 years to breed new cultivars, certify them and release to the farmers through the extension system. After participatory field trials, they will be disseminated to farmers.
0102	Development of climate resilient cropping systems and production technologies	Grain quality improvement – 85% New irrigation facilities, improved irrigation efficiency – 70% Coastal-area crop diversification – 70% Coastal-area biotechnology – 70% Crop diversification – 50% Agricultural sector support programmes, etc. – 50% Small-farmer development – 30% Mushroom projects, Tuber crops – 30%	69	Development of climate resilient cropping systems appropriate to different agro-climatic regions and sub-regions is vital to sustain and increase productivity. The changes will require farmers to modify their current cropping systems or change to alternative systems. Research is needed to develop and field test alternative systems, adapted to likely future conditions, so that choices are available for farmers as climatic conditions change. The associated seed supply and extension mechanisms also should be developed.
0103	Adaptation against drought, salinity, submergence and heat	Soil ecosystems – 80% Water management/surface water/rainwater – 50% Extension services/farmers' services – 40% Horticulture – 40%	66	The farmers must adapt climate stressed (e.g. drought, salinity submergence, heat) management options for agriculture in drier regions. With climate change, these conditions are likely to be exacerbated. The development of appropriate adaptive measures combining robust indigenous and new cultivars, new cropping systems and improved water management practices must be developed, tested and disseminated to farmers.
0104	Adaptation in the fisheries	Estuary development – 90%	62	Climate change is likely to adversely affect freshwater and marine

<sup>7</sup> The Climate Fiscal Framework (CFF) was adopted by the Government of Bangladesh in 2014. The CFF was prepared based on a comprehensive review titled 'Climate Public Expenditure and Institutional Review' in 2012.

Code	New Relevance Criteria (aligned with BCCSAP Programmes)	Relevance Criteria and Relevance Weight (%) in CFF 2014 <sup>7</sup>	Relevance Weight (%)	Rationale for new Relevance Weight
	sector	Cyclone-area fish farmers and fishermen related – 60% Irrigation facilities for fish cultivation – 50% Haor management – 30%		fisheries in Bangladesh. It is important that these potential impacts are identified and research and management strategies developed, tested and made ready, in anticipation of climate-related changes
0105	Adaptation in Livestock Sector	Animal resources development – 40% Ruminant breeding – 30%	48	Higher ambient temperatures, as well as floods and droughts, are likely to adversely affect poultry and livestock. It is necessary to understand these processes, develop appropriate adaptive measures, field test them and make them available to livestock and poultry farmers, many of whom are among the poorest and most vulnerable people in the country.
0106	Adaptation in Health Sector	Eradication of pests and diseases – 85% Health initiatives (arsenic mitigation, water supply, etc.) – 70% Health, nutrition, and population projects – 40%	40	One of the major impacts of global warming and climate change will be an increase in vector borne diseases (e.g., malaria and dengue fever). Global warming will also raise temperatures in the summer season, increasing the incidence of heat strokes, which could be further aggravated by shortages of drinking water.
0107	Water and sanitation programme for climate vulnerable areas	Water supply & sanitation activities in cyclone prone coastal areas – 80% Rural development through water-resource management – 45% Emergency measures/water supply – 40% Coastal town water supply and sewerage/drainage – 30% Water treatment/water supply/sanitation and drainage development – 30% Deep Tube Wells – 30%	46	The increasing prevalence of droughts will adversely affect availability of surface water and drinking water from and will require investment in deep set ground water technologies, conservation of water and rainfall harvesting, in some regions. Also, in the coastal zone, as sea level rises, salinity will move inland making safe drinking availability a big challenge. Urban areas are likely to be especially vulnerable to reduced surface and groundwater availability.
0108	Livelihood protection in ecologically fragile and climate vulnerable zones	Conservation – 75% Coastal environmental – 60% Livelihood enhancement – 40% Roads and highway construction in critical regions/hotspots - 40% Char (riverine silt island)/coastal market development – 40% Wildlife protection – 40%	52	Ecologically fragile areas and ecosystems may become more so due to changes in temperature and more erratic rainfall patterns. Climate related disasters may destroy people's homes, and incomes and employment could be threatened in many areas. Affected regions are likely to include the coastal zone, river chars, hilly areas (e.g., the Hill Tracts) and inland wetland areas.
0109	Livelihood protection of	Coastal-area lifesaving/ livelihoods – 70%	38	The poor and the non-poor will be affected differently by climate

Code	New Relevance Criteria (aligned with BCCSAP Programmes)	Relevance Criteria and Relevance Weight (%) in CFF 2014 <sup>7</sup>	Relevance Weight (%)	Rationale for new Relevance Weight
	vulnerable socio-economic groups (including women)	Social protection – 50% Ashroyan (shelter) projects – 50% Coastal-area nagors (port towns) poverty reduction – 50% AIGs – 30% Rural area poverty reduction – 30% Coastal-area rural development/resource management – 30% Chattogram Hill Tracts infrastructure development, etc – 25% Sericulture development, etc. – 20% Development of urban slum dwellers, etc. – 10%		change impacts because of their contrasting asset bases and incomes. Women and children are generally more vulnerable than men, especially in poor households, and all programmes will thus prioritise the needs of women and children. In some cases, the programme will provide protection against loss of employment and income; in others, health needs may be more acute; and for some social welfare measures through transfer programmes may be necessary.
02	Comprehensive disaster management			
0201	Improvement of flood forecasting and early warning systems	Warning and forecasting/ meteorological/weather/hydrology – 75%	61	Bangladesh is highly regarded for its competence in flood forecasting and early warning systems. The forecasts are released through e-mails as well as placed on a web-site. However, there is scope for improvement. It would be helpful to communities and the authorities to have longer range forecasts, even though they are not always reliable.
0202	Improvement of cyclone and storm-surge warning	Warning and forecasting/ meteorological/weather/hydrology – 75%	68	Dissemination of cyclone and storm-surge warnings is done, at community level, through the Cyclone Preparedness Programme (CPP) Volunteers of the Bangladesh Red Crescent Society (BDRCS). There is thus an urgent need to review the system and make improvements, where necessary.
0203	Awareness raising and public education towards climate resilience	Climate-related capacity building/rehabilitation – 75% Awareness building – 30%	46	Bangladesh has developed a comprehensive and effective disaster management system. The Standing Order on Disaster provides guidance to local communities and the authorities, at various levels, on their roles and responsibilities during and immediately after a disaster has struck. It also lays out procedures for alerting local communities when a disaster such as a flood, cyclone or storm-surge is likely to occur.
0204	Risk management against loss of income and	Emergency disaster damage/ haor-area rehabilitation, rural infrastructure in	77	Communities and families try to climate proof in several ways (e.g., raising the mounds on which they build their houses to protect them

Code	New Relevance Criteria (aligned with BCCSAP Programmes)	Relevance Criteria and Relevance Weight (%) in CFF 2014 <sup>7</sup>	Relevance Weight (%)	Rationale for new Relevance Weight
	property	coastal areas – 80% Vulnerable group development – 70% Economic development for poorest people – 50% Rural livelihoods, poverty reduction through livestock/ fisheries/agricultural production – 50%		from floods and the use of adapted varieties of crops). In addition, insurance against climate-related losses may also be an effective risk reduction mechanism. Adaptive insurance products should be developed for people, households and enterprises against climate related losses.
03	Infrastructure			
0301	Repair and maintenance of existing flood embankments	Flood control – 60% City outer ring-road – 50% River dams for augmenting food production/food Security – 50% Rehabilitation of embankments (integrated project areas) – 40%	68	Earthen embankments have been constructed by BWDB, along most major and medium-sized rivers in the country and some minor rivers. The heights of the embankments were designed based on recent major floods and/or statistical analysis of past river stage data. Many of these embankments are in poor shape due to lack of proper maintenance.
0302	Repair and maintenance of existing cyclone shelters	Cyclone shelters/preparedness – 95% Raising roads and homesteads in coastal areas – 80%	70	The cyclone shelters in Bangladesh are considered a major success among disaster management professionals. However, during Cyclone Sidr, many people who sought refuge in cyclone shelters were scared for their safety because of the poor condition of the structures. As another storm surge may hit the coast of Bangladesh, anytime, and at any location, cyclone shelters along the entire coastal belt must be urgently made fully functional and operational
0303	Repair and maintenance of existing coastal polders	Coastal climate-resilient infrastructure improvement – 95% New/redesigned dykes – 75% City berce badh (protection wall) – 50%	80	The coastal belt of Bangladesh faces severe cyclonic weather and storm surges at regular intervals. It is predicted that such natural calamities will hit the coastal belt with increasing frequency and intensity. The experience of Cyclone Sidr, in 2007, shows that damage was the greatest in unprotected areas and where the storm surge had breached the dyke (e.g. in Southkhali of Sharankhola Thana).
0304	Improvement of urban drainage	Coastal town infrastructure – 75% Eliminating water-logging in city areas – 50% Water logging – 30% Bridge/culvert construction – 20%	61	The current storm drainage systems of the major cities were designed using historical rainfall data. It is likely that these design capacities will be exceeded in future. One of the major impacts of climate change is likely to be an increase in the number of episodes of short duration and heavy rainfall. This will result in water logging due to drainage congestion
0305	Adaptation against floods	Disaster relief and food-related	70	One of the main impacts of climate change will be the increased



Code	New Relevance Criteria (aligned with BCCSAP Programmes)	Relevance Criteria and Relevance Weight (%) in CFF 2014 <sup>7</sup>	Relevance Weight (%)	Rationale for new Relevance Weight
0306	Adaptation against future cyclones and storm-surges	programmes – 95% Integrated flood protection for communities – 80%  Cyclone shelters/preparedness – 95% Raising roads and homesteads in coastal areas – 80% Cyclone recovery and restoration – 75%	72	frequency and intensity (duration and level) of floods. In view of this, hydrological modelling of the Brahmaputra-Ganges-Meghna basin, for different climate change scenarios is needed to estimate future river flows and flood risks. Key non-structural measures for flood management include flood proofing and flood plain zoning.  To protect the coastal belt, an extensive network of polders has already been constructed. However, with the sea level rises expected as a result of climate change, the heights of the dykes will need to be raised further. With sea level rise, drainage congestion may become a major problem in the polders. The importance of thick belts of mangroves in reducing the destructive capacity of storm surges, was demonstrated during Cyclone Sidr. An expansion of the 'green belts' would afford extra protection and increase livelihoods opportunities for the poor.
0307	Planning, design and construction of river training works	Coastal areas barrage/ river erosion protection – 75% Coastal-area development, e.g. chars (silt islands in rivers) – 70% Coastal town protection – 60% River erosion – 30% River training – 20%	48	River bank erosion has severe impacts on the livelihoods of affected people. In view of this, river training works should be taken up in an organized and comprehensive fashion, as part of a long term programme. Several components of the Flood Action Plan focused on river training works. Hydro-dynamic modelling exercises will assist us in establishing the costs of river training that may result from climate change.
0308	Planning, design and implementation of the resuscitation of the network of rivers and khals through dredging and de-salutations work	River restoration/dredging/ erosion protection – 50% Canal improvement – 30%	68	Due to climate change huge rainfall within short duration are likely to increase. This would result in soil erosion from watersheds. This will add to sediment loads and get deposited into the river and canal beds and silted up. This may be accomplished by commercial dredging work for big rivers. Where the canals are small, manual labour will be a viable alternative.
04	Research and knowledge management			
0401	Establishment of a centre for research, knowledge management and training on climate change	Safari/eco-park – 30% Coastal-area infrastructure research, etc. – 30% ICT, education/training/work – 30%	70	A comprehensive move towards adaptation and mitigation supported by technology transfer and financial flows (as envisaged in the BCCSAP) requires an up-graded system of knowledge creation, dissemination and training.
0402	Climate Change Modeling at National and sub-		90	In order to generate more precise climate change scenarios for Bangladesh, it is necessary to develop appropriate GCM models. These

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	national levels			models should be calibrated down to district and sub-district levels and teams of specialists should be able to work on selected models, to simulate future conditions under different scenarios and assumptions.
0403	Preparatory studies for Adaptation against sea level rise and its impacts		84	The sea level rise threatens the low-lying coastal belt and small islands. Much of our coast is protected with 4 to 5-meter-high dykes and will be further protected with additional planned polders. The main impacts of SLR would be: <ul style="list-style-type: none"> <li>- salinity ingress causing the rivers in the coastal belt to become brackish or saline. This would have serious impacts on production of food grains</li> <li>- rises in river levels, which would impede drainage from polders, resulting in water logging, which would also adversely affect agriculture</li> </ul>
0404	Monitoring of Eco system and Bio- diversity changes and their impacts	Land-use change - 30%	40	Salinity levels are also likely to increase significantly in the coastal belt. Mangrove ecosystems which are already under serious stress for anthropogenic reasons will suffer heavily due to further increases in salinity. These could alter the entire ecosystem of the Sundarbans and cause the extinction of some species
0405	Macroeconomic and sectoral economic impacts of climate change		83	Bangladesh has been experiencing strong economic growth in recent years and is on track to become a middle-income country by 2020. It is important that we understand the impacts that climate change will have on (a) macro-economic growth and stability; (b) different sectors of the economy, and (c) different regions and socio-economic groups, in the short, medium and long terms.
0406	Monitoring of Internal and External Migration and providing support of capacity building for rehabilitation		48	The areas that will suffer from major impacts of climate change will lose in livelihood opportunities and face reduction in productivity in agriculture sector. The worst affected areas will be the coastal belt of the country. The water in the whole coastal belt will become saline as the level of sea rises gradually. Increase of frequency of cyclonic weather will impact livelihoods of fishermen. People will be forced to move out to areas in search of safety and livelihood. Another impact of climate change will be in the form of increase in river bank erosion.
0407	Monitoring of impact for management of Tourism	Infrastructure research – 10% Tourism facilities development, etc.- 5%	32	Bangladesh has major potential for both commercial tourism and ecotourism. Commercial tourism is not fully developed. Ecotourism is

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05	Mitigation and low-carbon development			
0501	Improved Energy efficiency	Nuclear power – 90% Social and environmental standard industries project – 40%	69	We should carefully assess how we can become more efficient in producing and consuming energy. This will involve identifying any technical, economic or regulatory/ policy constraints to help improve performance and to learn how these constraints can be overcome.
0502	Gas Exploration and reservoir management	Oil-gas exploration/energy – 40%	28	Bangladesh has modest reserves of natural gas. Known reserves are expected to be used up in about a decade. Further gas exploration is possible. Finding new gas reserves would increase the country's energy security and may make it possible to remain on a low carbon growth path because natural gas is the cleanest of all fossil fuels in terms of CO2 emission.
0503	Development of coal mines and coal fired power station	Environment (clean air) – 50%	12	Bangladesh is geologically one of the least explored countries. However, the exploration that has taken place, indicates that there may be substantial amounts of coal at shallow depths in some parts of the country. Bangladesh would need to invest in 'clean coal technology' for power generation. Such technology is not cheap and would have to be imported.
0504	Renewable energy development	Power/solar energy – 80% Border-area electrification through solar power – 50%	81	The scope for developing renewable energy supplies (e.g., solar, wind, tidal, geothermal and modern biomass technologies) has not been explored well in Bangladesh. There is some use of solar power for limited domestic purposes. The potential of harvesting wind energy, though recognized for many years, has not produced tangible results so far. The tidal range of the coastal belt is considered to be adequate for the generation of tidal power. However, there has not been any attempt to harvest such energy.
0505	Lower emission from agricultural land	Bio-fertilizer plant/hydrocarbon unit – 40%	60	Emission of greenhouse gases (GHGs) from agricultural land is a major concern. Wet agricultural land produces methane (CH4). Nitrogenous (N2) fertilizers also contribute to GHG emission. A major reason for methane emissions is that rice fields are kept continuously flooded, which scientists now say is unnecessary.
0506	Management of urban	Vegetable production, development	46	A major portion of the urban waste of Bangladesh is composed of

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	waste	through organic waste uses – 50%		organic materials, which produce methane (CH4) as they decompose. The unit contribution of methane to global warming is much higher than that of carbon dioxide. Methane could be captured for subsequent use or waste could be incinerated to produce electricity. Proper management of urban waste could thus be an important area for mitigation while ensuring a cleaner city. Furthermore, the lowered emissions could be traded in the carbon market
0507	Forestation and reforestation program	Coastal forestation – 90% Hill-area afforestation – 50%	69	As salinity is expected to increase with rising sea levels, emphasis should be given to saline tolerant species. For freshwater wetlands, suitable submergence tolerant species such as Hijol and Koroch, which can also protect against wave erosion, could be used. Much of Government owned reserve forest land is largely without trees. Social and homestead forestry has gathered momentum in recent years. It needs to be further encouraged as it supports the livelihoods of the poor and local communities
0508	Rapid expansion of energy saving Devices e.g. CFL		68	Presently there is shortage of commercial energy in the country and urgent programmes are being planned for generation of more electricity. Bangladesh should take all out efforts to minimize the use of energy. One such major domain where energy saving mechanism can be pushed is introduction of more and more energy saving lighting in domestic as well as industrial units.
0509	Energy and water efficiency in built environment		48	Huge volumes of water are consumed in the energy sector for generating electricity, natural gas, and other fuels used in buildings. At the same time, significant energy is used to pump, treat, and use the water that is consumed in buildings to protect the health of its occupants.
0510	Improving in energy consumption pattern in transport sector and options for mitigation		28	The transport sector accounts for a large share of global greenhouse gas emissions and this share is expected to grow over the coming decades. Though transport share of emission of Bangladesh is low but energy consumption is growing much faster than any other sectors. Many vehicle technologies that have been proposed by developed countries to reduce GHG emissions may not be feasible in Bangladesh because of their high initial cost and lack of infrastructure. Necessary actions need to be taken towards low carbon transport.

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06	Capacity building and institutional strengthening			
0601	Revision of sector policies for climate resilience	Food policy – 40% Policy support for water supply – 25%	68	Climate change management needs to be integrated into the development activities of different sectors. Sectoral policy statements need to be modified to take account of and become consistent with climate change impacts and their management. The National Water Management Plan recognizes the need to make water sector activities resilient to climate change. However, the only sectoral policy that explicitly incorporates climate change considerations is the Coastal Zone Policy of Bangladesh, which was drafted in 2005.
0602	Mainstreaming climate change in National, Sector and Spatial Development program	Railway sector improvement – 20% International trade promotion – 20% Supportive legislative measures – 10%	77	This will require: (a) incorporating climate change into policies, plans, programmes and projects; (b) establishment and building the capacity of ministries and agencies; (c) focusing where climate change will be a key issue.
0603	Strengthening human resource capacity	Fire service and civil defense – 50% Human capital development – 35% Capacity/resilience building – 30%	48	Due to lack of expertise, Bangladesh has been unable to grasp opportunities to effectively use new global financial instruments. Also, climate change negotiations have now entered a phase where constant tracking and taking decisions at short notice are required. Activities should include short and long training at home and abroad, study tours, exchange programmes, and financing for attending negotiations.
0604	Strengthening Gender consideration in climate change management	Protection of women's/child's rights – 10%	26	Mainstreaming climate change issues in national and sectoral development will require strong organizations and a robust institutional framework to ensure that the activities are sustained over the next several decades and beyond. Some of the organizations will be new (e.g., climate cells in ministries and their agencies); others will have to be reformed and strengthened. In all cases, organizations will need to be provided with adequate logistics and other facilities, for which adequate financing will have to be ensured.
0605	Strengthening institutional capacity for Climate Risk Management	Agricultural information system – 50% Secondary and higher education development – 20% Access to information – 10% Primary education development – 10% Identity cards – 5%	66	Mainstreaming climate change issues in national and sectoral development will require strong organizations and a robust institutional framework to ensure that the activities are sustained over the next several decades and beyond. There is a pressing need to strengthen a number of existing organizations that are already underperforming in implementing their regular development programme.

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0606	Mainstreaming climate change in the media	Broadcasting networks – 10% Telecommunication – 10%	30	Bangladesh media has been pro-active in mounting public awareness on climate change issues for last two decades. But, given the scale of climate-induced adverse impacts on the national economy, livelihoods and eco-systems, the people requires to more aware while Bangladesh vibrant print and electronic media can play that effective role in a very comprehensive manner to help bring in positive changes in public opinion to make policy changes.



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