



Evaluation of Adaptation Policies in GBM Delta of Bangladesh



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Citation:

Haq, I., Omar, M.A.T., Zahra, Q.A. and Jahan, I., 2018. Evaluations of Adaptation Policies in GBM Delta of Bangladesh. DECCMA Working Paper, Deltas, Vulnerability and Climate Change: Migration and Adaptation, IDRC Project Number 107642. Available online at: www.deccma.com, date accessed

About DECCMA Working Papers

This series is based on the work of the Deltas, Vulnerability and Climate Change: Migration and Adaptation (DECCMA) project, funded by Canada's International Development Research Centre (IDRC) and the UK's Department for International Development (DFID) through the **Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA)**. CARIAA aims to build the resilience of vulnerable populations and their livelihoods in three climate change hot spots in Africa and Asia. The program supports collaborative research to inform adaptation policy and practice.

Titles in this series are intended to share initial findings and lessons from research studies commissioned by the program. Papers are intended to foster exchange and dialogue within science and policy circles concerned with climate change adaptation in vulnerability hotspots. As an interim output of the DECCMA project, they have not undergone an external review process. Opinions stated are those of the author(s) and do not necessarily reflect the policies or opinions of IDRC, DFID, or partners. Feedback is welcomed as a means to strengthen these works: some may later be revised for peer-reviewed publication.

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Table of Contents

| Title | Page No. |
|--|-----------------|
| Table of Content | iii |
| List of Tables | iv |
| List of Figures | v |
| Executive Summary | vi |
| Chapter 1: Introduction | 1 |
| 1.a Aim of the study | 1 |
| 1.b. Discussion of why climate change adaptation policy is of relevance in the delta | 1 |
| 1.c. Including gender in policy | 1 |
| 1.d. Outline of the paper | 2 |
| Chapter 2: Methodology | 3 |
| 2.a. Country context | 3 |
| 2.b. Method applied | 3 |
| Chapter 3: Data and Analysis | 9 |
| 3.a. Discussion of policy documents | 9 |
| 3.b. Content analysis | 18 |
| 3.c. Key themes emerging | 19 |
| 3.d. Gender and migration dimensions | 27 |
| Chapter 4: Discussion | 30 |
| 4.a. Comparison of findings with wider literature on climate change adaptation | 30 |
| 4.b. What is missing from their country context | 36 |
| 4.c. Opportunities for policy development | 37 |
| Chapter 5: Conclusion | 39 |
| Reference | 40 |

List of Tables

| Title | Page no. |
|--|-----------------|
| Table 1: List of selected plan/policies/acts included in the review | 7 |
| Table 2: Count of key terms related to climate change adaptation in selected plan/policies/acts | 42 |
| Table 3: Identification of key adaptation options in the selected plan/policies/acts | 44 |
| Table 3.1: Rank of policy documents based on the total count of key terms | 10 |
| Table 3.2: Category of adaptation options based on their count of mentions in policy documents | 18 |
| Table 3.3: Rank of policy documents based on their count of mentions of adaptation options | 19 |

List of Figures

| Title | Page no. |
|---|-----------------|
| Figure 3.1: Chronological development of key terms | 11 |
| Figure 3.2: Proportional, periodic and thematic trend of adaptation paradigm terms | 12 |
| Figure 3.3: Proportional, periodic and thematic trend of adaptation attribute terms | 13 |
| Figure 3.4: Proportional, periodic and thematic trend of disaster risk reduction attribute terms | 14 |
| Figure 3.5: Proportional, periodic and thematic trend of meteorological variables terms | 15 |
| Figure 3.6: Proportional, periodic and thematic trend of hazard category terms | 16 |
| Figure 3.7: Proportional, periodic and thematic trend of gender and migration terms | 17 |

Executive Summary

Over the last decades, Bangladesh has achieved success in many fronts including ensuring food security, provisioning drinking water supply, reducing poverty, empowering women and managing disasters. Many of these successes are increasingly facing challenges under climate change scenarios. The country has started preparing for such scenarios by formulating various policies, plans and acts, and by implementing various adaptation options according to these policy documents.

This policy review aims to create an assessment of the scope and types of adaptation policy that exist in GBM - Bangladesh delta (GBM-BD). The study collated policy documents and plans in order to identify government adaptation responses to climate change, variability or extremes in GBM-BD. A total of 21 policy documents belonging to topical areas such as Climate Change, Environment, Disaster Management, Sectoral, Comprehensive, Coastal, Gender and Cross-cutting are analysed.

Using the documents identified, policies/plans were searched for mention of climate change adaptation based on number of related terms such as Adapt, Cope, Thrive, Transform, Adjust, Risk etc. It was found Bangladesh Climate Change and Gender Action Plan (2013) includes the highest number of key terms followed by Standing Orders on Disaster (2010), National Adaptation Program of Action (2009) and Bangladesh Climate Change Strategy and Action Plan (2009). Mostly the climate change, disaster management, comprehensive and gender thematic areas shows the highest concentration of key terms among the selected policies.

The various policy documents were searched for climate change adaptation options. It is seen that issues like institutional capacity, governance, training, and research and development are mainly emphasized in most of the documents. Adaptations options like early warning, financial support, livelihood diversification, disaster management etc are also emphasized. The emerging adaptation options are among others, women empowerment, resilient cropping, and coastal management.

Gender and migration seem to be a very recent issue in the policy documents from climate change adaptation perspectives. The major advancement in gender issue is Bangladesh Climate Change and Gender Action Plan, which was formulated in 2013. Migration from climate change adaptation perspective was not appropriately addressed in the policy documents so far. The only document that mentions migration as an adaptation option is Bangladesh Climate Change Strategy and Action Plan.

Chapter 1: Introduction

1. a. Aim of the Paper

The policy review aims to create an assessment of the scope and types of adaptation policy that exist in GBM - Bangladesh delta (GBM-BD). The policy review forms the basis of our understanding of how governments aim to deal with a changing climate.

1. b. Discussion of Why Climate Change Adaptation Policy is of Relevance in the Delta

The Intergovernmental Panel on Climate Change's 'Fifth Assessment Report' reveals long-term implications for Bangladesh and its people from probable catastrophic impacts of climate change. Its exposure to frequent and extreme climatic externalities e.g. floods, cyclones, prolonged heat and cold waves, erratic weather events as well as the socio-economic vulnerability e.g. poverty, displacement, limited adaptation options etc, is a concern for policymakers and scientists. Over the years, successive governments, civil society organizations and development partners have come up with innovative approaches to help the affected people adapt to climate change. So far, as planned adaptation, Bangladesh government has formulated various policies aimed at enabling adaptation to climate change, e.g. National Adaptation Programme of Action (2005), Bangladesh Climate Change Strategy and Action Plan (2009), Bangladesh Climate Change and Gender Action Plan (2013). Additionally, various climate change adaptation issues are addressed to varying extents in other sectoral policies and plans of Bangladesh. This paper will assess the scopes and types of adaptation that is encompassed within policy in GBM-BD.

The changes in government views regarding various issues related to climate change adaptation pathways e.g. gender, disaster risk reduction, migration, community and ecosystem-based adaptation, sustainable development etc, for Bangladesh can be outlined from the analysis of their content. This knowledge will be crucial to see whether we are policy wise or in other words whether we are on the right track in adapting to climate change?

The study will also assess the extent to which climate adaptation is incorporated in national planning documents, such as the contemporary medium-term plan e.g. sixth five-year plan (2011-2015) and long term plan e.g. perspective plan (2010-2021) will be analysed in-depth to develop insight.

The key drivers of these policy developments will also be analysed based on a review of national and international wider literatures. The drivers can be internal e.g. chronic natural or man-made stresses related to climate change i.e. sea level rise, salinity intrusion, land use change, migration etc; or external e.g. international organizations, treaties, conferences etc. i.e. UNFCCC, COP, IPCC etc.

Overview of the coverage and gaps of adaptation needs within the policy framework in Bangladesh can enable identification of knowledge gaps for the scientific community, and action gaps for the policy makers.

1. c. Including Gender in Policy

Bangladesh is a patriarchal society and roles that men play in society have typically been prioritised over those of women. Women have most influence over household activities and also have significant amount of contribution in the development of agriculture and other economic sectors of the country. The Labour Force Survey, 2010 found an increase in women's labour force participation from 29.2% in 2005/6 to 36% in 2010 which, if distributed according to sectors shows that in 2010 68.84% of these women were engaged in agriculture sector followed by 21.89% in service sector and 13.32% in the industry sector. Participation of women in some of the important sectors such as the garment sector, which earns almost 80% of foreign exchange, and micro-finance sector is very high. But it was also observed that women were mainly involved in low end jobs rather than the higher end

of the value chain. This came up prominently in a survey in 2013, where it was observed that about 13% of international migrants were women, and they mainly work as housemaids, cleaners, care givers etc (Begum 2014).

Mainly due to the social and economic context e.g. education barriers, cultural barriers, lack of health facility, less income and limited working opportunity, sexual harassments etc., women are among the most vulnerable section of the population in Bangladesh. Moreover, women suffer more than men during and after climatic disasters. For example, more women than men die in disasters, and the reason behind it is that, not only they do not receive early warning information on time, but also because their decision making knowledge and confidence on how to respond when disasters hit, is very limited (Ahmed et al., 2007). Moreover a study showed that a large number (71.6% of women studied) of women were subject to more violence during disasters and huge number of females do not take shelter at designated places at time of disaster due to lack of personal security (Nasreen 2008).

Given the particularly vulnerable position of women in Bangladesh, it is crucial to mainstream women's needs and address them in policy making across sectors. So far, even if they have been included in policy it is still not enough, and no actual development is possible until it is done. Thus, an awareness of gender differences in vulnerability and adaptation to climate change needs to be mainstreamed in all the policies and different development initiatives to improve the status of women in the socio-economic context and also to increase their adaptive capacity in face of climate change and its related problems.

1. d. Outline of the Paper

The report is based on the following structure. Chapter 2 introduces the country context and the method applied to analyse these policies. Chapter 3 discusses the policy documents on the basis of key terms found on these documents. Then it presents the findings of the content analysis of the policies and the key themes that are emerging. It makes a separate discussion on gender and migration dimensions. Chapter 4 encapsulates comparison of findings with wider literature on climate change adaptation, what is missing from their country context in terms of policy and content and opportunities for policy development. Chapter 5 summarizes the whole study and give the concluding remarks.

Chapter 2: Methodology

2. a. Country context

Over the last decades, Bangladesh has achieved success in many fronts including ensuring food security, provisioning drinking water supply, reducing poverty, empowering women and managing disasters. Many of these successes are increasingly facing challenges under climate change scenarios. The country has started preparing for such scenarios by formulating various policies, plans and acts, and by implementing various adaptation options according to these policy documents.

Bangladesh has a number of sectoral policies such as in agriculture, fisheries and forestry. Its environment policy was formulated in 1992 as a follow-up of Rio Summit. Thereafter, the National Environment Management Action Plan was prepared in 1995. This policy is now being updated. It has cross-sectoral policies such as coastal zone policy and water policy. It prepared disaster management plan in 2010. The country prepares five year plans which provide planning framework for all sectors. Addressing climate change, it prepared National Adaptation Program of Action in 2005 and updated it in 2009. A more comprehensive Climate Change Strategy and Action Plan was formulated in 2009. In order to mainstream gender in this action plan, it formulated Climate Change and Gender Action Plan in 2013. Migration is an important issue in Bangladesh. There is no separate migration policy. But various other policies such as Labour Policy addresses migration.

2. b. Method Applied

The present study collated policy documents and plans in order to identify government adaptation responses to climate change, variability or extremes in GBM-BD. The research recognizes a policy as a general guidance for addressing public concerns and a plan as an outline of how to achieve policy goals in practice.

There are 4 steps involved in this process:

- i) Identify climate change adaptation-relevant policies
- ii) Compile these into a database of climate change adaptation relevant policies
- iii) Assess the extent of climate change adaptation in the policies through content analysis
- iv) Assess the evidence of adaptation in the policy documents through thematic analysis

i) Identification of Climate Change Adaptation Relevant Policies and Plans

a. Topical areas

The first step in the policy review was to identify relevant policy documents that reflect the government's approach to climate change adaptation. The policies that influence climate change adaptation may be found in several policy areas, for example sectoral development, resource management, as well as cross-cutting areas.

Sectoral development policies where climate change adaptation can be found of interest to DECCMA:

- Agriculture
- Fisheries
- Forestry

Resource management policies of interest to DECCMA:

- Flood /flood risk management
- Water resources management
- Coastal zone management
- Urban planning
- Rural development

Cross-cutting policy documents of interest to DECCMA:

- Disaster risk reduction
- Climate Change
- Poverty reduction
- Gender

The policies were reviewed in the following order:

1. Climate Change
2. Disaster risk reduction
3. Agriculture
4. Fisheries
5. Forestry
6. Flood /flood risk management
7. Water resources management
8. Coastal zone management
9. Urban planning
10. Rural development
11. Poverty reduction
12. Gender

b. Finding documents

Online sources

To find policies/plans the following online sources were consulted:

- Websites of national and state level government agencies within the country
- National country academic and research institutions
- International development agencies, - UNDP, UNEP, UNFPA, UNWomen, World Bank, WHO, FAO, WMO.

Tangible sources/ paper sources

Government offices were contacted for policies/plans that are not accessible from their respective website.

The list of policy documents which were gathered are as follows:

Climate Change

1. National Adaptation Programme of Action (NAPA), 2009
2. Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009

Environment

1. Environment Policy (1992)
2. The Bangladesh Environment Conservation Act (1995)
3. National Conservation Strategy (NCS)
4. National Capacity Self Assessment (NCSA)
5. National Environment Management and Action Plan (NEMAP), 1995

Disaster Risk Management

1. National Plan for Disaster Management (NPDM), 2010
2. National Disaster Management Act (NDMA), 2012
3. The Standing Orders on Disaster (SOD), 2010

Sectoral Policy

1. National Agriculture Policy, 2013
2. National Forestry Policy, 1994
3. National Water Policy (NWP), 1999
4. National Water Act (NWA), 2013
5. National Water Management Plan (NWMP), 2001
6. National Food Policy, 2006
7. National Fisheries Policy, 1998
8. National Energy Policy, 1995

Vulnerability Reduction (Poverty Alleviation)

1. Perspective Plan of Bangladesh, 2012
2. National Strategy for Accelerated Poverty Reduction, 2005
3. Bangladesh Sixth Five Year Plan (SFYP), 2011
4. Bangladesh Country Investment Plan, 2011
5. National Rural Development Policy, 2001
6. Foreign Employment Policy, 2006
7. Overseas Employment Act, 2011

Gender

1. Bangladesh Climate Change and Gender Action Plan (BCCGAP), 2013

Migration

1. Foreign Employment Policy, 2006
2. Overseas Employment Act, 2011
3. Bangladesh National Labour Policy, 2010

Coastal

1. The Coastal Zone Policy (CZP), 2005
2. The Coastal Development Strategy (2006)

Cross-cutting

1. Bangladesh Population Policy, 2012

Landscape Management

2. The National Housing Policy, 2008
3. The National Land Use Policy, 2001

ii) Searchable Database of Adaptation Relevant Policies/Plans

The database comprises the following details:

- the name of the document
- the Government Department, Agency or Ministry that is responsible for implementation of the policy/plan
- the date the policy/plan was written/published
- if applicable, the period the policy/plan is expected to cover, e.g. if it is a 5 year vision

iii) Content Analysis of Climate Change Adaptation

a. Identification of policies/plans that mention climate change adaptation

At this stage, the aim was to investigate if climate change adaptation is acknowledged within each policy/plan at the national level of Bangladesh. If a policy/plan acknowledges climate change adaptation, it was then included in the more detailed thematic analysis. Using the documents identified, policies/plans were searched for mention of climate change adaptation based on the following terms:

- Adapt
- Cope
- Thrive
- Transform
- Adjust
- Risk
- Vulnerability or vulnerable
- Resilience or resilient
- Robust
- Bounce back
- Capacity

In relation to one or more of the stressors below

- Climate
- Weather
- Variability
- Hazard
- Floods
- Drought
- Sea level rise
- Salinity
- Cyclones

For each key term, it was documented how many times this appears in the document. Where none of the key terms appear anywhere in the document, the policy was not sent through to the next round of analysis. However, if one or more key terms appeared in the document, the policy was sent through to the next round of analysis. The documented counts of the key terms were reviewed and revised based on their context of mentioning in the document e.g. when migration count was found in search result, then it may not necessarily imply human mobility, rather than it may also imply fish migration. These cases were carefully skimmed and scanned followed by revision of the original count. Several synonyms of the key terms were found useful to serve the purpose while searching the document e.g. using the term women or female along with gender for finding gender specific context. The list of selected documents is as follows:

Table 1: List of selected plan/policies/acts included in the review

| Topical Area | Plan/Policy/Act (Publication Year) | Implementer | Implementation Period |
|---------------------|---|---|----------------------------------|
| Climate Change | The Bangladesh Climate Change Strategy and Action Plan (2009) | Ministry of Environment and Forest | 2009-2018 |
| | National Adaptation Program of Action (2009) | Ministry of Environment and Forest | 2009-2014 |
| Environment | National Environment Management Action Plan (1995) | Ministry of Environment and Forest | 1995-2005 |
| | The Environment Policy (1992) | Ministry of Environment and Forest | Ongoing |
| Disaster Management | National Disaster Management Act (2012) | Disaster Management Council | Ongoing |
| | National Plan for Disaster Management (2010) | Disaster Management Bureau, Disaster Management & Relief Division | 2010-2015 |
| | Standing Orders on Disaster (2010) | Ministry of Food and Disaster Management, Disaster Management & Relief Division, Disaster Management Bureau | Ongoing |
| Sectoral | National Agricultural Policy (2013) | Ministry of Agriculture | Ongoing |
| | The Water Act (2013) | Ministry of Water Resources | Ongoing |
| | National Water Management Plan (2001) | Ministry of Water Resources | 2001-2025 |
| | National Water Policy (1999) | Ministry of Water Resources | Ongoing |
| | The National Food Policy (2006) | Ministry of Food and Disaster | Ongoing |
| | National Energy Policy (2004) | Ministry of Power, Energy And Mineral Resources | Ongoing |
| | National Fisheries Policy (1998) | Ministry of Livestock and Fisheries | Ongoing |
| Comprehensive | The National Forestry Policy (1994) | Ministry of Environment and Forest | Ongoing |
| | Sixth Five Year Plan (2011) | General Economics Division, Planning Commission | 2011-2015 |
| | Perspective Plan of Bangladesh (2012) | General Economics Division, Planning Commission | 2010-2021 |
| Gender | Bangladesh Climate Change and Gender Action Plan (2013) | Ministry of Environment and Forest | 2013-2018 |
| Migration | Bangladesh National Labour Policy (2012) | Ministry of Labour and Employment | Ongoing |
| Coastal | Coastal Zone Policy (2005) | Ministry of Water Resources | Ongoing |
| Cross-cutting | Bangladesh Population Policy (2012) | Ministry of Health and Family Welfare | Ongoing |

iv) Thematic Analysis of Adaptation Options

a. Identification of key adaptation terms

Using only the policies/plans that were not discarded during the previous stage, the final stage of the policy analysis investigated the adaptation options presented in each policy/plan. The policy documents were for evidence of any adaptation. It was expected that the adaptation options presented in each policy will be country-context specific. To address this, first own list of adaptation terms were generated for Bangladesh by identifying the types of adaptation they may expect to be promoted through policy. Policy documents were then searched for evidence of any adaptation that appears on the list.

Search for key adaptation terms

Using each of the adaptation terms, each policy/plan was searched. Where an adaptation is mentioned, this was documented. For electronic documents, it was not relied solely on the search function as a variety of terms may be used to describe each adaptation. For example, it is possible that a document that promotes participation of rice farming households' in aquaculture may not mention 'livelihood diversification'

b. Detailed description of adaptation options

A detailed description of each adaptation policy option was provided in a table as it appears in the policy/plan document. This was in the form of a direct quote from the policy document. The page number for each description was provided.

Chapter 3: Data and Analysis

3. a. Discussion of Policy Documents

After searching the documents with the climate change related key terms, the table 2 (at the end of the document) was derived. In the following paragraphs we will discuss the context of use the major key terms in our selected policy documents.

Gender: Mostly used in Bangladesh Climate Change Gender Action Plan 2013, emphasized in the Sixth Five Year Plan (2011-2015) and comes up significantly in the Bangladesh Climate Change Strategic Action Plan 2009 and National Agriculture Policy 2013. There is also considerable mention of this term in Coastal Zone Policy 2005, National Food Policy 2006 and National Plan for Disaster Management (2010-2015). The term is completely absent in earlier policies such as National Environment Policy (1992) and National Forestry Policy 1994. Here a chronological evolution of the focus on gender issues in the policies and plans of Bangladesh can be observed.

Migration: Most emphasized in Bangladesh Climate Change Gender Action Plan 2013. It is also mentioned in Bangladesh Climate Change Strategic Action Plan 2009 and Sixth Five Year Plan (2011-2015). Though it has been mentioned in a few previous documents, it seems from observation that migration has emerged as an important issue only in recent years.

Adapt: Most emphasized in Bangladesh Climate Change Gender Action Plan 2013, followed by National Adaptation Program of Action (NAPA) 2009. It is also mentioned considerably in the Bangladesh Climate Change Strategic Action Plan 2009 and Sixth Five Year Plan (2011-2015). It can be said that, like migration, adaptation too is emerging as an important issue only in recent documents.

Cope: Most emphasized in Bangladesh Climate Change Gender Action Plan 2013 and National Plan for Disaster Management (2010-2015). It is also significantly mentioned in Standing Orders on Disaster 2010, National Environment Management and Action Plan (NEMAP) 1995, Coastal Zone Policy 2005, Bangladesh Climate Change Strategic Action Plan 2009, National Adaptation Program of Action (NAPA) 2009 and Sixth Five Year Plan (2011-2015). In the remaining documents reviewed, it is completely absent. Thus, it could be said that 'coping' issue has always been present in environment, climate or disaster management related documents.

Thrive: Mentioned in only the Bangladesh Climate Change Gender Action Plan 2013 and National Adaptation Program of Action (NAPA) 2009. It is not an important issue in policy documents of Bangladesh.

Risk: One of the highest mentioned terms. It is mentioned in all the policies except Fisheries, Forestry and Agriculture policy. Most emphasized in Standing Orders on Disaster 2010, National Plan for Disaster Management (2010-2015) and also mentioned considerably in Sixth Five Year Plan (2011-2015), National Adaptation Program of Action (NAPA) 2009, Bangladesh Climate Change Strategic Action Plan 2009 and Bangladesh Climate Change Gender Action Plan 2013. Thus the term seem to be emphasized in most policies irrespective of the time of its implementation.

Vulnerability/Vulnerable: Vulnerability is used mostly in Standing Orders on Disaster 2010, Bangladesh Climate Change Strategic Action Plan 2009, Sixth Five Year Plan (2011-2015), National Plan for Disaster Management (2010-2015) to mean vulnerability of group or individual to disaster.

Resilience/Resilient: Resilience was included since 2009, mainly in climate related and comprehensive policies. By resilience most of the documents meant, capacity for a socio-ecological system to absorb stresses and maintain function in the face of external stresses imposed upon it by hazard or climate change.

Various statistical analyses using table 2 and their discussion are depicted below.

The following table shows the hierarchy of policy documents based on the total count of the key terms found in a policy document. Bangladesh Climate Change and Gender Action Plan (2013) include the highest number of key terms. Mostly the climate change, disaster management, comprehensive and gender thematic areas shows the highest concentration of key terms among the selected policies.

Table 3.1: Rank of policy documents based on the total count of key terms

| Plan/Policy/Act (Publication Date) | Total Count of Key Terms |
|---|---------------------------------|
| Bangladesh Climate Change and Gender Action Plan (2013) | 2516 |
| Standing Orders on Disaster (2010) | 1943 |
| National Adaptation Program of Action (2009) | 1145 |
| The Bangladesh Climate Change Strategy and Action Plan (2009) | 933 |
| National Plan for Disaster Management (2010) | 926 |
| Sixth Five Year Plan (2011) | 883 |
| National Water Management Plan (2001) | 736 |
| Perspective Plan of Bangladesh (2012) | 290 |
| The National Food Policy, (2006) | 260 |
| National Environment Management and Action Plan (1995) | 115 |
| Coastal Zone Policy (2005) | 75 |
| National Water Policy (1999) | 52 |
| National Agricultural Policy (2013) | 48 |
| National Energy Policy (2004) | 46 |
| National Population Policy (2012) | 39 |
| National Disaster Management Act (2012) | 36 |
| Environment Policy (1992) | 22 |
| National Fisheries Policy (1998) | 12 |
| National Water Act (2013) | 11 |
| National Labour Policy (2012) | 10 |
| The National Forestry Policy (1994) | 1 |

Graph 3.1 shows the temporal trend of cumulative counts of key terms in chronological policy years - policy year meaning, the year in which they came into being first. Only the policy years and their frequency distribution of policies on that particular year are shown in the graph. Therefore, some of the years for example 2007 and 2008 are not shown in the graph as no policy came into being during those years. The overall trend shows that, the count of the key terms in the policy documents are increasing over the years especially in recent years. It is apparent that climate issues are gaining much traction in the country.

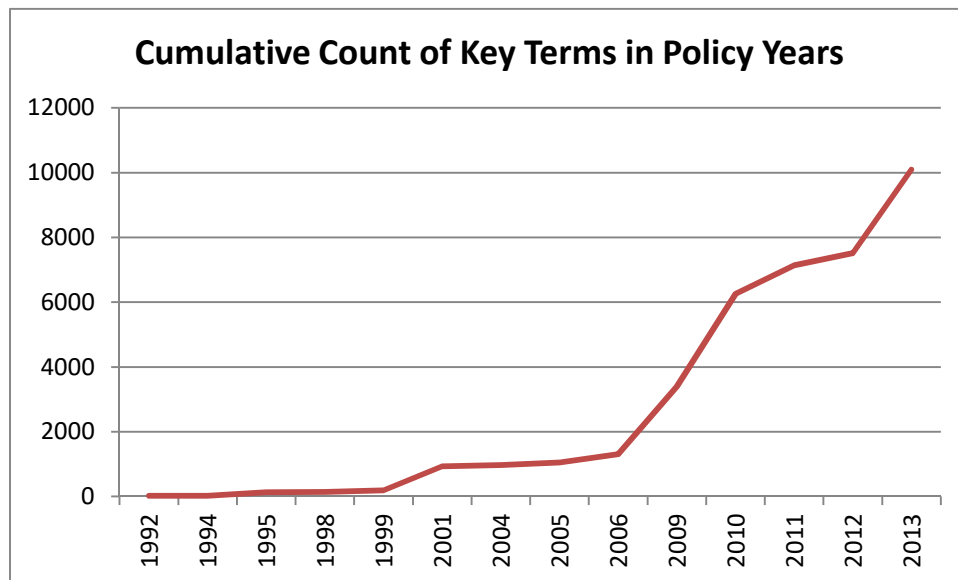


Figure 3.1: Chronological development of key terms

Adaptation Paradigm: It appears that the focus of the documents is more on adaptation than coping or thriving. These terms are mostly used in policies from 2009 onwards and especially in climate change, gender, disaster management and comprehensive thematic area. Thrive is a term that hasn't been used much yet.

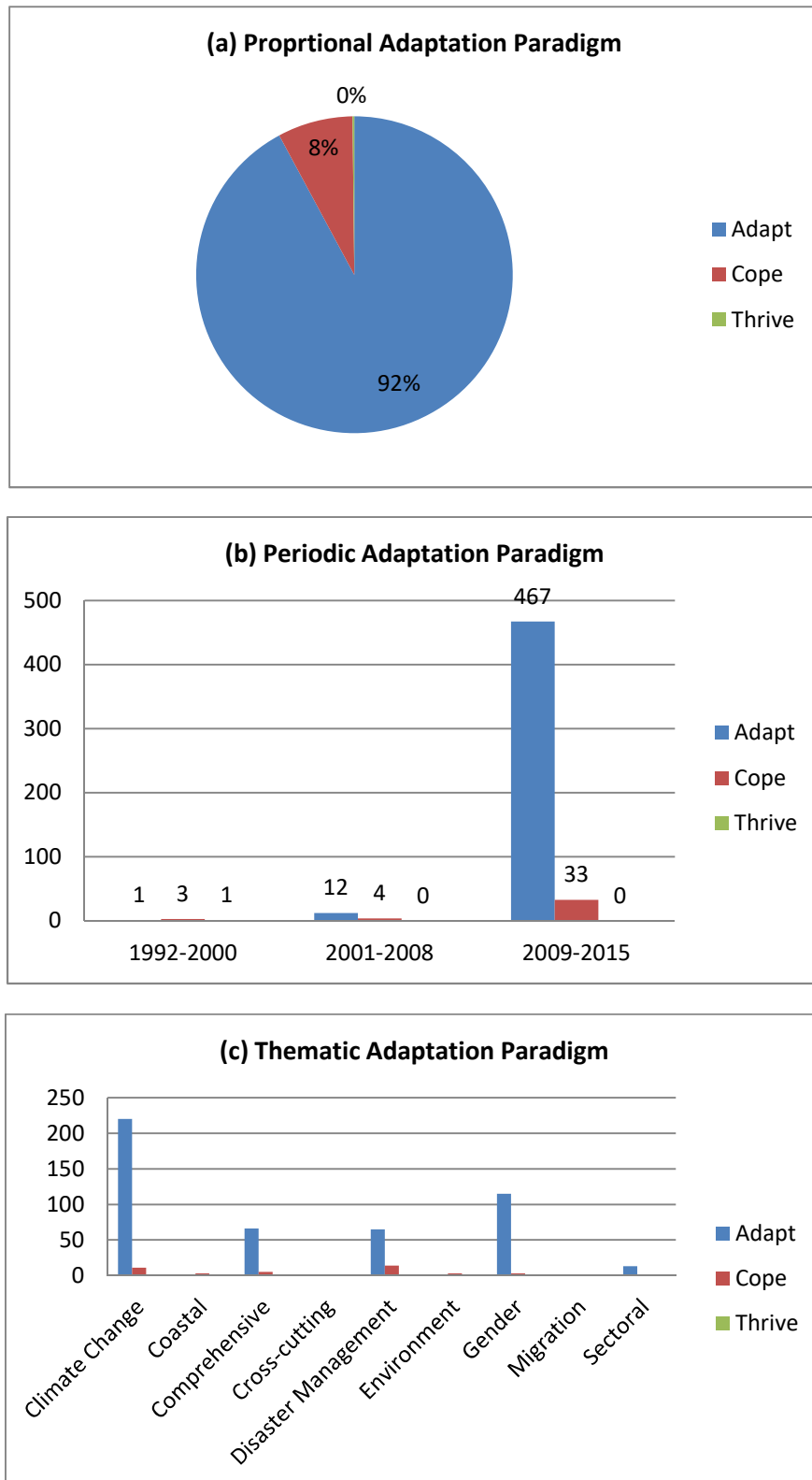


Figure 3.2: Proportional, periodic and thematic trend of adaptation paradigm terms

Adaptation Attribute: Figure 3.3 shows different adaptation attributes. Capacity has been found as the most mentioned adaptation attribute followed by transform and adjust. The contribution of bounce back is very low.

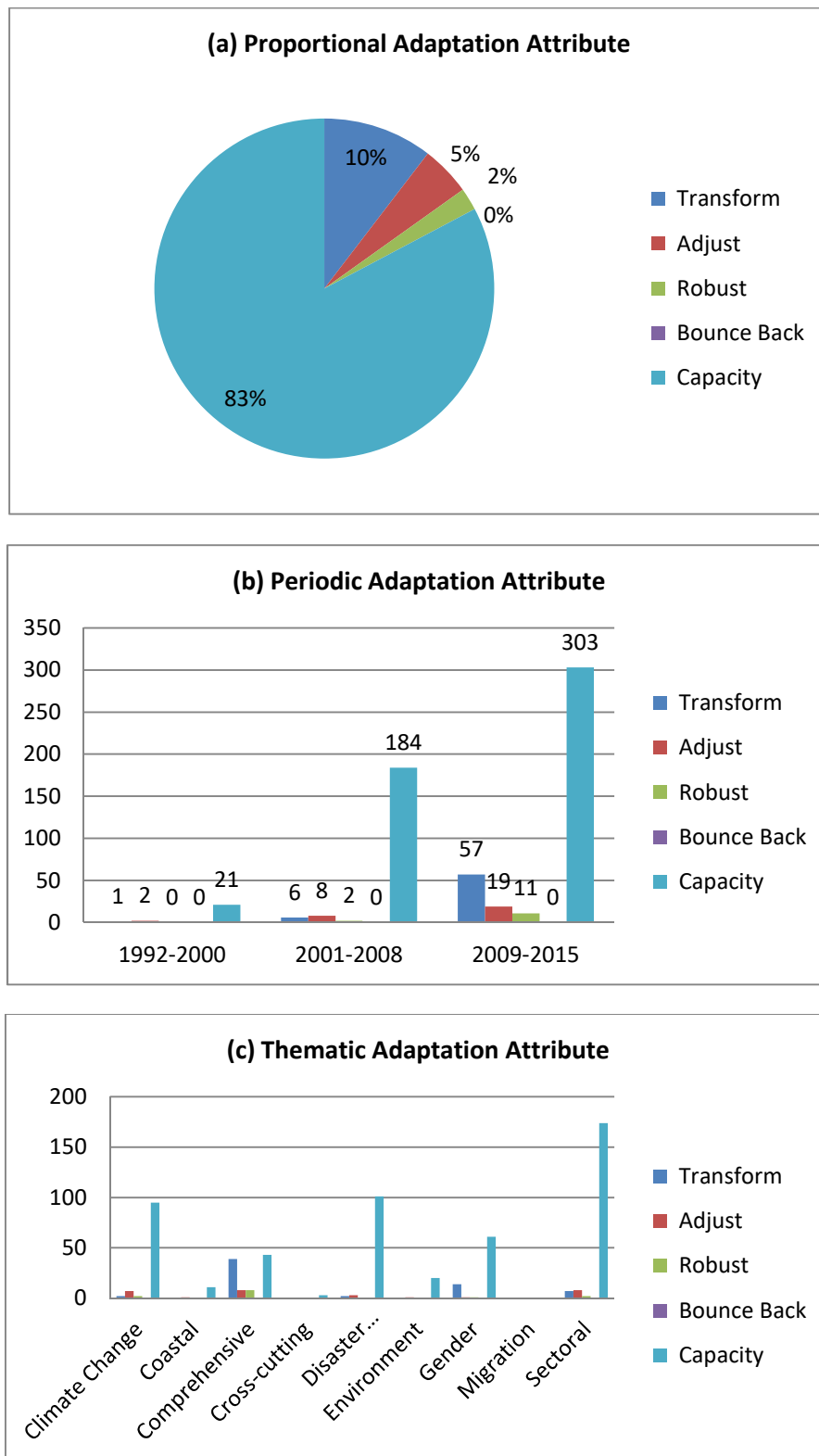


Figure 3.3: Proportional, periodic and thematic trend of adaptation attribute terms

Disaster Risk Reduction Attribute: The selected polices paper uses the term risk mostly other than vulnerability and resilience. Resilience is an emerging issue in 2009 onwards polices mainly in disaster management thematic area e.g. National Plan for Disaster Management (2010), National Disaster Management Act (2012), Standing Orders on Disaster (2010) etc. This rush was probably prompted by floods and cyclone disasters in 2007 and 2009.

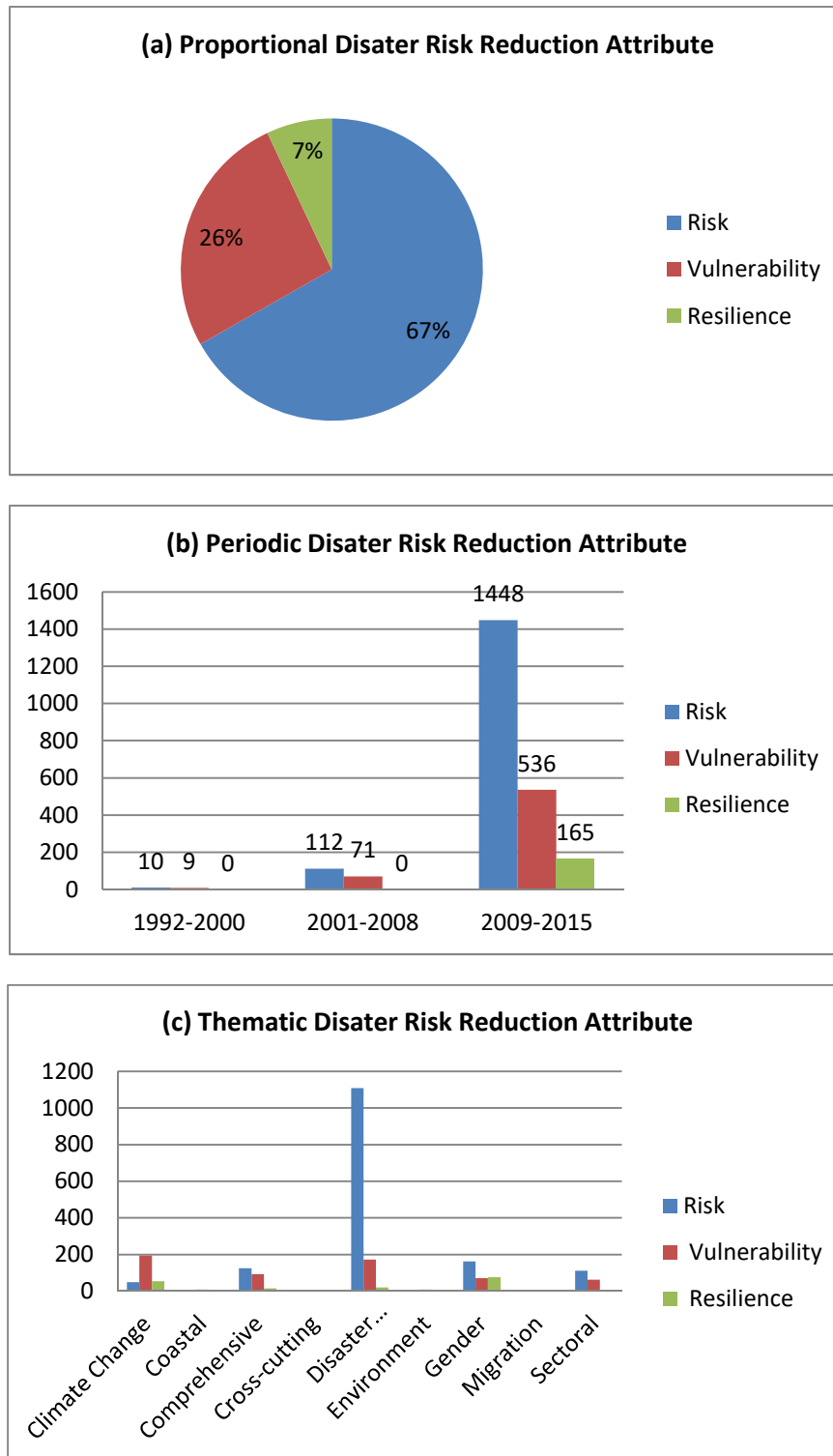


Figure 3.4: Proportional, periodic and thematic trend of disaster risk reduction attribute terms

Meteorological Variables: Climate is the most used meteorological terms followed by hazard and variability. The term climate is emphasized in recent climate change, gender and disaster management related policies.

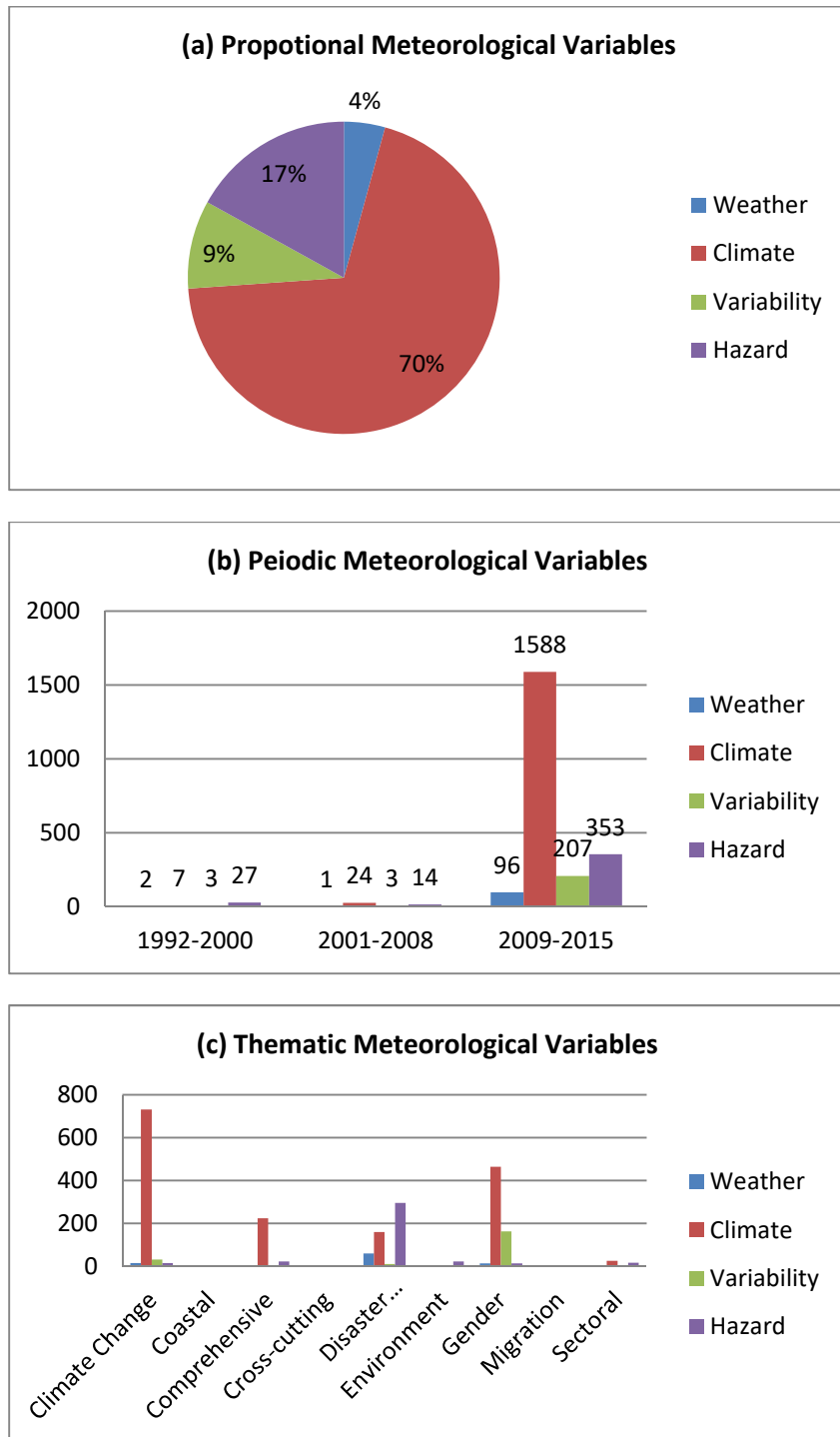


Figure 3.5: Proportional, periodic and thematic trend of meteorological variables terms

Hazard Category: The major hazard category is flood followed by cyclone, drought, salinity. Sea level rise is recent issue in the policy documents. These terms are mostly used in disaster management, climate change and sectoral policies.

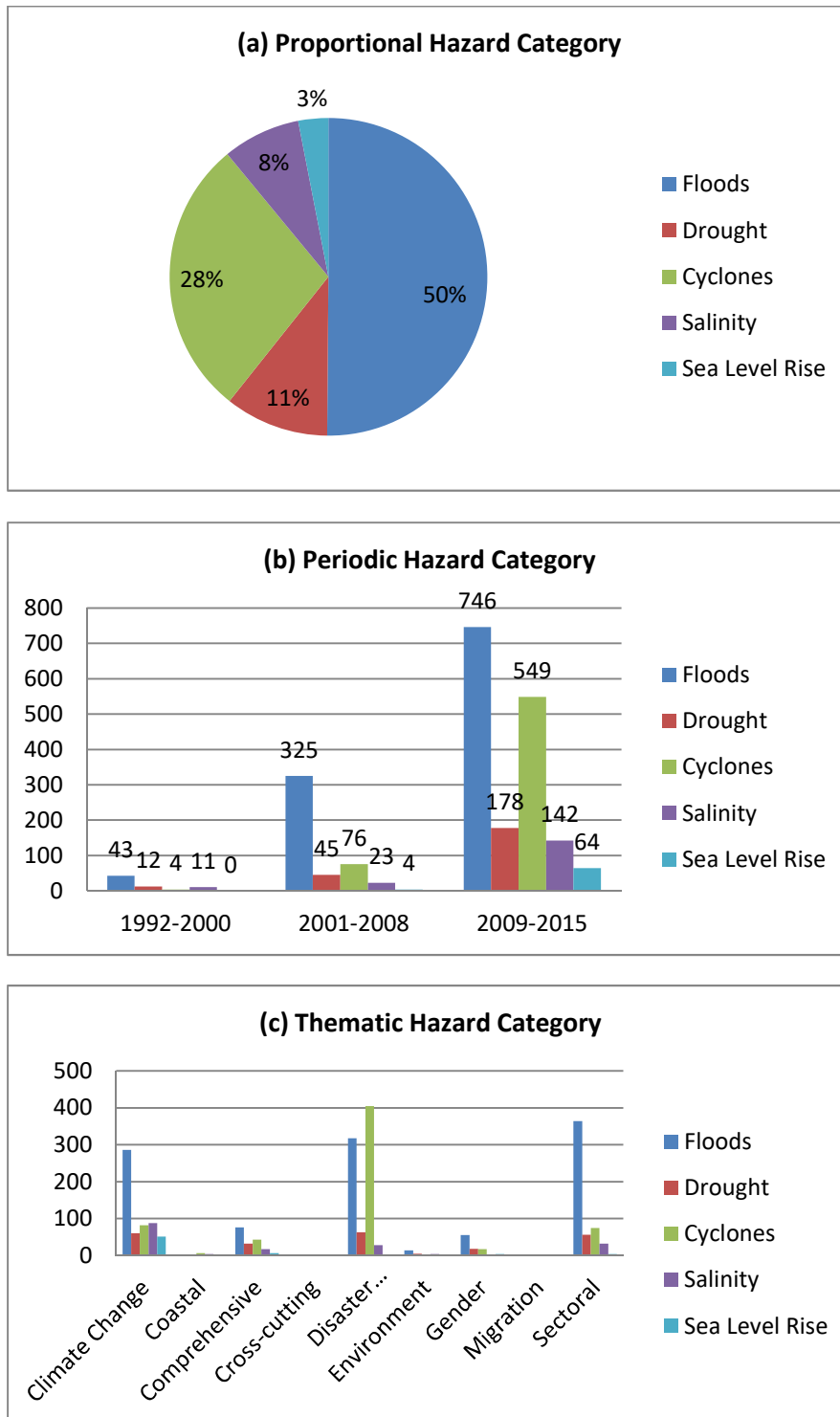


Figure 3.6: Proportional, periodic and thematic trend of hazard category terms

Gender and Migration: The following graphs show that, compared to other terms, gender and migration are less mentioned. The emergence of gender is rather a recent issue as it is mostly addressed in policies 2009 onwards, especially in Bangladesh Climate Change and Gender Action Plan (2013).

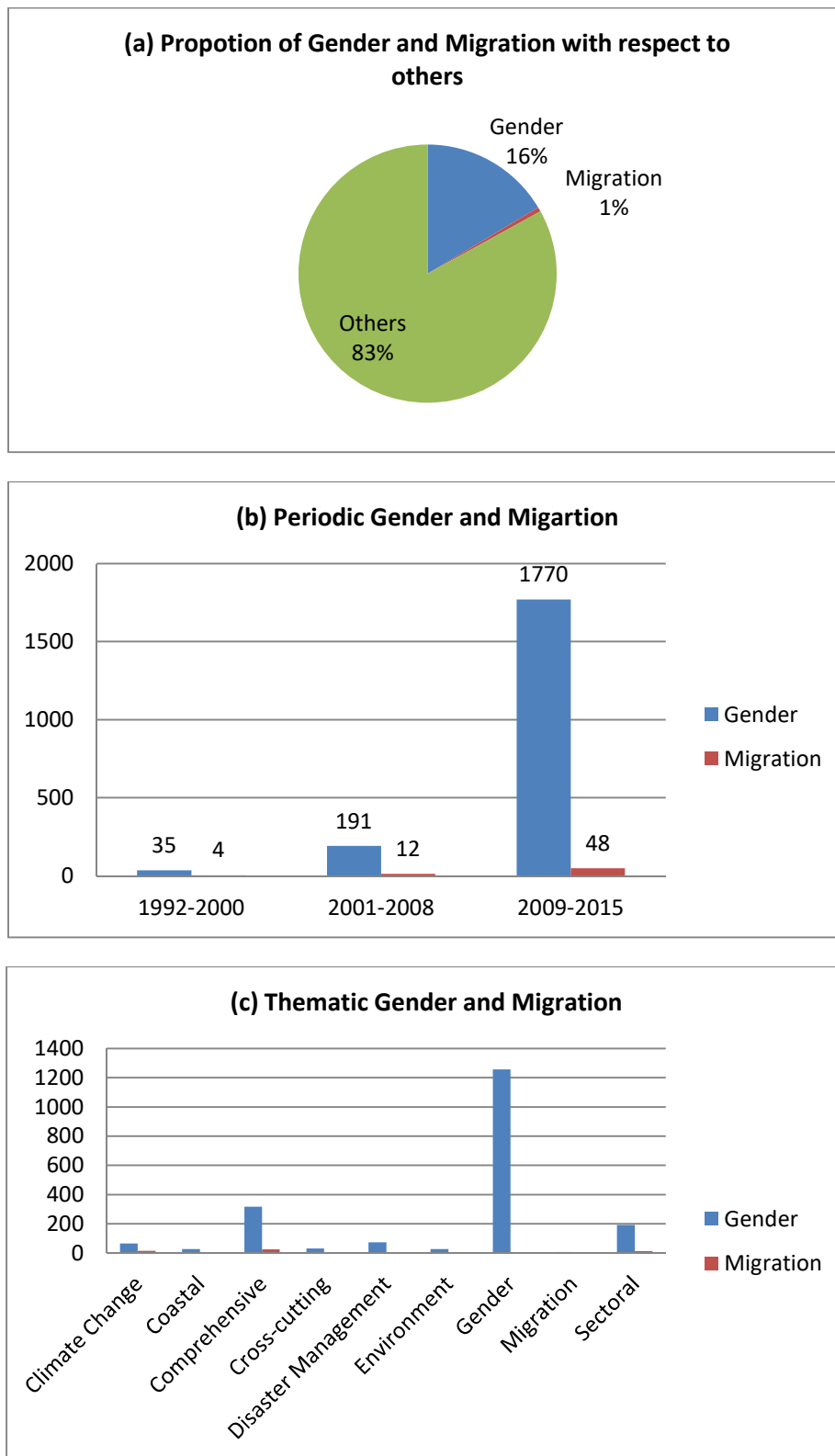


Figure 3.7: Proportional, periodic and thematic trend of gender and migration terms

3. b. Content Analysis

The various policy documents were searched for climate change adaptation options from country context. Table 3 (see end of the document) was formulated through the identification of adaptation options in the policy documents. From the analysis of table 3 following conclusion can be made.

From table 3.2, it is seen that issues like institutional capacity, governance, training, and research and development are mainly emphasized in most of the documents. Adaptations options like early warning, financial support, livelihood diversification, disaster management etc are emphasized. The emerging adaptation options are among others women empowerment, resilient cropping, and coastal management. Alternative energy and post-harvest loss management are yet to be prioritized.

Table 3.2: Category of adaptation options based on their count of mentions in policy documents

| Category | Adaptation Option Mentions in Policy Documents | Comment |
|----------|--|-----------------------|
| 16-17 | <ul style="list-style-type: none"> • Institutional capacity, governance and training • Research and development | Emphasized |
| 12-14 | <ul style="list-style-type: none"> • Knowledge, information management, surveillance and early warning • Financial support, insurance and incentive schemes • Livelihood diversification and risk transfer • Resilient land use, rural and urban planning • Water conservation and irrigation systems • Disaster response and management | Mainstreamed |
| 9-11 | <ul style="list-style-type: none"> • Resilient and hard infrastructure • Resilient cropping and new crop variety • Plantation, forestry, landscape and green space management • Women empowerment • Improved water, sanitation and hygiene (WASH) • Marine and coastal management | Emerging |
| 8-5 | <ul style="list-style-type: none"> • Improved social service delivery • Improved access to market • Post-harvest loss management | Yet to be prioritized |
| <5 | - | - |

Table 3.3 is in hierarchical order of policy documents based on count of mentions of adaptation options. If we compare it with table 3.1 we can see a number of environmental sectoral policies i.e. National Environment Management and Action Plan (1995), National Water Policy (1999), National Fisheries Policy (1998), National Agricultural Policy (2013) etc comes up in the higher ranks along with climate change, comprehensive policies. The National Environment Management and Action Plan (1995) was

found to be a rather forward looking document as per both table 3.1 and table 3.3 though it was formulated in 1990s.

Table 3.3: Rank of policy documents based on their count of mentions of adaptation options

| Policy Documents | Count of Adaptation Options |
|---|------------------------------------|
| National Environment Management Action Plan (1995) | 15 |
| National Water Policy (1999) | 15 |
| Standing Orders on Disaster (2010) | 15 |
| Sixth Five Year Plan (2011) | 15 |
| Perspective Plan (2012) | 15 |
| National Fisheries Policy (1998) | 14 |
| The Bangladesh Climate Change Strategy and Action Plan (2009) | 13 |
| National Agricultural Policy (2013) | 13 |
| Coastal Zone Policy (2005) | 12 |
| National Water Management Plan (2001) | 10 |
| The National Food Policy, (2006) | 10 |
| National Plan for Disaster Management (2010) | 9 |
| Bangladesh Climate Change and Gender Action Plan (2013) | 9 |
| National Energy Policy (2004) | 8 |
| The National Forestry Policy (1994) | 7 |
| National Adaptation Program of Action (2009) | 6 |
| Environmental Policy (1992) | 5 |
| National Disaster Management Act (2012) | 5 |
| National Water Act (2013) | 2 |
| National Labour Policy (2012) | 1 |
| National Population Policy (2012) | 1 |

3. c. Key Themes Emerging

The content analysis includes a total of 21 government plans/policies/acts, where 17 adaptation categories have been assessed. The study looks into how adaptation categories are addressed in those documents and their development trend and paradigm shifts over time. Table 4 (provided in a supplementary excel sheet) organizes different adaptation options under 17 categories in columns and policy documents in chronological order based on implementation date in rows starting from 1990 till date and then analyses them thematically to identify key themes emerging. In the end of the this section a comparison between fifth five year plan and sixth five year plan based on major adaptation issues are incorporated as case study (see Box 1).

Livelihood Diversification and Risk Transfer

The Fisheries Policy (1998) promotes livelihood diversification and resolves conflict between shrimp and paddy cultivation by encouraging their cultivations either concurrently or by rotation within polders.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP) (2009) suggests reducing involuntary displacement of people by doing proper river training works and thereby keeping the climate victims' number at minimal. It is an adaptation policy which reduces the number of climate victims and the

vulnerability of their livelihood. It entails livelihood protection for vulnerable groups (including women) and ecologically fragile areas.

National Adaptation Plan of Action (NAPA) (2009) emphasizes on agricultural research to develop flood, drought and salinity tolerant crop varieties to reduce risk of crop failure.

Sixth Five Year Plan (2011-15) has planned to create huge job opportunities in manufacturing and organised service sectors. It will help transfer agricultural labourers to the formal job sector. This policy will reduce livelihood vulnerability as agriculture is more dependent on climate and its variability. The policy of shifting to manufacturing and service industry will reduce livelihood vulnerability against the backdrop of climate change and will create a huge plight of migrant labourers from rural to urban areas.

Agricultural Policy (2013) encourages crop diversification in order to reduce the risk of crop failure and to reduce livelihood vulnerability.

Resilient and Hard Infrastructure

After the cyclone of 1991 the multipurpose cyclone shelter programme (MCSP) was developed under the Fourth Five Year Plan (1991-95).

To protect economic losses of 133 coastal *thanas* (sub-districts) and their 1.8 million households, 5000 km coastal embankments were put in place (constructed and repaired) during this Fourth Five Year Plan period.

The Sixth Five Year Plan continued the construction of cyclone shelters and has a target of elevating the number of usable cyclone shelters to 5352 by 2015 from its baseline number of 2852 in 2010. It has a plan to extend coastal embankment to 6000 km.

The National Plan for Disaster Management (2010-15) reiterates the need for constructing new cyclone shelters in coastal districts with provision for drinking water and separate toilet facilities for women in those shelters. It directs government to develop cluster housing for a group of households that are living in marginalized hazard prone lands, initially in Khas land with necessary utilities and infrastructures that are resilient to the hazards.

The Perspective Plan (2010-21) emphasizes on rehabilitation of coastal embankments as a long-term management strategy to help adapt to climate change. To improve navigability and water discharge, and to reduce flood risks, a strategy of dredging and draining of rivers in a planned and phased manner will be pursued.

Institutional Capacity, Governance and Training

NEMAP (1995) stresses incorporating environmental issues in all training programmes for public and private sector officials and employees. It is related to mainstreaming climate change adaptation issues in all training programs.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009 urges strengthening institutional capacity for climate change management and mainstreaming climate change in the Media.

National Plan for Disaster Management (2010-2015) focuses on designing a national training strategy aimed at building knowledge and understanding of climate change and disaster management roles and responsibilities of key players at all levels as per SOD.

Sixth Five Year Plan (2011-15) endorses the ECNEC's (held on 8 October 2007) decision to include "Risk identification and Risk Mitigation" in all development project proposal as a milestone in institutionalizing risk management in development activities and planning.

Knowledge, Information Management, Surveillance and Early Warning

BCCSAP, 2009 recommends the following:

1. 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.
2. Research and knowledge management to predict the likely scale and timing of climate change impacts on different sectors of the economy and socioeconomic groups; to underpin future investment strategies; and to ensure that Bangladesh is networked into the latest global thinking on science, and best practices of climate change management.
3. Establishment of a centre for research, knowledge management and training on climate change to increase institutional and human capacity on research and knowledge management related to climate change, and to train sector professionals.

Resilient Cropping and New Crop Variety

Coastal Zone Policy (2005) directed that salt-tolerant crop varieties will be developed and extended along with possible measures to resist salinity.

The Bangladesh Climate Change Strategy and Action Plan (2009) directs to 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.

National Agricultural Policy (2013) recommends research in the field of climate change impacts for example flood, drought, salinity, drainage congestion etc.

Women Empowerment

Standing Order on Disasters (2010) directs to ensure women participation in the preparedness and disaster management activities.

National Agricultural Policy (2013) says that women's empowerment in agricultural management, access to agricultural inputs, loan etc. will be ensured. Discrimination in agricultural wages will be brought down and women's participation will be encouraged in agricultural production and marketing.

Bangladesh Climate Change and Gender Action Plan (2013) wants to ensure crop insurance and/or other safety nets for female farmers.

Resilient Land Use, Rural and Urban Planning

NEMAP (1995) urges to integrate environmental considerations into all housing and all urban planning activities and research.

Fifth Five Year Plan (1997-2001) advises to build strongly built structure (houses in cluster having low heights etc.) to better withstand onslaught of disasters.

National Water Policy (1999) entails to designate flood risk zones and take appropriate measures to provide desired levels of protection for life, property, vital infrastructure, agriculture and wetlands.

Perspective Plan (2010-2021) emphasizes on stopping unplanned urban growth and formulating an urban renewal strategy.

Population Policy (2012) discourages rural to urban migration the difference between public services in urban and rural area should be narrowed down and new employment opportunities need to be created in rural areas to reduce this urban towards plight of people. It encourages planned urbanization with the proper coordination of various relevant government departments and agencies.

Agricultural Policy (2013) imposes bar on the use of agricultural land in non-agricultural activities.

Improved Water, Sanitation and Hygiene (WASH)

National Environment Management and Action Plan (NEMAP), 1995 put stress on increasing the coverage of water sealed latrine in rural areas and extending the piped water network in urban areas as a measure to reduce spread of water borne diseases. It tells nothing about spread of water and vector borne diseases due to climate change and its required adaptations.

There is no mention about improved water, sanitation and hygiene in Coastal Zone Policy 2005 which is quite unusual as scarcity of potable water in coastal area is a serious problem. WASH should have been incorporated into this policy at the backdrop of climate change.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009 emphasizes on implementation of drinking water and sanitation programs in coastal areas and flood and drought prone areas which are at greater risk of climate change.

Plantation, forestry, landscape and green space management

National Forestry Policy, 1994 emphasized on massive tree plantation in general through partnership with local people and NGOs.

National Environment Management and Action Plan (NEMAP) 1995 also stressed on involving local community in forest regeneration and their management through social afforestation programmes throughout the country.

National Fisheries Policy, 1998 emphasized on tree plantation in Shrimp Culture areas to ensure ecological balance.

National Water Policy, 1999 urges for collaboration with co-riparian countries for basin wide management in various areas including afforestation.

Coastal Zone Policy, 2005 avowed for conservation and development of natural environment of the Sundarbans.

Standing Orders on Disaster (SOD), 2010 puts top most priority on forestation especially in coastal areas, chars and islands involving local people.

Perspective Plan (2010-21) prioritizes on creation of coastal green belt and social and agro forestry.

Sixth Five Year Plan (2011-2015) prescribes to create 9000 KM Coastal Greenbelt of 0.5 KM buffer along the shorelines as an adaptation-mitigation strategy to be implemented with the help of local stakeholders and NGOs.

Water Act (2013) allows tree plantation on the flood control dam and embankments which consolidates its strength.

Financial Support, Insurance and Incentive Schemes

National Fisheries Policy, 1998 emphasizes on introducing fish and shrimp culture insurance and insurance for life and resources (boat, engine, nets, gears etc.). This policy also recommends for providing collateral free supervised loan to poor fishermen instead of mortgage based loans.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009 urges to constitute a pilot insurance scheme to protect against losses of income to persons, households, enterprises etc. due to climate change. If pilot scheme becomes successful a formal insurance scheme will be introduced for lowering the risk of adverse effect of climate change.

Perspective Plan (2010-21) recommends for concessional credit to marginal farmers so that they can purchase their own agricultural produces during harvest and release them all over the year with better prices for their produces.

Although Fifth Five Year Plan (1997-2001) recommended for crop insurance it was totally dropped from Sixth Five Year Plan due to some difficulties faced in ground implementations e.g. due to lack of policy support and partnership, expertise and monitoring and methodological problem etc.

However, National Agricultural Policy, 2013 has prescribed for introducing crop insurance again and post disaster agricultural rehabilitation. It has suggested raising a fund titled as “Agriculture Disaster Mitigation Fund”, which is quite innovative as an adaptation for post disaster rehabilitation

Water Conservation and Irrigation Systems

National Water Policy, 1999 encourages rain water harvesting to ensure safe and affordable supply of drinking water. It also recommended for recycling of drainage water, rotational irrigation, adoption of water conserving crops and conjunctive use of groundwater and surface water.

Coastal Zone Policy, 2005 recommends to build small water reservoirs in coastal area to capture tidal water to enhance minor irrigation. The policy also suggests for adopting appropriate water management system within polder for storing freshwater and utilizing other waters. It promoted harvesting of rainwater, excavation of ponds and tanks and adopting local water treatment technology like pond sand filter (PSF). It also advises for ensuring sustainable use of ground water.

National Food Policy, 2006 recommended for reducing dependency on ground water at the same time reducing the cost of irrigation water. It encouraged greater use of surface water along with technological development to minimize salinity.

Standing Orders on Disaster (SOD), 2010 recommends 1.5 inch diameter hand tube-well and harvested rainwater as measures of water conservation.

Post-harvest Loss Management

National Fisheries Policy, 1998 recommended to develop coastal fish landing centers to reduce post harvest loss. Fish landing center and marketing system would also be modernized to reduce post harvest losses.

National Food Policy, 2006 suggested to impart women with specific training on post-harvest technologies.

National Agricultural Policy, 2013 encourages private sector investment for constructing food storages to reduce post-harvest loss. Post harvest loss has been identified as a weakness of present agriculture.

Nothing is mentioned about post harvest loss management in Perspective Plan (2010-21) and in Sixth Five Year Plan (2011-15).

Improved Access to Market

National Water Policy, 1999 proposes to undertake dredging and other suitable measures to maintain navigational capacity of designated waterways to ensure easy and cheap access to market places.

National Food Policy, 2006 emphasizes on improving private storage, market and transportation facilities, improving market connectivity at local, national and international levels. It also puts stress on reducing market costs of agricultural products.

National Agricultural Policy, 2013 emphasizes on cooperative based agricultural marketing which will ensure proper market price for small and marginal farmers.

Bangladesh Climate Change and Gender Action Plan 2013 propose developing financial literacy of women and link women with market through mobile phones.

Improved Social Service Delivery

Perspective Plan (2010-21) reiterates the necessity of Safety Net Programs to address risk and vulnerability as a government effort and will remain so for the next decade.

Sixth Five Year Plan (2011-15) emphasizes on reducing vulnerability of at risk community through social safety net including cash or food transfer ensuring protection of women, children, aged and disabled population-who are most vulnerable to disaster and climate change.

Research and Development

As early as 1995, NEMAP (1995) recommended scientific studies on the impact of sea level rise.

National Water Policy, 1999 and Coastal Zone Policy, 2005 support the idea of continuing usage of mathematical modeling, remote sensing and geographic information system for Water Resource Planning and Integrated Coastal Zone Management

National Plan for Disaster Management (2010-15) urges to create a working interface with and between technical and scientific community.

Sixth Five Year Plan (2011-15) emphasizes on agricultural research to be carried out for developing saline, drought and flood tolerant crop varieties

National Disaster Management Act, 2012 recommends for establishing research institute for conducting research on disaster management and on effects of climate change.

Marine and Coastal Management

Fifth Five Year Plan (1997-2001) emphasized on the development of coastal areas through (a) development of appropriate housing for low income people (b) building more cyclone shelters (c) developing intensive shrimp and pisciculture (d) completing embankments, (e) encouraging fish processing industries (f) setting up export processing zones and (g) building efficient power transportation and telecommunication links, particularly with the islands. Major thrusts under Fifth Five Year Plan included conservation of coastal and marine resources.

Standing Orders on Disaster (SOD), 2010 emphasizes on mitigation projects, based on formal hazard and risk analysis.

SFYP (2011-15) pays special attention to coastal region Barisal to offset geographical disadvantages due to frequent natural disaster. Through programs in agriculture, environment, climate change and disaster management this plan will seek to reduce vulnerabilities in coastal regions. It encourages raising productivity of crop and non-crop agriculture that are best suited to coastal soil and climate. SFYP also encourages enhancing preparedness for natural disaster.

Disaster Response and Management

National Fisheries policy, 1998 has made keeping lifesaving equipment and radio in sea going fishing boats mandatory.

Standing Orders on Disaster (SOD), 2010 warrants a special rationing system and open market sale in the affected area and ensure adequate supply of food to the people and ensure stable price of commodities.

Fifth Five Year Plan has made a paradigm shift from a post disaster relief and rescue responses to a more holistic culture of disaster risk reduction (DRR).

Emerging Issues Regarding to Climate Change Adaptation in Bangladesh

The issues that come out from the thematic analysis of the following documents can be outlined as follows:

- Livelihood vulnerability is being minimized by shifting agricultural labourers to manufacturing and service sector, which are less dependent on climate variability. It will create huge plight of migrant labourers from rural to urban area.
- The need for zoning for preventing agricultural lands to convert into other land uses is a concern from food security point of view which has been addressed in relevant policies.
- Focus has been given on mainstreaming climate change issue in all policies and plans in order to maintain sustainable development.
- Special attentions are being given on developing climate resilient coastal infrastructure like coastal embankments, multi-purpose cyclone shelters etc. Ecosystem based adaptation e.g. the management and development of the Sundarbans and prevention of wetlands from conversion are also evident.
- In early 1990s forestation program had single focus of massive tree plantation involving local community and NGOs. From late 1990s special attention has been being given on creation of coastal green belts along the shoreline as an adaptation-mitigation strategy. Now-a-days, involving communities in forest conservation through co-management is recognized in various plans and policies.
- Different policies maintain the principle of reducing dependency on ground water, use of harvested rainwater, surface water and adopting local water treatment technology like pond sand filter (PSF) at the backdrop of dwindling freshwater supply and increasing salinity.
- Government has been dithering on the policy of introducing crop insurance as an adaptation option against climate change but finally has firmed its position on it.
- Since Fifth Five Year Plan emphasis has been given on Disaster Risk Reduction from the earlier stand of post disaster relief and rehabilitation. The importance of involving community for reducing disaster vulnerability and increasing resilience has been emphasized in different policy documents as a pre-emptive measure of comprehensive disaster management.

Box 1: Case Study on Comparison of Key Adaptation Issues between Fifth Five Year Plan and Sixth Five Year Plan of Bangladesh

| Adaptation Issue | Fifth Five Year Plan (1997-2001) | Sixth Five Year Plan 2011-15 | Comment |
|--|---|--|---|
| Livelihood Diversification and Risk Transfer | It was identified that diversification of export item reduces the risk due to price fluctuation in international market (pg 91). Policy of agricultural intensification and diversification was made to promote meeting the export target of tropical fruits, cut flowers and shrimp and thereby improving livelihood options. | Plans to create more job opportunity in manufacturing industries and organized service sectors to transfer large number of agricultural workers to raise the overall productivity of the workforce (page 3). It will reduce the livelihood vulnerability as industrial production is less dependent on climate variability than agriculture. | Shifting of agricultural labourer to industry will create a huge plight of migrant labourer from rural areas of lagging regions to urban centres; if not such employment opportunities are created in rural setups as prescribed in SFYP. Creating jobs in manufacturing and service industry is a major shift in livelihood diversification and risk transfer. |
| Knowledge, Information Management, Surveillance and Early Warning | Previously, people reacted to the situation after a disaster had taken place. The concept was changed in FFYP period. People need to be prepared in advance to face a disaster through information and motivation and by adequate structural and non-structural measures, to mitigate the impacts of a natural disaster. | Improvement of cyclone and storm surge warning has been identified as benchmark target under comprehensive disaster management program of SFYP. SFYP recommends ensuring that Bangladesh is networked into the latest global thinking on science, and best practices of climate change management. | The idea of Disaster Risk Reduction (DRR) first came into being in Fifth FYP and in SFYP the concept has been deepening its roots. |
| Resilient Cropping and New Crop Variety | Area under HYVs of rice and wheat was planned to be expanded through extension of water management and fertilizer use during FFY Plan period. | Sixth FFY emphasizes on the government effort (research projects) for developing saline, drought and flood tolerant crop varieties. | Fifth FYV emphasized on extending command area for HYV while Sixth FYP stressed on developing saline, drought and flood tolerant new crop varieties to fight back the impact of climate change. |
| Women Empowerment | About 0.79 million members were enrolled in various newly formed co-operatives out of which 60 per cent were women. The activities made a good impact on human resources development, particularly among women with focus on environmental problems, sanitation and safe drinking water and nutritional situation. | Share of women employed in non-agricultural sector to be raised from 25% (in 2010) to 50% by 2015. Women worker hostels in industrial areas and urban centres will be built to ensure job opportunity to climate migrant refugees from the remotes areas. | Policy of building women worker hostels in industrial areas (like EPZs) and urban centers has been adopted in Sixth FYP to ensure job opportunity to female migrant climate refugees from the climate vulnerable areas. |
| Financial Support, Insurance and Incentive Schemes | FFYP planned to explore the feasibility of agricultural insurance to minimize the impact of natural calamities in the volatility of income in the agriculture sector and welfare of rural households. Such measures are expected to contribute to the growth of private investment in the sector and reduce the risk of the banking sector as well. | Provision of life and disability insurance was prescribed especially for women workers. | Although Fifth FYP planned to introduce crop insurance but there was no mention about crop insurance in Sixth Five Year Plan. However, Agricultural Policy 2013 included provision of crop insurance again. |

3. d. Gender and Migration Dimensions

Climate change is a frequently discussed phenomenon in national policies today. Although, women have been identified as a vulnerable group in face of climate change in all documents, the gender issue is often ignored. The programmes rarely take a gender sensitive approach and the inequality between men and women has not been reduced (Vincent and Cull, 2015).

Gender and Climate Change Adaptation Options

A chronological evolution of the awareness of gender issues – and need to take into account the different practical needs of men and women - in the policies and plans of Bangladesh can be observed. Though the issue comes up significantly in the policies after 2009, Bangladesh Climate Change Gender Action Plan 2013 is the only document fully concentrated in this regard. This document was prepared for gender mainstreaming of Bangladesh Climate Change Strategy and Action Plan 2009. Other policy documents have less focus on the different needs of the men and women living in climate vulnerable zones.

It was found that Environment Policy 1992 mentions involvement of women in development activities, but not in climate change aspect. Later in the National Environment Management and Action Plan (NEMAP), 1995 women's participation was given much importance in the plan development. Their perception on various issues like poverty alleviation, disaster management, livelihood generation etc was taken into account. The plan discusses increasing status of women by improving their health, education and income opportunities. Provision of housing for single working women in urban areas is also urged to be improved. The National Water Policy 1999 and National Water Management Plan (NWMP) 2001 mentioned women in discussing water management during different seasons to manage flood, drought, salinity and their related problems. But adaptation options to reduce these problems are not stated.

The Coastal Zone Policy 2005 discusses empowerment of communities, through poverty reduction, participatory planning and decision making with special focus on women, to improve their coping capacity. Women's education, training, employment and right to land are emphasized. The National Food Policy, 2006 brings up gender issue in respect to equity in education, health, food security.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 discuss gender mainstreaming in the plans and policies of the country. It recognized that women play a role in mitigation and adaptation to climate change in their communities and households. Women are identified as vulnerable and thus prioritized for protection before and after disasters. Women's empowerment in agricultural production and marketing, agricultural management, access to agriculture inputs, loans etc. have been discussed too. At a similar time National Adaptation Program of Action (NAPA), 2009 was prepared through a workshop with women's participation. Poverty reduction and security of livelihoods with a dimension on gender issues has been ranked as the most important condition for prioritization of adaptation needs and activities. But no elaboration of gender reflective measures is found in this document. It should be stated that, while the NAPA discusses short-term actions, the BCCSAP has aims for the long and medium term.

The National Plan for Disaster Management (2010-2015) does not have a detailed discussion on gender issues, specifically in climate change aspect. Whereas the Standing Order on Disaster 2010 discusses disaster recovery and rehabilitation issues in an efficient and gender sensitive manner, by identifying the gender gap in all disaster management activities and ensuring its alleviation, it mentions ensuring women participation in the preparedness and disaster management activities. But none of these are explicitly in a climate change context.

Among the comprehensive plans, the Perspective Plan of Bangladesh 2010-2021 gender issues are discussed in education, health, employment perspectives- but not from a climate change point of view. Then in the Sixth Five Year Plan (2011-15) again gender issues are discussed in similar context. The

plan also states that women are affected differently than men by natural disasters, thus indicates the need for incorporating gender sensitivity in coping mechanisms and strategies. .

The National Labour Policy 2012 and Bangladesh Population Policy 2012 elaborately discuss gender issues in case of empowerment of women, equity at workplace, gender sensitive work strategy, improvement of female work efficiency, increase of salary etc. Female health/fertility, family planning, and maternity facilities (day care) are discussed too.

Finally, the Bangladesh Climate Change and Gender Action Plan, 2013 was introduced to address climate change through a gender sensitive lens.

From the previous discussion it can be seen that many of the policies and plans address gender issues and discusses what to do, but does not mention the “how to do”. For example, the BCCSAP (2009) does not elaborate on how women’s needs would be mainstreamed and what specific instruments or strategies are to be designed to implement gender mainstreaming. It also does not suggest the existence or creation of a crucial person, incentive structure, or monitoring system to ensure that it happens. Again, the National Labour Policy (2012) does not cover workers in the informal sector where the largest population of women are employed in Bangladesh. Thus, discrimination against women in the labour market, in particular, occupational segregation, a wide gender wage gap and the exploitation of girls still remains.

The BCCGAP (2013) integrates gender considerations into four of the six main pillars mentioned in the BCCSAP: (i) food security, social protection and health; (ii) comprehensive disaster management; (iii) infrastructure and (iv) mitigation and low carbon development. The remaining two pillars of the BCCSAP, such as- research and knowledge management and capacity building and institutional strengthening, were integrated within the stated four pillars as crosscutting issues.

The Plan highlights how women can play a focal role in adaptation to climate change with examples from other countries. Specifically, for Bangladesh situation it is stated to –

- Ensure women’s participation at all policy making levels from central to local and also in community risk assessment (CRA), vulnerability and capacity assessment activities. Also in capacity building activities.
- Mainstream gender considerations in coastal and social forestry programs. It suggests, as part of agro-forestry and afforestation efforts, women can plant trees that not only appropriate emissions, but also produce crops which may provide them with an alternative source of income, or have distinctive co-benefits such as assisting in disaster risk management, alternative household energy and others.
- Combinations of interventions such as income generation activities, distribution of saline resistant seed varieties (CCA) and disaster preparedness trainings (DRM), Social Safety Net (SSN)s, provision of immediate access to food may also allow households to invest in adapting and/or protecting their livelihood strategies, and thus enable poor households to sustainably deal with the shorter-term impacts of climate change. This, in turn, will reduce their exposure and increase their resilience to climate change-related shocks.
- Develop new agricultural technology and introduce innovative (and as far as possible organic) agriculture and aquaculture technologies in such a way that is user-friendly for female farmers and entrepreneurs.
- Boost women’s participation and capacity in planning, designing, construction and maintenance of climate related infrastructure

Migration and Climate Change

The policies have been looked into to see how migration has been reflected in their respective issues and it was found that overseas migration and migration due to economic reasons focused in most policies, and the issue was not addressed as a climate change adaptation option in any of the policies.

In the NEMAP (1995) migration is implicitly discouraged, as it negatively mentions the rural-urban migration as a problem creator in urban areas, and then suggests rural employments should be created by government, NGOs, CBOs to lessen the urban pull factors. Gender sensitive migration not discussed.

The NWMP (2001) mentions migration in aspect of the increase of urban population due to this. In 2006 the National Food Policy states that increasing landlessness and underemployment in rural areas and resulting rural-urban migration act as major drivers of chronic poverty and food insecurity in urban areas. It does not elaborate on the reasons behind the “landlessness and underemployment”, whether it is climate related or purely economic.

The BCCSAP 2009 states that migration must be considered as a valid option and asks to facilitate migration to another countries and the migrants’ integration in new societies. But no detail on the instruments and methods on how to do these are stated.

In the National Plan for Disaster Management (2010-2015) only poverty related out migration is mentioned, but not elaborated.

In the Perspective Plan of Bangladesh 2010-2021 in and out migration both are discussed, but mainly from an economic perspective. It states that due to change of employment to non-agricultural sectors the rural to urban migration has increased the urban population creating various negative impacts. Then contradictorily it states to facilitate migration from poor areas due to the poverty-reducing impact of remittances. Climate migrants are not mentioned here. The Sixth Five Year Plan 2011-15 also discusses internal or international migration due to economic reasons. It acknowledges that climate change related problems force people to migrate, due to inadequate access to coping mechanisms. The document says to facilitate migration from poor areas and reserve special quotas of overseas migration for poor of *monga* (yearly cyclical phenomenon of poverty and hunger in Bangladesh) prone areas. The National Labour Policy 2012 also encourages overseas migration and states to ensure safety of national and migrated labourers and to reduce cost of migration. This has no relation to climate change adaptation.

The Bangladesh Population Policy 2012 explicitly discourages migration to urban areas. For that measure it urges to reduce gap of facilities between urban and rural areas. It also discouraged migration of farmers.

The BCCGAP (2013) implicitly encourages migration. It urges the improvement of living and working conditions for the women migrating to urban areas for a living. But then the document suggests adaptation options for females in the vulnerable areas from where their male counterparts are migrating for a better livelihood. This might be an indication that females are being asked to adapt to circumstances while their counterparts migrate.

Chapter 4: Discussion

4. a. Comparison of Findings with Wider Literature on Climate Change Adaptation

IPCC 5th Assessment Report

The recent IPCC assessment report of Working Group II (AR5 WGII) gives a thorough, balanced, and nuanced picture of the impacts of climate change on human social dimensions. It emphasizes adaptation from a climate change perspective. It considers how impacts and risks related to climate change can be reduced and managed through adaptation and mitigation. The report assesses needs, options, opportunities, constraints, resilience, limits, and other aspects associated with adaptation. Some of the major decisions from the assessment are included below:

- Adaptation is becoming embedded in some planning processes, with more limited implementation of responses (high confidence).
- Adaptation is place- and context-specific, with no single approach for reducing risks appropriate across all settings (high confidence).
- Adaptation planning and implementation can be enhanced through complementary actions across levels, from individuals to governments (high confidence).
- Most assessments of adaptation have been restricted to impacts, vulnerability, and adaptation planning, with very few assessing the processes of implementation or the effects of adaptation actions (medium evidence, high agreement).
- Adaptation experience is accumulating across regions in the public and private sector and within communities (high confidence). (IPCC 2014)
- Responding to climate-related risks involves decision making in a changing world, with continuing uncertainty about the severity and timing of climate-change impacts and with limits to the effectiveness of adaptation (high confidence). (IPCC 2014)

This report addresses sectoral risk and potential opportunities for adaptation, where in the human security sector it suggests that changes in migration patterns can be responses to both extreme weather events and longer-term climate variability and change, and migration can also be considered an effective adaptation strategy (IPCC 2014).

A first step towards adaptation to future climate change is reducing vulnerability and exposure to present climate variability (high confidence). Available strategies and actions can increase resilience across a range of possible future climates while helping to improve human health, livelihoods, social and economic well-being, and environmental quality through adaptation measures like National & regional adaptation plans including mainstreaming; Sub-national and local adaptation plans; Economic diversification; Urban upgrading programs; Disaster planning and preparedness; Integrated water resource management; Integrated coastal zone management; Community-based adaptation; Integration of adaptation into planning and decision making can promote synergies with development and disaster risk reduction.

Gender issues are given special importance in this regard and suggested that effective adaptation policy should be incorporated with reduced gender inequality & marginalization, gender equity in education. Institutions at local, national, and regional levels suggested strengthening to support gender-oriented policy.

IPCC- CDKN Report

Climate & Development Knowledge Network (CDKN) has published a summary report on the findings in the IPCC 5th Assessment Report for South Asia (CDKN, 2014).

According to the CDKN report the AR5 offers nine key messages for South Asia which are:

1. South Asia's climate is changing and the impacts are already being felt
2. Further climate change is inevitable in the coming decades
3. Climate change poses challenges to growth and development in South Asia
4. Adaptation will bring immediate benefits and reduce the impacts of climate change in South Asia
5. Adaptation is fundamentally about risk management
6. South Asia has many adaptation options
7. Some low-carbon development options may be less costly in the long run and could offer new economic opportunities for South Asia
8. South Asia stands to benefit from integrated climate adaptation, mitigation and development approaches
9. International cooperation is vital to avert dangerous climate change and South Asian governments can promote ambitious global actions.

It has become inevitable for the Government of Bangladesh to give attention on the matter that whether issues addressed in the key messages are incorporated in the national policy or not. This report marked climate change as constrain in the way of growth and development in South Asia which can overcome by improving the level of adaptation as a risk management tool. 'No regrets' or 'low regrets' adaptation measures such as increasing access to information and resources, improving health services, diversifying cropping systems, strengthening access to land, credit and other resources for poor and marginalized groups. Making water and land management and governance more effective are good for development, irrespective of changes in climate. National policy should encourage inclusion of indigenous practices as local climate adaptation options. Overall an effective climate change adaptation policy should design so that it can strengthen livelihoods, enhance wellbeing and human security, and reduce poverty in South Asian region.

This report says, in a recent study accomplished by Government of Bangladesh finds that millions of rural Bangladeshis affected by climate variability choose migration as a coping mechanism but this climate-induced displacement is not properly addressed in policies and plans in Bangladesh. The suggestion is to consider migration as an adaptation option instead of looking at migration as a threat and reform the policies supporting internal migration and focusing on providing safe environments and facilities for migrants in areas of settlement.

Reports of International Organization for Migration

Bangladesh Context

IOM (2010) highlighted mainly on migration and assessing the evidences and collecting expert's opinion, this report of IOM asserts that migration issues in Bangladesh are not effectively mainstreamed with environmental, disaster management, or climate change policy. Based on this assertion it suggests some policy options for climate change migrants in Bangladesh that could contribute to integrating migration issues to related policies.

Policy options that are suggested with a view to minimizing forced migration and protecting the displaced include continuing investment into sustainable development and vulnerability reduction in environmentally vulnerable regions, awareness raising campaigns, livelihood strengthening, Disaster Risk Reduction (DRR) in disaster prone regions, mainstreaming of migration into adaptation strategies (IOM, 2010).

Suggestions made to support migration as a positive adaptation strategy including assistance to vulnerable people who choose to migrate through ensuring security, providing information and developing skills in environmentally vulnerable areas. Support for individuals and households from environmentally vulnerable regions who choose to migrate, including at early stages of environmental degradation (e.g. through the provision of information, strengthening of remittance channels and reduction of the costs for transactions, protection against human security risks and longer-term skills development in environmentally vulnerable areas. Major destination area for migrants should take into account for better planning and management from the intention to the benefit of host communities as well as migrants. From this concern, economic development should disperse in secondary cities and towns in vulnerable regions, rather than centralizing only in the capital and a few big cities of the country.

This report identified women as the vulnerable group likely to be affected the most. Migration of male members of households for work may cause problems for the remaining female members left behind. They have to face some particular problems like malnutrition, economic uncertainty, having no or less health care services, domestic violence and trafficking particularly in the protracted aftermath of climate change and environmental disaster. Adequate policy attention must be given to this vulnerable group and facilitate them with access to educational facilities, diverse livelihood options, greater security.

Global Context

Though most of the cases NAPAs consider adaptation strategies as ways to reduce migration pressures and allow people to remain in their original settlements. In contrast, some NAPA identifies migration as an adaptation strategy itself in contexts of considering migration as a way to reduce population pressures in places with fragile ecosystems and inevitable resettlement of some population should be accomplished with planning. The NAPA call for the government's intention to help and support vulnerable communities due to climate change through relocation and compensation (IOM, 2009).

Gender is marked as an important issue as local-level adaptive capacity has revealed it to be highly differentiated by gender roles and societal norms. In female-headed households women are actually more likely to migrate post-disaster and here-after more exposed to additional risks, hazardous jobs, gender discrimination and trafficking. On the other hand, women left in home due to migration of male member in search of livelihood are vulnerable in other way as they have to adapt with the changed environment. So, national policies need to identify adaptation options for women which will be their situation specific.

Conference of Parties Report

COP 20: Lima Call for Climate Action

As per paragraph 4 of decision 1/CP.20 Lima call for climate action The Conference of the Parties urges developed country Parties to provide and mobilize enhanced financial support to developing country Parties for ambitious mitigation and adaptation actions, especially to Parties that are particularly

vulnerable to the adverse effects of climate change; and recognizes complementary support by other Parties.

The Adaptation Committee (AC) attached some recommendations in the Annex of its report of Decision 4/CP.20 for consideration by the Conference of the Parties (COP). Emphasis is given on importance of indigenous and traditional knowledge and practices and integrating them into the adaptation planning in paragraph 5 of the recommendations part.

As per the document, The COP may wish to (Cop20 2014):

(a) Invite Parties to underline the importance of indigenous and traditional knowledge and practices, in a manner commensurate with modern science, for the effective planning and implementation of adaptation, including by encouraging the integration of indigenous, traditional and local knowledge into the NAP process;

(b) Encourage the Adaptation Fund, the Global Environment Facility (GEF) and the GCF to enhance their consideration of local, indigenous and traditional knowledge and practices and their integration into adaptation planning and practices, as well as procedures for monitoring, evaluation and reporting.

COP 18: National Adaptation Plans

According to the Decision 12/CP.18 of National adaptation plans (NAPs), The Conference of the Parties underlined that planning for adaptation at the national level and its implementation should be based on nationally identified priorities. Emphasis also given on building national adaptation plan that is country-driven, gender-sensitive and based on participatory action of vulnerable groups and communities (COP 18 2012). Bangladesh has started preparation of its NAP.

Foresight Report

International policies of migration should reform with the target to ensure migration take place maximizing benefits to both the migrants and destination communities as it can be effective adaptation option to build long term resilient. In this context funding mechanisms for adaptation to climate change should be developed integrating migration.

A comprehensive assessment of the potential impacts of migration on individuals' and communities' long term resilience to climate change is also required based on which, policies regarding migration, adaptation and development in the context of environmental change should be formulated (Foresight, 2011).

Stern Review

Adaptation policy is crucial for dealing with the unavoidable impacts of climate change, but it has been under-emphasized in many countries. Four key areas should give emphasized while planning for a policy framework to guide effective adaptation in the medium and longer term.

- Improvement of climate related information system and tools for risk management.
- Land-use planning for long-lived infrastructure.
- Long-term polices for climate-sensitive public goods, including natural resources protection, coastal protection and emergency preparedness.
- A financial safety net for the poorest and most vulnerable group of society.

Further public-private partnerships are also should got importance for climate-related insurance and to strengthen mechanisms for improving risk management and preparedness, disaster response and refugee resettlement (Stern Review 2006).

Comparison with Wider Literature: International Context

IPCC, IPCC-CDKN and IOM draw importance of incorporating a gender dimension into policies and programmes on climate change adaptation and migration. It is suggested that effective adaptation policy should address gender inequality and marginalization, gender equity in education, diverse livelihood options for women, assurance of security and health safety as women are especially vulnerable to climate change and natural disaster. In policies and plans of Bangladesh focus on gender issues is increasing. Sixth Five Year Plan (2011-2015), Perspective Plan of Bangladesh (2010-2021) Gender issues discussed in education, health, employment perspectives. Bangladesh Climate Change Gender Action Plan 2013 fully focused on gender from climate change context. Bangladesh Climate Change Strategic Action Plan (2009), National Agriculture Policy (2013), Coastal Zone Policy (2005) and National Plan for Disaster Management (2010-2015) discuss on gender mainstreaming and sensitivity, women empowerment, women education and women protection and wellbeing before and after disaster. Along with these issues it is also crucial to address gender issues more specifically in national policies in context of adaptation and migration.

The majority of the international documents including IPCC 5th Assessment Report (2014), IPCC-CDKN (2014), IOM (2010), IOM (2009), Foresight Report (2011) suggested migration as an effective adaptation option which is not reflected in our national policy documents. Except Bangladesh Climate Change Strategy and Action Plan (2009), in other policies or plans migration is discouraged. The foresight report and IOM identified that urban planning and management is closely associated with migration as majority of migrants choose urban areas of the country as their destination. It creates intense pressure on towns and cities. Specific policy and plan is needed for better planning and management to maximize the benefit of both the host communities and the migrants. But, currently Bangladesh does not have such specific policy for urban planning.

National Adaptation Plans (NAPs) of the COP suggests that national adaptation plan for a specific country should be country-driven. It should give importance on national priorities, gender-sensitivity and participatory actions of vulnerable community while developing National Adaptation Plans. NAPA (2009) of Bangladesh has identified the country's immediate priorities for adaptation. The need for community based adaptation is mentioned there from various dimensions e.g. disaster management, co-management of resources etc. The aspect of gender sensitiveness required in adaptation options is acknowledged but not elaborated.

The Adaptation Committee (AC) and IPCC-CDKN report impute importance on integrating indigenous and traditional knowledge and practices as local climate adaptation options into the adaptation planning. None other than the Coastal Zone Policy (2005) mentioned about the use of indigenous and traditional knowledge.

IOM report 2009 and Stern urges for government's intention to compensate and create financial safety net for poorest and most vulnerable group of society in the adaptation policy. But again it seems to be a major policy gap in our government policies. National Agricultural Policy, 2013 has suggested for introducing crop insurance and raising a post disaster rehabilitation fund for farmers. Perspective Plan (2010-21) recommends for concessional credit to marginal farmers. But these only cover the agricultural sector. BCCSAP, 2009 mention about an insurance scheme to protect against losses of

income to persons, households, enterprises etc. due to climate change but nothing about compensation or financial safety net.

In Lima call for climate action COP drew attention to the developed countries to provide funding for developing countries regarding adaptation actions. Foresight suggests for developing funding mechanisms for adaptation to climate change integrating all adaptation options. In this regard, none of the existing policy addresses mechanisms for allocating international and national funding in the sector of climate change adaptation.

Stern review and IOM (2010) emphasize on Improvement of climate related information system and tools for risk management guide effective adaptation in the medium and longer term. Stern review also underlined the necessity of land-use planning for long-lived infrastructure and which is also addressed in the Coastal Zone Policy (2005). But other important policies regarding climate change and adaptation like BCCSAP (2009), NAPA (2009), National Plan for Disaster Management (2010-2015), Perspective Plan of Bangladesh (2010-2021), and Sixth Five Year Plan (2011-15) do not mention this from climate change adaptation perspective.

IPCC, IPCC-CDKN, IOM, and COP put importance on Disaster Risk Reduction as an adaptation option. In this regard government of Bangladesh is leading a successful disaster risk management system. Government has formulated National Plan for Disaster Management (2010-2015) that is focused on risk reduction rather than relief distribution, Standing Orders on Disaster (2010) that provides guidelines on the responsibilities at each level of the administrative hierarchy of the Bangladesh government regarding pre-during-post disaster circumstances. National Disaster Management Act (2012) urges to manage national disaster events in a coordinated manner..

IPCC's 5th assessment report addressed with high confidence that very few assessments of adaptation is done assessing the processes of implementation or the effects of adaptation actions. Such kind of assessments and follow up programs to evaluate effectiveness of adaptation should be included in our national policies.

Comparison with Wider Literature: National Context

Shamsuddoha et al (2013) discusses climate change adaptation and mitigation initiatives in the Sixth Five Year Plan (2011-15) with respect to BCCSAP (2009) and NAPA (2009). But unlike our study, though it mentions BCCGAP (2013), it fails to take into consideration the gender aspects of climate change adaptation. The document completely overlooks the migration factor. The document discusses fund creation and specific policy development for climate change in the country.

Asaduzzaman et al (2013) in a critical review of BCCSAP (2009) addresses the slow implementation of the plan and the barriers thereof such as weak knowledge and sensitization, particularly at senior policy and political levels, poor coordination, lack of human resource and managerial capacities and their absence in the rights places, meagre budgets relative to needs, lack of fully transparent and accountable fund management, as well as sufficient policy-institutional support etc. Then it provides a roadmap for prioritization of the programs and mainstreaming the adaptation options. Though the report was elaborate and well thought-out, it neglects the role of the female section of the society in mainstreaming and implementing climate change adaptation programs.

Another literature recognizes a major concern about the BCCSAP (2009) that it “focuses too much on ‘infrastructure’ and too little on ‘adaptation’ itself” (Rabbani et al 2013). This is contradictory to our finding where we have seen that BCCSAP (2009) does address the various non-infrastructure adaptation options like- resilient crop invention, alternative livelihood opportunities, disaster awareness

and early warning etc. Rabbani et al (2013) also states that the document has given less emphasis on health insurance and availability of safe drinking water for the poor in vulnerable areas and public participation, i.e. NGO and Civil Society cooperation to implement the action plan, which is consistent with our findings. It was recommended by Rabbani et al (2013) that according to the recommendations in the BCCSAP a national climate change policy should be formed immediately. Responsibility of implementing climate action plan should be mentioned clearly in this climate change policy.

From review of the wider literature it was found that a document states, while climate change induced migration is already posing enormous threat to Bangladesh, the BCCSAP (2009) has only one program on migration issue, that too is a long term plan for implementation (Rabbani et al 2013). Another literature explores to what extent migration can be an effective way of adaptation to climate change and looks at policy options in this regard and finally provides some recommendations to improve the policies (Martin et al 2013). This paper is discussed as a case study in Box 2.

4. b. What is Missing from Country Context

From the review of policy documents and the review of the national-international wider literature it was found that there are some gaps in our national policies from climate change adaptation perspective. These gaps are discussed in the following paragraphs. In the end of the section we will also look into a case study of comparison between the findings of current study and another study.

Gender: Although BCCGAP (2013) addresses gender holistically, the gender issue is not mainstreamed in our sectoral policies from climate change and disaster management perspective. The role of women is not precisely assigned in case climate change adaptation and disaster risk management. Moreover the issue of what the government's stance should be in case of providing special facilities as a differently vulnerable group is not specified.

Migration: Migration due to climate change is occurring and so far it was not plausible to control or stop it even though it was discouraged in so many of our policies. There is yet no policy developed specifically for climate change migration which will ensure the maximum benefit of both sending and receiving community.

Development of Urban Planning Policy: Since rural-urban migration is inevitable either due to economic reasons or due to climatic stresses, specific policy on urban planning dealing with these issues is required.

Indigenous Knowledge and Traditional Practices: It was seen from review that the policies are prone to focus on successful adaptation options from international good practices. But the local adaptation practices following indigenous knowledge could have given a better result for a specific locality, which are not yet incorporated in existing adaptation plans.

Prioritization of Programs: The strategies for climate change adaptation are not yet specified or prioritized according to zones. Different zones have different characteristics. So the adaptation options should not be generic for the whole of country, rather specific for zones according to their needs and ground reality.

Land use Planning: Land use planning is not addressed according to climate change adaptation perspective in any of the relevant national policies.

Financial Support: There is no mention for compensation of losses due to climate change towards the poorest and most vulnerable.

Funding mechanism: None of the existing policies addresses mechanisms for distribution of international and national funds in the sector of climate change adaptation.

Evaluation and Monitoring: There is no proper mechanism to monitor and follow up the effectiveness of the adaptation strategies and funding allocation for climate change.

Box 2: Case Study: Comparison of Findings with “Policy Analysis: Climate Change and Migration in Bangladesh” Paper by RMMRU, University of Sussex and CDKN

RMMRU paper states that, policies seeking to restrain migrants usually fail to do so, and instead end up creating problems for migrants at their origin or destination places. (De Haas 2006; World Bank 2010). It states that, “*Migration may not be a part of the ‘problem’, but an important ‘solution’ as the Foresight report (2011: 10) notes.*”(Maxmillan et al 2013). And thus the policies and plans of Bangladesh should start seeing migration from that point of view.

In our assessments of the policy documents it was found that the government is trying to mainstream climate change into the overall development process, and taking various adaptation measures for it. But in the RMMRU document it states that these measures are not being successful to the expected level due to certain lack of coordination among different ministries. The Overseas Employment Policy that is pursued by the Expatriates’ Welfare and Overseas Employment Ministry does not deal with climate change issue whereas environmental policies pursued by Ministry of Environment do not look into the broader aspect of labour migration that the government is promoting (Siddiqui 2010, Siddiqui and Farah 2011). There is no monitoring and evaluation process built in to the policies, as a result though we have a bunch of excellent policies, there seems to be very little execution.

RMMRU paper looks at international initiatives to help mainstream migration adaptation strategies in Bangladesh. The document also assesses quite a few policies that came during 2009-2012, along with their previous versions and shows the comparisons. The paper finds that in most of the policies discussed there is a glaring omission of the lack of mention of internal (within the country) migration or its portrayal in negative or general terms. Another aspect of migration that is not reflected in policies is the often unreported migration to India. Bangladesh Population Policy (BPP) 2012 and BCCGAP (2013) are not covered in this paper. As a result the fact that, the encouragement towards migration that is found the BCCSAP (2009) is again contradicted in the BPP (2012), is not discussed here. The gender dimension of climate related migration is also not included in this document.

Finally, the paper recommends a policy reorientation towards reducing the necessity of migration where possible; at the same time it suggests to provide assistance to people who want to take part in the job market outside their locality that automatically involves migration (Kang 2012). A key point of the paper was to eliminate the negative mind-set and practices about climate migration and ensure the acceptance of it, and finally promote internal migration under appropriate conditions as a positive and effective climate change adaptation strategy (Maxmillan et al 2013).

4. c. Opportunities for Policy Development

So far government has formulated various plans and policies to address climate change adaptation from sectoral perspective. Government may formulate a comprehensive climate change adaptation and mitigation policy to make coordination among the sectoral approaches. Agricultural adaptations like innovation of climate resilient crop varieties, infrastructural adaptations like construction of cyclone and flood shelters, water abstraction adaptation like balancing between groundwater and surface water have been seen from a sectoral perspective. Now a comprehensive policy needs to be framed to bind them altogether from climate change perspective.

Government may frame a new urban development policy including provisions to provide safe accommodation and employment opportunities to climate refugees especially female migrants. The new urban policy should encourage and expedite decentralization of economic activities and services to regional hubs like medium and smaller townships to reduce the displacement distances of climate victims from their families while they out-migrate in search of alternative livelihoods. Government has envisaged shifting of surplus agricultural labourers to manufacturing and service industries under Sixth Five Year Plan. Under this new urban development policy government may detail out the strategy for locating and relocating manufacturing and service industries in new townships, export processing zone, growth hubs in such manner that this huge plight of rural to urban migrants may not end up in huge urban congestion and chaos in problem infested mega cities.

A polder maintenance policy is necessary to be framed for regular maintenance of existing polders to solve drainage congestions, maintaining navigational draught in minor rivers and inner canals, developing floodplain etc. This policy should spell out the institutional arrangement and governance mechanism for such maintenance, devolution of taxing power to local government bodies to generate local revenue for such maintenance. To fight back impending impacts of changing climate this policy is quintessential for regular maintenance of our coastal polders and embankments, our first line of defence.

A separate policy can be framed for regular maintenance and expansion of coastal embankments. Policy should be taken on the optimal height of coastal polders based on scientific research findings. Policy on equitable spatial distribution of cyclone shelters needs to be framed to bring all the at risk population under shelter cover.

Land use policy needs to be revisited through the lens of climate change adaptation options. Adaptation options need to be reflected in fixing national priorities and region specific strategies. Gender and migration as alternative adaptation option for climate change needs to be mainstreamed in all sectoral policies. Agricultural policy may incorporate adaptation options like making agricultural equipment suitable for female farmers' manoeuvring in absence of their male counterparts. More budgetary allocations can be made for inventing and innovating saline, flood and drought tolerant crop varieties to cope with the changing climate scenarios.

Bangladesh has recently been bestowed with a huge sea area under its newly attained maritime boundary by the verdict of International court of settlement of sea disputes. Bangladesh should explore these huge marine resources to diversify its livelihood options. Government may formulate a dynamic policy to explore these resources to uplift the overall standard of living and reduce the risk and vulnerabilities due to climate change by utilizing these additional resources.

Chapter 5: Conclusion

In the current study, efforts have been made to review the state of the art of planned adaptation in Bangladesh in terms of government policies, plans and acts. The major focus of the study was climate change adaptation issues with a particular emphasis on gender and migration. The objective was to make an inventory of the key adaptation terms and detailed description of adaptation options.

It has been found that although addressing climate change in various policy documents have started recently various terms and options which helps adaptation to climate change started appearing in policies as early as 90s. For example, NEMAP (1995) provided an action plan for scientific research on sea level rise.

Bangladesh has formulated NAPA and Climate Change Strategy and Action Plan in 2009 and currently taking steps to prepare NAP. However, it appears that a Climate Change Policy is very much needed to provide policy directives to different sectors. For example, the Agriculture Policy of 2013 have addressed climate change but not in a comprehensive manner in absence of such policy.

Gender and migration seem to be a very recent issue in the policy documents from climate change adaptation perspectives. The major advancement in gender issue is Bangladesh Climate Change and Gender Action Plan, which was formulated in 2013. Migration from climate change adaptation perspective was not appropriately addressed in the policy documents so far. The only document that mentions migration as an adaptation option is Bangladesh Climate Change Strategy and Action Plan. In this respect, another major gap is lack of an urban policy which has the potential to address the inevitable climate change migration to urban areas.

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Table 2: Count of key terms related to climate change adaptation in selected plan/policies/acts

| Plan/Policy/Act (Publication Year) | Gender/ Women | Migration | Adapt | Cope | Thrive | Transform | Adjust | Risk | Vulnerability/ Vulnerable | Resilience/ Resilient | Robust | Bounce Back | Capacity | Climate | Weather | Variability | Hazard | Floods | Drought | Sea Level Rise | Salinity | Cyclones |
|--|--------------------------|------------------|--------------|-------------|---------------|------------------|---------------|-------------|--------------------------------------|----------------------------------|---------------|--------------------|-----------------|----------------|----------------|--------------------|---------------|---------------|----------------|-----------------------|-----------------|-----------------|
| Environment Policy (1992) | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 8 | 1 | 0 | 2 | 1 |
| The National Forestry Policy (1994) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| National Environment Management and Action Plan (1995) | 26 | 3 | 0 | 3 | 0 | 0 | 1 | 1 | 9 | 0 | 0 | 0 | 20 | 5 | 1 | 3 | 24 | 6 | 4 | 6 | 2 | 1 |
| National Fisheries Policy (1998) | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 8 | 0 | 0 | 0 | 0 |
| National Water Policy (1999) | 8 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 21 | 7 | 0 | 7 | 2 |
| National Water Management Plan (2001) | 18 | 10 | 7 | 1 | 0 | 1 | 4 | 96 | 10 | 0 | 2 | 0 | 123 | 17 | 0 | 0 | 9 | 314 | 38 | 3 | 19 | 64 |
| National Energy Policy (2004) | 1 | 1 | 4 | 0 | 0 | 5 | 2 | 3 | 0 | 0 | 0 | 0 | 18 | 1 | 0 | 0 | 1 | 4 | 2 | 0 | 0 | 4 |
| Coastal Zone Policy (2005) | 27 | 0 | 1 | 3 | 0 | 0 | 1 | 2 | 9 | 0 | 0 | 0 | 11 | 6 | 0 | 0 | 2 | 1 | 1 | 1 | 4 | 6 |
| The National Food Policy, (2006) | 145 | 1 | 0 | 0 | 0 | 0 | 1 | 11 | 52 | 0 | 0 | 0 | 32 | 0 | 1 | 3 | 2 | 6 | 4 | 0 | 0 | 2 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|------|----|-----|----|---|----|----|------|-----|-----|----|---|-----|------|----|-----|-----|------|-----|----|-----|-----|
| The Bangladesh Climate Change Strategy and Action Plan (2009) | 48 | 12 | 50 | 1 | 0 | 1 | 3 | 16 | 79 | 46 | 2 | 0 | 64 | 430 | 10 | 0 | 0 | 85 | 20 | 13 | 21 | 32 |
| National Adaptation Program of Action (2009) | 18 | 3 | 170 | 10 | 0 | 1 | 4 | 33 | 115 | 8 | 0 | 0 | 31 | 301 | 6 | 33 | 16 | 201 | 40 | 38 | 67 | 50 |
| National Plan for Disaster Management (2010) | 22 | 1 | 54 | 9 | 0 | 0 | 2 | 294 | 56 | 9 | 0 | 0 | 39 | 131 | 6 | 10 | 118 | 91 | 49 | 2 | 17 | 16 |
| Standing Orders on Disaster (2010) | 52 | 0 | 11 | 5 | 0 | 2 | 1 | 803 | 116 | 11 | 0 | 0 | 62 | 22 | 54 | 1 | 162 | 227 | 14 | 0 | 11 | 389 |
| Sixth Five Year Plan (2011) | 296 | 14 | 54 | 2 | 0 | 28 | 4 | 96 | 69 | 10 | 5 | 0 | 0 | 158 | 2 | 0 | 19 | 54 | 24 | 6 | 7 | 35 |
| Perspective Plan of Bangladesh (2012) | 21 | 10 | 12 | 3 | 0 | 11 | 4 | 30 | 25 | 5 | 3 | 0 | 43 | 67 | 3 | 0 | 5 | 22 | 8 | 0 | 10 | 8 |
| National Disaster Management Act (2012) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 1 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 |
| National Labour Policy (2012) | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| National Population Policy (2012) | 30 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| National Agricultural Policy (2013) | 20 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 8 | 1 | 0 | 3 | 2 | 5 | 1 | 4 | 2 |
| National Water Act (2013) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 2 | 0 |
| Bangladesh Climate Change and Gender Action Plan (2013) | 1257 | 2 | 115 | 3 | 0 | 14 | 1 | 163 | 71 | 76 | 1 | 0 | 61 | 464 | 14 | 163 | 14 | 55 | 18 | 4 | 3 | 17 |
| Total | 1996 | 64 | 480 | 40 | 1 | 64 | 29 | 1570 | 616 | 165 | 13 | 0 | 508 | 1619 | 99 | 213 | 394 | 1114 | 235 | 80 | 176 | 629 |

Table 3: Identification of key adaptation options in the selected plan/policies/acts

| Adaptation Options Plan/Policy/Act | Environmental Policy (1992) | Forestry Policy (1994) | MEMAP (1995) | Fisheries Policy (1998) | NWP (1999) | NWMF (2001) | Energy Policy (2004) | CZP (2005) | Food Policy (2006) | BCCSAP (2009) | NAIPA (2009) | NPDM (2010) | SOD (2010) | SFYP (2011) | Perspective Plan (2012) | NDMA (2012) | Labour Policy (2012) | Population Policy (2012) | Agricultural Policy (2013) | Water Act (2013) | BCCGAP (2013) | |
|---|-----------------------------|------------------------|--------------|-------------------------|------------|-------------|----------------------|------------|--------------------|---------------|--------------|-------------|------------|-------------|-------------------------|-------------|----------------------|--------------------------|----------------------------|------------------|---------------|---|
| Livelihood Diversification and Risk Transfer | | | X | X | | | | X | X | X | X | | X | X | X | | X | | X | | X | |
| Resilient and Hard Infrastructure | | | | X | X | X | | X | | X | X | X | X | X | X | | | | | | | X |
| Institutional Capacity, Governance and Training | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | | | X | | | X |
| Knowledge, Information Management, Surveillance and Early Warning | | | X | X | X | X | | X | X | X | | X | X | X | X | X | | | X | | | X |
| Resilient Land Use, Rural and Urban Planning | | | X | | X | | X | | | X | | X | X | X | X | | | X | X | X | | X |
| Resilient Cropping and New Crop Variety | | | | X | X | X | | X | | X | X | X | | X | X | | | | X | | | X |
| Women Empowerment | | X | | X | X | | | X | X | X | | | X | X | | | | | X | | | X |
| Improved Water, Sanitation and Hygiene (WASH) | X | | X | X | X | X | | | X | X | | | X | X | X | | | | | | | |
| Plantation, Forestry, Landscape and Green Space Management | | X | X | X | X | X | X | X | | | | | X | X | X | | | | | | X | |
| Financial Support, Insurance and Incentive Schemes | | X | X | X | X | X | X | | X | X | | X | X | X | X | X | | | X | | | |
| Water Conservation and Irrigation Systems | X | X | X | X | X | X | X | X | X | | | | X | | X | | | | X | | | |
| Post-harvest Loss Management | | | X | X | | | | | X | X | | | | | X | | | | X | | | |
| Improved Access to Market | | X | X | | X | | | | X | | X | | | | | | | | X | | | X |
| Improved Social Service Delivery | | | X | | X | | | X | | X | | X | X | X | X | | | | | | | |
| Research and Development | X | X | X | X | X | X | X | X | X | X | | X | X | X | X | X | | | X | | | |
| Marine and Coastal Management | X | | X | X | X | | X | X | | | | | X | X | X | | | | | | | |
| Disaster Response and Management | | | X | X | | X | | | | X | X | X | X | X | X | X | | | X | | | X |

