

DEltas, Vulnerability and Climate Change: Migration and Adaptation

Evaluations of Adaptation Policy in GBM Delta of Bangladesh

Work Package 6

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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 study seeks to identify feasible and realistic planned adaptation strategies. More specifically, it will identify the spectrum of adaptation policy options currently being considered in GBM-BD and will allow comparison of policy choices and options between the four deltas. 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

Bangladesh has been identified as the most climate vulnerable country according to the climate change vulnerability index 2015 devised by maplecroft. Its exposure to frequent and extreme climatic externalities e.g. floods, cyclones, prolonged heat and cold waves, erratic weather events 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 climate sensitive policies e.g. National Adaptation Programme of Action (2005), Bangladesh Climate Change Strategy and Action Plan (2009), Bangladesh Climate Change and Gender Action Plan (2013), over the last two decades. Moreover, various climate change adaptation issues are more or less addressed in other policies and plans of Bangladesh. This paper will assess the scopes and types of adaptation policy that exist in GBM-BD.

The paradigm and paradigm shifts in government views regarding various dimensions, 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 in the right track in adapting to climate change?

The study will also look thematically into, how adequately policies are reflected in various plans of Bangladesh government. Contemporary medium term plan e.g. sixth five year plan (2011-2015) and long term plan e.g. perspective plan (2010-2021) will be analyzed in-depth to develop insight. Moreover, there is a plan to incorporate seventh five year plan (2016-2021) in the study if published during the study period to provide future implications.

The key drivers of these policy developments will also be analyzed from the 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.

The expected findings from this study e.g. climate change adaptation from gender and migration perspectives, key themes emerging, what's missing from the country context, opportunities for new policy development, plan-policy synergy etc has an appeal for both, scientific community and policy makers.

1. c. Discussion on Why Including Gender in Policy is Important

Bangladesh is a developing country with women constituting almost half of the population. The 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 will show 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 garments sector which earns almost 80% of foreign exchanges, and micro-finance sector is very high. But it was also observed that women's involvements were mainly in low end jobs rather than the higher end of the value chain. This came up prominently in a survey by BMET in 2013, where it was observed that about 13% of international migrants were women, and they mainly work as housemaids, cleaners, care givers etc, less than 3% of them were professionals due to lack of women's marketable skills (Begum 2014).

Mainly due to the social and economic context of the country, still the women are among the most vulnerable section of the population. Moreover, it is seen that women suffer more than men during and after climatic disasters. It was seen from study that 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).

Keeping in mind women's contribution to the development of the country and their vulnerabilities, the needs of women should be taken into consideration in making any decision in any sector of the country. This could be done by integrating this important portion of the population in the policy decisions. So far, even if they have been included to some extent it is still not enough, and no actual development is possible until it is done. Thus gender issues are needed 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. c. Outline of the Paper

The report was developed according to the following outline:

Chapter 1: Introduction

Chapter 1 sets the aims of the paper. It then rationalizes the relevance of climate change adaptation policy in the delta and the importance of gender analysis in policy documents.

Chapter 2: Methodology

Chapter 2 introduces the relevant climate change policies and the method applied to analyse these policies.

Chapter 3: Data and analysis

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: Discussion

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, opportunities for policy development etc.

Chapter 5: Conclusions

Chapter 5 summarizes the whole study and give the concluding remarks.

Chapter 2: Methodology

2. a. Country Context

The following 22 policies by the government of the people's republic of Bangladesh were selected for the present study.

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 and Action Plan (1995)	Ministry of Environment and Forest	1995-2005
	The Bangladesh Environment Conservation Act (1995)	Ministry of Environment and Forest	Ongoing
	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
	The National Forestry Policy (1994)	Ministry of Environment and Forest	Ongoing
Comprehensive	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 Labor Policy (2012)	Ministry of Labor 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

A short summary of these policies are presented below.

Environment Policy (1992)

Environment Policy (1992) provides a set of broad sectoral action guidelines and sets out the basic framework for environmental conservation. In this document involvement of women in development activities is mentioned but this is not in the context of climate change. Discussion on climate change, adaptation, migration etc. is not addressed in this early document.

The National Forestry Policy (1994)

The Forest Policy 1994 recognizes the importance of biodiversity for environmental sustenance. The Policy advocated social forestry, which includes agro forestry through community participation. Climate change issues were not mentioned in this policy.

National Environment Management and Action Plan (1995)

Among the policies and plans developed before 2000, this is first one to address climate change and sea level rise. This plan was developed through extensive people's participation with minimum 50% of women, taking into account their perceptions on various issues like poverty alleviation, disaster management, livelihood generation etc. It discussed about increasing status of women by improving their health, education and income opportunities. Coping mechanisms such as- hazard proofing of crops, crop insurance, crop diversification, adequate irrigation are mentioned in this document. Migration is presented in a negative light as it mentions the rural-urban migration as a problem creator in urban areas.

Bangladesh Environment Conservation Act (1995)

This document includes set of laws enacted by the government of Bangladesh for the protection of environment. The Act gives operational definitions of terms that historically did not exist, including ecosystem, pollution, waste and hazardous substance. The policy doesn't essentially include any content related to the interest of the present study e.g. climate change, adaptation, migration, gender etc.

National Fisheries Policy (1998)

This policy was promulgated to enhance the fisheries production along with maintenance of ecological balance and conservation of biodiversity. This document encourages females in fish culture and training accordingly. As a cyclone risk reduction option, the policy recommends radio to be carried by each sea-going fisherman. Climate change issues or related adaptation is not mentioned here.

National Water Policy (1999)

This policy mostly emphasized on hazards which are highly dependent on water management such as flood, drought and salinity. Importance has been given on research on overall water (flood, drought and other water related phenomena) management to ensure economic efficiency, gender equity, social justice and environmental awareness. Climate change impacts or adaptation in water sector are not addressed in this policy.

National Water Management Plan (2001)

National Water Management Plan (NWMP) is a comprehensive plan prepared as a supporting strategy that relates water sector development to the overall national goals. In this document emphasis is given on disaster management including disaster preparedness. Women issues came in the context of disaster management programs where particular needs of women are given special concern, rather than climate change and adaptation.

National Energy Policy (2004)

The document has discussed about the proper exploration, production, distribution and rational use of energy sources as well as the way to meet the growing energy demand of the country. Emphasis on area based planning is given to meet the energy needs of different locations. Use of renewable energy sources and selection of environmentally compatible technologies are encouraged but not from climate change mitigation perspective.

Coastal Zone Policy (2005)

Coastal zone policy (2005) has given importance on increasing coping capacity of the poor living in the coastal areas and reducing their vulnerability to coastal disasters. It recognizes the importance of empowerment of communities through poverty reduction, participatory planning and decision making with special focus on women to improve coping capacity. Gender equity in case of participation and capacity building through women's education, training, land allocation and employment is emphasized too. The policy recommends that implementation of adaptive measures identified in relation to climate change for coastal zone and resources shall be undertaken.

The National Food Policy, (2006)

The National Food Policy (2006) provides strategic guidance to address the key challenges facing Bangladesh in achieving food security in all dimensions, including food supply and availability, physical, social and economic access to food, as well as nutrition/utilization of food. It marked rural-urban migration phenomena as a result of landlessness and underemployment. This document has given importance on securing maternal and child health and women's contribution in family-based economic activities including household food security. At the same time women of the country are addressed to be the significant share of the food insecure population here.

Bangladesh Climate Change Strategy and Action Plan (2009)

The first document in Bangladesh to completely focus on climate change challenges. The BCCSAP focused on medium and long-term adaptation options for the climate vulnerable people. It mentioned migration as a valid option for them and give importance to facilitate migration to another countries and integration in new societies. BCCSAP makes numerous references to the potential impacts of climate change on migration, including the need to strengthen coastal polders to prevent coastal outmigration and the potential for river bank erosion and saline intrusion to displace large numbers of people. It also talks about gender mainstreaming & emphasis on sensitivity. Women are identified as vulnerable and thus prioritized for protection before and after disaster. Women's participation is encouraged in agricultural production and marketing. Importance is also given on women's role in mitigation and adaptation to climate change in their communities and households.

National Adaptation Plan of Action(2009)

The document has highlighted the main adverse effects of climate change. It also identified the country's immediate priorities for adaptation. The aspect of gender sensitiveness required in adaptation options is acknowledged but not elaborated.

National Plan for Disaster Management (2010)

A comprehensive disaster management document for Bangladesh. It provides necessary guidelines for disaster management at all administrative levels and states their integration. It recognizes that the focus should be on risk reduction rather than relief distribution. Gender and migration issues are not given much importance in this document.

Standing Orders on Disaster(2010)

This document provides necessary guidelines on the responsibilities at pre-during-post disaster circumstances, at each level of the administrative hierarchy of the Bangladesh government and people under their jurisdiction. The document recognizes the importance of involving women in all levels of disaster management activities.

Sixth Five Year Plan (2011)

This document is a comprehensive planning document for all sectors of the country. Internal or international migration mainly due to economic reasons is discussed and different natural calamities are addressed as the cause of rural-urban migration. Gender and women are discussed mainly in education and economic sectors and importance is given on bringing women into mainstream development activities. It seems a very significant document in recent days from the lens of climate change adaptation as it mentions the problem of climate induced forced migration and need of introducing gender sensitivity in coping mechanisms and strategies as women are affected differently than men during natural disaster. Adaptation options for climate change are discussed in detail.

Perspective Plan of Bangladesh (2012)

The Perspective Plan, a roadmap for achieving the targets of Vision 2021, lays down a long-term strategy to make that happen. In this plan internal as well as overseas migrations are discussed in case of rural-urban migration. Climate change induced migration is ignored here. Gender issues discussed here, but not in climate change perspective. Adaptation options like hydropower, structural, non-structural measures, crop diversification, afforestation, green growth etc. are encouraged. Disaster management including mitigation, preparedness, response, and recovery is given importance.

National Disaster Management Act (2012)

This Act was framed to manage national disaster events in a coordinated manner with preemptively fixed responsibilities to various committees at different tiers so that no confusion arises during the disaster event in deployment of manpower and resources in reducing disaster risks and in organizing relief and rescue operations. It fixes early warning responsibilities to each organization, including the media. It entails provision of relief and recovery options and facilities to disaster affected people. It also keeps provision for establishing institute for researching on disaster management and climate change effects as a measure to fight against climate change.

National labor Policy (2012)

This document is designed to cover the overall welfare of workers involved in all sectors including agriculture, industries and other informal sectors. Women participation in the labor market is encouraged by ensuring provision of creating appropriate work/place for women. Removing discrimination at workplace is also emphasized. Labor migration is also encouraged in this document by the provision of ensuring safety of national and migrated labors and reducing cost of migration. Climate change adaptation or migration related to this phenomenon is not mentioned here.

National Population Policy (2012)

This policy was adopted to plan the existing and projected population structure of the country for a better planning of human resources development and to utilize the favorable conditions like

“demographic dividend”. This policy discourages rural to urban migration. It encourages creating of new employment opportunities in rural areas to reduce migration to urban areas. It encourages planned urbanization with the proper coordination of various relevant government departments and agencies.

National Agricultural Policy (2013)

The comprehensive document provides general guidelines or directions about how the crop sector is to evolve to achieve the overall objective of food self-sufficiency and food security. Research in climate resilient crop varieties such as drought tolerant, flood tolerant and saline tolerant varieties is encouraged. Women’s participation is appreciated in agricultural production, marketing and management.

Bangladesh Climate Change and Gender Action Plan, 2013

This is one of the latest policy documents with a focus on climate change adaptation strategies. The document looks at these strategies in a gender sensitive way and promotes gender mainstreaming in the programs undertaken this action plan. While migration due to climate change is discussed here, it implicitly promotes male migration and encourages women to use various adaptation techniques to reduce their vulnerability in their residing areas.

National Water Act (2013)

This Act was formulated to make a better coordination among the water users and controlling authority for a proper allocation of water resources through optimal pricing and other mechanism according to set priorities. It has allowed the use of flood control dams as roads, highways with prior approval of the competent authority for optimization of land use. It also allows forestation on the flood control dams and coastal embankments for consolidating its strength and also to act as a first line of defense. It also gives authority to prepare national water management plan which takes climate change adaptation issues into active considerations.

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. All relevant policies, plans and strategies were included in the review.

There are 4 steps involved in this process:

- i) Identify climate change adaptation-relevant policies
- ii) Create a searchable 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 Polices 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, i.e. UNDP, UNEP, World Bank, WHO, FAO, WMO, other relevant UN agencies

Tangible sources/ paper sources

Government offices were contacted for policies/plans that are not accessible over the internet:

ii) Searchable Database of Adaptation Relevant Policies/Plans (Table 1)

For each policy/plan identified as potentially relevant, a searchable database was created to allow comparison between the deltas.

In each database, the following details were provided:

- 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
- If the policy/plan is in electronic (e.g. PDF, or MS Word) format or paper format

iii) Content Analysis of Climate Change Adaptation (Table 2 in Appendix)

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 can then be included in the more detailed thematic analysis. Using the documents identified, policies/plans were searched for any mention of climate change adaptation.

A policy/plan was deemed to mention climate change adaptation if it included any of 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

b. Searching the document

Method of searching for the key terms within the document was determined on if the documents are in electronic form (e.g. PDF, word) or in paper form.

Searching in paper documents

For paper documents, it was needed to read the policy/plan to identify if any of the key words are included. If a key word is included in the policy/plan, this was marked in Table 1. Policy/plan documents that mention key words were sent to the next round. If there is no mention of any of the key words in the policy/plan document this was not included in Table 1. The plan/policy was not sent through to the next round.

Electronic documents

For electronic documents, the content analysis of each policy/ plan began with a count of how many times the key terms relating to climate change adaptation were mentioned. When searching within electronic documents (e.g. PDF, word documents), it was possible to use the wildcard symbol (*) as this ensured similar words to the key terms are found. For example, using the search term „adapt*“ will find the words „adaptation“, „adaptive“, „adapt“ etc.

Other wildcard examples include:

- Climate - *Climat**
- Weather - *Weather*
- Variability - *Variab**
- Hazard - *Hazard*
- Flood - *Flood*
- Drought - *Drought*
- Sea-level rise - *Sea*
- Salinization - *Salin**
- Cyclones - *Cyclone*

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.

iv) Thematic Analysis of Adaptation Options

a. Identification of key adaptation terms (Table 3 in Appendix)

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 were 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 (Table 4 in Appendix)

Whilst filling out Table 3, a detailed description of each adaptation policy option was provided 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 (see appendix) 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 the National Forestry Policy 1994 and National Fisheries Policy 1998. 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. National Environment Conservation Act (1995) was discarded after this phase as it doesn't mention any of the key terms.

Table3.1: Rank of policy documents based on the total count of key terms

Plan/Policy/Act (Publication Date)	Total Count of Key Terms	Average Count
Bangladesh Climate Change and Gender Action Plan (2013)	2516	458.77
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)	109	
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 Labor Policy (2012)	10	
The National Forestry Policy (1994)	1	
National Environment Conservation Act (1995)	0	

Graph 3.1 shows the temporal trend of key terms count in chronological policy years. According to the graph 2010 shows the highest peak of the count of key terms. The overall trend shows that, the count of the key terms in the policy documents are increasing over the years.

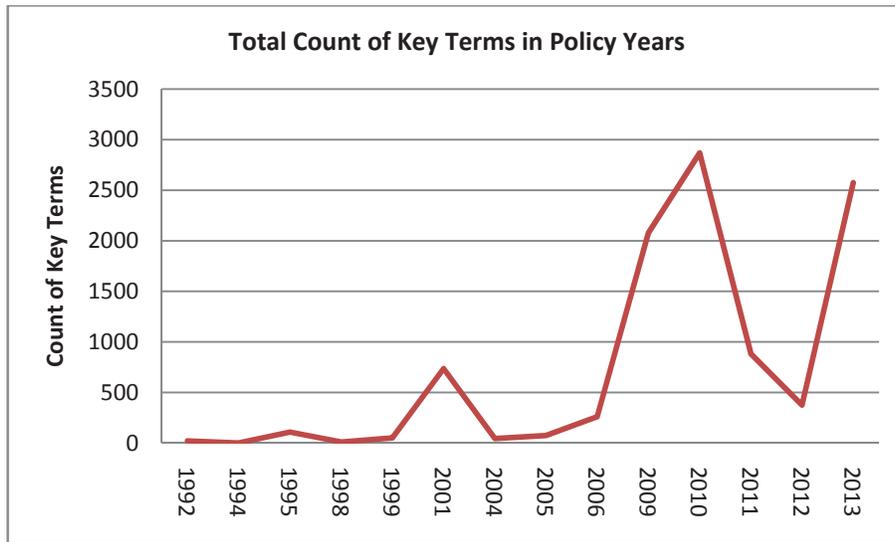


Figure 3.1: Chronological development of key terms

Adaptation Paradigm: The major adaptation paradigm found was to adapt rather than cope or thrive. These terms mostly used in 2009 onwards polices and especially in climate change, gender, disaster management and comprehensive thematic area. Thrive is term hasn't been used much yet.

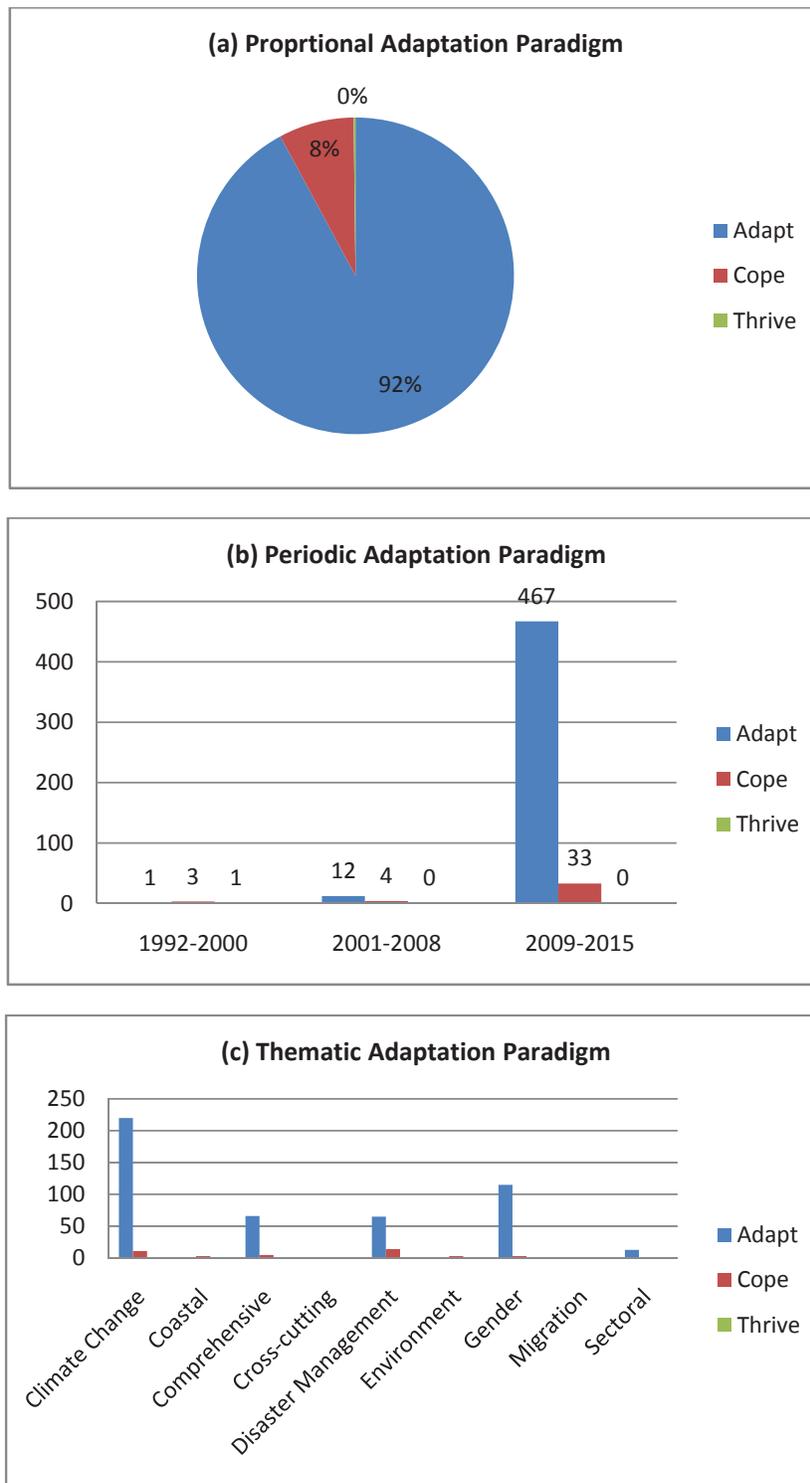


Figure 3.2: Proportional, periodic and thematic trend of adaptation paradigm terms

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

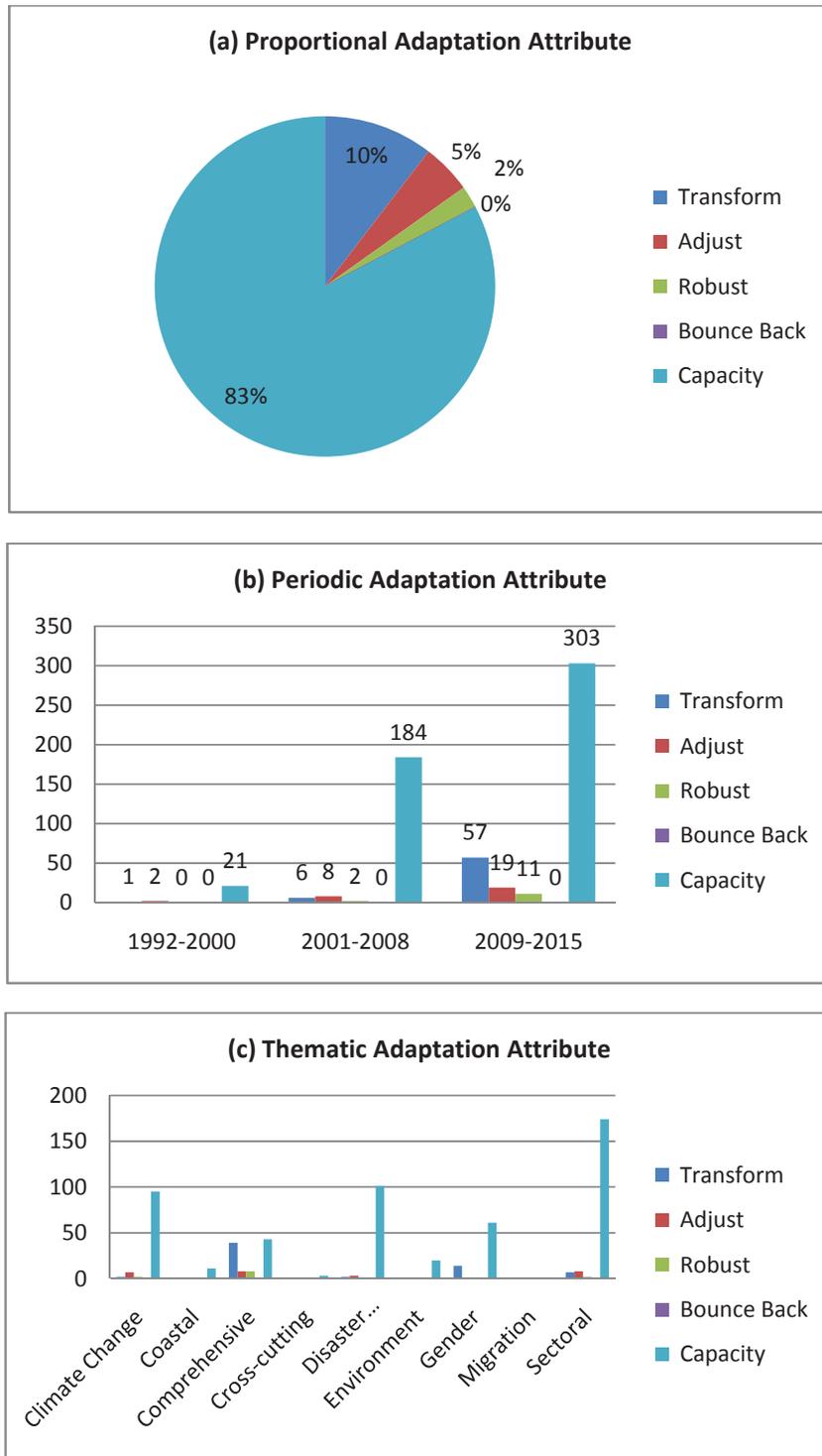


Figure 3.3: Proportional, periodic and thematic trend of adaptation attribute terms

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.

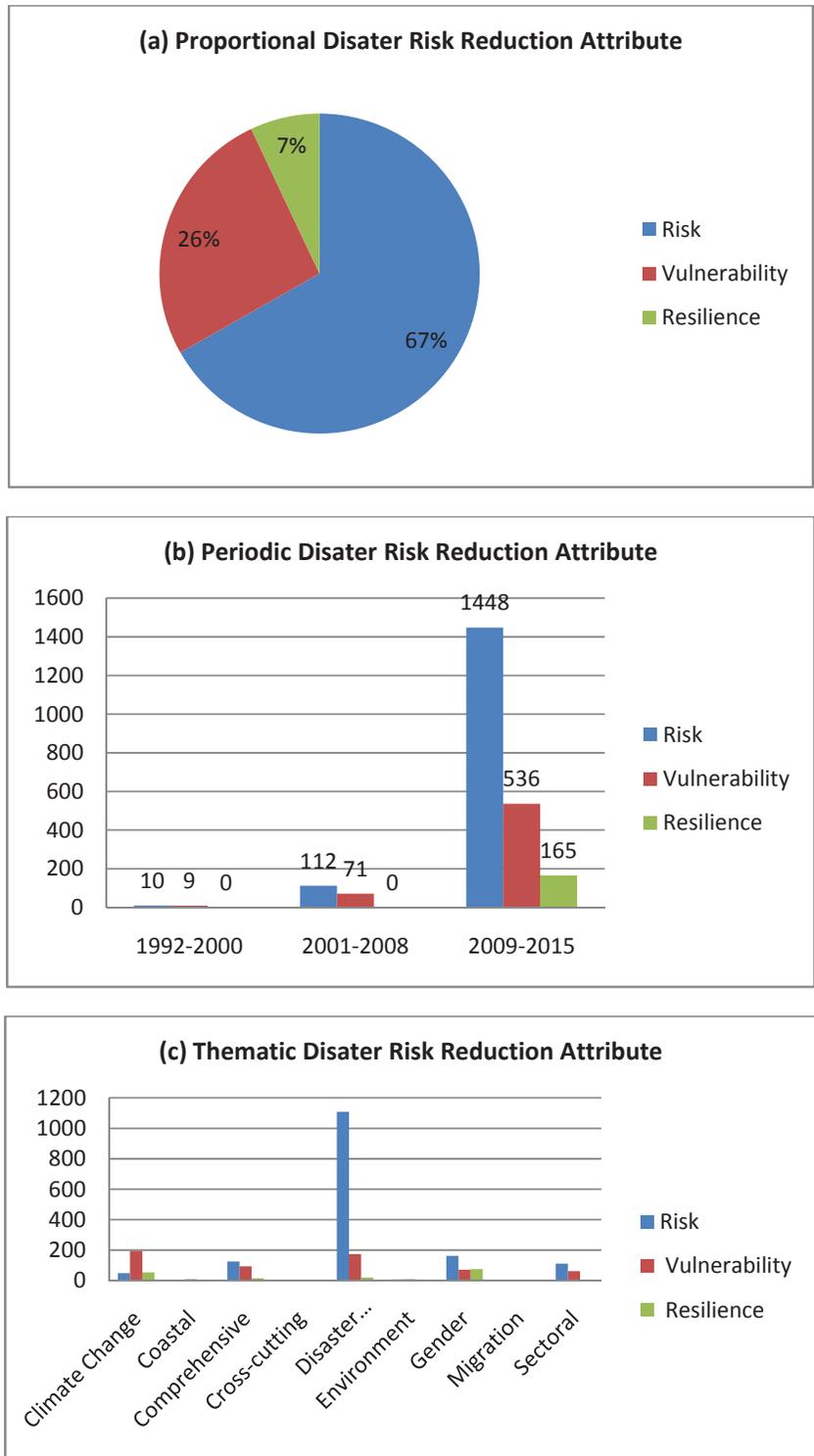


Figure 3.4: Proportional, periodic and thematic trend of disaster risk reduction attribute terms

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.

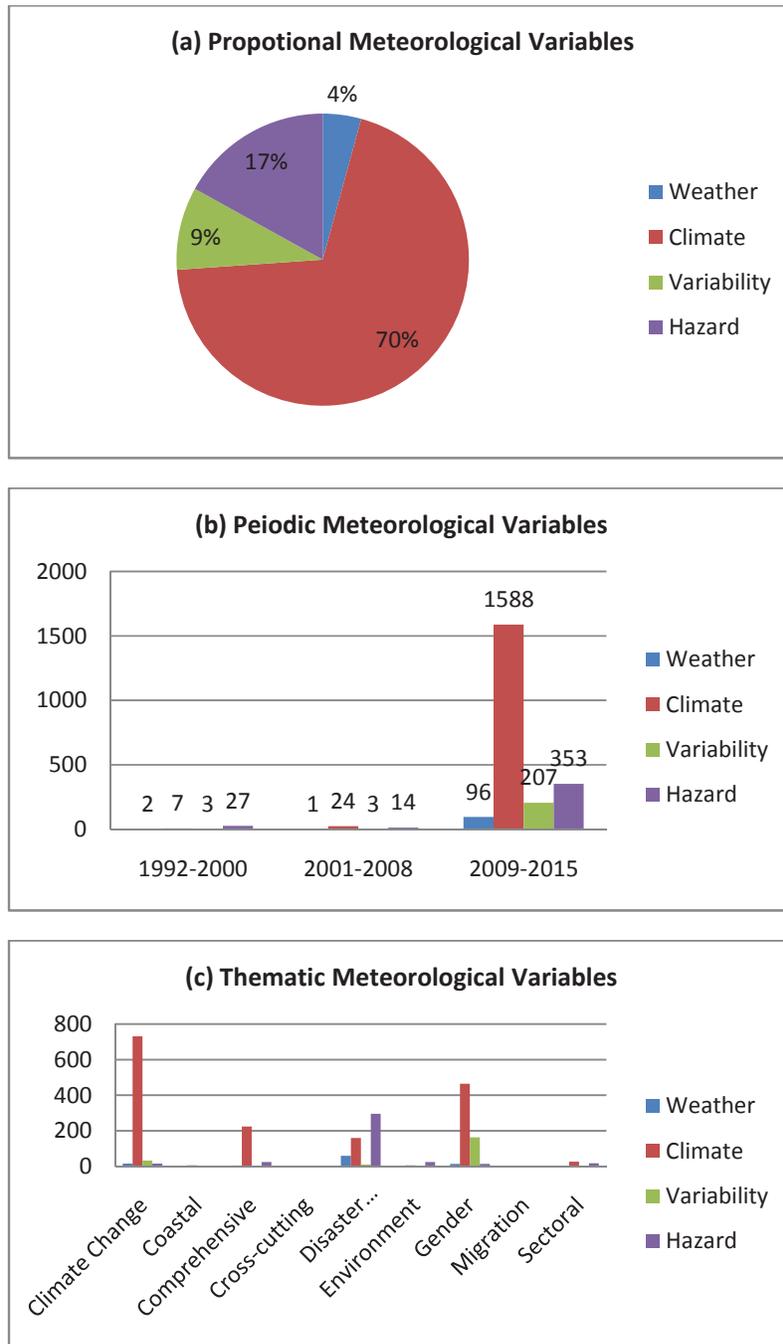


Figure 3.5: Proportional, periodic and thematic trend of meteorological variables terms

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.

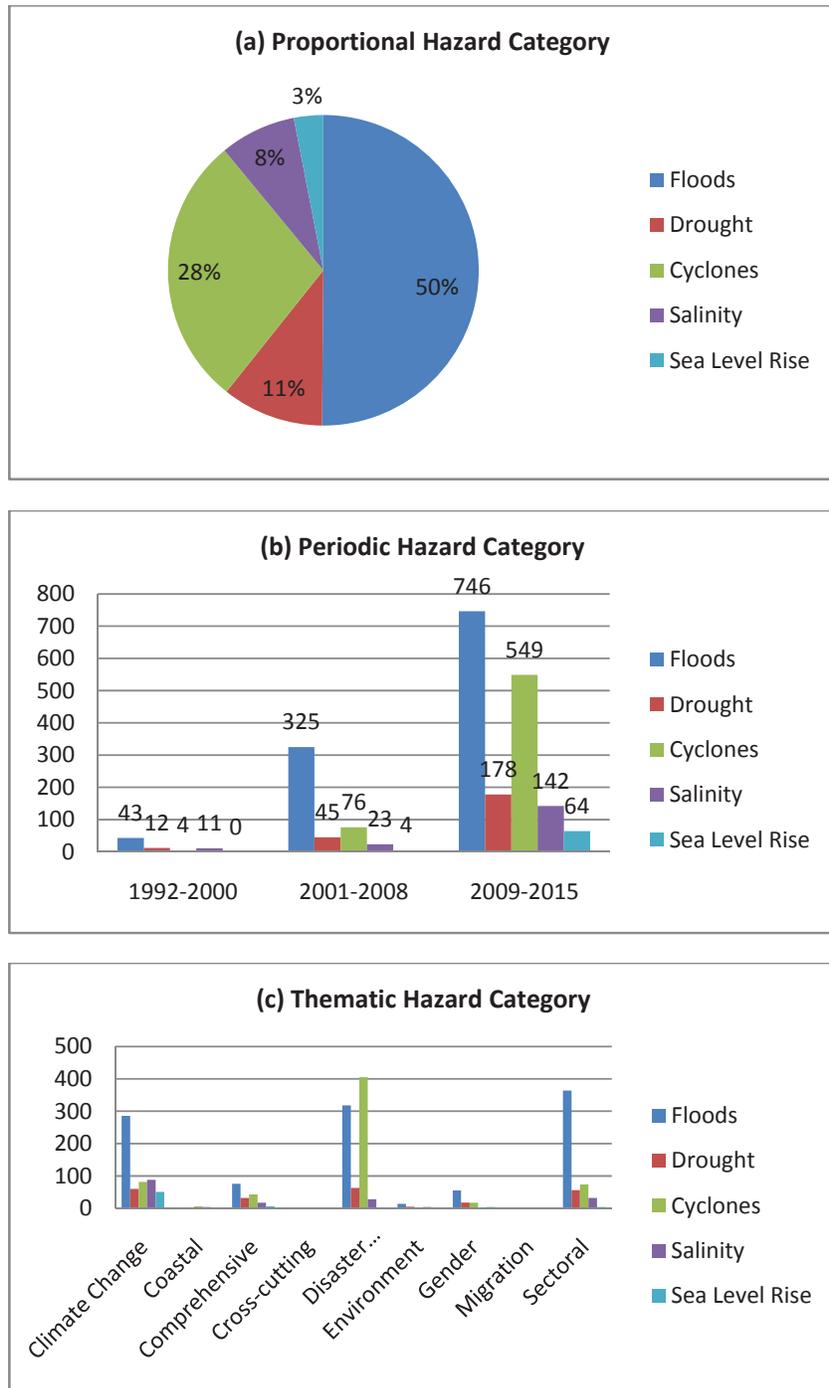


Figure 3.6: Proportional, periodic and thematic trend of hazard category terms

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).

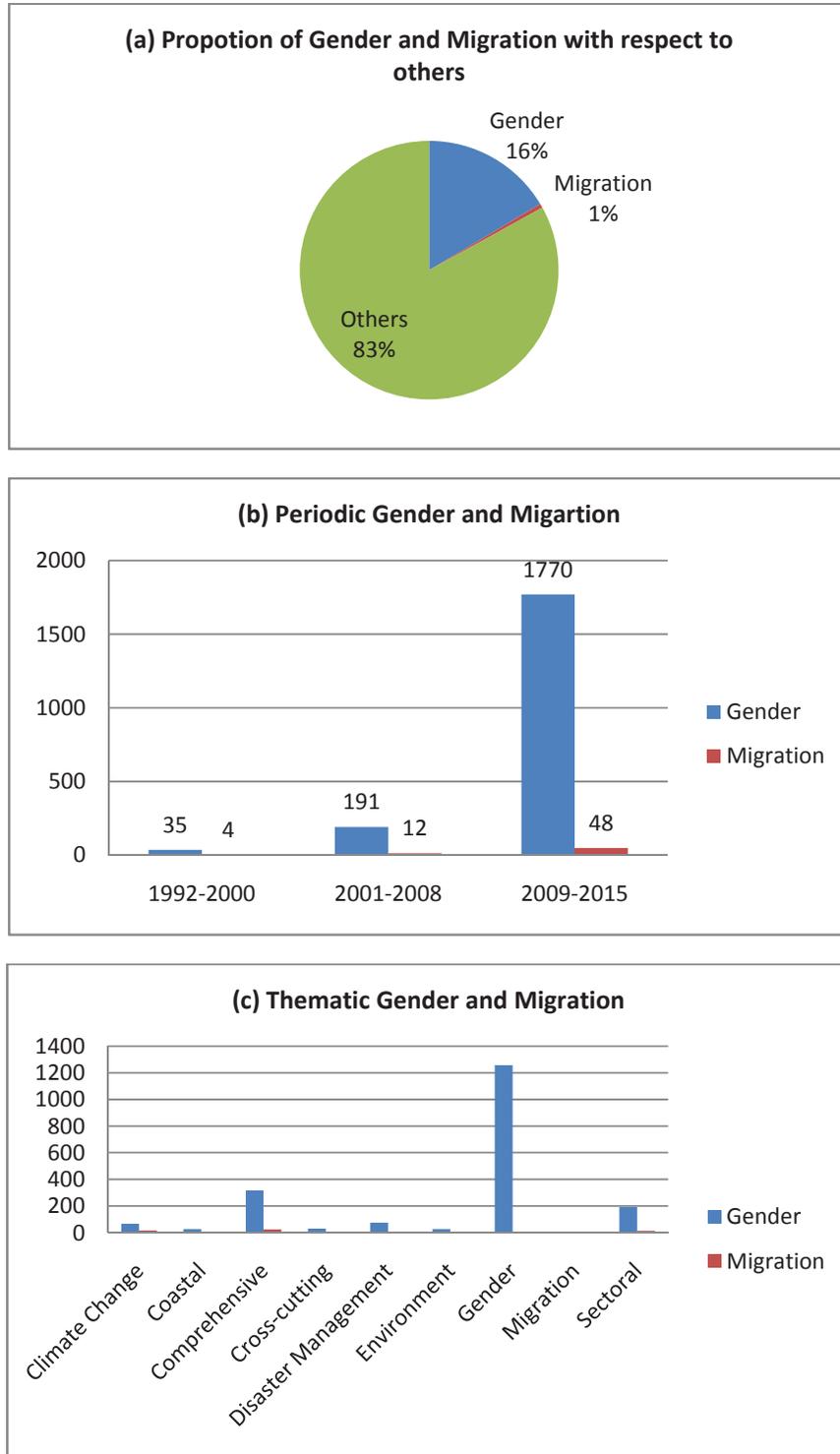


Figure 3.7: Proportional, periodic and thematic trend of gender and migration terms

3. b. Content Analysis

The various policy documents were searched for climate change adaptation options from country context. Table 3 (see appendix) was formulated through the identification of adaption 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 and 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 women empowerment, resilient cropping, coastal management etc. Alternative energy, post harvest lost management are yet to be prioritized.

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

Category	Adaptation Option Mentions in Policy Documents	Comment
>17	-	-
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 • Alternative energy • Improved access to market • Post-harvest loss management 	Yet to be prioritized
<5	-	-

Table 3.3 is hierarchical order of policy documents based on count of mentions of adaption options. If we compare it with table 3.1 we can see, few 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 polices. National Environment Management and Action Plan (1995) was found as a visionary document as per both table 3 and table 2 though it was formulated in 1990s.

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

Policy Documents	Count of Adaptation Options
National Environment Management and 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 total 22 government plans/policies/acts, where 14 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 organizes different adaptation options under 14 categories in columns and policy documents in chronological order based on implementation date in rows starting from 1990 till date and then analyzed 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 adaption issues are incorporated as case study (see Box !).

Livelihood Diversification and Risk Transfer

National Environment Management and Action Plan (NEMAP) (1995) warns that deforestation has negative effect on marine fishereies and thereby detrimental to fishermen’s livelihood but suggests nothing about how to adapt with it, let alone climate change related specific adaptations.

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 opportunity in manufacturing and organised service sectors. It will help transfer agricultural labourers to formal job sectors. This policy will reduce livelihood vulnerability as agriculture is more dependant on climate and its variability. The policy of shifting to manufacturing and service industry will reduce livelihood vulnerability in the backdrop of climate change and will create a huge plight of migrant laborers from rural to urban area.

Agricultural Policy (2013) encourages crop diversification and thereby reduce the risk of crop failure and therefore reduce the livelihood vulnerability.

Resilient and Hard Infrastructure

After the cyclone of 1991 multipurpose cyclone shelter programme (MCSP) was developed under Fourth Five Year Plan (1991-95) with a focus to save lives.

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

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.

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.

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 training of rivers in a planned and phased manner will be pursued.

Institutional Capacity, Governance and Training

NEMAP, 1995 stresses on incorporating environmental issues in all training programmes for public and private sector officials and employees. It is somewhat related with mainstreaming climate change adaptation issues in all training programs which helps.

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.

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.

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 ensuring protection of women, children, aged and disabled population-who are most vulnerable to disaster and climate change.

Alternative Energy

National Water Policy, 1999 supports construction of mini-hydro power development schemes if they are economically viable and environmentally safe.

Coastal Zone Policy, 2005 proposes to assess prospect of tidal and wave power in coastal area as potential source of energy. It also underpins to carry out survey and explorations for petroleum resources in the offshore areas without degrading the nature. It entails to introduce solar renewable energy in off-grid areas like remote islands to bring them under electricity coverage. This policy suggests using photovoltaic solar cells for cyclone shelters despite its high capital cost.

Sixth Five Year Plan (2011-15) emphasizes on developing renewable energy like solar home system and bio gas plants as a mitigation measure for reducing GHG emission.

Perspective Plan (2010-21) recommends to increase power generation through renewable sources, such as solar, wind, small hydro. It encourages to increase energy efficiency and capacity through renewable energy sources e.g. solar, small-hydro, geo-thermal, wave, wind and tidal energy, particularly in the coastal belt area.

Research and Development

Fifth Five Year Plan (1997-2001) stipulated that an Institute of Biotechnology would be set up to facilitate research in various aspects of agriculture in general and food crops in particular. Further, an Institute of Oceanography would be established to explore the ways and means of harnessing sea resources more widely and effectively.

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 Adaption 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 laborers to manufacturing and service sector, which are less dependent on climate variability. It will create huge plight of migrant laborers 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. The latest paradigm is involving communities in forest conservation through co-management are 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.
- There is a paradigm shift in disaster management. 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 preemptive 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
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.
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 nonstructural 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.
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 FFYP Plan period.	Sixth FFY emphasizes on the government effort (research projects) for developing saline, drought and flood tolerant crop varieties.
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.	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. 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.	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 much discussed phenomena in national policies now-a-days. Although, women have been identified as the vulnerable group in face of climate change in all documents, the gender issue has always been somewhat ignored. The programs taken are rarely gender sensitive and the inequality between men and women have not been reduced (Vincent et al 2015).

Gender and Climate Change Adaptation Options

A chronological evolution of the focus on gender issues 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. Adaptation on the other hand is emerging as an important issue only in recent documents. But if the policy documents are analyzed it is seen that though the focus is adaptation options, very few of them are specifically modified or developed according to needs of the females living in climate vulnerable zones. The policies have been looked into to see how gender has been reflected in their respective issues.

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. But none of this is specifically according to climate change. 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, and employment are emphasized to ensure gender equity in case of participation and capacity building in face of climate change related problems. Land allocation for vulnerable women is also mentioned here. The National Food Policy, 2006 brings up gender issue in respect to equity in education, health, food security, but nothing in a climate change context.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 discuss gender mainstreaming in the plans and policies of the country. It recognized that women can 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 disaster. 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 the disaster recovery and rehabilitation issues in an efficient and gender sensitive manner, 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 in 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 that supposedly occur due to climate change and, thus indicates the need for incorporating gender sensitivity in coping mechanisms and strategies.

The National labor 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. But these are not from a climate change perspective.

Finally, the Bangladesh Climate Change and Gender Action Plan, 2013 was introduced to address climate change through completely 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 Labor Policy (2012) does not cover workers in the informal sector where the largest population women are employed in Bangladesh. Thus, discrimination against women in the labor 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 policy 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

The BCCGAP (2013) document also calls for improvement of women's knowledge on climate change mitigation issues. Women's key role in mitigating climate change by optimizing energy efficiency, using low-footprint energy sources and techniques, and influencing a household's and community's consumption patterns- is acknowledged here.

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.

Migration of the male population focused in the Gender Action Plan, and it seems women were assumed to stay back and adapt to the climate change circumstances and work on mitigating it.

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. later 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 labor Policy 2012 also encourages overseas migration and states to ensure safety of national and migrated labors 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; p. 20)

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 & local adaptation plans; Economic diversification; Urban upgrading programs; Disaster planning & 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.

According to the CDKN report the AR5 (CDKN, 2014) 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 a constraint in the way of growth and development in South Asia which can be 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 be designed so that it can strengthen livelihoods, enhance wellbeing and human security, and reduce poverty in the South Asian region.

This report says, in a recent study accomplished by the 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.

International Organization for Migration Report

Bangladesh Context

Highlighted mainly on migration and assessing the evidence 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).

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.

Majority of the international documents including IPCC 5th Assessment Report (2013), 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. Accept Bangladesh Climate Change Strategy and Action Plan (2009), in other policies or plans migration are 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.

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 draw 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) to manage national disaster events in a coordinated manner wastage of resources used in reducing disaster risks and in organizing relief and rescue operations.

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 programmes to evaluate effectiveness of adaptation should be included in our national policies.

Comparison with Wider Literature: National Context

A literature by 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, which could have come up in our study too.

Asaduzzaman et al (2013) in a critical review of BCCSAP (2009) addresses the slow implementation of the plan and the drivers behind this. 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 portion 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 shown as a case study in Box 2.

4. b. What’s 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

This 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 this 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 labor 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.

This 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 irregular 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 etc. have been seen from 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 accommodations 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 defense.

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" maneuvering 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

Various innovative adaptation options have been incorporated in Bangladesh Government policies, many of them have been proved effective like cyclone shelters, coastal embankments, coastal greenbelts etc. Nevertheless many climate change adaptation issues have dearth of scientific data and research findings to take appropriate policy decisions. Interfacing among stakeholders, scientific community and policy makers needs to be improved to reflect stakeholder's aspirations into policy planning through recommendations from scientific research community.

In the next steps of the current study, it will look into various synergies between plans vs. policy, policy vs. implementation, planned vs. autonomous adaptation etc. It will also focus on science policy interaction. For DECCMA, an interlinking study of climate change adaptation stimuli e.g. climate change hotspots, actual adaptation practices by the local people and planned adaptation by the government is crucial to conceptualize the major gaps between climate change plans and practices in four country deltas.

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Appendix

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	0	2	1
National Environment Conservation Act (1995)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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

Appendix

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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
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 Labor Policy (2012)	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix

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	
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	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	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	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	17

Appendix

Table 3: Identification of key adaptation terms in selected plan/policy/act documents

Adaptation options	Environmental Policy (1992)	The National Forestry Policy (1994)	National Environment Management and Action Plan (1995)
Livelihood Diversification and Risk Transfer			X
Resilient and Hard Infrastructure			
Institutional Capacity, Governance and Training	X	X	X
Knowledge, Information Management, Surveillance and Early Warning			X
Resilient Land Use, Rural and Urban Planning			X
Resilient Cropping and New Crop Variety			
Women Empowerment		X	
Improved Water, Sanitation and Hygiene (WASH)	X		X
Plantation, forestry, landscape and green space management		X	X
Financial Support, Insurance and Incentive Schemes		X	X
Water Conservation and Irrigation Systems	X	X	X
Post-harvest Loss Management			X
Improved Access to Market		X	X
Improved Social Service Delivery			X
Alternative Energy			X
Research and Development	X	X	X
Marine and Coastal Management	X		X
Disaster Response and Management			X

Appendix

Table 3: Identification of key adaptation terms in selected plan/policy/act documents

Adaptation options	National Fisheries Policy (1998)	National Water Policy (1999)	National Water Management Plan (2001)
Livelihood Diversification and Risk Transfer	X		
Resilient and Hard Infrastructure	X	X	X
Institutional Capacity, Governance and Training	X	X	X
Knowledge, Information Management, Surveillance and Early Warning	X	X	X
Resilient Land Use, Rural and Urban Planning		X	
Resilient Cropping and New Crop Variety	X	X	X
Women Empowerment	X	X	
Improved Water, Sanitation and Hygiene (WASH)	X	X	X
Plantation, forestry, landscape and green space management	X	X	X
Financial Support, Insurance and Incentive Schemes	X	X	X
Water Conservation and Irrigation Systems	X	X	X
Post-harvest Loss Management	X		
Improved Access to Market		X	
Improved Social Service Delivery		X	
Alternative Energy		X	
Research and Development	X	X	X
Marine and Coastal Management	X	X	
Disaster Response and Management	X		X

Appendix

Table 3: Identification of key adaptation terms in selected plan/policy/act documents

Adaptation options	National Energy Policy (2004)	Coastal Zone Policy (2005)	The National Food Policy, (2006)
Livelihood Diversification and Risk Transfer		X	X
Resilient and Hard Infrastructure		X	
Institutional Capacity, Governance and Training	X	X	X
Knowledge, Information Management, Surveillance and Early Warning		X	X
Resilient Land Use, Rural and Urban Planning	X		
Resilient Cropping and New Crop Variety		X	
Women Empowerment		X	X
Improved Water, Sanitation and Hygiene (WASH)			X
Plantation, forestry, landscape and green space management	X	X	
Financial Support, Insurance and Incentive Schemes	X		X
Water Conservation and Irrigation Systems	X	X	X
Post-harvest Loss Management			X
Improved Access to Market			X
Improved Social Service Delivery		X	
Alternative Energy	X	X	
Research and Development	X	X	X
Marine and Coastal Management	X	X	
Disaster Response and Management			

Appendix

Table 3: Identification of key adaptation terms in selected plan/policy/act documents

Adaptation options	The Bangladesh Climate Change Strategy and Action Plan (2009)	National Adaptation Program of Action (2009)	National Plan for Disaster Management (2010)
Livelihood Diversification and Risk Transfer	X	X	
Resilient and Hard Infrastructure	X	X	X
Institutional Capacity, Governance and Training	X	X	X
Knowledge, Information Management, Surveillance and Early Warning	X		X
Resilient Land Use, Rural and Urban Planning	X		X
Resilient Cropping and New Crop Variety	X	X	X
Women Empowerment	X		
Improved Water, Sanitation and Hygiene (WASH)	X		
Plantation, forestry, landscape and green space management			
Financial Support, Insurance and Incentive Schemes	X		X
Water Conservation and Irrigation Systems			
Post-harvest Loss Management	X		
Improved Access to Market		X	
Improved Social Service Delivery	X		X
Alternative Energy			
Research and Development	X		X
Marine and Coastal Management			
Disaster Response and Management	X	X	X

Appendix

Table 3: Identification of key adaptation terms in selected plan/policy/act documents

Adaptation options	Standing Orders on Disaster (2010)	Sixth Five Year Plan (2011)	Perspective Plan (2012)
Livelihood Diversification and Risk Transfer	X	X	X
Resilient and Hard Infrastructure	X	X	X
Institutional Capacity, Governance and Training	X	X	
Knowledge, Information Management, Surveillance and Early Warning	X	X	X
Resilient Land Use, Rural and Urban Planning	X	X	X
Resilient Cropping and New Crop Variety		X	X
Women Empowerment	X	X	
Improved Water, Sanitation and Hygiene (WASH)	X	X	X
Plantation, forestry, landscape and green space management	X	X	X
Financial Support, Insurance and Incentive Schemes	X	X	X
Water Conservation and Irrigation Systems	X		X
Post-harvest Loss Management			X
Improved Access to Market			
Improved Social Service Delivery	X	X	X
Alternative Energy	X	X	X
Research and Development	X	X	X
Marine and Coastal Management	X	X	X
Disaster Response and Management	X	X	X

Appendix

Table 3: Identification of key adaptation terms in selected plan/policy/act documents

Adaptation options	National Disaster Management Act (2012)	National Labour Policy (2012)	National Population Policy (2012)
Livelihood Diversification and Risk Transfer		X	
Resilient and Hard Infrastructure			
Institutional Capacity, Governance and Training	X		
Knowledge, Information Management, Surveillance and Early Warning	X		
Resilient Land Use, Rural and Urban Planning			X
Resilient Cropping and New Crop Variety			
Women Empowerment			
Improved Water, Sanitation and Hygiene (WASH)			
Plantation, forestry, landscape and green space management			
Financial Support, Insurance and Incentive Schemes	X		
Water Conservation and Irrigation Systems			
Post-harvest Loss Management			
Improved Access to Market			
Improved Social Service Delivery			
Alternative Energy			
Research and Development	X		
Marine and Coastal Management			
Disaster Response and Management	X		

Appendix

Table 3: Identification of key adaptation terms in selected plan/policy/act documents

Adaptation options	National Agricultural Policy (2013)	National Water Act (2013)	Bangladesh Climate Change and Gender Action Plan (2013)
Livelihood Diversification and Risk Transfer	X		X
Resilient and Hard Infrastructure			X
Institutional Capacity, Governance and Training	X		X
Knowledge, Information Management, Surveillance and Early Warning	X		X
Resilient Land Use, Rural and Urban Planning	X	X	X
Resilient Cropping and New Crop Variety	X		X
Women Empowerment	X		X
Improved Water, Sanitation and Hygiene (WASH)			
Plantation, forestry, landscape and green space management		X	
Financial Support, Insurance and Incentive Schemes	X		
Water Conservation and Irrigation Systems	X		
Post-harvest Loss Management	X		
Improved Access to Market	X		X
Improved Social Service Delivery			
Alternative Energy	X		
Research and Development	X		
Marine and Coastal Management			
Disaster Response and Management	X		X