UNDERSTANDING CLIMATE CHANGE FROM BELOW, ADDRESSING BARRIERS FROM ABOVE

Practical experience and learning from a community-based adaptation project in Bangladesh

Embassy of Denmark

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Understanding climate change from below, addressing barriers from above

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Foreword

The book is an outcome of an action research project on Climate Change Adaptation and Disaster Risk Reduction (CCA-DRR). Although climate change is a global problem, its impacts are felt locally particularly in developing countries. The CCA-DRR project grasps the local voices to understand the vulnerability of climate change and facilitate those people to increase their resilience to adapt with climate change. This book is written on the basis on of those stories and identifies those crucial issues which act as a barrier to reduce their vulnerability.

This book is an excellent attempt to generate knowledge that is detailed and context specific on pro poor adaptation. The knowledge is presented here is invaluable in indentifying the determinants of community based adaptation. My hope is that it will help in changing the policies and interventions in the direction of pro poor adaptation. Besides it will also help development practitioners, adaptation researchers, CBOs and NGOs who are working on climate change and government officials as well.

Farah Kabir
Country Director
ActionAid Bangladesh

Foreword

Climate Change is neither a myth nor a prophecy, but something we need to prepare for. Global climate change has emerged as the greatest threat facing human kind today. It affects society, the economy and most ecosystems. It causes poverty and human insecurity. The effect of Climate Change depends upon a number of local factors, but least developed nations are often the most affected.

In recent years, Bangladesh retained steady growth and attained commendable results in specific areas such as reducing infant and maternal mortality and high enrolment rate in primary schools. But these success stories become blurred with the recurring events of more severe and frequent natural calamities, which are believed to be a direct result of climate change. Considering these extreme events and the IPCC report the international community feels the necessity to address this immediately.

Environmental sustainability has always been at the forefront of Danish development assistance. In the four decades long partnership with Bangladesh, Denmark also underpinned this principal. Therefore Denmark responded immediately to the challenges of climate change and left no stones unturned to assist the Government and resilient people of Bangladesh in their combat against climate change. A project lending assistance to local communities to adapt to climate change implemented by ActionAid, Bangladesh is one of the immediate initiatives.

The pilot project started in 2008 and continued till December 2010 focusing on harmonization of traditional local knowledge and scientific knowledge to enable inhabitants of three districts located in three areas of Bangladesh venerable to cyclones and surges, floods and droughts for climate change adaptation. With the lessons learned from the first phase, the second phase is ongoing.

Adaptation is not all about immediate survival; it is a continuous process of seeking sustainability in the face of change. The sought outcome of the project was not only to address the immediate need of the beneficiaries but also build their self reliance to make adjustments in their life and livelihoods for future sustainability.

This publication 'Understanding climate change from below – addressing barriers from above-Practical experience and learning from a community-based adaptation project in Bangladesh'' emphasizes on the first hand lessons learned from the action research project titled 'Assistance to Local Communities on Climate Change Adaptation and Disaster Risk Reduction'. The report analyzed the strength and weakness of community mobilization activities for climate change adaptation and also suggested a set of future actions both at policy and implementation level. I hope this report will help to bridge the gap between theory and practice and enable The Government of Bangladesh, Development Partners and NGOs to scale up their interventions

Svend Olling
Ambassador of Denmark to Bangladesh

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Executive summary

This report communicates the local, practical experiences and learning from one of the first action research projects on community-based climate change adaptation interventions in Bangladesh: *Assistance to Local Communities on Climate Change Adaptation and Disaster Risk Reduction* piloted by ActionAid Bangladesh and funded by the Embassy of Denmark. It is an action research project that facilitated local people's analysis of their own vulnerability towards climate change and piloted a variety of community-based adaptation measures.

Climate change is undeniable and unequivocal. Bangladesh, a low-lying coastal area in the middle of the heavily populated mega-delta of the Ganges-Brahmaputra plain, is widely recognised as one of the countries most vulnerable to climate change. With a high frequency of natural disasters such as flood, drought and cyclone, and with a weak economy and high poverty levels, Bangladesh is a climate change hotspot.

It is not necessary to consult global climate models and scientific predictions to know how to adapt to climate change. Rural people are the experts; they have a massive knowledge of local conditions. Climate change is a new term for people living in rural Bangladesh, but they can see the changes in nature that are taking place around them, and they know the problems they are facing due to these changes, even if they cannot explain the causes of global climate change. For them, climate change is about local problems and the relationship between people and nature. The changes they are experiencing are often related to a combination of factors – climate change, environmental degradation, overpopulation and poor governance of resources. The point is not that climate change is not a problem, but that climate change is intertwining with and increasing existing problems and vulnerabilities, putting extra strain on people who are already poor, socially excluded and disadvantaged. The effects of climate change are contextual; they intensify existing problems and create new problems, but always within an existing local reality.

Climate change adaptation calls for a comprehensive approach, taking into account problems as well as causalities. Adaptation must build on insightful and in-depth understanding of how climate change impacts are felt in local contexts, and draw on the knowledge of local people. Adaptation building on local understanding does not necessarily require an entirely new approach. In a context of extreme poverty and inequality, adaptation is essentially about development. Even if we take climate change out of the equation, problems are still there. People are not worried about their future food security when right now their stomachs are empty. And adaptation for the future cannot happen without addressing this 'development deficit'. In order to do adaptation properly, we must start by addressing basic and immediate needs,

like water and sanitation, food security and livelihood strategies, while at the same time reducing the risks of extreme weather events.

Scientific and technical knowledge is necessary to support and complement local knowledge. It is a key factor in finding new ways and strategies to adapt to changing circumstances. Too often this knowledge is not available to local people, as government service providers rarely visit villages. Scientific knowledge can also help local people to understand why changes are happening, and to realise that it is something they need to act on. Knowledge about climate change helps people understand that changes are caused by human actions, and therefore it is possible to do something about them. This means that long-term plans have to be made and people may have to change their livelihoods.

We need to be careful when referring to the global nature of climate change, though. Villagers can be overwhelmed by the complexity and globality of the problem. However, it is important not to portray poor people simply as victims, but as people who, with the right support, can assume a degree of responsibility for, and find solutions to, local environmental degradation. Science should help people understand themselves as both part of the problem and part of the solution.

Climate change is not an individual problem, and adaptation is not an individual task. Adaptation should empower poor people to become responsible citizens claiming their rights from government and taking responsibility for their lives collectively. A combination of local knowledge, scientific knowledge and knowledge about rights can enable people to move from individual experience to collective action. The problems they face are common problems that need to be addressed collectively. Those affected by climate change should not just be seen as receivers of help; they should be seen as citizens acting together on their problems and claiming their rights.

Adaptation takes place in a social, political and institutional context. It is not enough to consider the adaptation measures of individuals, households and communities. We need to take into consideration the broader social and political context in which local people strive to adapt to changing circumstances and to address barriers to adaptation.

Lack of resources is the most important barrier to poor people's adaptation. People need financial space to be able to adapt. They might have the knowledge, will and capacity to adapt, but without the necessary resources, they are left to live hand to mouth and cope as best they can. Climate change is increasing and exacerbating existing risks. Having a resource base is essential for one's ability to absorb risks and rise again after disasters. The strategies available for poor people with no resource base are mostly mal-adaptive, such as forced migration, borrowing money and selling labour in advance, none of which are sustainable. Villagers in rural Bangladesh, as in many other least-developed countries, depend on natural resources for their livelihoods.

They have very limited access to or control over natural resources. This inequality is rooted in ownership patterns in relation to the means of production. Poor people are kept poor by unfair production structures and land tenure systems. They are paid too little for their work and work under insecure and exploitative conditions. Often those who own crucial resources are also very powerful and influential locally. These inequalities need to be addressed.

Lack of government action is another crucial barrier to poor people's adaptation to climate change. Much debate on government institutions focuses on national and international levels, missing the point that adaptation is an inherently local process. Successful adaptation depends on the actions and capacities of local government institutions. Local government plays a central role in mediating access to scarce resources, providing basic services and ensuring appropriate protection from natural disasters. The institutional set-up around climate change adaptation is complex and confusing. Local politicians and government officials have very limited knowledge about climate change and generally do not consider it to be something that is on their desk. Local institutions are hampered by very little capacity for coordinated action and very low trust from the people they are intended to serve. Capacity building of local government institutions is essential to climate change adaptation.

Local government institutions operate in a national political and institutional context, and function as implementing agencies of policies determined at national level. Adaptation demands a comprehensive national climate policy to incorporate climate change into national development plans – a need that the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) does not fulfil. The strategy needs to be backed up with funds and specific laws and policies. It must prioritise local government to facilitate local adaptation, and give space and flexibility in planning and budgeting to find solutions suited to the local context. Local people must be included in policy-making processes so that they can contribute their knowledge about local circumstances. Policies must emphasise poverty reduction, address inequality in relation to resources, and ensure fair and democratic access to scarce resources. Adequate provision of government services must be a priority to ensure access to water, sanitation and health, as well as to support adaptation strategies with knowledge and information. Effective policies must ensure proper protection of people's lives, assets and livelihoods from natural disasters such as cyclones, flood, drought and erosion.

Adaptation does not come free. Rich countries must pay their climate debt. Adaptation is everybody's responsibility, but responsibilities should be defined according to everyone's respective capabilities. Bangladesh is an extremely poor country and, like other developing countries, has contributed very little to global emissions of greenhouse gases. Affected populations and countries have the right to be compensated for the damages inflicted by the rich.

Glossary of local terms

Bigha: land measurement introduced by the British and used in Bangladesh, Nepal, India and Fiji. It equals 1,600 square yards

Dadandar: local money lender

Jadu nol: literally means magic pipe. Used to conserve water and irrigate rice fields

Parishad: council

Shahu: local name for rich, powerful landlords in northern Bangladesh who own more than 100 bighas of land

Union: lowest local government administrative tier in rural Bangladesh

Upazila: sub-district

Understanding climate change from below – addressing barriers from above

Practical experience and learning from a community-based adaptation project in Bangladesh

1

Introduction

1. Introduction

Adaptation reiterates the old proverb: *think global, act local*. However, much climate change is a global phenomenon, the effects are felt locally and adapting to its impacts is a local process. Rural Bangladeshis have a long history of adapting to changing weather and climate. Often people living in villages are illiterate, and therefore thought to be unknowledgeable. Illiterate might be true, since the educational institutions are scarce and inaccessible for many. But rural people are not unknowledgeable; they get their education from nature and have a rich knowledge base on local conditions.

This report communicates the localised, practical experiences and learning from one of the first community-based climate change adaptation interventions in Bangladesh – ***Assistance to Local Communities on Climate Change Adaptation and Disaster Risk Reduction*** – piloted by ActionAid Bangladesh and funded by the Embassy of Denmark. There are currently many climate change adaptation projects in Bangladesh, but this is one of the first action research projects to facilitate local people's analysis of their own vulnerability towards climate change and to pilot a variety of community-based adaptation measures. The key idea of the project was to generate critical knowledge on poor people's vulnerability to climate change, their adaptive capacity, the effectiveness of various community-based adaptation measures and the feasibility of scaling up these to national level.

The project ran from 2008–10 and operated in three areas of rural Bangladesh vulnerable to natural hazards: Sirajganj on the Jamuna River, which is vulnerable to floods; Naogaon in the north-west, which is vulnerable to drought; and Patuakhali on the coast, which is vulnerable to cyclones, sea-level rise and salinity intrusion. See Appendix 1 for a brief overview of the project.

We now know that climate change is undeniable, and Bangladesh – a low-lying area in the middle of the heavily populated mega-delta of the Ganges-Brahmaputra plain – is widely recognised as one of the countries most vulnerable to climate change. With its high frequency of natural hazards like flood, drought and cyclones, a weak economy and high poverty levels, Bangladesh is a climate change hotspot. But the effect of climate change at local level is not something that can be learned from reading global-scale assessments such as the Intergovernmental Panel on Climate Change (IPCC) reports or following international negotiations. Climate change impacts are felt in specific villages by specific people with specific problems. The effects of climate change are highly contextual; they can intensify existing problems and create new problems, but always within an existing local reality.

It is not always necessary to consult the results of global climate models and scientific projections to know how to adapt to climate change at a local level. Rural people are the local experts and have a rich knowledge of local conditions. In Chapter 2, local impacts and understandings of climate change are explored, drawing on experience from the project and the practical knowledge of people living with climate change. The problems experienced by local people match the IPCC's scientific projections, but while the scientists tend to focus on cause and effect, local people's concerns centre on the problems they are experiencing. We argue that adaptation, building on local understanding, does not require an entirely new approach. Adaptation is essentially about development and requires a comprehensive approach.

Community-based adaptation must build on an insightful and in-depth understanding of how climate change impacts are experienced locally and draw on local people's knowledge. Coping mechanisms to deal with different hazards already exist. But climate change adds a new dimension to existing problems and vulnerabilities. As well as making poor rural people more vulnerable, their knowledge is no longer useful in a changed scenario. Adaptation must therefore also be based on technical and scientific knowledge about climate change and the newest adaptation measures. It must draw on the collective capacities of local people, enabling them to analyse and act on their situation together, empower them to know their rights and act together on climate change. Chapter 3 describes how the project used local knowledge, scientific knowledge and knowledge about rights to empower people to take collective action on climate change.

Climate change is not an individual problem. It is therefore not enough to consider the adaptation measures of individuals and households. We need to consider the broader social and political context in which local people strive collectively to adapt to changing circumstances.

Chapter 4 focuses on the barriers to adaptation in relation to access and control over resources. People might have the knowledge, will and capacity to adapt, but without the necessary economic space for action, they are left to live hand to mouth and to cope as best they can. Adaptation that enhances resilience to climate change requires resources. This chapter explores how access to and control over resources influence the adaptation options available to poor people, how people are able to absorb and handle different risks related to climate change, and the sustainability of various adaptation measures. It explores how local inequalities and ownership structures shape vulnerability to climate change and what adaptation measures are available. Finally, it discusses climate change-affected communities' access to finance and their relationship to national and global inequalities.

Chapter 5 deals with the role of local government and public service institutions in relation to climate change adaptation at local level. Climate change adaptation is highly dependent on institutional and political factors, therefore it is important to consider how the government is interpreting and fulfilling its responsibility to ensure the safety and wellbeing of those affected by climate change. This chapter explores how local institutions affect the adaptation options available for poor people, how they support and hinder poor people's adaptation, and the capacity of local institutions to take on the responsibility of facilitating local adaptation.

Local government and public service-providing institutions operate in a national political context and implement national policies. Chapter 6 reviews the central government strategy on climate change, the Bangladesh Climate Change Strategy and Action Plan (BCCSAP). In light of experience from the project, we argue that the plan is neither comprehensive nor sufficient. A national adaptation plan must be based on local realities, foster action at local level and address the structural barriers to adaptation by poor people. The chapter is our constructive input to the national policy-making process.

The report draws on experience from the (2008–10) project, backed up by extensive qualitative fieldwork by two graduate students from Denmark between August and October 2010. The fieldwork included focus groups and interviews with villagers, local politicians, government officials, resource owners and various local experts. See Appendix 3 for further details of the fieldwork.

From a country-coverage perspective, the 12 project villages might not be a representative sample. However, issues discussed – such as the importance of local knowledge, access to and control over resources and the role of local institutions – are similar to other districts and villages in Bangladesh and may also resemble issues in other developing countries. The experiences and lessons learned will have relevance to politicians, practitioners and researchers interested in adaptation. We hope the findings will inspire others to conduct more in-depth research and assist donors and development organisations in crafting funding policies and strategies for better adaptation programmes. Hopefully, the report will also encourage politicians and policy makers to formulate pro-adaptation policies and strategies, and ensure better regulatory mechanisms for their effective implementation.

2

Climate change gone local

2. Climate change gone local

- *Understanding climate change and adaptation from below*

However much climate change is a global phenomenon, adapting to its impacts is a local process. People do not adapt to global trends. They adapt to the changes they experience in their day-to-day lives. These are in part caused by global climate change, but they are also interwoven with a lot of other factors. In order to understand how climate change affects everyday life, we have to start by asking local people living with the changes. Only then can we start thinking about how to adapt. This chapter explores local impacts and understandings of climate change, drawing on experience from the project and the practical knowledge of local people living with climate change.

2.1. Understanding climate change from below

One of the main things we learned from the project is that villagers are very knowledgeable about local conditions and that they are observing changes in their environment. After all, their lives and livelihoods depend on their ability to adapt and make a living from nature. Although 'climate change' is a new term to them, for a long time villagers have been living with and trying to cope with the problems created by it. While they may not have an explanation for the global causes of climate change, they can explain many of the changes from a local perspective, drawing on local knowledge and experience.

Livelihood is the number one concern for poor people in rural Bangladesh. We might want to talk about climate change; they want to talk about livelihoods. We might want to talk about adaptation for the future; they want to talk about changes that are happening right now, like those that are affecting their ability to farm.

All over rural Bangladesh, seasons are changing, temperatures are rising and rainfall patterns have become unpredictable. Villagers report they can no longer differentiate between one season and the next. Farmers can no longer count on the monsoon rain coming at the right time, making it difficult to know when to plant crops. The unpredictability of rainfall and fluctuating temperatures is causing massive problems for farmers, whose main crop is rice paddy, which needs large amounts of water and the right temperature to thrive.

Changes in temperature and rainfall during the dry season are also putting pressure on the quality and availability of fresh water for both domestic and irrigation purposes. The rising sea level is increasing salinity intrusion into surface and groundwater

sources, although this varies from season to season. Coastal areas are also experiencing drought during the dry months. As well as reducing crop production, these changes are affecting domestic water supplies and sanitation, creating a greater risk of water-borne diseases.

In some regions the problem is too much water. Changing monsoon patterns are causing severe floods and river erosion in Sirajganj, and farmers in Patuakhali are struggling with increased salinity caused by tidal surges, sea-level rises and erosion of the coastline.

2.2 Climate change as one factor among many

People never just live in a climate. They live in a world shaped by social, cultural, environmental and economic factors. Climate change is therefore just one of many things people have to manage simultaneously with other problems, risks and vulnerabilities.

That is why climate change is never the only explanation for local problems. Problems are caused by a combination of climate change, environmental degradation, overpopulation and poor governance of resources. Local and regional deforestation is a contributing factor to changes in rainfall patterns. Mismanagement of ponds, canals and tube wells contributes to water scarcity problems. Overconsumption is contributing to decreasing ground-water levels and water scarcity in Naogaon, and the lack of fish in Patuakhali might be related to overfishing. Increased salinity of fresh water in Patuakhali is also related to mismanagement of sluice gates separating the rivers from canals. Increased agricultural difficulties can also be explained by soil and fertility degradation due to modernisation and the increased use of fertilisers and pesticides. The increased unpredictability of floods in Sirajganj might be related to both local and upstream river management. Problems with erosion and tidal surges might also be related to management of riverbanks and coastline.

2.3 Adaptation building on local understandings

The point is not that climate change is not a problem. But it is also interwoven with and increasing existing vulnerabilities, putting extra strain on people who are already extremely poor, socially excluded and disadvantaged. It is therefore difficult to distinguish between climate change impacts and other problems people experience in their relationship to nature and their efforts to make a living from it. Adapting to climate change is not something that requires an entirely new approach. It is essentially about development, and requires a comprehensive approach taking development issues into consideration as well as environmental and sustainability issues.

Adaptation must consider problems, not just causalities. Villagers generally talk about climate change as changes in the local environment and subsequent problems with making a living. People are so excruciatingly poor, they cannot think about the future. Adaptation for them is essentially about solutions to these problems, and therefore means addressing basic and immediate needs like water and sanitation, food security and livelihood strategies, while at the same time reducing the risk of natural disasters that disrupt their livelihoods and mobility, and damage their homes and assets.

A main learning from the project is that adaptation can only happen through addressing the development gap. One cannot ask people to worry about future food security when their stomachs are empty right now. It is very difficult to see where socio-economic development ends and adaptation to climate change begins. Adaptation calls for investment and long-term planning, which is beyond the scope of local people if they do not have their basic needs covered. Extreme poverty is a massive problem in rural Bangladesh. Addressing this issue is a precondition for even starting to talk about climate change adaptation.

From the outset of the project, villagers said what they need is safe drinking water, sanitary latrines, a safe home and a stable income. The project could not deal with adaptation without first dealing with these urgent concerns. Faced with a disaster or just a minimal drop in income, villagers struggle to survive, with no economic base from which to recover or adapt for the future. This is vividly illustrated by the agricultural extension officer in Naogaon when he explained how they hand out seeds to help local farmers adapt to climate change through crop diversification: "*We only work with farmers who are self-sufficient and able to support their own family. If the farmers are too poor there is a high probability that they will just sell the seeds instead of farming themselves.*"

3

Knowledge, rights and collective action

3. Knowledge, rights and collective action

- *Facilitating community-based adaptation processes drawing on the knowledge and capacities of local people*

There are many types of knowledge from many different sources. From the project, we learned that three types of knowledge are important in dealing with community-based adaptation: local knowledge, scientific knowledge and knowledge about rights. Local knowledge enables people to analyse their situation and helps them gain a practical understanding of their context. Adaptation must also draw on scientific knowledge to ensure an understanding of climate change and its causes. Adaptation initiatives must also provide people with knowledge about their rights and how to demand them. Together, these types of knowledge can empower people to take collective action.

3.1 Local knowledge matters

Most climate change projections are based on scientific modelling. While these types of data might give a picture of the global, or even regional or country, situation, they cannot give an accurate picture of what is at stake at local level. There are two city-based meteorological stations recording climate observations next to the Naogaon project area (in Rajshahi and Bogra city), but they do not show the climatic extremes people are experiencing in project villages. In order to adapt to climate change in a specific area, we need to learn from and use the knowledge and experience of the local community.

During the project, villagers were placed in teams, known as the Gonogobeshona or People's Research teams. These teams formed the focal points and backbone of the project. Through participatory research, the teams generated systematic knowledge of local problems and the impacts of climate change. The process began with analysing their existing problems and prioritising them on the basis of their importance and urgency. They then worked collectively to suggest and explore better adaptation practices – both structural (hardware) and behavioural or management-related (software). The teams have also been key actors in piloting the different solutions. By setting the framework and giving villagers the space to generate systematic knowledge, it became clear that individual community members were very knowledgeable about their own situations. By systemising, synthesising and organising this knowledge, what was already known became tangible and something they could act on collectively.

Knowledge was gathered through a people's research process inspired by the 'reflect' approach, which is based on the theories of the Brazilian educator and theorist

Paulo Freire. ActionAid Bangladesh has long experience and expertise in using this methodology, which makes people conscious of the social forces that determine their lives and gives them the tools to analyse their problems collectively and find collective solutions.

Protecting people and assets from disasters

The strength of local knowledge is that it does not differentiate between natural, environmental, socio-economic and cultural aspects, and so gives a comprehensive picture of what is going on. In Pathaukali, a team found that people were reluctant to go to shelters during cyclone warnings because they did not want leave their assets unprotected. Without assets, there would not be much point in staying alive, as this quote from a local fisherman illustrates: *"If I go to the cyclone shelter and survive, and come back only to find that I have nothing, then I might as well die, as I have nothing to live from."* The solution the team came up with was to build a collective bunker under the team house where villagers can store their belongings safely while they are in the safety of the cyclone shelters. Three members of the team will record what each person stores in the bunker, and the same three will be present when the belongings are given back.

3.2 Lack of respect for local knowledge

The project has shown that local people have huge amounts of knowledge on the changes happening locally and that they have the capacity to analyse and come up with solutions to their problems. However, there is often little respect for villagers' knowledge. Knowledge flows tend to be top-down, from national and local government officers to villagers, rather than from the bottom up.

There is a lack of will and no institutional set-up to incorporate local knowledge into planning and policy making around climate change adaptation. The government has a National Adaptation Programme of Action (NAPA) and a Bangladesh Climate Change Strategy and Action Plan (BCCSAP), but both documents provide standard directions and budgets that do not allow for flexible local solutions. In order to ensure sustainable adaptation locally, future policy making must take local knowledge into account.

3.3 How climate change affects local knowledge

Climate change is outdating some local knowledge. Many find that what they used to know about nature is no longer valid. Before, people used various indicators to track seasonal changes, such as the blossoming of a particular flower, the falling of bamboo

leaves in winter and new leaves on the trees in spring. Now villagers complain that they no longer see these kinds of indicators, making it increasingly difficult to use their farming knowledge and experience. A woman from Patuakhali explains: *"The seasons do not change the way they are supposed to. It is becoming unpredictable. When we expect cold, we get hot, and when we do not expect rain, we get rain."*

In flood-prone Sirajganj, local villagers used to be able to cope with and use the floods because they knew when they were coming. They could time crop cultivation with inundation and also benefit from river water sediment fertilising the soil. Nowadays, villagers complain that the floods are unpredictable and that they sometimes come at the wrong time and destroy crops.

Although some local knowledge is becoming invalid and unusable, local people are able to accurately compare how it used to be with what they experience now. They are also surprisingly creative when it comes to adapting to changing circumstances. After cyclones Sidr and Aila (in November 2007 and May 2008), the women of Patuakhali started to cut their hair because long hair can get caught in trees and bushes during storms. They also stopped wearing sarees and started wearing salwar-kamees (predominantly worn by working women in urban areas). Another local measure has been to plant strong trees, bamboos and coconut trees around homesteads to provide protection and something to hold on to during storms. During the project, local knowledge like this was shared between the villages, giving people ideas about how to adapt to new circumstances. At the same time, it prompted them to collectively abandon the convention that married women must wear *sarees*, giving a new dimension to the power of knowledge.

3.4 Using science to understand climate change

Scientific and technical knowledge is crucial to local adaptation, and can help local people relate the changes they are experiencing to global climate change. It has helped them understand what is happening around them and to some extent why, and made them realise it is something they need to act on.

As part of the local research process, villagers were given scientific explanations about climate change and predictions about future impacts. Scientific knowledge has complemented local knowledge, helping people to understand why changes are happening and that the climate will not just change back. A woman in Patuakhali explains it like this: *"Before joining the team and getting training, we did not know anything about climate change and its consequences. Previously, we used to think that there is something wrong with the climate. We knew that in our country we used to have six seasons but nowadays we can feel only three seasons. The heat is increased in relation to*

previous days. These were the things we used to feel but could not explain. In the team we have come to understand the reasons behind all the changes."

Scientific knowledge also helped people realise that climate changes are caused by human actions, and therefore it is possible to do something about them. Long-term plans have to be made and people may have to change their livelihoods. A male farmer in Naogaon puts it like this: *"Climate change is not something we can fight with, but we can take measures for adaptation. Now we know which vegetables or which crops are good for the land and how to cultivate with the changing seasons."* Often it is difficult for people to imagine changing a livelihood that may have been passed down from one generation to the next. But with new awareness and knowledge, villagers are more ready and willing to try new ways to adapt to new circumstances. Rural Bangladeshis are often described as survivors, but adaptation is about more than just surviving. It needs to be started gradually, not when there are no livelihood options left.

3.5 Accessing scientific knowledge to foster adaptation

Local people's knowledge can provide ideas for how to adapt, but there is also a crucial need for science to come up with new knowledge and new strategies. People need scientific knowledge to find new ways of living and making a living that are adapted to changed circumstances.

During implementation of the project, scientific and technical knowledge was crucial in piloting various solutions. In the Patuakhali cyclone bunker example, villagers identified the best solution themselves. Traditionally, they dug holes inside their houses and covered their valuables with soil. When it came to constructing a waterproof bunker, they needed technical knowledge so the team asked a local engineer to do a technical drawing based on the villagers' description of where it would be placed and how much it would have to hold. This approach of mixing local and scientific or technical knowledge was used in many other adaptation measures, such as designing sanitary latrines in drought-prone areas that use a minimum of water and introducing appropriate cultivation methods in saline land.

It is not easy for people living in rural areas to access scientific or technical knowledge. They often do not know what to ask for or where to begin looking for it. Even if they did it would be difficult to get to it because of the remoteness of their villages. Local government service providers are responsible for disseminating scientific and technical knowledge on issues like agriculture, livestock and fisheries through the local extension officers. But villagers complain that local government offices are understaffed and officials rarely visit them.

Bringing knowledge to the people

To close this knowledge gap and make scientific and technical information easier for rural people to access, a research and information centre was set up in Naogaon. Leaflets and posters provide information on different issues, and twice a month the agricultural extension officer and a local veterinary doctor (trained by the project) come to answer questions and disseminate information about how to raise cattle and treat diseases. Before, villagers in Naogaon had to travel a long way to see a vet. Bringing knowledge to the people can also promote efficient use of resources. Farmers in Naogaon use a special pipe, known locally as *jadu nol*, to calculate the amount of water they need to irrigate their crops. This is crucial in a water-scarce area. Originally, the idea was introduced through a national newspaper. Later, the project brought the technology to Naogaon where, according to farmers, it saves 25–30% of water.

Warning people about floods

The early warning system set up by the project in the flood-prone area of Sirajganj sends out flood forecasts from the central authorities through a system of flags and pillars. Village flood shelters are too small to accommodate people with all their assets, including livestock, so people often used to lose their cows, goats and sheep, as well as valuables such as their children's school books. Now the early warning system gives them time to save their household assets and take their animals to higher ground.

3.6 Knowledge about rights: the rights-based approach in action

Many of the adaptation measures villagers came up with are services – such as safe sanitation, clean drinking water and knowledge about agriculture, livestock and fisheries – which should be delivered by local government departments. As part of the project, local people were informed about their rights. However, many had bad experiences with local officials and politicians, so were reluctant to demand anything from them.

As well as being aware of their rights, people need to know the proper channels to go through in order to fight for them. Through the project, villagers realised the power of knowledge and the power of numbers when talking to the authorities. One person can easily be ignored, but it is harder to ignore 25 people from a people's research team or even a whole village. One team member from Naogaon explains: *"By sitting in the team we have learned to share our knowledge with each other. At the end we are able to choose the best solution for us. We realised that one more advantage of the team is that previously when we used to go to any government officials with our problems, no one would pay attention to us. But when we started to go in teams, people became bound to listen to us."*

The action research process also helped villagers do 'informed' advocacy. Their demands became much stronger when they made them as a group and were specific about their needs, for example, asking local government institutions for a tube well, to be installed in a particular place, using specific materials and made to a specific depth.

The rights-based approach emphasises the fact that vulnerable people should not be left waiting for hand-outs. As citizens, they have rights to government services, and should actively participate in deciding the how those services are used. The project has made local people more aware of their rights and created links between them and their local government institutions, although they still experience severe difficulties in getting the services they need and have a right to.

3.7 Fostering capacity for collective action

The people's research process enables people to move from their own individual experience to collective, systematised knowledge. To be able to use this knowledge, they need to have space for collective action – physically, economically and mentally.

Physical space was created by building a house in each village where teams could gather for regular meetings to share information, discuss problems and come up with solutions. The houses have also been used to disseminate scientific knowledge about climate change and adaptation options.

Economical space came from allocating a budget that each team could spend as they thought best. By providing a flexible budget, the project gave teams the economical space to experiment with new knowledge and pilot new solutions.

The research process itself provided the mental space. The process was not just a way of generating systematic local knowledge, but also an empowering process giving members the tools to analyse their situation and, as a group, collectively come up with the best solutions.

The research process taught people how to organise and how to use the knowledge they already had to act on climate change. In Sirajganj, local people were able to identify the areas in their village that are prone to floods. As a female team member explained: *"Previously, we did not discuss our problems or solutions with anyone. Nowadays, we sit together and talk about our problems and try to choose the best solutions for us. There were also floods previously, but then one family might take one measure and another family might take another measure to save livestock, food and drinking water. When we started to share our knowledge we were able to identify the simplest and collective ways to do this."*

The project is full of stories like this where people have found ways of working collectively to adapt to climate change and build resilience. In Naogaon, farmers have secured water for household and irrigation purposes through a system of collectively managed ponds. Farmers have also created a milk value chain, where they gather milk from many individual households and transport it to market together. Dealing with climate change is a collective not an individual problem. It is therefore crucial that adaptation programming facilitates collective action.

However, collective action is not to be taken for granted. The homogenous rural village idyll is most often a figment of the imagination. Tribal and indigenous people are often highly marginalised within their communities and it takes considerable effort to include them in collective processes. Poverty and frequent disasters are also dissolving community feeling and coherence in many villages. Loss of land and homes is forcing people to move to survive, especially in Patuakhali. Extensive relief items were distributed there after cyclones Aila and Sidr. These kept people alive through tough times, but too much relief can make people dependent. Since relief is distributed to individuals, people can start to view each other as competitors rather than as facing common problems that need to be addressed through cooperation, not competition.

The participatory approach used in the project has given villagers a sense of owning and sharing problems, and also given them the confidence to choose different solutions. Bringing local knowledge and collective action into the process, and giving villagers control over the allocation of budgets, has meant that they take responsibility for the solutions they implement. They are involved throughout the process, talking to contractors and approving materials. They are not just recipients of aid. They are responsible citizens finding solutions to the problems they face and claiming their rights.

4

Access to and control over resources

4. Access to and control over resources

- *How lack of resources, local inequalities and ownership structures hinder the adaptation of poor people*

In a context of extreme poverty, inequality and landlessness, resources matter. It is that simple. The previous chapter described how the project drew on local knowledge, scientific knowledge and knowledge about rights, and how together these can empower people to act collectively on climate change adaptation. The truth is, however, that knowledge, rights and collective action are not enough to facilitate adaptation. This chapter explores how access to and control over resources influences what adaptation options are available to poor people, whether or not they are able to handle risks, and the sustainability of various adaptation measures. It explores how local inequalities and ownership structures are shaping vulnerability to climate change and the availability of adaptation measures. Finally, it discusses people's access to finance for adaptation in relation to social, local and global inequalities.

4.1 Resources matter

Like the vast majority of people living in rural Bangladesh, those involved in the project depend on natural resources for their livelihoods. They struggle to cultivate miniscule pieces of land and secure fresh water for their crops. Those who are completely landless lease land from large landowners or work as agricultural labourers on other people's land. In Naogaon, almost everyone depends on agriculture and related businesses. In the coastal area of Patuakhali, many people are also fishermen, and in Sirajganj many rely on work in the handloom industry. A number of people are also involved in various types of rural wage labour such as rickshaw or van pulling and construction work.

4.1.1 Some have options – others do not

Poor people have very limited access to and control over the resources they depend on for a living. The majority do not own their own land or their own fishing boats and nets. They do not have the capital to invest in climate change adaptation, and they do not have the control to make decisions regarding the use and management of resources. Not all rural Bangladeshis are poor. The ones who own the resources have considerably more capacity to adapt to climate change. The extreme inequality in access to and control over resources means that some people have options, while others do not.

Rich people's adaptation: mal-adaptation creating poverty

The large landowners in Naogaon, the *shahus*, are experiencing the same climatic changes as other people in the area – changing rainfall and scarcity of water. These changes are making it increasingly difficult to cultivate paddy, which needs large amounts of water – leading to less rice production. Instead of leasing their land to poor farmers for paddy cultivation, many shahus have started planting mango trees. Although mango is also vulnerable to the weather (foggy weather can destroy the crop during early flowering), it has the potential for much larger profits than paddy. It also requires much less water and labour. As mango trees take seven to eight years to mature, it is a long-term investment and an option not open to poor people. As a local Naogaon farmer explains: "*Those without land cannot cultivate mango trees on other people's land. The rich people plant mango trees, and only call on us when they need us to do particular work, like spraying pesticides. The rest of the time we have no work.*" Because mango orchards are less labour intensive than paddy fields they provide less work for agricultural labourers. The move from paddy to mango is reinforcing local inequalities, leaving poor people with fewer options and the rich with more. The *shahus* are not adopting mango cultivation as an adaptation strategy. They are doing it for financial gain and to exploit a law specifying that the maximum amount of land anyone can own increases if they convert to mango.

Poor people's adaptation: forced migration and money borrowing

The main strategies available to poor people with no access to resources are migration, borrowing money or selling labour in advance, none of which can be classified as adaptation strategies. Mal-adaptation might be a more appropriate term, as these strategies are not sustainable and contain no consideration for the future. In all project areas, migration is the number one strategy. In Naogaon, seasonal labour migration is widely used to cope with the lean period from October to December when there is very little work available. Climate change is extending the lean period so that more and more people are forced to migrate, even though migration is far from solving their problems. Men often migrate to cities where living expenses are higher than in the rural areas and the amount of money they are able to save is limited. While the men are away, their families often have to borrow money at high interest rates to buy food. Any money saved is often only enough to pay back the debt. Sometimes people borrow money to get through the lean period by selling labour to the shahus in advance. The catch is that the price for labour sold in advance is only 50% of the price in the agricultural season. Many people are caught up in a vicious cycle of debt, having to take out a new loan to pay off the old one.

4.1.2 New options come with resources

Locally, there is a great abundance of ideas for adaptation measures. Some villagers suggest investing in irrigation. Others suggest investing in cattle or other types of livestock. Some suggest switching to different crops more suited to the new situation. The people's research teams were given a budget to work with. This gave them the possibility to pilot a variety of adaptation measures, many of which would otherwise have been out of reach for local villagers. An important learning from the project is that people need economic space to have the capacity to adapt.

Growing vegetables and rearing livestock to support the family

In most villages adaptation measures evolved around improving household income to increase resilience. The most popular options were rearing livestock such as cows, goats and ducks, and growing vegetables and fruit trees. These options were especially popular among women, as they could contribute to household income while staying at home. They were trained in the best ways to rear livestock and cultivate crops around their homestead in their specific area. More importantly, they were also given livestock and seeds for various vegetables and fruit trees. A woman from Patuakhali explains how she has been able to raise her income through growing vegetables: "*Not only do I have vegetables for my family to eat, I can also earn money to use for my children's education. I can also help my neighbours, and sometimes if people ask I am able to give away some of my vegetables.*" Without the actual input of resources this would not have been viable options for most people, as they are mostly in deficit and never have any surplus to invest in the future. Another woman in Sirajganj explains how the extra resources have helped build the resilience of her family: "*During floods we used to have nothing to do. We had to borrow money to survive in those times. Now we have raised the level of our houses to protect the homestead from floods, and therefore we can go for growing pumpkins and papaya, and we can also keep our livestock safe.*" But within the context of extreme inequality in access to land, people are still facing severe constraints on their adaptation, as this woman from Naogaon explains: "*I do not have that much land to grow vegetables on. So I cannot grow large-scale and sell for commercial purposes. On my small piece of land (around 20 square metres) I can grow 160 kg vegetables. If I had three times as much land, maybe I could grow 500-600 kg.*"

4.1.3 Shouldering risks, bouncing back

Climate change is exacerbating risks related to making a livelihood from nature. These risks include increasingly difficult agricultural production due to changing rainfall patterns, lack of fresh water, problems with salinity, lack of fish and the increasing risk of losing lives and assets due to river erosion, flooding and cyclones.

Having a resource base is essential to be able to absorb risks and rise up after disasters. When dealing with periods of decreasing income, having a bit of capital dramatically increases people's resilience.

Handling the casino economy of fishing

In the coastal area of Patuakhali, fishing is a risky business. First, each fishing trip requires massive investment to hire a boat and fishing equipment, and to pay living expenses while away. Secondly, fishermen face the risk of cyclones and storms that are ravaging the Bay of Bengal.

The fishing industry is characterised by large businessmen, the *dadandars*, who own the boats, put up the capital and control the fish markets. Most ordinary fishermen either borrow money for their own fishing trips or work as wage labourers for other fishermen. There are massive differences in how *dadandars* and ordinary fishermen experience risk and how they are able to handle it. A *dadandar* can survive even severe losses, as he will have capital to reinvest and buy new boats. For an ordinary fisherman, staying on land because of a cyclone warning can be extremely costly. On the other hand, if he loses everything in a storm he will be heavily indebted to the *dadandar* who provided him with the boat, equipment and capital for the fishing trip.

A combination of rainfall changes, overfishing, pollution and the destruction of fishing grounds is making fishing an even more risky business. Fishermen complain that the *Ilish*, the type of fish fishermen in Patuakhali make most of their money from, is migrating to the deep sea. As one local politician explained: "*Fishermen who used to make a good profit are now totally at a loss. They are not making any profits. Therefore many fishermen have left their professions and migrated to Dhaka to work as day labourers.*" The changes mean that larger, motorised boats and longer fishing trips are necessary. While the *dadandars* have the capital to make the bigger investments necessitated by climate change, many ordinary fishermen are pushed out of the fishing industry and forced to find alternative livelihoods.

Losing everything, again and again

In Sirajganj, the lives of people living on the banks of the unpredictable and wayward Jamuna River are being affected by more untimely floods and severe erosion. Heavy sedimentation is causing the riverbed to rise and creating new char lands (river islands), while at the same time there are massive erosion problems along the riverbanks. Climate change is exacerbating existing vulnerabilities and putting severe stress on people who are already very vulnerable. A shift involves money, labour and extra

effort. Many people have lost everything over and over again. Every time a family has to start over they are stuck in even deeper poverty. New land created through sedimentation is distributed to landless people, but the process of land distribution takes a very long time and depends on government initiatives. In the meantime, people are landless, often living in scatter settlements outside the embankments. As one project staff member explained: "*When the frequency of hazards and disasters is rising, it is affecting their strength, both financially and mentally. I have seen a family shifting their home 35 times. It is extremely stressful. Every time they are back to scratch!*"

4.2 Ownership of the means of production

Poor people have very limited access to or control over the resources they depend on for a living. Ownership structures are related to social class and local power structures. Often those who own the crucial resources are also very influential locally. Meanwhile, poor people are kept poor by unfair production structures. They are paid too little for their work and work in insecure and exploitative conditions. Addressing access to and control over resources means tackling traditional inequalities and discussing the redistribution of resources, production structures, minimum wages and job security. The following examples illustrate vividly the sharp distinction between those who own resources and those who do not.

Feudal relations in Naogaon

In Naogaon, agricultural production is characterised by extreme inequality in land distribution. Land is owned primarily by a small elite of very large landowners, the *shahus*. Most *shahus* own much more than 100 *bighas* of land, which is the legal upper limit. They work round the legal limit by placing formal ownership with various relatives. The *shahus* are rarely the ones getting dirt under their fingernails, tending to live comfortably in urban areas. Actual cultivation is done by ordinary people, either by leasing a small piece of land as sharecroppers or working as agricultural labourers on other people's land.

Some people own miniscule pieces of land that are not nearly enough to be self-sufficient so have to supplement household income with sharecropping or as agricultural day labourers. Others have to migrate to find work or borrow money. Agricultural labour is generally low paid and comes with no job security. Workers are hired on a day-to-day basis and as there are often more people seeking work than there is work available, wages are forced downwards.

Farmers also complain about exploitative tenancy agreements that are almost always in favour of the *shahus*. A sharecropper has to give 50% of the total crop to the *shahu*

who owns the land. The other 50% they can keep for themselves, but they also have to bear all the costs for seeds, irrigation and fertiliser. In the end there is often not much left.

The relationship between ordinary people and the landowners resembles feudalism. A *shahu* tends to consider the people living on his land as his servants, as a male sharecropper in Naogaon described: "*We do not even share 50/50. After harvesting we have to give paddy and hay to the farmers. We also have to feed them or give them a grand treat with gifts such as ducks or any other livestock. Sometimes we have to do household work for the shahu without any payment.*"

In times of decreasing agricultural production, sharecroppers in Naogaon are bearing all the risk of crop failure. Furthermore, they are suffering from water scarcity. *Shahus* often control access to fresh water. They have ponds and deep tube wells on the land they own, and charge sharecroppers and marginal farmers high rates to use the water for irrigation.

Caught in the jaws of loan sharks

Most ordinary fishermen either borrow money for their own fishing trips or work as wage labourers for others. They often go on fishing trips for 10 to 15 days and have to borrow money from *dadandars* to buy food for their families while they are away. Fishing is a seasonal livelihood with two peaks and two lean periods, one from December to February and the other from June to August. During these lean periods most fishermen have no work and often have to borrow money and sell their labour in advance to *dadandar*s. Some are caught up in never-ending debt cycles, forced to sell their labour in advance or borrow money from *dadandars* just to buy food to survive.

Fishermen complain that when they come back from a fishing trip they have to pay the *dadandar* in fish at a price fixed by the *dadandar*, who can then go on to sell the fish at a higher price. The wife of a fisherman explained: "*We are held captive by the dadandars. Our men risk their lives to catch fish. Dadandars only provide the money. Still we have to give a percentage of the fish we catch. The dadandar is getting both the fish and the profits. If we could sell directly to the market, we could make a better living, but the dadandars will not allow us.*"

Fishing is a risky business. Some even compare it to gambling. Fish might not be where the fishermen expect them to be. They might catch too few or too small fish. They might have to stay inland because of a cyclone warning. Or, even worse, lose the boat and equipment in a heavy storm. If a fisherman is unlucky, he still has to pay back

the *dadandar*. In 2010, by October there had already been 17 low depressions. This is affecting fishermen severely. It is becoming increasingly difficult to make a living as an ordinary fisherman, as the wife of one explained: "*It is no longer profitable to take money from the dadandars and go fishing. There are no fish to catch, so it is becoming a burden. The interest rates are high and increasing day by day. Every time we miss a payment the interest rate goes up. If we do not pay back on time, the dadandar will take everything from us: our house, our land our nets…"*

Working in the mills of Sirajganj

Sirajganj might be a rural district, but it is heavily dominated by handloom factories. Women often work at home colouring and processing yarn, while men work in the numerous handloom factories scattered around the district.

Wages in the handloom industry are very low and job security is very poor. People are hired and fired on a weekly basis and an abundance of available labour is pushing wages downwards, as one project staff member explained: *"Population is there and labour is in abundance. Nowadays day labourers are working for 80 taka per day. But if population growth continues, wages will be pushed down further. Soon people will work for maybe 50 taka per day."*

Like fishing, the handloom industry is a risky business. It is affected by unpredictable rains and untimely floods that damage infrastructure and disrupt transport and mobility in the area. Low-lying factories might be inundated and have to stop production for long periods. In summer, high temperatures make the thread hard and in winter heavy fog makes it soft and sticky. The unpredictability of floods has affected productivity. It is increasingly difficult to plan production and take precautions such as moving equipment and keeping extra yarn in stock. The handloom industry is also sensitive to price fluctuations and other developments in the international cotton and garment markets, as one factory owner explained: "*The international price of cotton is rising. India has stopped exporting cotton to have enough for their own garment industry. Bangladesh is not producing cotton so we have to buy expensive cotton from Pakistan.*"

As with Naogaon and Patuakhali, in Sirajganj the risks are pushed downwards. Men in the handloom factories are always uncertain of their livelihood. Women are often self-employed in pre-loom processing, buying yarn from businessmen and selling it after processing. Once again the greatest risks are borne by those with the least capacity to absorb them, as one woman described: "*The contractors are not giving us work like previously. We are so poor that if the contractors do not give us work, we have nothing to do."*

4.3 Access to finance for adaptation

Poverty and the general lack of resources in Bangladesh are not just related to local inequalities, but also to global inequalities and the massive gap in global financing for adaptation.

Global climate change is caused primarily by rich, developed countries. Human-induced emissions of greenhouse gases such as carbon dioxide have changed the global climate, and continued emissions are very likely to cause further warming. Adapting to the impacts of climate change is a necessity for all climate change-affected communities. However, adaptation requires a huge amount of investment, such as strengthening local governments with knowledge, skills and resources. Different livelihood groups living in danger or facing greater risks due to climate change impacts require extra inputs in the form of knowledge and resources. Like other developing countries, Bangladesh has contributed very little to emissions of greenhouse gases. Those who are affected have the right to be compensated for the damages inflicted by rich countries.

Climate change impacts are felt more severely in developing countries where people are more exposed to natural disasters and lack the social, economic and institutional capacity to deal with them. Bangladesh is widely recognised as one of the countries most vulnerable to climate change. It is a low-lying coastal area in the middle of the heavily populated Ganges-Brahmaputra mega-delta plain. The high frequency of natural disasters such as floods, droughts and cyclones combined with a weak economy and high poverty levels make Bangladesh a key hotspot for climate-induced vulnerabilities.

Adaptation is expensive. It requires enormous amounts of money to facilitate community-based adaptation, draw on local and scientific knowledge, empower people to demand their rights and build their capacity for collective action. Processes like this have to be followed up with money. The bottom line is that Bangladesh is an extremely poor country. Politics in Bangladesh tends to be a game with lots of players and very few resources. It is not possible for the country to handle climate change alone. International donors have to step up and support it with resources.

5

Local institutions

5. Local institutions

- *How local institutions fail to take on responsibility for facilitating local adaptation*

Much debate on government institutions tends to focus on the national and international levels, missing the point that adaptation to climate change is an inherently local process. For adaptation processes to succeed, much depends on the capacity and will of local government and public service institutions to act on climate change. This chapter investigates the role of local government and public service institutions and assesses the capacity of local institutions to take on responsibility for facilitating local adaptation. Here local institutions include local government (eg union parishad, upazila parishad) and public service institutions (eg agriculture extension services, livestock offices, etc). See Appendix 4D for an overview of the involvement of local institutions in the project.

5.1 Local government matters

As adaptation to climate change is an inherently local process, it is imperative to understand the role of local government and public service institutions in linking individual choices with collective choices, and in providing the framework for local adaptation strategies. Focusing on the management of fresh water resources, protection from floods, cyclones and erosion, and government services, this section investigates how local government and public service institutions have supported or hindered adaptation options for poor people.

5.1.1 Management of fresh water resources

Eighty-five per cent of people in rural Bangladesh depend on agriculture in one way or another. Poor people's vulnerability to climate change could in theory be reduced through proper local government management of fresh water resources, ensuring equal and democratic access to water. Experience from the project shows, however, that more often than not the management of local water is not contributing to – and is sometimes even hindering – poor people's adaptation.

Water for the rich, not the poor

Nowhere is the issue of fresh water more pressing than in the historically drought-prone Barind Tract in Naogaon. There are no rivers ensuring a continuous flow of fresh water, so agriculture – the main livelihood – is dependent on rain. The area is therefore severely affected by changing rainfall patterns. Farmers report that rainfall is becoming unpredictable and that it is increasingly difficult to decide when to plant crops.

Since the 1980s, the government has installed a number of deep tube wells to irrigate crops. Although there are still some areas without wells, it is possible to irrigate two crops per year in most of the district. However, there are signs that use of the deep tube wells is threatening drinking water resources in the area. According to many villagers, as well as landowners, local politicians and government officials, using the wells for irrigation is causing the groundwater level to go down. Officials from the government agency responsible for installing the tube wells maintain that groundwater aquifers are being recharged every year during the rainy season. But villagers are experiencing severe scarcity of clean drinking water during the dry season, which is forcing poor people to drink water from muddy ponds, causing severe health problems and diarrhoeal diseases.

Land is extremely unevenly distributed in Naogaon. Most villagers do not own any land of their own. For them, water for drinking and domestic purposes is a much bigger priority than irrigation. To ensure a supply of safe drinking water, the only sustainable alternative to the deep tube wells seems to be storing rain water in ponds. This adaptation option has been promoted in the project and has proved to be a viable solution, as this quote from a local farmer illustrates: "*Nowadays there is less rain, and the rain is not coming on time. We would put crops in the field, but without water for irrigation we would have crop failure. From the new pond we get the water on time, and therefore we are not affected by the lack of rainfall.*"

There are many government ponds in the area, and with proper excavation and maintenance they are a viable solution. However, government-owned ponds are leased via bidding rounds, ensuring that rich and powerful people control them. They often use them for fish cultivation and sometimes also sell water to others at a high price. Farmers report that they are only rarely allowed to use the ponds for irrigation. Government officials have reported several incidents of fighting over water and complain that they are unable to control the ponds because of lack of capacity and manpower.

Shrimps or people?

Patuakhali is situated along the coast of the Bay of Bengal and at the mouth of the Ganges-Brahmaputra delta. As in Naogaon, farmers here are severely affected by changes in rainfall patterns as agriculture is widely rain fed. In addition, farmers in Patuakhali are also facing problems with increasing salinity in rivers and canals. This is making it increasingly difficult to ensure sufficient water for crops, as this local woman explained: *"We used to do two different types of paddy per year. That was possible because there was timely rainfall and sweet water available. Nowadays, we can only do one crop per year. Salinity is increasing and the land is less cultivable."*

Changing rainfall patterns, attributed to climate change, are leading to decreased water flow in the rivers. This is causing an increased backwater effect and an influx of saltwater into rivers and canals. This is not the full explanation, though. Between the canals and rivers a widespread system of sluice gates are designed to manage the influx of water into the canals. These sluice gates are supposed to be open only when there is heavy rainfall, to let in fresh water. They should be closed when there is less rainfall as the backwater effect leads to an influx of saltwater. Sluice gates are the responsibility of local government, but the majority are damaged and not working.

Powerful local people benefit from the mismanagement of the sluice gates, by letting in saltwater and using canals for shrimp cultivation. As local government departments under the Water Development Board are responsible for maintenance of the sluice gates, the shrimp farmers are able to avoid responsibility. Advocacy work by the project has targeted management of the sluice gates, but local government has not been very responsive towards the requests of local farmers and sharecroppers.

If the sluice gates were functioning and canals and ponds properly managed, local farmers would be able to grow more than one crop per year. River and rainwater could be stored in canals and used for irrigation of *Boro* paddy, which is cultivated before the rainy season and therefore entirely dependent on irrigation.

5.1.2 Protection from floods, cyclones and erosion

Floods, cyclones and erosion are not new to the many Bangladeshis living in the middle of the mega-delta of the Ganges-Brahmaputra but climate change is intensifying and changing the nature of these hazards. The frequency of serious and recurrent floods as well as the intensity of tropical cyclones in the Bay of Bengal has increased, and Bangladesh can expect to see more extreme events like this in the future. It takes time to recover from disasters, especially those that leave people with nothing and having to start piecing their lives back together from scratch. Experience from the project shows there is a limit to how much disaster poor people can absorb. Local government needs to ensure that people's lives, assets and livelihoods are properly protected from cyclones, floods and erosion. Without this basic safety, people cannot be expected to find the surplus energy needed to worry about adapting for the future.

Living with the wayward and unpredictable Jamuna River

In Sirajganj, people are struggling with floods from the Jamuna River. Flooding is not a new thing in this area. Farmers used to consider floods a blessing because they brought sediments and fertility to the soil. However, climate change is changing the life of the river. In winter, the flow of the river is decreasing and heavy sedimentation

is causing the riverbed to rise and creating more char lands in the river. Untimely floods and longer inundation periods are destroying crops and causing severe losses for farmers. The untimely floods are usually related to heavy rainfall upstream.

Sirajganj is largely dependent on income from the handloom industry. Untimely floods and longer inundation periods are disturbing production, infrastructure and communication. During floods, factories stop production and people cannot work or earn a living, as a local woman explained: *"We have no work to do during the flood other than sitting idle in the home. There is water everywhere. So we have to borrow money from others to survive."*

Whenever there are river erosions many people lose their homes and their assets, and are left destitute. The union of Char Koijuri has already lost as much as 50% of the area to erosion. The loss of land combined with population growth is causing people to live closer and closer together, and many are forced to live outside the embankments. Some people have experienced losing their home up to five times. This is putting enormous stress on people who are already extremely poor.

There is an urgent need for local government to take responsibility for managing the river and protecting people, assets and livelihoods from severe floods and erosion. This includes appropriate river management and protection of the riverbanks, as well as the establishment of safe shelters and efficient flood early-warning systems. Without necessary measures, huge areas of land could be lost in river erosion, and the productivity of the area will be severely affected by unpredictable, untimely floods.

Tomorrow everything could be washed away

People living in the coastal area of Patuakhali are suffering from cyclones, tropical storms and tidal surges. Besides the obvious threat to people's safety, these hazards are also severely affecting livelihoods. Saltwater inundation is increasing salinity of the soil and damaging crops, causing severe losses for the farmers. Cyclones and storms are making fishing very dangerous, as the lack of fish in the rivers is forcing fishermen to go out to the deep sea to catch fish.

As part of the project, local households were provided with seeds for vegetables and fruit trees to boost their household income. In 2009, cyclone Aila hit the area and everything was washed away. A number of households started up again, just to see many of their crops damaged again in saltwater inundation by heavy storms and tidal surges in September 2010. The continuous hazards of cyclones, storms and tidal surges have caused severe apathy among local people. As one woman explained: *"At first people were very enthusiastic and they gave their labour even though it is a very tiring*

job. But the second time people were given seeds, many chose not to take them. 'What is the use?' they asked. 'We invest our time and labour, and then some other cyclone comes. Everything can be washed away tomorrow.'"

How people handle disasters matters. Government and international donors have ensured that proper cyclone warning systems are in place, so fishermen can seek land and people can seek shelter. But people complain that cyclone shelters are mismanaged and too small to accommodate all the people in the area. For many, the nearest cyclone shelter is simply too far away to reach during a cyclone. The whole of Patuakhali is protected by embankments, but they are often too small and too weak to withstand the forces of nature. Locals complain that embankments are broken in many places, and that they often break again shortly after they have been repaired. Local government needs to take responsibility for building higher and stronger embankments and ensuring that proper systems are in place to protect people and their assets.

5.1.3 Government services

Adequate and appropriate provision of government services should be a priority to support poor people's adaptation, but experience from the project shows that even the most basic services are usually not in place.

Supporting adaptation

In the dry and drought-prone area of Naogaon, erratic and unpredictable rainfall is making it increasingly difficult to cultivate the rice paddy on which the area depends. The agriculture department has a central role to play in promoting alternative crops that require less water, such as lentils, mustard and wheat.

As part of the project, households were given livestock that can survive in dry areas, such as ducks, chicken and sheep. Villagers consider livestock a viable adaptation option in a scenario where cultivation is becoming more and more difficult. Because a change like this requires backup, the project trained para-veterinarians who provide information about appropriate fodder, livestock diseases and vaccinations.

Government services – which are neither appropriate nor adequate to support adaptation measures – have been an important advocacy target for the project. Often service providers do not have enough resources to reach people in the villages, and government officials usually stay in the larger cities. Farmers and sharecroppers rarely know where to go or whom to ask for services. Even after they had been made aware through the project, many said they would not take advice from someone who rarely leaves their office, as this quote from a farmer in Naogaon illustrates: *"They just sit in*

their offices. They have never seen my fields. If they tell me what kind of fertiliser to use I do not trust them. They have to come and see my land and take some tests. Then they can give advice."

Health, water and sanitation

Lack of sanitary latrines and safe drinking water is more the rule than the exception in many of the project area villages, causing severe health problems and diarrhoeal diseases, especially among poor people who cannot afford treatment and medication. From the start of the project, it became clear that water and sanitation was a top priority for most villagers. No one can start worrying about adapting for the future while their immediate basic needs are not being met, so the project provided sanitary latrines and clean drinking water through tube wells.

Although local government is responsible for water and sanitation, more often than not they are not providing them, or they are providing them in a standard way that does not suit the local context. In the highland area of the *Barind Tract* in Naogaon, the government's standard issue tube wells are often not deep enough to reach groundwater during the dry period. In flood-prone Sirajganj, government tube wells and latrines are rarely flood proofed, which means drinking water is polluted with river water during inundation and latrines are flooded, causing serious health problems and diarrhoeal diseases. This could be remedied by simply raising the ground on which the latrine or tube well is placed.

As with other government services, villagers rarely knew where to go or whom to ask. Even after they had been made aware through the project, they complained that local service providers are not providing the services they are entitled to. Many villagers can tell stories about gruelling meetings with local government, as this quote from a female villager in Naogaon vividly illustrates: *"There is no way the government would have given us anything. We actually tried to go to our UP [Union Parishad] chairman and ask for sanitary latrines, but he just mocked us asking: 'What do you need latrines for? You do not have anything to eat, so what will you do with a toilet?'"*

5.2 If local government matters, is it up for the task?

Much of the new climate change adaptation architecture calls on local government to act, with very little understanding of what it can actually do. The following section analyses the capacity of local government institutions to handle the challenge of climate change and take responsibility for facilitating local adaptation. It begins with an introduction to both the national and local institutional set-ups around climate change, and moves on to assessing local capacity based on experience from the project.

5.2.1 The national institutional set-up for climate change adaptation

Successful adaptation depends on the actions and capacities of local government and public service institutions to act on climate change. But local government and public service institutions implement policies determined at the national level.

The government of Bangladesh has taken a mainstreaming approach to climate change. This means there is no single ministry in charge of climate change. Instead, 35 ministries and government agencies are responsible for adaptation policies. These include those responsible for water resources, health, agriculture, urban planning, roads and transport. See Appendix 4A for a list of key ministries involved in climate change adaptation.

The national set-up for climate change adaptation is complex and confusing. The Ministry of Environment and Forests is in charge of coordinating climate change adaptation, but in reality has very little to do with implementing adaptation measures, except maybe in relation to forest plantation. Responsibility for implementing adaptation measures is shared by a number of ministries, but there is no clear division of responsibilities between the different ministries involved. For example, the Ministry of Water Resources and the Ministry of Local Government, Rural Development and Cooperatives share responsibility for water management, but the Ministry of Fisheries and Livestock also seems to have a role to play. The Ministry of Food and Disaster Management and the Ministry of Agriculture have overlapping responsibilities in relation to food production and food security. There is also an overlap in relation to disaster management between the Ministry of Food and Disaster Management and the Ministry of Water Resources.

Responsibility for issues such as agriculture, water and disaster management is shared by several ministries, leaving considerable gaps in relation to climate change adaptation. In the agriculture, disaster management and coastal zone sectors, climate change is addressed as a specific concern, but it is yet to be addressed in policies concerning fisheries and livestock, environment, food security and water and sanitation. See Appendix 4C for an overview of policies and strategies related to climate change issues.

5.2.2 The local institutional set-up for climate change adaptation

The local institutional set-up is as complex as at national level, with a number of different organisations and offices at different levels and with overlapping responsibilities. Many of the national ministries involved in climate change adaptation have departments at upazila (sub-district) level, and some also have departments

at union level (essentially a cluster of villages and the lowest administrative tier). There are agricultural departments at both upazila and union level dedicated to the introduction of new farming technologies, crop and seed varieties and information about fertilisers, pesticides and insecticides. There are livestock departments at upazila level responsible for immunising livestock and training farmers. District departments of the Water Development Board are responsible for local water management and the construction of dams, embankments and irrigation canals. There are Disaster Management Committees at upazila and union level responsible for coordinating, reviewing and implementing disaster management activities such as local risk reduction, early warning systems and post-disaster relief and recovery. The Upazila Nirbahi Officer (UNO), under the Ministry of Local Government, Rural Development and Cooperatives, is in charge of coordinating local government institutions. See Appendix 4B for a schematic overview of ministries and local departments involved in climate change adaptation.

In the formal political system there are elected politicians at both upazila and union level. Upazila Parishad, under the Ministry of Local Government, Rural Development and Cooperatives, is the formal elected body of the upazila. It consists of an elected chair and two vice-chairs. Upazila Parishad is responsible for all major development activities in the area, including formulating and monitoring development plans, maximising food production, environmental management and implementation of government policies and programmes. Union Parishad is the formally elected body at union level and consists of a council of members headed by a chairman. The Union Parishad is entrusted with a large number of functions and responsibilities relating to civic and community welfare as well as local development. Functions include civic and public welfare, police and defence, revenue and general administration, development and judiciary. In addition to these formal functions, the Union Parishad also has to comply with instructions issued by different ministries. It is allowed to levy taxes, rates and fees on certain items, but the bulk of income comes from the government as restricted, earmarked funds. See Appendix 4E for an analysis of the strengths and weaknesses of local government institutions involved in the project.

5.2.3 Little capacity for coordinated action at local level

At local level, coordinating all the local departments of each line ministry is a difficult task. Local departments are often more accountable upwards towards their ministry than towards the local community. Local politicians and government officials air frustrations over the bureaucracy involved in getting anything done. To build a road along an embankment they have to involve local departments of the Water Development Board under the Ministry of Water Resources as well as the Local

Government Engineering Department under the Ministry of Local Government, Rural Development and Cooperatives, in addition to their superiors at national level. Together, they have to agree on who does what and how it gets paid for. Even to recruit people for local-level government positions, they have to involve the Ministry of Finance and Ministry of Establishment as well as the immediate line ministry.

This local institutional set-up can be further complicated by the lack of clear leadership. At upazila level, the Upazila Chairman, a locally elected politician, and the Upazila Nirbahi Officer, a civil servant, are responsible for coordination. There are several accounts of conflict between these two posts and contrary opinions about who ranks higher than whom. To complicate matters further, there are also accounts of Members of Parliament meddling in local affairs and considering themselves the chief coordinators of local development. At union level, responsibility for coordination rests solely with the Union Chairman. Nevertheless, many local politicians and government officials air frustrations about the lack of coordination, as this quote from an Upazila Nirbahi Officer illustrates: *"There are government departments working. There are NGOs working. International organisations. And I feel the level of coordination is not good enough. At national level the Ministry of Foreign Affairs is coordinating to some degree, and also the Ministry of Social Affairs and the Ministry of Disaster Management. But between these government ministries there must be better coordination as well."*

5.2.4 Knowledge of and attitudes towards climate change within local government

Although climate change is a policy priority at national level, this does not seem to have reached local government levels. The sensitisation of local politicians and government officials about climate change has therefore been an advocacy priority for the project.

Many local politicians and government officials know very little about how climate change is affecting their area and the kinds of problems it is causing for local people. They are more inclined to talk about future and far away problems such as holes in the ozone layer, the thawing of Siberia or the rising sea level in Greenland – problems that have very little to do with the immediate concerns of local farmers and fishermen. There are, of course, exceptions. Government officials who go regularly to the rural areas can have extensive knowledge about the problems local people are facing.

Local politicians and government officials have a tendency to use global climate change to explain a variety of environmental changes that are often also related to local problems such as deforestation, environmental degradation, population growth and poor management of resources. While villagers tend to give local explanations, local politicians and government officials tend to blame global warming, which places

responsibility with rich countries. This quote from an Upazila Nirbahi Officer (UNO) illustrates this: "*We are not a rich country. We are a least-developed country. And climate change is not caused by us. It is caused by the rich people. And it is not possible for us to adapt to this alone, because huge amounts of money are required to cope with this.*"

While there is truth in this line of argument (although money alone will never be enough), it is worrying when local politicians and government officials use climate change as an excuse for not taking responsibility for local problems. In the Patuakhali coastal area, where farmers are severely affected by the increased salinity of rivers and canals, local politicians and government officials rarely admit that the problem is closely related to the mismanagement of sluice gates that are meant to protect fresh water resources. Instead, they blame climate change, as this quote from a government official illustrates: *"There are huge amounts of ice melting in the Himalayas so the sea level is rising, and this water is going into the rivers and canals and causing it to go saline."*

5.2.5 Weak local-national linkages

The fact that national climate change policy has not reached local government levels is highly problematic. Climate change may be a global phenomenon, but its impacts are felt locally, and adaptation will have to happen locally.

Most local politicians and government officials report that they have not received any policies, directions or funds for climate change adaptation. Some have heard that the government is working on climate change plans at national level, but nothing has reached local level yet. As a result, local government institutions are generally reluctant to do anything about climate change adaptation.

It seems to be a general trait of local government that very little happens unless it is initiated from above. Many government officials, and even some local politicians, say their role is to follow and implement national instructions. There is very little scope for independent planning and policy making at local level as all funds are centrally controlled. Local government institutions are allotted funds earmarked for specific services. Other sources of income are very limited or simply non-existent. When asked, all local politicians and government officials stated that government should act on climate change adaptation. Many expressed frustration about the lack of local capacity, especially in relation to funds and staff.

Given that local administration in Bangladesh is so centrally coordinated and accountable upwards, it is surprising that very few local politicians and government officials have been asked to contribute to the national policy process of climate change adaptation. Those who have are merely asked to monitor local climate changes. Several

local politicians and government officials complained that policies are made centrally, with very limited knowledge about the local problems they are meant to address, as this quote from an Upazila Chairman illustrates: *"Our government is sitting in Dhaka developing adaptation policies in an a/c room. This will not help. Government should come to the root level, see the problems and then decide what to do. But they do not bother to come to the root level. There is lack of communication between national and local level."*

5.2.6 Low trust in local government

There is no doubt that local government needs to take responsibility for facilitating local climate change adaptation, but it is hampered by distrust from the very people it is supposed to serve. The general attitude is that local government does not do anything for poor people. Many villagers complain that their local politicians and government officials do not listen to them and that they only rarely put their words into action.

Most people have no faith in their local government institutions. All can tell stories about government officials only giving services to certain people they know or like, or of local politicians getting rich on relief and development money or by taking bribes for contracts for public construction work.

Given the nature of corruption, it is difficult to determine how much truth there is in these stories, but they illustrate how little trust and confidence local people have in local government institutions. When the project first started in Sirajganj, locals insisted on not involving local politicians and government officials. They claimed that previous projects involving local government had become corrupt, with most of the benefits ending up in the wrong pockets. This quote from a woman in Sirajganj illustrates the deep distrust towards local government: *"The Chairman and members are busy cheating the poor people by not giving us the help that government sends for us during floods. They are just concerned about how to keep the money themselves and share it with village headmen."* Distrust is also marked among local elites in all project areas, and even some local politicians and government officials express frustration about the institutionalised corruption.

Many villagers have considerably more trust and confidence in non-governmental organisations (NGOs), because NGOs listen to them and come to their villages and homes to see what problems they are facing. Even some local politicians and government officials say they have more trust in NGOs than in government. They often mention government and NGOs together when asked who should take responsibility for climate change adaption.

Villagers say local politicians and government officials prefer to deal with NGOs when providing local services. For example, one local politician told villagers to ask NGOs for a latrine because they would be able to provide one of much higher quality than he could. This is not surprising, as NGOs often have access to more funds than local government, but it is also a matter of grave concern as local politicians and government officials use NGOs as an excuse for not taking responsibility.

6

National policy matters – make it matter more

6. National policy matters – make it matter more

Local government and institutions that provide public services operate in a national political context, implementing policies determined at national level. In reality, very little happens locally without national policies. Community-based adaptation is a participatory empowerment process that helps climate-affected communities to systemise and synthesise their knowledge around climate changes. The process deepens their understanding of the relationship between human beings and the environment, and makes them aware of their collective role as active citizens in coping with the changes. It also strengthens their ability to identify available resources and opportunities, and to access and manage them. This requires policies that facilitate local knowledge generation, strengthen the roles and responsibilities of local government institutions, create access to and control over resources for poor people and enable them to utilise opportunities for a dignified life. To be inclusive, policy should be demand driven, and the demand should come from below. The Bangladesh Climate Change Strategy and Action Plan (BCCSAP) is the only officially endorsed government strategy on climate change. This chapter reviews the plan in light of experience from the project, and constitutes our constructive input to national policy-making processes on climate change adaptation.

6.1 Lack of a comprehensive policy

Climate change adaptation calls for comprehensive policy making. Climate change is intertwining with and increasing existing vulnerabilities and problems. To adapt, we must therefore take a comprehensive approach. Unfortunately, there is currently a lack of comprehensive national policy making around climate change.

Bangladesh has two major strategies dealing with climate change: the BCCSAP and the National Adaptation Programme of Action (NAPA). The NAPA was written in 2005 by the Ministry of Environment and Forests as a response to the Seventh Session of the Conference of the Parties of the United Nations Framework Convention on Climate Change, where it was agreed to take immediate and urgent action on climate change. Later it was revised in 2009.

However, the BCCSAP is the only document that is officially endorsed at government cabinet meetings. Principally, it is an extended version of the NAPA, with long-term strategies that take into account the country's development priorities as well as the government's election manifesto, Vision 2021. The plan was developed in 2008 by the Ministry of Environment and Forests as an attempt to tackle long-term climate change impacts with the help of external donors. Originally, it outlined 37 programmes under

six main pillars on both adaptation and mitigation. It was revised and reviewed in 2009 based on further knowledge and experience from recent adaptation experiences and research programmes, as well as Vision 2021 development priorities. The plan covers 2009–18, and now has 44 programmes under six pillars to be implemented by 2013.

6.2 Lack of action behind the words

Having a strategy is not enough. Words need to be backed up with action and specific laws and policies to implement the programmes. Unfortunately, the BCCSAP makes no reference to policy and gives no directions to formulate a national climate change policy within its action plan. It is said that the implementation of proposed programmes will be backed by sectoral policies, but issues related to climate change are almost absent in those policies, as is clear from the overview of sectoral policies in Appendix 4C.

Recently, however, there have been signs of action. In 2009, the government called for proposals based on the BCCSAP programmes and selected a few adaptation projects for implementation. It has so far allocated US$100 million in 2009-2010 and 2010-2011 FY to implement the programmes. Most recently, the government has begun integrating climate change into sectoral and national policies, but these documents do not specify any target groups or show how the adaptation problems of those who are most vulnerable will be addressed.

6.3 Lack of local knowledge in the policy process

Adaptation starts locally, and policy making should take local knowledge into account to ensure appropriate adaptation actions. Policy should be demand driven and local people should contribute to the policy process with their knowledge and experience of local circumstances.

The BCCSAP is an expert-driven document. Like the NAPA, it was led by consultants and endorsed by a few policy elites in the capital, Dhaka. The plan is not informed by local knowledge. It is based entirely on global scientific models and predictions from the third and fourth assessment reports of the Intergovernmental Panel on Climate Change. While these reports are good for making global predictions and international policy making, they are not suitable for making specific, efficient and sustainable adaptation plans at local and national levels.

Bangladesh consists of five ecological zones and 30 agro-ecological zones, but in the global models it is often considered in a single grid. This misses the country's ecological differences and variations in temperature and rainfall over time and in different geographical locations. It also ignores the different impacts of climate

change on poor people's lives and livelihoods. An appropriate action plan must build on in-depth understanding of how climate change affects each local context, and there must be space and flexibility in the planning and budgeting processes to find solutions suited to each local context.

The BCCSAP mentions comprehensive and participatory planning and investment, but participation is not reflected in the plan. An appropriate participatory process is needed, as seen in the formulation of the Integrated Coastal Zone Management Strategy. Developing a national strategy and action plan should build on national consensus. It requires a political process, along with a broad technical process involving consultation with various experts.

6.4 Supporting local government in facilitating local adaptation

As adaptation is an inherently local process, it is crucial to involve local government in adaptation to climate change. Considerable investments and long-term engagement are required to facilitate adaptation locally.

According to Article 59 of the Bangladesh constitution, local government at union and upazila level is responsible for rural development. However, neither the BCCSAP nor the NAPA recognise local government's role in adaptation.

Only five programmes out of 44 in the BCCSAP mention the Ministry of Local Government, Rural Development and Cooperatives as one of the 'responsible institutions' for implementation. Four of these relate to urban drainage, water and sanitation, and supported migration. Only one mentions the involvement of Union Parishad (the T3P8 Planning, design and implementation of reconstruction of the networks of rivers and canals through dredging and de-siltation work).

The lack of importance given to local government is further exacerbated by the fact that local politicians and government officials have very limited knowledge of the BCCSAP, which was written in English and has still not been translated into Bengali. Policies and strategies – including plans and budgets covered in articles 9, 11, 59 and 60 of the Bangladesh constitution – should be written in the native language so that people can participate in government functions. If practised, these constitutional rights could lead to allocations for climate change adaptations at local level.

6.5 Poverty reduction must be a primary concern

National policy must take the national context seriously – and in Bangladesh it is a context of extreme poverty. We cannot talk about adaptation without addressing poverty. Adaptation deficits are in fact development deficits, which cannot be

alienated from poverty issues, as discussed earlier in Chapter 2. Poverty reduction needs to be a primary concern in relation to climate change adaptation.

The Bangladesh Climate Change Strategy and Action Plan is not giving much emphasis to the issue of poverty reduction. Instead, the fifth pillar, Mitigation and Low Carbon Development, has been given highest priority in terms of the number of programmes. The sectoral approach of the Bangladesh Climate Change Strategy and Action Plan also fails to address particular livelihood groups and their specific problems and vulnerabilities towards climate change. The plan proposes development in the agricultural sector, but it does not make any reference to the specific problems of landless people and sharecroppers. The plan deals with the fisheries sector, but does not mention the extreme vulnerability factors of poor fishermen. The plan is focused on maintaining the scale of production or sustaining the sectors under the challenge of climate change, while missing a focus on the particular groups of poor people that the sectors actually depend on. Essentially, the resilience of key sectors depends upon the resilience of the people and workers involved with and contributing to those sectors. The plan broadly mentions mainstreaming of poor and vulnerable groups, including women and children, in all programmes, but the actions stated under each programme do not indicate how or where they will be addressed or incorporated.

6.6 Policies must address unequal access to resources

Poverty is rooted in unequal access to and control over resources. To address poverty, policies must also address this inequality. They must ensure fair and democratic access to resources for poor people, so they have a base from which they can shoulder risks and invest in adaptation themselves.

Issues of access to and control over resources are totally absent in the BCCSAP. Under the livelihood programme it is stated that government will make all necessary assessments and conduct participatory planning to build resilient livelihoods. However, there is no direction given as to how poor, marginalised and disadvantaged people will be assured access to and control over resources.

There are five specific programmes under the theme of food security, social protection and health specifically aimed at building resilience for different livelihood strategies for farmers and fishermen in ecologically fragile areas. For farmers, this includes developing different cropping patterns with flood, drought and saline tolerant crops in different ecological zones. However, this may not make any difference for landless people, sharecroppers and small holders, who usually do not have access to or control over land and production patterns. Improved varieties may not yield better production if farmers do not have access to sufficient sweet water. There may be newer seeds and

varieties, but the capital required to buy seeds and fertilisers or to take out a lease are out of reach for most poor people.

Bangladesh has various policies, rules and regulations on access to and control over land, water and finance, but experience from the project shows that these are either not functioning or not adequate. To facilitate adaptation, policies need to address issues of redistribution, fair land tenure, minimum wages and job security.

6.7 Policies must ensure protection from natural disasters

Without basic safety, poor people cannot be expected to worry about adapting to future uncertainties. Effective adaptation policies must ensure proper protection of people's lives, assets and livelihoods from natural disasters such as cyclones, floods, droughts and erosion. Even though there is currently a lot of work being done in this sector, it is not enough until all people can live safe lives.

Having a comprehensive disaster management policy is vital. In the BCCSAP, comprehensive disaster management is addressed by 10 actions under the theme of Improvement of Forecaster and Early-Warning Systems. The emphasis is primarily on strengthening national forecasting and early-warning systems. There is only one action aimed at training local people in shelter management, search, rescue and health issues related to disaster management. The plan does not take into account that different warning systems must be livelihood and location specific. From the project, we know that warning signals must be disseminated differently for farmers, fishermen and other occupations.

Furthermore, the BCCSAP is focused on rapid onset disasters like cyclones, ignoring slow onset disasters like drought, even though drought-prone areas are among the most ecologically vulnerable.

The plan puts emphasis on repair and maintenance of existing flood embankments, cyclone shelters and coastal polders. It does not address the need for construction of new embankments, shelters and polders even though our experience shows there is a shortage.

Natural hazards are not new in Bangladesh. Therefore, infrastructure-related work should take into account experience from previous large infrastructure projects like the Flood Action Plan. The BCCSAP does not require any such assessments when suggesting new infrastructural interventions. This is an important omission, as serious concerns could be raised about whether infrastructure is solving problems or aggravating hazards. Questions also remain on how effective various interventions will be in the changing, longer-term scenario.

The plan has also failed to capture regional cooperation to address regional issues in relation to water sharing. Bangladesh is an active delta with more than 700 rivers. These rivers are still bringing silt to form the country's land, as well as acting as a source of life and livelihood for millions of people. The rivers are of great importance in providing sweet water and preventing the influx of saline water due to sea-level rise. However, most of the water sources are outside the country and it is beyond the control of Bangladesh to balance water flow in the rivers. Upstream water withdrawal during winter might increase the salinity and drought problems, while releasing upstream water during the rainy season can accelerate the frequency and intensity of flood.

6.8 Policies must ensure adequate provision of government services

In the BCCSAP, health, water and sanitation come under the theme of Food Security, Social Protection and Health. The actions under these programmes will monitor future changes in health and in the quality and quantity of water, and prepare a much-needed plan to invest in additional measures in a changing climate.

As mentioned above, the plan also contains programmes on livelihood, agriculture, fisheries and livestock. But these are not specifically for poor people, and there are no directions on how the newest knowledge about adaptation options will be made available to people in the villages.

7

Conclusion and way forward

7. Conclusion and way forward

Climate change is a global phenomenon, but impacts are felt locally. Adapting to the impacts of climate change is an inherently local process. This report contains the localised, practical experiences and learning from one of the first community-based climate change adaptation interventions in Bangladesh. We facilitated local people's analysis of their own vulnerability towards climate change and involved them in piloting a variety of community-based adaptation measures.

Local people have vast knowledge of local conditions. People living in villages are often illiterate, and considered unknowledgeable. In reality, however, they are best placed to observe and understand the changes in their environment. Since they depend on nature to make a living, they know that climate changes have a big impact on their lives and livelihoods.

Climate change is just one among many factors. The changes people are experiencing are often related to a combination of climate change, environmental degradation, overpopulation and poor governance of resources. The point is not that climate change is not a problem, but that climate change is intertwining with and increasing existing problems and vulnerabilities, putting extra strain on people who are already poor, socially excluded and disadvantaged.

We must take a comprehensive approach and consider problems as well as causalities. It is impossible to distinguish between climate change impacts and other problems in the relationship between nature and the people making a living from it. For example, we cannot say exactly what percentage of flood problems is caused by climate change, and what is due to poor river management or broken embankments. Even if we take climate change out of the equation, problems are still there.

Basic needs first. People cannot worry about their future food security when their stomachs are empty right now. For villagers in rural Bangladesh, climate change means changing seasonal characteristics and the problems this causes in relation to making a living from nature. For them, adaptation is about finding solutions to these problems. In order to do adaptation, we must start by addressing basic and immediate needs like water and sanitation, food security and livelihood strategies, while at the same time reducing the risks of extreme weather events. In reality, people are so excruciatingly poor that they have very little surplus to think about adapting for the future. Adaptation can only happen through addressing poverty.

Respecting local knowledge is mandatory for successful adaptation. Adaptation starts locally and policy should take local knowledge into account to ensure sustainable

adaptation. Community-based adaptation builds on insightful and in-depth understanding of how climate change impacts are felt in local contexts and draws on the knowledge of local people. Even though the uncertainty and unpredictability caused by climate change is severely challenging existing local knowledge, local people still have precise knowledge about what is changing and valuable adaptation ideas. Unfortunately, politicians and government officials are often not interested in and lack respect for local knowledge.

Scientific and technical knowledge is necessary to complement local knowledge. Scientific knowledge on climate change can help villagers understand why changes are happening, and to realise that it is something they need to act on. Scientific knowledge is also a key factor in finding new ways and strategies to adapt to changing circumstances. Often, however, this knowledge is not disseminated to villagers, as government officials rarely visit them.

Knowledge about citizens' rights is crucial. Adaptation should build on a rights-based approach, informing local people about their rights and empowering them to do advocacy work with their politicians and government officials. A combination of local knowledge, scientific knowledge and knowledge about rights can enable people to move from individual experience to collective action. The problems faced by individuals are common problems that need to be addressed collectively. Those affected by climate change should not just be seen as receivers of help; they should be recognised as citizens acting together on their problems and claiming their rights.

People need financial space to be able to adapt. Even with the knowledge, will and capacity to adapt, without the necessary resources people are left to live hand to mouth and cope as best they can. Climate change is increasing and exacerbating existing risks. The strategies available for poor people with no resource base are mostly mal-adaptations, i.e. forced migration, borrowing money and selling labour in advance, none of which are sustainable. To absorb risks and rise again after disasters, people need a sound resource base.

Unequal access to resources needs to be addressed to facilitate adaptation for poor people. Villagers in rural Bangladesh, as in many other least-developed countries, depend on natural resources for their livelihoods. They have very limited access to or control over natural resources. This inequality is rooted in ownership patterns in relation to the means of production. Poor people are kept poor by unfair production structures and land tenure systems. They are paid too little for their work and work under insecure and exploitative conditions. Often those who own the crucial resources are also very powerful and influential locally.

Local government institutions are central to facilitating adaptation locally. As climate change adaptation requires considerable investment and long-term commitment locally, successful adaptation depends on the actions and capacities of local government institutions. Local government plays a central role in mediating access to scarce resources, providing basic services and ensuring appropriate protection from natural disasters. Unfortunately, local government institutions often hinder rather than help adaptation by poor people.

Local institutions are not ready to handle climate change adaptation. The institutional set-up around climate change adaptation is complex and confusing. Local politicians and government officials have very limited knowledge about climate change and generally do not consider it to be something that is on their desk. Local institutions are hampered by very little capacity for coordinated action and very low trust from the people they are intended to serve. Capacity building of local government institutions is imperative in relation to climate change adaptation. Local government institutions are central in facilitating adaptation locally. This will be the focus of the next phase of the project: *Scaling up Community-based Adaptation with Local Government in Bangladesh* (see Appendix 2 for a brief description).

National policies matter. Local government institutions operate in a national political and institutional context, and function as implementing agencies of policies determined at national level. It is essential to prepare a comprehensive national climate change policy to accommodate the issue into national development planning – a need that the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) does not fulfil as it is now. The strategy needs to be backed up with action and the programmes implemented in specific laws and policies. The strategy also needs to emphasise the importance of local government for it to be able to facilitate local adaptation. Capacity building of human resources and institutions at national and local level is essential in relation to this. Adaptation financing is also essential. It is a good start that the government has set up the Bangladesh Climate Change Trust Fund, but it is not nearly enough. More funds are needed in this area.

Politicians must listen to the people. The BCCSAP is essentially an expert-driven document building primarily on global scientific models. This is suitable for global predictions, but national policy must build on in-depth understanding of how climate change affects local contexts. Standardised solutions are not appropriate in different contexts, even within the same geographical region. There must be space and flexibility in planning and budgeting to find solutions suited to the local context, and local people must be included in policy-making processes so that they can contribute their extensive knowledge about local circumstances.

Poverty reduction must be a primary concern. We cannot talk about adaptation without addressing poverty. Adaptation deficits are in fact development deficits, which cannot be separated from poverty issues. Policies must address unequal access to resources and ensure a sufficient resource base for poor people so they have a base from which to shoulder risks and invest in adaptation. Policy makers must ensure fair and democratic access to and control over scarce resources. We also need to discuss issues such as redistribution, fair land tenure systems, minimum wages and job security. Adequate provision of government services must be a priority to ensure coverage of basic needs and to support individual adaptation strategies with knowledge and information.

Safety first. Government is responsible for ensuring people's basic safety. Effective policies must ensure proper protection of people's lives, assets and livelihoods from natural disasters such as cyclones, floods, droughts and erosion. Without this basic protection, people cannot be expected to worry about adapting to future uncertainties. Even though there is currently a lot of work being done in this sector, we are not done until all people can live safe lives. A comprehensive disaster management policy is vital, and it must include wide-ranging forecasting and dissemination systems usable by all communities and for both rapid and slow-onset disasters. Infrastructure management for embankments, polders and shelters must be pro-poor, and new constructions should be built appropriately with the involvement of local people.

Adaptation does not come free. Rich countries must pay their climate debt. Human-induced emissions of greenhouse gases have changed the global climate and continued emissions are very likely to cause further warming. Adapting to the impacts of climate change is a necessity for poor countries. Adaptation is everybody's responsibility, but responsibilities should be defined according to respective capabilities. Bangladesh is an extremely poor country and, like other developing countries, has contributed very little to global emissions of greenhouse gases. As with other affected populations and countries, Bangladesh has the right to be compensated for the damages inflicted by rich countries, as has been acknowledged by the United Nations. Compensation money should be additional to Official Development Assistance targets of 0.7% of gross national product (GNP).

The right to development should not be limited in the name of mitigation. Development is needed to facilitate adaptation and meet the development deficit facing the huge numbers of people living in extreme poverty. Global climate change should not be used as an excuse for denying poor people their basic rights. Mitigation is indeed desperately needed, but as long as development benefits are globally so extremely unevenly distributed, it is the rich, polluting countries that must bear the primary responsibility for mitigation.

Further Reading

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8

Appendices

8. Appendices

Appendix 1A: The Assistance to Local Communities on Climate Change Adaptation and Disaster Risk Reduction in Bangladesh project

This report draws on the practical, localised experiences of the action-based research project, *Assistance to Local Communities on Climate Change Adaptation and Disaster Risk Reduction in Bangladesh* (CCA-DRR). The project was started in 2008 with funding from the Embassy of Denmark in Bangladesh.

In 2005, the Danish government launched a Climate and Development Action Programme incorporating climate change concerns into Danish development assistance. The programme seeks to assist the least-developed countries, including Bangladesh, in strengthening their capacity to handle the challenge of climate change. As part of this, ActionAid's CCA-DRR project aims to develop the adaptive capacity of the people and communities most vulnerable to climate change and contribute to establishing a national capacity for climate change adaptation and disaster risk reduction in Bangladesh.

The key aim of ActionAid's project is to generate critical knowledge on the effectiveness of structural and non-structural community-based interventions and the feasibility of expanding these to a national level.

Objectives

- To scale-up and pilot selected climate change adaptation options in an integrated manner in three districts prone to flood, drought and sea-level rise.
- To facilitate the skills, capacities and resources of local communities to adapt to climate change, and to develop the planning capacity of selected members of civil society, local government and vulnerable communities to utilise those resources.
- To generate, document and disseminate critical knowledge on poor people's adaptation to more severe flooding, drought, salinity intrusion and cyclones brought about by climate change.
- To advocate with selected ministries, the Department of Environment and selected NGOs to integrate climate change adaptation and disaster risk reduction concerns into poverty eradication and selected sector policies and programmes.

Beneficiaries

Twelve villages in three disaster-prone districts were selected to participate in the project; four villages in Sirajganj with high risk of flood and riverbank erosion, four villages in Naogaon with high risk of drought and four villages in Patuakhali with high risk of cyclones, salinity intrusion and sea level rise. In the selection of the 12 villages, several factors were considered, including vulnerability to disaster, geographical diversity, land ownership, diversity in agricultural practices, diversity in livelihoods, existing coping mechanisms, communication barriers, presence of ethnic diversity, insignificant development activities, migration patterns, power structures, early warning system initiatives and, above all, the extent of poverty. All these villages are vulnerable to multiple hazards and vulnerabilities, which will be exacerbated by climate change. In targeting participants, the project emphasised particularly those with greater vulnerability, such as female-headed households, vulnerable livelihood groups like fishermen and farmers, people with disabilities and those who are otherwise socially excluded.

Methodology and approach

Since it was an action research project, People's Research Teams were formed in each village. Altogether there were 27 teams in 12 villages, consisting of 25–30 members and including individuals from the most vulnerable households. Emphasis was placed on having a balanced representation of different livelihood groups and of securing the participation of women and marginalised groups. The main aim of setting up the teams was to engage people in analysing their own problems and vulnerabilities to climate change, and to engage villagers in preparing community adaptation plans (CAPs). The teams were given a budget to work with and implemented selected adaptation options at community and household level. The teams were also engaged in doing advocacy work, targeting local government to incorporate options from the CAPs into local government annual development planning.

Efforts were made to develop participatory methodologies, raise awareness of climate change and foster adaptive capacity. The formation of People's Research Teams provided communities with the scope and space to realise their collective identity and ingenuity. As a pilot project, the goal was to learn about climate change impacts on the community and to increase their resilience by enhancing their capacity to cope with climate extremes and shocks. A number of adaptation options were presented, but it was up to the community to decide which suitable options should be piloted. During the process, the People's Research Teams accepted, rejected and proposed alternative options. The teams and other members of the community identified every

activity that was implemented at field level. This approach to community-based adaptation has increased communities' capacity to understand basic climate change concepts, and how to cope with recent climatic changes. Efforts were also made to identify alternative livelihoods, as most of the existing ones are severely affected by climate change.

Activities

Through the project, a wide variety of climate change adaptation and disaster risk reduction options were piloted. These include:

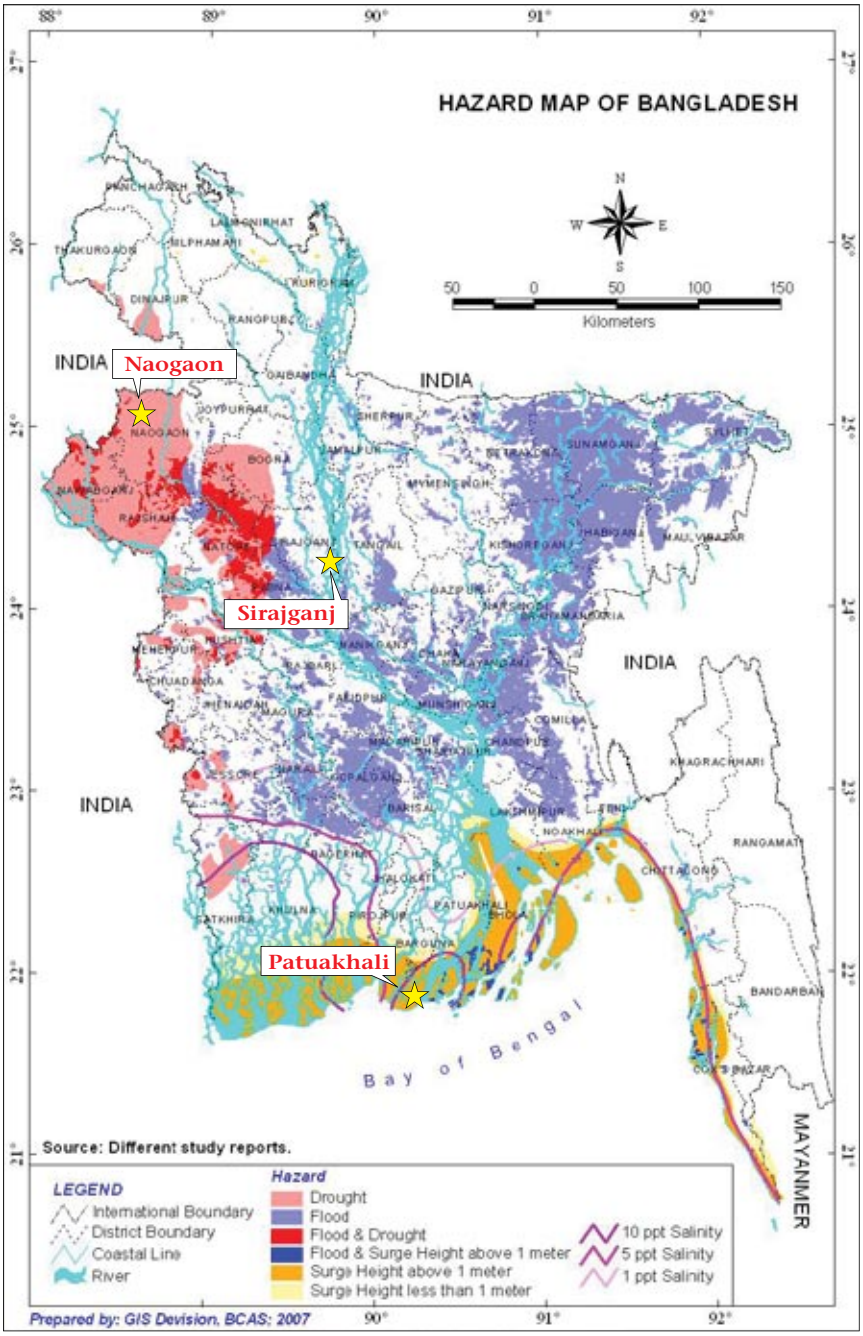
- water and sanitation – tube wells, ring wells, pond excavation and re-excavation, and climate-friendly sanitary latrines
- disaster risk reduction – plinth raising of homesteads and early warning systems
- livelihood support – distribution of livestock such as sheep, goats and ducks, vegetable seeds and fruit tree seedlings, and charkas (handloom mills)
- training – of para-vets, on vegetable growing, and climate change for local politicians, government officials and journalists
- climate-resilient cluster villages and handloom factory

Appendix 1B: Overview of project districts and villages

District	Upazila	Union	Village	Total households	Main occupations	Main hazards	Major government and NGO interventions	Other
Sirajganj	Shahjadpur	Koijuri	Char koijuri	950	Handloom and day labourer, farmer, fisherman	Flood, river erosion, hailstorm, drought	Micro-credit, early warning initiatives, disaster preparedness, VGF, VGD and other allowances by government but limited, primary and high school	Small village but large population, poor sanitation facilities, highly prone to river erosion
			Bhat deghulia	232	Handloom and day labourer, farmer, fisherman	Flood, river erosion, hailstorm, drought	CLP coverage, one primary school, VGD, VGF	Char area and hard to reach, less land ownership, social conflict, scarcity of safe drinking water during disasters
	Belkuchi	Rajapur	Charkonabari	204	Handloom and day labourer, farmer, fisherman	Flood, river erosion, hailstorm, drought, heat wave	CLP coverage, micro-credit, VGD, VGF	Relatively new char area, no formal education facility
			Baghbaora	142	Handloom and day labourer, farmer, fisherman	Flood, hailstorm, drought, heat wave	CLP coverage, CLP coverage, micro-credit, VGD, VGF	No formal education facility, relatively established agriculture, multi-hazard characteristics
Naogaon	Porsha	Ganguria	Baharul	140	Agriculture and agri-based wage labourer	Drought, excessive rain , norwester, hailstorm & heavy fog	Micro-credit, TUP, HISAWA, VGD, VGF, BMDA	No irrigation coverage and no Boro cultivation, landless majority,
			Poshchim deulia	165	Agriculture and agri-based wage labourer	Drought, heavy rain, norwester, hailstorm, heavy fog & flood	Micro-credit, TUP, HISAWA, VGD, VGF, BMDA	Partial Boro cultivation with irrigation facilities, landless majority,
	Shapahar	Tilna	Haripur	115	Agriculture and agri-based wage labourer	Drought, heavy rain, norwester, hailstorm & heavy fog	Micro-credit, TUP, HISAWA, BMDA Foshol (Care), VGD, VGF	No irrigation coverage and no Boro cultivation. Vast cultivation of watermelon using irrigation from pond
			Babupur	264	Agriculture and agri-based wage labourer	Drought, heavy rain, norwester, hailstorm & heavy fog	Micro-credit, TUP, HISAWA, BMDA Foshol (Care), VGD, VGF	Boro cultivation with irrigation facilities. Cultivation of Aman/ Aush even in drought due to irrigation coverage

District	Upazila	Union	Village	Total households	Main occupations	Main hazards	Major government and NGO interventions	Other
Patuakhali	Kolapara	Latachapali	Gora Am khola Para	107	Agriculture, fish business and fishing, day labourer	Cyclone, river erosion, salinity, tidal surge	Micro-credit, Foshol project, VGD, VGF	Rehabilitation work under Sidr response
			Khajura	530	Agriculture, fish business and fishing, day labourer	Cyclone, river erosion, salinity, tidal surge	Micro-credit, VGD, VGF	A big village with a large fishing community
		Lalua*	Charipara	362	Agriculture, fish business and fishing, day labourer	Cyclone, river erosion, salinity	Micro-credit, Foshol project, VGD, VGF	Rehabilitation work under Sidr response
			Pasur Bunia	116	Agriculture, fish business and fishing (fish & crab), day labourer	Cyclone, river erosion, salinity, tidal surge	Micro-credit, Foshol project, VGD, VGF	Rehabilitation work under Sidr response

Appendix 1C: Project areas



Appendix 2A: Scaling up community-based adaptation with local government in Bangladesh – the upcoming project

The follow-up project 'Scaling up Community-based Adaptation with Local Government in Bangladesh' will start in January 2011, again with funding from the Embassy of Denmark in Bangladesh. The project will run until June 2012.

Background to the project

The new project will be implemented in four climate hot spots in three physiographic regions that are prone to flood, drought, cyclones and salinity. Practices and knowledge generated from the 2008–10 action research project (see Appendix 1A) will be taken into account when implementing the project, along with newer initiatives to make community-based adaptation more comprehensive, effective and sustainable. A particular focus will be strengthening local government and linking institutions for effective community-based adaptation, from a human rights perspective, as well as capacitating communities to adapt and confront the challenges of climate change.

Project objectives

1) Capacitating community to adapt with climate change
2) Strengthening local government to facilitate community-based adaptation
3) Facilitating climate sensitive development budgets at local level
4) Scaling up and replicating better adaptation processes and practices through local government
5) Sensitising politicians and policy makers at local, national and international levels for pro-poor adaptation financing and effective utilisation of adaptation funds.

Expected outcomes

1) Community research groups in targeted areas are active and have better links with local government
2) Communities in project areas have capacities to advocate for their rights and demands
3) Targeted villages have demonstrated an ideal model of community-based adaptation
4) Targeted Union Parishads have demonstrated an ideal role to facilitate community-based adaptation
5) People's right to adaptation has formal recognition at local level.

Appendix 2B: Schematic overview of new and existing project districts and villages

District	Upazila	Union	Village	Status
Sirajganj	Shahajadpur	Koijuri	Char koijuri	Areas covered under "Assistance to Local Communities on CCA and DRR in Bangladesh" (2008-2009)(2010) Project activities going on from 2008, but have limited focus on local government, development governance, local government annual plans and budgets
			Bhat deghulia	
	Belkuchi	Rajapur	Charkonabari	
			Baghbaora	
Naogaon	Porsha	Ganguria	Baharul	
			Poshchim deulia	
	Shapahar	Tilna	Haripur	
			Babuparu	
Patuakhali	Kolapara	Latachapali	Gora Am khola Para	
			Khajura	
		Lalua	Charipara	
			Pasur Bunia	
NEW AREA Faridpur	Sadar Upazila	3 No North Channel	1 ward (3 villages) will be selected after community consultation	Prone to flood and river erosion. Will have better links with local government from the very beginning.

Appendix 3: Fieldwork methodology

This report draws on experience from the Assistance to Local Communities on Climate Change Adaptation and Disaster Risk Reduction in Bangladesh project as well as extensive qualitative fieldwork carried out in relation to the project by two Danish Masters students: Nana Gerstrøm Alsted from the Department of Sociology at Copenhagen University and Manja Hoppe Andreasen from the Department of Development Studies at Roskilde University. Both conducted fieldwork for their Masters theses in relation to project in the period from August–October 2010.

The overall approach

Qualitative methods deploy an inductive and exploratory methodology designed to investigate complex and often non-quantifiable processes, and the meanings that people assign to these processes. The strengths of qualitative data are the explanatory power, the richness of data and the depth of understanding. The fieldwork includes focus groups and interviews with villagers, local politicians, government officials, resource owners and various local experts in all three project areas. The three areas represent what could be called a 'diverse cases' sampling, where the purpose is to catch the different meanings and variations in the field, without saying anything about how the different cases are distributed in the total population.

Focus groups

Fieldwork included six focus groups in six different villages: two villages in each project area. To make sure that both men and women would feel comfortable participating in the focus groups, half of them were with just male participants and half of them with just female participants. Each focus group had five to six participants selected on the principle of taxonomic sampling, where participants are selected on the basis of their difference in relation to the categories of age, livelihood strategies, landownership and relationship to the project. A person is, of course, not only a sharecropper or only a woman. People have overlapping identities, and the participants were therefore representative of their gender, age group and land ownership category, their livelihood strategy and their relationship to the project.

Focus groups make use of the benefits of group interaction. Participants can discuss with each other, ask each other questions and correct and validate each other's statements. As climate change is a covariate risk that affects everybody, it is a very suitable subject for group interaction. Changes in the weather patterns and the natural environment are obviously a natural subject of conversation in most rural villages. It is not a subject that would require the privacy and confidentiality of more

personal and delicate issues. Focus groups were also a good choice for more practical considerations about time and resource constraints.

Key informant interviews

Key informant interviews are interviews with key central actors who possess a special knowledge in the area of investigation. We have strived to capture the variety of experiences and meanings in the field. We have listened to high- and low-level field workers, local politicians, local resource owners, local government officials and service providers and various local experts. Because of the more or less elite status of these informants, individual interviews were most suitable. All interviews were semi-structured and explorative, with relatively free dialogue between interviewer and interviewee. The interview checklist was adjusted according to each interviewee. This induced a form of questioning that promoted the dynamic and conversational character of the interview. The aim was to get each interviewee to feel safe and comfortable enough to talk freely.

Appendix 4A: Key ministries involved in climate change adaptation

Ministry of Environment and Forests

The Ministry of Environment and Forests is the focal ministry for all work on climate change. It is in charge of mainstreaming climate change into national development planning and for implementation of the national Bangladesh Climate Change Strategy and Action Plan (BCCSAP). Recently, the government has opened a new Centre for Climate Change. The main responsibilities of this centre are to manage all climate change-related policies.

Ministry of Agriculture

As climate change is severely affecting agricultural production in Bangladesh, the Ministry of Agriculture is another key player in relation to climate change adaptation. It is in charge of developing and promoting new agricultural technologies to boost agricultural productivity through different research agencies, including the Bangladesh Agricultural Research Council, Bangladesh Agricultural Research Institute, Bangladesh Rice Research Institute and Soil Resource Development Institute. The ministry provides extension services through the Department of Agricultural Extension to increase productivity and technology transfer.

Ministry of Water Resources

Through the Bangladesh Water Development Board, this ministry is handling a variety of water-related issues such as flood control and flood forecasting, irrigation schemes and management of underground and surface water resources to boost agriculture and fisheries. Furthermore, the ministry is responsible for coastline protection, soil conservation and prevention of salinity intrusion.

Ministry of Local Government, Rural Development and Cooperatives

Under this ministry, the Local Government Engineering Department is in charge of development and management of local infrastructure for increasing production and creating employment, developing, maintaining and managing transport, trading and small-scale water resources infrastructure at local level. The Department of Public Health and Engineering is also under this ministry. This department is responsible for drinking water and sanitation facilities.

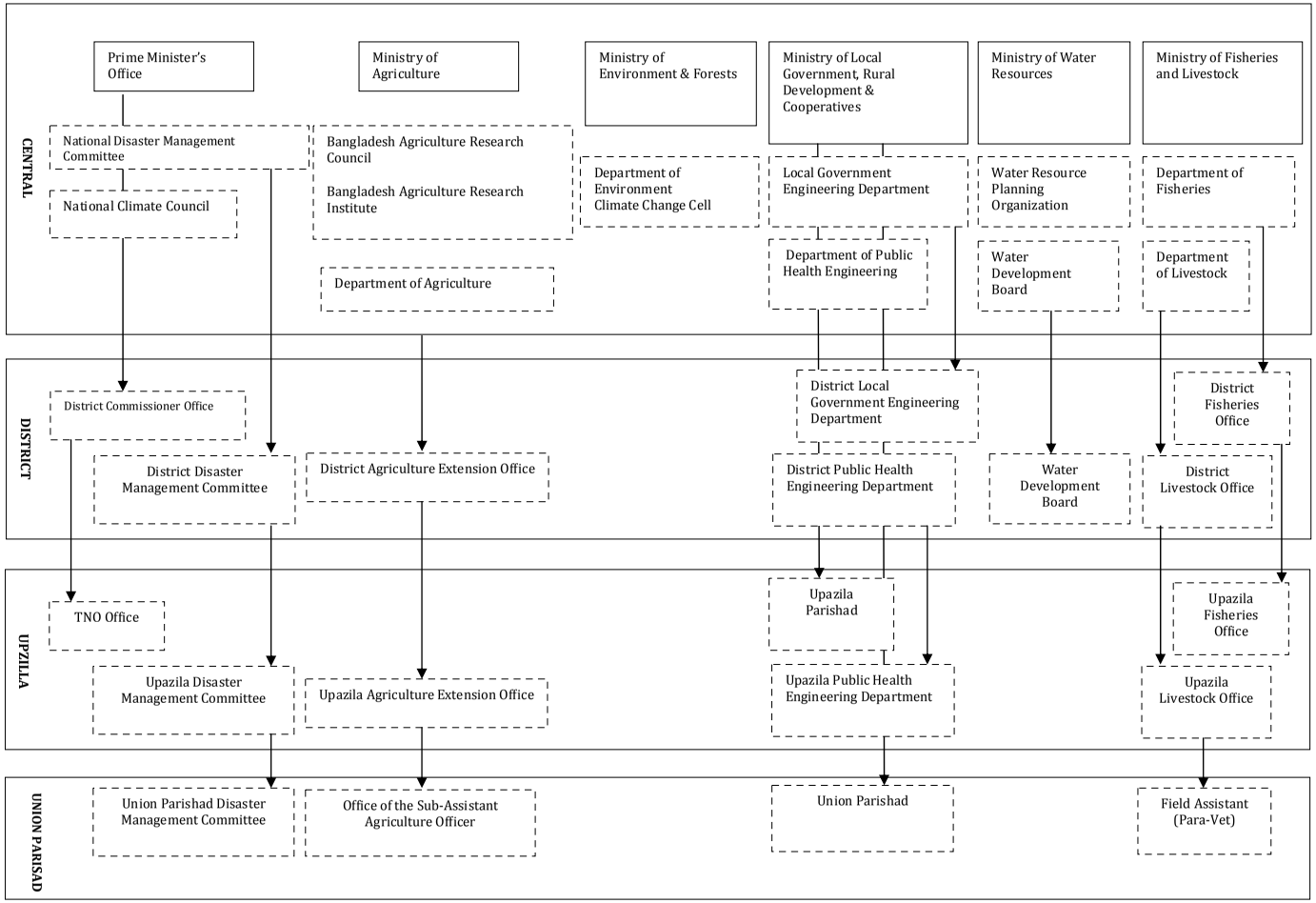
Ministry of Food and Disaster Management

Through the Disaster Management Bureau, this ministry is responsible for executing and coordinating all activities in relation to disaster management action plans from national to local level. This includes disaster preparedness, local-level disaster action and raising awareness about these.

Ministry of Fisheries and Livestock

This ministry is responsible for preserving fisheries resources, creating employment opportunities for rural poor people, exporting fish and fishery products, managing water bodies and research in fisheries and livestock development.

Appendix 4B: Overview of ministries and local departments involved in climate change adaptation



Appendix 4C: Overview of policies and strategies related to climate change issues

Sectors	Policy/Strategy	Relation to climate change issues
Agriculture	National Agricultural Policy (NAP), 2009 (5th Draft)	- Climate change is seen as an environmental issue as well as a major threat to agricultural production - Stress on research and development to develop new species for different agro-ecosystems that are flood, drought and saline tolerant - Special attention to weather and crop forecasting, climate change and disaster management - Special programme on environmentally fragile/vulnerable areas
	New Agricultural Extension Policy, 1996	- No clear direction regarding climate change, i.e. temperature rise, rainfall variability and salinity intrusion is not depicted in policy document
	Integrated Pest Management Policy, 2002 (9th Draft)	- Nothing about climate change
	National Seed Policy	- Seed policy puts importance on producing better seeds and making those seeds available to farmers. It does not consider climate change issues at all
Fisheries and Livestock	National Fisheries Policy, 1998	- Impact of climate change on different aquatic ecosystems and fish species is not taken into account
	National Livestock Development Policy, 2007	- Emphasis on institutional strengthening and capacity building. Climate change and disaster risk reduction are not mentioned

Sectors	Policy/Strategy	Relation to climate change issues
Water and Sanitation	National Policy for Safe Water Supply and Sanitation 1998	- Water and sanitation will be ensured - Emphasis on pre-, during- and post-disaster measures, but no additional measures for rising temperatures, rainfall variability and increasing salinity
	National Water Policy	- No provision for climate change and its related issues but there are some options that can contribute mitigation and adaptation to climate change
Disaster	National Plan for Disaster Management, 2010-2015 (Final version)	- Clearly identified climate change issues - Emphasis on institutional capacity building
Environment	National Environmental Policy, 1992	- Climate change is not mentioned
Food Security	National Food Policy, 2006	- This policy document does not directly address climate change at all but there is a clear indication for emergency relief during natural disasters like flood, drought and cyclones - It also gives a direction to increase agricultural production like supplementary irrigation during drought, development and extension of more location-specific flood/drought tolerant varieties and associated production technologies for major crops and homestead gardening, including fruit and vegetable farming, social forestry, livestock and backyard poultry within the homestead in flood-free years

Sectors	Policy/Strategy	Relation to climate change issues
Coastal area	National Coastal Zone Policy (CZMP), 2005	- Vulnerability reduction due to climate change is the priority - Highlighting institutional arrangements and strengthening, and upgrading of technology, as well as building their capacity to produce better data for long-term prediction of climate change impacts, especially sea-level rise in Bangladesh - Emphasis on implementation of identified adaptive measures and maintenance of sea dykes to protect coastline from sea-level rise
Rural Development	National Rural Development Policy (NRDP), 2001	- Emphasis on implementing and financing flood control and all other natural disaster mitigation-related activities - Sustainable and environmentally friendly land use and natural resource management will be promoted to increase food production - Crop insurance programme will be encouraged to help natural disaster-affected farmers/sharecroppers

Appendix4D: Overview of involvement of local institutions in the project

Activity	Project area	Issues involving local government institutions	Responsible local government institutions
Cluster Village	Sirajganj Patuakhali	Permission to build cluster village	Upazila Parishad Union Parishad
Water and Sanitation	Sirajganj Naogaon Patuakhali	Technological input Sharing with local / district level	Upazila Public Health Engineering Office Union Parishad
Livestock	Sirajganj Naogaon Patuakhali	Training to community people Training to develop Para-Vets Immunisation and rearing technology	Upazila Livestock Office
Homestead Gardening	Sirajganj Naogaon Patuakhali	Skill enhancement through training community people Technical support	Upazila Agriculture Office Sub Assistant Agriculture Officer (Union Block Supervisor office)
AILA Response (with temporary earthen embankment)	Patuakhali	Information sharing/ Package and number of families Earthen temporary embankment	Upazila Parishad Union Parishad Water Development Board
Plantation	Patuakhali Naogaon	Sharing Permission for plantation on embankment	Union Parishad Dept of Forestry Water Development Board
Agriculture	Patuakhali Naogaon	Training Seed collection Technical support	Upazila Agriculture Office Union Block Supervisor office
Handloom factory	Sirajganj	Skill enhancement, market linkages	Weavers' cooperative, Handloom board
DRR	Sirajganj Patuakhali	Training, Early warning dissemination	Union Parishad Disaster Management Committee (UPDMC) Upazila Disaster Management Committee (UZDMC)

Appendix 4E: SWOT analysis of local institutions involved in the projec

	Strength	Weakness	Opportunity	Threat
Upazila Parishad	– Coordinate all local public, civic and private institutions – Communication platform for all development actors – Aware of global climate change	– Lack of local knowledge – No financial control/ access – Roles are not clearly defined – No research capacity	– Structural presence – Yearly development planning	– Political influence on development activities – Natural disaster like flood, drought, cyclone
Department of Agricultural Extension (DAE), Upazila	– Reliable information provider – Relationship with farmers – Knowledge about field – A strong link between top-down and bottom-up – Technical staff involved at grassroots level	– Not enough human resource – Little knowledge on climate change and not enough capacity link with climate change – No influence /power in decision making – Technical equipments available but not in use	– Opportunity for collaborative research (BARI and BRRI) to introduce new climate friendly varieties – Demonstration of new crop varieties – Disseminate information on disaster through UZDMC and UPDMC	– Rising of temperature, rainfall variability and salinity intrusion – New dimension in disaster – GMO seed – Disappearing local varieties

	Strength	Weakness	Opportunity	Threat
Upazila Livestock Office	– Available technical person	– No knowledge on climate change and its impacts on livestock – Not prepared to deal with epidemics – No links with farmers and fields – Very few human resources	– Organisational structure – Introduce improved varieties	– New diseases due to climate variability
Water Development Board	– Financial resources – Links to influence government planning – Well-organised technical department including available infrastructure, technology and technically sound human resources	– Too technical in problem analysis – No public participation in decision-making process – No information to lower level – Highly reliant on infrastructure-related solution	– Basic and applied research capacity – Good links with donors – Integrated water resource management	– Irregular floods, river bank erosion and sea-level rise – Siltation in existing channels – Influenced by political and local elites

	Strength	Weakness	Opportunity	Threat
Department of Public Health Engineering (DPHE), Upazila	– Capacity to reach community – Capacity to respond in disaster – Strong links with like departments – Available instrument supply	– No updated information and climate change is not well understood – Very few trained person – Lack of public participation and technological knowledge – Lack of proper planning – Lack of soil and water testing laboratory	– Opportunity to monitor groundwater – Inter-institutional links with DAE and water development board – Collective efforts of GoB and NGOs	– External (donors) pressure – Political influence – Extreme weather events – Salinity intrusion in groundwater
Disaster Management Committee, Upazila Parishad	– Community mobilisation – Community acceptance of DMC – Links with other departments at Upazila level	– Not functional always – No knowledge of climate change – No committee in slow-onset disaster areas (drought) – Their duties and responsibilities not defined clearly – Lack of funding – Incapacity to act timely	– Involvement with government research/with other departments	– Frequency of disaster

	Strength	Weakness	Opportunity	Threat
Disaster Management Committee, Union Parishad	– Works at very local level – Capacity to respond immediately – Community mobilisation – People's acceptance – Communication with Upazila disaster management committee	– Very few disaster response materials – Lack of skilled people – Shortage of flood/ cyclone shelter – No instant disaster fund – No knowledge on climate change	– Bridge between government and people – Involve in local level planning	– Disaster like big tidal surge – Riverbank erosion – Unplanned embankment – Old flood/ cyclone shelter centre – Political influence during project implementation
Union Parishad	– Mobilisation capacity – Emergency meeting conduct – Communication with Upazila Parishad – Link with government.	– Lack of emergency fund – Lack of accommodation at cyclone shelter during disaster – Lack of adequate manpower – Lack of understanding of climate change – Lack of information about climate change – Lack of financial flow	– Students awareness initiation on disaster and climate change – Awareness creation among fishing community – To create green belt at riverbank – To build raised embankment (heavy wave tolerance)	– Flood – Drought – River erosion – Cyclone