Chapter Twelve

BANGLADESH ON THE FRONT LINE OF CLIMATE CHANGE

The Bangladesh Rice Research Institute is developing salt and flood tolerant rice. The national government is building new cyclone shelters. BRAC University architects are designing stronger houses. Climate change is already happening and most studies point to Bangladesh as one of the most vulnerable countries. But it is refusing to be a victim; Bangladesh is not standing by helplessly, waiting for others to act. Instead it is already adapting to climate change and is playing a leading international role in building pressure to halt global warming.

Bangladesh confronts climate change from a basis of knowledge and experience. It has always had an unusual position. It is the world's most densely populated country because it is a rich delta and feeds itself. But that natural wealth has costs in floods and cyclones and a hugely variable climate – which, over centuries, have also made Bangladeshis masters at adaptation. For Bangladesh, climate change does not create new and catastrophic problems – it will not entirely disappear beneath the sea or have huge areas transformed to desert, as will happen in some countries. But nearly one-third of the country is less than 3 m above sea level and the sea is rising; cyclones can kill thousands and all forecasts are that they will get worse; rainfall and flooding will be greater due to global warming. In the country's towns and cities there are likely to be dramatic changes that are not yet understood.

In two different ways, Bangladesh is on the front line of climate change. First, it is highly vulnerable. But second, its history of dealing with an extremely complex and difficult climate made it one of the first to understand the implications of climate change. Climate change was not some theoretical future problem, and Bangladeshis could see what the impact of global warming would be on their country. This led to international campaigning from 1990, and Bangladeshi scientists and intellectuals have been playing a leading role in international negotiations for the past two decades. Inside Bangladesh it led to early consideration of how existing programmes to meet climate problems could be adapted and accelerated to deal with climate change.

In the 45 years since independence, Bangladesh has had remarkable success in dealing with its difficult environment. The worst cyclones used to kill hundreds of thousands, but a post-independence cyclone shelter and early warning programme cut the death rate by 98 per cent. One important response to climate change is building more and stronger shelters which is already underway. At independence, Bangladesh was billed as a famine-ridden 'basket case', but now it feeds itself, partly because of new rice varieties. The shift from monsoon rice production to locally developed irrigated winter *boro* rice

took less than a generation and transformed agriculture. So, another important response to climate change is the development of new rice varieties and better agronomic techniques. Faced with waterlogging of the fields, farmers in coastal areas developed ways to use the sediment in the high tides to raise the level of the land. The scientists and engineers named it Tidal River Management and see it as a way of raising land levels to match sea level rise caused by global warming. By using its experience and existing techniques, Bangladesh is already responding to the likely impacts of climate change.

How High Will the Temperature Rise?

For Bangladesh, the Intergovernmental Panel on Climate Change (IPCC) predicts: temperatures will rise, sea level will rise, the number of cyclones will not increase but they will be stronger and more damaging, rainfall and flooding will increase, and while rice production will increase, wheat production will probably become impossible. However the seriousness of these changes depends on the extent of global warming. Bangladesh is pushing for a global agreement to limit maximum temperature increase to 1.5°C over pre-industrial levels, which is 0.5°C over present levels. If that were accepted, the damage done by greenhouse gases would peak in the middle of this century and then decline. The most common proposal is 2°C over pre-industrial levels by the end of this century, which causes increasing damage and rising seas and temperatures well into the next century. Pledges made at the Paris conference in December 2015 would mean a 2.7°C rise in the current century and much more serious damage in the next century.

Greenhouse gases are long-lived in the atmosphere and some of the carbon dioxide emitted now will still be causing climate change a century from now. Bangladesh is pushing for the 1.5°C limit because, in practice, it could cope with that. Adaptation programmes being considered, announced and underway would be sufficient, at least in rural zones. But 2.7°C, the only offer on the table now, will be quite problematic later in this century – for our children and grandchildren – and even worse in the next century.

The Unlivable Cities

Bangladesh's leading role and international standing on climate change adaptation is based on rural areas, where the majority of people still live. Dealing with floods, cyclones, crops and sea level rise has been entirely rural and the expertise and understanding of climate change in Bangladesh by the global experts is built on a deep rural understanding. Unfortunately, Dhaka is a megacity of 18 million people, and lessons from adaptation in rural areas have very limited relevance. It is ranked as one of the least liveable cities in the world, and it becomes ever less able to deal with climate change.

Many factors come into play. The rural areas have a long history and most of the country's intellectuals have rural roots. Political parties look to rural vote banks to win elections. In these areas, patron-client politics is moderated by social networks and a sense that in times of crisis the better off have a social responsibility to the poor. In contrast Dhaka is a new megacity, with a short history and shallow social roots. Its economy is largely informalized. It has grown in the era of neo-liberalism and primacy of the

private sector, so the state has played only a limited role in its evolution. What rules exist are easily subverted. The poor majority live in slums and bear the brunt of environmental problems – and climate change; it is their houses that get hottest when the temperature rises; it is their shacks that are flooded when it rains. And they will be evicted as soon as their slum can be replaced with high-rise apartments for the better off.

London at the end of the nineteenth century and Kuala Lumpur, Singapore and Bangkok at the end of the twentieth century made a transition – once they were congested megacities where it was difficult to move and dangerous to breathe, but they became more liveable cities where movement was possible. That transition requires effective urban governance, which in turn requires business leaders to want to change the city and to think long term about prosperity and liveability. Successful cities need a local elite that wants to be proud of their city and wants it to be an acceptable global face of their country. That has not yet happened in Dhaka, where the political and business elite assumes their children will leave Dhaka and Bangladesh and make their lives elsewhere if the city becomes unlivable. Even when the elites do hope their children will return, the children think and do otherwise – why would they come back to the most unlivable city when they can be in the most liveable ones such as London, Melbourne, New York or Toronto.

Climate change will have three main impacts on Dhaka.

- In the flood season rivers are already higher than much of the city; East Dhaka is unprotected and goes under water. Dhaka is caught in the middle by climate change as more water pours down the rivers while sea level rise and storm surges reduce the amount of water that can flow out to the sea, raising river levels near Dhaka. Major embankments are necessary to protect the eastern half of the city and create space for expansion, and existing embankments must be raised.
- Heavy rains flood the part of the city protected by dykes because the water cannot be pumped out quickly enough. Climate change will make this worse because it will bring more intense rainfall. Reopening illegally infilled canals (*khals*) and drainage channels, building storm drains, creating water-holding areas by deepening lakes (*jheels*) and providing adequate pumps will all be needed.
- Cities are normally hotter than the surrounding area and rising temperatures mean Dhaka will suffer from heat stress more often. Many slum-dwellers already report that this is happening. Offices and homes of the better off are air conditioned but the electricity supply already cannot cope. Green infrastructure, improved energy efficiency and housing designs that facilitate air flows will be needed in the future.

Responses to these problems are linked. First, it is the government and government regulated utilities that build infrastructure and provide services and they will need to lead on any response to climate change. We have seen this in rural areas, where it is the national government that leads on rice research, cyclone shelters and other initiatives, but this is not happening in urban areas. Second, there will need to be an acceptance that the poor majority are a part of Dhaka. They have a 'right to the city' and they are central to its economy. They require service provision, including water, sanitation, rubbish collection

and electricity. It requires land policy that encourages high-rise, low-cost housing and security of tenure to allow slum dwellers to improve their own homes, to help them cope with higher temperatures and more intense rainfall. And it requires a low-income urban housing strategy. This is a daunting and expensive list, but climate change demands the kind of urban initiatives that are already common in rural areas.[1] Politicians talk of reducing migration, but in the prevailing unregulated practices and markets, rural to urban population shifts are inevitable.

It is difficult for those who know Bangladesh well to imagine such policy reforms but change may have begun. In 2012 Dhaka was split in half, into north and south, and the two mayors elected in 2015 seem more dynamic than past leaders. The current project to save the Hatirjheel, the largest water body inside Dhaka, and turn it into a public open space and holding area for rainwater, shows what is possible – while also showing how influential private interests can still disrupt projects that will deal with climate change. In other parts of the world business people, political leaders and bureaucratic elites have formed coalitions that make cities liveable and make sustained prosperity more probable. One has to hope that similar conditions can develop in Dhaka and Chittagong and look to support them. Such collective action is not purely altruistic as it serves both the self-interest of the elites while meeting the needs of the poor.

The Climate Continuum

For Bangladesh, climate and the response to climate change is a continuum, because climate change makes the normal problems worse. The World Bank estimates that 'by 2050 the total adaptation cost to offset added inundation from climate change is estimated at $5.7 billion' – 5.7 per cent of GDP.[2] The Bank says Bangladesh must invest at least $3.3 bn to protect roads, railways, embankments and other infrastructure from river floods and $2.4 bn in coastal defences and cyclone shelters to respond to climate change. Bangladesh knows how to improve these defences and build the shelters, but that is a daunting amount of money. More money will be needed for Tidal River Management. But if the industrialized and industrializing countries insist on 2.7°C, then the embankments will need to be higher, there will need to be more and stronger cyclone shelters, and Tidal River Management (Chapter 4) will need to be accelerated to keep up with sea level rise.

Similarly, more rain and more floods mean more erosion, more lost land and crops, and more poverty. This, in turn, means more relief and rehabilitation programmes, including cash grants to help millions of people re-establish themselves – or it means

1 An alternative would be to try to reduce the role of Dhaka as a primate city which centralizes all political and economic activity. This would mean actively promoting decentralization to smaller cities. Government would need to lead, probably by moving ministries out of Dhaka. Resistance would be substantial, and it may be too late.

2 World Bank, *The Cost of Adapting to Extreme Weather Events in a Changing Climate* (Dhaka: World Bank, 2011), Bangladesh Development Series Paper No. 28, xvi–xvii.

increased poverty which will push more migration to the cities. Cash transfers, often in the form of re-establishment grants for a year or two, will be necessary to keep people in rural areas and allow them to rebuild their livelihoods.

A range of adaptation programmes are underway or possible – high-yielding rice varieties that will withstand longer floods, affordable pumps for water-logged fields, moving houses onto higher plinths and making them stronger to withstand the floods and cyclones and so on. Climate change does not change the problem, just the severity – is a 1 m high house plinth enough, or does global warming require 2 m? Bangladesh knows what is needed but the cost is high – bigger dykes, stronger houses, more pumps and relief payments for those hit by climate change are not free. Bangladesh is not responsible for global warming and the stronger cyclones and rising seas – so who pays for the adaptation? And who decides what is done?

The Bangladesh delta has been spectacularly misunderstood by foreign 'experts'. They ignored the massive watersheds and huge sediment loads and assumed it was like the United States or the Netherlands. Indigenous technical knowledge, local expertise and history were repeatedly dismissed. The rejection of the Flood Action Plan and the introduction of Tidal River Management have been turning points as local knowledge is applied first to reverse damage done by some aid projects, and then to confront climate change.

If the industrialized countries are to pay for the damage they have done – through 'aid', loss and damage payments or green climate funds – will they also insist on saying how the money will be used? Will highly paid foreign consultants continue to be allowed to transfer solutions from other parts of the world and ignore local expertise? The other problem is that aid projects, and particularly climate change projects, have to be presented to rich country taxpayers as 'new' because climate change is seen as something 'new'. Yet in Bangladesh climate change demands more of the same – will donors pay for more cyclone shelters, higher dykes and more relief funds? Or will they say these cannot be seen as climate change adaptation because some already exist? Transforming Dhaka and other cities and defending them against climate change involves massive urban housing construction as well as expanding sewerage and water supply. Will donors realize that these are essential to adapt to climate change, or will they say it is just part of the growth of a megacity and therefore Bangladesh's problem?

As Chapter 11 showed, fund management is likely to be a key issue. So far the international community has tried to keep a tight control over climate change adaptation funds and over the choices as to how they are spent, often ignoring local expertise and experience. Their excuse is usually 'corruption' which is indeed a serious obstacle, but pursuing best practices and achieving nothing may need to be replaced by viable 'second-best' solutions. Part of the problem is that both sides are trying to maintain patron-client systems. The international community wants subservient intermediaries while the Bangladeshi political parties want projects that benefit the influential people in their parties. And both sides have to satisfy people at the top, in capitals or international offices in Geneva or New York, or at senior levels in the party. Which means neither side acts transparently, and each side mistrusts the other. Is this an intractable problem, like Dhaka, or can each side give some ground so that progress can be made?

Keeping Our Heads above Water

Bangladesh can keep its head above water and can maintain the momentum on flood control, response to cyclones, raising coastal land levels and producing more food. Some significant domestic political changes will be essential, especially checking corruption and patronage, and showing the same dynamism and foresight that is already shown in rural areas in the cities too. The governance of Bangladesh is highly imperfect; however, it has delivered steady economic growth for almost 25 years and advanced the country's human development status faster than India.

But Bangladesh is also shaped by outside forces. The delta is built from water and sediment coming from thousands of kilometres away. The cyclones come up the Bay of Bengal. Occupation by the Moghuls, the British and West Pakistan, plus the influence of the cold war and of international agencies, have moulded this land both politically and physically. Sometimes it is essential to adapt to superior forces.

Now global warming is the outside superior force. It is almost entirely created by the wealthy countries from more than a century of fossil fuel emissions, and now pushed by newly industrializing neighbours. The contribution of Bangladesh's rice fields, power stations and garment factories to global warming has been tiny. Yet again, Bangladesh will adapt to outside forces. But many important decisions will be made in the rich, industrialized countries. We see three possible scenarios:

- *Curb emissions:* The most sensible choice for Bangladesh, and for the planet, is a sharp reduction in emissions and meeting the target of limiting global warming to just 1.5°C above pre-industrial levels. Although warming and sea level rise would continue for much of the rest of this century, the damage is manageable and Bangladesh could cope.
- *Emit and pay*: Before the Paris COP 21 meeting, the industrialized, and industrializing nations accepted only a limited curb in emissions, to just 2.7°C at the end of this century. This leads to much more serious damage to the planet and means that Bangladesh would have to make huge adaptation investments – in infrastructure such as embankments, shelters, drains and pumps, and in cash transfers and other support for those whose livelihoods are lost from heavier rain and floods and worse cyclones. At recent COP meetings, the international community has reluctantly accepted the concept of 'loss and damage'. Although not the best choice, if the industrialized countries are prepared to pay for the damage they will continue to cause for the next century, then Bangladesh can adapt.
- *Let the poor pay*: Bangladesh remains one of the poorest countries in the world, but it has used its limited resources relatively wisely to educate its people and raise health and living standards above those of its wealthier neighbour. Will the rich nations say the short-term demands of their own citizen take precedence; that emissions, temperature and sea level must continue to rise; and that they will not pay for the damage they are causing? Will they say that Bangladesh has shown itself skilled in dealing with climate, and must adapt to climate change with its own resources – taking money away from education and social services to raise the dykes and build shelters? Will they say

that those who lose their livelihoods to flood and cyclone should just migrate to the megacity?

Yet again, the future of Bangladesh is partly in the hands of people far away, over whom it has no control and only limited influence. Years of international negotiations in which some of Bangladesh's brightest intellectuals and scientists have played a leading role have brought some gains, with an agreement to prevent runaway global warming and instead limit temperature rise to 2.7°C at the end of the century – which is hugely damaging but at least not catastrophic. And at least lip service has been paid to 'loss and damage'. This is enough to ensure that Bangladesh will keep its head above water – but potentially at a very high cost.

What happens in Bangladesh depends to a significant degree on those of us who live in industrialized countries. Can we push our own governments to lower the temperature rise target to 1.5°C or 2°C? If not, can we at least force them to keep to their 2.7°C pledges? And can we push our governments to pay for the damage we are causing? The rich industrialized countries and their citizens created the global warming that is driving climate change that will raise sea level, increase floods and cause more devastating cyclones. Bangladeshis are already doing more than their fair share and, come what may, will keep their heads above water. Largely using its own money and expertise, Bangladesh is already adapting to climate change. Surely 'we' have a moral duty to help the people of Bangladesh tackle the problems we created.