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- **How to have climate-resilient food security in the coastal area**

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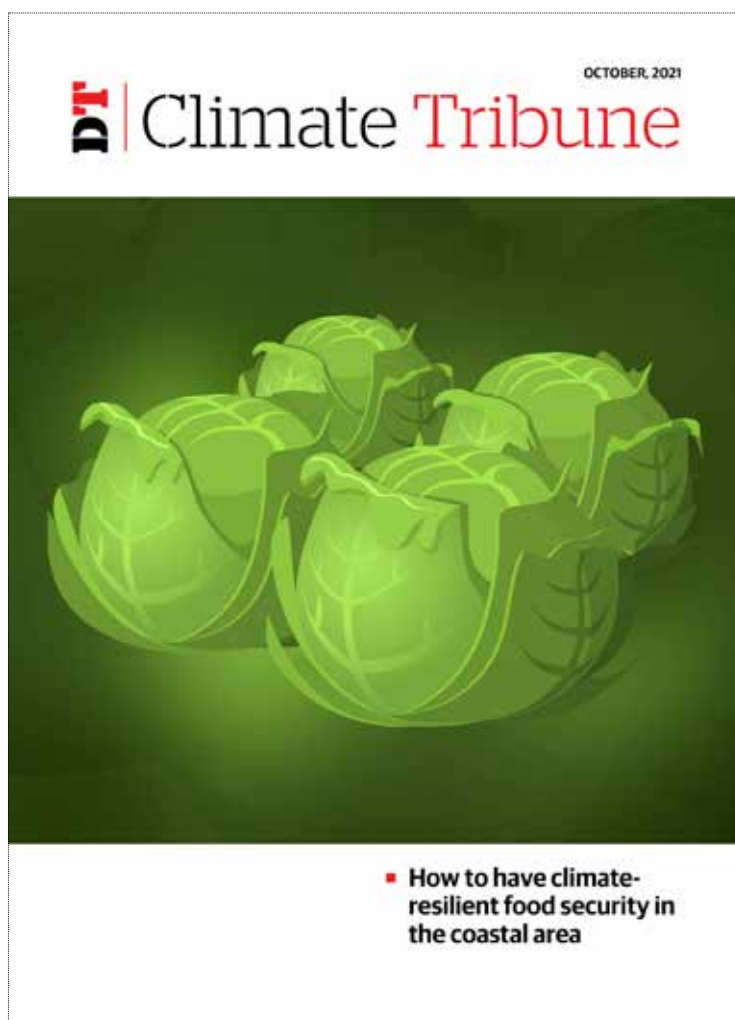
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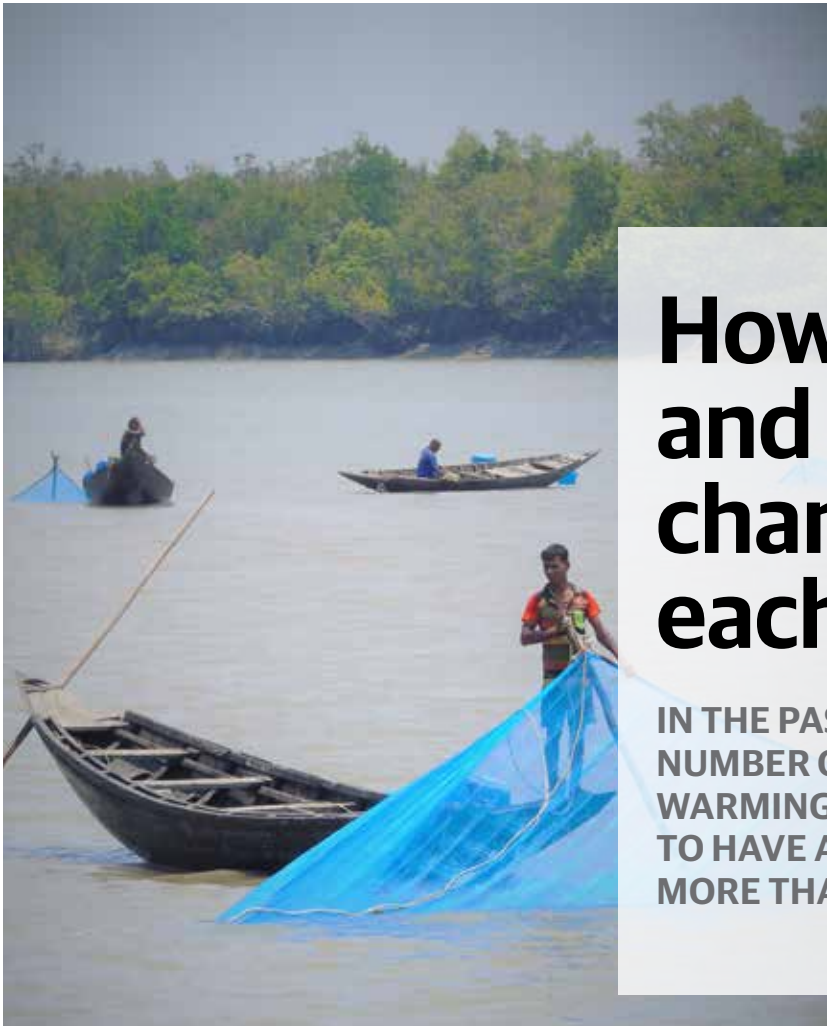
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COVER PHOTO: PIXABAY



A fisherman in the Sundarbans.

How fishery and climate change affect each other

IN THE PAST 50 YEARS, THE NUMBER OF MARINE EXTREME WARMING EVENTS, ARE ESTIMATED TO HAVE ALREADY INCREASED BY MORE THAN 50%

CATHERINE FOGLEI

“ The global levels of ocean productivity are expected to decrease rapidly in the tropical and inter-tropical areas, affecting the possibility to fish locally, with the local fishing operations that have already been reduced by up to 40% ”

Catherine Fogli

Nowadays fisheries and aquaculture not only represent a pillar of the world's economy but are also recognized as fundamental for the food security of 12% of the world's population, a percentage that goes up to almost 36% if we consider how many people rely, as a source of protein, on food coming from the ocean (FAO, 2020).

In that sense, the situation is alarming, if we think that fishery is an industry that is already suffering the impacts of climate change. Indeed, the processes of acidification, changes in currents, deoxygenation, rising temperatures and pollution of the ocean are all already affecting fisheries, and are expected to be increasing in the coming years. The growth and the reproduction of certain organisms are affected by these changes in the marine environment, with a resulting reduction in the available populations of many commercial species.

In the past 50 years, the number of marine extreme warming events, are estimated to have already increased by more than 50% (Smale, DA, et al, 2019), and these heat-waves are not only much more frequent but also heavier as individual events. Furthermore, all around the world, ocean temperatures are predicted to increase, by the end of the century, even 4°C above the current average temperatures (Laffoley, D. et al, 2016).

The global levels of ocean productivity are expected to decrease rapidly in the tropical and inter-tropical areas, affecting the possibility to fish locally, with the local fishing operations that have already been reduced by up to 40% (FAO, 2018.)

Significant repercussions are expected for small islands and countries highly dependent on fisheries, such as Bangladesh, India, Vietnam, Indonesia, Angola, and Peru. This is also increasing inequalities between states. The ocean's productivity could increase in the Polar regions, but an increase of the fishing activities in northern countries such as Norway, Iceland, Alaska, and Russia, as well as around the North Pole, could overheat and pollute the area, leading to much more rapid melting of permanent glaciers, and therefore to even more changes to the natural ecosystem.

The state of world fisheries and aquaculture – Meeting the sustainable development goals

It is not just fish stocks safety that is at risk, coral reefs are also at risk due to climate change and pollution effects on the ocean, with nearly all tropical coral ecosystems that are expected to disappear by 2050.

At first instance, one may think that coral reefs are not a part of the human food chain, and therefore do not affect our food security. However, by functioning as nurseries for many species, protecting coasts from erosion, absorbing carbon and nitrogen, they are vital to many ecosystems, economies and food systems in the world, especially – but not limited to – those of small islands.

Bacterial and phytoplankton communities, even though also not directly related to human food security, are fundamental for the maintenance of the marine ecosystem, and are another thing highly at risk due to climate change impacts on the marine ecosystems.

Adaptation measures in fishery and aquaculture are very much needed but, in current times, due to a lack of a targeted analyses of the sector's vulnerabilities to climate change and of those that are the risks associated to the impact of climate change, not many responses options have been thoroughly studied and even less have been implemented. This article, of course, is not intended to fill in that gap, but just to shed a light on the current and future issues regarding fishery.

Moreover, not only we are not implementing strategies to reduce the impacts of climate change on oceans, and therefore on the fishery, but in many parts of the world we are

also supporting an irresponsible, intensive, unsustainable, and oftentimes illegal fishing industry, which is contributing to oceans' pollution and to the devastation of fish stocks, coral reefs, seabeds, and is bringing, or has already brought, species to extinction.

Globally, the total amount of fish caught is nearly three times larger than what the oceans can handle; the fish that remain are unable, with reproduction alone, to replace all the specimens caught. 53% of the world's fishing areas are fully exploited, and 32% are in many cases over-exploited (FAO, 2020), impoverished or unusable because they are in a period of recovery from previous exhaustion, even if it is not certain that this recovery is possible.

“ Globally, the total amount of fish caught is nearly three times larger than what the oceans can handle ”

Mitigation and adaptation strategies for climate change impacts on fishery are very much needed, but also a shift in our diets, away from unsustainable produce, is essential to combat climate change and environmental degradation at a personal level. ■

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PIXABAY

How small cities coped with food insecurity during Covid lockdown

FOOD SECURITY AND COVID-19

Sumaiya Sudha

The Covid-19 pandemic has had a significant impact on food, one of the most important fundamental rights of humans. The situation of the food problem is not very atypical in our country. The food security disrupts during the natural disaster but the condition becomes complex and uncertain during a pandemic outbreaks.

Covid-19 was declared as a health emergency earlier but currently it has an impact in each and every sector. When addressing the food security issue, both the rural and urban areas would get the attention directly. In contrast, the small cities with both urban and rural potentiality and challenges would lag in this front.

A study during the first phase of Covid-19 lockdown showed the situation of food security in Mongla and Noapara upazila of Bangladesh. The writing highlights some of the key findings from The Covid-19 rapid response research funded by the GCRF Living Deltas Hub NE/S008926/1.

It was under the 'Liveable Regional Cities in Bangladesh' project funded by the Capacity Development Acceleration Fund of the Centre for Sustainable, Healthy and Learning Cities and Neighbourhoods (SHLC). SHLC is funded via UK Research and Innovation, and administered through the Economic and Social Research Council, as part of the UK government's Global Challenges Research Fund (GCRF).

The scenario and coping mechanism during lockdown were different from the regular days. Livelihood opportunities for a day labourer, street hawker, rickshaw puller were greatly affected during the first phase of lockdown. Wage earners faced difficulties and struggled to maintain pre-Covid income. This reduced earnings always contributed to less food consumption and reduction in nutrition access.

However, the effect of food insecurity problems is not the same for the people having a regular source of income. Still, the scenario was not unexpected after an economic reduction during the pandemic. Moreover, the government system related to supply and mitigation of demand doesn't always work in these small cities like major cities, and this inequity is valid for the global south even for the research.

The study shares the comparison on food security issues before and during Covid-19. The first study took place in September-October 2019 and the later part was done during March-May, 2020. Less funding, resources and more minor political influences are typical in these small cities and for which the inhabitants suffer the most. While the informal settlement dwellers are ensuring food security, it isn't necessarily providing nutrition. Due to the high expenses of living in the city, it's become difficult for people to eat balanced food.

While the people in these small towns find it more challenging to get used to cyclone Amphan, salinity intrusion and storm surges in these areas became aggravated during the covid-19 lockdown. Though people were willing to follow the imposed laws of the government regarding COVID-19, residents faced trouble in going to work and in buying things necessary food and essential items. Both Mongla and Noapara Municipality are dependent on outside sources for food production and this led to a price hike during the pandemic driven lockdown.

A resident said, "We are consuming fewer foods in terms of quantity and quality. Now I cook less rice than before. Sometimes we manage to get some vegetables or spinach. As our source of food is mostly dependent on the income, and I am not doing any work - so our family is dependent on the very much lower amount of my son's earnings."

Deficiency of affordability and limited access to the market is simultaneously portraying these scenarios. Even if people are spending 100% of their income, they can't even buy adequate food. Time restriction in the daily market during lockdown was another reason vendors and buyers had faced losses and difficulties.

Taking loans from others, cutting off the quality and quantity in food consumption as well as meals, increasing total allocation for food, accessing relief are the common path to accommodate the issue. The local authorities, non-governmental organizations, the military and the Upazila (the second-lowest tier of regional administration in Bangladesh) have worked hard to ensure that residents could survive the

crisis by providing food relief packages immediately.

The amount of food given in Mongla was 10 kilograms of rice, 2 kilograms of potatoes, 500 grams of pulses and some soap. In Noapara, residents received 20 kilograms of rice, 1 kilogram of onions, 1 kilogram of pulses such as lentils, some soap and cooking oil. But this assistance is not adequate for all people who need help.

The other side of this issue is that middle-income people can't ask for help as easily as lower-income people. Sometimes the situation turns very differently for them who are going to take relief for the first time of their life.

Also, the borrowing money options from relatives or

“Wage earners faced difficulties and struggled to maintain pre-Covid income. This reduced earnings always contributed to less food consumption and reduction in nutrition access”

people become less as most of the known people weren't able to provide money. The overall condition for coping with the present day situation of this pandemic, people are getting exhausted whether they are from middle income people or lower income ones.

The heterogenic poor and their vulnerability in accessing food become difficult during disasters be it Covid-19 pandemic or impacts of climate change. Drawing from evidence-based research, the social safety net and other related programs must be prioritized in small cities and municipalities especially in climate vulnerable areas.

In addition, international, national and local policy and strategies need to focus on these cities and people so that they can be helped to develop according to their needs and expectations, especially after this pandemic breakdown of economic conditions. ■

Sumaiya Binte Selim is a research officer of International Centre for Climate Change and Development and she was a part of the stated projects.



Fisherman fishing in local fishponds, where salinity is a key reason for low production.

COURTESY

How to have climate-resilient food security in the coastal area

THE LOCAL GOVERNMENTS MUST STRICTLY IMPLEMENT 'JATIYO CHINGRI NITIMALA 2014' TO GUARANTEE AN EQUAL DISTRIBUTION OF AGRICULTURAL AND SHRIMP FARMING RESOURCES

M Manjurul Islam and Ashish Barua

An array of adverse environmental conditions threatens Bangladesh, particularly its coastal region. Periodically, the country has been plagued by cyclones, storm surges, riverbank erosion, floods, and saline intrusion due to its geographic position and physical state of coastline.

Native populations in the southwest coastal area rely heavily on natural resources like water bodies, land, and forests for their livelihoods. Most of the people here are dependent on the agricultural sector for their livelihood. Climate change-induced stressors and strains are the biggest threat to Bangladesh's farming production, particularly in the coastal areas, where most of the population depends on agricultural goods.

Loss of households, farmlands, water, and food are all short-term consequences of climate-induced changes on the environment and especially on agriculture. Also, farming activities will potentially be further disturbed by saline water due to increasing sea levels encroaching on fertile land in the long run. Non-climatic anthropogenic sources, in addition, exacerbate the coastal community's loss of livelihood.



Small-scale fish farming in a 'shrimp gher'.

COURTESY

“ Many farmers in the southwest coast, in recent years, have given up agriculture because of significant crop failures and poor profits ”

The scenario of food insecurity

Many farmers in the southwest coast, in recent years, have given up agriculture because of significant crop failures and poor profits. Low agricultural yields have been caused by a gradual rise in salinity both in soil and groundwater, being amplified by the frequent storms in the region.

Current coping mechanism and limitations

There is numerous evidence on the ground regarding how the community in the coastline area in general, and then in the southwestern and southern region specifically is trying to adapt to the variations in domestic food production influenced by climate change.

There are good examples based on their traditional knowledge and acquired learning despite their struggle with increased soil salinity inhibiting development, lowering fertilization, fading of agricultural land, and affecting total agricultural output.

Because of limited access to information and knowledge, the farmers are taking a long time to cope with this adverse

“Because of limited access to information and knowledge, the farmers are taking a long time to cope with this adverse situation”

situation. Likewise, lack of capacity to produce saline tolerant and resilient crops is a key concern when it comes to optimal production.

In recent years, almost all the initiatives have been deemed ineffectual because of a lack of essential resources and inadequate knowledge about the consequences of climatic variability. Diverse organizations aid in food and other necessities, but relatively few programs specifically address food insecurity leaving the problem unrectified.

In addition, responsible authorities often operate and maintain the facilities but in unsatisfactory condition. There are several agricultural and shrimp farming policies and standards for shrimp farming in place in Bangladesh, but the

procedure is made worse by a lack of cooperation between several governmental bodies. And a lack of good governance in the sector ultimately prevents the country from achieving its long-term and sustainable goals.

Way Forward

In this context, certain measures should be considered for execution to guarantee food security and to improve adaptability in the situation of a changing climate. Firstly, the Department of Agriculture and relevant government agencies should provide free and low-cost saline and flood-tolerant seedlings to the farmers so that it is promoted in a timely manner.

Secondly, ensuring capacity building opportunities on climate change context and adaptation for the Union and Upazila level agricultural, fisheries, and other relevant local government authorities will contribute to better yield.

Thirdly, the local governments must strictly implement 'Jatiyo Chingri Nitimala 2014' to guarantee an equal distribution of agricultural and shrimp farming resources. Then, maintaining rigorous execution and incorporating disaster risk reduction and climate change adaptation into local development planning will be key to addressing local challenges and mobilizing required finance and other resources.

Additionally, local governments should set up well-managed collection hubs and storage facilities in each community to guarantee enough market infrastructure. Last but not the least, the local government and the Bangladesh Water Development Board must adequately manage and maintain existing sluice gates and embankments.

As a supplement, local governments with support from government and non-government organizations should re-excavate irrigation canals and cancel illicit agreements on communal water sources. Therefore, particular emphasis on homestead gardening and diversification of food security is needed to alleviate such food shortages at the household and community level.

Overall, government and non-government organizations must concentrate on improving food security and water availability in light of a changing environment to meet the demands and contributing to fighting poverty and improving food security. ■

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The dual impact of cyclones and Covid on food security in Bangladesh

MANY FAMILIES HAVE HAD TO GO THROUGH A FOOD CRISIS OVER THE PAST YEAR AS THEY HAVE NOT BEEN ABLE TO GO TO WORK FOR A LONG TIME DUE TO THE LOCKDOWN



PIXABAY

Mahmuda Akter

The increasing frequency and severity of extreme weather events such as cyclones, floods, and droughts as a result of climate change over the past few years are having a catastrophic effect on food security and livelihoods.

Also, it is mentioned in the IPCC fifth assessment report that climate change can adversely affect people's propensity to produce, access and consume food. Considering all of these issues, the government of Bangladesh is determined to address these challenges through relevant measures and policy approaches.

“Despite climate change and natural disasters, Bangladesh has been tackling food insecurity by using modern technology”

Besides, various NGOs, INGOs, research institutes and development entities are working together to ensure food security and to achieve continuous higher economic growth to minimize poverty.

Despite climate change and natural disasters, Bangladesh has been tackling food insecurity by using modern technology. In particular, in the northern region of Bangladesh, people have been using flood-resilient seeds as well as doing floating gardens or hydroponics since 2005.

Besides, in the south coastal region, people have been using saline-resilient seeds and doing agricultural work by practising some locally-led adaptation strategies including aquaponic, tower gardening, sack gardening and so on.

So, the people of Bangladesh have now learned how to cope with climate change and disasters, and how to cultivate well in this adverse weather. Moreover, many have moved away from their traditional livelihood practices to alleviate their poverty and are making significant gains in new works.

For example, many people in the coastal region are now making a lot of money by cultivating shrimp instead of paddy, although many poor people are being forced to do seasonal migration due to this practice. To cultivate shrimp on paddy land, those who used to earn a living by working as day labour on paddy land now have to move to other areas due to lack of work. Nevertheless, they were able to manage their family's food until the pandemic of Covid-19.

Many families have had to go through a food crisis over the past year as they have not been able to go to work for a long time due to the lockdown to be protected from the Covid pandemic.

Sathi Rani's story is one of many stories, whose husband became unemployed after the crab sale was stopped due to lockdown. She mentioned that her husband had borrowed a lot of money from various associations, and now they are facing the uncertainty of repaying this loaned money.

Sathi's family is afraid that if they do not pay this money, they will have to leave their home in search of new livelihood and repay the debt (Sathi Rani Mondal, Individual Interview, Burigoalini Union, Shyamnagar Upazila, Satkhira, February 2020).

Pabitra Kumar, a farmer, said that due to the lockdown last year, many of his crops could not be sold and had to be rotted and thrown into the water. (Pabitra Kumar Mondal, Individual Interview, Kultali Village, Burigoalini Union, Shyamnagar Upazila, Satkhira, September 2021).

The financial loss increased during the lockdown period when cyclone Amphan also hit. Many people's houses were destroyed, fish from ponds and enclosures washed away, and crops destroyed.

To make up for this loss, they had to borrow money again as they could not go out to work due to the lockdown. They started cultivating crops, fish, shrimp and crabs again in the hope that they would repay the loan with that money by

cultivating again.

But misfortune seems to follow them like a dramatic irony. Another cyclone, Yaas badly affected local people's lives, as they have already become destitute due to cyclone Amphan and Covid lockdown.

In addition, the crop was submerged in saltwater for a long time due to two more floods in the same year, so that the current crops are almost on the verge of ruination. As a result, there is a possibility of food shortage in this area as well as in

“Sathi's family is afraid that if they do not pay this money, they will have to leave their home in search of new livelihood and to repay the debt”

the areas where food is exported from here. Now the main concern is what they will do to alleviate the food crisis in the coming years if once or twice a year everything starts to be destroyed due to climate change and disasters.

To overcome this uncertainty, ICCCAD, a research organization, is working on a project called TAPESTRY on what could be the sustainable livelihood approaches of the future. Through this research, researchers are trying to understand the bottom-up approaches, how climate change and disasters are affecting Bangladesh and the Indian Sundarbans, and how locals are coping with it.

Also, the project aims to scale up the existing livelihood approaches to ensure its sustainability. Like ICCCAD, other NGOs and development entities are now considering the above issues to minimize the food insecurity of Bangladesh.

However, most of the work is project-based, so as soon as the project is over, their effectiveness ends. Therefore, projects must start with a long-term plan along with proper monitoring during, as well as at the end of the projects. ■

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Climate vulnerable agricultural sectors

STORIES OF SHIFTING FARMING PATTERNS DUE TO CLIMATE CHANGE IMPACT IN SOUTHERN BANGLADESH

Sufiya Khatun

The word ‘vulnerable’ denotes an alarming situation to the possibility of being harmed. And here ‘vulnerable agricultural sectors’ define the possibly risky situation of agricultural sectors. Climate and agricultural productions are part and parcel of each other. Agricultural practices influence climate change and climate change also affects crop production and farming patterns.

The world’s climate is changing day by day and becoming a more severe threat to agricultural sectors. Due to its vulnerable geographical position and other environmental reasons, Bangladesh is one of the most climate-vulnerable countries in the world. Based on the present climatic scenario, the climate of Bangladesh can be grouped by medium to heavy rainfall in the rainy season, high temperature in the summer season, and high humidity in the winter season, whereas once it used to have six different seasons with their different flavors. Effects of climate change have become a great threat to agricultural sectors in both scholars’ and farmers’ perceptions.



Damaged vegetable (Papaya) yard due to heavy rainfall and waterlogging.

COURTESY

The agricultural sector alone is contributing almost 12% of the GDP and creating employment opportunities for almost 44% of the population (IUCN, nd). Agricultural production mainly depends on climatic factors like temperature, rainfall, humidity, sunlight intensity and duration, and radiation, which are predicted to be erratic due to climate change, consequently posing threat to the agricultural sector.

Climate change may alter crop patterns and volume of production due to increasing crop pests and diseases forcing farmers to use more pesticides like herbicides and fungicides (Lake et al, 2012). In our country over the last three decades,

“ Effects of climate change have become a great threat to agricultural sectors in both scholars’ and farmers’ perceptions ”

the temperature is rising and the predicted average daily temperature is expected to have an increase of 1.0 C by 2030 and 1.4 C by 2050 (Alamgir et al, 2018).

Constant natural disasters like cyclones, flood, storm surge, sea-level rise, drought, and rising atmospheric temperature are causing damage to food production rate. Although impacts of climate change have telling effects in the world’s agricultural sector, in Bangladesh’s case, where livelihood and lives mainly depend on agricultural production, it’s becoming a great threat to national food security. Let’s see the practical and present scenario of Bangladeshi farmers in the Southern region (from Koyra Upazila under Khulna district):

According to a couple of Rice farmers - almost 10 years ago they could cultivate rice in more than 10 bighas of land and the overall production cost was relatively low. But in recent times they are very fearful to take the risk of damage in crop production. As farmers don’t have enough updated

knowledge about climate change effects, they can’t figure out the solutions to the problems they are facing in rice cultivation.

They have noticed that the variety of crop pests and diseases are increasing alongside the soil fertilization becoming low. As a result, the increase in pesticide and fertilizer costs are proving to be an added burden to them and they are limiting their crop production area to 2 bighas instead of the previously used 10 bighas. Another major problem is natural disasters like cyclones, flooding, and saline water inundation damaging the net production output.

Again, according to the owner of a vegetable production yard, last year he cultivated pumpkins and the final product was not so profitable because most of the pumpkins became rotten. In the running year, he cultivated papayas instead of pumpkins so as not to face the same situation as before. In the first-round his total cultivation cost was Tk60,000, but unfortunately, most of the plants and leaves were affected by fungus and turned a yellow color.

Different types of fungicides and pesticides were used but he was able to sell the Papayas only for Tk7,000. In the next round, he bought papaya seedlings for Tk12,000. But unfortunately, he faced another loss. As it’s the rainy season, most of the plant’s roots rotted due to rain waterlogging. At last he planned to shift his farming pattern totally and made a poultry farm instead in his vegetable yard.

According to Water Resource and Climate Specialist Professor Dr Ainun Nishat, due to world climate change, seasonal change doesn’t occur at the right time and the frequency of natural disasters is increasing with a low return period. As a result, when the crops bloom, they don’t get a suitable environment for pollination, which in return is decreasing the final crop production.

What can be the youth’s contribution to this sector? The youth are the builders who can build a risk-free future. Sadly though, they don’t have much interest in the agricultural production sector, even the ones who are facing unemployment.

In Bangladesh, there are one private and six public universities which are specialized in agricultural science. Instead of the agriculture sector, most of the graduates go for career prospects in unrelated service sectors (Uddin, nd).

But it’s time to apply initiative techniques and up-to-date cultivation knowledge to cope with the vulnerable situations due to climate change. The Youth can play a vital role via engaging themselves and make use of all agricultural initiatives to ensure food security. ■

Sufiya Khatun is working in Youth Climate Lab (YCL) as a Regional Associate (Bay of Bengal), her research interest lies in Climate Change effects, Conserving vegetation especially the forest area which soaks CO2, and engages youth to initiate and implement sustainable environment-friendly development steps. Can be reached at sufiyakhatunsumi@gmail.com.



PIXABAY

Madagascar is on the verge of becoming the world's first climate-related famine

A WAKE-UP CALL

■ Maria Mehrin

Heatwaves in Europe, Wildfires in the United States, if there are still any doubts that the year 2021 is a global awakening call over the climate crisis, we can add one more issue to the list: “Famine”. Madagascar, an island of Africa’s southeast coast, is on the verge of experiencing the modern world’s first climate change-induced famine.

Madagascar is a low-income country. Agriculture is a mainstay of Madagascar’s economy employing about 80% of the population (International Trade Center, nd). Rain-

““ The Grand Sud region, the southern part of Madagascar has experienced back-to-back droughts during the 2017-2020 rainy seasons ””

fed small-scale subsistence farming dominates the agriculture of this country.

However, the Grand Sud region, the southern part of Madagascar has experienced back-to-back droughts during the 2017-2020 rainy seasons. This has had a disastrous impact on agriculture resulting in crop failure and leaving families to scavenge for insects to survive. The World Food Program (WFP) of the United Nations has proclaimed the crisis to be caused by “climate change.”

The west and southwestern parts of the island displayed the highest rise in temperature as the Potential impact of 1.5 C, 2 C global warming levels. Since 2015, Madagascar has consistently experienced rainy seasons where rainfall has been below average.

From November 2017 to April 2018, during the rainy season in southern Madagascar, severe drought conditions resulted in almost dry dams in various parts of the country. As a result, the national rice production in 2017 was 3.1 million MT which was 21% lower than the 5-year average and 19% lower than the previous year (Food Security Outlook, 2017).

This situation continued as below normal cumulative rainfall has been recorded in southern Madagascar between October 2019 and February 2020. This occurred at the time when the majority of the crops were at the flowering stage. This is now the fourth year when farmers have had to wait for the harvest. It is feared that the current dire situation would worsen during the “lean season,” collapsing the food inventories.

Droughts and floods have always plagued the country, but this time, a four-year drought has pushed at least 30,000 people to level five famine, the greatest globally recognized level of food insecurity, according to the United Nations World Food Program. As Madagascar enters the typical “lean season” before harvest, there are fears that the number of people affected may increase dramatically.

Famines have historically been caused by crop failure, calamity, or insect invasion; current famines, on the other hand, are primarily thought to be man-made, resulting from conflict, natural calamities, or mismanagement and political meddling. Madagascar has none of these problems, making it the first famine in modern history to be completely driven by climate change. The World Food Program has declared that catastrophic levels of hunger in drought-stricken Madagascar should serve as a “wake up call” on climate change.

Madagascar produces a little more than 0.01% of the world’s annual carbon dioxide emissions every year (World Economic Forum, 2021). Fossil CO2 emissions in Madagascar were 3,026,047 tons in 2016 (Worldmeter, n.d.) whereas fossil CO2 emissions in the United States were 5.42 billion Tons. The Ecological Footprint of Madagascar is 0.65 Planets.

If everyone in the world consumed and produced like Madagascar then it would take only 0.65 Planets to absorb waste and regenerate resources. Despite the fact that this

““ Droughts and floods have always plagued the country, but this time, a four-year drought has pushed at least 30,000 people to level five famine, the greatest globally recognized level of food insecurity, according to the United Nations World Food Program ””

region of the world has made no contribution to climate change, they are “paying the biggest price.” They don’t burn fossil fuels and yet they are bearing the brunt of climate change.

Everything is very unpredictable about the weather now. “What will happen tomorrow?” It’s a huge, huge question mark. Madagascar may seem far away, but the issues should feel close to home, wherever “home” might be. ■

Maria Mehrin is a final year student of Bangladesh University of Engineering and Technology, her research interest lies in sustainable environmental management. Can be reached at mariamehrin3@gmail.com

SALINITY INTRUSION

How people in Durgabati village are adapting after saline water left it barren

Hafizur Rahman, Lutfor Rahman, and Vaskar Mandol

The Durgabati village in Burigoalini Union of Shyamnagar, Satkhira district is a remote area in Bangladesh. The people living in this remote area have long been facing the adverse effects of a food crisis resulting from the worldwide phenomenon that is climate change. In the past 10 to 15 years, the lands where paddy, wheat, maize, etc were cultivated, have become barren. Consequently, the livelihoods of the people living in this unfortunate area have taken a massive blow.

YOUTH CLIMATE ACTIVISTS LIKE VASKAR MANDOL ARE WORKING WITH THEIR COMMUNITIES TO ENSURE CAPACITY BUILDING AND AWARENESS BUILDING ON CLIMATE RESILIENCE



A farmer from the Durgabati Village cultivating vegetables in the macha system

BASANTA MANDAL

To further comprehend the extent of the salinity crisis in his community and how it has been affecting his hometown, Vaskar Mandal, a local youth leader doing his Honor's in local-level education while working as a Youth Associate for Climate Resilience Collective (CRC) Youth Climate Lab (YCL) and International Centre for Climate Change and Development (ICCCAD), conducted a few case studies to identify a few salinity tolerant agricultural technologies and started training the locals to help them adopt these technologies.

The following are some excerpts from the case studies Vaskar Mandals conducted regarding his local research project under the CRC project.

“Basanta Kumar Mondal (45) has been battling various natural calamities living in the coastal village of Durgabati amidst scarcity and poverty. He has chosen agricultural work as his working profession. Throughout his life, he has engaged in all kinds of work related to agriculture; be it cutting the soil, cultivating paddy, or farming shrimp despite his reluctance to do the latter. Drawing from his experience he mentioned that the increase in salinity and recurring river erosion aggravated by natural disasters in his village has affected the food production.

In the past, he used to produce various crops including paddy on his land. But due to repeated river erosion and increasing saline water intrusion as a consequence of tidal surge, he is not able to produce crops despite all his efforts.

One of the reasons for this increase in salinity is the erosion of coastal dams, which is almost a given every year. Due to regular riverbank erosion and embankment breaching, the salinity of the soil is increasing day by day as the saline water of the river enters the agricultural and arable lands.

As a result, arable lands have become uncultivable which adversely affects food security. Likewise other farmers in the area are suffering the same fate. This did not stop Basanta Kumar Mondal though. To avoid a food crisis, he has been cultivating different types of vegetables in his backyard using the knowledge he gained from training.

He attended training from the Caritas Sufal-2 project, where the participants learnt different farming methods, including the sack method, macha method, and aquaponics method. Basanta Kumar Mondal has implemented these adaptation techniques in his farming routine and is now able to grow food and sell it to the local market, all after meeting the needs of his family.

Basanta Kumar Mondal has been proactively trying to find a solution to his problems in the face of such constant adversity. Many local youths in the community like Vaskar are also taking up leadership roles to build up the resilience of the community. Vaskar is passionate about his work, and feels he has an important role to play to enhance the awareness and skills of the local people regarding climate/ salinity tolerant agricultural technologies.

He focuses mainly on the impact of climate change,

especially salinity on food security. Salinity is seen as a major global issue owing to its adverse impact on agricultural productivity and sustainability. Salinity, if not managed timely, can reduce the crop yield and completely eliminate the crop above certain salinity thresholds. Currently, no accurate and recent statistics exist on the global extent of salt-affected soils, an issue which needs immediate sorting.

Vaskar Mondal had experience in getting data from his community through conducting FGDs and case studies from back when he carried out his project. This presented the perfect opportunity to find helpful solutions to the problems faced by the locals. He conducted the FGD and case studies and highlighted the quality of life in the community by uploading pictures of their problems and solutions on social media. In his research, he showed that increased awareness of climate change and salinity intrusion impacts food security in Durgabati village.

Farmer's education on the management of saline soils, adoption of salt-tolerant crops (bio-saline agriculture), efficient nutrient and water management, crop management, post-harvesting, and marketing, is the prerequisite for the technology adoption.

Mondal believes that if the farmers receive specialized training, agricultural intensification is possible, leading to increased food production per unit area which will set the way forward to achieve food sustainability. This requires investments in strengthening Research-Extension-Farmers linkage, a key to successful agriculture in saline soils. In general soil education is fundamental for the nation and better knowledge reduces risks in decision making.

The youth can play an important role regarding development at local, national and even international level. ‘Youth Engagement for Global Action’ is an opportunity to highlight the engagement of young people in climate action at the local, national and global levels as well as in the UN Climate Change process (UNFCCC, 2020).

Youth climate activists such as Vaskar Mandol are working with their community to ensure capacity building and awareness building on climate resilience. To further enhance the process, the youth need more technical and voluntary support from the expert organizations.

Most of the local young leaders are deprived of a space or opportunity where they can share their knowledge or experiences. It is imperative that we recognize them and all their hard work and help them in their mission at both national and international level.

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Climate change is an absolute threat for food security In Bangladesh

IMPACT OF CLIMATE CHANGE ON FOOD

Most Mastura Munia Farjana

While Climate change is a global issue, the negative and unfavourable outcomes of climate change pose a great risk to agri and food industries of any given country. Climate change and agriculture are intertwined in a way that is critical for food security (Amir & Ahmed, 2013). Bangladesh is already battling the threats of climate change. The serious risks posed by these threats on the agriculture sector are disruptive to the health and economy of the country.

“ In 1973 about 1.5 million hectares of land was attacked by salinity which increased to 2.5 million hectares in 1997 ”

Approximately 4,000 square kilometres of land in the north-eastern part of the country and 1400 square kilometres in the southeastern part of the country face unpredictable floods (UNB, 2021). In the north of the country, many times these flash flood events have caused loss of thousands of acres of boro paddy right before the harvesting season.

On the other hand, seasonal drought (March-April) creates unsuitable conditions for Aman paddy, Aush paddy and jute production. Drought creates a water crisis. Farmers most of the time need deep irrigation, but deep and artificial irrigation is costly. As a result, crop growth diminishes and overall production becomes lower in amount.

In the coastal region flash flood and salinity intrusion impact is huge. In 1973 about 1.5 million hectares of land was attacked by salinity which increased to 2.5 million hectares in 1997. This large salinity intrusion resulted in huge crop loss in those areas and also is a threat to our food sector. Moreover, Cyclone Sidr created a significant impact on the production of different crops. Production of rice (7.5%), chili (11.66%) and vegetables (10%) was reduced due to saline water intrusion into the crop field after Sidr.

Salinity in the water of the coastal areas is increasing, making irrigation a problem. More salinity means less yield in crops as salinity impacts soil fertility. Less crop is undoubtedly a threat to food and agriculture. This year farmers of Dighinala Upazila of Khagrachari district found that rice has started to become mouldy and the overall production also got affected because of climate change and less precipitation. Farmers of Merung Upazila also experienced a decrease in the production of ginger, turmeric, pumpkin, maze, flaxseed and banana.

Not every time climatic hazard affects food and agriculture directly. Scarcity of favourable harvesting seasons and environment because of climate change is a great threat to agricultural production and food.

This year in April, approximately 40,000 hectares of Boro rice field has been destroyed because of a cyclone followed by heatwaves dampening the hopes of boro farmers in Kishoreganj, Netrakona, Mymensingh, Sunamganj, Moulvibazar, Barishal and Patuakhali. Department of Agricultural Extension (DAE) estimated that approximately 47,000 hectares of Boro paddy had been affected on this course (Zahid & Islam, 2021).

Every year, a huge number of paddy fields, wheat fields and other crops get destroyed when a flood, cyclones and nor-wester hits the country. Keeping pace with food production with continuous population growth while battling climate change has been difficult. Moreover, it is mostly the small scale farmers in the country who are at the core of the food security challenge in Bangladesh.

To fight against this challenge, we need to find effective solutions for climate change impact on food security. Revising Bangladesh Climate Change Strategy and Action Plan (BCCSAP) to incorporate scientific, evidence-based,

“ Farmers of Merung Upazila also experienced a decrease in the production of ginger, turmeric, pumpkin, maze, flaxseed and banana ”

and need-based strategies into the system, can be the way forward to strategically build resilience against food security challenges. ■

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A persistent yet rarely highlighted issue from south-western coastal Bangladesh

THE 'REPAIR AND MAINTENANCE OF EMBANKMENT' HAS BEEN THE SOLE DEMAND OF THE SOUTHWEST COASTAL COMMUNITIES FOR A LONG TIME, BUT IT HAS CLEARLY BEEN IGNORED

Ashish Barua

The climate-vulnerable communities in 27 sub-districts in 9 districts, especially the low-lying areas in south-western Bangladesh were flooded by tidal surges even though the landfall caused by cyclone Yaas was largely in India. The cyclone caused some indirect damage, breaching the coastal embankments, an estimated 27 kilometres in length.

Several embankments were damaged and communities in the adjacent areas experienced water flows during high tide every day, some are experiencing this even till now. This has been a challenge for the communities as most of them are yet to recover from the loss and damage of cyclone Amphan.

The experiences over the period

Tidal surge, in addition to the cyclone, has been a serious concern for the coastal communities. Cyclone Sidr (2007) was by far the worst natural disaster in Bangladesh with the loss and damage being enormous.



“Record shows that the loss of life has gradually decreased in Bangladesh but other loss and damage effects persist due to tidal surges”

On the other hand, cyclone Aila (2009), despite being a lower category tropical cyclone, caused widespread inland flooding because of the tidal surge with many people in some cases needing more than two years to be back to their home.

Similar types of effects related to tidal surges were



experienced during the recent cyclones including Mahasen (2013), Roanu (2016), Fani, Bulbul (2019), and Amphan (2020). The investigation around the track record shows that the loss of life has gradually decreased in Bangladesh but other loss and damage effects persist due to tidal surges and high tide remain a big question.

Climate change impacts and changed dimensions of disasters.

The tidal surge has been a concern mainly in the southwest coastal areas because of the poor repair and maintenance of the embankments. The embankments are damaged almost every year because of tidal surges and in some areas it happens even during the high tide.

Recently Bangladesh has been experiencing a 6-7 feet high tidal surge on average while almost all the embankments are lower than that and not well-maintained. The repair work of the embankments is usually a lengthy wait, while the maintenance work and its process are difficult for the community and stakeholders to comprehend. There are various contributing factors to this, including mandated authorities, the role of local governments, coordination among the stakeholders, funding, and work time.

Due to all these, tidal surge has been a more persisting hazard unlike cyclones; which pass after a single hit. The communities continue to experience tidal flooding two times a day during high tide until the breached embankment is repaired.

This consequently contributes to increasing ‘saline intrusion’ which is also influenced by sea level rise. Moreover, due to regular flooding every day, salinity both in soil and water rises gradually, which impacts local agriculture, life, and livelihood. It is evident how much the crops, fishing, livestock have changed over the decades impacting relevant livelihood options. In addition, the drinking water crisis has been increasing day by day causing long term health impacts on the community, especially on women and adolescent girls.

Climate change has a direct impact on sea-level rise which is a factor for higher-level tidal surges. It has been experienced by the coastal communities in the last few years through higher-level flooding and high tide. Due to the increase in the intensity of cyclones, including rainfall and wind speed, tidal surge and flooding are anticipated to be severe in the near future.

In this context, repair and maintenance of embankments have become the most common and only demand from the local community. But the irony is that this common request has remained either unheard or ignored. Relief and support after an emergency is still a common practice in this area, even though the Government of Bangladesh has shifted its strategy from disaster response to disaster preparedness long ago.

Way forward to deal with the challenges

To overcome the existing problems, the application of the updated strategy by the government is mandatory. In addition to strategic shifting for disaster management, the state is now guided by and equipped with Bangladesh Delta Plan 2100 and Perspective Plan 2021-2041, which highlight climate change issues with a special focus on community prosperity.

If we put the spotlight on the embankment repair and maintenance, the mandated authorities will have to address the changing trend of tidal surge, flooding, and increased salinity in the context of climate change.

“Due to regular flooding every day, salinity both in soil and water rises gradually, which impacts local agriculture, life, and livelihood”

Thus, reconstruction of the embankment in addition to repair and maintenance is necessary to address the emerging issues. The technical feasibilities should be looked at immediately and upgraded as necessary to address the climate change impacts. As mentioned earlier, the disaster preparedness and management of cyclones have been proved to be very good, both at the community and duty bearers end but remains shaky for tidal surges, flooding, and increased salinity.

It is also high time to revisit and restructure the mandated

authority – the Water Development Board – considering the changed perspectives. A programmatic and structural shift within the board is important to address the actions provided in the national plans. It is already evident that the board, with less to no coordination with local government institutes, fails to repair and construct the embankments on time.

In addition, the existing system, and practices of contracting and subcontracting by the board for emergency repair and regular maintenance no longer fits with the needs and demands on the ground and hence this conventional approach needs to be updated.

Accountability is the key to a system and structure in a democratic society. It is evident that millions of climate-vulnerable communities have been experiencing loss and damage every year but there is hardly any example of bringing the agenda to the table and discussing who is accountable for this.

This is the time to define accountability and most importantly to institutionalize the accountability mechanism within the structure of the responsible authorities so that they are held accountable. This is also necessary for the policymakers, political parties, institutions, donors, development, and humanitarian organizations to stop and look back at their commitments.

We all should reflect on ‘how much we have held ourselves accountable for the commitment to the community, this is our obligation. Apart from this, the civil society networks and platforms must be courageous to uphold the accountability mechanism and its application on the ground.

In the end, the most important one is ensuring participation of the communities. The ‘repair and maintenance of embankment’ has been the sole demand of the southwest coastal communities for a long time, but it has clearly been ignored.

This means practicing the so-called ‘participation of communities’ does not provide any scope for contributing to decision making. To date, the participation and engagement of the local people in several stages of the project and program represent the practice of tokenism which is resounding evidence of injustice.

There is no question about the ownership of the community for the embankments and how they respond to real-time disasters; it is evident through almost all the disaster news and reports. This is the right time to capitalize on their ownership, to use the power and strength of people as an investment, and to respect the knowledge and experience of the locals for ensuring the prosperity of the community in line with the vision of the government of Bangladesh. ■

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