

VOL 3, ISSUE 9 | SEPTEMBER, 2019

# **CT** | Climate **Tribune**



## **YOUTH WHAT DO THEY THINK?**

Page 8

## QUICK BYTES

### Champions League final planned in Africa

Referee Gehad Grisha has been suspended after controversy in the final of the African Champions League, where hosts Wydad Casablanca were denied a penalty and had disallowed, the Confederation of African Football said Tuesday. The decision comes after the Moroccan Football Federation lodged a complaint at Grisha's decisions during a match pitting Wydad against Tunisia. Grisha ruled out a penalty for the hosts, Wydad Casablanca, but later denied them a penalty after replays.

AFP

### Manchester United to release Carroll, Adrian and Nasri

Manchester United striker Andy Carroll, goalkeeper Adrian and four other team players set to leave the club when their contracts expire at the end of next month, the Premier League said yesterday. Carroll, who joined the club on loan from Liverpool in 2012, helped the newly-promoted side win their top flight status before announcing his move permanent the next year. He scored a total of 34 goals for the club in all competition. Adrian made 150 first team appearances for Manchester United since arriving in east London from Spanish club Real Betis in 2011.

### Manchester City recalled after compassionate release

Manchester City starlet David Alaba has been linked with a move to Bayern Munich, which can advance his high-profile move after the club's success in Wales's Euro 2020 and Croatia and Hungary. Bayern winger missed a training session following the death of his father but Wales manager Ryan Giggs will be expecting him to play against World Cup finalist Croatia and Hungary on June 8 and 11 respectively.

### Bayern boss Hoenes says Sane transfer tough

Bayern Munich president Uli Hoenes has admitted that it will be "difficult" for the club to sign Manchester City winger Leroy Sane. Germany international Sane, 23, has been heavily linked with a move to Bayern in recent weeks after reportedly becoming unhappy at a lack of game time in Manchester. Hoenes confirmed last weekend that Bayern were interested in Sane, but suggested on Wednesday that he could be too expensive for the Bundesliga champion.

AFP

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## Rice price fall farmers hard

Farmers in Brahmanbaria have been counting about Tk300 loss per maund of rice here in the current Boro season due to fall in rice prices. Visiting Ashuganj rice market, the biggest rice wholesale market of the country's eastern region, the UNB correspondent and farmers from Kishoreganj, Narail, Thakurgaon, Moulvibazar, Sunamganj and Comilla were here by river steamer. The mill owners buy rice directly from farmers at its spot price. Farmers said they may be counting huge losses as they are not getting a fair price this year. Mill owners are buying maximum rice at a low price produced in the haor areas instead of the government.

The production cost of per maund of rice including the labourer cost is near Tk1,000 while its selling price is only Tk550 to Tk750 in the local markets, they said. Ramzan, a farmer hailing from Sarail upazila, said he has lost a day labourer's wage every day with a day labourer's wage for food. He said he is still waiting for the government to buy rice wholesale. He said he has lost 10 maunds of rice and he has to sell those at low price. He said he has lost a loss of Tk4...

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# Celebrating

# 75TH ANNIVERSARY

## Dhaka Tribune



# CONTENTS

ALTERNATIVE AGRICULTURE	4
ENVIRONMENTAL LAW	6
YOUTH	8
CLIMATE MARCH	10
CRAB FARMING	12
DENGUE	15
DISPLACEMENT	18
NATURE	20
RAJSHAHI	22

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### Dear Readers

The climate emergency has finally been registered with the broad public on a global scale and resulted in a mass world-wide protest in September.

These protesters across the world voiced the much needed disapproval of how things are run by world's governments and powerful organizations.

As more ferocious cyclones hit all regions, glaciers keep melting - to mention but only two most known examples of climate change impacts - the voices of these protesters must be heeded. There is indeed no Planet B.

This issue covers some of the most recent events on climate protests as well as other stories. From stories on how mushroom farming can bypass the climate change impacts to what legal instruments should be employed to fight inaction on climate change, provide a wide spectrum of perspectives and expert views.



COVER: MANLAKE GABRIEL

As the global struggle for climate justice grows, we hope that these stories from Bangladesh will be valuable addition to the overall knowledge base for everyone to benefit from. ■

# MUSHROOM CULTIVATION A TOOL FOR CLIMATE CHANGE?

**GROWING MUSHROOM MAY BE A GOOD INCOME OPPORTUNITY FOR FARMERS IN DROUGHT-STRICKEN AREAS AS THEY REQUIRE LITTLE WATER TO GROW**

Adiba Bintey Kamal

**W**hat do mushrooms and climate change have in common? Interestingly, there is a connection. Mushrooms could serve as a new and innovative solution for drought-prone farmers in the Barind area of Bangladesh.

The adverse impact of drought has started posing a severe threat to the farming sector alongside overall living and livelihood condition in the vast Barind tract consisting of the districts of Rajshahi, Naogaon and Chapainawabgonj. Every five years, Bangladesh is affected by major country-wide droughts. It is considered as the leading cause which hampers the estimated agricultural production of the Northwestern part of Bangladesh.

However, local droughts occur regularly affecting crop production in Bangladesh. Droughts are a significant natural hazard faced by communities directly dependent on rainfall for drinking water, crop production, and rearing of animals. During drought periods there is a direct and negative impact on water, sanitation, public health and livelihoods.

Generally, livelihoods security depends upon sufficient, sustainable access to resources and income, so that essential needs for farmers are met. For farmers, droughts are a severe livelihood threat, and this is alarming. The farmers of the northwestern part are mostly small scale farmers, due to dependence on agriculture for securing their lives and livelihood suffer the most. Connectedly, unemployment and poverty arise as a result. Mostly, these people choose migration as a way of reducing vulnerability from their lives and livelihood. They, along with their family, shift to different places in search of better lives and livelihoods. The situation gets more difficult onwards for them as they struggle to cope with other livelihood practices. Changing their occupation, the majority of these people work as a day labourer in the construction sites, some start to pull rickshaws or vans, others find jobs in tea stalls or other shops.

### **Adaptation Strategy for Climate Change**

To tackle these extreme events, varying adaptation strategies are essential, especially for those people most vulnerable to

climate change. One new and innovative idea is mushroom cultivation. It has the potential to reduce vulnerability, poverty and strengthens livelihoods through the generation of a fast yielding and nutritious source of food and a reliable source of income.

Since it does not require access to land, mushroom cultivation is an available and attractive activity in the



drought-prone areas. Small-scale growing does not include any significant capital investment. The mushroom substrate can be prepared from any clean agricultural waste material, producing the mushrooms in temporary clean shelters. They can also be cultivated on a part-time basis, requiring little maintenance.

Indirectly, mushroom cultivation also provides opportunities for improving the sustainability of small farming systems through the recycling of organic matter. Which can later be used as a growing substrate, and then returned to the land as fertilizer. Through the provision of income and improved nutrition, successful cultivation and trade in mushrooms can strengthen livelihood assets, which can not only reduce vulnerability to shocks but enhance an individual's and a community's capacity to act upon other economic opportunities.

Primarily it works as an opportunity for the women of the drought-prone area to be empowered and financially interdependent. NGOs can facilitate the small scale farmers

with a soft loan. The Government can also provide money as a subsidy to cultivate mushrooms on a large scale in order to provide for a growing local market or a potential export market. Media broadcast can encourage more people to acknowledge mushroom production as a sustainable livelihood practice.

Climate change poses a severe and additional threat to the region's poor farmers. The impact of drought ranges from hunger and susceptibility to disease, loss of personal income and livelihoods. Adaptation strategies are unlikely to be an effective solution for the drought-prone area's farmers. However, livelihood diversification options in the drought-prone area of Bangladesh can. Including mushroom cultivation and its enormous potential to improve food security, income generation, and strengthening sustainable livelihoods. ■

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**Adiba Bintey Kamal is a research intern at the International Center for Climate Change and Development.**

PIXABAY



# LEGAL RESEARCH AND CLIMATE SCIENCE

### WHAT ARE WE DOING WRONG IN LEGAL RESEARCH AND STUDIES, THAT HAS THUS FAR RESULTED IN NO ADEQUATE RESPONSE TO CLIMATE CHANGE?

■ Anne-Laure Pilat

If we consider law as an ancient discipline aimed at giving collective responses and analyses on matters that are of particular concern in a given society, it is then surprising to see that we are still confronted today with a weak legal response to the climate change issue. Despite the growing societal mobilization to ask for stronger actions to fight climate change, as can testify the worldwide climate march from the 20th September 2019. One would have thought that with the proliferation of quality scientific research (both in the field of climatology as well as in connected fields such as social science, economics among others), on the questions related to climate change its causes and impacts. One might assume we would have a new set of rules or at least more “responsibility and compensation” cases in courts making use of the produced knowledge. It is important to note that we are not questioning whether science is useful in the legal

field. Indeed, there is always much to gain from a well guided cross-sectoral approach to complex challenges. Instead, the urgent question that we should ask ourselves, (particularly those involved directly or indirectly with the legal field), is what are we doing wrong in legal research and studies, that has thus far resulted in no adequate response to climate change? What are the constraints that exist today in the legal systems obstructing more extensive use of climate science in courtrooms and research studies?

Before diving into the question of constraint, it is essential to understand what the legal research methodology is (that is the philosophy behind the legal research). The methodology of legal research builds upon the idea of justice. Indeed, justice, as a value, considers the equal treatment of similar situations. This concept is also the guiding principle for the legal research methodology, which is the search for mechanisms concerning the fair and equitable application of rules and legal principles. Therefore, all legal research does include



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some doctrinal (or fundamental research) but also empirical (non-legal) research activities.

All practitioners and scholars are first confronted with the question of discovering what the current state of the law is. Meaning what are the existing rules; their content (their explanation); and thus engaging in purely doctrinal research. The second stage of their research will be what we can call “applied research” or “action research”. These concepts aim to understand the application of these rules and principles to resolve a given problem within society. Not only for legal sources exploration but also non-legal sources mobilization such as science in the broad sense. To understand, for example, the value of a given society, understand the consequence of the implementation of a given law (legal impact assessment), influence of external factors on the law applications and legal decisions including other sources. Applied research is used in court cases but more widely to reform law or the adoption of new laws to solve and advance some challenges in society.

The second stage of research would naturally appear as the space and opportunity for incorporating scientific knowledge in legal research. It appears as it would be accessible at this stage to use climate science for a better application or existing laws and formulation of new principles. However, despite the growing use of scientific evidence or documents such as the IPCC reports, these fields stay widely underexplored in the law arena for three main reasons.

First, the prevailing approach of legal expert relies firstly on the idea of law and science second. The result is that science is viewed as a “sometimes” useful tool for legal argument development but not always as a necessary one. The explanation of this order of importance can be deduced from the second obstacle examined below and related to the scientific investigation process.

The second issue resides in the divergent approach taken by both fields when dealing with the matter of “indeterminacy”; specifically indeterminacy in causation. Even though law and science are both rooted in rationality (logical problem solving by using general rules). In this case, scientists assume they did not prove the existence of a causal relation, if they cannot reject to a wide degree the hypothesis of the nonexistence of the causal relation. Meanwhile, the legal practitioner aims to know what really happened and therefore leave less place for uncertainty. This approach is particularly interesting for the field of GHG emission attribution and further responsibility actions against the more significant polluters. Equally, a scientist can say that the evidence is leading to believe or would tend to attribute a certain amount of emission to a particular company. A judge would be bound to reject those arguments as the causal relation between the company actions and pollution, as the causation is not fully demonstrated.

Leading to an increased burden of proof on the scientific community to produce evidence with a higher degree or al-

““ The prevailing approach of legal expert relies firstly on the idea of law and science second ””

most near certainty, when they are called to testify on question/opinion on causation (causal hypothesis). The same goes with “climate migration”, as such a judge will be able to recognize the existence of climate change as this phenomenon is well documented and reached a scientific consensus. However, a judge will not be able to accept the link between climate change and migration as it is still under a degree of scientific uncertainty. As much as scientists are comfortable with considering the most plausible explanation with a degree of uncertainty in their quest for certainty, legal practitioners are less likely to assume the same approach. This second issue is partially due to the third constraint identified as the divergence of “language” used in both fields.

Doubtlessly, understanding scientific data, graphs, representations and studies require a certain level of literacy and interpretative skills. Considering science data and findings can be probabilistic, legal practitioners need to understand what a specific hypothesis or analysis entails. This understanding is needed to appreciate the level of certainty and reliability it presents. This understanding also involves understanding the scientific research process, data collection and utilization, additionally to a certain level of core scientific knowledge.

Ultimately, the question of better use and dissemination of climate science in legal studies and courtrooms is rooted in a better understanding of what a scientist does by legal experts. Moreover, scientists equally need to understand what legal practitioners need in the formulation of their research conclusions. ■

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**Anne-Laure Pilat, has a background in Public and European environmental law**

# WHAT DO THEY THINK?

## A YOUTH PERSPECTIVE ON CLIMATE CHANGE

Jennifer Khadim and Saqib Huq

The younger generation comprises a large percentage among the total population in Bangladesh. With a strong history of student participation in various movements, our country already has a foundation for youth engagement at the policy level. One pressing issue in Bangladesh is climate change. Our country has already taken steps to adapt through community involvement. But how do we engage students and young professionals more so that they are able to fight for the cause as well as find innovative solutions?

To look for that answer, a youth policy dialogue was organized jointly by the International Centre for Climate Change and Development (ICCCAD) and Centre for Climate Change and Environmental Research (C3ER), Brac University on 31 August, 2019. The policy dialogue was part of the Climate Finance Transparency Mechanism (CFTM) project of PROKAS programme of British Council. The event brought around 50 young minds from 8 districts to share information on local climate change issues. The discussion of course involved climate change problems and solutions. However, the focus of the discussion was on the perception and feelings of the young minds who will ultimately take action on these



“How do we engage students and young professionals more so that they are able to fight for the cause as well as find innovative solutions?”

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matters in the future.

What was interesting about the discussion were the cross-cutting issues which in turn brought in government initiatives, their approaches and attitudes towards solving the issues, monitoring the issues and how climate finance and governance works. It is vital to understand that inclusiveness will help solve these issues efficiently.

The perception of seeing the problems from afar and experiencing them upfront are different, this is where the engagement becomes more compelling. Although the general notion of the system is that all local community goes through the local government, which then goes to the relevant higher authority of the government. While the system runs its usual course, these policy dialogues only open the door for a few youth representatives to talk face to face with higher authorities. The policy session mentioned above was attended by significant climate change personnel of the government such as Saber Hossain Chowdhury MP and President of IPU Parliament, as well as notable climate change experts such as Dr Saleemul Huq, Dr Ainun Nishat and others. Youth from 8 districts eagerly voiced their concerns about climate change issues and in some cases, pointed out local level situations that are hindering the progress. This meeting helped in creating a platform where equity was reserved and confidence was restored to speak openly which bridged the gap among different stakeholders.

Some recommendations from the youth during the policy dialogue were:

- Inclusion of youth in the 8th Five Year Plan (8FYP) and implementing the SDGs can include youth as an integral stakeholder
- Use of apps and social media for youth to help the government monitor environmental and climate change issues at local level
- Introduction of environmental/climate change project-based award and penalty systems
- Ensure equal rights of ICT use for youth
- Build a central monitoring cell which will ensure implementation of the rules, regulations and framework

If we are to make our youth population leaders of tomorrow who will think and act to tackle climate change, we need to empower them. Policy involvement can support youth to understand the importance of their opinion and make way for them in becoming the next generation leader equipped with knowledge and skills about the best practices on climate action.

One of the most important things in a globalized world like ours is networking. A network of youth climate change researchers, thinkers and problem - solvers will ultimately benefit the nation in several ways. Firstly, there will be flow of information on climate change problems and solutions. What should be the best practice for local level climate concerns? What works and what doesn't? What worked in a similar part

“ If we are to make our youth population leaders of tomorrow who will think and act to tackle climate change, we need to empower them ”

of the country and how can we harness that? This network may include interested ministries who can monitor the type of information being shared and if necessary government experts can also get in touch with the youth. The government needs to invest in the potential youth brings in the climate change sector. This in turn will support in giving the youth a chance to learn how to make the right decision, which will benefit our development progress.

One of the highlights of the youth dialogue was the youth's expression of interest in taking part in the government's decision making process. Are we taking into consideration that the younger generation in the most vulnerable areas to climate change have some issues they face? Perhaps these issues are unique to other places of the country and being young it has been difficult to speak up. When a youngster says we do not know where to go and who to talk to because no one listens to us -- this immediately exhibits a lack of support for the youth in the climate vulnerable areas. What can we do about it? The solution also came from the youth! Their demand is to have separate ministries for youth. Having one ministry handling issues of both youth and sports may not serve all purpose but having two different ones can make a lot of changes. This will help identify more potential youth leaders from every district of the country.

The question remains, will their voices be heard?

We do hope so!

We would like to acknowledge our partner organisations IID, CSRL, and Coast Trust for their support. ■

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**Jennifer Khadim is Coordinator of Youth Programme at ICCCAD.**  
**Saqib Huq is Coordinator of Climate Finance Programme at ICCCAD.**

## CLIMATE MARCH

# PEOPLE'S CLIMATE MARCH!

### AN ACCOUNT OF THE CLIMATE MARCH IN DHAKA

Jennifer Khadim

I woke up early in the morning on 20 September 2019, a Friday, and immediately checked my Facebook account to see if there was any news or pictures of the climate march. I found one which was happening in Manik Mia Avenue under a massive banner on the urgency to address climate change. Around midday, my facebook news feed was filled with pictures of a peaceful rally of school children.

Many climate scientists cautioned last year that we only have a decade to limit global warming to a maximum of 1.5 degrees Celsius. If we are unable to restrict that, even half a degree rise will worsen the state of different natural disasters such as flood, heat waves, and drought. Ultimately, this will put millions of people around the world at risk and vulnerable to the effects of climate change. During mid-August last year, a 9th-grade Swedish teenager called Greta Thunberg decided not to attend school as a way to protest for climate change. Sweden was faced with severe heat waves and wildfires last year, and it was also regarded as Sweden's hottest summer in the previous 262 years. Soon many other students started similar protests in their communities. They began a school climate strike movement under the name "Fridays for Future". Greta Thunberg addressed this issue during COP24 in Poland. At that time, student strikes took place every week somewhere in the world. The "People's March for Climate Change" on 20 September 2019 was the cumulative result of all these movements, and the scenes from different parts of the world were unimaginable.

When we started receiving news from our friends and colleagues on the global climate march happening in their towns, we had already finished our ones in Dhaka. We prepared for the march at short notice, but we had no less enthusiasm than the rest of the world. The small stand of 60 to 70 people in front of Press Club, Ramna was at first delayed by sudden rain. But people had already gathered and took their places on the foot-path with their colourful posters, placards and banners. All the signs had wonderful messages which demanded an urgent action to prevent climatic risks. Students, teachers, researchers, humanitarians and environmentalists stood together at the streets and shouted out their slogans.

As we finished our brief march in Dhaka, our team in New



York joined around 250,000 people in one of the biggest rallies for climate justice. Pictures and videos shared on social media exhibited a scene of solidarity and a collective voice -- save our planet as there is no planet B! One of the colleagues in Melbourne took part in the climate march there which he described as the biggest one they ever had (around 100,000 people). He felt amazed by the change in climate change scenario only within a year and commented that "it all comes to nothing without sustained and ongoing organizing, storytelling, agitation, witnessing, creativity, contemplation and rebellion in the name of a safe planet."



ICCCAD team at the New York Climate March  
SAQIB HUQ



Snapshot from the Melbourne Australia Climate March

MICHAEL CHEW

I believe, as we move from the “business as usual” scenario to “what is right for our world”, we will surely achieve global peace and sustainability. ■

**Jennifer Khadim is Coordinator of Youth Programme at the International Centre for Climate Change and Development (ICCCAD).**

## CRAB FARMING



# A TALE OF CRAB FARMING IN SATKHIRA

WHEN BULI RANI'S HUSBAND FELL ILL, IT WAS LEFT TO HER TO EARN MONEY TO SU



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## SUPPORT THE WHOLE FAMILY

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### Shababa Haque and Mahmuda Mity

**W**ith the call for Fajr prayers, dawn breaks in Burigoalini, and Buli Rani starts her day. Buli Rani's day is packed with activity, she begins by completing all her household chores, following which she rushes to her job as a day laborer, where she works from 7 am to 1 pm earning herself a half day wage of tk. 150. After this she returns home and her full focus goes towards working on her own kakra gher (crab farm).

In 2015, her husband Poritosh had a massive stroke, which left him physically unfit to work, leaving Buli Rani no choice but to take on the full responsibility of providing for her household. At the age of 46, Buli Rani is now the head of the household, where she lives with her husband, her 11-year-old son and her mother-in-law.

Back in the day Poritosh and Buli Rani would both work as day laborers and earn a fair share of money, but after Poritosh fell ill one person's wage was no longer enough to raise a family. So she decided to utilize the skills she gained from working as a day laborer in the local crab farms to start their own business. Buli Rani applied for a loan from Gonomukhi foundation and used it to set her family's very own kakra gher (crab farm). According to her, crab farming is more profitable and relatively safe in their salinity prone area.

Ever since then, she and her family work in their own farm and sell their produce to the local market. She also continues to work as a day laborer for at least half of the day to earn some extra income. With this income Buli Rani can successfully provide for her full family, and also cover the education of her 11 year old son. In the past years, she took two other loans, which she has now successfully paid off with her own income, to get her two elder daughters married.

Buli Rani said she feels like she now has a say in her family affairs. She and her husband Poritosh make their decisions together. Her day is long and it is always filled with things she needs to get done, but for her, this is not something to complain about. This is the only life she knows. For her, being busy with tasks is far better than having no work at all.

Buli Rani is one of the many women earning their livelihood from the ever expanding crab farming industry covering most of Shyamnagar.

# CRAB FARMING

These areas previously relied on agriculture for their livelihood but as salinity continued to increase, growing rice, vegetation and fresh water aquaculture got more and more difficult. Many of the community members shared that their agriculture farms were mostly affected following cyclone Aila in 2009. The soil became more saline and intolerant of its usual crops. During this time many farmers, especially marginal farmers, lost their livelihoods.

The area went through a major transition. As salinity restricted the usual livelihood options, saline tolerant crops and fisheries had to be explored. Brackish water aquaculture became a popular option for the area. Hectares of shrimp cultivating farms spread across the saline land and this allowed people in the area to once again be employed. Those with their own land started their own shrimp farms, while many others joined work as day laborers in the large commercial shrimp farms that were emerging in the area.

However, things quickly changed as shrimp farming began to go downhill. Since, shrimp cultivation was mainly done in saline water, as the number of shrimp farms continued to grow, so did the salinity. After a certain point the water got too saline for shrimp to survive, and they started getting attacked by viruses. This led to rapid loss in the market and proved shrimp cultivation to be a rather dangerous livelihood choice.

As many small scale shrimp farms failed, the area was once again in turmoil. Another shift happened and more saline tolerant options had to be explored, this then led to the farming of mud crabs in the area. Situated in the south west edge of the country, the people of Burigoalini have always had access to the many estuaries and tidal rivers running through the Sundarbans. These rivers are abundant in mud crabs.

Gita, one of the ladies working at Kakra Point (which is how they locally refer to the densely packed crab farming area), shared that she and her sister wake up at 5 in the morning and make their way to the Sundarbans to collect small crablings. They then sell these crablings to the crab fattening farms so they can be cultivated till they are mature enough for selling in the market.

As crab farms have multiplied greatly, more people have shifted their livelihood towards crab farming activities. Most of the community women are engaged in numerous commercial crab farms, cultivating both hard shelled and soft shelled crabs. These crabs are mainly cultivated for export purposes; feeding the appetite of countries such as Japan, China, Singapore and Hong Kong.

At present, there is no doubt that crab farming has been extremely profitable for the area of Shyamnagar and has given livelihood opportunities to many of the poorest members of the community, however the sustainability of this industry and its impacts on the local ecosystem still remains questionable. As the threat of climate change continues to loom over the region, there is a growing risk of increasing salinity and more frequent and enhanced natural

“As crab farms have multiplied greatly, more people have shifted their livelihood towards crab farming activities”

disasters in the area. Making the crab farmlands extremely vulnerable. Another concern is the effect it can have on the neighboring Sundarbans ecosystem. Due to the lack of crab breeding hatcheries in the local area the industry is almost completely reliant on the Sundarbans. As more people invade the Sundarbans to collect crabs and crablings it will inevitably create unrest for wildlife in the area and threaten the local environment of the mangrove forest.

And so some of these burning questions still remain, how sustainable is this for the people and the forest in the long run? If not, what happens if this too fails and the soil has become too saline for almost any food to grow? What is the alternative livelihood to resort to? What is the next plan of action? ■

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# FIGHTING DENGUE AS WE FOUGHT MALARIA

## USAGE OF METEOROLOGICAL INFORMATIONS TO PREVENT VECTOR-BORNE DISEASES (VBDS)

**Sakib Rahman Siddique Shuvo**

The diversified impacts of climate change are continuously becoming apparent. With this year's rise in dengue cases, you probably know someone who has been affected yourself. Different health-related issues are directly or indirectly affected by weather and climatic extremities, which can be lethal and kill thousands of people every year.

A vital health issue in the tropical and subtropical regions, vector-borne diseases (VBDs) are infectious diseases spread by the bite of infected arthropods, ie, mosquitoes. Weather and climatic patterns can also stimulate VBD, along with non-climatic factors, eg, habitat destruction.

Vector-borne diseases statistics

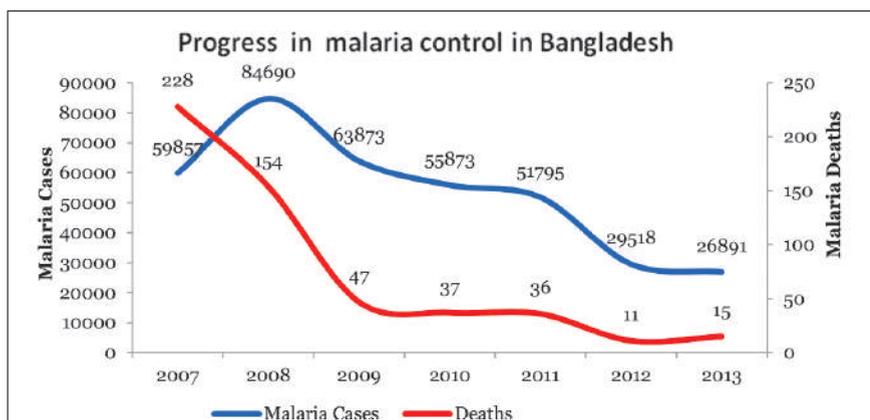
Aedes mosquitoes are the carrier of dengue. Approximately 50 million infections and around 15000 deaths occur every year across 100 countries as a result of dengue. Similarly to dengue, malaria is a parasitic disease spread by the infected Anopheles mosquito bites. According to the World Malaria Report by the World Health Organization, published in 2011, malaria remains prevalent in 106 countries in the tropical and subtropical areas of the world. The deaths that occur are estimated 1 million per year while 200 to 500 million people infected by this disease – thirty-five Central African countries account for more than 80 per cent of cases and more than 90 per cent of deaths each year.

These vector-borne diseases have had a significant impact on Bangladesh over the past few years. Malaria killed 228 patients in 2007. Studies have shown that the number of

malaria patients increased from 27000 in 2016 to 29000 in 2017. Chikungunya saw a massive impact on people across Dhaka in 2017. With a documented 13000 clinically confirmed cases in the Dhaka city, a vast number of positive cases were reported from 23 districts. This year dengue outbreak took a severe turn; the unofficial death toll stands at over 132.

### Drivers of vector-borne diseases

These vector-borne diseases predominantly occur on a full scale in tropical and subtropical regions. The high population density, in combination with abundant mosquito breeding sites, supports high rates of infection. In combination with these socioeconomic determinants, climatic factors also influence both dengue and malaria. The breeding sites for Aedes and Anopheles is standing water. Drought and heavy rainfall can both cause standing water. Average temperature ranging between 27 and 32 degrees celsius is ideal for Aedes mosquitoes to breed. Global warming can create more suitable places for Aedes to breed. Rising mean seasonal temperature to 27-32 °C create the environment through which higher rates of penetration of dengue. Climatic variables - Rainfall, humidity, and temperature are essential to the proliferation of mosquitoes. Rainfall produces mosquito-breeding sites. Humidity increases into mosquito survival and temperature affect the parasite development rates. Mapping, forecasting, and monitoring, these variables enables health services to better understand the onset, intensity, and length of the transmission season.



source: MIS, NMCP

# WATER AND SANITATION

## Fighting vector-borne diseases

In Africa, information products were produced by the World Health Organization (WHO), World Meteorological Organization (WMO) and Famine Early Warning System for several years. The capacity of seasonal forecasting has built with the collaboration with National Meteorological Services and enabled a much denser network of the ground station with the widespread coverage of satellite data. The program uses the seasonal climate forecast to predict malaria epidemics ahead of time, permitting effective control and other preventive measures. This seasonal climate forecasts issued by the Southern African Regional Climate Outlook Forum is the

foundation for the development of Malaria Early Warning System. The health ministries have a lead time to prepare before malaria, plague, and Rift Valley Fever epidemics. By monitoring the users' health tracking behaviours online, tech giant Google published a web service named Google Flu Trends in 2008, provided estimates of influenza activities for more than 25 countries. This method was able to predict regional outbreaks ten days before the existing system. Four years back in 2004, Google took another initiative to anticipate the Dengue fever. These types of warning systems can save thousands of lives.



### Fighting malaria: Bangladesh scenario

Mortality rates in the case of malaria have been reduced in recent years. The Government of Bangladesh took several initiatives to achieve this. Firstly, in 2007, a cross-sectional study conducted to identify the prevalence of malaria by IC-CDR, B, and BRAC, which illustrated the scenario, ultimately declaring 13 eastern and north-eastern border belt districts vulnerable. In 2009, a three-year surveillance study began to map malaria epidemiology, aimed to record information on the prevalence of infection, knowledge and awareness, health-seeking behaviour, use of bed nets and socioeconomic differentials in the community. This study portrayed the sce-

nario of malaria in Bangladesh. Then the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM) project launched and aimed to take proper steps to malaria control interventions.

Moreover, the Bangladesh government developed a new National Strategic Plan 2017-2021 to ensure maximum effort to eliminate malaria. This action aimed to achieve a “malaria-free Bangladesh by 2030” by reducing annual parasite incidence, interrupting local transmission in the 13 endemic districts, and ensuring the remaining districts from local malaria transmission by 2021. This strategy has been aligned with the WHO Global Strategy for Malaria (2016 - 2030) and ensured to contribute to achieving overall national development and the SDGs.

The combined efforts of these actions resulted in a significant drop in death caused by malaria. The number of deaths fell from 228 in 2007 to 15 in 2013 and malaria cases declined nearly half in this period. A similar approach is needed to ensure such outbreaks do not happen again, not only for malaria but also for dengue and chikungunya.

### Conclusion

The dengue outbreak of this year proved that similar attention is needed to prevent further epidemics. There is no effective medication for dengue currently. Control programs depend on environmental or chemical controls of the vectors, rapid case detection, and case management in hospitals for severe dengue. These are challenging interventions, and the success rate is low in terms of outbreak control. So it is essential to get better control in time and space as well as better interventions in future initiatives.

Climatic factors strongly influence the ecology, development, behaviour, and survival of mosquitoes and the transmission dynamics of the diseases they transmit. Temperature, rainfall, and humidity are especially important, but others, such as wind and the duration of daylight, can also be significant. Seasonal shifting (ie, increasing warm days) can also affect vector proliferation. It is the complex interplay of all these factors that determines the overall effect of climate on the local prevalence of mosquito-borne diseases. Monitoring climatic information can have a vital contribution to portray where and when dengue cases are likely to occur. It can help to take necessary preparedness to fight with dengue in the future and prevent a health hazard. ■

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## DISPLACEMENT

# LOOKING FOR A SOLUTION TO INTERNAL DISPLACEMENT

**"INTERNAL DISPLACEMENT IS THE GREAT TRAGEDY OF OUR TIME."-  
KOFI ANNAN, FORMER UN SECRETARY-GENERAL**

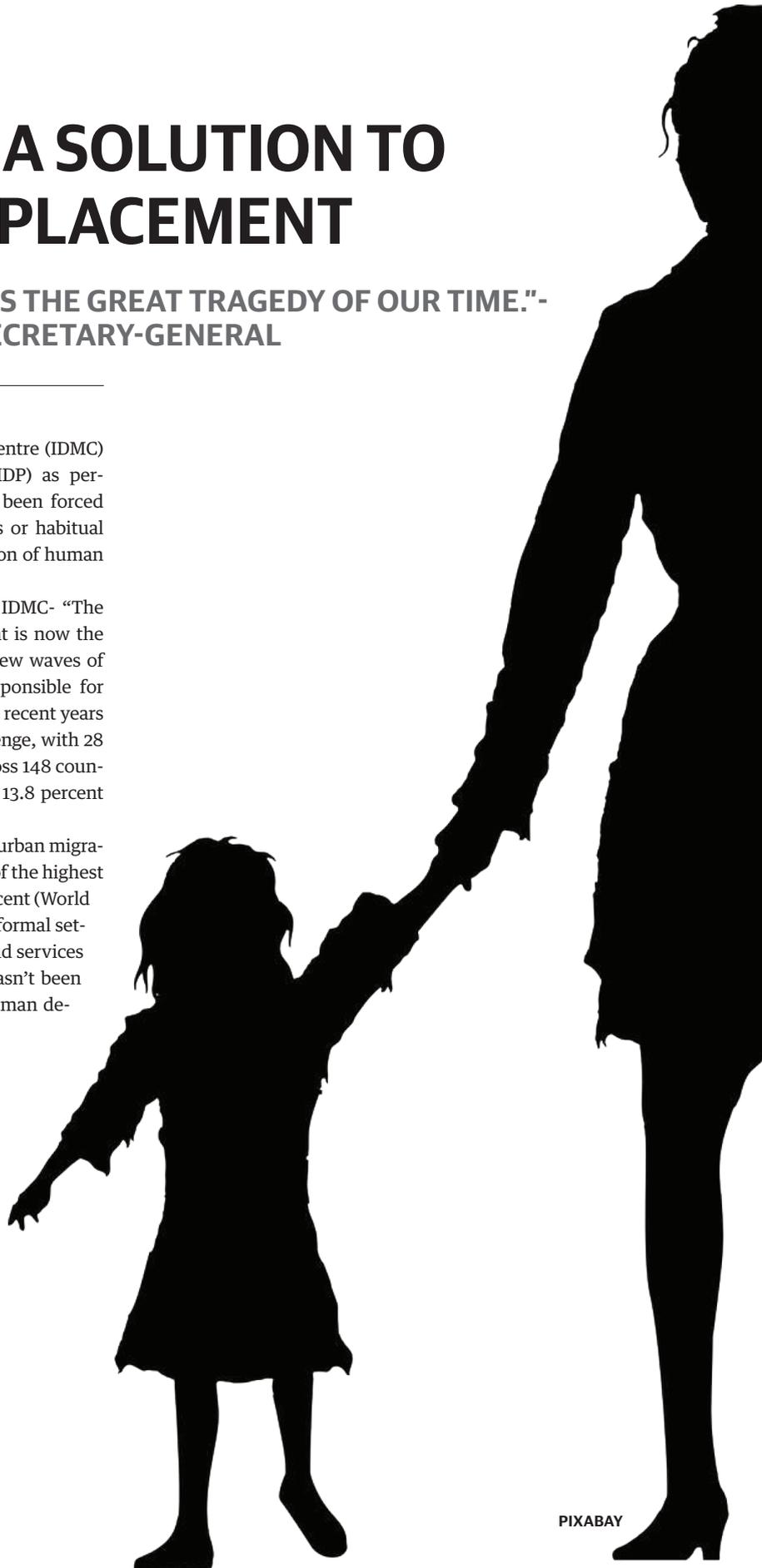
**Rukhsar Sultana and Dr Saleemul Huq**

**T**he Internal Displacement Monitoring Centre (IDMC) defines Internally Displaced People (IDP) as persons or a group of persons who have been forced or obliged to flee or leave their homes or habitual residence, as a result of or to flee conflict, violation of human rights or disasters.

According to Alexandra Bilak the director of IDMC- "The number of people living in internal displacement is now the highest it has ever been. Unresolved conflicts, new waves of violence and extreme weather events were responsible for most of the new displacement we saw in 2018." In recent years Internal Displacement has become a global challenge, with 28 million new internal displacements recorded across 148 countries and territories in 2018 (GRID,2019). Of this, 13.8 percent were in South Asian Countries.

Natural population growth along with rural to urban migration in the towns and cities gives South Asia one of the highest annual urbanization rate in the world at 2.493 percent (World Bank); 30 percent of them in South Asia live in informal settlements, due to lack of housing infrastructure and services (GRID,2019). As such higher urbanization rate hasn't been reflected in the case of economic growth and human development in this region.

**“**The number of people living in internal displacement is now the highest it has ever been **”**



PIXABAY



“ Bangladesh is frequently cited as a ‘ground case’ of displacement and migration, as the country is struggling with an increased number of displaced people resulting from climatic hazards ”

In the year 2018, 17.2 million displacements took place worldwide as a result of disasters; 16.1 millions of these disaster-related displacements were caused by weather-related events (GRID,2019). Some 5.4 million people of those were displaced due to floods (GRID,2019). The sudden dramatic onset of disasters like cyclone, monsoon floods, river erosion, etc., ravages economic and social context of people, pushing them to flee away from climatic hotspots as an attempt of survival (CPRD,2015). Political drivers such as failure in governance, post or during a disaster, can also trigger displacement. Cyclone Aila in Bangladesh in 2009 and Cyclone Nargis in Myanmar in 2008 had forced people to migrate as the governments delayed in response, causing food and drinking water crisis (CPRD, 2015, Shamsuddoha Md. et. al. 2013, Lachowski, T., 2013).

Bangladesh is frequently cited as a ‘ground case’ of displacement and migration, as the country is struggling with an increased number of displaced people resulting from climatic hazards (CPRD,2015). According to IDMC flood displacement risk model, our country has the third-highest flood displacement risk in the world. Back in September of 2018, riverine floods in Bangladesh triggered 12,000 new displacements in Moulvibazar district while in Shariatpur riverbank erosion resulted in displacing around 44,000 (GRID,2019). Waterlogging in the South West of Bangladesh resulted in farmers losing their subsistence as crop production has become inaccessible, it has led to forced displace-

ment of 80,000 people from several South-western districts (Ahmed, A.U & Neelormi,2008).

Dhaka, the capital of Bangladesh has been identified as the country’s main destination for people fleeing disasters and climate change impacts, and local authorities have been unable to cope with this influx of people (GRID,2019). This has become a serious implication on municipal authorities and urban communities who are already coping with unplanned urbanization. Displacements further aggravate inequalities and generate further risks of instability. Internal displacement puts additional strain on already limited local capacities and resource. As climate-induced migration is morphing into an inevitable reality, alternative durable solutions that reduce the risk of repeated displacement has to be worked into our countries urban development strategy to ensure a migrant-friendly city. GRID-2019 report suggested a new approach to develop the potential of secondary cities to host IDPs.

On the lines of building migrant-friendly cities, ICCCAD’s urban resilience program has been working on an action research project titled “Support to host city local government plans for growth and increased migration, including plans for education, housing and health facilities”, funded by PROKAS. Under this project, ICCCAD has been actively involved in providing research-based knowledge on building Mongla town as a migrant-friendly city with a focus on quality education, better health, and housing facility. The study findings will help feed the master plan of Mongla town. Moreover, the findings from the study will also provide information on developing a long term bankable action project proposal for international donors. ■

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# NATURE-BASED SOLUTIONS

## A NEW INFLUENCE FOR SOCIO-ENVIRONMENTAL MANAGEMENT IN BANGLADESH

Farah Anzum and Tasfia Tasnim

Many of the solutions to address the challenges associated with development can be found in nature itself. Nature-based solutions (NbS) are emerging as a way of dealing with societal conflicts and environmental challenges. Climate change has negative impact on natural resources and transforming the green lands into dry landscapes. As a consequence, people are suffering from the uncertainty of food security and falling into human conflicts. NbS can be a potential tool that widens the horizon of a sustainable future by holding the motto of preserving ecosystem while ensuring the wellbeing of all humans. According to IUCN, “Nature-based Solutions (NbS) are actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.” They are also referred to as an “umbrella concept” for the existing nature-based approaches such as ecosystem-based adaptation (EbA) and mitigation (EbM), eco-disaster risk reduction (Eco-DRR), and green infrastructure (GI). NbS also go beyond the traditional biodiversity practices or management while focusing on the benefits of both ecosystems and people through sustainable solutions that have the capacity to respond to environmental change over the long-term.

NbS also referred as a low-risk low-cost “green” solution to many climate change-related impacts and offer key advantages over “grey” engineered interventions. We can understand this if we look into the example of forest restoration or planting trees in rural and urban settings. Forest restoration in the upper catchments area can help to protect communities downstream from flooding, at the same time as increasing carbon sequestration and protecting biodiversity. Meanwhile, planting trees and increasing green space in cities can help with cooling and flood abatement, while storing carbon, mitigating against air pollution, and providing recreation and mental health benefits. However, NbS has the potential to address the environmental challenges along with keeping the well-being of the human population in the future.

In the recent paper on ‘Global recognition of the importance of nature-based solutions to climate change impacts’, Seddon et al. (2019) mentioned the need to consider three pillars for NbS which are - integration of science, local knowledge and policy. For the adaptation needs of communities and ecosystems, practitioners must be acquainted with the best avail-

able science and local knowledge. At the same time, there is an urgent need to develop robust mechanisms for monitoring and evaluation and contrast the performance of different approaches for defining, measuring and tracking the effectiveness of NbS for taking the future climate change into account.

NbS has been also emerged as an integrated approach to reduce trade-offs and promotes synergies among the Sustainable Development Goals. In late 2018, NbS were endorsed in the IPCC 1.5 degrees Special Report and declared a major theme or “pillar” in the UN’s upcoming Climate Summit. According to a study of Seddon et al., (2019), among the 141 adaptation components of the 167 Nationally Determined Contributions (NDCs) that were submitted to UNFCCC by all signatories of the Paris Agreement, 103 nations included NbS in the adaptation component of their NDC, 76 nations included them in both their adaptation and mitigation component, and an additional 27 included them as part of their mitigation plans only. In other words, 130 nations--or 66% of all signatories to the Paris Agreement--have articulated intentions of working with ecosystems, in one form or another, to address the causes and consequences of climate change. It has been also notable that the substantial number of developing countries has also articulated NbS in their NDC’s considering they are the worst

“ Forest restoration in the upper catchments area can help to protect communities downstream from flooding, at the same time as increasing carbon sequestration and protecting biodiversity ”



affected countries due to climate change and in crucial need of sustainable adaptation approaches.

Situated on an active delta, Bangladesh has been popularly known for its climatic and socio-demographic vulnerabilities. Higher population pressure coupled with several natural disasters is one of the major threats for this country. Adaptation is one of the major devices that the country has been practicing dealing with the numerous threats. However, to keep pace with the national and global goals, Bangladesh has also been thriving to develop simultaneously. Recently, there have been several mega projects in Bangladesh, such as: Padma Multi-purpose Bridge or Rampal Coal Powered Plant in the adjacent area of Sundarbans Mangrove Forest. Mangroves are known as earth's carbon power houses and they sequester 45% more carbon than other forests. They also protect the communities from the impacts of sea level rise and natural disasters and support livelihoods. Bangladesh needs to look after its valuable natural resources, and needs to get global support for that. If development activities destroy them, it would make no sense economically. This is a context where NbS are really applicable.

NbS can act as a vital tool for supporting the economic development, environmental protection and human welfare together in Bangladesh. It is important to undertake both proactive and preventive measures which can help to lead to transformational change in the interventions to support green

growth. In this regard, awareness raising in the communities should be adopted to integrate this approach in their daily life. Capacity building of the policy makers and practitioners has to be enhanced in order to create widespread recognition of the NbS. They must work together to clarify and properly disseminate information on what makes NbS effective; enhance capacity to develop robust adaptation plans, re-tuned with local demographic and ecological contexts; access suitable levels of adaptation finance and/or technical support; and ultimately plan appropriate to implement NbS effectively for the benefit of human societies and ecosystems. On the other hand, private sectors should also acknowledge the necessity of protecting the biodiversity and encourage themselves to incorporate low-cost and low-risk NbS tools into their interventions rather than expensive high engineering approaches. However, in this way, NbS can be a great instrument for the future sustainability in order to adapt to the future climate vulnerabilities of the world while protecting the human welfare as well. ■

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# UNSTOPPABLE RAJSHAHI, SETTING THE PACE IN GREEN-TECH REVOLUTION

## A YOUTH PERSPECTIVE ON CLIMATE CHANGE

Sherpard Zvigadza and Noor-E-Elahi

Effectively tackling urban air pollution, Rajshahi is not only making headlines across many global mainstream media. The City is also setting the pace along the green technology pathways. It is no wonder it is becoming the leading centre in terms of developing one green success story after another. Rajshahi is unstoppable!

Flashing its name across the Guardian in 2016, the tabloid lauded Rajshahi's success story in tackling urban air pollution. What is more, the local media also reported local but high-level awarding plaudits by the Prime Minister for its tree-planting initiatives in 2009, 2010, 2011 and 2013. Initiatives that have contributed to the fight against air pollution, once threatening this splendid City!

According to the WHO data, Rajshahi has shown a 67.2 per cent decrease in the concentration of PM10 particles, from 195 micrograms per cubic metre of air volume ( $\mu\text{g}/\text{m}^3$ ) in 2014 to 64  $\mu\text{g}/\text{m}^3$  in 2016. This reduction was the most significant percentage in PM10 concentration worldwide. PM10 is particulate matter 10 micrometres or less in diameter. Particles less than or equal to 10 micrometres in diameter are so small that they can get into the lungs, potentially causing severe health problems. Furthermore, PM2.5 concentration also nearly halved from 70  $\mu\text{g}/\text{m}^3$  to 37  $\mu\text{g}/\text{m}^3$ . The WHO air quality guidelines aim for the lowest possible levels, recommending an annual mean concentration of 20  $\mu\text{g}/\text{m}^3$  of PM10 and ten  $\mu\text{g}/\text{m}^3$  of PM2.5 only.

According to the UNFCCC, the Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping global temperature rise this century well below two degrees Celsius above pre-industrial levels. Battery Electric Vehicles is one technology that can support this goal. It



Showing BEVs in Rajshahi in action

also targets to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Bangladesh is a signatory to this convention and has shown its commitment to it through its 2015 Nationally Determined Contribution through Energy Transport and Industry sector

From the introduction of; the Auto-rickshaw in 2004; increased tree-planting initiatives; encouraging the development of fruit orchards; raising of the brick-kiln chimney heights in the locality. The RCC has continued to support climate-friendly initiatives. However, this is just one part of the story.

BEVs have emerged and fast-rising in becoming an excellent technological response strategy to deal with Greenhouse Gas emission reduction (Skippon and Garwood, 2011; Bjerkan et al., 2016). In line with the two degrees Celsius goal and the increase in urban population, governments worldwide are encouraging the use of mass transport, instead of private cars, in order to curb traffic jams. In Bangladesh, the BEV is commonly known as the Easy Bike, seemingly because of its model and environment-friendliness. It has also become a disruptive transport system taking Bangladesh by storm. It has grown tremendously against an operational backdrop, without regulation and policy support. Rechargeable lead-acid batteries power the BEV as a source of power. (Rian and Rahman 2014). Due to pollutants and traffic jams across the country, the promotion of sustainable fuels has become critically important. One such transport and energy technology solution is the Battery Electric Vehicle (BEV). Despite all the perceptions from a num-



COURTESY

“ Besides auto-rickshaws, Rajshahi has deliberately and thoughtfully decided to move to greater heights in line with the expectations of the Paris Agreement by introducing the BEV ”

ber of the BEVs critics, in Bangladesh, the green revolution has not just started, but it is unstoppable!

### **Electric vehicles policy in Rajshahi on the go**

Besides auto-rickshaws, Rajshahi has deliberately and thoughtfully decided to move to greater heights in line with the expectations of the Paris Agreement by introducing the BEV. From a policy perspective, BEVs do not only address ambient air pollution but is seen as a solution in addressing greenhouse gas emission.

Through supporting these initiatives, the Rajshahi City Corporation (RCC) is finalizing its localised BEV Policy. Overall, in its eight districts, Rajshahi has about 52000 BEVs, while in the City Corporation, about 10000 registered BEVs and 5000 Rickshaws including Auto-Rickshaws exist. Under its BEVs policy, an online, e-registration platform was created, and the process began from 31st July 2019. A quite remarkable development indeed that calls for follow-up and support. The City has started to register all BEVs in the City. Alongside this policy measure, it issues driver and local car registration details identification on chipped smartcards. These smartcards are all linked to the local police database and the Bangladesh Road Transport Authority (BRTA). Fake identity car details expired registrations, and ownership credentials are detected using apps installed in police officers' smart-phones.

The need to create order and accountability has prompted Rajshahi to embark on this. In order to deal with congestion

in the City, the RCC started working on the local policy to regulate the BEV transport system. One of the critical elements of the policy provisions is to introduce shift based systems (6 am - 2 pm and 2 pm - 10 pm) marked by two different BEV colours. After that and during the holidays, the roads are free for all. A Multi-Stakeholder Committee has been developed. Comprising of the City Corporation Mayor, and his team from (Department of Environment Office, Electrical Engineering), Power Development Board, Metropolitan Police, BRTA, Local Universities like Rajshahi University of Engineering and Technology (RUET), BEV owners, Drivers Association, BEV dealers and Owners of BEV Charging Stations.

### **Creation of a local EVs industry**

Against this background, slowly, a BEV industry is shaping up. Besides the drivers, some mechanics would maintain BEVs mechanical challenges. Since the BEV is mainly electrical, (motor and wiring) auto electricians and graduates from electrical engineering departments have guaranteed jobs from the running of BEVs. On the shop-floor, some people are fixing tyres while others are painting them.

There are currently 52 000 BEVs plying the roads in Rajshahi, and this is having a significant and expansive impact on the local community. The emerging industry has impacted 52 000 drivers who now have secure and sustainable urban jobs. Subsequently, 208 000 individuals are benefiting from this industry in Rajshahi through the inflow of disposable income into families.

The BEV is clean because it does not have tailpipe greenhouse gas emissions. Hence, BEVs contribute to environmental sustainability, job creation, and economic growth and subsequently contributing to sustainable development within the district. Further, the provision of the urban transport system has resulted in ease of mobility. It also replaces potentially GHG emitting industries. The BEVs have now formed a base for a ready market to link with other related economic activities, for example- passenger availability, battery, motor and spare parts.

BEVs have the potential to rejuvenate other relevant sectors involving more people in green jobs and minimizing the lack of employment in an area that currently lacks industry. Also, it is contributing to increasing climate change adaptation resilience, from the money remitted by husbands back in the village. For example, a BEV driver working in Rajshahi city can support his family agriculture activities with cash. Overall, Rajshahi is one of several successful BEVs initiatives in the country, regionally and globally where Bangladesh government policymakers can learn from and take advantage. Otherwise, it lags and misses this green wave golden opportunity. ■

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