

# CO2 mineralisation can help curb pollution in Bangladesh

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Bangladesh's industrial boom has propelled economic growth, but at what cost? Rivers that once sustained communities, such as the Buriganga and Shitalakkhya, are now some of the most polluted in the country. Industrial waste, textile dye effluents, heavy metals, and untreated sewage have turned these rivers into toxic cesspools, posing serious threats to public health and biodiversity. The Buriganga alone absorbs 21,600 cubic metres of toxic waste daily, mainly from tanneries, textile mills, and chemical factories, according to a study presented at the IICSD conference in 2015. With no robust wastewater treatment infrastructure, the challenge of industrial pollution looms large. However, an emerging technology called CO2 mineralisation offers a game-changing solution that not only captures industrial CO2 emissions but also neutralises harmful contaminants before they reach our lives.

CO2 mineralisation is a form of carbon capture, utilisation, and storage (CCUS) that converts captured CO2 into stable carbonates through reactions with alkaline industrial byproducts like cement kiln dust, steel slag, and fly ash. This process permanently stores CO2 in solid form, preventing it from re-entering the atmosphere, while also neutralising harmful contaminants in industrial wastewater. The result is a dual benefit: reducing emissions and mitigating water pollution.

Globally, companies like Holcim, CarbonCure, and Carbon Clean are pioneering large scale CO2 mineralisation projects. These initiatives have demonstrated that the technology is not only effective, but also economically viable. Bangladesh has already explored carbon credit markets, selling 2.53 million carbon credits worth \$16.25 million since 2006. Integrating CO2 mineralisation into its industrial zones could unlock both environmental and financial rewards for the country.

The textile and tannery industries, which drive much of Bangladesh's economy, are also among the biggest sources of pollution. In areas like Hazaribagh and Savar in Dhaka, leather processing releases highly toxic substances, including chromium, sulphides, and acids, directly into the Buriganga River.



FILE PHOTO: STAR

Once a vital lifeline for Dhaka, the Buriganga River now faces severe pollution from chemical waste, medical disposal, and plastic debris.

CO2 mineralisation can neutralise these hazardous chemicals by introducing CO2-reactive alkaline materials that convert them into non-leachable, harmless compounds, preventing further contamination. A similar approach can be applied to wastewater from textile dyeing, which is often laden with sulphates, phosphates, and heavy metals. Through CO2 induced precipitation, these toxic substances can be removed before they are discharged, significantly reducing

water pollution. This aligns with successful global initiatives like CarbonCure's concrete technology, which injects CO2 into concrete mixtures to enhance durability while reducing emissions.

CO2 mineralisation not only cleans wastewater but also repurposes industrial

Adopting this method in Bangladesh could significantly reduce the cement industry's carbon footprint and address the country's growing industrial waste problem.

One of the biggest concerns surrounding CO2 mineralisation is its high initial cost. However, Bangladesh can offset these costs

pilot projects and full-scale implementation. Public-private partnerships (PPPs) could also facilitate financing the transition. Beyond financial incentives, repurposing industrial byproducts into construction-grade materials could create new revenue streams for businesses, reduce dependency on imported building materials, and promote sustainable infrastructure development.

The environmental and social benefits of CO2 mineralisation are equally compelling. Restoring cleaner rivers would improve public health by reducing exposure to toxic pollutants. Fishermen, farmers, and communities that rely on these waterways would regain access to cleaner water sources, improving livelihoods. The reduced carbon footprint of major industries would contribute to Bangladesh's climate commitments, helping the country emerge as a leader in sustainable industrial practices.

Unfortunately, despite its enormous potential, CO2 mineralisation in Bangladesh faces several obstacles. The high initial investment required for implementation, coupled with a lack of supportive policy frameworks, hinders its adoption. Additionally, many industries remain unaware of the economic and environmental benefits of this technology, creating a gap in awareness and willingness to invest. However, the landscape is shifting. The Bangladesh Climate Change Trust Fund (BCCTF) and international initiatives like the Green Climate Fund (GCF) are potential sources of financing that could help bridge the cost gap. Furthermore, the growing global interest in carbon trading markets could provide the financial incentives needed to encourage industries to integrate CO2 mineralisation into their waste management strategies. Countries like Norway and the Netherlands have already established carbon trading programmes, proving that emissions reductions can be monetised. If Bangladesh follows a similar path, it could turn CO2 reduction into an economic asset while simultaneously improving its environmental footprint.

Bangladesh's industrial success does not have to come at the expense of environmental health. CO2 mineralisation offers a revolutionary approach to transform pollution into progress, providing a pathway to cleaner rivers, reduced carbon emissions, and new economic opportunities. Technology exists and funding mechanisms are within reach. The only question that remains is: how soon will Bangladesh take action?

## RESOLVING THE ROHINGYA CRISIS

# Does Bangladesh need to shift gear?

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Recent developments in Myanmar, tensions at the Bangladesh-Myanmar and Bangladesh-India borders, and even the return of Donald Trump as president in the US have dramatically affected geopolitics in the South Asian region. While 64,718 Rohingya entered Bangladesh in 2024, according to the foreign ministry, and they continue to enter Bangladesh in small groups every day, according to the Rohingya living in the camps in Cox's Bazar, Bangladesh needs to shift gear from talking about repatriation and start focusing on finding ways to stop the influx.

Based on the recent domestic political changes in Bangladesh, as well as the global changes, some questions arise in this regard. For one, when there is no instance of strict border closure in the past, can we hope that Bangladesh will be able to stop the (ir)regular small- and large-scale influxes of the Rohingya people? Also, since the country has not been able to successfully repatriate the Rohingya after the 2017 exodus, is it considering better alternatives to repatriation? While the foreign ministry considers the Arakan Army (AA) as a "non-state actor," Bangladesh has, on occasions, been in contact with the AA. Has the government done enough homework on how to engage with the AA, if necessary?

The Awami League government did not focus on formulating the country's own legal instruments, such as a national policy, regarding the Rohingya issue. What about the interim government? Has it started developing a national refugee policy or a national policy for the Rohingya? With the emergence of "Arakan" in Rakhine, now controlled by the Arakan Army, have all the stakeholders in Bangladesh reached a consensus on what strategies to adopt to deal with the situation? Indeed, questions abound. However, at present,

it is important to understand the motives and motivations of the AA.

Strangely, a fake message claiming AA asked Bangladesh for help was circulated by some individuals without realising the damages it might cause. Some speculate that the supply

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chain for AA's daily essentials may be linked to Bangladesh. The Myanmar junta may cut the internal supply chain anytime. Relying completely on India for a long time is surely not prudent because of the costs involved with it. This may make AA somewhat dependent on Bangladesh. Yet, because of their strength in arms and planning, they have reasons to create a fearful and threatening environment at the

Bangladesh-Myanmar border, which is now under their control.

But at the same time, it is necessary to have experts and others study the nature of AA and its background characteristics to deal with them.

Let's consider the AA's statement, "We recognise the human rights and citizen rights of the Rohingyas" (by Maj Gen Twan Mrat Naing). It may seem quite promising, but the fact is, in less than three years after making this statement in an interview with Bangladeshi journalists, they appeared before the Rohingya people in Rakhine as an equally brutal entity as the Tatmadaw. As a result, the 2024 influx took place.

Despite the negative sides, AA knows that it may have to rely on Bangladesh to maintain the supply chain for their survival. In the past, Bangladesh failed to seize this opportunity to start negotiations on the Rohingya issue. Will it now leap into action, or keep waiting for "the right time" to raise the issue? Realistically, there is no such thing as "the right time" when it comes to the situation of refugees like the Rohingya. It is all about protecting the human rights of over a million stateless people and saving Bangladesh from irreparable social, economic, and environmental damage.

It is not difficult to understand that the Rohingya issue may destabilise the entire region of South Asia. This is known to the global community as well. But we must remember, all superpowers, no matter how friendly they are with Bangladesh, have their investments in Myanmar. China and India have their own geopolitical and geo-economic interests in Rakhine, which dictate their policies for the region. Regional platforms may also remain passive. And the UN has so far been ineffective at doing anything to help Bangladesh resolve the crisis. So what other options are available to us?

There does not seem to be any practical alternative to meeting the AA with a strategic agenda. Engaging with a non-state actor is not an endorsement. And engaging with the AA may not even be enough to break the stalemate. It alone does not guarantee success. Engaging with other national, regional, and international actors simultaneously is necessary to bring the AA to the negotiating table.

### কালবৈশাখী/দুর্যোগপূর্ণ আবহাওয়ায় বিশেষ নৌ সতর্কীকরণ বিজ্ঞপ্তি

কালবৈশাখী মৌসুম আসন্ন। এ মৌসুমে নৌযান দুর্ঘটনার আশংকা বেশি। দুর্যোগপূর্ণ আবহাওয়ার মৌসুমে নিরাপদ নৌপরিবহন ব্যবস্থা নিশ্চিতকরণ এবং নৌদুর্ঘটনা পরিহারের লক্ষ্যে নিম্নরূপ অতিরিক্ত সতর্কতা অবলম্বনের জন্য বিআইডব্লিউটিএ'র পক্ষ থেকে সংশ্লিষ্ট সকলের প্রতি নিম্নরূপ সতর্কতা অবলম্বনের জন্য অনুরোধ জানানো যাচ্ছে।

#### যাত্রীদের প্রতি :

- আবহাওয়ার পূর্বাভাস জেনে যাত্রা করুন। দুর্যোগপূর্ণ আবহাওয়ায় লক্ষ্যে যাত্রা করবেন না;
- দুর্যোগপূর্ণ আবহাওয়া দেখা দিলে আপনার যাত্রা বাতিল করুন। কোন অবস্থায় জীবনের ঝুঁকি নেবেন না;
- পশ্চিমবঙ্গে হঠাৎ দুর্যোগপূর্ণ আবহাওয়া শুরু হলে লক্ষ্যে এদিক সেদিক ছুটছুটি করবেন না; ছুটছুটি করলে লক্ষ্য ভারসাম্যহীন হয়। এরূপ সময়ে শান্তভাবে পরিস্থিতি মোকাবেলা করুন এবং জীবন রক্ষাকারী সরঞ্জামাদি হাতের নাগালে রেখে মহান সৃষ্টিকর্তাকে শ্রবণ করুন।

#### চালকদের প্রতি :

- কালবৈশাখী/দুর্যোগপূর্ণ আবহাওয়ায় লক্ষ্য পরিচালনা করবেন না। বন্দর/ঘাটে অবস্থানকালে কালবৈশাখী/দুর্যোগপূর্ণ আবহাওয়ার সম্মুখীন হলে আবহাওয়া সম্পূর্ণ বিপদমুক্ত না হওয়া পর্যন্ত লক্ষ্যে বন্দর/ঘাট ত্যাগ করবেন না;
- লক্ষ্যে রেডিও, মোবাইল ফোন রাখুন এবং নিরামিত আবহাওয়া বর্তা শুনুন। আবহাওয়া সংকেত জেনে আবহাওয়া সংক্রান্ত প্রচলিত বিধি-বিধান মেনে লক্ষ্য পরিচালনা করুন;
- পশ্চিমবঙ্গে কালবৈশাখী/দুর্যোগপূর্ণ আবহাওয়ার সম্মুখীন হলে কিংবা বিপদের আশংকা দেখা দিলে দ্রুত লক্ষ্য নিরাপদ আশ্রয়ে সরিয়ে নিন;
- যাত্রীদের বসার স্থানে মালামাল রাখলে লক্ষ্যের ভারসাম্যতা ফুঁসে যায়। তাই যাত্রীদের বসার স্থানে মালামাল না রেখে হ্যাচে মালামাল রাখুন এবং যাত্রার পূর্বে হ্যাচ কভার পানি রোধক করে সম্পূর্ণরূপে বন্ধ রেখে লক্ষ্য পরিচালনা করুন;
- লক্ষ্যে পর্যাপ্ত জীবন রক্ষাকারী সরঞ্জামাদি মজুদ রাখুন এবং এগুলো যাত্রীদের হাতের নাগালে রাখুন।

#### মালিকদের প্রতি :

- যাত্রী সাধারণের জান-মালের নিরাপত্তা বিধান করা আপনার নৈতিক দায়িত্ব। তাই উপযুক্ত সনদধারী এবং নির্ধারিত সংখ্যক মাস্টার/সারে ও ড্রাইভার দ্বারা নৌযান পরিচালনা করুন;
- বন্দর/ঘাটে অবস্থান কালে কালবৈশাখী/দুর্যোগপূর্ণ আবহাওয়ার সম্মুখীন হলে আবহাওয়া সম্পূর্ণ বিপদমুক্ত না হওয়া পর্যন্ত মাস্টারকে লক্ষ্যে নিয়ে ঘাট/বন্দর ত্যাগ করার অনুমতি দেবেন না;
- প্রতিটি লক্ষ্যে রেডিও, মোবাইল ফোন এবং পর্যাপ্ত জীবন রক্ষাকারী সরঞ্জামাদি সরবরাহ করুন। দুর্যোগপূর্ণ আবহাওয়ায় নৌযানের মাস্টারের সাথে পুনঃপুনঃ যোগাযোগ রক্ষা করে সার্বিক বিষয় কঠোরভাবে মনিটর করবেন।

#### সাধারণ নির্দেশনাবলী :

- লক্ষ্যের নাবিক/স্টার্কগণকে অনুরূপভাবে মাস্ক পরিধান ও স্বাস্থ্য বিধি মেনে নৌযানে দায়িত্ব পালন করতে হবে এবং বিপদের মুহুর্তে যাত্রীগণ যাতে সহজে তাদের নিকট হতে সেবা নিতে পারে তজ্জ্বা সকল নাবিক/স্টার্ককে নির্ধারিত পোশাক পরিধান করতে হবে।

#### জরুরী ধরোজনে যোগাযোগ :

- বিআইডব্লিউটিএ'র কলসেন্টার নম্বর ১৬১১৩।
- কালবৈশাখী মৌসুমে/দুর্যোগপূর্ণ আবহাওয়ায় সূঁ ও নিরাপদ নৌপরিবহন ব্যবস্থা নিশ্চিত করণে সংশ্লিষ্ট সকলের সহযোগিতা কামনা করা হচ্ছে।