

SYNERGY

BANGLADESHI ENGINEERS & ARCHITECTS WORLDWIDE

Welcome to Synergy Magazine:

A New Chapter for BEAWorld!

“The adverse impact of climate change would vary from country to country, region to region, location to location. More adverse impacts should be felt in the northern hemisphere.”

- Dr. Ainun Nishat ”



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Editorial Message

Synergy starts its maiden voyage as BEAWORLD quarterly Magazine on 7th May commemorating Engineers’ Day, the day The Institution of Engineers, Bangladesh founded in 1948. We express our profound respect to those founding leaders. The editorial board targeted the significant day and finally achieved it on account of our esteemed board members’ extensive engagement in different events demonstrating their strong commitment to professional development. Synergy declares its debut with a visionary objective to connect stakeholders, collaborate with allied bodies, engage members, inspire, and accelerate cutting-edge technology to build a better world that our founders aimed for. Synergy ushers new hope and enthusiasm among BEAWORLD members to carry forward their professional journey. Intellectual researchers across the board and beyond will get the opportunity to review and revisit their groundbreaking ideas and thoughts through Synergy. It would prioritize innovation in the field of contemporary trends and advancements of sustainability and eco-friendly approaches in Engineering practices for the benefit of mankind. I extend my sincere gratitude to well-wishers and advisors for their worthy guidance towards this mission. BEAWORLD organizers exhibit unwavering dedication to opening up digital platforms by developing Synergy domains with the shortest duration. The editorial board extends its warmest regards to authors for their endeavors and submissions of their valuable write-ups within the framework and deadline. We hope The Synergy not only meets but exceeds the expectations of readers. May Synergy be the spokes-media of BEAWORLD and glorify this platform by reaching out to members, partners, and stakeholders with its vision and mission.

Engr. Rafiqul Islam Talukder, P.Eng, F/3808
Vice Chairman - Occupational Safety Board IEB
Vice Chairman - IEB UAE Overseas Chapter
Former Senior Engineer, ADNOC

Message



I am pleased to learn that BEA World has been organizing webinar sessions on regular basis with a view to highlighting contemporary disrupting new technologies, and the challenges facing the technical professionals across the globe. The platform also helps sharing best practices being pursued by the developed countries and their personal insights on these new technologies. By this way, this platform offers a unique opportunity for all such professionals to enrich their knowledge and understanding and the framing of Bangladesh's national policy in these fields.

Furthermore, the publication of "Synergy" by this group will further reinforce their understanding on disrupting technology. It will unlock potentials of our professionals spreading all over the world. I am happy to see that Bangladeshi Engineers and Architect living in the UAE are leading this group demonstrating their commitment and passion for their motherland.

Most importantly, our professionals not only contribute to the socio-economic development by way of sending remittances but also brighten the image of Bangladesh in their host countries.

I congratulate the Editorial Board members for their noble initiative. Hope that the publication will live up to the expectations of both readers and researchers at large.

Mohammed Abu Zafar

Ambassador

Permanent Representative

Message



With great pleasure, I extend my warmest congratulations to Bangladesh Engineers & Architects Worldwide (BEAWORLD) on the publication of their quarterly newsletter, 'Synergy,' on the auspicious occasion of Engineers Day, 7th May 2024. It is heartening to learn that BEAWORLD, founded and operated by Bangladeshi Engineers and Architects residing in the UAE, has established itself as a leading webinar platform for innovative technical sessions, bringing together participants across the globe to share their knowledge and experiences.

I believe that the publication of 'Synergy' is a strong reflection of BEAWORLD's dedication and passion for professional excellence. Undoubtedly, this publication will unveil the immense opportunities for experts, researchers, and academics all over the world to unlock their potential for technological advances.

I congratulate the organizers and editorial board members for their noble efforts in bringing this publication to fruition. I am confident that the contributors, editors, and readers of 'Synergy' will showcase the true essence of this endeavor and thus, inspire future innovations. May this publication thrive and continue to be a source of knowledge and inspiration for all.

My best wishes to BEAWORLD and all its members on Engineers Day. I hope the hard work and dedication of the engineers and architects of BEAWORLD will shape a better and more sustainable future for Bangladesh and the world.

Happy Engineers Day!

BM Jamal Hossain
Consul General, Dubai

Message



It is indeed a great pleasure to learn that Bangladesh Engineers and Architects worldwide are going to publish a quarterly newsletter, Synergy, on May 7th, commemorating Engineers' Day. Since its inception, The Institution of Engineers Bangladesh (IEB) has been conducting professional activities through centers, sub-centers, divisional committees, and overseas chapters, thus contributing to the development of Bangladesh and its economic growth. IEB established the Bangladesh Professional Engineers Registration Board as an autonomous body to register engineering professionals, ensuring accountability to their respective clients. It also established Engineering Staff College offering professional training programs for engineers throughout the year. Moreover, IEB has bilateral agreements with regional and international professional bodies, demonstrating effective collaboration in various areas. In this way, IEB is portrayed as a center of excellence. Bangladesh dreams smart Bangladesh under the leadership of our Honourable Prime Minister Sheikh Hasina, publication of Synergy signifies to put forward this vision.

I am pleased to see members working abroad organize themselves and arrange knowledge-sharing sessions, contributing to professional development. In this regard, the publication of Synergy justifies its commitment. Hope to see Synergy shall come to light with glimpses of latest technologies, innovations, and research updates of the contemporary world. By that way our professional uplift will take place eventually society will advance in terms of economic growth.

I would like to congratulate the members of the editorial board for undertaking this noble initiative. I extend my best wishes to the writers and scholars who contribute their precious articles to make it a success. Let the journey of Synergy begin smoothly towards becoming a game-changer in the engineering arena.

Engr. Md. Abdus Sabur MP

President

The Institution of Engineers, Bangladesh (IEB)

Message



I am delighted to learn that Bangladesh engineers and architects worldwide are going to publish a quarterly newsletter, "Synergy," to commemorate Engineer's Day on May 7th. The Institution of Engineers was founded in 1948 by our visionary leaders with the aim of building a better world. "Synergy" will contribute to advancing that vision by engaging our talented engineers spread across the globe. I am delighted to see that Bangladeshi engineers are involved not only in the development of their home country but also participating in development activities to other countries. In this way, they are contributing to strengthening Bangladesh's economy by sending valuable remittances while also upholding homeland image abroad. It is expected to have knowledge dissemination across the board and beyond through this publication. Moreover it will capture facts and figures from reality world thus enabling us to figure out national policy. Hope that Synergy will successfully pick up remarkable achievements and technological advancement what our Engineers around the globe bring about. We will be eagerly awaiting to celebrate all these achievements through this newsletter.

I would like to congratulate the members of the editorial board for undertaking this noble initiative. I extend my best wishes to the writers and scholars who contribute their precious articles to make it a success. Let the journey of Synergy begin smoothly towards becoming a game-changer in the engineering arena.

Engr. S. M. Monjurul Haque Monju

Honorary General Secretary
The Institution of Engineers, Bangladesh (IEB)

Message



Formation of BEAWORLD is a recent story still passes its infant stage. But by this time it disperse light rays all over the world among engineering professionals. It operates not only within Engineers and Architects but extends its functions amongst the students also demonstrating passion and commitment to profession. Diversification in online activities already popularize this platform and signifies as unique identity among the stakeholders. It proves that this platform has immense potential demonstrating morning shows the day.

In this course, publication of Synergy adds another feather to its success story. It will enlighten this platform further, able to accelerate knowledge transformation among the circles. By this way, we will have team of excellence who endeavor even better service to the professional field.

I congratulate organizers and editorial board members for undertaking such noble efforts. Hope that writers, reporters and readers will showcase the best essence of this publication.

Engr. Moazzem Hossain

Advisor, BEAWORLD, President -Bangladesh Association, UAE
Held the office of Divisional Manager - Network Management Division - Abu Dhabi Distribution Company (ADDC) / Abu Dhabi Water and Electricity Authority

Message



Congratulations on the launch of Synergy involved in Science, Technology, Engineering, Mathematics newsletter/magazine.

Our commitment to sharing insights into the latest advancements in technology & engineering, commendable. I look forward to seeing the impact this publication will have in keeping the community informed.

It is with great enthusiasm that we present a platform dedicated to celebrating innovation, exploring emerging trends, and delving deep into the ever-evolving world of technology.

You'll find a curated selection of articles, features, and insights crafted to inspire and inform. Whether you're an industry expert, a tech enthusiast, or simply curious about the latest advancements, this magazine.

Thank you for joining us on this adventure. Here's to a future filled with knowledge, discovery, and boundless possibilities!

Best wishes for your continued success in this endeavor.

Engr. Moniruzzaman Sarkar (Mohon)

Advisor, BEAWORLD, Chairman, IEB -UAE Overseas Chapter
Operation Manager - Dubai Water and Electricity Authority (DEWA), UAE

Message



Dear esteemed Engineers & Architects,

It is our immense pleasure and pride to welcome the first publication of our much-anticipated magazine, “The Synergy” – the hub of engineering excellence. As a team of BEAWORLD and this endeavour, we are thrilled to witness the realization of a shared vision to create a platform dedicated to the exploration, the culmination of our collective efforts and passion for technology and knowledge sharing.

We are immensely grateful to the Chief of Editor, Editorial Board Members, Authors and Advisors for their invaluable insights, expertise and excellent display of team work. Their passion for their respective fields shines through in each article, and we are confident that their contributions will spark thought-provoking discussions and pave the way for future breakthroughs.

Since the commencement of BEAWORLD in June 2023, it initiated regular programs like, Knowledge Sharing Session, Panel Discussion Session, Students’ Leadership Session, Business Support Session etc. By offering such diverse programs, we are catering to various interests and needs for Bangladeshi Engineers & Architects and ultimately fostering a dynamic and supportive environment for growth and development.

This publication of magazine marks a significant milestone in our journey. Our journey to this moment has been marked by dedication, collaboration, and a relentless pursuit of excellence. Today, we stand at the threshold of a new chapter in the realm of technical articles, poised to disseminate cutting-edge insights, breakthroughs, and expertise to a global audience.

Within the pages of this inaugural issue, we will find a diverse range of topics, from the latest developments in sustainable engineering, solutions against climate change, renewable energy, IOT, health and safety risk assessment etc. Our goal is to provide the Engineers & Architects with a comprehensive overview of the ever-evolving landscape of technology and inspire curiosity and creativity along the way.

To the Engineers & Architects worldwide, we extend our sincerest gratitude for being with us on this journey and extraordinary venture. We are optimistic that this magazine will serve as a source of inspiration, knowledge, and collaboration, fostering the individuals united by a shared passion for development.

We look forward to the opportunities and development with visionary action, and will continue the publication of the same in regular interval.

Rezaur Rahman

Founder & Organiser, BEAWORLD

Message



Our (Bangladeshi Engineers & Architects-Worldwide (BEAWorld) mission is to cultivate a vibrant community of engineers dedicated to innovation, collaboration, and excellence. We provide a platform for engineers to connect, share knowledge, and advance their careers through networking events, workshops, conferences, and online resources. Our goal is to empower engineers with the tools, skills, and support they need to tackle complex challenges and drive positive change in their fields. Join us in shaping the future of engineering and making a difference in the world.

“Publication of Newsletter Synergy: The Journal of Engineering Excellence” is a peer-reviewed publication dedicated to showcasing innovative technologies, and best practices in engineering across various disciplines. Our journal serves as a platform for engineers, researchers, and practitioners to share their findings, insights, and experiences, fostering collaboration and advancing the field of engineering. We welcome submissions spanning a wide range of topics, including but not limited to civil engineering, mechanical engineering, melectrical engineering, computer science, and environmental engineering. Through rigorous review processes and editorial excellence, Synergy aims to deliver high-quality content that informs, inspires, and drives progress in the engineering community.

Hats off to the Synergy Hats off to the Synergy on a job well done! Your dedication, hard work, and passion for excellence have truly shone through in each edition of the newsletter. The insightful articles, engaging content, and meticulous attention to detail have made it a valuable resource for our community. Thank you for your commitment to excellence and for all that you do to keep our readers informed and inspired. Here's to many more successful editions ahead!

Engr. Mohammad Amzad Hossain Khan

Organizer

Bangladeshi Engineers & Architects-Worldwide (BEAWorld)

Formation of BEAWorld and its history

Bangladeshi Engineers & Architects_ Worldwide (BEAWorld) was established on 11 June 2023 to serve as a professional platform where practicing Bangladeshi Engineers and Architects worldwide converge to exchange insights. The necessity of forming a fully effective professional body that lies in its ability to facilitate connectivity, professional development and opportunities, uphold standards, foster inclusivity, and advocate for the collective interests of its professional and the broader community.

Purposes of BEAWorld:

Professional Development and Networking: BEAWorld is to provide opportunities for ongoing education, training, and networking, enabling members to stay updated on industry trends, exchange knowledge, and build professional connections. By offering these benefits without discrimination, it supports the career advancement of the Engineers and Architects.

Global Standardization: In an increasingly interconnected world, BEAWorld is to establish connectivity among Bangladeshi Engineers & Architects working worldwide. This fosters consistency and quality in professional services or products, promoting trust and reliability in global markets.

Collaborative Problem-Solving: BEAWorld is to facilitate collaboration and cooperation among professionals from diverse backgrounds. This enables collective problem-solving and innovation, leading to better outcomes for both practitioners and the broader society.

Facilitated Mobility: BEAWorld is to facilitate more easily navigate international boundaries and work in different countries. Mutual recognition agreements and standardized accreditation processes streamline the recognition of qualifications, reducing barriers to professional mobility and promoting a dynamic, globally integrated workforce.

Global Recognition and Influence: BEAWorld is an inclusive and impartial professional body to gain recognition and respect on a global scale, as it demonstrates a commitment to universally applicable principles of professionalism, integrity, and inclusivity. This enhances the influence and credibility of the profession in international contexts.

Advocacy and Representation: BEAWorld is to serve as a powerful advocate for the interests of its professionals on the global stage. By representing the collective voice of practitioners, it can influence policies, regulations, and initiatives that affect the profession worldwide, ensuring that the needs and concerns of professionals are addressed at an international level.

Promotion of Diversity and Inclusion: BEAWorld is to promote diversity and inclusivity within the profession, ensuring that all individuals, regardless of background or identity, have equal opportunities for participation and advancement. By fostering a culture of inclusion, it enriches the profession with diverse perspectives and experiences, driving innovation and creativity.

Ethical Standards and Integrity: BEAWorld is to establish and uphold ethical standards that are universally applicable and impartially enforced. This promotes integrity within the profession and enhances public trust in the competence and ethical conduct of its professionals.

Principles

BEAWorld, a worldwide professional organization, is to adhere to several key principles to effectively serve the professionals and fulfill its mission on a global scale:

Teamwork: It emphasizes collaboration, cooperation, and synergy among individuals to achieve common goals. Teamwork begins with a shared understanding of organizational goals and a collective vision for success in a systematic way.

Professional Development: Providing opportunities for professional development, continuous learning, and skill enhancement is essential to help members stay abreast of industry trends, best practices, and emerging technologies. This includes workshops, training programs, certifications, and mentorship initiatives.

Knowledge Sharing and Collaboration: Facilitating knowledge sharing and collaboration among members promotes innovation, fosters exchange of ideas, and accelerates problem-solving. The organization can facilitate networking events, conferences, online forums, and collaborative projects to facilitate interaction and collaboration among professionals worldwide.

Integrity and Trustworthiness: Upholding integrity fosters trust among stakeholders, including employees, customers, investors, and the public. When individuals and organizations demonstrate integrity in their actions and words, they earn the trust and respect of others, which is essential for long-term success and sustainability.

Transparency and Accountability: Operating with transparency and accountability fosters trust and confidence among its professionals and stakeholders. BEAWorld is to maintain open communication channels, provide regular updates on activities and decisions, and adhere to sound governance practices.

Inclusivity and Diversity: Embracing diversity and inclusivity ensures that BEAWorld represents and serves professionals from various backgrounds, cultures, and regions. It promotes equality of opportunity and fosters a sense of belonging among Bangladeshi Engineers & Architects worldwide.

Global Outreach and Engagement: Actively engaging with professionals, organizations, and communities worldwide helps broaden BEAWorld's reach and impact. This may involve establishing partnerships, alliances, and chapters in different regions, as well as participating in international conferences and events.

Quality Assurance and Accreditation: Establishing standards of excellence and accreditation programs can help ensure the quality and integrity of the profession. BEAWorld is to develop criteria for accreditation, conduct assessments, and recognize individuals and organizations that meet the established standards.

Community Engagement and Social Responsibility: Demonstrating a commitment to social responsibility and community engagement enhances the organization's reputation and contributes to positive social impact. This may involve supporting charitable initiatives, volunteering efforts, and community development projects.

Adaptability and Resilience: In a rapidly changing global landscape, BEAWorld is to remain adaptable and resilient to effectively navigate challenges and seize opportunities. This may involve staying flexible in response to evolving needs and trends, embracing innovation, and continuously evaluating and refining its strategies and operations.

Aims and Objectives of BEAWorld

Bangladeshi Engineers & Architects Worldwide (BEAWorld), established on 11 June 2023, serves as a professional platform where practicing Bangladeshi Engineers and Architects worldwide converge to exchange insights.

Aims: Building a Global Hub of Bangladeshi Engineers & Architects for Professional Excellence

We envision a world where Bangladeshi Engineering & Architectural Professionals have seamless access to a global hub of excellence, transcending geographical boundaries. Our vision is to be the preeminent platform that revolutionizes professional development in the Engineering & Architectural field. We aspire to be the go-to resource for Engineers & Architects seeking to stay at the forefront of technological advancements, connect with like-minded peers, and contribute to a sustainable and technologically advanced future. Through our platform, we aim to foster a collaborative ecosystem that not only enhances individual careers but also propels the engineering community to address complex global challenges.

Objectives: Empowering Bangladeshi Engineers & Architects, Transforming Futures

Our mission is to create a dynamic and inclusive platform that empowers Bangladeshi Engineering & Architectural Professionals to continually advance their skills, knowledge, and career trajectories. We strive to foster a community where Engineers / Architects can engage in continuous learning, collaboration, and innovation. By providing access to cutting-edge resources, mentorship, and real-world experiences, we aim to catalyse individual growth and contribute to the overall evolution of the engineering profession.

The current focal points include:

- Enhancing connectivity among Bangladeshi Engineers & Architects.
- Conducting regular Training and Knowledge Sharing Sessions. Shaping into an institution is in a plan to effectively facilitate competency development for Bangladeshi professionals, specially for the expat Bangladeshis, empowering them to thrive in their careers, contribute to organisational success, and drive positive change within their industries.
- Publication of Magazine / Newsletter in regular intervals representing BEAWorld's activities, showcasing its expertise, enhancing its reputation within and beyond the community. 'Synergy' is the first milestone of BEWorld's publication.
- Providing a platform for job opportunities.
- Creating avenues for business opportunities.
- Implementing a leadership development program for students.
- Facilitating Outsourcing and Freelancing work for Bangladeshi-owned companies, both within Bangladesh and internationally.
- Supporting Engineers and Architects engaged in remote work.
- Offering technical feedback and suggestions to address challenges encountered in the professional field.

Navigating Climate Chaos: Global Action Needed Now to Avert Unthinkable Consequences

Professor Dr. Engr. Ainun Nishat is a prominent Bangladeshi scientist and environmentalist. He is professor emeritus of BRAC university and former professor of Department of Water Resources and Engineering, BUET, Bangladesh. He's well-known for his expertise in climate change, water management, and sustainable development. Dr. Nishat has been actively involved in various national and international initiatives to address environmental challenges facing Bangladesh and the world. Synergy editorial team interviewed him on climate change issues, recent climate emergencies and sustainable solutions and development.



Q1. Identifying Vulnerabilities: In securing UNFCCC's attention for increased climate funding, how can we effectively communicate the specific vulnerabilities our region/country faces due to climate change?

Prof. Dr. Ainun Nishat:

The adverse impact of climate change would vary from country to country, region to region, location to location. More adverse impacts should be felt in the northern hemisphere. Science has now thorough analysis of the probable impacts at various locations. The global negotiation process is conducted through two angles or two channels. One is science based on science. The other one is based on politics or the responsibility of the countries. Issues related to climate change are being considered by the whole world in a very fast pattern. The first manner to develop a global convention is a global law or a global practice. It takes 30, 40, 50 years just to develop the basic convention. For example, a law on polythene and plastic is being discussed. And for the last three, or four years, the language of that law is being drafted. It might take another two, or three years. Another example is mercury pollution. It started immediately after the Second World War and then it took about 50 years to develop the first law, which is called the mini bata convention now because is an industrial product that is required when you produce the stainless steel and various other things now. So its use must be limited. We use it in floating glass, in producing the floating glass. Its production or mining must be restricted. In Bangladesh. How much mercury

do we use every year? We have no data. The entire mercury is going through the west drains into the river and it is going into the body of the fish. Unfortunately, we are not even aware of that. So, climate change. The adverse impacts of climate change were first recognized around 1986-87 in the USA. Some let me rephrase the adverse impacts of global warming resulting from the accumulation of greenhouse gases in the atmosphere was debated since the 18th century. 19th-century scientists wrote papers the first industrial revolution which started around 1750. That was the time the industry started working. Locomotives started moving. Many a power energy was being produced. So carbon volume of carbon dioxide, methane, nitrous oxide, and in those days chlorofluorocarbon. But that has been now replaced by hexafluorocarbon. Their volume in this atmosphere is increasing. At the end of the 19th century, scientists were very serious about it, but the political governments never bothered about it. Because in the name of development, we need more energy, we need more industries, we need more vehicles, trucks, and trains. So around, as I said, 19 85 86 some researchers from MIT felt something was wrong and they noticed that the sea level was rising. Of course, they made some mistakes in their calculation, but they projected some numbers based on which the whole world became interested. So around 88 89, science conferences were organized. Scientists of the world gathered together, including researchers from NASA in the USA. And they modeled and projected that with a two to three-degree rising temperature, a lot of unwanted things would happen. Number one, on those days they projected the sea level rise would be to the tune of four meters. Since then it has been corrected. Now it is around 1 meter. But that mistake resulted in major political, shall I say discussion. If it is even two meters, then all the low-lying countries in the Caribbean, in the Pacific would be submerged. Even in Bangladesh, maybe one-third to one-fourth of Bangladesh should go underwater. The Netherlands would not be able to manage it because this is below sea level. Maldives would vanish. So, they formed a scientific community called the IPCC Intergovernmental Panel on Climate Change. And they invited scientists or the countries to nominate scientists. The whole meeting was organized by UNEP and WMO, two organizations. So they nominated selected research organizations including NASA and from the UK and USA Canada and Sweden. And those people produced their first report in 1990. And they said this is an irreversible process. And the world has become, had become hotter or cooler seven times over the century. If the age of the earth is taken 230 or sorry, 300 crores can you get a passer here? So, if it is the earth is very old, 320 crore years old from one hot condition. Then it starts getting cooler and the warmth is now in the cooling phase and then it goes up and in between there could be 200 million years, 300 million years, something like that. But they projected this time within the next hundred years the world could be up to six degrees hotter. And if it is six degrees hotter then the entire South Pole and North Pole would melt down.

North Poles have already melted down. But the South Pole is the most dangerous. The Himalayas would melt down. Already the Alps have melted out. So, in the summer season in the Alps, there is almost no ice, and in a few years, it will not be there. So the result, main result thread would be flowering pattern of plants should change the flowering pattern. For example, as I am talking, in 2024 mangoes in Bangladesh bloomed about two to three weeks late last year. In 2023 and 2022 in the month of Ashar and Shabun, July and August the rainfall was much low. And this year the Amun crop which grows during the monsoon had to be cultivated by pumping water from the ground. Unthinkable matter. Normally the rainfall is so high, that our problem is drainage. But this time we had a problem with irrigation.

The result was we were prepared for irrigation in the dry season in March, April, and May. And we could have faced a major problem in irrigation because the water table was lowered. But luckily for the last two weeks in April, we have had rainfall. So, these are erratic things. So, the food drainage shortage was the main problem. The sea level would go up. I will come to the correct figure. The present projection in a minute. Therefore, in the coastal wealth salinity would increase in a hundred years, entire southwestern Bangladesh would become part of the sea. If I draw a line from Jasore to Gopalganj to Champur to Feny, the southern part of this line would become the seawater, about 40 pp. With a 40,000 per million level of salinity. And then there would be brackish water further up north. So that would create total change in the ecosystem and biodiversity. People will lose their livelihood, people will lose their food insecurity, lose their food security, and therefore they will start migrating. The migration would result in a lot of unexpected unforeseen projections that would be erratic.

It may rain where it is supposed to rain and it may not rain where it is supposed. So it may rain where it is not

supposed to rain and may not rain where it is supposed to rain. It may not rain when it is supposed to rain like in monsoon. It may rain in the pre-monsoon and post-monsoon periods. That worries us. So this.

Therefore, the scientists in 1990 advised us to prepare and these impacts should be felt maybe in 30 to 40 years. But they said unless you prepare control on greenhouse gas production it will be too late. Because greenhouse gases are accumulating in the atmosphere. So very quickly the world got together. Even the General Assembly requested in 1991 that all countries that let us prepare a law global convention. This convention was approved in 1992. There were four major building blocks in that law. So, the first is to cut down greenhouse gas mitigation and the countries that are responsible for mitigation. Sorry that a responsible greenhouse gas generation.

That is the developed countries of those days like the UK, USA, entire European Union countries, Japan, Russia, Australia, and New Zealand. They admitted in 1992 in writing by signing the agreement that we are responsible. So, the whole world was divided into two blocks.

So those who signed it or admitted they are called annex one and we are nonannex one. Inside a nonannex country, there are also various subgroups. So we belong to the LDC country group as of today. So among the developing countries, the least developed countries are the least responsible. The second building block is adapted. It would result in the long run with a lot of adverse impacts. Change of seasons, change of agricultural productivity, migration, increase in diseases. Because if you consume saline water, there will be a lot of diseases like hypertension among men and women. In the Kulna area, Baggerhad Satkhira Borguna Kulna Shadur it is already reported that men and women are having more heart attacks and more blood pressure-related problems. It is also being reported that women are losing their fertility, and their maternal, sorry, not maternal, reproductive health is being adversely affected. We do believe in Sadkira, in Shemnagurthana, the women are losing their uterus because it is so bad condition. So having said that, by 1992, the global convention, the third element of the convention was finance.

You need a lot of money. The fourth element was technology transfer and capacitability. But in 2000, sorry, in 1990 or 1995, and the third report came out in 2001, the scientists could not confirm that global warming is a result of greenhouse gas accumulation. They said most probably very likely. But advise the world to do something right now because, by the time the science should be proven, it may be too late to adjust. You get my point. And the whole world accepted. So in 1992, the global convention was prepared. In their fourth report in 2007, the scientists said, we are definite it is happening unequivocally. That's the term, about a 95% probability based on that. So in 19 2007, the world said, the way you are working is not good enough. Enhance your rate of working and set up a global target.

And within two years, by 2009, a new global law was supposed to be prepared. Earlier in 1997, the Kyoto Protocol was produced which was basically on mitigation. So mitigation was addressed under the protocol, but adaptation, finance, technology transfer, and capacity building, were to be addressed.

So in 2009, 2009, the whole world failed to produce the new law, but they were convinced that there would be a convention or agreement should be completed. It was done in 2015 in Paris. So the whole world is now working on the Paris Agreement. But in the meantime, the four building blocks I mentioned have now been split up into eight building blocks, including two three new ones. So let me explain those eight and then I will answer your question one by one. So first, the building block is an adaptation for developing countries as well as for developed countries because climate change is going to every country of the world. So adaptation second is mitigation. This time a change was made compared to 1992, developed countries must pursue the process of reducing greenhouse gases, which means switching over to renewable energy. But between 1992 and 2015, many of the developing countries started producing more greenhouse gases, namely China and India.

So today China and India are number one and number three culprits. And number two is the USA. And maybe in five years, India will overtake the USA but their population is high. So we also calculate in terms of per capita emission will be shocked with my next statement. Which country is the most culprit in terms of per capita commission? Qatar. Qatar. Number two, UAE. UAE. So Saudi Arabian oil-producing countries. So they waste a huge amount of energy. So mitigation, adaptation. Third is finance. By this time, the world has agreed that the developed countries have to support the least developed countries. And the countries which most will suffer most,

that is the island countries. As I said, the 1992 classification of annex one country or developed country and annex one country, which means other countries.

Now it has been split into three parts. So the list of developed countries is undisturbed. And among the developed countries, sorry, among the developing countries, few countries are called advanced countries. Among developed countries, developing countries like India, China, Singapore, Korea, etcetera. Japan is developed. So the names are there. You cannot change it. Since you asked me, one country is trying to move out of that list, which is Turkey. They are saying that we are not so rich compared to others, because they wanted to be a member of the European Union. And Kazakhstan is trying to join the list. They said our economic conditions, we are rich anyway. So this is part of global politics. So mitigation, adaptation, and finance. And the whole world is committed to making billion dollars, not million hundred billion dollars available every year for adaptation and mitigation and finance. The finance will be made available for the fourth element is capacity building.

The fifth element is technology transfer. 6th element. The world has now agreed that there must be global standards. So on mitigation, the world committed that you should be able to keep the temperature within 1.5. So that is a global target. But you cannot force a country to commit to what will be their reduction. So they must declare that commitment voluntary. The first voluntary commitments were made in 2015. But the scientists calculated and found is not ambitious enough. Then they pressed us, to make your commitment in 2021. Still not good enough. The next commitment will be made in 2025. So this is called nationally determined commitments. And on adaptation, all the countries were required to prepare their national adaptation plan called a map. About 60, 50 60 countries have already prepared. Rest are in the process of preparing. Now then the world said you must have a standard on adaptation. To give an example, in Bangladesh, most of our river training programs or flood control projects have a safety level of a year return period.

Okay. Germany uses a 1000-year return period. The Netherlands uses a 1250-year return period. For the coastal embankment, they use a 10,000-year return period. So Bangladesh, we have hundred-year return period embankments. But we are apprehending it may not be good enough. So again, let me repeat, mitigation adaptation, finance, technology, transfer, and capacity building. They were separated and 6th is the global target. 7th is loss and damage. A new phenomenon has come up. The money that would be given for adaptation would prepare a country to face a disaster. But what happens if an extreme event and disaster adversely affect the country? To explain in the coastal belt you have the coastal polder 15ft high we are in the return period. We normally hope it will be good enough but it may be overtopped. Last year in Georgia and Florida they had 17ft high. Last year in 2023 there were five major cyclonic events in the Bay of Bengal. One affected us which is in Teknaf. Other four. One affected Andaman and the other three affected the eastern coast of India. One namely Ampan. A few years back was very powerful. If Ampan had hit bodhisattva I don't know what would have happened. Maybe 5 million or 10 million people would have died. So if I have an adverse impact that is beyond my adaptive capacity then I should receive some support. That is called loss and balance. And the 8th one is interesting. The world is saying okay we are going to make money available to you but we must be sure that you are using the fund correctly and honestly and that is called compliance mechanism. So in 2015, they formulated how it should be done.

As professional engineers you know that we monitor the progress of a project through a logical framework. But now they are saying your LFA must be topped up with theory of change type analysis. What is the ultimate goal of it? So point I am now trying to make is whole world has now prepared its strategy, prepared their commitments.

Now Bangladesh is quite advanced in meeting the commitment, in developing the commitment not implementing the committee. So we have the NDC document we produced in 2016. The second one we produced in 2022 we have submitted to the world. But are we implementing our commitments? The answer is no. We have prepared our NAP document national adaptation plan. Are we ready to implement that? Partially because you have another document called Bangladesh Climate Change Strategy and Action Plan that has. That was finalized in 2009. So you have all the right solutions included over there. So now with this as a background, funds are available but we can't reach out to collect. The question is who will do it now climate change is not the subject matter of

environment ministry only. They are supposed to work with global ideas and advise all the ministries. Your main problem would be in agriculture.

So agriculture ministry must be impacted. Another major impact would be on livelihood. So local government should be involved and the planning commission should be involved. The major impact would be in the health sector, so the health ministry should be. Your major impact will be in infrastructure building. As the rainfall intensity increases, all your drainage structures will be in trouble. Dhaka city is in grave danger. Anytime we may have 300 rainfall. If we have 300, which Rangpur had three years back, if we have 300 rainfall, Dhaka would be underwater for 10 to 15 days.

Bodhisattva never faced any flood, but now, every year in July and August, the town is underwater. Think of Chittagong, Agrabah, their heart, industrial. They are their commercial zone. That is underwater. So for Bogura, there's a spring tide. So, having said that, Bangladesh has developed a capacity in modeling that is not our model, but we are using the model produced by the British government, by us government, so they have given us the model, and we can run it.

We know the. What would be the adverse impact, because we have developed the NAP document? So both the NDC of Bangladesh and the NAP of Bangladesh have been approved by the cabinet, has been approved by the prime minister. Now it is our time to start preparing how to implement it. So, having said that, let me address your points

Q2: Alignment with UNFCCC Goals: How can we best design mitigation and adaptation projects that demonstrably align with the UNFCCC's overall goals and priorities to maximize funding potential?

Prof. Dr. Ainun Nishat:

To design mitigation and adaptation projects that align with the UNFCCC's goals and priorities and maximize funding potential, it's crucial to recognize that the adverse impacts of climate change vary significantly by region. This underscores the importance of tailored solutions that consider the specific vulnerabilities and risks each region faces. Northern hemisphere nations are expected to bear a greater burden of these adverse effects.

Key Strategies:

1. **Scientific Foundation:** Ground projects in thorough scientific research to align with the UNFCCC's science-based approach. This includes understanding the latest climate projections, regional impacts, and trends, such as rising sea levels and changing rainfall patterns.
2. **Policy Integration:** Align project objectives with national and international policies, ensuring that political responsibilities for climate change mitigation are considered. Projects should adhere to international frameworks while addressing regional policy nuances.
3. **Adaptation and Mitigation Balance:** Balance between adaptation and mitigation measures is essential. Mitigation projects should focus on reducing emissions, while adaptation projects should prepare for the changing climate. Prioritize sectors such as agriculture, energy, and water management, where climate change will have significant impacts.
4. **Global Law Compliance:** Ensure projects comply with existing and emerging global laws, conventions, and agreements. Learn from previous conventions like the Minamata Convention and consider the challenges in establishing regulations for pollutants like mercury.
5. **Finance and Capacity Building:** Seek funding and capacity-building opportunities that align with UNFCCC goals. Projects should outline clear financial plans and demonstrate effective technology transfer to ensure sustainability.
6. **Cross-Sector Collaboration:** Engage with scientific communities, governmental agencies, and international organizations. Leveraging the expertise of groups like the IPCC and UNEP can help ensure projects are aligned with global best practices.

Q3. With so many climate funds available, what are the key differences between them, and which ones might be most relevant for Bangladesh?

Prof. Dr. Ainun Nishat:

The developed countries are supposed to contribute to this global fund and contribution is related to the emission level of that particular country. The USA produces 30 percent of the global emissions. So, of 100 billion dollars, they must provide 30 billion dollars. But this is a part of the political game. So the present US president is keen on that, but the next one, if it is Donald Trump, will not get anything. And the money from the advanced countries among developed countries, they say we will provide funds bilaterally, like China, but this is a part of the political game. So China is putting money in the African countries. India is still keen to collect money from the global level. So is Egypt Turkey and many other countries. So I would agree the balanced distribution of climate change money is not happening in a balanced manner, is not reaching the most vulnerable countries, and depends on the capacity of the country to extract money. But also globally they have certain rules, OK, we will give the island countries this amount of money, low line delta countries this amount. So it would help if you were up to date. Some of these officers in ERD were quite up-to-date. But I recently found that they are transferred within six months or one year. So that's another problem. You can build capacity by training a person, he is trained within three months, and he is transferred.

Q4. Building Alliances: What strategies can be employed to build alliances with other vulnerable countries or regions to present a united front for increased funding allocation from the UNFCCC?

Prof Dr.Inul Nishat:

Collaboration and Alliance Partnership. In the global negotiation, there are four major alliances. It's called the Umbrella Group, which includes the USA, Canada, Japan, Russia, New Zealand, etc., So it is that rich countries, in their bloc. All these countries are members of the OECD, a France-based organization. The second group is called the European Union. The third group is called the Environmental Integrity Group. Some so-called neutral countries like Switzerland, Norway, South Korea, Monaco, and Liechtenstein. So Sweden is part of the Umbrella Group. So this is the Integrity Group. And the fourth one is called G77 and China. So we belong to G77 and China. Under G77, there are several eight or ten subgroups. So we belong to the LDC Group. The most powerful group possibly would be the small island states.

Africa Group is very strong. And there are alliances outside the negotiating blocs. One group is called the Kartegana Group, led by West Germany or Germany, no longer West Germany. And another powerful group is called the Basic Countries. Brazil, South Africa, India, and China. You insert R, Russia, in Basic, it becomes Brazil, BA, South Africa, India, and China. If you insert R, it becomes BRICS. So Bangladesh is trying to become a member of BRICS and Basic Countries. Bangladesh is a member of the Kartegana Alliance, which is a combination group. So we are already in various types of alliances. The problem is, to collect funds, you have to operate individually. President Mitterrand of France visited Dhaka recently. And he advised the government to concentrate on adaptation. Mitigation is not your baby. But unfortunately, mitigation is the baby of all the bilateral donors. So they push all their recipients of funds, go for mitigation, go for mitigation. We produce less than half a percent of the global emissions. So even if we become zero, it will not change the global scenario. And Mitterrand said the second thing, it's not Mitterrand, sorry, Macro. Macro said to concentrate on adaptation, concentrate on biodiversity. When Bangladesh said we need money, and funds, Macro said, okay, we will have a separate fund, one billion euro. It will be signed any day. It is almost ready. So funds are coming. We must focus exactly where we should pay attention. Now let me go serially, okay?

Q4: What is global stocktaking?

Prof. Dr. Ainun Nishat:

I said earlier the world in 2007 agreed there should be global targets. The target for mitigation has been fixed at 1.5 in 2015 through the Paris Agreement, but no target for adaptation has been fixed as of today. What sort of

rainfall shedding concept? What sort of heat hot weather should be ready for? So each country is sovereign and there are 198 parties, why parties? The entities who are allowed to comment or vote in the UNFCCC are called parties, like Palestine is a party though it is not a sovereign state, like the European Union is a party. Still, it is not a government. So in that way, we have about 198 parties. I think a total number of parties possibly, the total number of sovereign countries think 192, but 198 parties in climate change and that is a sovereign country or state. So you can request them, please tell me what you are going to do in the form of mitigation. So they gave the first report in 2015, which scientists calculated, was not adequate. They said okay revise your statement, we have done that in 2021-22. So you submit your plan every year with a 5-year projection with a 10-year target.

So in 2015 we projected for 2020 but calculated up to 25. So in 20, we calculated up to 2030 but it will be evaluated in 25. So in 25 we will submit for 35 but check in 2030. So this checking is called stock taking. So one would calculate what you are doing, and how much you are committing. So present state is the total greenhouse gases, the volume should be around 40-42 gigatons. But the way the NDC documents have been produced, they exceed 60 gigatons, sorry not 200, 40 gigatons and it exceeds 60 gigatons. So what it is saying is, please increase your ambition and in 2025 they will do a GST, global stock-taking. Similarly, there will be stock-taking on adaptation, there will be stock-taking on finance. So those 8 building blocks, are called GST. So this is a part of the Paris Agreement. So in COP, we check how far we have materialized the COP of the Paris Agreement's decision. So this is GST on mitigation. Similarly, on adaptation, there will be GST but the target for adaptation has not been fixed. So the procedure for finalizing the goal of adaptation will be finalized in 2030. So maybe around 2035, the world would be able to say are we prepared or not prepared? Similarly, in finance, there would be stock-taking. You are supposed to pay this much, you have not paid. There would be similarly, there would be stock-taking on capacity building and capacity building. But stock-taking means that you cannot say you have to reduce by 10%. So they ask Bangladesh how much you are going to reduce. Can it be performance-based? We promise and it is a 10-year rotation with 5-year checking. So that means performance-based, yes. In 2015 Bangladesh said what it would do, what its target for 2025 is, and what is their goal up to 2020. So in 2021, they produced another one, 2030, but verify it at 2025. Benchmarking sir? Well below 1.5 degrees in terms of temperature output. But the global benchmark was 2030 for 1.5 degrees. In 2023 1.5 has exceeded. So we have failed to keep our promises. And 2 degrees Celsius was the target for 2050. 2 degrees means food grain production will go up. And projection is that we will not be able to keep our limits at 2 degrees. Earlier it was 4 degrees, now it is 3.7. So the graph is like this and then it will come down. So this is 1.5. Average. But it will cross and go up a lot. If the earth can go down. This is a 100-year target. In 100 years our average will be 1.5 degrees Celsius. No, we will not let it go above 1.5 degrees. If it goes up, it will be a big problem. If it goes up, we will not let it go above 2 degrees. So the food grain production will be half, it will be above 2 degrees.

Sir, it will not be like this when the thief enters the house and says, see a little more, see a little more. Can anyone go out like this? I can say 2 degrees, but he can go out a lot. I live in this house. The thing is that we are not able to do it. Now the problem is that the 17 goals of sustainable development, their number is 20. Now it is being said that we must ensure food security and poverty. If we go to eradicate poverty, create employment, and do food security, then we cannot do this pressure mitigation. India and China are saying that brother, there is still a lot of poverty in our country, do not force us, we will eradicate poverty first. The target was in 2050, well below 2 degrees. Now they are trying to cover it in 2070-2080. If my graph starts falling in 2070 or 2080, by that time it will go down to 3 degrees above 2 degrees. And if it goes down to 3 degrees, what will happen? Sir, I have another relevant question from the perspective of our country.

Suppose our rice production is hampered, by sudden rainfall, high rainfall, or sudden seawater surge, then what will happen to our rice? Will we be able to claim a loss and damage fund for that? You are talking about loss and damage? Yes, sir. I have said a lot of things, but it is clear to me because I am sitting in a negotiation. Yes, sir. But other people will take the blame. Yes, sir. Because in negotiations, there is no time to flip the paper. No, sir. I have said a lot of things, sir. The issue is, in 1990, the scientists said, start making arrangements quickly, if we cannot prove it. They proved it in 2007. 2007. Finally, they proved it in 2015.

Q5: Who will give insurance about climate change?**Prof. Dr. Ainun Nishat:**

First of all, we have to give insurance. And we have to tell other countries, this happened because of you. Since 1990.

Reparation. It didn't happen because of us, it happened because of you. This was discussed in the UNFCCC. But other countries don't let us say anything. How old is it? How old is it for us? We don't want forgiveness. We don't want forgiveness. So, from 1990 to 2010. They didn't let us say anything. In 2010, they said that the loss and damage had to be accounted for. In 2011, they didn't let us say anything. In 2012, they agreed. We said it's okay. We don't want any compensation from you. We don't want your forgiveness. We don't want your forgiveness. I don't want it, and I don't want insurance either. This was in 2010, 2011 and 2012. In 2013, it was said that we have to do a definition theory. We have to calculate it. That our loss is due to climate change. For example, if the dam breaks in Bhola today, the height of the dam is 15 feet. The water level is 10 feet. If it breaks, I don't maintain it. They say that there will be no loss or damage. You can't adapt. If there is a drought, if the water level is 20 feet, then your loss and damage will be felt. Can you redefine this definition? Now, this topic has become so emotional. In 2012, the meeting was held in Doha. In Doha, they said that they were worried. After that, the meeting was held in Warsaw. A committee called Warsaw International Mechanism was formed to further work on this. After that, many meetings were held. The first meeting was held in San Diego. It was held in 2012. It was said that the loss and damage had to be started immediately. At the Dubai meeting, Sultan Al Zowar Sahib, a very intelligent and knowledgeable person, said that the meeting would take 12 days 5 days, 2 days, Saturday and Sunday, and 5 days, 12 days. At the end of the 12 days, the decision was made. At first, he said that he would give 100 million dollars. The loss and damage was sudden. He gave 750 million dollars. Million dollars. Not a billion dollars. 100 billion dollars. The 100 billion was lost. Dubai was, in my view, cleverly silenced us. There is another story in 1992. It is called the Response Mechanism are talking about mitigating. We have to reduce the amount of petrol. Fossil fuel.

At the same time, Saudi Arabia's leadership in the Arab world said that if we do this, we will reduce the amount of petrol. If it is reduced, we will become poor. We will have to be compensated. And they did it. Saudi Arabia's negotiation capacity is very, very high. When the girls do not have a floor... The girls? Yes. I was the chairman of the technical committee called the Nairobi Ward Program. The chairman had a problem. I gave him 2-3 minutes. But if he did not stop within half an hour, there was no way. A Saudi woman, a dangerous woman, said something in English. I asked her slowly. She said she was sent to America when she was a child. She was sent to America after completing her education. Yes, after completing her education, she went for special training. At that time, this was called the Response Mechanism. Every meeting was separate from this. They said, what will happen to us? The reason why the world has collectively encouraged them is that our solution is tourism.

In 5 years, Saudi Arabia will be a major tourism country. This is the world's idea. In the desert, they are surrounded by hotels.

Q6: How to climate change affect food security?**Prof. Dr. Ainun Nishat:**

Climate change is not a linear phenomenon. It may start raining ahead of the rainy season or there may not be any rain and it may happen before that. The best example is 2017. Bangladesh March, end of March, and beginning of April. So huge amount of rice paddy was destroyed in Sylhet and Shunem Goonj, Etro Kona, and Kishore Gaon. And then we had heavy rainfall at the month of end of September and October which resulted in the loss of almond crops. The previous one was a borrowed crop and we had to import a huge amount of food. So 2017, 18, 19, 20, 21, and 22 every year we are importing food because of the irregularity of the flooding and no rainfall which is drought.

Q7. Sir, I have a question, a sub-seminar question here. Can we claim here loss and damage fund for this past year?

Prof. Dr. Ainun Nishat:

Good question, I will answer that later on. So, the point is, we must, is not, let me rephrase. At one time at BUET, I used to teach hydrology. And I used to say, collect 30 years of data and project it because the past is an indicator of the future. But now I say the past is no longer an indicator of the future. It is erratic. So the past-previous line is like this based on the return period. Now it can go any way. Erratic. So we have to generate the worst condition and design for it. But we must have a solid database of what is happening. condition and design for it. But definitely, we must have a solid database of what is happening. As I said, severe storm surges may happen at times.

Q8. How to write a proposal for fund allocation?

Prof. Dr. Ainun Nishat:

At BRAC University, with the Planning Commission's support and guidance, we are now operating training courses on how to write a proposal to get the funds. We do not know how to write a proposal. It needs three thick documents, about 16-17 annexures, and it requires consultation. The world is now using some buzzwords like the implementation should be locally led or in other words local people should be involved. So there are a few other conditions I am going to explain as soon as I can do it. And what is the typical process for applying for and securing the fund other conditions I am going to explain as soon as I can do it. And what is the typical process for applying for and securing the fund?

Q9. Local Research and climate change matters concerning Bangladesh

Prof. Dr. Ainun Nishat:

Okay, two questions, two points. Number one, yes, there are a lot of things that can be adopted, a DOPTED. There are a lot of things that cannot be adopted. As, we need five varieties of cultivars, rice or wheat or whatever it is. Number one is submergence tolerance. Any time there could be a flood. And more important for the charred lands and the low-lying areas. You go to the Vikrampur area and charred lands. Number two, drought drought-prone areas. Long no rainfall. Number three, salinity tolerant. So, flood tolerant, drought tolerant, submergence tolerant, and shorter duration so that the exposure And the fifth is heat tolerant. Now Nigeria has a variety of rice called Noriyaka or something, anyway, said the Nigerian variety, where the heat is very high on the equator. And one of our agriculture ministers purchased some rice from Norway and brought it to Bangladesh. And it didn't work. That variety is heat tolerant, but the microclimate is different. Salt tolerant variety, currently our research organizations BINA, Bangladesh Nuclear Agriculture, Institute of Nuclear Agriculture, and BD have produced 7-8 PPT varieties of rice. But in Shatkira, Shyamnagar, and Paigacha, okay, in that area salinity right today would be about 12 to 15 ppt. So even that variety would not work because that is valid up to 7. So the government is now giving funds to research organizations. Dhaka University, we have given 10 crore. I am a member of the trustee board. Chittor University another 7 crores, BD and Bari. So whenever they apply to Chittor University another 7 crore, BD and Bari. So whenever they apply for funds we just give it. So research has to be supported.

Q10: How to write a proposal for climate found collection

Prof. Dr. Ainun Nishat:

Okay. I currently work for BRAC University and there I also have the opportunity to talk to BRAC, the main NGO. As a part of BRAC University, I head a research organization called Center for Climate Change and Environmental Research. And we are running lots of courses to build capacity and we can apply for funding. So through call, we have developed a proposal for private sector organizations. So we have the capacity. BRAC is also doing a lot of pilot activity and this information and knowledge are available. BRAC as an organization

always works with the government, for example, they have just set up climate adaptation clinics to support the agriculturalists all over the country. So yes, BRAC is working on the research center with the BRAC University we are working on and many of the implementational roadmaps that are being developed by my organization.

Q11: And they must contribute more. That is why we see every year in the G7 meeting and G20 meeting. Climate change is a major consideration

Prof. Dr. Ainun Nishat:

That is, one mechanism is called the transfer of technology. For example in a windmill, the current global requirement is minimum technology is five meters per second. 5.5 meters per second. We don't have that kind of velocity normally. But I am told a breakthrough has happened. And now you need three meters per second. So we need that technology. And then from Shapuri dev intact up to Satkhira, we can have thousands of windmills. The solar panels that we use are not the most advanced ones. I am pushing for a solar home solar cooker. So if it is reflector type, and if you can reflect through a concave convex. I think it all is doing. It calls is doing. So you can concentrate the solar power at the central point. And you can use it. You can boil water, cook rice, or fry your fish. That technology is available, but we must bring it to Bangladesh very soon. Maybe it is initially a little bit expensive

Q12: What will take initiative in BD Government regarding climate change found a collection from First Worlds or Climate found

Prof. Dr. Ainun Nishat:

Calculated from three sides. Even the General Assembly calculated us government IPCC process. They produce a certain number even if triple c produced the number UK. Nicholas Stern, I think was also involved in global. In other words, from every corner, they said we need about a hundred billion dollars every year. That kind of money is not going to be available readily. A new source of money is also being demanded which is called loss and damage fund. In last December 2023 2023, about \$750 million were committed. Million dollars not billion dollars under loss and damage. So, I am not very hopeful the amount of funding will be increased soon. My humble request to my government would be that if we make all our projects climate-responsive, climate is not going to happen independently. Whatever we are doing now, climate change would add the problem or dimension of the solution. Let me give a simple example. We have a rainwater pipe from the roof. The rainwater will be collected and it will go downstream. Stormwater management. Usually, we use a three-inch diameter pipe. I started advising using an inch diameter because the runoff would be higher. Do you get my point? Yes sir. You have a. In monsoon, we have the crop. In winter we have a crop. Both are designed for irrigation and flood control. But rainfall may be erratic. I am now advising in each plot you must have a drain on all sides so the water can get accumulated over there. Like a ring line. Or you can have it one on one side. And farmers are already doing it on their own.

Q13: What advice would you give to countries or organizations looking to tap into climate funds to support their mitigation and adaptation efforts?

Prof. Dr. Ainun Nishat:

The world is demanding that accountability and transparency must be ensured. For that, they are putting us in seven conditions. The project must be transparent.

The project must be accountable. The financial side must be inclusive. It must involve private and public partnership involvement of private sector four. Fifth is m, 6th is r, and 7th is V. M for monitoring. R is reporting, and v is verification. So they demand that we must provide data in a given format, given by the world, reported in that format, and they would send an independent party to monetize. So these are the seven conditions. Do you have the capacity to fulfill their monitoring requirement? The answer is no. Are we ready to allow the foreign

experts to come and verify whether we have done the right thing? The answer is still not there. So this is a major area where we are facing problems. I am arguing with the government that you have to pay attention to transparency and accountability.

Q14: Building Alliances: What strategies can be employed to build alliances with other vulnerable countries or regions to present a united front for increased funding allocation from the UNFCCC?

Prof. Dr. Ainun Nishat:

Paris Agreement is under UNF triple C, but most of the actions would be changed under the Paris Agreement. So effective communication is a very important need. Local people must understand what sort of disaster we are going to face and the policy makers must understand. But the UNFCCC decisions are taken through COP. So the COP decisions and IPCC decisions are all available and lots of training programs are going on. But I think the state should take responsibility. I have been involved in the training of journalists and training of the youth and still people are doubtful. It's happening so quickly, that people are not sure about it.

Q15. What strategies can we use to effectively communicate our needs and proposed projects to key stakeholders within the UNFCCC framework, including developed nations?

Prof. Dr. Ainun Nishat:

We should be aware of two questions here. Number one is the way we have designed the Climate Change Trust fund which will be operational hopefully within two months. The world once is fond of an interesting phenomenon which is co-financing. You put a hundred crore and they are ready to put 500 crore. So it is always a financing mechanism like we approach the British government, give us \$10 million, and utilizing that \$10 million we can develop a good proposal and get \$500 million from the Green Fund. I believe this co-financing approach should be taken and Bangladesh has its own money. But my next point is any development project we undertake must be climate change sensitive. For example, we are building a bridge. You should take into account the climatic parameters. If you ask me, has it been practiced? Of course, in Padma Bridge, we have taken future climate change impacts and arranged for that next question.

Q16. Can showcasing past successes in climate change mitigation or adaptation efforts within our region/country strengthen our case for increased funding allocation?

Prof. Dr. Ainun Nishat:

A fair and balanced distribution of the finance. Interesting question, a very correct question. In the NAB document which talks about the national adaptation plan, we have identified 14 hazards and eleven most vulnerable areas like Shunammganj area flash floods like Natore and Sriracha, Chalonbil area late monsoons floods like Naogaon and Chapai Novabgonj and Jaipur hut drought In like Monshigan Dharangan In monsoon In flood like the coastal belt high salinity so the which is the most vulnerable area and who should be prioritized for funds have already been identified by the government.

Q17. How can we ensure transparency and accountability in our proposed project plans to build trust with the UNFCCC and potential donors regarding the responsible use of allocated funds?

Pr Prof. Dr. Ainun Nishat:

How the national capacity must be built and expertise. The point is that most of many of the bilateral donors like Defeat and USAID and also multilateral donors like ADB or World Bank have already given lots of money to the government to build capacity and expertise. Many training courses have been run over the last ten years. I have attended at least 20 of them and these training programs are organized in the resorts outside Dhaka, in Gazipur or Sheraton Sonar, Gaon, or Interconnect and I have the privilege of having lunch or dinner in all these 20 places after delivering the lecture. But I don't think the expertise has been developed properly. But the point is most of

the public sector organizations are aware that climate change should be factorized in their planning process. The last lecture I gave was before the private-public partnership that secretariat so all their officers were alerted. This opportunity exists to build national capacity and expertise. Work has started but it will take a few more years.

Q18. What are some key considerations for designing a mitigation or adaptation project that is competitive for climate finance?

Prof. Dr. Ainun Nishat:

Designing a mitigation or adaptation project that is competitive for climate change science. The world has given certain guidelines or hints like one is called ecosystems-based adaptation, one is called nature-based solution, and one is called locally laid adaptation. It must be done holistically. The project must focus on the needs of the youth or sensitize them. It must be gender sensitive. It must have proper monitoring, and baseline setup so we know the factors and consultants are available. However inter-ministerial coordination in Bangladesh is very poor. Who is going to suppose we want to build a culvert, a series of culverts? Who will plan it? LGD local government, roads, and highways, district municipality, Mayor Sophie's so we have all kinds of problems. Food security. Who is going to handle it? Food ministry. The food ministry is busy importing food. Grass disaster management ministry. They are very much interested. Environment ministry. Not their cup of tea. Prime Minister's office no. So we have a lot of things to be done at the operational level so that the mitigation and adaptation projects are done matching the requirement of the GCF.

Unlocking Connectivity: The Transformative Potential of Satellite IoT in a Hyper-connected World

Engr. H M Moinul Islam

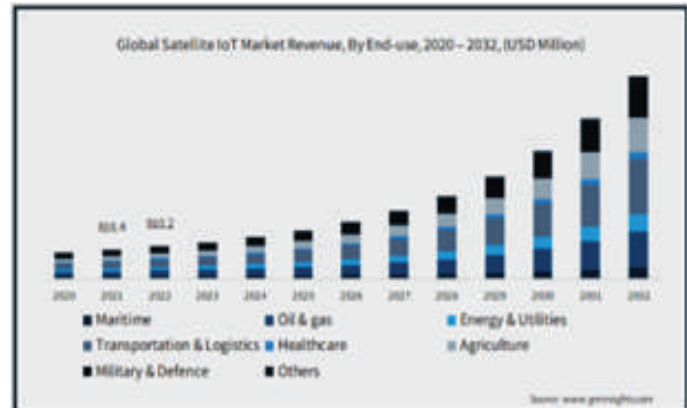
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Introduction

Satellite IoT, or Satellite Internet of Things, refers to the use of satellite networks to enable connectivity and communication for Internet of Things (IoT) devices in areas where traditional terrestrial networks are unavailable

or impractical. This technology extends the reach of IoT applications to remote, isolated, or mobile environments, facilitating the seamless transmission of data between IoT devices and central management systems.

The global Satellite IoT Market is anticipated to be USD 10.2 billion by 2033. It is estimated to record a steady CAGR of 20.8% in the Forecast period 2024 to 2033. It is likely to total USD 1.9 billion in 2024.



Satellite IoT Benefits Over Cellular Network:

Satellite IoT offers several key benefits when compared to traditional cellular networks, particularly in scenarios where cellular coverage is limited or unavailable. Here are the primary advantages of Satellite IoT over cellular networks:

- Global Coverage:** Satellite IoT provides truly global coverage, reaching remote or isolated areas where cellular networks may not be available or cost-prohibitive to deploy. This enables seamless connectivity for IoT devices in regions such as oceans, deserts, and polar areas.
- Ubiquitous Connectivity:** Satellite IoT ensures ubiquitous connectivity, irrespective of geographic location, making it suitable for applications that require continuous monitoring and data transmission in areas beyond the reach of cellular networks.
- Resilience and Reliability:** Satellite IoT networks are inherently resilient to natural disasters, network congestion, and infrastructure failures that can disrupt cellular connectivity. This makes satellite IoT a robust choice for mission-critical applications, emergency response, and disaster recovery.
- Low-Power Device Support:** Satellite IoT solutions are designed to support low-power IoT devices, enabling efficient and long-term operation without the need for frequent battery replacements or recharging. This is particularly advantageous for remote and off-grid deployments.
- Scalability:** Satellite IoT offers scalable connectivity solutions without the need for extensive terrestrial infrastructure. This scalability is especially beneficial for rapidly deploying IoT devices in remote or temporary locations, such as during disaster recovery efforts or scientific expeditions.
- Security and Privacy:** Satellite IoT can provide enhanced security and privacy for data transmission, as it reduces the risk of interception or unauthorized access compared to some conventional cellular networks.
- Rapid Deployment:** Satellite IoT networks can be rapidly deployed, allowing for quick establishment of connectivity in new or remote locations without the need for extensive groundwork or infrastructure development.
- Long-Term Cost-Efficiency:** In certain remote or low-population areas, the long-term cost of deploying and maintaining a satellite IoT network can be more economical than extending cellular coverage to these

regions.

While cellular networks excel in densely populated areas with established infrastructure, Satellite IoT is uniquely positioned to provide connectivity and data transmission capabilities in remote, challenging, or underserved environments, making it an indispensable technology for a wide range of applications across industries.

Satellite IoT Service Providers:

Several companies provide satellite IoT services, offering connectivity solutions tailored to various industries and applications. Some notable satellite IoT service providers are Iridium, Inmarsat, Globalstar, ORBCOMM, Thuraya, Astrocast and some of the Nanosatellite and Microsatellite Operators like Swarm Technologies (SpaceX), Kepler Communications, Wyld, Fleet Space Technologies etc.

These are just a few examples of satellite IoT service providers. When choosing a satellite IoT service provider, organizations should consider factors such as coverage, reliability, scalability, cost-effectiveness, and compatibility with their specific use cases and requirements.

Sensors for Data Gathering on Sat IoT Platform:

When selecting sensors for a Satellite IoT application, it's essential to consider factors such as the specific requirements of your use case, the environmental conditions in which the sensors will operate, power consumption, data transmission requirements, and compatibility with the satellite communication technology being used. Here are some commonly used sensors for Satellite IoT applications:

- Environmental Sensors - Temperature Sensors, Humidity Sensors, Pressure Sensors, Gas Sensors
- Geolocation Sensors - GPS Modules and GNSS Module (GLONASS, Galileo, or BeiDou)
- Motion and Vibration Sensors – Accelerometers, Gyroscopes, Seismic Sensors
- Fluid Flow and Level Sensors - Flow Meters, Ultrasonic Level Sensors
- Optical Sensors - Photovoltaic Cells, Light Sensors, Camera Modules
- Electrical Sensors - Current Sensors, Voltage Sensors, Power Monitors
- Biometric Sensors - Heart Rate Monitors, Temperature Sensors
- Chemical Sensors - pH Sensors, Dissolved Oxygen Sensors, Chemical Gas Sensors
- Miscellaneous Sensors - Proximity Sensors, Weight Sensors

Depend on the application, it's crucial to choose sensors that are energy-efficient, rugged, and capable of operating in harsh environmental conditions. Additionally, ensure that the sensors are compatible with the communication protocols and data formats supported by the satellite communication technology being used.

Use Cases of Satellite IoT:

Satellite IoT technology has a wide range of use cases across various industries and applications. Here are some notable examples:

- Environmental monitoring and conservation efforts
- Asset tracking and management in remote or inaccessible areas
- Precision agriculture for monitoring and optimizing crop growth
- Maritime and aviation tracking and safety applications
- Emergency and disaster response communications
- Remote industrial infrastructure monitoring and control
- Connected vehicle and transportation systems for fleet management

- Remote monitoring of infrastructure such as pipelines and utilities
- Wildlife tracking and conservation efforts
- Global supply chain monitoring and logistics

Satellite IoT Application in The WATER, OIL, and GAS Transmission Sectors?

Satellite IoT technology can help improve the efficiency, reliability, and safety of water, oil, and gas transmission systems. Here's how Satellite IoT is applied in these sectors:

- **Remote Monitoring and Control:** Satellite IoT enables real-time monitoring of water, oil, and gas transmission infrastructure, including pipelines, pumping stations, storage tanks, and treatment facilities. IoT sensors deployed along these assets collect data on parameters such as flow rates, pressure, temperature, water quality, oil levels, gas flow, and leak detection. This data is transmitted via satellite communication to centralized control centers, allowing operators to monitor system performance, detect anomalies, and respond to issues promptly, even in remote or inaccessible areas.
- **Leak Detection and Prevention:** Satellite IoT plays a crucial role in leak detection and prevention in water, oil, and gas distribution networks. IoT sensors installed along pipelines detect changes in pressure, flow rates, or chemical composition that may indicate leaks or abnormalities. Satellite communication enables rapid transmission of this data to operators, facilitating early detection and response to leaks, minimizing resource loss, and preventing environmental contamination or safety hazards.
- **Asset Tracking and Management:** Satellite IoT facilitates asset tracking and management in water, oil, and gas transmission systems. GPS-enabled IoT devices installed on equipment such as valves, meters, tanks, and drilling rigs transmit location data via satellite, enabling utilities and oil companies to track the movement of assets, optimize maintenance schedules, and ensure regulatory compliance.
- **Environmental Monitoring:** Satellite IoT efficiently enables environmental monitoring along water, oil, and gas transmission lines. IoT sensors collect data on water quality parameters such as pH, turbidity, dissolved oxygen, temperature, oil spill detection, gas emissions, and pollutants. This data is transmitted via satellite communication for analysis, enabling utilities and oil companies to assess environmental impact, ensure regulatory compliance, and implement corrective measures as needed.
- **Emergency Response and Disaster Recovery:** Satellite IoT provides essential communication capabilities for emergency response and disaster recovery in water, oil, and gas transmission networks. In the event of emergencies such as pipeline ruptures, oil spills, or natural disasters, satellite-enabled IoT devices enable operators and emergency responders to maintain communication and coordination, facilitating rapid response, containment of hazards, and restoration of services.
- **Regulatory Compliance and Reporting:** Satellite IoT helps utilities and oil companies meet regulatory requirements and reporting obligations related to water, oil, and gas transmission operations. By providing real-time monitoring data and historical records via satellite communication, organizations can demonstrate compliance with environmental regulations, safety standards, and quality control measures, ensuring transparency and accountability.

Overall, Satellite IoT enhances the resilience, efficiency, and sustainability of water, oil, and gas transmission and distribution networks by providing real-time monitoring, leak detection, asset tracking, environmental monitoring, emergency response, and regulatory compliance capabilities. As organizations continue to adopt and integrate Satellite IoT technologies into their operations, they can improve operational performance, minimize environmental impact, and ensure the safe and efficient transportation of essential resources to communities and industries.

Satellite IoT Drawbacks:

Satellite IoT, while offering numerous benefits, also presents certain disadvantages, including

- **Latency:** Satellite communications can introduce latency due to the distance that signals need to travel between Earth and the satellite, impacting real-time applications that require instant responsiveness.
- **Cost:** Satellite IoT solutions can involve higher upfront costs for equipment and services compared to terrestrial options, potentially making them less cost-effective for certain use cases.
- **Limited Bandwidth:** Satellite networks may have limited bandwidth compared to terrestrial networks, which can impact the volume of data that can be transmitted at a given time, potentially affecting applications with high data requirements.
- **Signal Interference:** Environmental factors such as weather conditions or physical obstructions can interfere with satellite signals, leading to potential disruptions in connectivity.
- **Power Consumption:** Satellite communication devices, particularly those that need to transmit signals over long distances, may require relatively higher power consumption, which can be a challenge for battery-powered IoT devices.
- **Hardware Limitations:** Satellite communication hardware may have limitations in terms of size, weight, and form factor, making integration with IoT devices challenging and restricting interoperability between different satellite networks.
- **Regulatory and Compliance Considerations:** Satellite communication services are subject to regulatory and licensing requirements, which can vary across different regions and may add complexity to deployment and operation.

Understanding these disadvantages is crucial for stakeholders to make informed decisions when considering Satellite IoT, enabling them to address potential challenges and maximize the technology's benefits.

Conclusion:

The emergence of Satellite IoT technology marks a significant milestone in the realm of connectivity, offering a solution to bridge gaps in communication infrastructure across the globe. By leveraging satellite communication infrastructure, Satellite IoT enables ubiquitous connectivity for IoT devices, regardless of geographic location or terrain. This technology opens doors to a countless of applications, from remote asset tracking and environmental monitoring to disaster response and infrastructure management. Despite its numerous benefits, Satellite IoT faces challenges such as cost, latency, limited bandwidth, and regulatory compliance. However, with advancements in satellite technology and collaborative efforts among stakeholders, Satellite IoT holds immense potential to revolutionize connectivity and enable innovative solutions for addressing societal challenges on a global scale.

Professor Dr. Saleemul Huq: Pioneering the Path to Climate Justice and Climate Resilience for Sustainable Future

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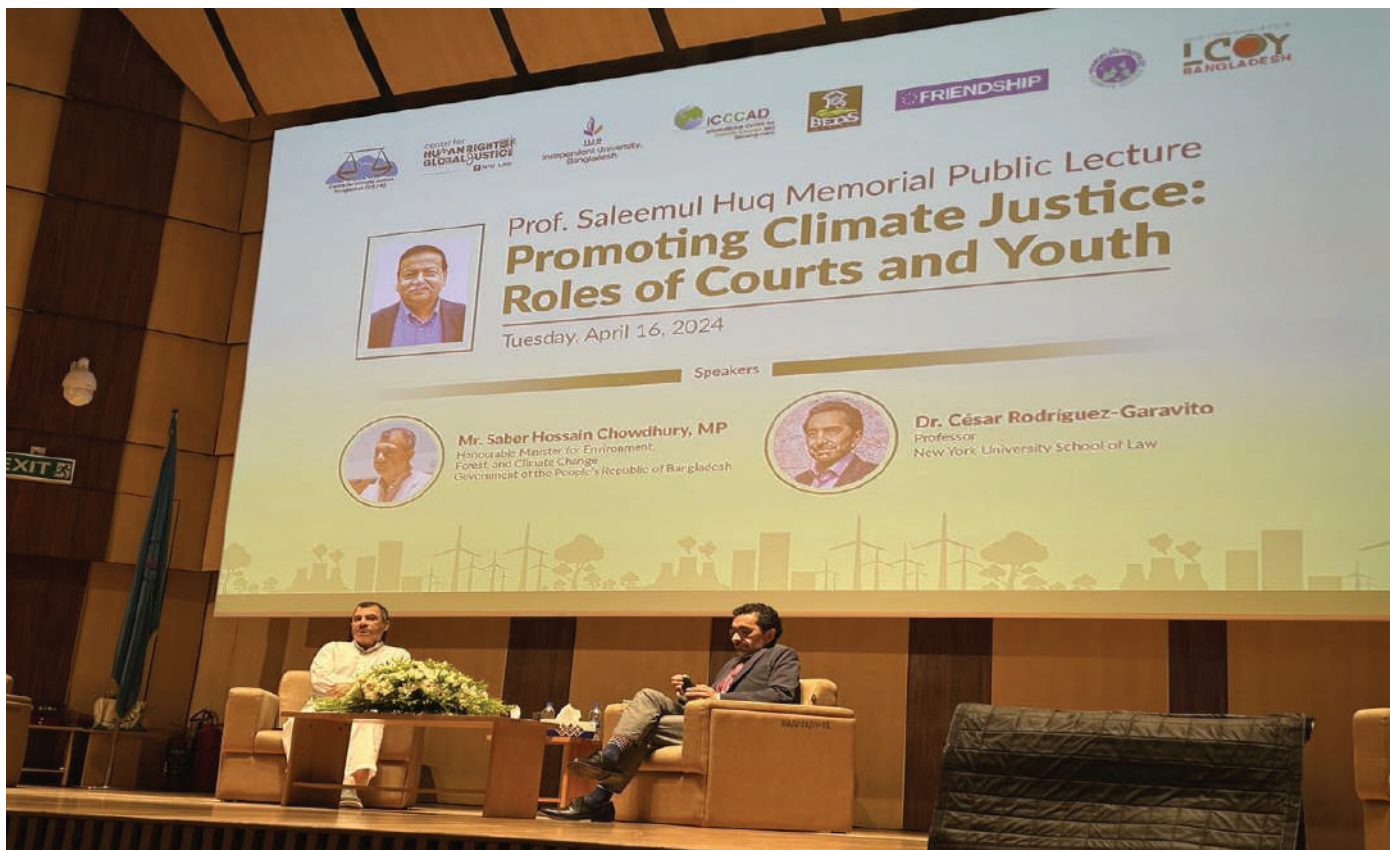


Professor Saleemul Huq (2 October 1952 – 28 October 2023) was a prominent Bangladeshi climate expert, scientist and a leading advocate for promoting climate justice. He was the Director of the International Centre for Climate Change & Development (ICCCAD) based in Bangladesh, also a Professor at Independent University, Bangladesh (IUB). In 2022, he was chosen as one of Nature's 10 (ten) best scientists. He has been instrumental in developing a "Climate Generation" to address climate change during the last thirty years, not just in Bangladesh but globally as well. Academics, researchers, students, young people, parents, climate negotiators, policymakers, NGOs, UN agencies, and development partners make up this growing generation. His passing signifies a loss for their ongoing endeavours'.

This tribute celebrates the remarkable contributions of Prof. Huq as a titan in the field of promoting climate justice and climate resilience for sustainable future, especially for developing and vulnerable nations. His extensive scholarship, advocacy, and leadership have played a pivotal role in advancing the cause of climate justice on the global stage. Through his tireless efforts, he has raised awareness about the disproportionate impacts of climate change on vulnerable communities and championed solutions that prioritize equity and fairness. This is a cordial attempt to make a tribute for his significant achievements, including his pioneering work on adaptation, loss and damage, and capacity-building in developing countries. By honoring his legacy,

this tribute also stressed the urgent need to continue his legacy of promoting climate justice and empowering marginalized communities in the face of the climate crisis.

Center for Climate Justice-Bangladesh (CCJ-B) organized the first Prof. Saleemul Huq Memorial Public Lecture this year on 16 April 2024 at the auditorium of Independent University Bangladesh (IUB) in partnership with Department of Law (IUB), NYU Center for Human Rights and Global Justice, International Centre for Climate Change and Development (ICCCAD), Friendship, Bangladesh Environment and Development Society (BEDS) and World's Youth for Climate Justice. The theme of the public lecture was **“Promoting Climate Justice: Roles of Courts and Youth”** The two public lectures were given by well-known climate change specialists from both the national and international arenas. Professor Dr. Cesar Rodriguez- Garavito, a Professor of Clinical Law and Chair of the Center for Human Rights and Global Justice at NYU School of Law, delivered a lecture on the role of litigations in promoting the climate justice. Another talk by Honorable minister, Mr. Saber Hossain Chowdhury, MP, focused on the importance of youth engagement in achieving climate justice and securing a sustainable future for the next generation.



On April 26, 2024, at IUB Auditorium, Dhaka, Bangladesh, Honourable minister Saber Hossain Chowdhury (left), MP, GOB and Dr. Cesar Rodriguez Garavito (right), Professor, NYU law school delivered Prof. Saleemul Huq Memorial Public Lectures organized by Center for Climate Justice-Bangladesh (CCJ-B) and partners.

The concept of Climate Justice has been formulated based on the principles of proportionality and the polluter-pays principle. It stipulates that responsibilities for addressing vulnerabilities, impacts, and responses to climate change should be determined according to historical pollution levels in the atmosphere. Moreover, vulnerable developing countries ought to receive financial, technological, and capacity-building support from polluting countries based on their vulnerabilities. However, the concept of Climate Justice is not adequately reflected in policies and practices. Legal communities across various jurisdictions are making efforts to compel polluters to pay for climate-related loss and damage. Concurrently, youth and children have emerged as crucial stakeholders in the multi-stakeholder governance approach to climate change.

During his talk, Professor Rodríguez-Garavito discussed his interactions and experiences from previous COP sessions with Professor Saleemul Huq. Rights-based climate cases, or litigation grounded on human rights law,

are becoming a more vital instrument for obtaining stronger climate action as the climate emergency worsens. As climate emergency becomes real and more frequent, he stressed the importance of litigations and shared some known climate change cases and litigation outcomes. He discussed the findings of his practice and book “Litigating the Climate Emergency”, as well as the role that courts and youth can play in facing the climate crisis. He emphasized the significance of developing subjects like climate compensation, loss and damages, right to health environment and right based biodiversity and jurisprudence.

Mr. Saber Hossain Chowdhury, MP, currently holds the esteemed position of Minister at the Ministry of Environment, Forest, and Climate Change (MoEFCC), talked about the various stakeholder engagement strategies that may be created and put into practice to guarantee that young people are effectively involved in local, national, regional, and international climate change planning processes. Recalling his personal connection, he talked about his interactions with Professor Saleemul Huq and highlighted his sincerity, commitment, expertise in attribution science, analysis, conviction, vision for climate justice and outstanding ability to convince people. Prof. Huq was someone who inspired the climate generation in Bangladesh, a visionary leader who could see and plan for the future.

Dr. Saleemul Huq is one of the most prominent figures in the history of climate change. A scholar, activist, and advocate, Dr. Huq has dedicated his life's work to understanding, mitigating, and adapting to the impacts of climate change, particularly in the most vulnerable regions of the world. His tireless efforts have not only contributed to scientific understanding but have also catalyzed action on both local and global scales. His journey into the realm of climate change began decades ago, fueled by a deep-seated commitment to social justice and equity. His early work focused on the intersection of climate change, sustainable development, and poverty alleviation, recognizing that the impacts of climate change are disproportionately felt by the most marginalized communities around the world. Through pioneering research and advocacy, he shed light on the urgent need to address the vulnerabilities of these communities and integrate their perspectives into climate policy and decision-making processes.

One of Dr. Huq's most notable contributions is his role in amplifying the voices of the Global South in international climate negotiations. As a leading expert from Bangladesh, a country highly vulnerable to climate change, Dr. Huq has been a staunch advocate for climate justice and equity. He has consistently emphasized the principle of "common but differentiated responsibilities," arguing that developed nations bear a greater burden in addressing climate change due to their historical emissions and greater capacity to act. His advocacy has been instrumental in shaping the discourse around climate equity and ensuring that the concerns of vulnerable nations are given due consideration in global climate agreements.

Beyond his advocacy on the international stage, Dr. Huq has also played a pivotal role in building resilience at the grassroots level. Recognizing that adaptation is essential in the face of inevitable climate impacts, he has championed community-based approaches that empower local stakeholders to identify and implement adaptation strategies tailored to their unique circumstances. Through initiatives such as the International Centre for Climate Change and Development (ICCCAD), he has provided training, support, and guidance to vulnerable communities, equipping them with the tools and knowledge to build resilience and adapt to changing climatic conditions. Moreover, his influence extends far beyond academia and activism. As a mentor and educator, he has inspired countless individuals to pursue careers in climate science, policy, and advocacy. His mentorship has nurtured a new generation of leaders who are committed to addressing the challenges of climate change with compassion, integrity, and innovation.

Dr. Huq's contributions to the field of climate change are unparalleled. His pioneering research, advocacy, and mentorship have shaped the global discourse on climate justice, equity, and resilience. Through his unwavering dedication and leadership, Dr. Huq has not only advanced our understanding of climate change but has also catalyzed action to address its impacts, particularly for the most vulnerable communities. As we confront the existential threat of climate change, Dr. Huq's legacy serves as a beacon of hope and inspiration, guiding us towards a more sustainable and equitable future for all.

Engineering Sustainable Solutions Against Climate Changes in Bangladesh

Md.Ai-Emran Hossain

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Bangladesh is a model of inventiveness and resiliency in the face of rising climatic concerns. As the nation struggles with the many effects of climate change, creating sustainable solutions is being looked to as a ray of hope and a means of achieving resilience. To ensure a resilient future for its people and ecosystems, this article highlights the significant progress Bangladesh is making in the engineering fields to tackle climatic challenges.

Comprehending the Climate Dilemma

Bangladesh, which is surrounded by the powerful Padma, Brahmaputra, and Meghna rivers, is particularly vulnerable to the effects of climate change. Due to its low-lying topography, dense population, and agricultural economy, the nation is especially vulnerable to floods, cyclones, saline intrusion, temperature, and sea level rise. These issues are not only environmental; they also have a significant impact on national growth, food security, and socioeconomic stability. Bangladesh is responding to these effects by using engineering to develop long-term resilience and sustainable solutions.

The following are the salient features of Bangladesh's climate dilemma:

Regional Susceptibility

Low-lying Topography: Approximately one-third of Bangladesh is in danger of sea level rise due to its low-lying terrain. Because of this, it is especially vulnerable to storm surges, floods, and coastal erosion.

Riverine Country: Bangladesh is prone to yearly flooding during the monsoon season due to the abundance of

rivers and their tributaries. This may be advantageous for agriculture when floods do not become destructive, but it can also be a burden.

Socioeconomic Elements

Density of people: Bangladesh has one of the highest densities of people in the world, with a significant portion of its citizens residing in regions like river floodplains and coastal zones that are susceptible to the effects of climate change.

Agriculture Dependency: A sizable section of the population makes their living from agriculture. Climate change directly jeopardizes agricultural output and food security via unpredictable rainfall, floods, and saline intrusion.

Economic Constraints: It is difficult to invest in the infrastructure and technology required to sufficiently mitigate and adapt to the effects of climate change due to a lack of financial resources.

Effects of Climate Change

Greater Frequency and Intensity of Extreme Weather Events: Cyclones, heat waves, and periods of intense rainfall occur more often and with greater severity in Bangladesh. These catastrophes have long-term socioeconomic effects and immediate loss of lives and property.

Sea-Level Rise: Due to rising sea levels, low-lying coastal regions may get inundated, uprooting people, destroying agricultural land, and introducing saline into freshwater supplies.

Modifications to Monsoon Patterns: Modifications to monsoon patterns, including time variations and unequal rainfall distribution, impact agriculture, water supply, and flood control.

Ecosystem and Biodiversity Loss: Changing climatic conditions are putting the nation's distinctive ecosystems, including the Sundarbans mangrove forest, in jeopardy, endangering biodiversity and the livelihoods that rely on them.

Going Ahead: Adaptation and Resilience Techniques

Bangladesh's climate dilemma calls for a comprehensive strategy that includes international assistance and collaboration as well as the integration of mitigation and adaptation to climate change into national development goals. Important tactics consist of:

Building and implementing robust infrastructure, varied farming methods, and sustainable water management systems are ways to strengthen climate resilience.

Community-Based Adaptation: This strategy emphasizes participatory methods while providing local communities with the information, tools, and resources they need to adapt to climate change.

Ecosystem-Based Approaches: preserving and rehabilitating natural ecosystems to capitalize on their capacity to fend off the effects of climate change.

Foreign Collaboration and Support: Using financial assistance, technological transfer, and foreign experience to strengthen Bangladesh's efforts to adapt to climate change.

Water Resource Engineering: An Inundation of New Developments

Bangladesh must effectively manage its water resources due to its deltaic environment. Innovative flood control technologies that save water for dry spells while also guarding against flooding are being developed by engineers. This involves the construction of multipurpose dams that store water, prevent flooding, and generate hydroelectric power. To prevent groundwater depletion and guarantee water supply, community-based rainwater gathering systems are being encouraged. In addition, building raised plinths for houses in high-risk regions for flooding is a simple yet efficient adaptation tactic that greatly lessens the susceptibility of rural populations to floods.

This is a thorough plan to deal with the issues caused by floods, improve readiness, and guarantee public safety and security:

1. Improve Early Warning and Flood Forecasting Systems

Use Advanced Monitoring Technologies: To increase the accuracy of flood predictions, use satellite imaging, remote sensing, and Internet of Things (IoT) devices to track weather patterns, rainfall, and water levels in real time.

Create All-Inclusive Early Warning Systems: Construct an integrated early warning system that uses radio, mobile devices, and community-based networks to notify susceptible groups of impending flooding in a timely and effective manner.

2. Boost Infrastructure Resilience

Flood-resistant development: To reduce damage during floods, encourage the development of flood-resistant structures and infrastructure, such as elevated roadways, flood barriers, and higher dwellings.

Upgrade Drainage Systems: To manage periods of intense rainfall, upgrade urban drainage systems to lower the danger of waterlogging and urban floods.



3. Adopt Water and Land Use Strategies That Are Sustainable

Conservation and restoration of wetlands: These natural sponges absorb excess floodwaters and lessen the intensity of floods. Protect and restore wetlands.

River Basin Management: To lessen runoff and sedimentation, use integrated river basin management techniques that take into account the whole watershed. These methods should encourage sustainable land use, reforestation, and erosion control.

4. Encourage Response and Adaptation from the Community

Develop Community Resilience: Provide the information and tools necessary for nearby communities to anticipate, react to, and recover from floods. Community-based planning, emergency response training, and the formation of volunteer disaster response teams in the area are all included in this.

Encourage climate-smart agriculture: To guarantee food security both during and after flood occurrences, and promote flood-tolerant crop types and floating gardens, among other flood-resistant agricultural techniques.

5. Make Use of Nature-Based Solutions and Green Infrastructure

Green Urban Areas: To improve water penetration and decrease runoff, including permeable pavement, rain gardens, and green roofs in urban areas.

Mangrove Reforestation: Encourage the planting of mangroves in coastal regions to act as a natural barrier against coastal floods and storm surges.

6. Assure Sanitation and Clean Water Availability During Floods

The implementation of Water, Sanitation, and Hygiene (WASH) programs may mitigate the risk of waterborne infections by providing clean drinking water and sanitation facilities during floods.

7. Establishing Policy and Coordinating Institutions

Create and Implement Land Use rules: Implement rules that control land use in regions vulnerable to flooding, restricting construction in high-risk areas and encouraging the preservation of natural floodplains.

Boost Institutional collaboration: To ensure efficient flood management and response operations, establish robust collaboration between government agencies, non-governmental organizations, and foreign partners.

8. Financial Assistance and International Cooperation

Seek International help: To carry out extensive flood prevention and climate adaptation projects, and cooperate with international organizations and donor nations for technical help, knowledge exchange, and financial aid.

Climate funding: Using international climate funding institutions like the Green Climate Fund to invest in flood resilience and climate change adaptation projects.

Developing Resilience via Agricultural Engineering

Bangladesh's agricultural economy is being transformed via agricultural engineering to resist the unpredictable effects of climate change. The development of crop varieties resistant to drought and salt is evidence of the creative use of genetic engineering and biotechnology. Precision farming minimizes the environmental impact of agricultural activities by monitoring crop health and optimizing water consumption via the use of IoT technology and remote sensing. In response to shifting rainfall patterns, engineers are also creating effective irrigation systems and water management techniques that save water and boost agricultural output.

The following important initiatives and technological advancements might assist Bangladesh in building resilience in its agriculture sector:

1. Management of Water Resources

Water Use Efficiency: Use drip and spray irrigation systems, as well as other micro-irrigation techniques, to minimize water use and boost water efficiency. This is particularly crucial in regions that are vulnerable to drought.

Rainwater Harvesting: To lessen the effects of irregular rainfall patterns, develop and promote rainwater harvesting technologies for use in agriculture.

Flood Control and Drainage Systems: During flood occurrences, fields often experience waterlogging and salt intrusion. To avoid these problems, design and build sophisticated drainage systems.

2. Crop Development That Is Climate-Resilient

Drought and Flood-Resistant Varieties: To ensure food security even in the face of unfavorable climatic circumstances, invest in the research and development of crop varieties that are resistant to drought, floods, and salinity.

Precision Agriculture: Make use of satellite imaging, drones, and GPS technology to optimize planting, watering, and harvesting techniques to maximize agricultural yields and minimize waste.

3. Management of Soil Health

Organic Farming Practices: Promote the use of soil-healthy organic farming methods, such as crop rotation, composting, and green manure, to increase soil fertility and structure and lessen erosion and degradation.

Soil Testing and Analysis: Help farmers apply nutrients and fertilizers more accurately, reducing their effect on the environment and enhancing crop health. This may be done by promoting soil testing services.

4. Ecological Control of Insects and Diseases

Integrated Pest Management (IPM): Use IPM techniques to reduce hazards to the environment, economy, and public health by combining biological, cultural, physical, and chemical instruments.

Natural predator populations and biopesticides: To reduce pest populations with the least amount of ecological disturbance possible, promote the use of natural predator populations and biopesticides.



5. After-harvest and Logistics Solutions

Efficient Storage Facilities: Create and spread technology, such as sun dryers and hermetically sealed storage bags, to enhance storage facilities and lower post-harvest losses.

Cold Chain Development: To preserve the quality of perishable items, cut waste, and boost farmer earnings, invest in cold chain infrastructure, such as refrigerated transportation and cold storage facilities.

6. Extension and Education Services for Farmers

Climate Adaptation Training: Make sure farmers have the information and abilities to react to changing climatic circumstances by offering them training on climate adaptation strategies and technology.

Extension Services: To promote best practices, provide technical assistance, and ease the implementation of

cutting-edge agricultural engineering solutions, strengthen agricultural extension services.

7. Investment and Policy Support

Policies and Programs to Encourage Sustainable Techniques: Create policies and initiatives that provide financial support for water-saving irrigation systems or tax exemptions for using renewable energy sources to encourage farmers to embrace resilient and sustainable farming techniques.

Research and Development Funding: Raise funds for agricultural R&D aimed at finding answers to climate change concerns and promoting cooperation amongst academic institutions, research centers, and the agriculture industry.

Green Energy: Energizing the Future

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Coastal Engineering: Protections for the Shoreline

To safeguard coastal areas from natural dangers such as erosion, storm surges, and sea level rise, engineers strategically use ideas and technology known as shoreline safeguards. This entails a range of methods and strategies targeted at strengthening the resilience of coastal regions against the effects of climate change in the context of Bangladesh, a nation with a long and vulnerable coastline.

How Bangladesh's Coastal Engineering Combats Climate Changes:

1. The purpose of embankments, sea walls, and storm surge barriers is to physically prevent saltwater from infiltrating inland regions, hence preventing erosion and floods. Through the integration of contemporary engineering principles and technology, these barriers are strengthened to resist the heightened severity of storms and the elevated sea levels brought about by climate change.



2. **Mangrove Plantation Projects:** Mangroves serve as organic barriers against cyclones and storm surges. These plants' roots aid in preventing erosion and maintaining the shoreline. Natural coastal protection is greatly aided by projects that increase mangrove areas, such as the Sundarbans, the biggest mangrove forest in the world, which is situated in Bangladesh's coastal region. Mangroves also trap carbon, which helps to lessen the consequences of global warming, making this method particularly pertinent in the face of climate change.
3. **Creative Bioengineering Solutions:** Using bioengineering methods to support embankments, including using geotextiles, is a more environmentally friendly way to defend coastal areas. The use of geotextiles may lessen the effects of storm surges by preventing soil erosion and encouraging the development of plants atop embankments, which can absorb wave energy. These ideas are intended to improve the ecological resilience of coastal regions while coexisting peacefully with the environment.
4. **Adaptive Management:** In light of climate change, coastal engineering also incorporates adaptive management techniques. This implies that in light of the most recent scientific findings and climatic projections, coastal defense tactics are constantly updated and adjusted. It guarantees the continued efficacy of coastal protection measures in the face of changing climatic conditions.
5. **Community Involvement and Capacity Building:** An essential component of effective coastal engineering projects is including local people in coastal protection initiatives and strengthening their ability to adapt to risks linked to climate change. This involves participation in mangrove restoration efforts, instruction in maintaining protective structures, and education on the effects of climate change.

Urban Infrastructure: Creating Resilient Cities



The creation of resilient urban infrastructure is essential to reducing the effects of climate change in urban areas due to the growing urbanization of these places. Green construction guidelines are incorporated into sustainable urban planning, encouraging the use of energy-efficient materials and heat-absorbing architectural elements. An approach to urban planning and design known as "water-sensitive urban design" (WSUD) incorporates water cycle management into the process of urban development. It attempts to manage rainfall, wastewater, and drinkable water in a manner that resembles the natural water cycle as closely as possible to reduce environmental degradation and enhance aesthetic and recreational appeal. The three main tenets of WSUD are collecting rainwater for future use, using plants to enhance water quality, and limiting impermeable surfaces to minimize runoff.

Given Bangladesh's distinct potential and constraints, WSUD implementation might be very advantageous in that nation:

1. **Flood Management:** Bangladesh's position on the Ganges, Brahmaputra, and Meghna river delta makes it vulnerable to recurrent floods. By using elements like rain gardens, swales, and permeable pavements that absorb and slow down runoff and lessen the load on drainage systems, WSUD may help reduce the danger of floods.
2. **Enhancement of Water Quality:** Urban runoff has the potential to be highly contaminated by pollutants, fertilizers, and sediments. By using WSUD techniques like biofiltration units and artificial wetlands, runoff water may be organically treated, resulting in better-quality water entering lakes, rivers, and subterranean aquifers.
3. **Groundwater Recharge:** In Bangladesh, excessive groundwater extraction for industrial, agricultural, and drinking purposes is a serious problem that lowers groundwater levels. The focus of WSUD on groundwater infiltration may support groundwater levels and recharging aquifers.
4. **Urban Heat Island Mitigation:** Climate change may make the urban heat island effect—where metropolitan areas are noticeably warmer than their rural surroundings—worse. By increasing green space and plant evapotranspiration, WSUD helps to cool cities.

5. Community Well-Being and Biodiversity: By establishing green spaces, enhancing air quality, and providing habitat for urban animals, WSUD can improve the livability of metropolitan regions. This in turn enhances mental health and contributes to the well-being of the community by providing leisure areas.

The implementation of WSUD in Bangladesh will need thorough preparation and adaptation to local circumstances. Important things to think about would be:

- Local Climate: WSUD systems must be made to effectively manage significant amounts of water due to Bangladesh's monsoon climate and heavy rains.

- Urban Density: Cities with high population densities, like Dhaka, may need to come up with creative ways to include WSUD components in constrained areas.

- Public Awareness and Participation: Encouraging the community, developers, and government agencies to learn about the advantages of WSUD and to become involved in the implementation process is essential to the project's success.

- Policy and Regulation: For WSUD concepts to be widely adopted, policies that support them must be developed and enforced. Examples of such policies include incentives for rainwater collection and requirements for green construction standards.

Imagining a Sustainable Future: Regulation and Execution



The shift to sustainable infrastructure needs all-encompassing policy frameworks that stimulate investment, creativity, and cross-sector cooperation. Through the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), the National Adaptation Programme of Action (NAPA), and the Bangladesh Delta Plan 2100, the government of Bangladesh has made progress in this area. But the real test of these policies will be how well they are implemented, which will need coordinated efforts from the public and commercial sectors, civic society, and foreign allies.

The following are some ways that policy and execution may help Bangladesh become more resilient to climate change and promote sustainable development:

Creation of Policy Frameworks

1. **National Climate Change Strategy:** Create a thorough plan for addressing climate change that is in line with Bangladesh's development objectives and places a strong emphasis on adaptation, resilience, and low-carbon growth. Particular goals for water resource management, sustainable agriculture, urban planning, and renewable energy should all be included in this plan.
2. **Enact legislation enforcing environmental protection, regulating emissions, promoting green technology, and requiring climate risk assessments for new projects to take action against climate change.** Legal frameworks may guarantee long-term commitment to climate objectives and accountability.
3. **Financial Mechanisms for Climate Investment:** Provide grants, subsidies, and tax breaks to encourage the use of renewable energy sources, sustainable practices, and green infrastructure initiatives. Establish a climate fund to support nationwide adaptation and mitigation initiatives.
4. **Integrating Climate Education:** To increase knowledge of the effects of climate change and the value of sustainability from an early age, including climate change education into the national curriculum.

Strategies for Implementation

1. **Creating Climate-Resilient Infrastructure:** Make investments in infrastructure that can withstand the effects of climate change, such as elevated roadways, flood-resistant buildings, and better drainage systems. Infrastructure projects must be grounded on thorough risk assessments and use both conventional wisdom and cutting-edge technical techniques.
2. **Promoting Energy Efficiency and Renewable Energy:** Put in place national initiatives to increase the use of hydroelectric, solar, and wind energy. Promote energy efficiency in all areas by implementing policies and procedures that lower energy use and carbon emissions.
3. **Sustainable Agricultural Practices:** To improve food security and rural livelihoods, encourage the use of climate-smart agricultural techniques such as crop diversity, stress-tolerant crop types, effective water usage, and organic farming methods.
4. **Urban Planning and Green Spaces:** Create green cities with enough green areas, such as parks and community gardens, to reduce flooding and sequester carbon emissions. To control stormwater and lessen urban heat islands, use water-sensitive urban design.
5. **Prioritize the preservation of vital ecosystems, such as wetlands, forests, and mangroves, which are important for sequestering carbon dioxide and providing protection from the effects of climate change.** Take part in extensive repair and replanting initiatives.
6. **Community-Based Adaptation Programs:** Provide local communities with the tools and information they need to put adaptation plans into action. This entails giving communities access to climate-resilient seeds and technology, educating them about sustainable practices, and including them in decision-making processes.

Encouraging Cooperation and Partnerships

1. **International Cooperation:** To exchange information, get funds, and gain access to technology for climate change adaptation and mitigation, fortify alliances with international organizations, non-governmental organizations, and other nations.
2. **Encourage public-private partnerships, or PPPs, to make use of private sector capital and know-how in creating innovative technologies, sustainable infrastructure, and renewable energy initiatives.**
3. **Involve NGOs, neighborhood associations, and the general public in climate action projects to promote civil society engagement.** Participatory methods and public awareness campaigns may guarantee broad support for successful policy implementation.

Furthermore, funding is still a major obstacle. To mobilize the required resources, it is imperative to use international climate financing institutions, encourage private sector investment in green infrastructure, and foster public-private partnerships. Furthermore, encouraging a sustainable culture via community involvement, education, and awareness may energize the public in favor of taking action on climate change.

i. Developing New Building Materials to Increase Thermal Efficiency

Reevaluating construction materials is necessary due to the rising temperatures. Modern construction materials having a high Solar Reflective Index (SRI) are essential for reflecting solar radiation and preserving a lower interior temperature in buildings. By using these materials, the need for air conditioning may be greatly decreased, increasing sustainability and energy efficiency.

ii. Including Cooling Techniques in Building Architecture

To maintain pleasant living conditions, creative cooling techniques are required due to the unrelenting heat and humidity. Green roofs, passive cooling systems, and natural ventilation are architectural features that help reduce heat without using more energy.

iii. Increasing the Efficiency of Electrical Appliance Design

Heat has an impact on electrical equipment longevity and efficiency in addition to human comfort. Appliances made especially for hot and muggy environments are desperately needed. They must be strong and long-lasting to survive the harsh weather.

iv. Putting Heat Stress Management Into Practice at Work

To address the growing issue of heat stress in the workplace, occupational health and safety (OHS) regulations need to change. Workers may avoid heat-related diseases by implementing heat stress management systems, making sure they drink enough water, and shifting their work hours to later hours of the day.

v. Handling the Scarcity of Drinking Water

The shortage of drinking water is made worse by altered rainfall patterns and higher evaporation rates. Despite increased energy and operational expenses, submerged aquatic resources are a feasible approach. To guarantee that everyone has access to drinkable water, cutting-edge water purification technology, and effective distribution networks are essential.

vi. Dietary and Lifestyle Modifications

The effects of climate change go beyond changing food and lifestyle choices. Nutrition and food security will be impacted if dietary choices adjust to the fluctuating availability of food crops due to changing agricultural patterns. This calls for a greater understanding and acceptance of sustainable eating habits and alternate food sources.

vii. Medical Care and Illness Control

Climate change has a significant influence on health, leading to a rise in heat-related disorders and the appearance of new diseases. The burden on the healthcare system demands large expenditures on new drugs, facilities, and research. Bangladesh and other developing nations must undertake the difficult job of providing sufficient resources to address these health issues.

In summary

A glimmer of hope as Bangladesh navigates the choppy seas of climate change is the implementation of sustainable infrastructure plans. Bangladesh can lessen the effects of climate change and create the conditions for a resilient and sustainable future by rethinking its approaches to energy, water management, agriculture, urban growth, coastal protection, and disaster risk management. Although there are many obstacles along the way, Bangladesh has the potential to become a worldwide leader in sustainability and climate resilience if it demonstrates a strong sense of collective will, creativity, and determination.

Innovation Design Can Change the World

Engr. Md. Abdul Hamid

Engr. Md. Abdul Hamid is an innovator, author, and entrepreneur. He studied at BUET in the Chemical Engineering Department. Additionally, he earned a degree in Business Administration from the Institute of Business Administration at Dhaka University. Furthermore, he has completed numerous online leadership courses from Harvard University. He also works as an organizer to transform the society.

Abstract

Innovation design stands as a transformative approach focused on creating new products, services, and processes. This bridges the gap between present circumstances and a better future. This method involves a series of well-defined steps beginning with understanding people's needs. By observing, empathizing with, and interviewing users, designers identify pain points and opportunities for innovation. Next, the process of imagining new solutions utilizes creativity to conceive novel ideas that address these needs effectively. Once ideas are formulated, they are transformed into prototypes for testing and refinement based on user feedback, ensuring they meet real-world requirements. Collaboration is also crucial, bringing together diverse skills and perspectives to enhance the creative process and outcome. Additionally, forward-thinking is encouraged, prompting designers to anticipate future needs and trends which ensures the longevity and relevance of their innovations. Finally, maintaining flexibility and openness to feedback throughout these stages allows for continuous adaptation and improvement, crucial for successful innovation design. This comprehensive approach not only addresses immediate needs but also sets the stage for future advancements, significantly impacting society and improving lives through thoughtful design and execution.

Details of the Article

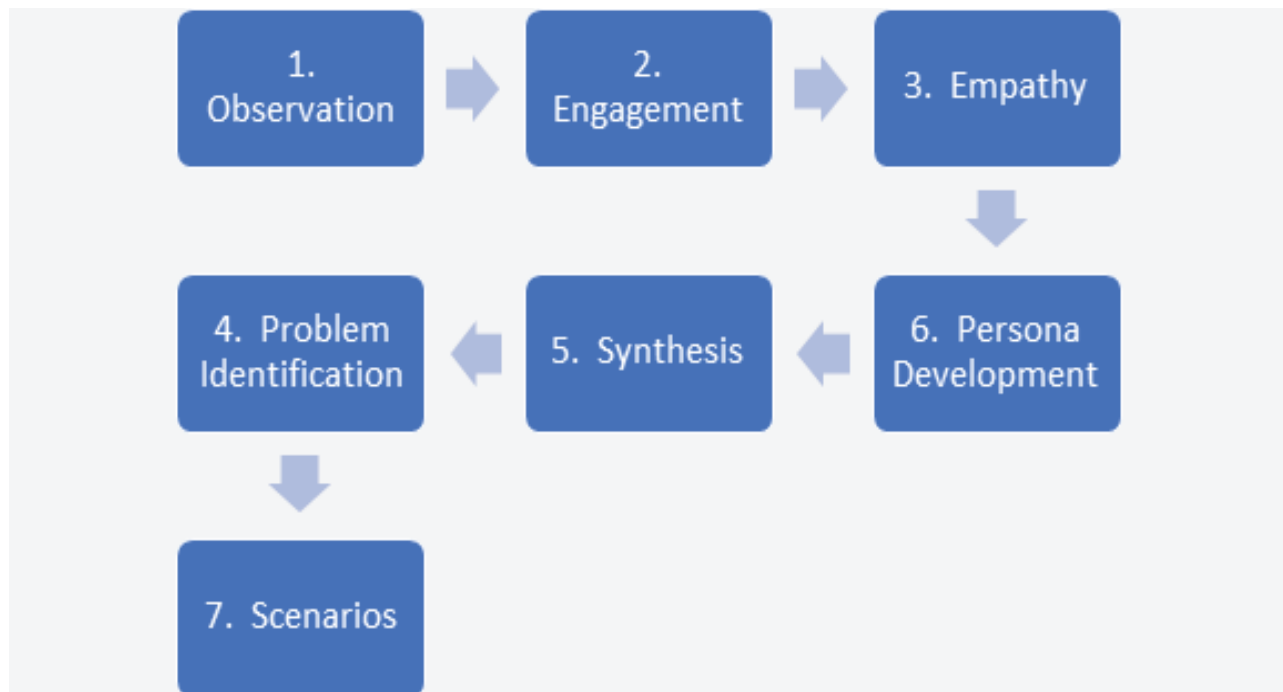
Introduction

Generally, people want new products, services or processes. Innovation design is a definite way of thinking and creating those new products, services or processes. It is like building a bridge between what is now and what could be in the future. This helps to solve issues and make life better. As an innovator I'm giving here the six steps of innovation design:



1. Understanding People's Needs

This is the first step in innovation design. This process explores deeply what people really want or need in their daily lives. That can create products, services or solutions that really matter to them. Here's the innovation designers approach for understanding people's need:



Innovation designers observe how people live, work, and interact in the environment. They pay close attention to the issues that people don't even fully recognize themselves. Listening to people's experiences, complaints and wishes gives designers a real-world insight.

Empathy is at the heart of understanding human needs. It means putting yourself in another's shoes to understand their perspectives. For designers, developing empathy is crucial because it helps them feel the emotions and challenges of the users. This empathetic approach ensures that the solutions developed are truly useful and relevant to users.

Designers often use interviews and surveys to ask users direct questions. Questions are carefully designed to uncover deep insights into users' needs. This can include understanding their preferences.

By observing, empathizing and questioning, designers identify pain points. These pain points often highlight opportunities for innovation. By focusing on these areas, designers can develop solutions.

All the information gathered from observations, interactions, and feedback is then synthesized. This means designers compile and analyze the data to find common themes. This synthesis helps in understanding the broader needs of a group rather than just individual preferences.

Sometimes, designers create detailed profiles called personas. These personas represent typical users and include their habits, needs, goals, and challenges. Personas help designers maintain a clear focus on whom they are designing for throughout the design process.

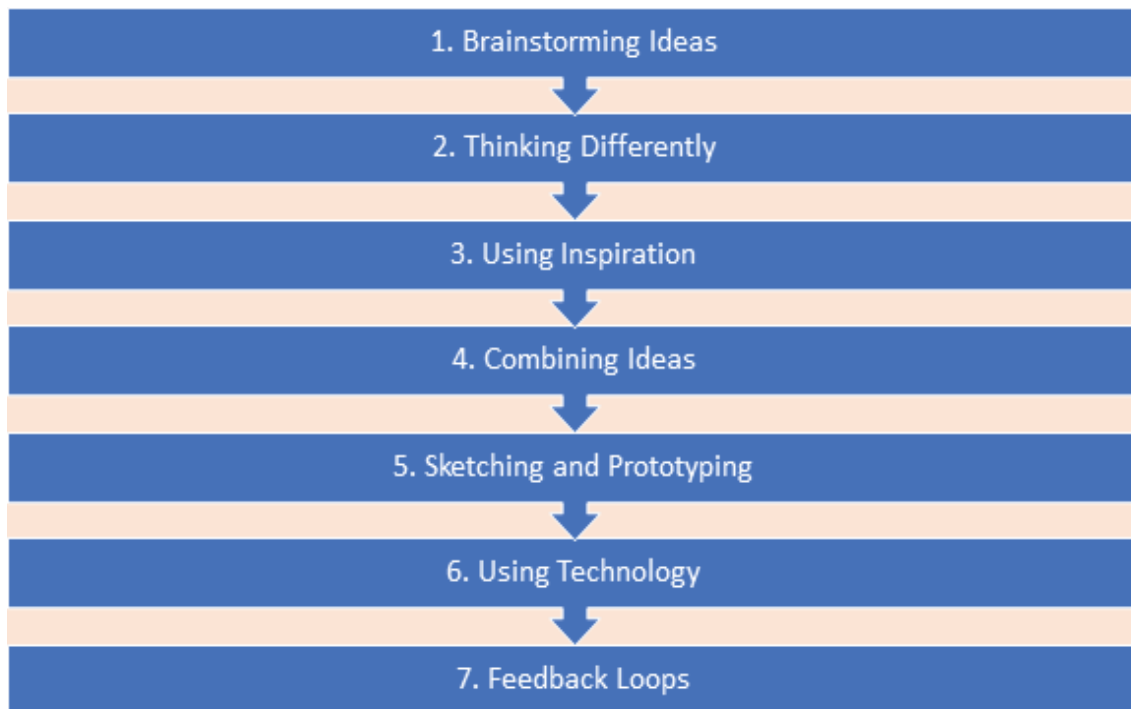
Creating scenarios or telling stories in which individuals encounter specific situations can also help users imagine how they might interact with a new product or service in their daily lives. This strategy helps predict potential problems and user behavior.

2. Imagining New Solutions

This is like using your imagination to think of new ideas. It can help solve problems or make things better. Here are the points for imagining new solutions:

Innovation designers use their creativity to think of brand new ideas. They imagine things that nobody has thought of before. These ideas can be for new inventions, gadgets, apps, or even simple ways to improve everyday tasks.

The creativity means thinking in different ways. Innovation designers might doodle, write, or brainstorm to come up with ideas. They might imagine wild and crazy things because sometimes those turn out to be the best ideas!



Innovation designers often get inspired by things around them. They might see a problem and think, "Hmm, how can I fix that?" Or they might see something cool and think, "What if I make it even cooler?"

Remember when we talked about understanding people's needs? Well, when imagining new solutions, designers think about what would make people's lives easier, safer, or more fun. They try to come up with ideas that will really help people.

Sometimes, the best ideas come from unexpected places. Innovation designers stay open-minded and ready to explore all kinds of ideas. They know that every idea has the potential to lead to something great.

Innovation designers might take bits and pieces of different ideas. They put them together to make something totally new. It's like mixing ingredients to make a delicious recipe!

When imagining new solutions, designers also think about what the world might be like in the future. They try to imagine how their ideas could fit into that future world and make it better.

By imagining new solutions, innovation designers come up with creative ideas. This can change the world for the better. It's like dreaming big and then making those dreams come true!

3. Testing and Improving

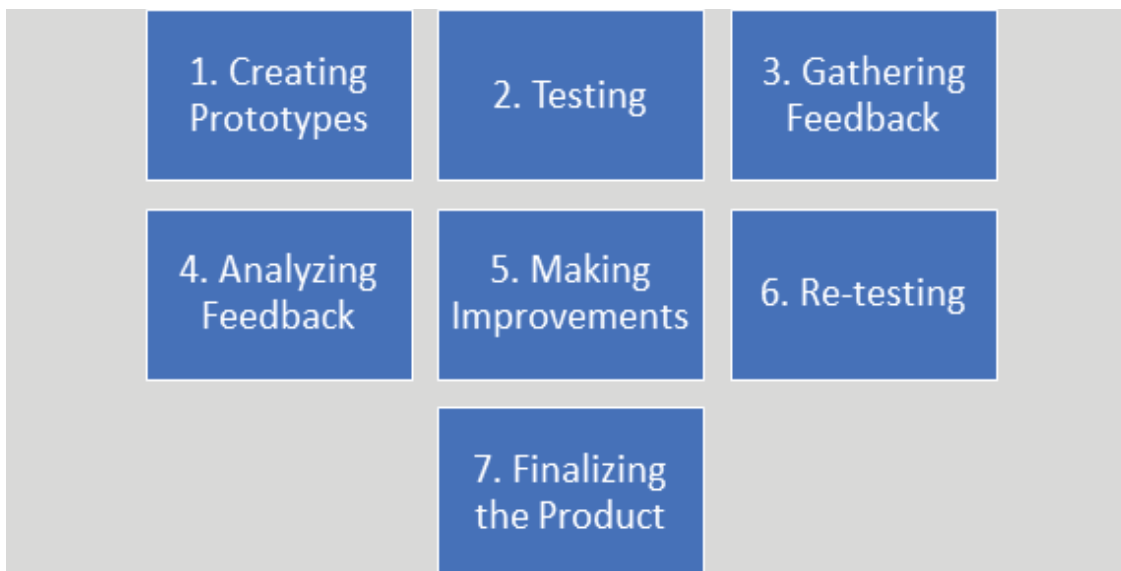
This step helps designers make sure that their ideas work well in real life and actually help people. Here's how this process typically unfolds:

A prototype is a basic version of the product designed. It doesn't have to be exactly like the final product. The main goal is to create something that can be used to check. For example, if someone is designing a new chair, they might make a simple model of the chair to see.

Once the prototype is ready, it's time to test it with real people. This means giving the prototype to users who might use it in everyday life. These testers try the prototype and provide feedback on how it works.

Collecting feedback involves listening to the testers and observing how they use the prototype. Designers might ask questions, watch testers as they interact with the product. This feedback is crucial because it comes directly from potential users of the final product.

After testing, designers analyze all the feedback and data they collected. They look for patterns or common issues that many users experienced. This helps them understand which parts of the product need more work and what features are already working well.



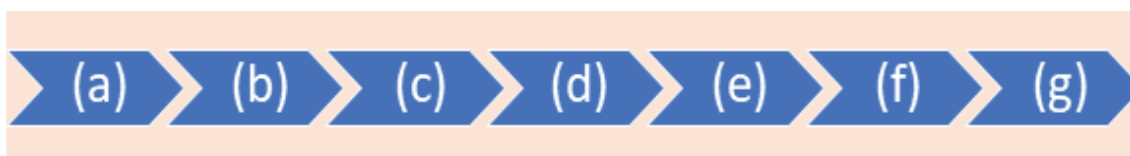
With the insights gained from the feedback, designers go back to their drawing boards to make the necessary changes. This might mean tweaking the design, changing materials, or adding new features to better meet users' needs.

Improvement is often a cycle. After making changes, designers create a new prototype and test it again. This cycle of testing, collecting feedback, and improving continues until the product meets the goals set out in the design phase.

Once the prototype performs well in tests and users are happy with it, it's time to finalize the design. This final version is what will be produced and sold to the public.

4. Collaborating with Others

This is an important part of innovation design. When people work together, they can come up with better ideas and solutions than they might on their own. The steps of collaborating with others:



- (a) Bringing Different Skills Together
- (b) Sharing Ideas
- (c) Learning from Each Other
- (d) Solving Problems Faster
- (e) Boosting Creativity
- (f) Improving the Final Product
- (g) Building Support

Everyone has different skills and knowledge. For example, a designer knows how to make things look good and easy to use, an engineer knows how to build things, and a business expert knows how to sell things. When these people work together, they can make a product that looks good, works well, and can be sold successfully.

When people collaborate, they share ideas. This can lead to finding new and better ways of solving problems. Sometimes, one person's idea can spark another idea from someone else.

People can learn a lot from each other when they collaborate. Everyone brings their own experiences and knowledge to the table. This helps the whole team understand more about different aspects of a problem and how to solve it.

Working together can also help solve problems faster. When people discuss and tackle issues as a team, they can find solutions more quickly.

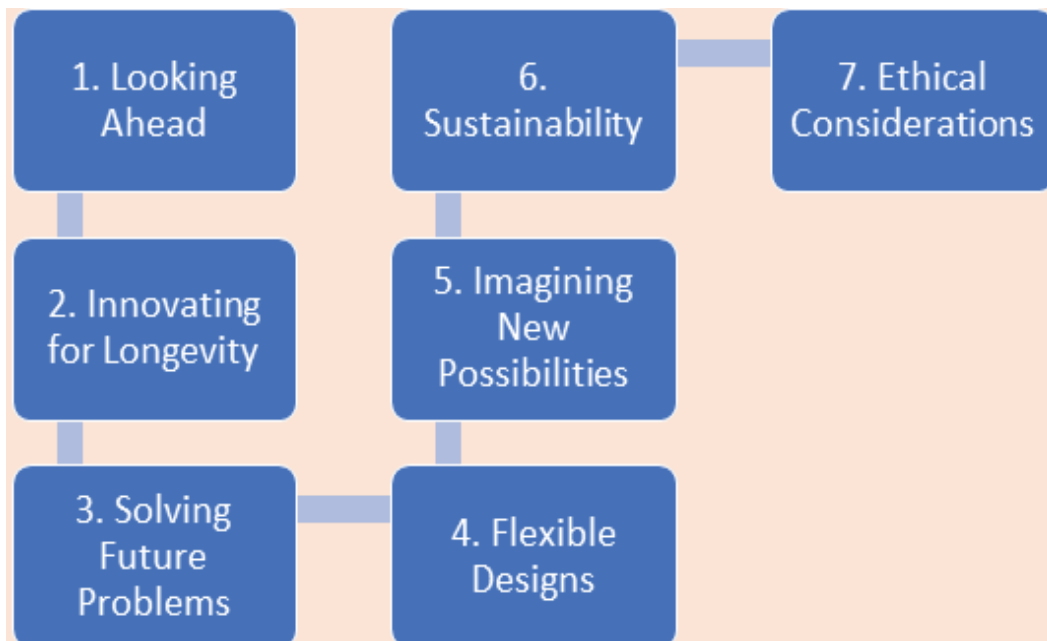
Collaboration often leads to a boost in creativity. Being around other creative people can inspire team members to think more creatively themselves. Also, creating an environment where people feel comfortable sharing out-of-the-box ideas can lead to very innovative solutions.

With many eyes on the product, errors are caught sooner. This teamwork ensures that the final product is of high quality and meets the needs of the users.

When a team works closely together, each member becomes invested in the success of the project. This creates a support system where everyone encourages each other and pushes the project towards success.

5. Thinking About the Future

This is an important part of innovation design. It means imagining the things we create today will fit into future. Think about the following sub-steps:



Innovation designers don't just focus on solving today's problems; they also think about what the world might need in the future. They use their creativity to imagine how people's lives might change and what new challenges might arise.

Designers pay attention to trends in technology, society, and the environment. They try to predict how these trends might evolve over time and how they could impact the things they create. This helps them stay ahead of the curve and create solutions that will remain relevant in the future.

Innovation designers think about the long-term effects of their creations. They consider how their products or services might impact the environment, society, and people's lives. This helps them make responsible decisions and create sustainable solutions.

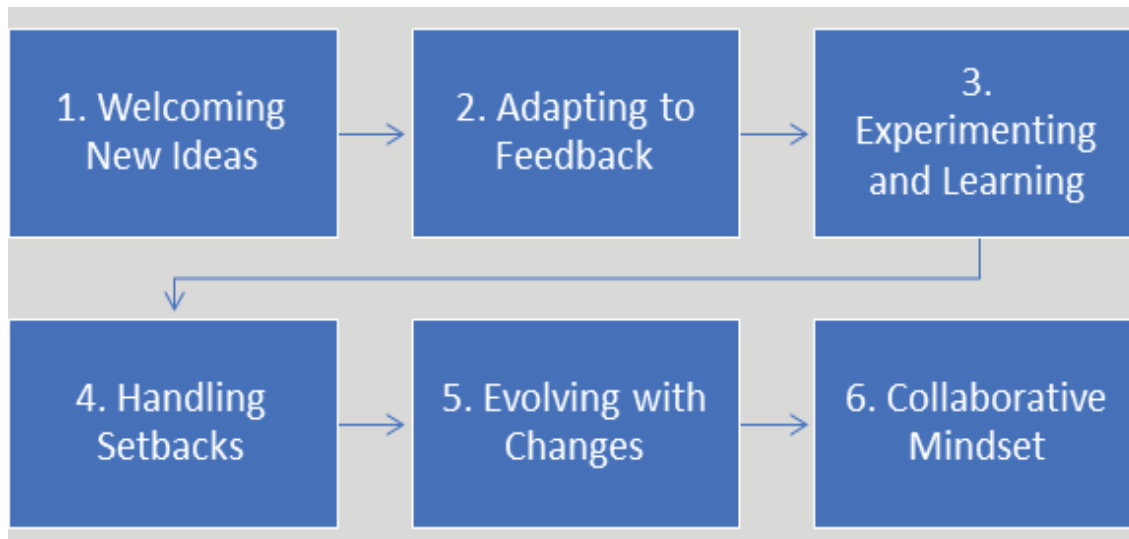
Designers anticipate future changes and design their creations in a way that allows for easy updates. This ensures that their designs can continue to meet people's needs as the world evolves.

Thinking about the future also means preparing for challenges that we might face down the line. Designers brainstorm potential obstacles and come up with strategies to overcome them. This proactive approach helps ensure that their creations can withstand whatever the future holds.

By thinking about the future, innovation designers inspire others to think big. They encourage people to imagine a better world and work towards making it a reality through innovation and creativity.

6. Being Flexible and Open-Minded

Innovation designers can create products and services that are not only creative but also highly effective and relevant to users. This approach helps ensure that innovations will be useful, appreciated, and successful in the real world. Here I'm adding some points:



Innovation designers stay open to new ideas. Sometimes, a great idea can come from someone outside the project team. Being open to these ideas can lead to better solutions.

When designers test their new products or services, they get feedback from users. This feedback is very valuable because it shows what works well and what doesn't. Being flexible means using this feedback to make changes.

Innovation isn't always about getting it right the first time. It's often about trying different things to see what works best. Designers might experiment with different materials, shapes, or ways. Each experiment can teach something new, helping to improve the design.

Sometimes things don't go as planned. A material might not work out, a technology might fail, or users might not like a feature. Being flexible and open-minded means not getting too discouraged by setbacks.

Instead, designers learn from these challenges and find new ways to move forward.

What people need and technology can change quickly. Being open-minded means keeping up with these changes and adapting designs to fit new possibilities. For example, after smartphones became popular, many products were redesigned to work well with them.

Being flexible often involves working closely with others, listening to their perspectives, and combining ideas. This collaborative approach can lead to more innovative and well-rounded designs.

Final thought

It is fact that innovation design is a powerful tool for the transformation. By understanding people's needs, imagining new solutions, testing and improving, collaborating with others, thinking about the future and being flexible innovation designers can make a difference in the world and improve the lives of many.

Sailing towards Sustainability

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Introduction

Since the inception of human civilization on earth, the maritime sector is spontaneously serving as the lifeblood of global trade, connecting nations, and facilitating economic exchange. However, as the world contends with the existential hazard of climate change and the urgent need for sustainability, the maritime industry finds itself at a critical stage. The sector faces a mass of challenges, from rising sea levels and extreme weather actions to regulatory pressures and operational complexities. In this article, we will explore into the interconnectedness of climate change, sustainability, environmental concerns, and operational challenges within the maritime sector, exploring the ways in which stakeholders are striving to navigate these turbulent waters towards a more sustainable future.

Climate Change and Its Impacts on Maritime Operations

Climate change poses noteworthy risks to maritime operations, aggravating existing challenges and generating new vulnerabilities. Rising sea levels, melting polar ice caps, and changing weather forms are altering maritime environments, affecting navigation, port infrastructure, and vessel safety. Extreme weather events, such as hurricanes and typhoons, are becoming more frequent and intense, upsetting shipping routes, causing delays, and imperiling crews and cargo.

The Intergovernmental Panel on Climate Change (IPCC) warns that unimpeded emissions from maritime activities contribute to global warming, leading to sea level rise, ocean acidification, and biodiversity loss. Coastal communities, particularly in low-lying areas, are increasingly vulnerable to flooding and storm surges, necessitating adaptation measures and resilient infrastructure investments.

Furthermore, the melting of Arctic ice presents both chances and challenges for the maritime sector. While new shipping routes, such as the Northwest Passage, offer shorter transit times and cost savings, they also raise concerns about environmental effects, indigenous rights, and sovereignty disputes.

Sustainability Imperatives and Environmental Responsibility

In response to rising environmental concerns and regulatory pressures, sustainability has emerged as a directorial principle for the maritime industry. Governments, international organizations, and industry stakeholders are increasingly focused on reducing carbon emissions, conserving marine resources, and promoting responsible stewardship of the oceans.

The International Maritime Organization (IMO) has implemented regulations such as the MARPOL convention, that sets limits on air and water pollution from ships, and the Energy Efficiency Design Index (EEDI), that promotes energy-efficient vessel design. Additionally, the IMO's Initial Greenhouse Gas Strategy aims to reduce carbon intensity from shipping by at least 40% by 2030 and pursue decarbonization pathways towards 2050.

Shipping companies are financing in cleaner fuels, such as liquefied natural gas (LNG) and biofuels, and exploring alternative propulsion systems, including wind, solar, and hydrogen. Additionally, innovative technologies such as air lubrication systems, hull coatings, and waste heat recovery systems improve fuel efficiency and reduce emissions.

Operational Challenges and Technological Innovation

Despite progress towards sustainability, the maritime sector faces operational challenges that deter the adoption of green technologies and practices. Retrofitting existing vessels with eco-friendly technologies can be costly and time-consuming, requiring noteworthy upfront investment and operational interruption. Moreover, the global nature of maritime trade obscures regulatory compliance and enforcement, as standards vary across jurisdictions and regions.

Technological innovation holds the key to overcoming these operational challenges and unlocking new openings for sustainable growth. Digitalization, automation, and data analytics optimize vessel performance,

enhance route planning, and improve fuel efficiency. For example, advanced weather forecasting systems enable captains to avoid stormy seas and optimize fuel consumption, while predictive maintenance algorithms identify potential equipment failures before they occur, reducing downtime and maintenance costs.

Furthermore, the emergence of autonomous vessels, unmanned aerial vehicles (UAVs), and remotely operated underwater vehicles (ROVs) revolutionizes maritime operations, enhancing safety, efficiency, and environmental performance. These technologies minimize human error, reduce labor costs, and enable round-the-clock monitoring and surveillance of vessel operations and environmental conditions.

Collaborative Partnerships and Multilateral Cooperation

Addressing the interconnected challenges of climate change, sustainability, and operational efficiency requires collaborative partnerships and multilateral cooperation among governments, industry stakeholders, academia, and civil society.

Multilateral forums such as the IMO, the United Nations Framework Convention on Climate Change (UNFCCC), and the World Maritime University (WMU) provide platforms for dialogue, knowledge sharing, and capacity building. These forums facilitate the development of common standards, best practices, and technological solutions to address shared environmental concerns.

Public-private partnerships (PPPs) and cross-sectoral collaborations catalyze innovation, investment, and knowledge transfer in sustainable maritime development. Industry consortia such as the Global Maritime Forum's "Getting to Zero Coalition" bring together shipping companies, technology providers, investors, and policymakers to accelerate the transition towards zero-emission shipping.

Furthermore, initiatives such as the Blue Economy Initiative, the Ocean Decade, and the Sustainable Ocean Alliance promote sustainable ocean governance, marine conservation, and responsible ocean stewardship. By leveraging diverse expertise and resources, stakeholders can co-create solutions that balance economic growth with environmental protection and social equity.

Conclusion

In conclusion, the maritime sector faces a myriad of interconnected challenges, from climate change and environmental degradation to operational intricacies and regulatory pressures. However, by embracing sustainability, fostering innovation, and forging collaborative partnerships, stakeholders can chart a course towards a more resilient, equitable, and sustainable future.

Along with coordinated action at the local, regional, and global levels, the maritime industry can mitigate its environmental footprint, enhance operational efficiency, and promote responsible ocean stewardship. By connecting the power of technology, policy coherence, and stakeholder engagement, we can navigate these turbulent waters towards a brighter and more sustainable future for generations to come.

About the Author

An academician served at Bangladesh Marine Academy (1993–2023; last 14 years as Commandant), at Ocean-going Ships (1980-1993) and at World Maritime University (WMU), Sweden (2013–2024) as a Board of Governors' Member; currently a Maritime Ambassador of IMO since 2016; besides a Trustee of IMarEST and a Trustee of IMarEST Guild of Benevolence, a Maritime Expert of IMO and GlobalMET Australia.

Achieved Class I MEO from UK, MSc in Maritime Safety Administration from World Maritime University, Sweden and a DSc (Honoris Causa) in Maritime Education from Commonwealth University, UK; authored 26 books, 40 Research papers and over 250 features. Awards include 'Outstanding Contribution to Marine Education', 'Recognized Speaker' and 'President's Commendation' from IMarEST and 'Outstanding Alumnus 2023' from WMU. Remarkable achievements include pioneering 'BSMR Maritime University, Bangladesh' based on his thesis 'A proposal for establishment of a Maritime University in Bangladesh', introducing Female Cadets & Honours Degree in BMA and establishing 4 New Marine Academies in Bangladesh.

Engineering Best Practices-P3M

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Vice Chairman - Occupational Safety Board IEB. Vice Chairman, IEB UAE Overseas Chapter,
Former Senior Engineer, ADNOC.

Introduction:

This article showcases asset management tools and techniques as a guidance for the process plant operator. Operating plant indicates those plants need running twenty four by seven or three sixty five days. This is an ideal case, in reality it doesn't happen. Then Plant operators target to maximize stream days for highest throughput, say 350 days with 15 days down time. Strategy dictates maximizing stream days, minimizing downtime for highest productivity. Therefore Plant performance is unwavering demand to reach the target. P3M strategy can achieve it. P3M stands for preventive, predictive and planned maintenance.

PM Strategy:

Preventive maintenance grouped 02 types Time based and Meter based. Time based is considered for in-situ asset continuously running within a complex process plant supposedly central air conditioning system. Control equipment like PI (pressure indicator), TI (temperature indicator), transmitter embedded with process equipment shall undergo time based PM while meter based policy is taken out for the asset running sporadically like road vehicle. Time based classifies as fixed preventive maintenance or floating preventive maintenance. Fixed preventive maintenance schedule shall appear at its pre-set interval irrespective of the PM execution date sooner or later while floating preventive maintenance schedule will appear at its interval from the last PM execution date.

It is mandated for time based PM to post validation tag at visible location on the equipment body at each interval. Validation tag shall mention date of PM done and upcoming PM date.

Meter based PM

Meter based is intended to have PM of the asset after elapse of certain hours, miles and cycles. For cars, miles/kilometer is the PM basis. Production machine may follow hourly basis.

PM Interval:

PM interval has to justify optimal utilization of resources and asset healthiness. For example, if an Air Handling Unit (AHU) installed in a dusty environment having end user sensitivity, it has to be taken down frequently for PM. In case PM interval is short, need more manpower and resources to maintain leading to cost issue. Equipment maintenance manual also gives key information setting PM interval. So considering all factors including equipment manual, interval has to set out in due course.

Recurring Task to set:

Action mostly includes checking wears and tears of sensitive parts followed by replacement, washing/cleaning/ replacement of suction filters, oil changes or top up, calibration of instruments etc. Finally functionality check followed by parameters record on record sheet. Manufacturer maintenance manual and experience may guide significantly in preparing task list.

Prioritize Your Asset in PM

In process industry, multiple assets engage to process final product. Plant operator has to follow a definite strategy to justify maintenance cost over the total production cost. Asset shall be categorized in terms of service criticality demonstrating impact of machine outage to production line. Plant Operator can adopt systematic approach to prioritize the asset to be brought under PM Plan like Risk Priority Number (RPN). Risk Priority Number is calculated in combination with Severity, Occurrence and Detection

$RPN = \text{Severity} \times \text{Occurrence} \times \text{Detection}$.

Severity – Indicates degree of overall production loss ranking 1-10 (where 10 being highest degree of loss)
 Occurrence – Indicates probability of machine failure ranking 1-10 (where 10 being likely to fail)
 Detection –How likely to detect the mode of failure ranking 1-10 (where 10 being less likely to detect)
 Based on the ranking of risk priority number (RPN), Plant Operator may decide which machine to be brought under PM which not. This tool will dictate the right asset moves to PM plan, asset having less RPN remains outside PM program thus eliminating overdo inspection and cost thereto.

In general PM strategy reasonably suits for the mega process plant where round the clock product manufacturing takes place. For example, Petro-chemical plant, Refinery and power plant. Business Impact, process sensitivity and criticality on end user side shall be the key elements to justify PM implementation.

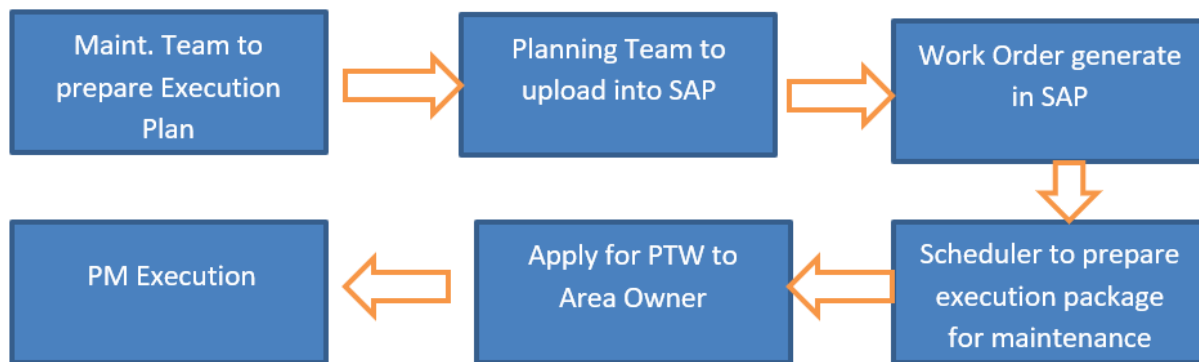
ERP Software for PM Plan:

‘Set it and forget it’ until it pops up on your ERP gateway. SAP is the best choice to administer PM plan. SAP features has the definite PM module to capture all related information about PM Plan. Module includes Notification, Work Order, Work Order operations, Display Master data, Failure analysis, Time management, Reservation ZRES, PM Plan etc. Moreover PM Plan can be visible in terms of Display functional location task list, Display lists of task list, Display maintenance plan, Display list of maintenance plan, scheduling overview list.

PM program is uploaded to SAP system and SAP will automatically set to generate PM work order at par frequency. PM program includes frequency/interval, activity/ task list with resources, checklist or document number, BOM (bill of materials) with material number etc..

Planning Role:

It is planner responsibility to upload PM plan into SAP system. Scheduler will run the SAP and print Work order along with the checklist for the maintenance team. He will also reserve materials / spares as per PM plan . Finally he will arrange Task risk assessment meeting along with concerned parties. Work order, checklist, material reservation, risk assessment make up execution package. Scheduler then hand over execution package to execution team. Execution team after receiving work order will apply for Permit to Work (PTW) against that PM work order. After execution of the task, generate maintenance report and work order is closed. In case PM work order remains opened and work is not completed, it will appear as backlog in SAP system affecting the KPI of the department. All concerned parties will be accountable for such backlog.



Standby Unit :

No doubt PM improves machine performance, reliability and lifespan. Execution team may perform PM by shut down the running unit or after switching running unit to standby unit. It depends on process whether standby unit is required or not. Particular process may be designed either with single train or along with standby unit. It depends on completely process demand. Set up a standby unit entails additional investment. If cost of production loss exceeds more than that of standby unit, standby unit is justified. Sometimes, each machine becomes integral part of the process unit or trigger process upset in absence of particular machine underlying PM functions. Standby unit should be considered. Supposedly HVAC systems built for human occupants and HVAC system built for plants equipment doesn't carry the same importance. Of course, HVAC system for plant equipment carries more importance in terms of production loss or equipment

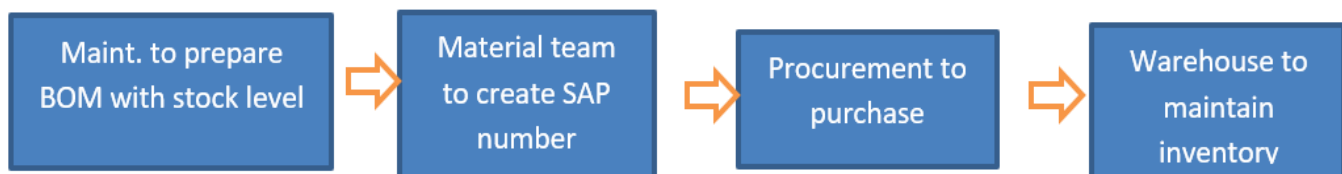
damage. In case of single train equipment, machine outages notification due to maintenance to be served among the end users with timing from to.

A typical HVAC unit PM Tsk list is furnished below

Task/Activity	Resource	Duration	M-H
Perform LOTO	Electrician 1 no	30 min	0.5
Blower fan cover open and belt check	Mech. Tech. 1 no.	30 min	0.5
Motor fan cover open and clean dust	Electrician 1 no	1 hr.	1
Air filter removal, wash / replace and fix back.	Mech. Tech. 2 no.	4 hr.	8
Other control instruments calibration if is due.	Control Tech. 1 no.	4 hr.	4
Level check of refrigerant and top up.	Mech. Tech. 2 no	2 hr.	4
Chilled water system check like pump/motor, lubricant, water etc.	Mech. Tech. 1no	2 hr.	2
Functionality check and data records	Supervisor 1 Control Tech. 1 Mech. Tech. 1	2 hr.	6

Streamline Bill of Materials (BOM):

Successful PM program depends on supply reliability of spares and materials like backward linkage. Maintenance team shall create stock requisition for PM related spares with stock level like maximum quantity, reorder quantity, safety quantity to generate material number. Accordingly material team create SAP number with MRP type (suppose V1). In line with MRP type procurement will purchase materials, warehouse will maintain inventory. Once stock falls on reorder level, PR will automatically trigger.



Conclusion:

To set up PM plan obligate owner to invest more money in terms of additional manpower, specialized team, training, standby unit and system articulation. Nevertheless PM is preferable over corrective maintenance to mega manufacturing process plant in particular. In a continuous running plant, Preventive maintenance is highly demanding from reliability point of view. It increases stream days , reduce down time, maximize profitability. In contrary, Corrective maintenance is least preferred one since it is somewhat run to fail. Plant operator should adopt PM philosophy in combination with SAP to optimize plant reliability and maximize operability.

Risk Assessment and Safety issues at Construction Projects in Bangladesh: A Case Study from a Bridge Project

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Abstract

Bangladesh Institute of Labour reported that construction is the most dangerous industry in terms of health and safety at work. In the project, due to an accident during Pier construction, the authority carried out underwater MS plate installation and welding work in the damaged steel cofferdam. Prior to repair activities, method of statement was prepared with risk assessment and its control measures for comparatively safe work. The Hazards and severity of each component were identified and Risk assessments were performed. Based on the well-established methodology, the probability and severity levels are determined to calculate the Risk Factor. It is observed that for the reported activities the probability scores are varied from 2 to 4, whereas the severity varies from 3 to 5 (5 for most of the activities).

Keywords: Health and Safety, Risk Assessment, Hazard, Severity

1. INTRODUCTION

This research aims to identify the safety standards and Occupational Health and Safety Management System (OHSMS) of the construction industry in Bangladesh, as well as to present a case study to reduce the risk factor through risk assessment.

2. METHODOLOGY

2.1. Study Area

In this study a particular task of Jamuna Railway Bridge Construction is considered as the case study to assess the risk and effect of precaution measures on it. In the project, due to an accident during Pier construction, the authority carried out underwater MS plate installation and welding work in the damaged steel cofferdam. Prior to repair activities, method of statement was prepared with risk assessment and its control measures for comparatively safe work. The Hazards and severity of each component were identification and Risk assessments were performed.

2.2. Methodology for Risk Assessment

One kind of risk matrix that is shown graphically as a table

↑ PROBABILITY	Very Likely-5	5	10	15	20	25
	Likely-4	4	8	12	18	20
	Probable-3	3	6	9	12	15
	Unlikely-2	2	4	6	8	10
	Very Unlikely-1	1	2	3	4	5
			1	2	3	4
		Negligible	Slight	Moderate	High	Very High
						→ SEVERITY

RISK	RISK LEVEL	ACTION
1 to 6	Low Risk	May be acceptable but review task to see if risk can be reduced
8 to 12	Medium Risk	Task should only be undertaken with appropriate management authorization after consultation with specialist personnel
15 to 25	High Risk	Task must not proceed. It should be redefined or further control measures should be put in place to reduce risk. The control should be in place

Figure 1: Risk Matrix

3. RESULTS AND DISCUSSIONS

3.1. OHS in Global and Regional Scales

At the corporate, governmental, and international levels, the financial consequences of these accidents and fatalities are enormous. Estimates of these losses, taking into account missed wages, medical costs, training and retraining, production disruption, lost working time, and other factors, are regularly placed at about 4% of the world's gross national product annually, and probably considerably more. A total of US\$122 billion was estimated to have been spent on compensation for a group of OECD countries in 1997 alone, with 500 million working days missed due to illnesses or accidents (Alli, 2008: 4). Work-related mortality in some developed countries are presented Figure 2. Here Morality Index= (Number of work -related death/Total workforce) x 100,000.

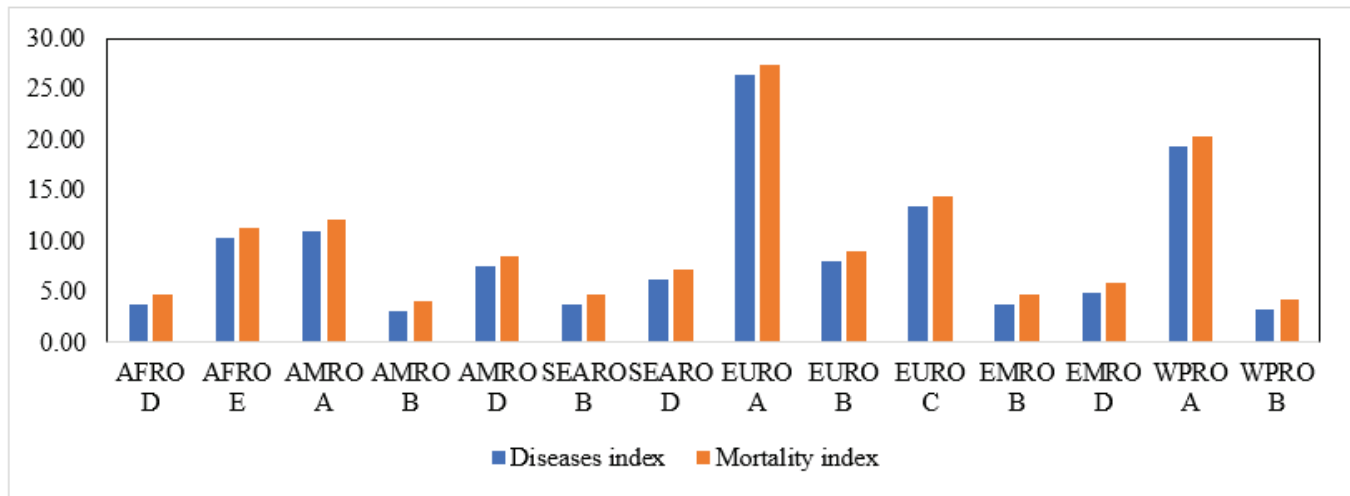


Figure 2: Work-related mortality in some developed countries (as per ILO, 2023)

Table 1: Work-related mortality in some developing countries

Country	Economically active population	Fatal accident 2003	Accident causing at least 4 days' absence Average 2003	Work-related diseases	Work-related mortality	Deaths caused by dangerous substances
Bangladesh	46,325,000	9,652	9,074,601	34,831	44,483	11,662
Bhutan	1,270,174	405	380,776	955	1,360	320
India	473,300,000	46,928	44,120,055	355,863	402,791	119,153
Korea, Democratic of	9,600,000	1,956	1,838,523	7,218	9,174	2,417
Maldives	88,000	13	11,810	66	79	22
Myanmar (Burma)	27,010,000	7,069	6,645,868	20,308	27,377	6,800
Nepal	11,700,000	3,372	3,170,090	8,797	12,169	2,945
Timor-Leste	400,000	117	109,793	301	418	101
Total	569,693,174	69,510	65,351,517	428,339	497,849	143,420

Table 2 shows the OHS statistics for some developing countries according to ILO.

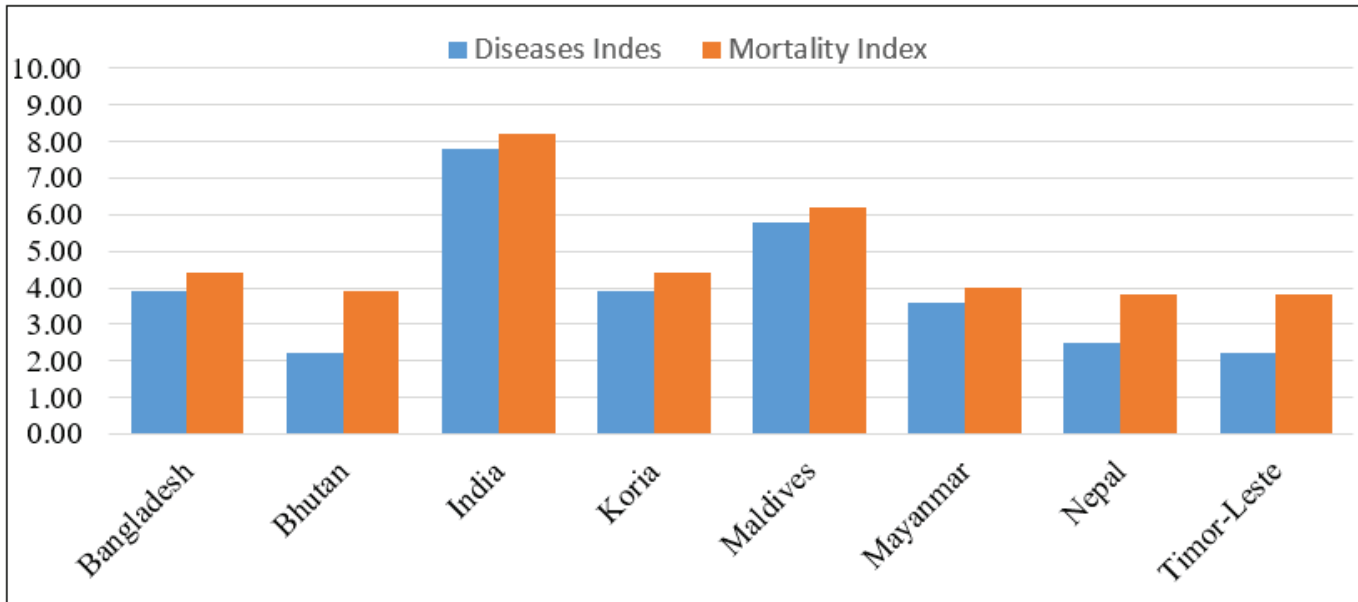


Figure 3: Work-related mortality in some developing countries (Source: ILO, 2023)

Some key aspects of health and safety practices in Bangladesh are explained below:

Fire Safety: The prevention of fires is vital, particularly in the apparel and textile sectors. The 2013 Rana Plaza tragedy, in which a structure housing apparel factory collapsed, brought attention to the need for stronger fire and building safety regulations.

Healthcare Facilities: Basic healthcare facilities are supposed to be provided by employers to their staff; larger establishments might have on-site medical facilities.

Social Compliance and International Standards: A large number of Bangladeshi industries, especially those engaged in exporting goods, follow international standards for social compliance. These standards frequently contain clauses pertaining to safety, health, and labour rights.

3.1 Risk Assessment: A Case Study

The authority decided that Diving and underwater MS plate installation and welding work will be done will need to be carried out in accordance with standard operating procedure. All personnel will wear appropriate Personal Protective Equipment (PPE).

Table 2: Hazard identification and Risk assessment for under water welding work

Item	Description of Job	Hazards	Risks	Initial Risk Rating		Risk Factor
				Probab. x	Severity	
Safety Precaution for general activity				P	S	RF
1A	Selection of tools & Tackles	Select defective/improper tools leading to equipment damage & accident	Damage/Injury /Fatality	4	5	20
	Temporary power connection from DB	Electrocution, spark & fire	Property damage/burn injuries/fatality	3	5	15
	Movement of heavy machinima around the	Miscommunication of signal	Injured of people/worker	3	3	9

Item	Description of Job	Hazards	Risks	Initial Risk Rating		Risk Factor
				Probab. x	Severity	
	site & lifting operations					
1B	Working over water	Potential to fall in river	Injury/fatality	3	5	15
2A	Before entering Confined space	- Gasses - Lack of or excess oxygen - Slip, Trip, Fall	Nausea, Fire explosion, injuries	3	4	12
2B	Entry to Confined space	Fall from man basket, slip, trip, fall	Serious Injury/ Fatality	3	5	15
2C	Working in Confined space	-Restricted access/egress - Contaminants - Carbon monoxide - Struck by objects falling into confined space - Temperature - Slip, Trip, Falls	Serious Injury/ Fatality	3	5	15
3A	Clan up on Completion	Trip hazards, Rubbish	Sprains of streams, Back injury, minor or major cuts	4	3	12
3B	Emergency preparedness during the execution of the Underwater Welding Works	Physical injuries (Minor, Serious, Fatal)	-Incident/Accident from Human suffering Human injury -Potential of Fatal Accident -Occupational illness -Incident related to Underwater welding activities	4	5	20

Table 3: Preventive measures and its reflection in minimizing the Risk Factor

Item	Description of Job and Hazards	Precaution/ Prevention Measure	Initial Risk Rating		Risk Factor
			Probab. x	Severity	
		Safety Precaution for general activity	P	S	RF
1A	Temporary power connection from DB: Electrocution, spark & fire	1.All electrical equipment should be checked as per checklist 2.Powr cable to be checked properly and it should be used through RCCB (30mA) 3.All electrical connection should be carried out authorized electrician.	1	5	5

Item	Description of Job and Hazards	Precaution/ Prevention Measure	Initial Risk Rating		Risk Factor
			Probab. x	Severity	
		4.All power cable to be kept in proper routine and not laid on access. 5.Cable joint should be properly with cable connection. 6.Fire extinguisher to be kept at near working area 7.Proper earthing to be provided in DB and electrical equipment			
	Movement of heavy machinima around the site & lifting operations: Miscommunication of signal	1.Only one person should be appointed for signaling work 2.All signals should be known to all staff and workers 3.Signalman should stay where machine operator can see his signal.	1	3	3
1C	Working over water: Potential to fall in river	1/Life ring and life jacket shall be provided 2.Unauthorized people or machinery are prohibited to enter working area. 3.Clear information and instructions about activities in working area. 4.safety awareness training. 5.Check the weather condition before starting work. 6.Conduct working over water safety awareness training for all involving employee	1	5	5
2A	Before entering Confined space: 1.Gasses 2.lack of or excess oxygen 3.Slip, Trip, Fall	1.Ensure all people are confined space trained. 2.Develop the job specific confined space induction including emergency rescue procedure, for all people work in or around the confined space. 3.Complete the confined space Entry Permit. 4.Check the possible gases an oxygen level by the gas tester. 5.Isolate all equipment, materials, services and energy sources possibly dangerous to people working in or near the confined space. 6.Determine the need for cleaning and purging. 7. Maintain an acceptable atmosphere by ventilation. 8.Provide appropriate PPE, ensure all rescue equipment is available. 9.Keep a person hole watcher and maintain the log entry/exit log sheet	1	4	4
2B	Entry to Confined space: Fall from man basket, slip, trip, fall	1.Mas basket must be inspected by competent person. 2.Full body harness must be worn and hook up with the auxiliary hook 3.The crane operator and signal man must be competent. 4. Before starting the activity check the weather condition	1	5	5
2C	Working in Confined space: 1.Restricted access/egress 2.Contaminnts 3.Carbon monoxide	1.Appropriate signs/Barricades 2.Regular atmospheric monitoring 3.Wear Hearing and/or dust masks to be worn when necessary 4.Use pinch bars as much as possible to minimize noise and dust from hammers. 5.Keep generators away from entrance of pit to keep exhaust fume away.	1	5	5

Item	Description of Job and Hazards	Precaution/ Prevention Measure	Initial Risk Rating		Risk Factor
			Probab. x Severity		
	4.Struck by objects falling into confined space 5.Temperature 6. Slip, Trip, Falls	6.Keep clear around entrance area 7.Care when passing material out of confined space. 8.Mechanical Ventilation (fans) 9.Adequate lighting 10. All light, fans, generator and lead to be tested and tagged as per Bechtel procedures 11. Leads to be elevated keep work area tidy. Small items to be removed immediately or stacked neatly.			
3A	Clan up on Completion: Trip hazards, Rubbish	All possible due diligence to be exercised to ensure zero slips, nips and falls. All rubbish to be disposed of in bins provided.	2	2	4
3B	Emergency preparedness during the execution of the Underwater Welding Works: Physical injuries (Minor, Serious, Fatal)	Emergency vehicle to standby all the time at site vicinity The injured person should be given First aid immediately. First aid box shall be made available with required medicines in adequate quantity and Certified First Aider available at work location. Employees shall be explained about the provisions of first aid, assembly point and contact numbers etc. Emergency assembly area, emergency siren should be available Emergency shower & eye wash facility should be available Tie up with hospital in case of medical facility. Emergency Protocols: Establishing clear emergency procedures to swiftly respond to any electrical hazards or accidents that may occur during underwater welding operations. Emergency Preparedness: Have plans in place for contingencies like equipment failure, diver emergencies, or foreseen situations. Commination: Maintain clear commutation between the dive team, face support, and any other involved patties throughout the operation. Standby ambulance and rescue boat	2	3	6

CONCLUSION

Long-term cost savings are a possible outcome of investing in health and safety practices. Reduced medical costs, insurance premiums, project delays, and legal liabilities are all lowered when there are fewer accidents. Prioritising health and safety create a positive work environment that increases employee engagement and morale.

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Green Economy in Bangladesh : Pathways to Sustainable Development

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In line with the UN environmental program, “In a green economy, growth in employment and income are driven by public and private investment into such economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services”. As a nation grappling with various environmental challenges, Bangladesh is pivoting towards a green economy to ensure sustainable development while aiming to reduce ecological footprints. The green economy model focuses on reducing environmental risks and ecological scarcities, and it aims for sustainable development without degrading the environment, according to the United Nations Environment Program. For Bangladesh, this shift is not just a necessity but an opportunity to enhance energy security, create environmental jobs, and ensure a sustainable future for its dense population.

The Imperative for Green Economy

Bangladesh has demonstrated genuinely remarkable development over the last half-century since gaining its independence. Life expectancy increased from 45.81 years in 1973 to 73.82 years in 2024, the adult literacy rate increased from 22% in 1974 to 74.9% in 2020, per capita income increased from less than \$100 in 1972 to \$2064 in 2020, GDP growth averaged 6.8% per year between 2009 and 2019 compared with 4% during 1975-1985, and poverty decreased from approximately 80% in the early 1970s to 21% in 2019. Bangladesh now aims to become a high-income country (HIC) by 2041 and an upper middle-income country (UMIC) by 2031, building on existing achievements. To meet these goals, Bangladesh will need to implement numerous institutional, governance, and policy reforms in addition to addressing the rising costs of environmental degradation and the negative effects of climate change up front. Although previous attempts to keep these expenses under control have been beneficial, they do not constitute a complete response plan. As a result, the expenses have mounted up and now seriously jeopardize long-term growth sustainability. However, Bangladesh is particularly vulnerable to the impacts of climate change, with its low-lying geography making it susceptible to rising sea levels and catastrophic flooding. These environmental challenges are compounded

by the country's high population density. Transitioning to a green economy offers Bangladesh a path to mitigate these risks through sustainable practices that promote environmental stewardship, economic growth, and social inclusion.

Current Initiatives and Successes

More than ever, worldwide stakeholders are paying close attention to sustainable and renewable methods as the earth's environment continues to degrade at an alarming rate. With 173 green factories designated by the Leadership in Energy and Environmental Design (Leed) program of the US Green Building Council (USGBC), Bangladesh is currently leading the world in the RMG industry's transition to a green economy. The Climate Change Trust Act of 2010; Bangladesh Delta Plan 2100 (BDP 2100); a ten-year Implementation Roadmap for the Nationally Determined Contributions (NDCs) for 2016–2025 (prepared to manage growing emissions without compromising economic development); the Perspective Plan (2021–2041); and the Eighth Five-year Plan (2021–2025) are just a few of the many policy guidelines that the government of Bangladesh has adopted through adoption.

Government Policies and Frameworks

Bangladesh Bank intends to introduce mandatory green project investment requirements on banks and other financial institutions. They will have to allocate 15% of their loans, including 2% for green finance, for sustainable financing under this legislation. In addition, Bangladesh Bank mandated that all banks and non-bank financial institutions (NBFIs) operating in the country meet a least 5% green finance attainment target. With the implementation of the Alternative Investment Regulations in 2015, the government has been incentivizing foreign impact investors by lowering stamp duties. Launched in 2016, Bangladesh Bank's \$200



million Green Transformation Fund (GTF) refines environmentally-friendly initiatives. In June 2019, the fund's scope was expanded from just three sectors (textiles, leather, and jute) to include all manufacturing and export-oriented entities, regardless of sector. By 2030, the government also aims to establish more than 100 green economic zones, 30 of which are currently being developed.

Forging collaborations with regard to green investments in Bangladesh has been made possible in large part by foreign development partners and international financial organizations. France is eager to satisfy

Bangladesh's financial demands because of its knowledge and experience in dealing with climate change challenges. It will do this by aiding the government in resolving climate-related issues and by offering Agence Française de Développement (AFD) concessional loans for green initiatives.

Bangladesh recently received a \$4.7 billion loan from the IMF, of which \$1.3 billion came from the Resilience and Sustainability Facility (RSF). One of the first nations in Asia to receive this grant to address national climate change challenges is Bangladesh.

The country has initiated several key projects that signify steps toward green development. Renewable energy, particularly solar energy, has seen significant uptake. The Solar Home Systems program is a standout success, with over 4 million systems installed, benefiting about 20 million rural inhabitants who previously relied on kerosene. This initiative not only reduces carbon emissions but also enhances rural electrification and quality of life. In urban areas, efforts to increase green spaces and reduce air pollution have been implemented. Dhaka, the capital, has embraced rooftop gardening, not only to combat the heat island effect but also to provide fresh produce in an urban setting. Additionally, the introduction of compressed natural gas (CNG) vehicles has significantly lowered air pollution levels by reducing the amount of vehicular emissions.

Bangladesh's Green Economy's Challenges

Despite these initiatives, Bangladesh faces several challenges in fully implementing a green economic model. Financing remains a significant hurdle, with substantial investment required to transition to sustainable technologies and infrastructure. Institutional weaknesses and lack of coordination among various government agencies also impede the effective implementation of green policies.

Expensive: The cost of installing a green factory can be up to 30% higher than that of a normal factory because of the higher construction expenses associated with rainwater accumulating, solar panel technology, environmentally friendly technology, water conservation technology, and appealing production processes. As a result, the area's shortage of skilled workers drives industry to hire foreign consulting companies, which dramatically drives up building costs. Moreover, achieving economic sustainability is increasingly challenging.

Absence of Policy: There isn't a formal green industrial policy statement from Bangladesh. A further barrier to green industrialization is the high rates of corporation tax and value-added tax, which also make it difficult to import expensive machinery from overseas.

Absence of Knowledge: Another challenging aspect of the growth of the green business is consumer behavior. Customers in the area are not well-informed on the significance of turning green. Simply put, the Western business community is the source of the demand for green products. Therefore, the only businesses that are driven to move from green sectors are those that focus on export.

Corruption: And lack of transparency can stall progress, while limited public awareness and engagement in sustainable practices often mean that large segments of the population do not participate actively in green initiatives. Addressing these issues is crucial for the successful transition to a green economy.

Other Difficulties: The lack of land, excessive loan interest rates, inadequate transit alternatives, inadequate infrastructure for utility services, and other issues may make it difficult for Bangladesh to build green enterprises.

Future Directions

According to a World Bank report created for the government, Bangladesh plans to green its energy, manufacturing, transportation, and agricultural systems in order to maintain economic growth and advance. This is a significant initiative that will cost more than \$200 billion in climate action funding over the course of the next 20 years. The report "Designing the Bangladesh Green Growth Vision and Financing Options" cites estimates and research conducted for the government's various climate-related agendas and action plans. It states that Bangladesh must raise its spending on environmental protection and climate change programs to 3% of GDP by 2031 and to 3.5% of GDP by 2041. "Complementary plans and initiatives will also require billions of dollars to be fully implemented," says the report drafted jointly by the World Bank Group and the Green Growth for Bangladesh. The report, presented to the Economic Relations Division (ERD) in June 2023, seeks to provide a framework for implementing the Bangladesh government's green growth target as envisaged in the 8th Five Year Plan and the Bangladesh Perspective Plan 2041. According to the paper, implementing green growth policies may need to go above and beyond what is required to transition to a

green economy. This is because these policies prioritize efficiency and sustainability over environmental preservation and protection.

Looking forward, Bangladesh must focus on several strategic areas to advance its green economy agenda. Enhancing energy efficiency across all sectors, expanding renewable energy beyond solar to include wind and hydroelectric power, and improving waste management systems are critical areas of development. Promoting sustainable agriculture and ensuring water resource management will also be crucial, given the country's dependence on agriculture and its vulnerability to water-induced disasters. Public-private partnerships can be a pivotal component of advancing the green economy, offering an avenue for combining public policy initiatives with private sector innovation and investment. Moreover, international cooperation and access to global green funds will be essential to finance large-scale infrastructure projects and technology transfers.



Parting words

The move towards a green economy in Bangladesh is fraught with challenges, yet it presents a unique opportunity to set the country on a sustainable development path that includes all sections of society. By building on current initiatives and addressing existing barriers, Bangladesh can continue to forge a model of growth that is both environmentally sustainable and economically viable. This transition is not merely beneficial—it's essential for the nation's survival and prosperity in the face of global environmental changes.

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Techno-World

Embracing Tomorrow: A Glimpse into the Cutting-Edge Technologies Shaping Our Future

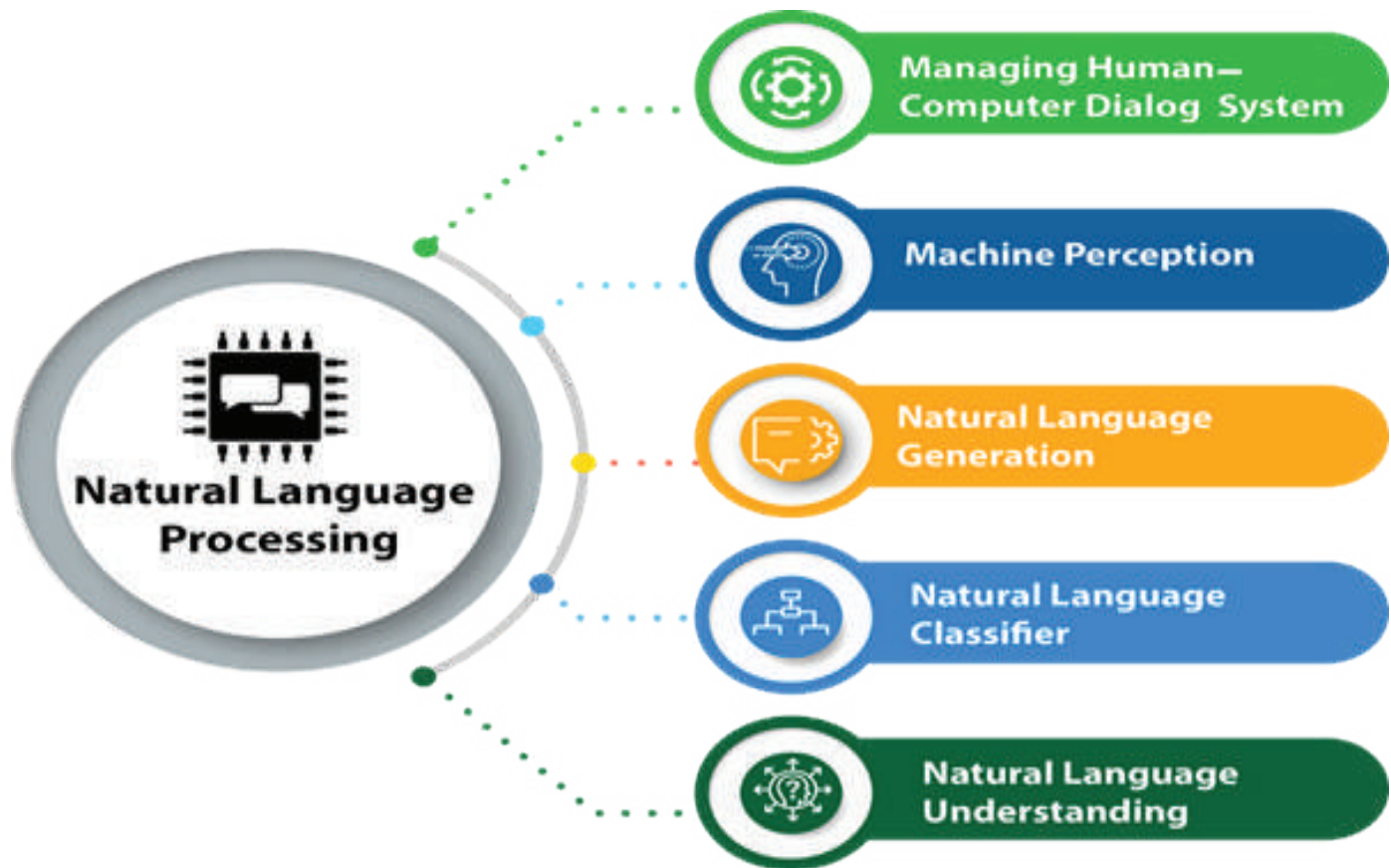
Shawkat Ali Khan

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In the ever-evolving landscape of technology, advancements continue to redefine the boundaries of what was once deemed impossible, blurring the lines between science fiction and reality. With each invention, the trajectory of our future is shaped, presenting both opportunities and challenges, particularly in the realm of online privacy. Today, we embark on a journey to explore 12 cutting-edge technologies poised to revolutionize our societies and redefine the way we interact with the world.

Natural Language Processing (NLP):

Artificial Intelligence (AI) has emerged as a transformative force, revolutionizing various aspects of our lives. Among its myriad applications, Natural Language Processing (NLP) stands out as a game-changer. NLP, a branch of AI, enables machines to comprehend and respond to human language, ushering in a new era of seamless human-computer interaction. From virtual assistants like ChatGPT to applications in digital marketing and content optimization, NLP is reshaping industries and enhancing productivity in unprecedented ways.



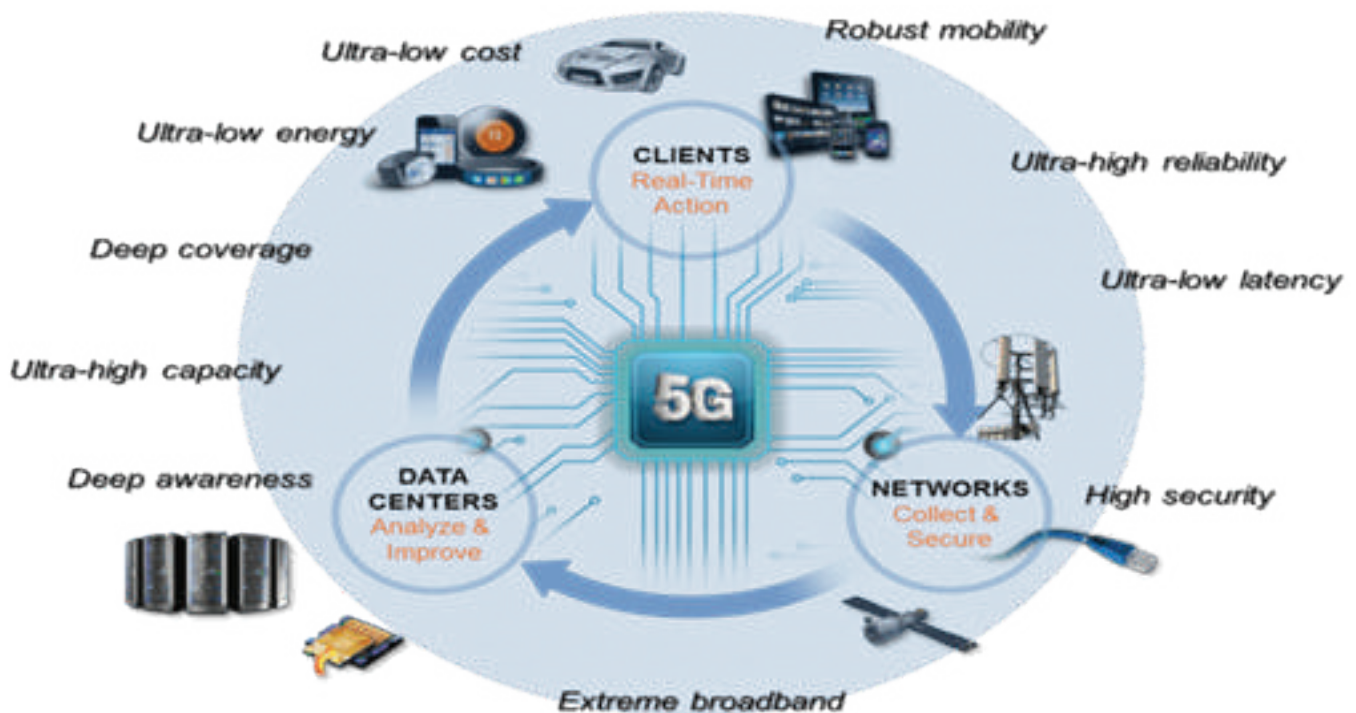
Optical Character Recognition Technology (OCR):

Optical Character Recognition (OCR) technology, though not new, continues to evolve, offering novel applications with profound implications for the future. By extracting text characters from images, OCR facilitates accessibility for visually impaired individuals and streamlines document digitization processes. Moreover, its utility extends to data extraction in business settings, paving the way for enhanced efficiency and accuracy in data management.



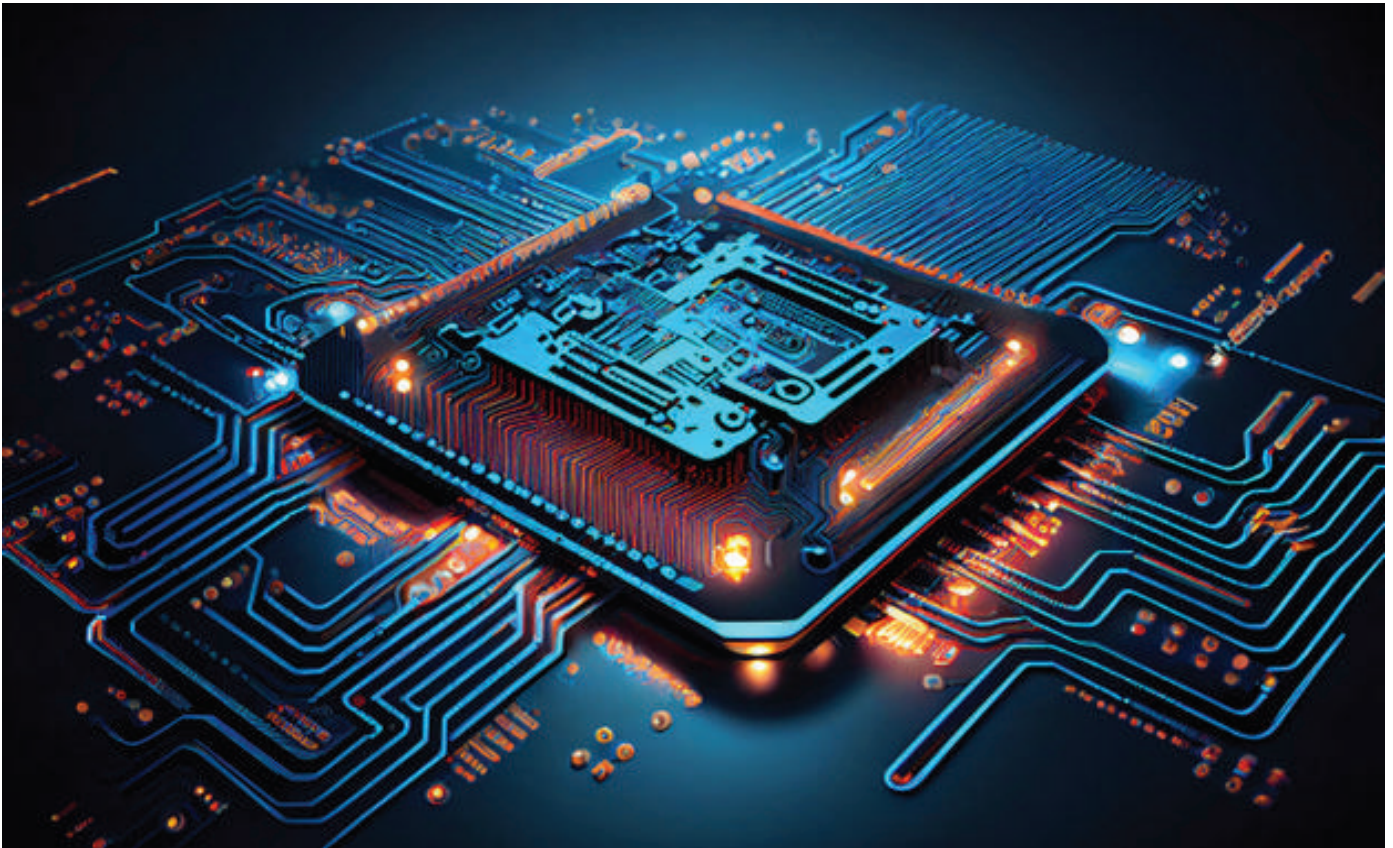
5G Technology:

The advent of 5G technology heralds a new era of connectivity, promising unparalleled speed, reliability, and responsiveness. With download speeds reaching unprecedented levels, 5G networks unlock a plethora of opportunities, from seamless multimedia streaming to real-time communication and IoT integration. As 5G becomes ubiquitous, it will catalyze innovation across industries, fueling advancements in areas such as telemedicine, autonomous vehicles, and smart infrastructure.



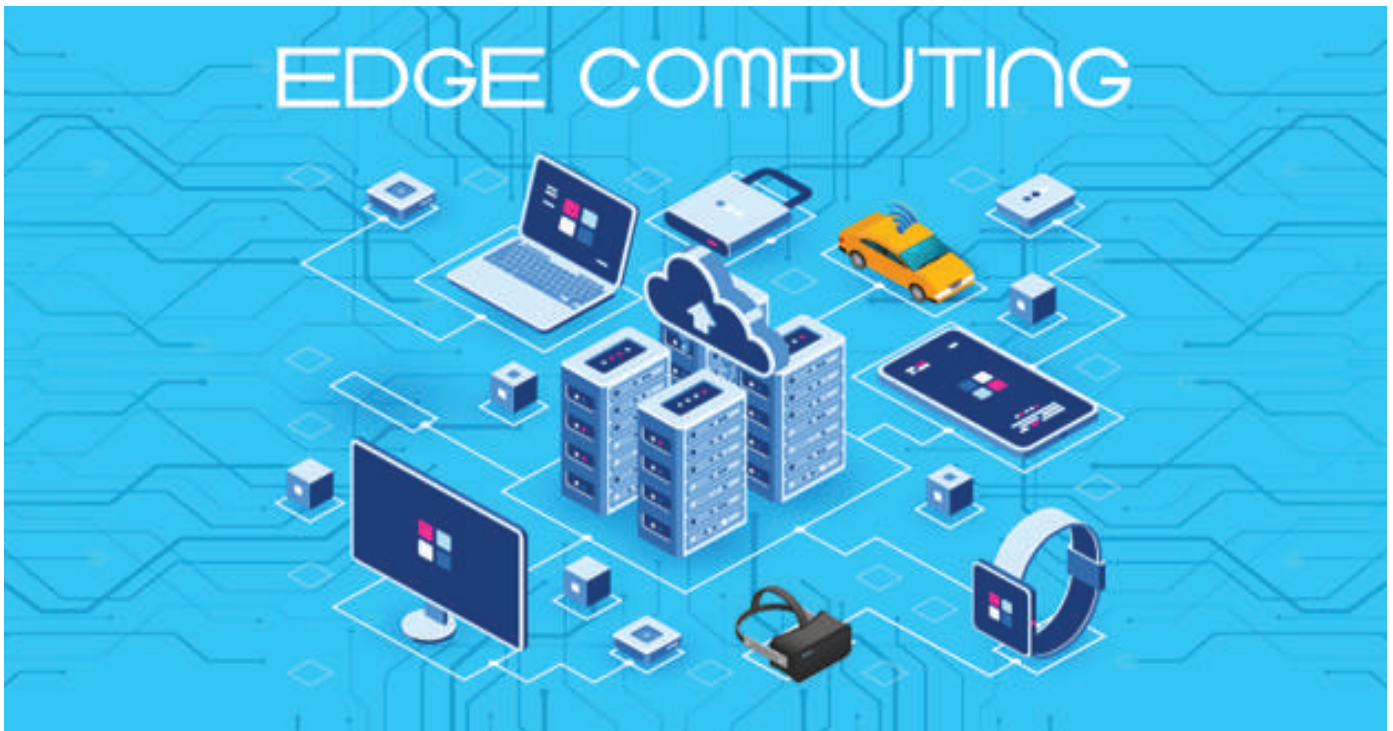
Quantum Computing:

Quantum computing, leveraging the principles of quantum mechanics, holds the key to solving complex problems beyond the reach of traditional computers. By harnessing the power of qubits and phenomena like superposition and entanglement, quantum computers offer exponential computational capabilities with far-reaching implications. From cryptography and scientific research to space exploration, quantum computing promises to redefine the boundaries of human knowledge and capability.



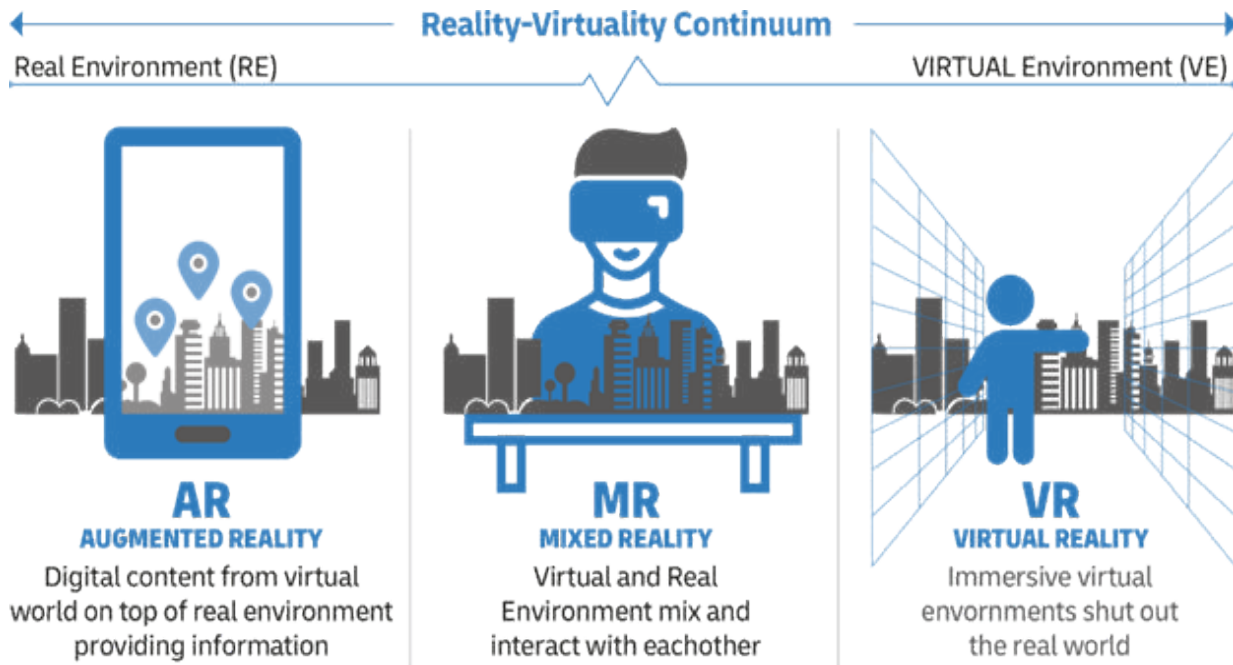
Edge Computing:

Edge computing, characterized by decentralized data processing at the network's periphery, represents a paradigm shift in computing architecture. By bringing computation closer to the data source, edge computing minimizes latency, enhances security, and enables real-time analytics. With applications spanning healthcare, energy management, and environmental monitoring, edge computing emerges as a critical enabler of the Internet of Things (IoT) and digital transformation initiatives.



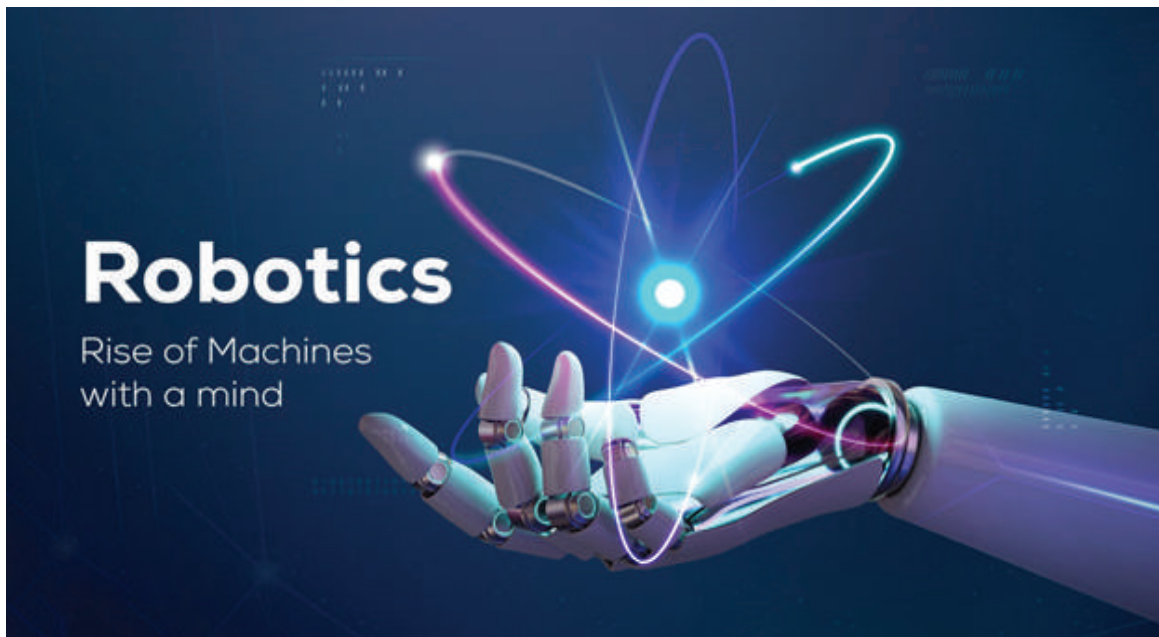
Wearable Technology: Virtual, Augmented, and Mixed Reality (VR/AR/MR):

Wearable technology, encompassing a range of devices from smartwatches to AR glasses, transcends traditional boundaries, blending fashion with functionality. Beyond enhancing fitness tracking and entertainment experiences, wearables hold immense potential in healthcare, enabling remote patient monitoring, disease diagnosis, and intervention. Moreover, their integration into education and gaming landscapes promises immersive learning experiences and interactive gameplay, driving innovation in these domains.



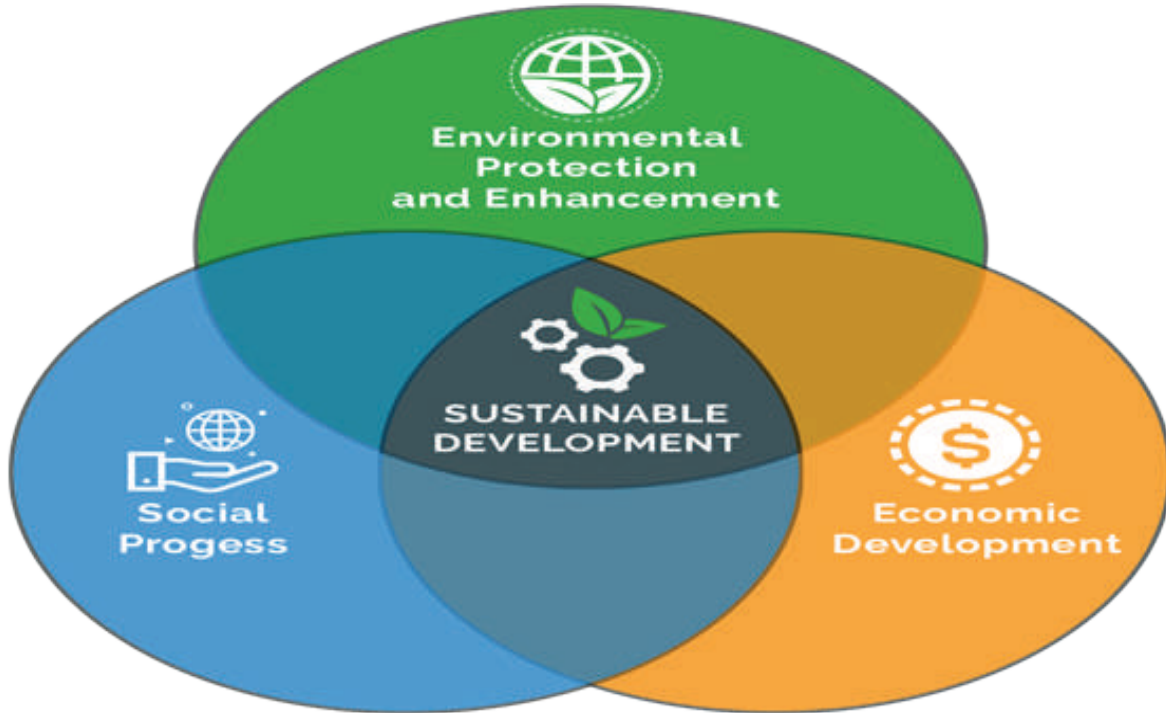
Robotics:

Advancements in robotics, fueled by AI and machine learning, herald a future where intelligent machines collaborate seamlessly with humans. From humanoid robots like Ameca and Sophia to swarm robotics for agricultural tasks, robotics technologies are poised to revolutionize industries and augment human capabilities. However, ethical considerations surrounding data security and privacy underscore the importance of responsible AI governance.



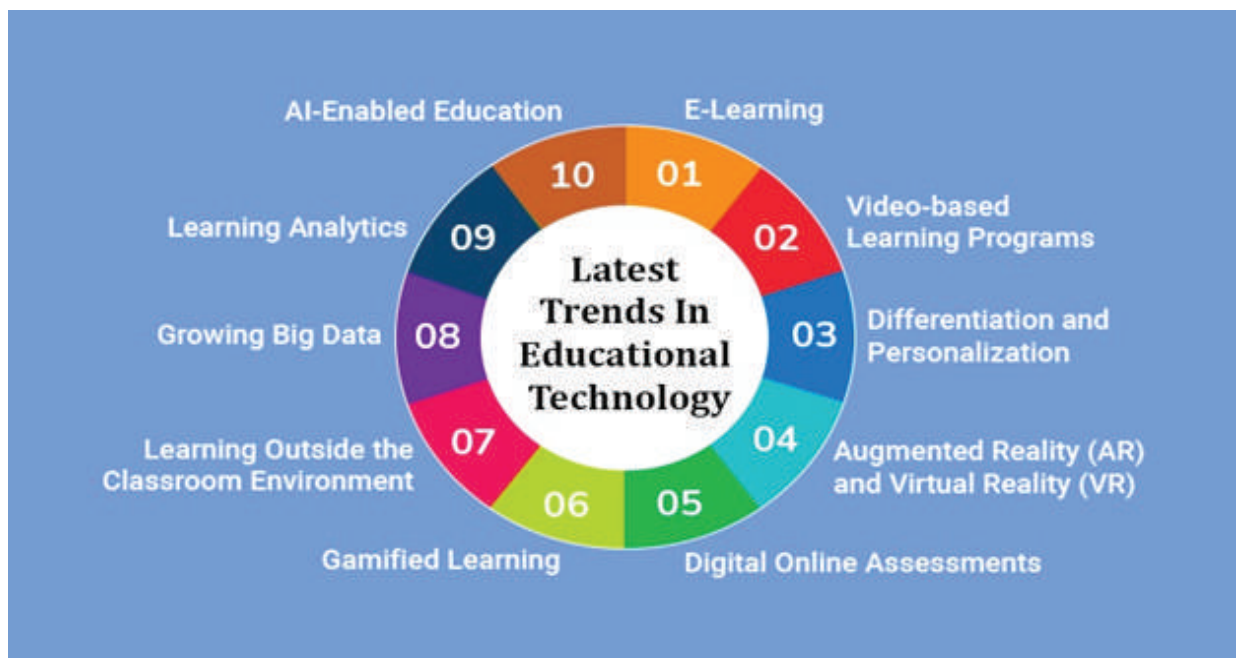
Sustainability:

In an era of escalating environmental challenges, technology emerges as a catalyst for sustainability-driven innovation. From electric vehicles to renewable energy solutions and carbon-neutral data centers, technology plays a pivotal role in mitigating climate change and promoting resource efficiency. By embracing sustainable practices across industries, we can pave the way for a greener, more resilient future.



Technology Trends in Education:

The digitization of education is reshaping learning paradigms, fostering personalized, interactive learning experiences. From adaptive learning platforms to gamification and microlearning, technology empowers educators to cater to diverse learner needs and transcend traditional classroom boundaries. As education transcends geographical constraints, ensuring digital safety and parental engagement becomes paramount.



Cloud Security:

As data increasingly migrates to the cloud, ensuring robust security measures is imperative to safeguarding sensitive information. Cloud security technologies, encompassing encryption, multi-factor authentication, and threat detection mechanisms, play a crucial role in mitigating cyber threats and ensuring data integrity. Moreover, with the proliferation of IoT devices, securing interconnected systems is paramount to prevent data breaches and privacy violations.



Cybersecurity Management:

As cyber threats proliferate, organizations must adopt proactive cybersecurity strategies to safeguard against evolving threats. From passwordless authentication to privileged access management and compliance with data protection regulations, cybersecurity management frameworks are essential for protecting sensitive data and mitigating cyber risks. Moreover, fostering a culture of cybersecurity awareness and training is critical to building resilience against cyber-attacks.



The Future of Artificial Intelligence (AI):

Artificial Intelligence (AI) continues to drive innovation across industries, shaping the trajectory of technological advancement. As AI permeates every facet of our lives, ethical considerations surrounding data privacy, bias mitigation, and AI governance become paramount. By harnessing the transformative potential of AI while upholding ethical principles, we can unlock a future where technology serves humanity's collective welfare.



Conclusion:

As we stand on the cusp of a technological revolution, the future beckons with promise and possibility. From AI-driven innovations to sustainable solutions and transformative educational paradigms, the trajectory of our future is shaped by the convergence of cutting-edge technologies. Yet, amidst the excitement of progress, ethical considerations and responsible stewardship of technology must remain central to our endeavors. By embracing innovation while upholding ethical standards, we can navigate the complexities of tomorrow and build a future that enriches human lives and sustains the planet for generations to come.

Safety Management

Engr. Hafizur Rhaman, P.Eng
President of OBS -IEB

Before the industrialization started, the economy and businesses were based on agriculture. Farm products were produced, processed and marketed manually. Scientific inventions such as, steam engines, internal combustion engines, electricity etc made a huge change in this arena. Mechanization took place and machines gradually replaced the human labour. But people at this stage were not much trained technically or knowledgeable enough to handle the machines. As the machines at this stage were not very critical or huge, accidents were frequent but were limited with mainly human casualties, and no property or environmental damage.

Gradually industries were developed with complex chemical processes, high severity operation, and complicated machineries to produce improved and modified products and to have better yields—In present days industrial accidents result in high dimensional personal injuries, death, property & environmental damage.

What is Safety?

Safety of a person may be defined as “the minimization of contact between human and hazard and is predominantly concerned with the prevention of physical harm (injury) to a person.”

Safety of the plant means “safe operation of all equipment, safe activities of working persons, safe storage of raw materials and products.”

In a broader aspect safety refers to guidelines and efforts to keep people unharmed, to secure assets, to have un-interrupted productions, and to protect the environment.

Historical Perspective of Safety Philosophy:

The history of the accidents is as old as civilization. But the establishment of a Safety culture and growing awareness in industries has only recently been explored. Most of the employees have no idea about industrial hazards and are less bothered about safety. They have the misconception that the safety aspects are the sole responsibility of the management. Even private entrepreneurs have the conception that safety is an additional burden and safety aspects should not be ventilated much at the mass level of workers. They consider safety as the personal safety of people only, they do not consider the total safety of their plant assets. Some traditional ideas of safety are described below:

- a) The deterministic approach “the operator will work correctly and punished if he does not.”
- b) Safety is a separate issue and not to be integrated with maintenance, operation, and other industrial activities.
- c) If sufficient instrumentation is installed in a plant, process operators become less important and will be less dutiful/responsible.
- d) Safe working merely requires established rules and criteria to be followed. Individuals should take care of their safety.
- e) If people are much more educated about the hazards of the work situation, they may be more cautious, and overall efficiency may fall.
- f) If, safety matters are more exposed, the labor union may have upper hand to bargain.

Recent Developments:

In many industries, these beliefs still exist, despite evidence to the contrary. More successful recent approaches to safe operation have followed a “human factor” or “behavioral approach” and a new set of safety principles have been defined.



As applied to the process industries these are: -

- a) Safety should be like other managerial functions (setting goals-then planning, organizing, motivating, implementing and then monitoring to achieve goal).
- b) Certain types of activity are more likely to cause accidents:-
 - Unusual or non-routine activities.
 - Nonproductive activities.
 - Construction and unscheduled maintenance activities.
- c) Safety personnel must take a pro-active approach by:-
 - Searching for the root causes of accidents and
 - Establishing procedures to reduce the chance of accidents or not having the same type of accident again.
- d) The causes of unsafe behavior can be recorded, analyzed and changes made to minimize the chance of reoccurrence.
- e) In many cases, the changes highlighted above are part of normal human behavior.
- f) There are three essential elements in an employee safety system:
 - The physical (Safety equipment, tools , machines , facilities, personnel, office etc)
 - The managerial (Safety regulations, training, incentive plan etc.)
 - The cultural (Safety practice at all level & for all)
- g) There is no single correct way to achieve safety in an organization but the following aspects are all essential for achieving safety:-
 - Involve supervisors and make them accountable
 - Involve management at all levels
 - Senior management must demonstrate commitment
 - Be flexible
 - Be perceived as positive

Why safety?

Safety program becomes an integral part and obligatory item of industrial operation now a day, because of the following aspects.

1. Moral or ethical obligation
2. Legal obligation
3. Financial obligation
4. Corporate reputation
5. Buyer's requirement

1. Moral or Ethical obligation:

Entrepreneurs or the management people employ the employees for different jobs of the company and ultimately they become integral part of the organization. Management feels the moral obligation to safe-guard her employees from hazards or accidents.

2. Legal obligation:

Government has introduced certain laws and acts to protect her citizens working in industries & enterprises. There are some government agencies, who imposes certain rules/procedure for safe operations and monitor such activities. They also impose fines or restriction on unsafe activities.

3. Financial obligation:

Accident has various implications. Losses due to medical expenses, workers compensation, degraded morality of workers, loss of materials, equipment & properties, down time of production etc which incurs huge involvement of money. It is beyond doubt that it is less costly to establish and run a effective safety program rather than to happen accident frequently.

4. Corporate Reputation:

Reputation and goodwill of a company is a valuable asset of an enterprise. Safe & uninterrupted operation of a business ensures steadiness & peace in the organization and also confidence to the consumers.

5. Buyer's requirement:

Sometimes buyer imposes safety requirement at production level to fulfill the satisfaction of their own customers as for example- RMG industries.

Safety and Productivity



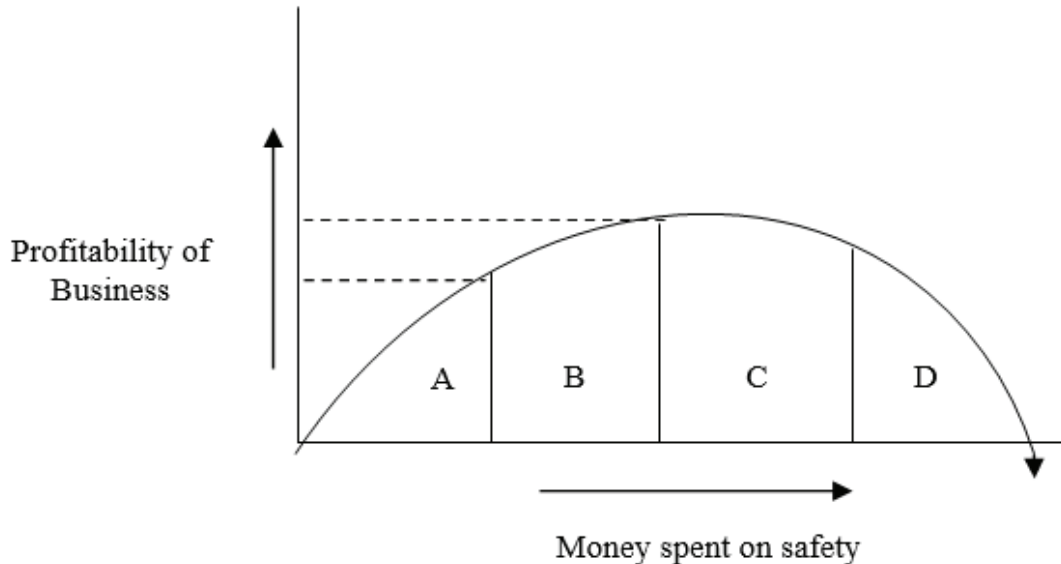
Safety is an important criterion for increasing productivity

- **Uninterrupted production**
- **Keep people moral high**
- **No unplanned shut-down & production loss**
- **Better Labor-management relationship**

Safety aspects- where to stand?

Peter Ducker in his book of “The Practice of management” makes the point that *management must always in every decision and action, put economic performances first. It can only justify its existence and authority by the economic results it produces.*

So management/owner intention is to be in the business through successful financial performances and also desires to save their people, property and environment through sincere efforts. To ensure safety, it is essential to achieve and maintain high standards of plant integrity through good design, reliable procurements, proper installation, expert operation and justified maintenance. Safety requires efforts to eliminate potential hazards at every stage of plant life. But it is quite obvious that all the hazards of the plant are not possible / not viable to eliminate. Modifying plant design and installing more safety devices no doubt ensures more safety of the plant but all these also incur money investment. Project cost is a vital factor of a business as it affects the product cost and increases financial liabilities. On the other hand because of better safety system, the plant operates uninterruptedly at lower maintenance cost and compensation or medical expenses. So with minimum accident incidents & interruption in plant operation there would be more revenue income. So investment in safety has both positive and negative implication. So “where to stand with safety aspects?” Following diagram provide a guideline to adopt or follow a safety program. Here we see that the relation between money return in business and money spent on safety does not always move positive and is not linear.



A: Safety is a good business:

This is the condition when plant has no safety measures in consideration. Efforts in implementing safety program provide a good return to the business. Safety measures against the major accident events, such as plant blow-up or frequent disruption in operation etc will save a line share of losses. Minor accidents like personal injuries may prevail in normal operation.

B: Safety is a poor business:

There is further scope of saving money by preventing accident losses/unplanned stoppage loss. Money invested for safety will have a return rate but will not be as much as earlier. The slope of the investment & return curve in this segment will not be much steeper as that of previous case. Some portion of money will be back but not as much as it will be' if spent other wise.

C: Safety is a bad business but good humanity:

Money is spent so much that people do not get hurt and company does not expect to get any material profit back in return for safe plant operation. Safety becomes more important than the business. Accident loss prevention return will not cover the investment for safety.

D: Out of business:

So much money is spent to achieve an ideal and perfect safety program that management has forgotten business goal – to earn profit, ultimately organization will go for closure.

So, management should consider safety as a part of the business activities and investment for this purpose should have reasonable return also. Because organization establish their existence and command by performing financial successfulness while operating.

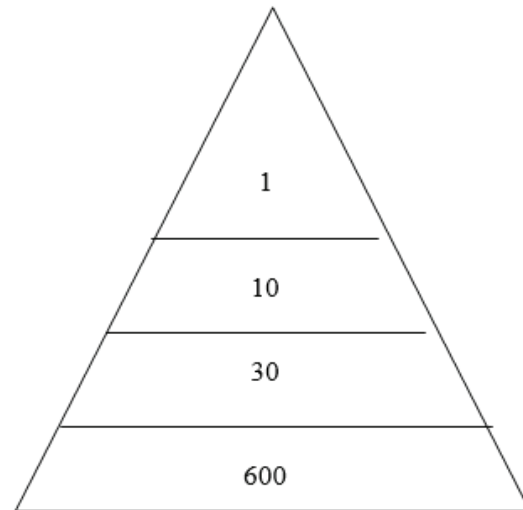
The Safety Triangle:

Several studies show that there is a “triangular” relationship between the frequency of minor incidents and major ones. In other words, for each major accident there will be many minor accidents and even more incidents which do not result in injury at all. Actually minor accidents informs or alarms for the major accidents to come.

It is therefore obvious that by preventing minor incidents occurring the chance of a major accident happening may be reduced.

Frank E Bird, Jr. made an analysis of 1,753,498 accident reported by 297 co-operative companies. He found a ratio relationship between minor & major accidents events.

- 1 Serious or disabling injury
- 10 Minor Injuries
- 30 Property damage accident
- 600 Incident with no visible injury or damage.



Safety Committee:

Each industry should have a safety committee, the size of which will depend upon the complexity of the operation. It should be in a position to advise the management on the technical and legal aspects of safety and to provide a stimulus for improving safety performance by training programs and safety campaigns.

Safety Management:

In recent years actually a lot of terms relating to safety have emerged which are very similar and they are termed as “accident prevention”, “loss prevention”, “loss control”, “safety engineering”, “safety management” etc. “Safety management” seems to be the most widely accepted and used by the safety professionals.

When viewed from a broader perspective “Safety management may defined as a concern for safe equipment and process design, safe work methods design, promotion of safety awareness from an individual and organizational stand point, education in safety at all levels in the organization, managerial & financial support for the moral and ethical responsibility that underline any successful safety program”

Activities of Safety Management:

Five events may be classified from the above definition of safety management. They are

- (i) Safe Equipment and Process Design.
- (ii) Safe Work Method Design.
- (iii) Promotion of safety awareness from an individual and organizational stand point.
- (iv) Education in Safety at all levels in the Organization and
- (v) Managerial and financial support for the moral and ethical responsibilities.

(i) Safe Equipment and Process Design:

“Prevention is better than cure” is an old say and is widely used. Many and most of the accident now a day happen due to equipment or process failure in addition to human failures. Reliable equipment, with the efficient and economic process operation leads to high productivity of a plant and ensures safety.

Every installation, during its construction, four aspects are to be studied thoroughly and minutely by a group of specialist people, that is by Project Management Team (PMT) to ensure safety of the plant, people, neighboring community and the environment and these are: (a) Plant layout, design perspective, piping and instrumentation diagram. (b) Equipment and material specifications. (c) Process chemistry (process flow diagram & chemistry of all materials) and (d) Maintenance scope, safety & fire protection system.

(1) (a) Plant lay-out design is made on the basis of the project concept paper (PCP) and other information as provided by PMT or owner. This is the primary and most priority event in respect of safety aspect and equipment, machines, vessels, piping etc should be placed in such a manner in plant lay-out design that required safe distances are maintained, operational and maintenance flexibility and easiness are to be ensured, one minor failure event should not indulge other events to occur. Fire networks and fail-safe interlocks and monitors are provided in the proper location.

(b) P&I diagram should be thoroughly studied so that piping and instrumentation are adequate and properly placed. Consequences of Power and each instrument failure are to be studied carefully and proper facilities are to be provided to exclude serious events, if necessary safe interlocking system should be provided.

One thing to keep in minds that to make a plant totally safe & to provide good operation and maintenance facilities etc will incur money. Huge project costs will not make the business viable, so there should be a compromise between the capital investment and safe - efficient plant design.

(2) Equipment failure not only disrupts the operation of a process but also cause serious accident events. Specification of equipment, machines and materials to be prepared following the relevant standard and codes (API, ASTM, ASME NFPA, NEC, IEC, IP, TEMA etc.). They should be procured from reliable vendors or manufacturer. Their installation and fabrication should follow proper procedure.

(3) A comprehensive study of the process flow diagram are to be carried to evaluate the extent of hazard from the raw material, intermediate products, products, catalyst and other inhibitors, waste etc at different condition of the process. To ascertain this, chemistry of each process, which materials of the process stream is flammable or toxic? How readily they may be ignited or detonated? Fast like gunpowder or slow like a smoldering cigarette? What will be their burning and heat dissipation rate? How much combustible or toxic materials will be exposed during the failure event? Are there any materials, which have radiation effect? All these studies will assess the extent, type and location of process hazard. PMT in cooperation with the designer and consultant will try to exclude major events of hazards and provide safety system & operational procedure for the unavoidable minor events.

(4) Proper fire water piping, fire water reserve, fire pumps, fume and gas detection system, alarm system, fire extinguishers, foam trailers, fire truck etc are to be provide on the basis of the merit of the hazard existed in the plant. There should be proper approach for fighting to the hazard prone areas. NFPA is a proper handbook to follow for fire events.

One prime and important factor for safety management is to be remembered that during commissioning of new plant many modifications are often made and some times revamping of old plants are done, but in each case proper safety study must be carried and changes must be recorded in the concern drawings and record book.

(ii) Safe Work Method Design:

Various types of works are executed by an individual or by a group of people for plant operation & maintenance, also at the time of plant/equipment installation. Their style and standard of work might be different and may not match with the equipment or environmental requirement, which may result in accident. Safe work procedure for every job should be designed by specialists on the basis of certain standards, code, vendors, instruction, own experience etc. Work executor must follow the procedure as specified or designed. Proper supervisions by the management staffs will ensure that proper work procedure is followed.

“All the technologies of the world will be useless if we do not follow the norms.”

(iii) Promotion of safety awareness from an individual and organizational stand point:

Safety awareness places a vital role in accident prevention program of an organization. Organizations having successful safety programs invariably have a strong management commitment to safety. “People never plan to fail but usually fail to plan”. Management must have proper planning for growing safety awareness all level of workers, staffs and officers. There should be a safety department in the organization responsible for all safety activities.

Safety committee comprising of people from safety department, specialist and workers representative may be formed for formulating new safety regulations, performing safety audit, safety performance review etc.

(iv) Education in safety at all level in the organization:

“People will make mistake as they have not proper to be infallible.” On the other hand “Hazard analysis recognized that all the hazards can not be eliminated totally.” So it is obvious that there is a chance of people for making a mistake and hazards exist in the plant to trigger an accident. One thing we must remember that the behavior of people cause or prevent accident. If the behaviors of people are modified to improve their safety awareness, accident prevention could be successfully managed. Proper selection of worker/ staff/ supervisor, necessary training for the job, educating them about hazard and safety will undoubtedly improve the safety management system.

(v) Managerial and financial support for the moral and ethical responsibilities that underline any successful safety program:

The basic causes of accident are poor management policies and decisions, in addition to personal and environmental factors. To establish a good safety management program need to have a well-designed plant, proper equipment, training, placement of manpower, equipment & material purchase policy, safety awareness and high moral of employee’s etc.

All these activities as stated above will be ineffective without managerial and financial support. So there should be adequate budget allocation to move with a sound and effective safety program, which is planned, set and practiced by proper management.

Elements and characteristic of a safety management system:



Legal Frame Works for Safety & Health in Bangladesh

Industrial safety regulations in Bangladesh generally deal with the worker's health and safety. Unfortunately, the rules are not adequate and are not updated properly. The main instrument of such legislation are Bangladesh Labour Act. 2006.

The office of the Chief Inspector (explosive), chief inspector (factories) & Chief Boiler Inspector deal & control with some aspect of factory design & operational safety.

Government policy makers and Industrial entrepreneurs do not properly care for and promote safety aspect in Bangladesh. The most inspiring thing is that recently Institution of Engineers, Bangladesh has set up a committee in the name of the "Industrial Safety Board of Bangladesh" with safety professionals of different organizations & discipline. The committee has already started working by doing seminars; workshops etc & are ready to give all sorts of safety related support to interested concerns.

Conclusion:

Safety management is an integrated effort and requires management at all levels for a successful implementations and practice. Workers' participation in formulating safety policy of the organization and their role in implementing these policies at work place has a great importance. Present day philosophy of managing a concern of business is participative management. An effective safety committee can improve the general safety standards of the organization, thus preventing accident incidence. This ultimately establish better understanding between workers and management people, less down time of production, less maintenance cost, Confidence of the customer etc. all of which directly promote productivity and profit of the enterprise. More profit better incentive plan and welfare activities for the employees.

The establishment of a good safety culture is a complex task. But to achieve best performance from the employee the company must establish positive safety culture. The safety culture is a fragile entity-it takes time to establish but that can easily be damaged if not adequately cared for.

Book of reference:

- 1) Risk Management Report for ERL - Johnson & Higgins
- 2) Basic Philosophy of Accident Prevention – ILO

Photo Gallery



Chief Editor Engr. Rafiqul Islam, with Dr. Prof. Ainun Nishat



Chief Editor Engr. Rafiqul Islam and Editorial Board Member Engr. Al Emran with IEB President Engr. Abus Sabur, MP



Editorial Board Member Engr. Al Emran with Dr. Prof. Ainun Nishat



Chief Editor Engr. Rafiqul Islam with Dr. Naser, DFO, Khulna Division



Chief Editor Engr. Rafiqul Islam with Bangladesh Ambassador in UAE HE Mohammed Abu Zafar

News Updates

IEB Declares Overseas Committee for UAE



IEB HQ circulates UAE Overseas Committee for 2023-2025 tenure through Office Order vide no.: HQ/IEB/Sub-Centre/AA-65 (6)/2024/1315 dated 04.05.2024. The Committee embodies twenty-two members with **Engr. Maniruz Zaman Sarkar Mohan** F/12900 as Chairman and **Engr. Md. Mominul Islam Manik** F/13711 as Secretary while **Engr. Rafiqul Islam Talukder**, P.Eng F/ 3808 (life) remains as Vice-Chairman.

Dignified members among others represent this committee like **Engr. Md. Abu Zafar Chowdhury**, CIP M/05557, **Engr. Md. Moazzem Hossain**, F/08444, President Bangladesh Association, UAE and Advisor BEAWORLD, **Engr. Liaquat Ali Khan**, F/ 6975 President NRB Engineers, Dubai. **Engr. Md. Shahidul Islam**, M/12224, Advisor, BEAWORLD.

Condolence message from BEAWorld for passing of Sheikh Tahnoun bin Mohamed Al Nahyan

On behalf of BEAWorld, we extend our deepest condolences on the passing of Sheikh Tahnoun bin Mohamed Al Nahyan, Abu Dhabi Ruler's Representative in Al Ain Region. His departure leaves a profound void not only in the hearts of his loved ones but also within all communities in this region, where his influence and leadership were deeply felt.

Sheikh Tahnoun's visionary outlook and unwavering commitment to progress have been an inspiration to all of us. His support for innovation, technology, and infrastructure development has played a pivotal role in shaping the landscape of the industry and driving advancements that benefit society as a whole.

Beyond his remarkable contributions to this region, Sheikh Tahnoun will be remembered for his compassion, humility, and profound generosity. His unwavering support for engineering education, research, and development has empowered countless individuals to pursue their passions and make meaningful contributions to society.

During this time of profound loss, we extend our deepest condolences to Sheikh Tahnoun's family, loved ones, and the people of the United Arab Emirates. May they find comfort in the knowledge that his legacy will live on in the countless lives he has touched and the enduring impact he has had on our profession and the world.

As we bid farewell to a beloved leader and visionary, let us honor Sheikh Tahnoun's memory by continuing to pursue excellence, innovation, and service in everything we do. His legacy will continue to inspire and guide us as we work together to address the challenges facing our world and create a brighter future for all.

In remembrance of Sheikh Tahnoun bin Mohamed Al Nahyan, may his soul rest in eternal peace, and may his legacy continue to inspire generations of professionals to come.

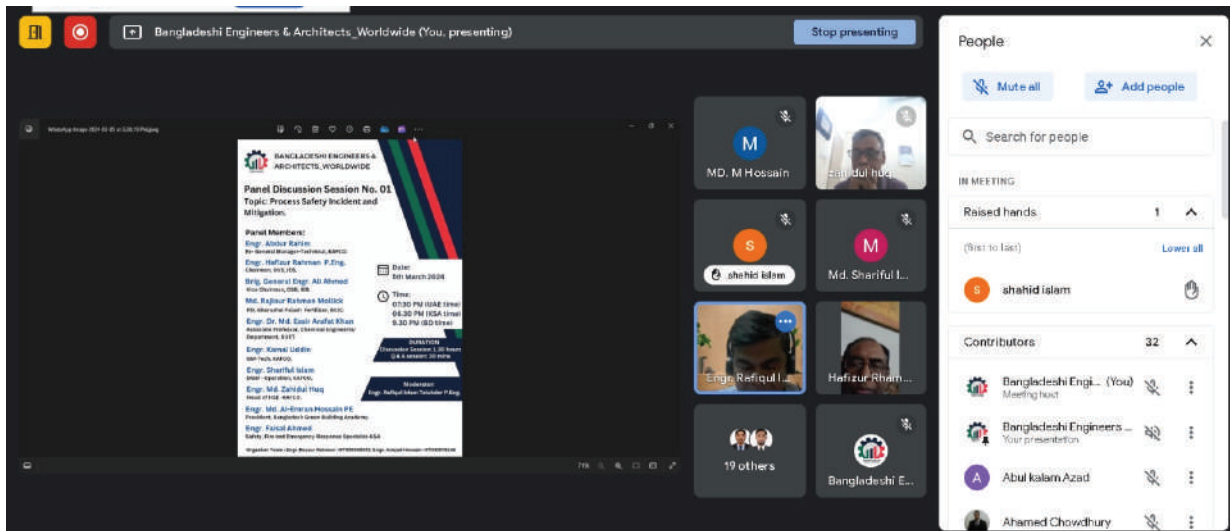
Regards.

On behalf of
Bangladeshi Engineers & Architects, Worldwide (BEAWorld)



News Updates

Panel Discussion Recap



Recently, a panel discussion titled "**Process Safety Incident and Mitigation**" was held, bringing together industry leaders and experts to explore essential safety protocols and strategies for managing process safety incidents. Here are the details and main insights from the discussion:

Panel Discussion Overview:

Topic: Process Safety Incident and Mitigation

Moderator: Engr. Rafiqul Islam Talukder, P.Eng

Panel Members and Their Contributions:

1. **Engr. Hafizur Rahman P.Eng** - Chairman, OSB, IEB Highlighted regulatory frameworks and the importance of compliance for safety.
2. **Brig. General Engr. Ali Ahmed** - Vice Chairman, OSB, IEB Focused on military precision and discipline in safety protocols.
3. **Engr. Dr. Md. Easir Arafat Khan** - Associate Professor, Chemical Engineering Dept, BUET Introduced new research findings related to chemical process safety.
4. **Engr. Kamal Uddin** - GM-TECH, KAFCO Discussed technological advances in safety equipment and systems.
5. **Engr. Md. Zahidul Huq** - Head of HSE, KAFCO Emphasized health, safety, and environmental strategies in workplace safety.
6. **Engr. Md. Al-Emran Hossain PE** - President, Bangladesh Green Building Academy Addressed building safety and sustainable construction practices.
7. **Engr. Faisal Ahmed** - Fire & Emergency Response Specialist, KSA Shared international best practices and innovations in emergency response.

Key Takeaways:

The panel discussion underscored the importance of a holistic approach to process safety, involving technological, regulatory, and personnel-focused strategies. The insights shared by our esteemed panel members provided valuable guidance for improving safety measures across industries.

Stay tuned for additional events where we will explore more important topics, guided by insights from industry experts.

News Updates

Knowledge Sharing Sessions Recap

The group has successfully arranged numerous knowledge-sharing sessions in a short period of time. We are excited to share highlights from past Knowledge Sharing Sessions. These sessions united experts from various fields to discuss key issues and advancements in construction, technology, and safety. Here's a recap of some insightful presentations:

Past Sessions Recap:

1. Overview of Quality Management System in Construction Projects

Date: July 7, 2023

Speaker: Engr. Shamiul Islam, QA/QC Manager, ECC

A comprehensive review of quality management practices essential for construction project success.

2. Medium and High Voltage Switchgear Operational Interlock

Date: July 15, 2023

Speaker: Engr. Md. Abdul Latif (AADC)

An exploration of mechanical and electrical interlocks for switchgear safety and functionality.

3. BIM and MEP-Fundamental Overview

Date: July 21, 2023

Speaker: Engr. Md Ashraful Alam, Lead MEP Engineer

Insights into Building Information Modeling and its critical role in MEP planning and execution.

4. FOC and Advancement of Photonic Crystal Fibers in Fiber Industry

Date: July 28, 2023

Speaker: Dr. Md. Anwar Hossain, Professor of EEE, BUBT

Discussion on the latest advancements in fiber optics and their applications in the fiber industry.

5. Safety Risk and Mitigation

Date: August 4, 2023

Speaker: Engr. Rafiqul Islam Talukder, Vice Chairman, Occupational Safety Board

Key strategies and measures to mitigate safety risks in engineering projects.

6. Climate Resilient Transport Infrastructures

Date: August 9, 2023

Speaker: Dr. Mohammad Shariful Islam, Professor, Department of Civil Engineering, BUET

This session explored strategies to enhance the resilience of transport infrastructure against climatic challenges, emphasizing adaptive and sustainable engineering practices.

7. Infrastructure Master Plan - Initiation & Execution in the Whole Life Cycle of a Development

Date: August 18, 2023

Speaker: Engr. A K M Nizam, Head of Utilities (Infrastructure), ACE International Consultant, UAE

An in-depth look at the stages of infrastructure planning and execution, focusing on long-term development impacts and sustainability.

8. A Brief History of AI and Its Bold Future

Date: August 24, 2023

Speaker: Dr. M. Mehedy Masud, Professor, College of IT, UAE University

This presentation covered the evolution of artificial intelligence and projected its future impacts on technology, work, and society.

9. QA/QC Testing Requirements in Construction Projects

Date: September 8, 2023

Speaker: Engr. Shamiul Islam, QA/QC Manager, ECC

Insights into the critical quality assurance and control tests necessary for ensuring the integrity and safety of construction projects.

10. Construction of Bangabandhu Sheikh Mujibur Rahman Tunnel

Date: September 24, 2023

Speaker: Dr. Hossain Md. Shahin, Dept. of Civil and Environmental Engineering, IUT

A detailed review of the engineering challenges and solutions in constructing this major infrastructure landmark.

11. Line Differential Protection with Backup Distance

Date: October 6, 2023

Speaker: Engr. Md. Abdul Latif, AADC, UAE

Discussion on the implementation of line differential protection systems and their importance in maintaining the reliability of electrical networks.

12. Electro-Mechanical System in the Healthcare Construction

Date: October 20, 2023

Speaker: Mohd. Gofran, Lead Engineer, AJ Consultants, Saudi Arabia

An overview of the integration of electro-mechanical systems in healthcare facilities, focusing on the unique requirements and standards for medical environments.

13. Green Building Concept & Integrative Strategies

Date: November 3, 2023

Speaker: Engr. Md. Al-Emran Hossain PE, President, Bangladesh

Green Building Academy An in-depth discussion on sustainable building practices and the integration of green technologies in modern construction.

14. Project Supervision and Monitoring Techniques

Date: November 17, 2023

Speaker: Dr. Abu Naser Chowdhury, Superintending Engineer, PWD, Bogura

Expert advice on effective project management strategies and tools for supervising large-scale projects.

15. Medium Voltage Cable Construction & Fault Finding in Electrical Network

Date: December 1, 2023

Speaker: Engr. Md Hassan Ali, Assistant Manager, DEWA

Techniques and challenges in constructing medium voltage cables, along with practical solutions for troubleshooting.

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12. Electro-Mechanical System in the Healthcare Construction

Date: October 20, 2023

Speaker: Mohd. Gofran, Lead Engineer, AJ Consultants, Saudi Arabia

An overview of the integration of electro-mechanical systems in healthcare facilities, focusing on the unique requirements and standards for medical environments.

13. Green Building Concept & Integrative Strategies

Date: November 3, 2023

Speaker: Engr. Md. Al-Emran Hossain PE, President, Bangladesh

Green Building Academy An in-depth discussion on sustainable building practices and the integration of green technologies in modern construction.

14. Project Supervision and Monitoring Techniques

Date: November 17, 2023

Speaker: Dr. Abu Naser Chowdhury, Superintending Engineer, PWD, Bogura

Expert advice on effective project management strategies and tools for supervising large-scale projects.

15. Medium Voltage Cable Construction & Fault Finding in Electrical Network

Date: December 1, 2023

Speaker: Engr. Md Hassan Ali, Assistant Manager, DEWA

Techniques and challenges in constructing medium voltage cables, along with practical solutions for troubleshooting.

16. French & Its Importance in School & Professional Life

Date: December 17, 2023

Speakers: Professeur de français & Engr. Khaja Ahamed, D27 French Language Centre

The significance of learning French and its benefits in academic and professional settings.

17. Life and Safety in High Rise Buildings

Date: December 29, 2023

Speaker: Engr. Md. Al-Emran Hossain PE, President, Bangladesh Green Building Academy

Essential safety measures and life-saving protocols essential for high rise building management.

18. Cybersecurity 101: Prevalent Attacks and Defences

Date: January 12, 2024

Speaker: Dr. M. Mehedy Masud, Professor, College of IT, UAE University

A critical overview of common cybersecurity threats and the best practices for protecting digital infrastructures.

19. COP 28 and Bangladesh Perspective

Date: January 26, 2024

Speaker: Engr. Rafiqul Islam Talukder, Vice Chairman, Occupational Safety Board, IEB

A comprehensive look at the outcomes of COP 28 and their implications for Bangladesh, focusing on sustainable practices and policy changes.

20. Global Warming and Climate Change: Impacts over Bangladesh

Date: January 27, 2024

Speaker: Prof. Dr. Ainun Nishat, Former VC, BRAC University

Analysis of global warming effects specifically on Bangladesh, highlighting decisions made at COP 28 in Dubai and strategic responses.

21. How to Select a Portable Fire Extinguisher for Your Building?

Date: February 9, 2024

Speaker: Engr. Md. Al-Emran Hossain PE, President, Bangladesh Green Building Academy

Practical guidance on choosing the right fire extinguisher for different types of buildings, ensuring safety and compliance.

22. Significance of Earthquake Parameters in BNBC on the Design of Building Structures

Date: February 23, 2024

Speaker: Dr. Md. Khasro Miah, Professor, Department of Civil Engineering, DUET

A detailed discussion on the importance of considering earthquake parameters in the Bangladesh National Building Code for safer architectural designs.

23. Data Privacy in the Digital Age

Date: March 8, 2024

Speaker: Md Raihan Maruf, Data Privacy Manager, Robi Axiata Limited

Insights into the challenges of data privacy today, with strategies for protecting personal and corporate data in an increasingly digital world.

Upcoming Sessions

Be sure to check out our upcoming webinars for more opportunities to learn from industry leaders.

24. Complexity and Challenges of Construction Management: A Case Study of NSTC, Bangladesh by Dr. Abu Naser Chowdhury, Superintending Engineer, PWD, Bogura Circle.

Dr. Chowdhury will explore the intricate challenges faced in managing large-scale construction projects using NSTC, Bangladesh as a case study. This session will cover strategic approaches to project management, stakeholder engagement, and overcoming logistical hurdles in complex environments.

25. Generate Credit in Voluntary Carbon Market for an Option to Offset GHG and Economic Prosperity by Engr. Rafiqul Islam Talukder, P. Eng, Vice Chairman, Occupational Safety Board, IEB.

This webinar will discuss the mechanisms of the voluntary carbon market, focusing on how organizations can generate carbon credits as a strategy to offset greenhouse gas emissions while fostering economic prosperity. Engr. Talukder will provide insights into global carbon trading frameworks and practical steps for participating in these markets.

26. Basic Concept of UV Base Disinfection System for HVAC Systems by Engr. Md. Al-Emran Hossain PE, President, Bangladesh Green Building Academy.

Understanding the role and benefits of UV-based disinfection technologies in HVAC systems is crucial for maintaining healthy indoor environments. Engr. Hossain will outline the fundamental concepts, benefits, and implementation strategies of UV disinfection systems in modern building management.

For more information on future events or to access recordings of past sessions, please visit our website or group links.

News Updates

Knowledge Sharing Sessions Recap

Another highly praised event organized by the group is the Students' Leadership Sessions, designed to encourage dialogue among students on various critical topics. Each session is moderated by students who have shown exceptional leadership and a deep understanding of the subjects discussed.

Session Recaps:

1. Session 1: Introduction and Open Discussion

Date: September 1, 2023

Moderator: Abdullah Tahsin, Mechanical Engineering Student, De Montfort University, Dubai

The series kicked off with an open discussion, setting the stage for the themes and expectations of the upcoming sessions.

2. Session 2: Preparing for Success, Parental Impact, and Inclusive Education

Date: September 15, 2023

Topics discussed included strategies for academic success, the psychological impact of parental conflict, and the integration of autistic children into general education settings.

3. Session 3: Safety, Health, and Extracurricular Importance

Date: September 29, 2023

Moderator: Rayhan Ahmed, Al Ain Juniors School

This session emphasized the importance of obeying traffic rules, maintaining healthy eating habits, and the role of extracurricular activities in holistic student development.

4. Session 4: Friendship, Science and Technology, and Aspirations

Date: October 13, 2023

Moderator: Ragib Nihal Sadab, International School of Choueifat Discussions included the qualities of a good friend, the impacts of science and technology, and personal aspirations and dream jobs.

5. Session 5: Cultural Respect, Knowledge, and Reading Preferences

Date: October 27, 2023

Moderator: Abdullah Tahfim, Progressive English School

The importance of cultural respect, the value of general knowledge, and preferences between physical books and e-books were explored.

6. Session 6: Homework, Environmental Responsibility, and Time Management

Date: November 10, 2023

Moderator: Sariyah Bint Shamiul This session addressed the debate over daily homework, strategies for ensuring a green environment, and the critical skill of time management.

7. Session 7: Social Media, Teamwork, and Social Impacts of Technology

Date: November 24, 2023

Topics included the appropriateness of social media for children, the significance of teamwork, and whether technology is making people less social.

8. Session 1: Video Games, Humility, and Deforestation

Date: December 8, 2023

Moderator: Abrar Bin Murshed, Good Will Children PVT School, Abu Dhabi

Topics discussed included the impact of video games on children, the value of humility, and strategies to combat deforestation.

9. Session 2: AI, Respectful Disagreement, and Program Improvement

Date: December 22, 2023

Moderator: Rayhan Ahmed, Al Ain Juniors School

This session explored the ethical implications of artificial intelligence, the importance of respecting differing opinions, and ways to enhance the Bangladeshi Students' Leadership Building Program.

10. Session 3: Online Safety and the Role of Exams

Date: January 5, 2024

Moderator: Ragib Nihal Sadab, International School of Choueifat

Discussions focused on maintaining online safety, the significance of empathy, and a debate on whether exams should be eliminated until Grade 08.

11. Session 4: Team Leadership and Open-Mindedness

Date: January 19, 2024

Moderator: Abdullah Tahfim, Progressive English School

This session dealt with effective team formation and leadership, along with the necessity of open-mindedness in communication.

12. Session 5: The Value of Hard Work and Grit

Date: February 2, 2024

Moderator: Sariyah Bint Shamiul

A debate on whether hard work and perseverance are more crucial than innate talent for achieving success.

13. Session 6: Fairness and Community Building

Date: March 1, 2024

Moderator: Rapangel Arin Yana, Global English School

Topics included the importance of fairness and practical steps towards building a happier and more cohesive community.

14. Session 7: Social Media and Creativity

Date: March 15, 2024

Moderator: Sariyah Bint Shamiul, Rosary School

A lively debate on whether social media stifles creativity among young people.

15. Session 8: The Importance of Non-Academic Reading

Date: March 29, 2024

Moderator: Tahmeed Ahmed, Islamiya English School

Discussion on the importance of non-academic reading and presentation of influential books and their authors.

16. Overcoming Cognitive Biases

Date: April 19, 2024

Moderator: Abdullah Tahsin, 1st Year Student, Mechanical Engineering, De Montfort University, Dubai

Topics: Importance of Overcoming Cognitive Biases: Understanding the role of cognitive biases in shaping our perceptions and decisions.

Common Cognitive Biases: Discussion on two prevalent cognitive biases in our attitudes and effective strategies to mitigate their effects.

17. Cyberbullying Awareness and E-Safety for Teenagers

Date: April 21, 2024

Moderator: Radiah Mubasshira Khan Afsa, Grade 7, Islamiya English School, Abu Dhabi

18. The Risks of Cyberbullying: Exploring the impact of cyberbullying on teenagers and preventive measures.

Ensuring E-Safety: Practical tips and guidelines to ensure safety and security online for young internet users.

Feedback and Outcomes: The sessions were highly interactive and provided a platform for students to express their views, learn from each other, and develop leadership skills. Feedback from participants was overwhelmingly positive, highlighting the sessions' role in enhancing communication skills and broadening perspectives.

For more details about future sessions or to revisit the discussions, please visit our website or group links.

News Updates

Business Support Session Recap

A Business Support Session was recently held successfully, focusing on sustainable urban development. This event was a major opportunity for professionals engaged in city planning and ecological initiatives. Here is a summary of the session:

Session Recap:

Session Number: 1

Topic: "Greening KSA Cities Addressing Vision 2030" by Bangladeshi Community

Moderator: Engr. Rezaur Rahman (AECOM), (Pearl Qualified Professional, Estidama)

Presenter: Arch. Md. Ashraf Al Alam, Architect, Sustainability Consultant, entrepreneur Date: 22 October, 2023

Overview: Architect Md. Ashraf Al Alam led a compelling presentation on sustainable urban development within the Kingdom of Saudi Arabia. The discussion centred on aligning ecological restoration and green infrastructure projects with the ambitious goals of Vision 2030.

Key Takeaways:

Innovative Urban Design: The session highlighted innovative strategies to integrate green spaces into urban environments, enhancing both aesthetic appeal and ecological health.

Sustainable Practices: Sustainable solutions such as the implementation of vertical gardens, green roofs, and the preservation of natural water bodies were explored.

Community Engagement: Emphasis was placed on the critical role of community involvement in planning and sustaining urban development initiatives.

Feedback from Participants: The session received positive feedback, with attendees appreciating the practical examples and the opportunity to engage with a leading expert in the field of sustainability.

Stay tuned for more sessions like this as we continue to explore important topics with expert insights in our Business Support Series.