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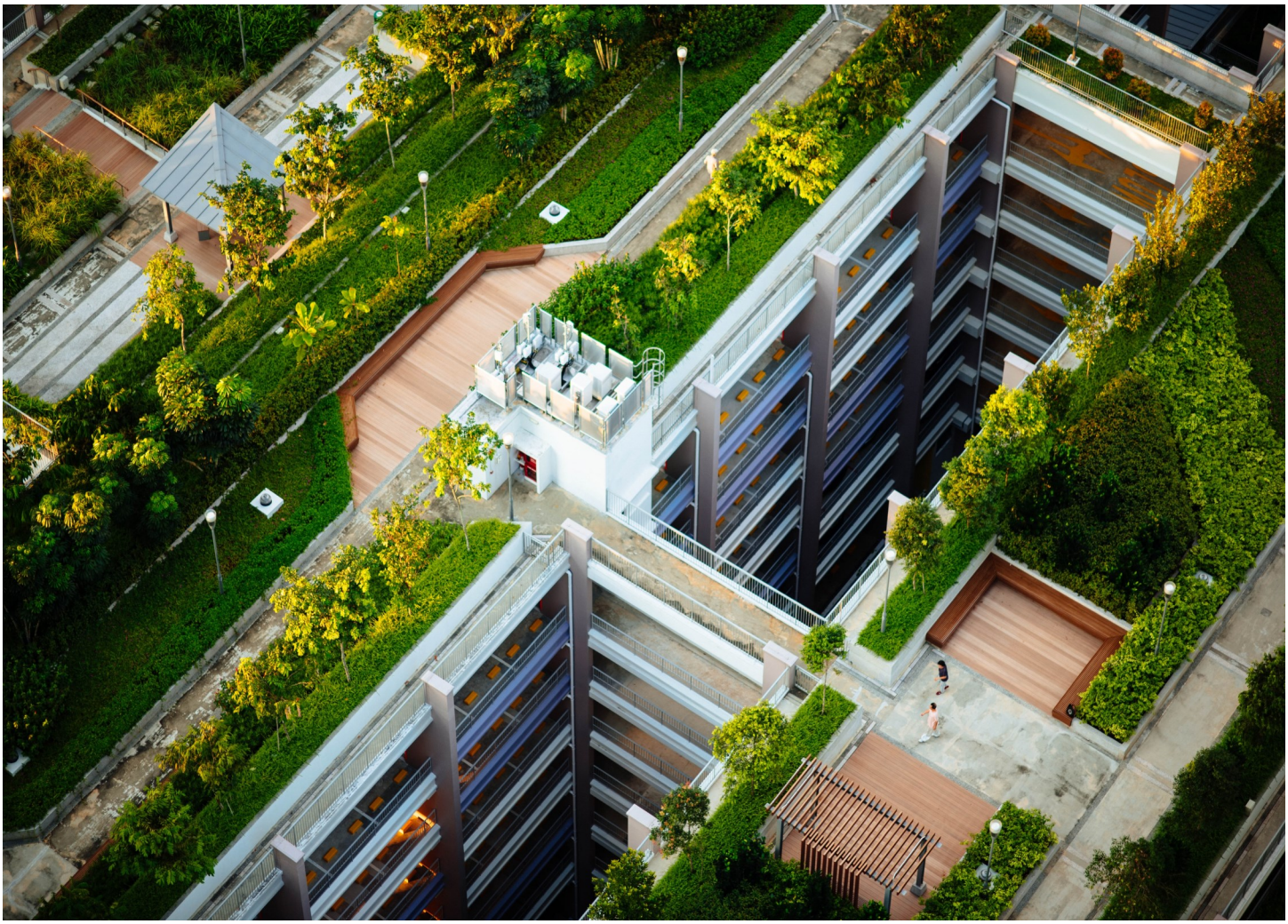
Green Technology for Green Earth:
Perspective of Bangladesh

Nadira Islam

Without green technology, it would be impossible to think of sustainable world or future mankind. Social equitability, economic feasibility and environmental sustainability are the key parameters for green technologies. Specially, in developing countries which mainly focused on how these technology worked to conserve nature and how they are benefited.

In the past few years, Bangladesh has been going through a digital revolution. Its economy is growing at 7%, and soon we'll be citizens of a middle-income country. However, as old industries like readymade gar-



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ments and fisheries grow, and new industries like ICT emerge, one big concern remains: how do we balance high economic and technological growth with environmental sustainability. Cityscape Tower is considered a cultural and business hub of Dhaka city, and while most of us have probably been there just to get coffee, this building is one of the pioneering structures that promote green architecture in the country. The building has a self-sustaining power and water supply. This ensures 40% less power consumption and reduces water wastage by 60%. Green architecture heavily depends on generating renewable energy and recycling. As the industries of Bangladesh continue to thrive and its population grows, the natural environment and climate of the country will continue to deteriorate unless proper steps are taken. Industries should adopt green technologies, while citizens should adopt a green lifestyle. If we all play our parts right, our economic growth will continue to be strong and sustainable. Green technology is an encompassing term. It deals with using science and technology in order to protect the environment. A lot of techniques fall under this term such as the use of green chemistry, environmental monitoring, and more. All of these things have to deal with making sure that the environment remains protected. This technology is used to breathe life back into a damaged ecosystem. It is also referred to as environmental technology or clean technology. The main goal is to conserve nature, and to remedy the negative impact that humans have on it.

Here are few step for creating a green world:

1. Wastewater treatment

In this field, there are few technological developments, but the existing ones are important. Key developments include membrane filtration, microbial fuel cells, nanotechnology, development of biological treatments and natural treatment systems such as wetlands. All these processes are used to make water drinkable or signifi-

cantly reduce the presence of pollutants from what is discharged into the sea and rivers.

2. Elimination of industrial emissions

As experts in the treatment of emissions, the management of air pollutants in industries can significantly reduce the greenhouse effect. Methane and carbon dioxide are substances that harm the environment. Industries such as chemical, petrochemical, pharmaceutical, automotive, etc. must eliminate their emissions so as not to cause serious environmental damage. Our technology is oriented to create custom solutions for each company.

3. Recycling and waste management

The increase in household and industrial waste has been disproportionate. Managing solid waste is the commitment of companies as well as individuals. Outstanding technologies such as smart containers, automated food waste tracking systems and automated optical scanning technologies can help sort mixed plastics by separating them from others.

4. Self-sufficient buildings

Self-sufficient buildings are those constructions that are able to function by themselves by generating energy without the need of an external contribution. One way to achieve greater production with the same surface of photovoltaic panels is to incorporate intelligent

Source: Unsplash

solar tracking systems, thus obtaining an optimal use of radiation.

5. Waste-to-Energy

The generation of energy from waste, also called Waste-to-Energy, is technology that generates energy from garbage. We can develop waste treatment solutions that generate energy in the form of steam, hot water or electricity that each company can later use for internal processes.

6. Generation of energy from the waves

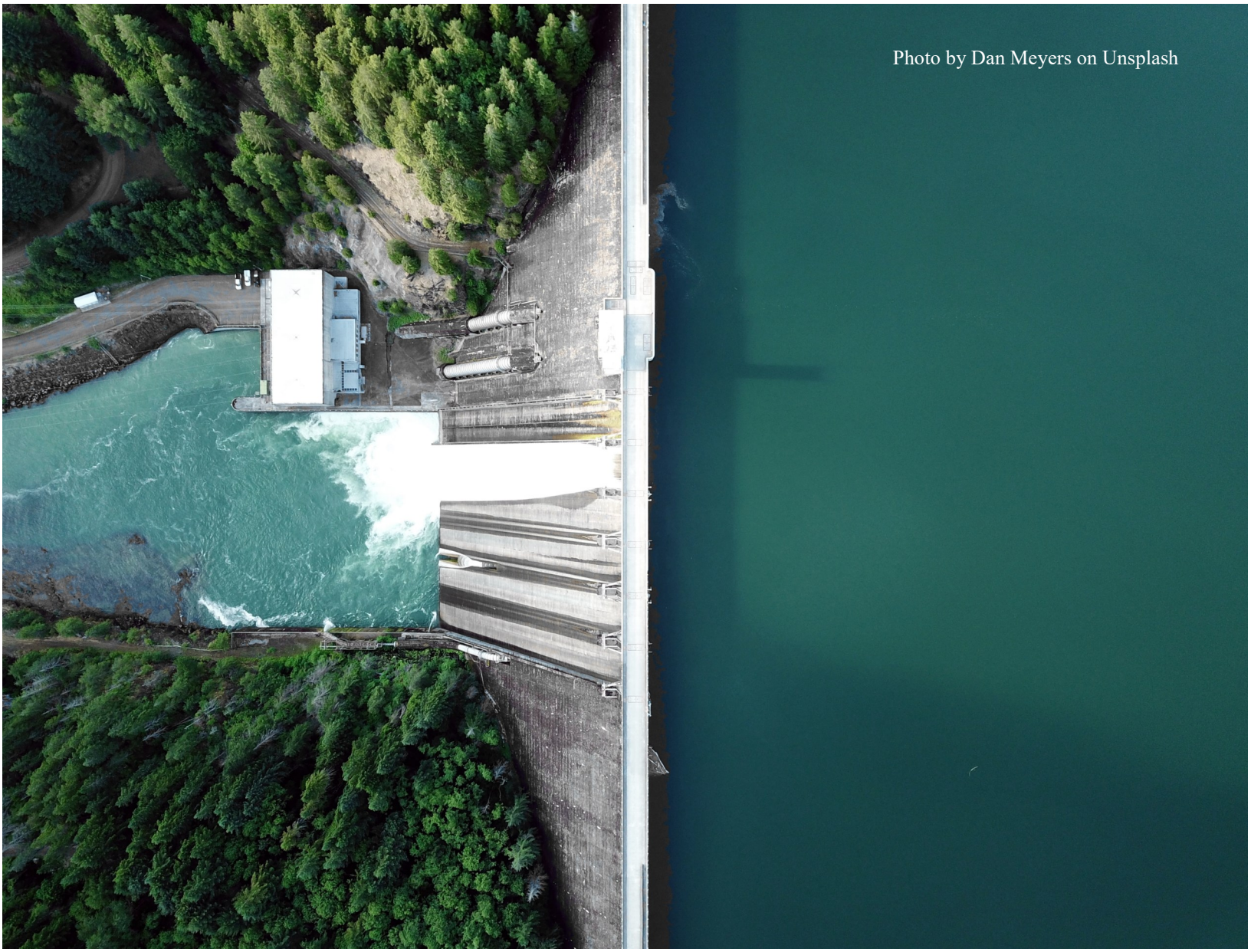
The first wave energy management plant was built in Aguçadoura, Portugal, 8 kilometers away from the coast. The plant has a capacity of 2.25 MW and is able to supply electricity to up to 1500 homes. The installation consists of steel tubes floating on the ocean surface, measuring 3.5 m in diameter and 150 meters long, called "Pelamis". Those components are semi submerged in the sea and are responsible for transforming the movement of the waves into electrical energy.

7. Vehicles that do not emit gases

Known as ecological vehicles, they are so called because their use does not negatively influence the environment and contributes to reducing the presence of polluting gases in the atmosphere, mainly carbon dioxide (CO2), carbon monoxide (CO), nitrogen oxide (NOx), unburned hydrocarbons (HC) and compounds of lead and Sulphur dioxide.

8. Harnessing solar energy

Perhaps these are the systems that have been worked on and researched the most. Examples of solar energy



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Source: Unsplash

conversion technologies are high vacuum tube for hot water, polypropylene collector for hot water, photovoltaic collector to produce electricity and solar streetlamps, among others. All those technologies aim to reduce dependence on energy from hydrocarbons and fossil fuels and promote greener solutions.

9. Vertical gardens and farms

The installation of vertical gardens in buildings also helps save energy and brings many benefits to the environment. Vertical gardens don't need watering routines that involve unnecessary use of water, and because they are installed along a wall, they reduce the intense hearing pollution that comes from the outside and even that one that you can generate. Moreover, it helps isolate the high temperatures that are presented by climate change, resulting in significant savings in energy, heating and air conditioning. If we extrapolate this technology to farms, we can save a lot of water and take care of the fertile soil. Today, there are vertical farms of up to 100 hectares. Perspective of Bangladesh this is one of best step to move forward for creating environment friendly country.

10. Natural gas boilers

Green boilers are boilers that consume as little fuel as possible or use renewable energy. Natural gas, although it is also a fossil fuel, has the particularity that it emits almost no toxic gases such as nitrogen oxides, particles, carbon monoxides nor Sulphur. It releases more water vapor and less carbon dioxide. It is the most environmentally friendly fossil fuel in terms of emissions, with 204 grams of CO2 per thermal kW/h. Therefore, natural gas boilers tend to be condensed, which means that they recover the heat from the water vapor coming out of the chimney, achieving higher thermal yields with less air pollution.

11. Off-shore Wind Power

One of the last great hurdles for renewable energy is offshore wind — turbines located just off the coast that can generate near-constant green power. Experts say wind could provide up to one fifth of world demand of electricity within the next 15 years. The UK government is legally committed to delivering 15% of its energy demand from renewables by 2020. There is no disputing that some energy subsidies counter the goal of sustainable development, as they may lead to higher consumption and waste, exacerbating the harmful effects of energy use on the environment, creating a heavy burden on government finances and weakening the potential for economies to grow.

Source: Unsplash

Green technology is crucial for the implementation of the Sustainable Development Goals. Currently, there is an urgent need to form a long-term mechanism for screening, evaluation and promotion of appropriate green technology. Therefore, the Green Technology Bank was initiated as a new platform to bridge the gaps between different stakeholders and promote the innovation and transfer of green technology. However, lack of standardized classification system may hinder the pace and depth of green technology development. In our country, the first step towards green innovation needs to come from the government. While they have been successful in pushing green technology in some sectors, such as banking, they haven't really looked into many other important sectors, such as construction and architecture.

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Implementation of Integrated Pest Management

Md. Arafat Rahman

Photo by Arjun MJ on Unsplash

A broad-based approach that integrates practices for economic control of pests is known as Integrated Pest Management (IPM) or Integrated Pest Control (IPC). IPM aims to suppress pest populations below the economic injury level. The UN's Food and Agriculture Organization defines IPM as "the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment."

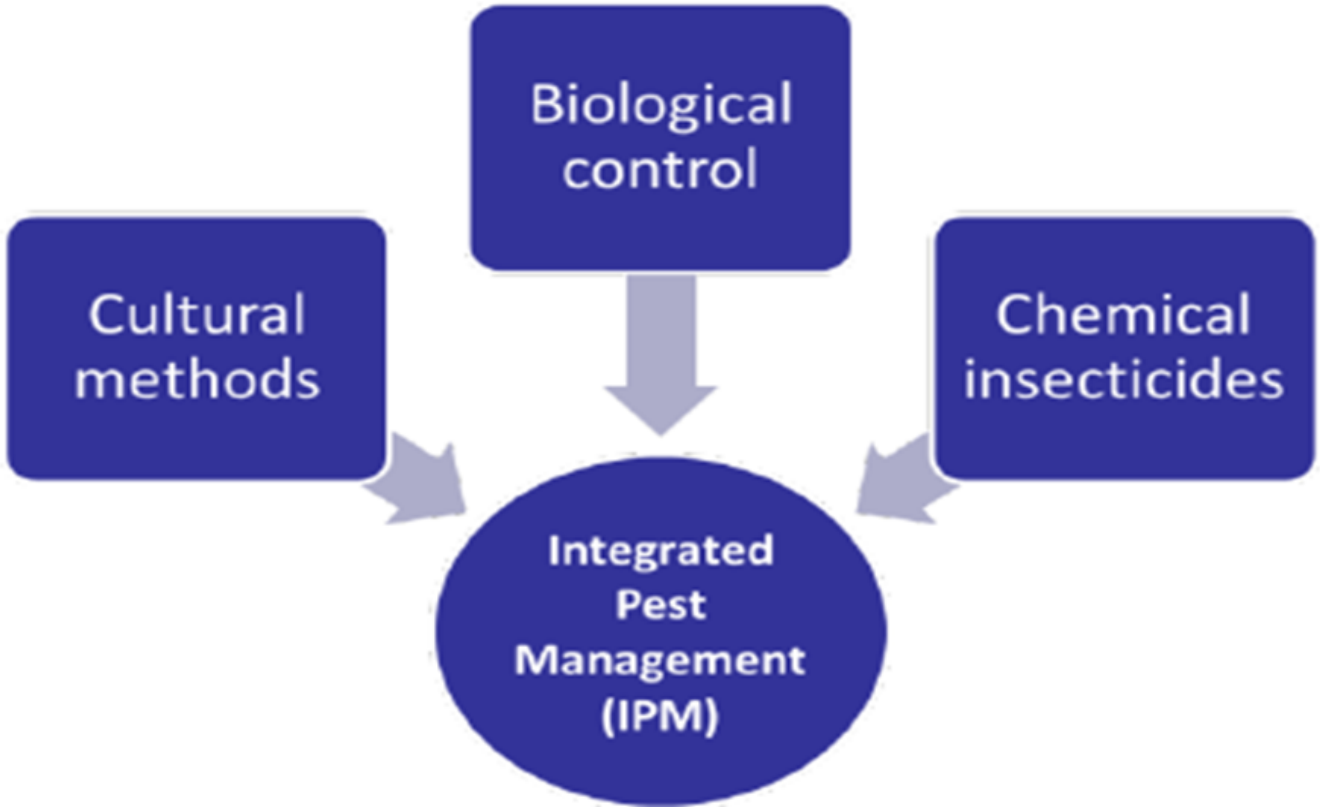
Entomologists and ecologists have urged the adoption of IPM pest control since the 1970s. IPM allows for safer pest control. The introduction and spread of invasive species can also be managed with IPM by reducing risks while maximizing benefits and reducing

costs.

Shortly after World War II, when synthetic insecticides became widely available, entomologists in California developed the concept of "supervised insect control". Around the same time, entomologists in the US Cotton Belt were advocating a similar approach. Under this scheme, insect control was supervised by qualified entomologists and insecticide applications were based on conclusions reached from periodic monitoring of pest and natural-enemy populations. This was viewed as an alternative to calendar-based programs. Supervised control was based on knowledge of the ecology and analysis of projected trends in pest and natural-enemy populations. Supervised control formed much of the conceptual basis for the "integrated control" that University of California entomologists articulated in the 1950s. Integrated control sought to identify the best mix of chemical and biological controls for a given insect pest. Chemical insecticides were to be used in the manner least disruptive to biological control. Chemical controls were to be applied only after regular monitoring indicated that a pest population had reached a level that required treatment to prevent the population from reaching a level at which economic losses would exceed the cost of the control measures.

IPM extended the concept of integrated control to all classes of pests and was expanded to include all tactics. Controls such as pesticides were to be applied as in integrated control, but these now had to be compatible with tactics for all classes of pests. Other tactics, such as host-plant resistance and cultural manipulations, became part of the IPM framework. IPM combined ntomologists, plant pathologists, nematologists and weed scientists.

An American IPM system is designed around six basic components:



Source: researchgate.net

1. Acceptable pest levels:

The emphasis is on control, not eradication. IPM holds that wiping out an entire pest population is often impossible, and the attempt can be expensive and unsafe. IPM programmes first work to establish acceptable pest levels, called action thresholds, and apply controls if those thresholds are crossed. These thresholds are pest and site specific, meaning that it may be acceptable at one site to have a weed such as white clover, but not at another site. Allowing a pest population to survive at a reasonable threshold reduces selection pressure. This lowers the rate at which a pest develops resistance to a control, because if almost all pests are killed then those that have resistance will provide the genetic basis of the future population. Retaining a sig-

nificant number of unresistant specimens dilutes the prevalence of any resistant genes that appear. Similarly, the repeated use of a single class of controls will create pest populations that are more resistant to that class, whereas alternating among classes helps prevent this.

2. Preventive cultural practices:

Selecting varieties best for local growing conditions and maintaining healthy crops is the first line of defense. Plant quarantine and 'cultural techniques' such as crop sanitation are next, e.g., removal of diseased plants, and cleaning pruning shears to prevent spread of infections. Beneficial fungi and bacteria are added to the potting media of horticultural crops vulnerable to root diseases, greatly reducing the need for fungicides.

3. Monitoring:

Regular observation is critically important. Observation is broken into inspection and identification. Visual inspection, insect and spore traps, and other methods are used to monitor pest levels. Record-keeping is essential, as is a thorough knowledge of target pest behavior and reproductive cycles. Since insects are cold-blooded, their physical development is dependent on area temperatures. Many insects have had their development cycles modeled in terms of degree-days. The degree days of an environment determines the optimal time for a specific insect outbreak. Plant pathogens follow similar patterns of response to weather and season.

Source: uwyo.edu

4. Mechanical controls:

Should a pest reach an unacceptable level, mechanical

Source: accuratetermitecontrol.com

methods are the first options. They include simple hand-picking, barriers, traps, vacuuming and tillage to disrupt breeding.

5. Biological controls:

Natural biological processes and materials can provide control, with acceptable environmental impact, and often at lower cost. The main approach is to promote beneficial insects that eat or parasitize target pests. Biological insecticides, derived from naturally occurring microorganisms also fall in this category. Further 'biology-based' or 'ecological' techniques are under evaluation.

6. Responsible use:

Synthetic pesticides are used as required and often only at specific times in a pest's life cycle. Many newer pesticides are derived from plants or naturally occurring substances, but the toxophore or active component may be altered to provide increased biological activity or stability. Applications of pesticides must reach their intended targets. Matching the application technique to the crop, the pest, and the pesticide is critical. The use of low-volume spray equipment reduces overall pesticide use and labor cost. Historically, the main focus of IPM programmes was on agricultural insect pests. Although originally developed for agricultural pest management, IPM programmes are now developed to encompass diseases, weeds and other pests that interfere with management objectives for sites such as residential and commercial structures, lawn and turf areas, and home and community gardens.

IPM is the selection and use of pest control actions

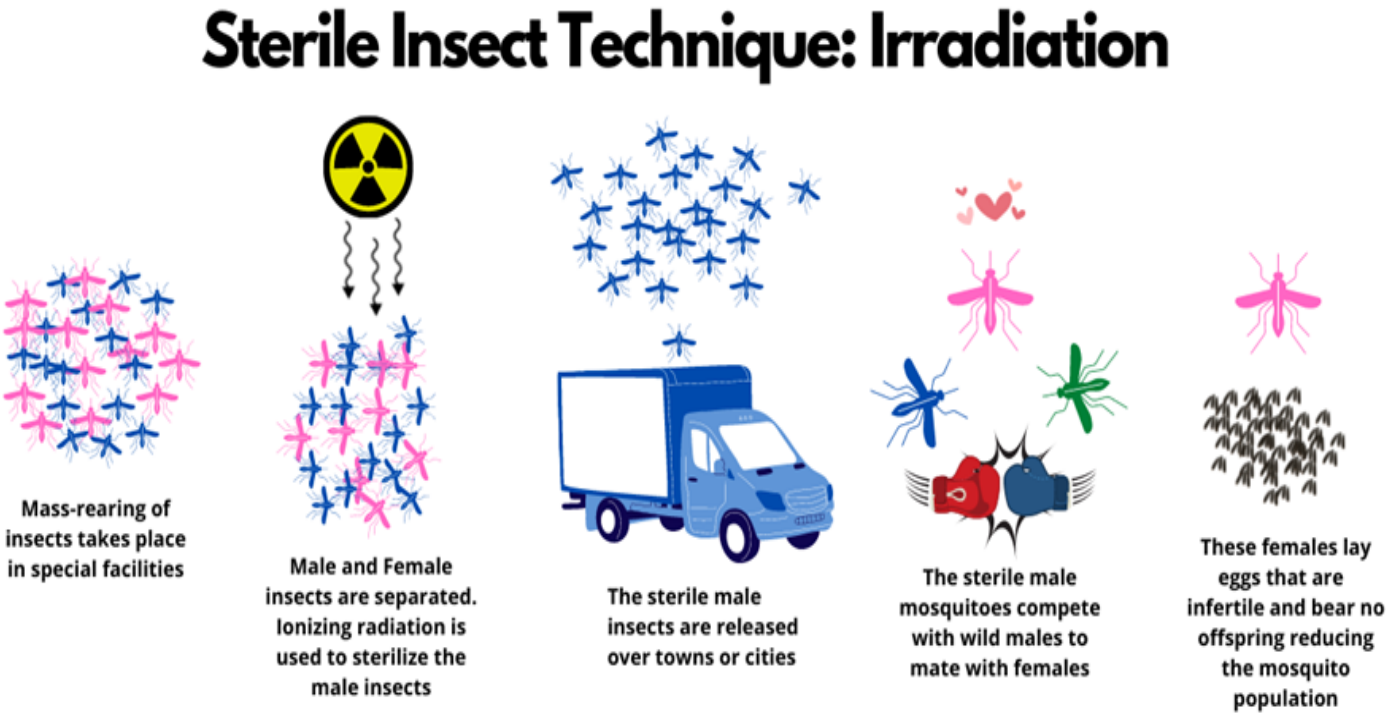
that will ensure favourable economic condition, ecological and social consequences and is applicable to most agricultural, public health and amenity pest management situations. The IPM process starts with monitoring, which includes inspection and identification, followed by the establishment of economic injury levels. The economic injury levels set the economic threshold level. That is the point when pest damage (and the benefits of treating the pest) exceeds the cost of treatment. This can also be an action threshold level for determining an unacceptable level that is not tied to economic injury. Action thresholds are more common in structural pest management and economic injury levels in classic agricultural pest management. An example of an action threshold is one fly in a hospital operating room is not acceptable, but one fly in a pet kennel would be acceptable. Once a threshold has been crossed by the pest population action steps need to be taken to reduce and control the pest. Integrated pest management employs a variety of actions including cultural controls such as physical barriers, biological controls such as adding and conserving natural predators and enemies of the pest, and finally chemical controls or pesticides.

Reliance on knowledge, experience, observation and integration of multiple techniques makes IPM appropriate for organic farming. Although the pesticides and particularly insecticides used in organic farming and organic gardening are generally safer than synthetic pesticides, they are not always more safe or environmentally friendly than synthetic pesticides and can cause harm. For conventional farms IPM can reduce human and environmental exposure to hazardous chemicals, and potentially lower overall costs.

Risk assessment usually includes four issues:

1) characterization of biological control agents,
2) health risks,
3) environmental risks and
4) efficacy.

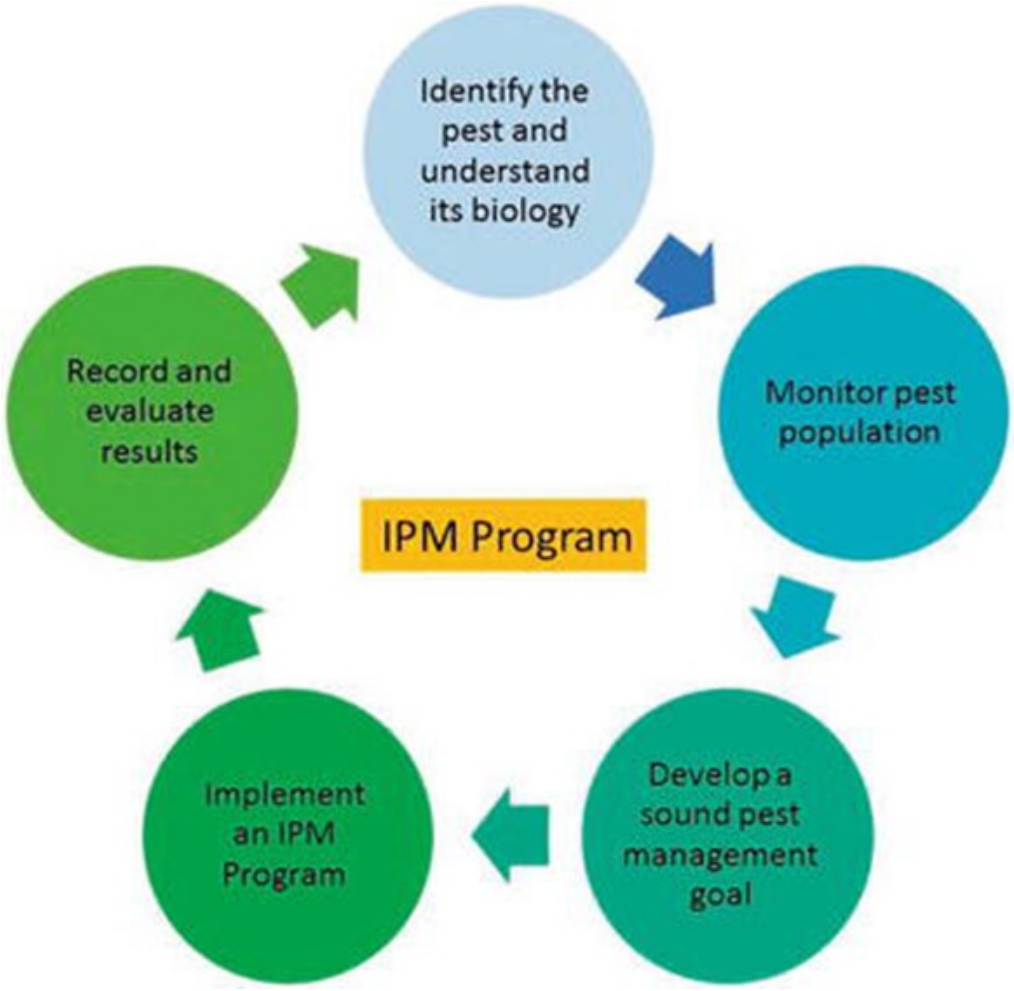
Monitoring begins immediately, before the pest's activity becomes significant. Monitoring of agricultural pests includes tracking soil/planting media fertility and water quality. Overall plant health and resistance to pests is greatly influenced by pH, alkalinity, of dissolved mineral and oxygen reduction potential. Many diseases are waterborne, spread directly by irrigation water and indirectly by splashing. Possible interventions include mechanical/physical, cultural, biological and chemical. Mechanical/physical controls include picking pests off plants, or using netting or other material to exclude pests such



as birds from grapes or rodents from structures. Cultural controls include keeping an area free of conducive conditions by removing waste or diseased plants, flooding, sanding, and the use of disease-resistant crop varieties. Biological controls are numerous. They include: conservation of natural predators or augmentation of natural predators, sterile insect technique (SIT). The sterile insect technique (SIT) is an area-wide IPM program that introduces sterile male pests into the pest population to trick females into (unsuccessful) breeding encounters, providing a form of birth control and reducing reproduction rates. The biological controls mentioned above only appropriate in extreme cases, because in the introduction of new species, or supplementation of naturally occurring species can have detrimental ecosystem effects. Biological controls can be used to stop invasive species or pests, but they can become an introduction path for new pests. Augmentation, inoculative release and inundative release are different methods of biological control that affect the target pest in different ways. Augmentative control includes the periodic introduction of predators. With inundative release, predators are collected, mass-reared and periodically released in large numbers into the pest area. This is used for an immediate reduction in host populations, generally for annual crops, but is not suitable for long run use. With inoculative release a limited number of beneficial organisms are introduced at the start of the growing season.

This strategy offers long term control as the organism's progeny affect pest populations throughout the season and is common in orchards. With seasonal inoculative release the beneficials are collected, mass-reared and released seasonally to maintain the beneficial population. This is commonly used in greenhouses. In America and other western countries, inundative releases are predominant, while Asia and the eastern Europe more commonly use inoculation and occasional introductions.

Chemical controls include horticultural oils or the application of insecticides and herbicides. A green pest management IPM program uses pesticides derived from plants, such as botanicals, or other naturally occurring materials. Pesticides can be classified by their modes of action. Rotating among materials with different modes of action minimizes pest resistance. Evaluation is the process of assessing whether the intervention was effective, whether it produced unacceptable side effects, whether to continue, revise or abandon the program.



Source: intechopen.com

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Crucial Need to Protect Native Flora and Fauna for Healthy Environment

Zannatul Mouwa Naz

Ecological services are the biological functions that different species of animals and plants perform for their survival. This is the tree that produces oxygen, they do it for their benefit. Occasionally we are taking in oxygen. The pollination that insects cause is essential for the survival of insects and grains themselves.

Whoever has life, we call him a living being. From tiny viruses to giant elephants or whales or plants, herbs, shrubs, everything is diverse. Biodiversity is the name given to the diverse celebration of life on earth. There is a deep connection between plants and animals. It is difficult for one to survive without the other. Plants that herbivores use as food for survival. Carnivores eat carnivores. Again, big carnivores live by eating small carnivores.

Humans use both animals and plants as food for their survival. Every animal and plant are dependent on each other for survival. Foreign traders and tourists have been coming to Bangladesh since ancient times as it is an important route of international trade. They have brought with their grains, fruits and herbs of their own country. So far, scientists have been able to identify about 300 species of such plants. At the same time, they have made a list of aggressive species of plants and animals. They said that there are 69 species of exotic plants and animals that are widely grown in Bangladesh. These are becoming a major threat to native species.

Researchers from five universities in Bangladesh, the United States, Australia and Germany have researched exotic species of plants and animals in Bangladesh. The research report was published this month in the science journal Global Ecology and Conservation. It is said that Bangladesh has 48 species of plants, 16 species of fish, 5 species of insects, 1 species of snails and 1 species of birds.

The International Union for Conservation of Nature (IUCN) has compiled a list of the world's 100 most invasive species of plants and animals. It contains the names of all the 69 species. These include widely grown plants such as water hyacinth, Assam creeper, lantana or lantern and forest. To meet the sustainable development goals and maintain the natural balance of Bangladesh, we need to know which species of trees and animals are harmful to our country's ecosystem.

A non-governmental organization said in Prothom Alo that most of the fruits popular with the people of Bangladesh come from abroad. However, he said it was not right to have any foreign species of trees in the natural forests of Bangladesh, adding, "There is nothing to prevent anyone from planting foreign trees commercially on their land."

However, we need to have a full survey on all the exotic species of plants in Bangladesh. We need to evaluate how much they are good or bad for the environment. According to the study, 51 per cent of the 69 invasive species of plants and animals in Bangladesh are deadly invasive. Species that are at risk of being 36 percent aggressive and 9 percent aggressive. Of these, 26 species have been imported from North America, 18 species from other Asian countries, 9 species from Africa and 6 species from Australia. Of these, 36 species of trees came before independence.

Asked about this, Chief Forest Conservator Amir Hossain Chowdhury told Prothom Alo, "The forest department has planted trees in 16,000 hectares of land in the last two years." It's entirely a native species of tree. A comprehensive survey of any foreign invasive species affecting native species in Bangladesh has been initiated by the Forest Department and Bangladesh National Herbarium. Once that is done, we will be able to make a clear decision about these trees.

According to the study, if these invasive species of trees and animals are not controlled, the native species will gradually become extinct. Bangladesh has signed the UN Charter on Biodiversity. Where stated, native and indigenous species must be protected.

Photo by Ryutaro Tsukata from Pexels

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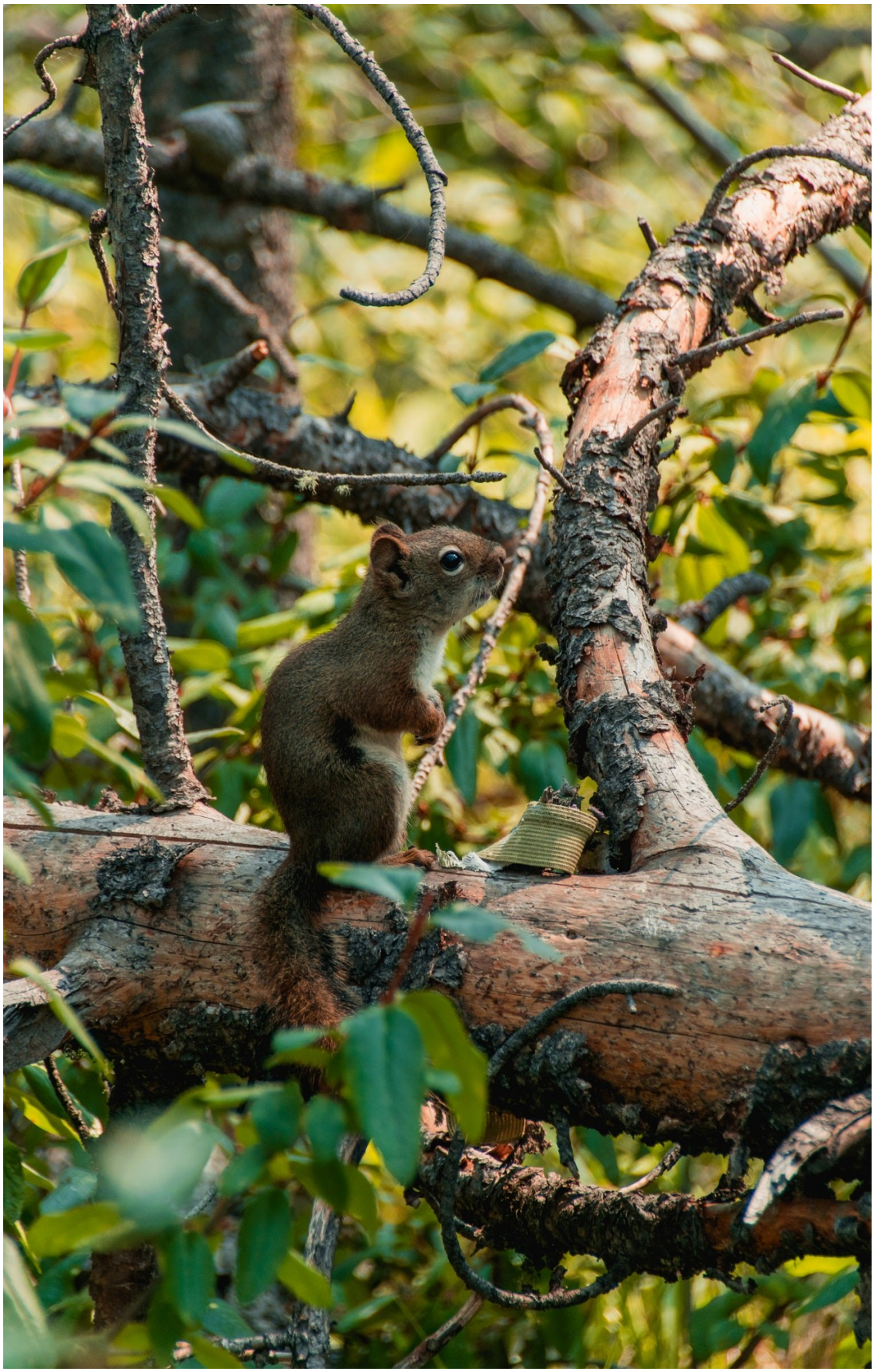

Photos by Enric Cruz López from Pexels

The existence of plants and animals in our country is under threat due to human activities. Due to the rapid increase in population, houses are being built on deforested and croplands for human habitation. Large numbers of animals are losing their habitat as a result of indiscriminate logging. As a result, the existence of these animals is endangered. Bangladesh's biodiversity is now under threat due to increasing population pressure and indiscriminate extraction of various resources. People are cutting down forests and building habitats. As a result, many plants and animals have become extinct. Therefore, in meeting the sustainable development goals, importance has been given to the protection of native species.

Lack of waste management and use of chemical fertilizers and pesticides on land are also affecting biodiversity. Industrial waste is sometimes dumped directly into a pond or open space or pond. These wastes are very harmful to the environment. Again, dumping waste in the river kills aquatic animals or infects them with various diseases. Similarly, the use of chemical fertilizers on land pollutes the water of the surrounding water bodies and kills other aquatic animals, including fish, or they cannot reproduce. Flood control dams, obstruction of drainage systems and cultivation of low lands with dams do not maintain the normal flow of water. As a result, many animals related to water and plants are under threat.

"No animal on earth can live alone. All animals depend on each other for survival. Birds and insects are needed for the reproduction of flowers, fruits and grains. Crows, vultures and foxes all eat the flesh of dead animals to protect the environment from pollution"

Photos by Nikollo71 from pixabay

Unplanned use of high yielding crops and seeds is also destroying biodiversity. At one time there were about 14,000 varieties of paddy in our country. Most of the land is now being cultivated with some varieties of high yielding paddy. This is losing other species of rice. The biggest reason for the destruction of biodiversity is the lack of awareness of the common people. Many times, people are very negligent and cause damage to many plants and animals. Initiatives should be taken to make the general public widely aware of this issue.

No animal on earth can live alone. All animals depend on each other for survival. Birds and insects are needed for the reproduction of flowers, fruits and grains. Crows, vultures and foxes all eat the flesh of dead animals to protect the environment from pollution. Even if a banyan tree is cut down, many animals lose their shelter. If we cut down fruit trees or banyan trees and plant only shawls, teak, mahogany trees, then the birds will lose their shelter and who will go elsewhere or become extinct.

Protecting biodiversity is essential to keeping the earth habitable. People need to be made aware of this. Measures should be taken to compile accurate statistics of the biodiversity that already exists in the country. At the same time, the existing rules and regulations for the conservation of animals need to be further enhanced and the law needs to be properly enforced. Make a list of endangered birds and animals and set up separate zoos or protected areas for their conservation.

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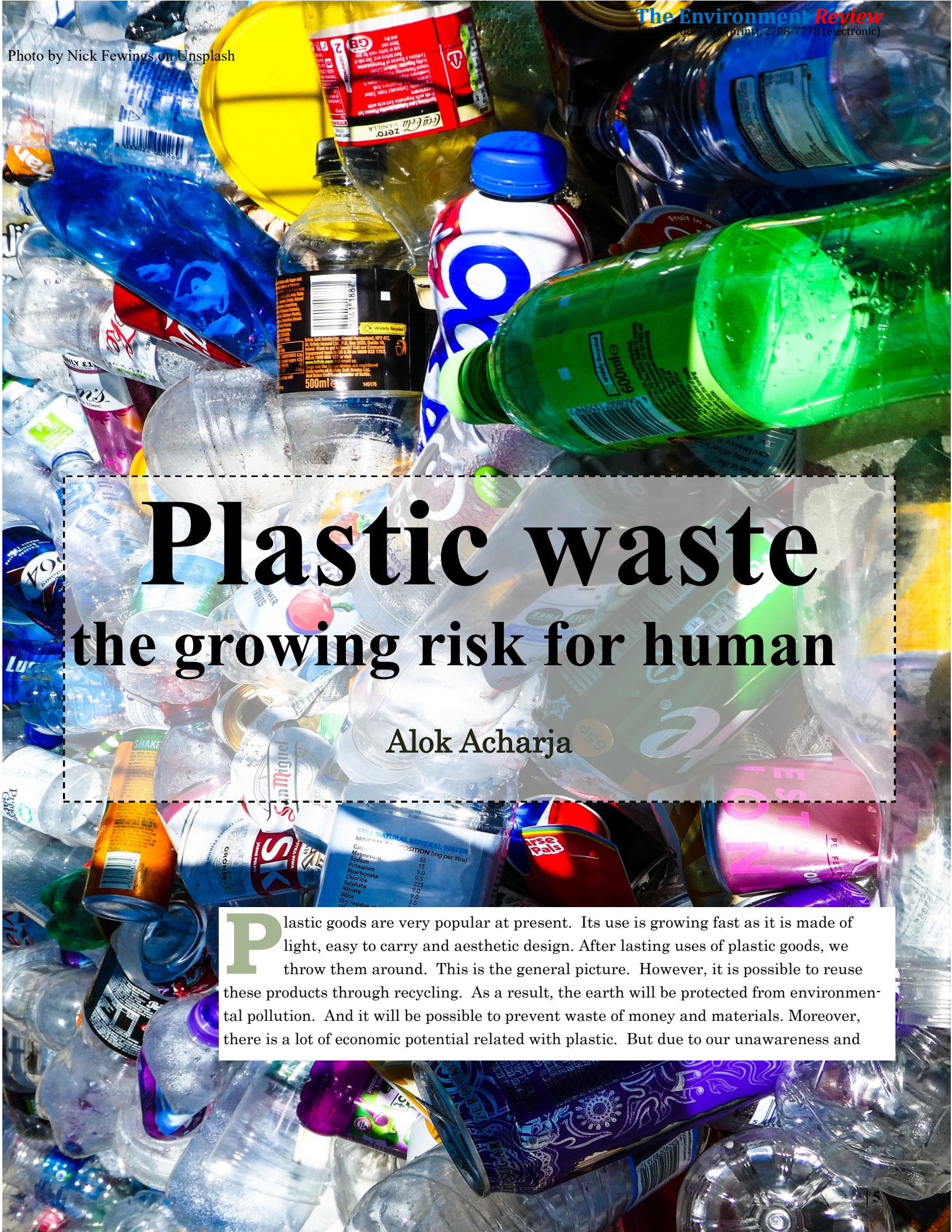

Photo by Nick Fewings on Unsplash

Plastic waste
the growing risk for human

Alok Acharja

Plastic goods are very popular at present. Its use is growing fast as it is made of light, easy to carry and aesthetic design. After lasting uses of plastic goods, we throw them around. This is the general picture. However, it is possible to reuse these products through recycling. As a result, the earth will be protected from environmental pollution. And it will be possible to prevent waste of money and materials. Moreover, there is a lot of economic potential related with plastic. But due to our unawareness and

Photo by Antoine GIRET on Unsplash

lack of effective planning, plastic has become a threat to us. Plastic furniture used in the home is not the apparent main and only cause of our plastic pollution. Because these products are used for a long time and a large part of them are recycled. But the shampoos, food wrappers, plastic bags, straws, small bottles or other small products that we are using from the market are all threatening the environment. I am throwing it on the road after drinking. Then it goes to the drain. From there these wastes goes to the river. These bottles can be seen often floating on the river or sea. From there many are collecting and selling it again and recycling from. But the question is how much is being recycled. After using these, we throw them in the streets, drains, rivers, parks, seas. In a word, anywhere. It seems that throwing here and there is our habit! Just think how many people are using small plastic products every day and throwing them away again. There is no one to clean up this mess. As a result, these wastes are going somewhere in the soil. Very few are going to recycle. And thus the use of plastics is becoming a threat to the environment. Just same as polythene is a threat to us. One of the major threats is the use of disposable plastic materials.

As an alternative to tea cups, disposable plastics such as dishes, glasses, etc. are very popular. They are being dumped in nearby ponds or canals or rivers without being destroyed after use. These are not easily destroyed. Many people know but do not have the tendency to comply. These non disposable plastics are creating climate change and environmental disasters. It is known that disposable plastic products are mainly made with fossil fuels. These products are very difficult to reuse. Only 10-15 percent of these products can be reused every year. Oceans, rivers, ponds are nowhere to be excluded from plastic pollution. Lots of plastic is being found in the stomachs of dead animals in the sea. Which we are throwing of the sea at different times. I never thought that this plastic product I had thrown away would cause a crisis for the fauna. We know plastic is harmful but we use it and throw it away for environmental pollution. But why am I doing it? The answer is consistent with the use of polythene. Its use is increasing due to its affordability, low cost and comparative durability. Plastic is a popular carry-

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ing item in the market, shops and markets every day. At the moment there are no suitable alternatives to plastic. Where once wooden furniture was made, today plastic materials are being decorated. This has benefited the environment. But simply because of lack of awareness and recycling these materials are becoming a threat to the environment. Yet a large portion of our daily use products remain out of recycling, posing a threat to mankind. Who will recycle when we throw plastic in the river? Our neighbor India has plans to build a plastic-free country by 2022. Every day many of us go to the market empty hand and come back to buy something plastic. Then when the need arises, we throw it around. There is no time to think about how much damage that thing can do to us or any responsibility towards the environment.

According to a report published in the media on this year's world Environment Day, plastic waste has more than tripled in the last two decades in the capital alone after the ban of polythene. The amount of plastic waste in the capital is 646 tons per day. In 2005, an average of 178 tons of plastic waste was generated per day. This product does not rot in the ground even in 500 years. As a result the soil loses its normal capacity. After reviewing 24 research reports on plastic waste, a report published in a Journal in March this year said that tiny particles of plastic were entering the bodies of many animals, including fish. It is enter-

Photo by Markus Spiske on Unsplash

Photo by John Cameron on Unsplash

ing the human body through the food cycle. These are playing a role in creating various complex diseases including cancer. We forget that plastic is not made of any natural material but its effect is so severe that it stays on the ground for ages. As it is popular among the people, there are no signs of its decline. It is not possible to say where its use will end up. However, it can be said that if effective steps are not taken, then the plastic will be boomerang for us as the polythene has appeared today. One-time plastic products from the country's most polluted cities and villages. Concerns are growing around the world about the growing use of plastics and its aftermath. A large part of these plastic products have reached the sea. Like other beneficial discoveries in science, the invention of plastic was an excellent one. But like many inventions, plastics are threatening our human civilization today. People are responsible for this. We can't use it properly. In a country like ours where people are not aware, less people have a headache about the environment, there will be a plastic threat. The tendency throwing things away is exacerbating the crisis. We have to do our best to free the environment from the adverse effects of plastics. Although it is not easy, we have to do it. Because the huge amount of plastic that is being used now cannot be eliminated. The alternative may be the use of plastic can be reduced. There was a time when plastic was not so widely used. At that time the pollution of the environment was less. The threat is growing as its use increases. Especially the bottom of the sea is being filled with these plastic materials which is a threat to the entire biodiversity. Plastic is also very popular today. If the recycling process can be done largely, then the solution of the problem is largely possible. As well as awareness with this is must. The habit of throwing us where we are has become ingrained. I have to get out of there. Everyone must fulfill this responsibility to secure their future.

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Plastic waste management:
Very important for sustainable development

Mahmud Kamal Anamul Haque

People are using a lot of things to make life easier. Undoubtedly, plastic is one of them. Plastic waste is increasing with the use of plastic. Plastic waste management can be an important tool in sustainable development. Moreover, plastic waste management has been given more importance in waste management, as plastics remain in the environment for a long time in an indigestible state. The per capita consumption of plastic in Bangladesh is only 5 kg whereas the average consumption of plastic in the world is about 20 kg. These plastic wastes include bottles, rice bags and plastic bags. Proper management of plastic waste in Bangladesh, like in all other developed countries, will solve the serious environmental impacts that pose a threat to human life and various animals and increase the rate of

Source: DataBD.com

creation of this plastic waste. Therefore, it is important for the waste management authorities to have accurate and detailed research information on the amount of waste being generated in the cities of the country and the type of waste being generated. At the same time, due to the lack of financial and management capacity, it is becoming easier to plan and implement the city's waste management properly. Different methods need to be adopted for the management of plastic waste in sustainable development while maintaining the balance of the environment.

Source: TODAYonline, AFP

In addition, plastic and polythene wastes are mixed with water, which is detrimental to its quality as well as adversely affecting biodiversity in the water. The amount of plastic and polythene in rivers and seas is increasing. Extensive research on marine resources is currently a major threat to plastic waste.

A 2012 study found that about 175 million tons of waste plastic floated in the ocean, threatening about 800 species of marine life. If plastics continue to grow at sea, the coral reef will pose a serious threat to the future. According to marine scientists, the second biggest threat after rising sea levels is plastic waste, which increases the risk of coral reef disease by 20 times.

Moreover, plastic is one of the major causes of waterlogging in Dhaka city. Groundwater reservoirs are not being filled properly due to the increase in plastic and polythene wastes at the soil level. On the other hand, the demand for water is increasing day by day. Therefore, it is thought that this kind of management of plastic waste is risky for the future.

After the waste is finally collected, transported and removed, it is disposed of at a landfill site. The capacity of the space used for the waste accumulated in the piles is running out day by day. It is important to follow some rules for landfill. The Environmental Protection Agency (EPA) has outlined a number of policies in this regard. According to the 1991 policy, there will be no reservoir within 30 meters of the landfill site, no drinking water tube well within 180 meters and any house, school or park within 75 meters. Landfilling is therefore considered extremely wasteful as it requires a lot of space and wastes energy contained in chemical components and plastics. It is not easy to increase the landfill site for waste management due to population growth and development. In places where landfills are made for plastic waste management, this in turn makes it impossible to make good use of land and there plastic waste can easily be carried by water or carried to the sea in flood waters. Since most of the plastic waste remains in the soil, they are degrading the quality of soil and water. In addition, plastics can release pollutants (phthalates and bisphenols) into the soil and surrounding environment once they have been eroded in the landfill.

When plastic is used as fuel, some energy is returned. In fact, the amount of energy that can be produced from one pound of plastic is almost equal to the energy produced from waxing coal and fuel oil. So making fuel from plastic waste is one of the significant waste management. However, the process of plastic fuel can re-

lease hazardous substances into the atmosphere which will have a detrimental effect on the environment and health. For example, PVC and halogenated additives mix hazardous substances with plastic waste and release them into the environment when used as fuel. Therefore, before using plastic waste as fuel, it is important to select well and develop scientific technology. The heat generated by making fuel from plastic waste can be used to generate electricity by turning turbines. Recycling can be one of the ways to manage plastic waste. Plastics are usually derived from petroleum or natural gas, the amount of energy stored in this plastic waste gives more stored energy than any other waste. If this project is implemented in municipalities and city corporations across the country, the waste will be greatly reduced. As a result, it will be possible to meet the energy demand of the country by producing electricity and gas in a scientific way. Also some of the waste can be incinerated for plastic waste management. According to a study, it is possible to reduce about 90 percent of waste by burning it. But this process must be in a scientific way.

Bangladesh generates 633,129 tons of plastic waste annually, of which 51 percent is being recycled to 323,000 tons. There are about two thousand factories in Bangladesh, of which 50-60 are directly exporting plastic pieces abroad. Besides, different types of toys are being made by managing plastic waste. The government can apply for VAT (Value Added Tax) exemption on recyclable plastic products which will play a role in investing in the plastic recycling industry.

Many times plastic waste can be recycled and the recovered materials can be used a second time. Although recycled plastic is the most effective way of waste management. However, due to difficulties in collecting and sorting plastic waste, this method is not being fully utilized. The Government of Bangladesh has undertaken various projects for the management of plastic waste. At the same time, due to the recycling of plastics at the private level, a lot of waste is being reduced.

Source: Daily Bangladesh

Source: Wikipedia, USEPA

Biodegradable plastics can play a key role in waste management, as they are biodegradable plastics. Biodegradable plastics have the potential to solve waste management problems, especially when packaging cannot be easily separated from organic waste. Biodegradable plastics can be completely metabolized by organisms to carbon dioxide and water, but biodegradable plastics can release metals into the environment.

Conservation of organic and inorganic wastes is one of the important issues for plastic waste management. A policy has been formulated to separate waste from primary level. With economic development and population growth, people's participation at all levels of government is essential to prevent plastic waste. At the same time, in order to maintain the balance of the environment, a project has to be undertaken to convert plastic waste into resources. However, there is still no law in Bangladesh for the management of plastic waste. Therefore, in order to protect the environment of the country, it is necessary to enact laws for the management of plastic waste and implement it quickly. In order to develop waste management, first of all, it is necessary to increase the rate of waste collection in a proper manner, utilize efficient and improved waste transportation system and use of waste management technology that does not pose a threat to public health. In addition, if the country's municipal and city corporations can make plastic waste management effective and sustainable, it will make a positive contribution to the economy; At the same time we will get a clean country. The main advantage of sustainable waste management is that it reduces the impact on the environment, improves air and water quality and contributes to the reduction of greenhouse gas emissions.

Therefore, there is no alternative to sustainable plastic waste management to transform Bangladesh from a developing to a developed country and to protect the environment.

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Source: Eventige

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Sinkhole

A New Threat to Life, Property & Overall Environment

Shahrin Tabassum

We are faced with various types of natural disasters in our daily lives that are floods, cyclones, droughts, earthquakes, salinity. A new natural disaster is a sinkhole, which is seen in Turkey, Israel, and even neighboring countries India at a massive rate nowadays.

A sinkhole is a hole formed by the sudden or gradual collapse of land in a place. Groundwater extracting or excessive lifting of rocks and minerals results in sinkholes. These usually range from a few feet to several hundred acres and may have a depth of 1 to 2000 feet. These look a lot like shallow bowls or kitchen sinks. In some sinkholes when water accumulates, ponds are made naturally. According to experts, global warming and climate change are direct the sinkholes are being made by effects. These holes are becoming visible in many countries of the world. Again in some countries, more than 300 sinkholes are completely natural. It takes decades even centuries to create a sinkhole. Recently its rate has increased drastically.

Scientists blame the excessive extraction of groundwater and minerals for the increase in the number of sinkholes. Sinkholes are usually formed by two processes: (1) From the chemical breakdown of various ore rocks and (2) The suffosion process where water or any other liquid causes groundwater or rocks to evaporate. A sinkhole is a hole in nature formed suddenly. When it rains, the surface water is filtered and stored in the soil subsoil which we call aquifer. The water stored in this aquifer is used for various purposes such as irrigation, drinking, household chores, etc. We lift this water with the help of machines. Sometimes we extract more water than our needs. In many cases, we waste the extra water. This lifting creates inconsistencies in the ground and creates gaps. Then a large hole fell on the surface is created.

Geologists say that not only water extraction but also the removal of hard rock inside the soil is increasing the number of sinkholes. In areas where there is hard rock in the soil, the rate of extraction is higher. There

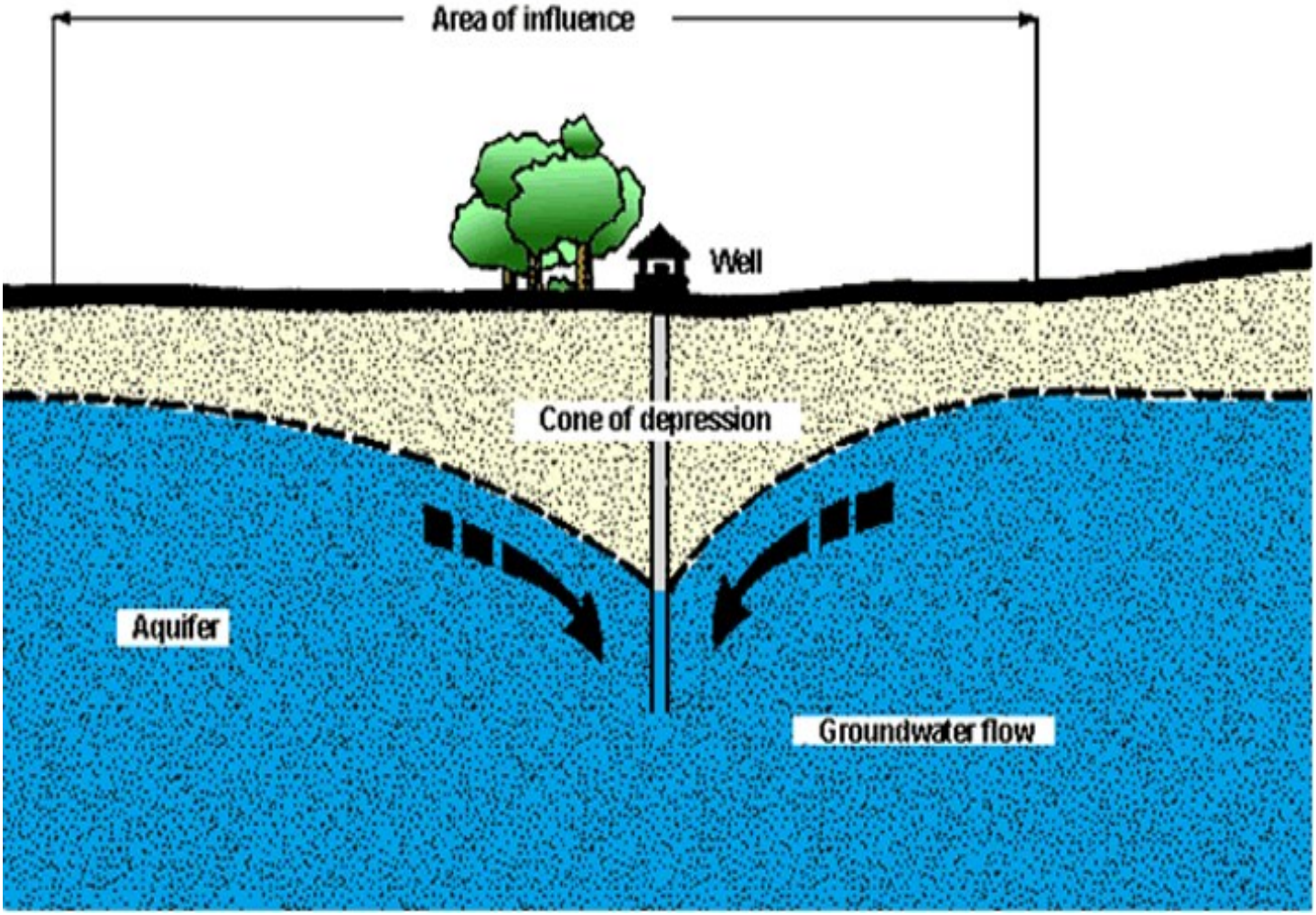
Sources: hurriyetdailynews.com

are salts and mineral layers like limestone, copper, and gypsum in there. Unplanned and excessive extraction of these minerals results in soil hollow spaces inside. Then the soil surface of the area collapsed under its weight and made a sinkhole. Also due to global warming, severe erosion, soil erosion, falling water levels, effects of methane gas, etc., sinkholes are made. Unplanned underground sewerage lines or underground constructions are referred to as the cause of sinkhole growth in the city. The work is being taken over. Although sinkholes are thought to be landslides, they are two completely different natural forms. Sinkholes are not a new disaster in nature. However, geologists are worried that the hole will be made in five countries within a month has done. Turkey, a Middle Eastern country, is one of the biggest concerns about the recent sinkholes. Most so far in the country, more sinkholes have been seen. In 2020, the number of sinkholes there was 360, now it has increased to 600. The country's water management policy is being blamed for this. For wheat cultivation, due to 10-15 years of drought farmers have to depend on groundwater as irrigation water. Where previously there was drought, farmers irrigated twice a year but now they have to irrigate five to six times a year. As a result of lifting billions of liters of water, the water level went down and giant holes are being made. If this situation persists, Turkey is heading for another epidemic in the innumerable sinkholes. Yes, there will be extreme famine.

Apart from Turkey, sinkholes are widespread in many other countries of the world. The largest natural sinkhole in the world is in Egypt located in Cairo, it is 133 m deep, 60 km long, and 120 km wide. 2690 feet deep sinkhole located in Chile, Chukuichamata was created in 1910. The Xiaojai Tiankeng sinkhole in Chongqing, China, is 62 meters deep and 628 meters wide. There are sinkholes in Siberia covering an area of 1 km. In Croatia after an earthquake, more than a hundred sinkholes have been created. It has also been made in Italy, Mexico, Israel, and even India.

In many cases, the sinkholes do not form suddenly. It takes many months and even years. Again in some cases, the holes were seen to be formed without any prior signal. Researchers are working day and night to find the real culprits. The goal is to gain a thorough understanding of structure, nature, and etymology. Change is visible in the place of sinkholes. A sign can be seen of a deep sinkhole forming cracks in the foundation of a building or house or inside a house, cracks in the ground. Even if it occurs, appropriate steps should be taken. Even if the plants die, dry up, or suddenly fall to the ground sinkholes may be created there. Water and other elements are removed from the sinkhole area thus trees of the area can't live. Also, be careful even if the water in the tubewell or tap is suddenly opaque or the turbidity is high. Because of the different minerals with the dissolution of soil and water this opaque or turbid water is formed. In many cases after the appearance of a circle on the ground within a few minutes to a few hours, a place can turn into a sinkhole. As a result, many have to face adversity which is not desirable at all.

Natural sinkholes cannot be prevented. For example, layers made of limestone or gypsum are easily absorbed into the water. As a result, the layers become thinner and sink to the ground as they cannot carry the load on top. Of this structure, sinkholes are naturally formed and are irresistible. Some holes are also made by humans. As a result of excessive extraction of groundwater, the water level goes down and accelerates the formation of holes. Special attention should be paid to raising the water level and recharging the groundwater table. Unnecessary wastage of water should be reduced. Everyone should follow the proper rules of resistance to drought and must continue. In many cases, it is seen that the holes made are used for dumping waste or dirt which is not desirable at all. This is because leachate or water made from dirt often contaminates the water by mixing with the groundwater level. In this manner, diseases are caused by germs entering the human body. So the sinkholes are



Sources: Daily-sun.com

not littered in any way and cannot be used for dumping.

In agricultural Bangladesh, 7.5 meters of water is taken annually. Of which 5.5 meters comes from the surface of the earth and the remaining 2 meters is from rainwater. Thus, groundwater is used extensively for irrigation in agriculture and more is wasted than used.

Sources: thehindu.com

As a result, the water level has dropped to more than 6 meters and in that place, high-density marine saline water is taking its place. If such a situation continues, there will be a disaster like a sinkhole in Bangladesh. Earthquakes are now becoming very common in the country. Earthquakes are largely responsible due to the increase in the number of sinkholes. Extreme disasters can create a sinkhole for a developing country like Bangladesh. So all of us must be aware and the level of groundwater extraction must be reduced. Towards groundwater table recharge special attention should be paid. Only then will it be possible to get rid of the disaster called a sinkhole.

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Beat Plastic Pollution and Save the Environment

Mohoshina Akter

Photo by Catherine Sheila from Pexels

Plastic is a great human creation that changed the world and brought comfort to our lifestyle. Plastics are micro-molecules, formed by polymerization and having the ability to be shaped by the application of reasonable amount of heat and pressure or any other form of forces

Photos by Maruf Rahman from Pixabay

Everywhere we use plastic products to help make our lives cleaner, easier, safer and more enjoyable. Now plastics are in all human activity ranging from clothing to shelter, infrastructure to communication, agriculture to construction, hardware to packaging and entertainment to health care. The growth in consumption of plastic products will continue in the coming decade.

This possible rise in plastic consumption may lead to huge plastic waste in municipal areas. According to the trade association plastics Europe, world plastic production grew from some 1.5 million ton (about 1.7 million tons) per year in 1950 to an estimated 275 million ton (303.1 million tons) by 2010 and 359 million ton (nearly 396 million tons) by 2018; between 4.8 million and 12.7 million ton (5.3 million and 14 million tons) are discarded into the oceans annually by countries with ocean coastlines.

A report produced by the world economic forum (2018) found that by 2050, there will be more plastic than fish in the world's oceans due to 13 million ton of plastic ending up in the ocean each year. A National Geographic report says that plastic kills millions of marine and land animals every year. Experts have found out that all species to have eaten micro plastic – from small shrimps to big elephants. The effects vary from damaging the digestive and reproductive systems to death.

Most used plastic materials are non-biodegradable and decompose at different rates. Managing plastic waste is increasingly becoming a global environmental and economic challenge.

"Plastic pollution can have harmful effects on the land and rivers by affecting wildlife and habitat, but also on human health. Plastic debris represents a chemical pollution in several ways. They contain compounds that can be chemically transferred to organisms during ingestion."

Researchers estimate that more than 8.3 billion ton of plastic has been produced since the early 1950s. About 60% of that plastic has ended up in either a landfill or the natural environment. Micro plastics (pieces under 5 millimeters long) and Nano plastics (pieces under

0.001 millimeter) are the result of plastic breaking down and that is how it is transported in the air we breathe, infiltrates our tap water and goes into our food.

Every year, we are potentially absorbing tens of thousands of micro plastic particles. Plastic pollution can have harmful effects on the land and rivers by affecting wildlife and habitat, but also on human health. Plastic debris represents a chemical pollution in several ways. They contain compounds that can be chemically transferred to organisms during ingestion. Some mals die every year because they get strangled in bags or mistake them for food. Plastic pollution causes harm to humans, animals and plants through toxic pollutants. It can take hundreds or even thousands of years for plastic to break down so the environmental damage is long-lasting. It affects all organisms in the food chain from tiny species like plankton through to whales. Toxins work their way up the food chain when plastic is ingested and can even be present in the fish people eat.

Because of the chemical additives used during plastic

Photos by meinerestetampe from pixabay

of these molecules are potentially toxic and can accumulate in the body. Besides, plastic bags also affect the growth of crops, by hindering the process of photosynthesis in agricultural fields.

The most direct effect of plastic pollution is the imprisonment of animals in nets or large debris. It is a cause of significant mortality of marine mammals, turtles and birds. According to the Natural Environment approximately 100,000 sea turtles and other marine ani-

production, plastics have potentially harmful effects on human health. Indeed, exposure to toxic chemicals coming out of plastic can cause cancers, birth defects, impaired immunity and other health problems. Beating plastic pollution is an important step in preventing environmental degradation and biodiversity loss, strengthening food security, and reducing negative health impacts. We need to slow the flow of plastic at its source, but we also need to improve the way we manage our plastic waste. Because right now, a lot of

Photo by Magda Ehlers from Pexels

it ends up in the environment. The global volume of plastic waste continues to grow, and some of the biggest producers don't manage their waste effectively. Bangladesh, which became the first country in the world to ban polythene bags in 2002, made a voluntary commitment last year at the ocean conference in New York to significantly prevent and reduce marine pollution by 2025.

To beat plastic pollution, we need to entirely redesign or rethink our behaviors relating to the consumption and production of plastic. It is time for research and investment to lead to suitable, environmentally-friendly and affordable alternatives to plastic. To efficiently reduce plastic pollution, there is an evident need of reducing our usage of plastic. It means changing our everyday behaviors and not using plastic when there is a better alternative to it and only using plastic when strictly necessary.

We all have a role to play. As individuals, we can reduce our plastic pollution and be more environmentally conscious by avoiding single-use plastics (e.g. Straws, cups, cutlery, etc.) And packaging materials (e.g. Polybags). Instead we can use jute bags, glass bottles or jars, steel or ceramic cutleries and utensils, and paper-made tetra packs. The private sector needs to invest more in producing alternatives and biodegradable plastics and in phasing out the production of plastic. More research and technology investment and development is required to make alternatives to plastic that are economically viable and affordable. Government should play a leading role by enacting strong policies and regulations to beat the plastic pollution for environmental safety.

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