E-waste: A growing concern

Research activities and awareness on the issue is inadequate in the country. There is no doubt that we need comprehensive study in the area for better understanding of the gravity of the problem and effective policy decision.

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RAPID progress in science and information technology, growing manufacturing activities, expanding urbanisation and increasing globalisation have elevated consumption and production for newer, better and faster electrical and electronic devices. With the growing use of these devices by businesses and households, the rate, at which people are constantly rejecting outdated product, is rapidly rising. Many of these are having short lifespan and not costlier to throw the old and buy the new one. These escalating obsolete and rejected electrical and electronic equipment, known as electronic-waste or e-waste, have become a significant concern to the society.

E-waste contain up to over 1000 diverse materials and components such as arsenic, copper, nickel, zinc, mercury, lead, and flame retardants. These substances are known to cause harm to humans and the environment if not properly disposed and recycled. The burning of e-waste like soldered material and plastic components in open areas lead to the release of toxic gases. Since these components are imperishable, they are threatening to the soil fertility. Moreover, the release of all these toxic waste and materials into rivers and oceans pose a danger to aquatic life. Safe disposal, safe and viable recycling, and reuse of outdated and old electronic goods are important and relevant issues of e-waste management. These materials require special handling and recycling methods, the absence of which leads to serious health and environmental hazards. There is also no viable market for some recycled materials.

E-waste management presents a huge challenge to everyone, including government, manufacturers and international organisations. In the international arena, Basel Convention is a remarkable initiative in response to outrage at the international trafficking of hazardous waste that entered into force in May 1992. Developed countries have relatively greater contribution both in creating and managing e-waste. Sometimes, developed countries export these rejected equipment to developing countries under the guise of aid. Among developing countries, China is well ahead in producing e-waste from others. Big corporations in different economies are taking actions to handle e-waste in a number of ways, from changing product designs to offering reuse and recycling programmes. But smaller businesses and residential PC-users have to find their own safe disposal programme.

Role of consumer awareness is crucial for e-waste management. Buying more responsibly made products contributes to reduce the problem of e-waste. Developed countries at least make it a point to impose fine on vendors and consumers who do not follow the laws. But, in developing nations, there are no strict rules and people are not much aware about the negative consequences and dangers of the improper disposal methods. In this connection, South Asia featured by exponential increase in e-waste; the lack of regulations regarding its safe disposal; the absence of a management infrastructure; and the lack of institutional capacity and general awareness to tackle the problem.

In Bangladesh, the ICT sector has turned out over 35 thousand tonnes of e-waste in the last 10 years, according to a recent survey conducted by Environment and Social Development Organisation. Reuse of e-equipment is a common practice and recycling and dismantling is a growing business in Bangladesh. Generally, dismantlers of rejected or obsolete equipment exist only in the informal sector, which is highly polluting. Computer recycling involves employing people to strip down computers and extract parts that can be used again in machines to be sold as refurbished products. The rest is then burned or dumped, both of which are highly hazardous to the environment. Workers taking apart the old machines handle toxic materials -- this could pose serious health problems.

The country has no regulation specifically dealing with e- waste till date. Medical Waste Management Rules, 2008 addresses the waste management issues for the medical sector. As Bangladesh is a signatory to Basel convention, import of any kind of waste requires government's permission. In the National ICT Policy, 2009, environment, climate and disaster management is identified as one of the ten objectives and aims to ensure safe disposal of toxic waste. Government has already prepared draft National 3R (Reduce, Reuse and Recycle) Strategy where e-waste issues are addressed. It is encouraging that recently the High Court of Bangladesh has prohibited scrap ships from entering the country without ensuring public health safety.

There are some scattered interventions where people have tried to rescue some parts of used PCs and reuse them in assembling a product for the local market in Bangladesh. One such initiative involves the conversion of monitor into television in the southern district of Bagerhat. Few corporate offices have taken initiative to distribute computers to different organisations for reuse. For example, Standard Chartered Bank has distributed their used PCs to schools. Some NGOs and Computer Jagat, an IT magazine, have been working to develop awareness to redistribute the used computers to schools in remote areas. In Bangladesh, Nokia tried to promote its green technology campaign in order to collect used mobile phones for its recycling plant.

Research activities and awareness on the issue is inadequate in the country. A recent study conducted by D.Net addressed the issue of quantifying e-waste and assessed the awareness level of residents in Dhaka city. There is no doubt that we need comprehensive study in the area for better understanding of the gravity of the problem and effective policy decision. Awareness campaign is essential through both traditional (newspapers, TV) and new media (web, blogs, social networks). The campaign should address policy makers as well as the general public. For consumer it is important that one should maintain and keep equipment as long as possible. People should donate their unwanted electronics for reuse. Government can support and encourage manufacturers to incorporate waste recycling plants as part of their production. Consumers need to know more about what to do with electronic waste. Very importantly, Bangladesh needs to enact laws and build infrastructure to ensure safe disposal of e-waste.

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Genetic engineering for modern agriculture

Although researchers believe that GMFs most likely do not have any negative effects on human health, long-term studies are needed to evaluate the safety of GMFs for human consumption.

MD. ABU SAYED

SINCE the 1990s, scientists have been able to change the genetic makeup of plants and animals that are used for human consumption. These products are called genetically modified foods (GMFs), or genetically modified organisms (GMOs). GMFs are produced to enhance or improve the organism's natural traits. In order to produce GMFs, scientists combine genes from different organisms. For instance, researchers have added genes to plants, such as corn, to make them more nutritious or insect resistant. This is done through a process called recombinant DNA technology.

In addition to crops, animals have also been genetically engineered. Researchers can genetically alter animals, including chickens and cows, to increase their productivity of meat, eggs, and milk. Not all genetically modified plants are grown as food crops. Plants, including trees, have been genetically modified to help reduce the amount of heavy metal pollution in contaminated soil, lessening an environmental concern.

There are four main ways to create genetically modified foods (GMFs).

Biolistics: Biolistics has been used to genetically alter plants. It involves directly inserting new genes into the plant. Microscopic pieces of gold or titanium are coated with the new gene and loaded into a cartridge (sometimes called a "gene gun"). The microscopic particles are fired through the plant cells, leaving behind the new DNA. The DNA then combines with the plant chromosomes.

Injection: Injections are mainly used in animals. New DNA is injected through a very thin needle into the nucleus of a single cell, usually a fertilized egg that is later inserted into a female uterus. This procedure, however, is often unsuccessful because in some cases, the cells do not express the desired traits of the new DNA.

Protoplast transformation: Protoplast transformation is often used to create genetically modified plants. Enzymes are first used to dissolve the cell wall of the plant. This leaves behind a protoplast. Then DNA is added and the cell is grown in a special environment to help the protoplast re-grow cells walls. This new plant is now genetically altered.

Vectors: Vectors have been used to create genetically altered plants and animals. Scientists change the genetic makeup of a virus or bacterium so it carries new DNA instead of viral or bacterial DNA. In other words, the disease-causing genes are removed, and new genes are inserted. The vector is then inserted into the organism's cells or tissue.

Technologies for genetically modifying foods offer dramatic promise for meeting some of the 21st century's greatest challenges. But like all new technologies, they also pose some risks, both known and unknown. Controversies surrounding GM foods and crops commonly focus on human and environmental safety, labeling and consumer choice, intellectual property rights, ethics, food security, poverty reduction, and environmental conservation.

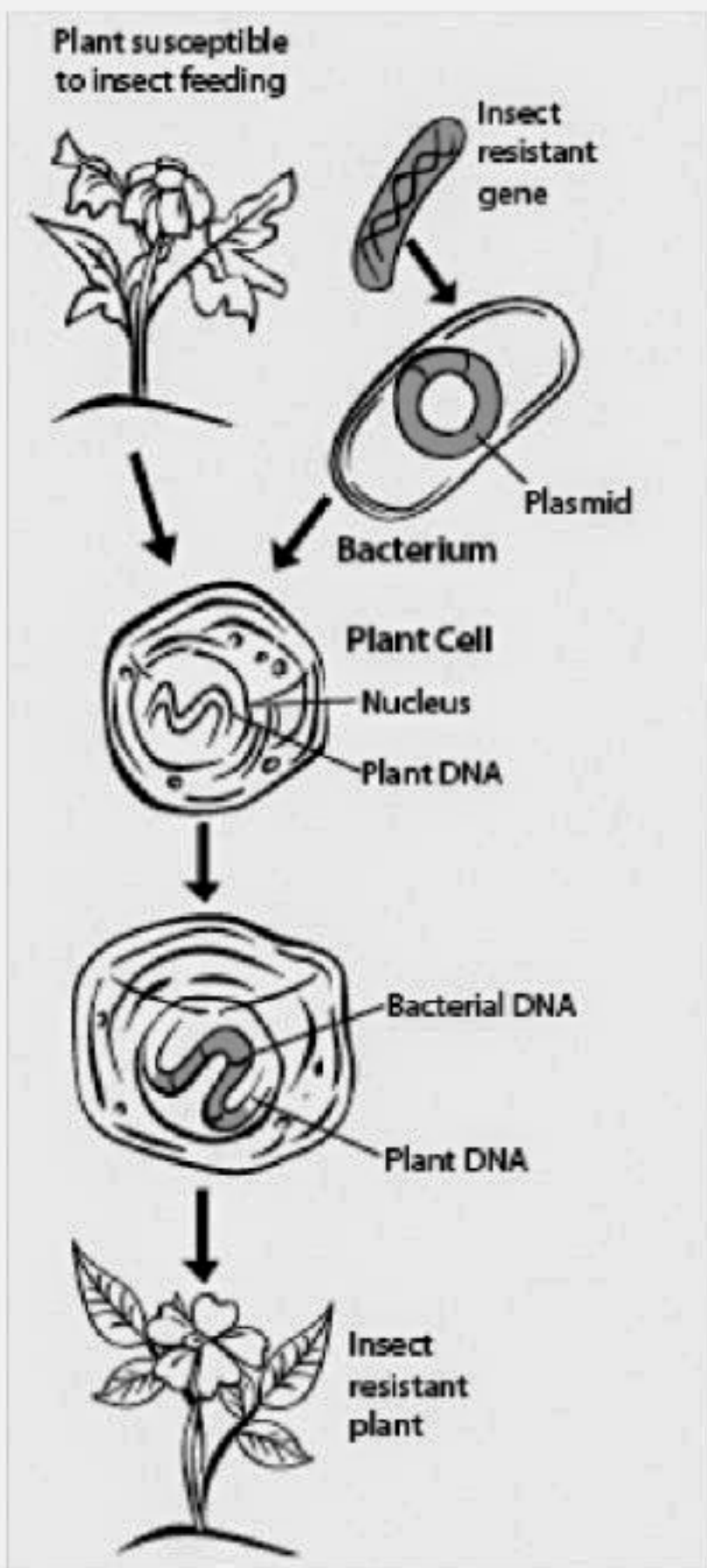**GM products: Benefits and controversies**

Benefits

Crops
• Enhanced taste and quality
• Reduced maturation time
• Increased nutrients, yields, and stress tolerance
• Improved resistance to disease, pests, and herbicides
• New products and growing techniques

Animals
• Increased resistance, productivity, hardiness, and feed efficiency
• Better yields of meat, eggs, and milk
• Improved animal health and diagnostic methods

Environment
• "Friendly" bioherbicides and bioinsecticides
• Conservation of soil, water, and energy
• Bio-processing for forestry products
• Better natural waste management
• More efficient processing

Controversies

Safety
• Potential human health impacts, including allergens, transfer of antibiotic resistance markers, unknown effects.
• Potential environmental impacts, including: unintended transfer of transgenes through cross-pollination, unknown effects on other organisms (e.g., soil microbes), and loss of flora and fauna biodiversity.

Access and intellectual property
• Domination of world food production by a few companies
• Increasing dependence on industrialised nations by developing countries
• Biopiracy, or foreign exploitation of natural resources

Ethics
• Violation of natural organisms' intrinsic values
• Tampering with nature by mixing genes among species
• Objections to consuming animal genes in plants and vice versa
• Stress for animal

Labeling
• Not mandatory in some countries (e.g., United States)
• Mixing GM crops with non-GM products confounds labeling attempts.

Society
• New advances may be skewed to interests of rich countries.

Although researchers believe that GMFs most likely do not have any negative effects on human health, long-term studies are needed to evaluate the safety of GMFs for human consumption. Preliminary evidence suggests that GMFs may trigger allergic reactions. Researchers speculate that introducing a gene into a plant may create a new allergen, which may cause allergic reactions in sensitive people. To date, all GM foods available in the market have been proved as fit for human consumption.

The environmental problem of GM crops is, it can potentially permeate other non-modified crops that are growing nearby. The movement of genes from GM plants into conventional crops or related species in the wild (referred to as "outcrossing"), may have an indirect effect on food safety and food security. This risk is true, as was shown when traces of a maize type which was only approved for feed use appeared in maize products for human consumption in the United States. Several countries have adopted strategies to reduce mixing, including a clear separation of the fields within which GM crops and conventional crops are grown.

Finally the labels must be designed to clearly convey accurate information about the product in simple language that everyone can understand. In January 2000, an international trade agreement for labeling GM foods was established. More than 130 countries, including the United States, which is the world's largest producer of GMFs, signed the agreement. The policy states that exporters must label all GMFs so that importing countries can decide whether or not they want to purchase the products.

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Process for creating an insect-resistant plant

Dhaka's dilemma!

S. K. LALA

"METRO rail stops at air force red signal" has been the headline of a news item published in The Daily Star on September 13, 2011, followed by another news item published in the same daily on September 14, 2011 headlined "Now Louis Kahn's JS masterpiece at stake". To any conscious citizen, these news items are disturbing and arising out of reasons relatively insignificant. First one is a security concern and the second, environmental. But these can be overcome without disturbing the proposed metro.

The whole issue has arisen from the Air Force's insistence on flight safety from Tejgaon. No body will question the importance of ensuring maximum operational facility to an airport being used by the Air Force, at times of emergencies or in a situation of war. But what if such operations in their entirety are shifted to a new location? There is an air strip in Comilla, which is not in use now. Why not the Air Force operations are transferred there? It is hardly 15/20 minutes air travel distance between the two locations. The newspaper report states the air chief to be quoting Hadith that even a mosque can be shifted for the welfare of the people. The same reasoning makes it more justifiable that alternative spot for Air Force operations may be chosen instead of jeopardising the metro link. And if metro link is allowed then, no question of desanctifying the Jatiya Sangshad environment arises.

It is imperative that as a sovereign nation, we must take decisions on national issues for our best interest without submitting to any external pressure, but at the same time we have to be extremely careful not to antagonise any genuine friendly agency for any insignificant reason as such are noticed globally and which may create a situation of isolation, for ourselves.

There are also other issues to seriously consider in this connection. An Air Force Base or Air Strip is perhaps one of the most vulnerable locations where any enemy will tend to strike first and continue to strike until one or the other is obliterated. Essentially such vulnerable establishments should be located in areas relatively less populated and away from important installations of any other kind. Needless to say from this consideration alone, the government should decide that Tejgaon Airport must cease to be an operational airport for Air Force.

Last but not the least, Tejgaon, if kept in recognition to be a functional airport (which it is not), has to comply with Civil Aviation Authority of Bangladesh's regulations that will restrict construction in a major part of this city within 150'-0" (height). This will mean many buildings already constructed higher than this level will have to be demolished and future construction will be restricted to a maximum of 15 storeys or less. Ours is a small country but with a big population. Our viable way of survival and to prosper is to go for high-rise construction. Such a scenario can well be achievable if the functions of the Tejgaon Airport are diverted elsewhere.

Further for emergency operations, use of helicopters are more frequent, which can still be allowed from Tejgaon. For use of fixed wing aircraft in case of any untoward emergency there is an Army Aviation Airstrip at the Shahjalal International Airport that may be used. All operations of combat aircraft in a situation of war ought to be shifted to an alternative suitable place. This is logical and perhaps in the best interest to all quarters. One would expect our national objective to be a far sighted one to achieve our ultimate desire to have a developed country with a proper, environmentally charming, commercially vibrant, and as much possible risk free, capital city.

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