

Myopic e-waste trade

Economic boon or ecological bane?

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E-MAIL, e-medicine, e-commerce, etc has made life easier, brought dramatic changes to our lifestyle and are regarded as environment friendly. Colour computer monitors and televisions contain cathode ray tubes (CRTs), most of which contain lead to protect users from x-rays, generated while the tube is in operation. A typical computer monitor may contain up to three kilograms of lead. The EPA estimates that more than 250 million computers in the US alone will be retired from use over the next five years. The world has become more aware of the natural environment and more sensitive to the implications of ecological damage.

About 500 companies and groups in the United States take part in the electronics recycling industry. Many of these companies are paid handsomely by major US corporations to keep the old computers, televisions and radios from polluting ecosystems. Few Americans realise that the obsolete computer they pay someone to take, in hopes it would be recycled, might end up in China or some other far-off Asian destination. Even the best-intentioned recyclers have been forced, due to market realities, to participate in this failed system. Huge quantities of hazardous electronic wastes are being exported from the US to China, Pakistan and India where they are processed in operations that are extremely harmful to human health and the environment. America's hi-tech revolution poisons the land and water on which local people depend. The number of electronic items only in the US to be recycled is projected to grow from 12 million in 2000 to 25 million in 2005. Many more are thrown out each year. It is estimated that between 1997 and 2007, 500 million pieces of electronic equipment will be discarded, containing 1.5 billion pounds of lead, 632,000 pounds of mercury, and three million pounds of cadmium, all toxic substances. The US cannot handle all of this waste, so this hazardous waste is "recycled" by selling it to countries like China and India.

In the Quangdong province, northeast of Hong Kong, where about 100,000 poor migrant workers are employed in breaking apart and processing obsolete computers imported primarily from North America. The workers were found using 19th-century technologies to clean up wastes from the 21st century. The operations involve men, women and children toiling under primitive conditions often unaware of the health and environmental hazards and risks. In Guiyu workers smash the cathode ray tube from a computer monitor to remove the copper laden yoke at the end of the funnel. The glass is laden with lead but the biggest hazard is the highly toxic phosphor dust coating inside. Monitor glass is later dumped in irrigation canals and along the river where it leaches lead into the groundwater. Workers picking through wires torn out of computers. At night, the wires - laden with cancer-causing polycyclic aromatic hydrocarbons (PAHs) and dioxins - are burned in the villages where the sorters live and work. Polychlorinated Bi-phenyls (PCBs) are listed as suspected human carcinogens and are known to cause cancer in laboratory animals. In humans, exposure to the PCBs can cause development problems, neurological defects, skin ailments and other diseases. Workers sweep toner out of printer cartridge. Toner are made of carbon black, which is carcinogenic. The cartridges are later dumped into the river. Tonnes of electronic wastes are being dumped along rivers, in open fields and irrigation canals in the rice growing area. The pollution in Guiyu has become so devastating that well water is no longer drinkable and water must be trucked in from 30 kilometres away for the entire population.

The reason for this flood of electronic waste exports is the ready availability of cheap labour in some Asian countries, and the inadequacy of these nations' environmental and labour protections. In addition, some American states, including California and Massachusetts, have already banned land filling of computer monitors and other electronic wastes, increasing domestic pressure to export these wastes. A free trade in hazardous wastes leaves the poorer peoples of the world with an untenable choice between poverty and poison - a choice that nobody should have to make. Some may call this recycling, but it's really dumping by another name. Yet to our horror, it is further discovered that rather than banning it, the US government is actually encouraging this ugly trade in order to avoid finding real solutions to the massive tide of obsolete computer waste generated in the US daily. Most manufacturers have refused to eliminate hazardous materials or design their products for ready disassembly. The US government fails to hold these manufacturers responsible for end of life management of their products. Although manufacturers and waste managers in the US have made some efforts to reclaim and recycle some of the most valuable - and the most toxic - of these ingredients, many remain destined for hazardous

waste landfills or unregulated foreign dumping grounds. Recycling centres often offer 'false solutions'. Between 50 to 80 per cent of the electronic waste collected for recycling in the western US is not recycled domestically but instead lands on container ships bound for destinations like China, after a few valuable components are removed. The US is the only developed country in the world that has failed to ratify the Basle Convention, a United Nations environmental treaty which has adopted a global ban on the export of hazardous wastes from the world's most developed countries to developing countries. The US has exempted electronic wastes from the Resource Conservation and Recovery Act and the export laws, because the material was claimed to be destined for recycling. The 15 countries that make up the European Union have implemented the Basle Convention and have banned the export of all hazardous wastes to developing countries for any reason. They have also readied legislation that will ensure that manufacturers are responsible for the entire life cycle of computers, are required to take computers and appliances back with the costs being born by the producers, and additionally, must agree to specific phase out dates for toxic components. Japan also has taken steps to solve the problem by mandating design criteria and mandatory take back programmes.

In New Delhi, children are routinely employed to burn circuit boards. In Karachi, children remove solder circuit boards with blowtorches, a process that is usually done indoors with no ventilation. The children breathe the highly toxic fumes. Thankfully, Bangladesh has not started importing such things, however, slowly but surely we will be disposing a great number of computers and TV monitors in the near future. It could be a nightmare for a poor country like ours to abate the

retardants. Compounds of heavy metals have an adverse effect on self-purification process of water body. The presence of these compounds, even relatively in low concentration is harmful for aquatic biota. Among the aquatic biota fish is the most important animal that are subjected to heavy metal effect. In fish, heavy metals accumulate in lipid rich tissues. In general, these compounds have a tendency to bioaccumulate in the food chain. It is well documented that the exposure of heavy metals can cause elevated levels of contamination in fish. Previous studies showed that the precipitated insoluble hydroxides of metals deposited in the gills and eggs could cause mortality of both eggs and fish. Sediment acts as an indicator of the burden of heavy metals in an aquatic environment, as they are the principal reservoir for heavy metal. Heavy metals may accumulate, unnoticed, to toxic levels.

The Ganges floodplain is one of the most heavily populated areas of the world. The sediment flux through the basin is one of the highest on a global scale. A significant portion of this sediment load finds its sink in the basin itself because of its lower elevation and frequent flooding. The Bengal basin occupies the total lower drainage of the GBM system an area of approximately 200,000 square-kilometres. Global annual sediment flux is 15 billion tonnes and GBM river system alone is 2-2.5 billion tonnes. The Ganges is not only gagged at its upper reaches but it is decidedly dirty as it flows down from its source head bearing unforeseen environmental burden for the lower riparian Bangladesh. The sediment load of GBM river system consists exclusively of fine sand, silt and clay at their lower reaches within the Bengal basin, Bangladesh, and it deposited under uniformly fluctuating, unidirectional energy condition. The mineral assemblage is domi-

activities. The EC issued guidelines for eco-labelling that became operational in 1992. Under the EC directive, a product is evaluated on all significant environment effects throughout its life cycle, from manufacturing to disposal - a cradle-to-grave approach. Laws that mandate systems to control solid waste, while voluntary in on sense, do carry penalties. The EC law requires that packaging material through all levels of distribution, from manufacturer to the consumer, must be recycled or reused. Abusing our environment and ignoring the cries of pain of our neighbours is easy if you don't feel a connection to the world. Knowing the consequences of your choices can't hurt you as much as ignoring them will. What keeps us from establishing life-affirming priorities? We are so afraid of fully accepting the consequences of our purchases, for to do so would mean that we might have to make another choice, maybe even decide to not to buy.

Markets are the principal institutions through which resources are allocated and firms interact with those in their environment. Goods and services are exchanged voluntarily in markets on a system of property rights that entitles the participants to the benefits from their exchanges. Some markets may fail to exit and others may to perform efficiently because of economics of scale, asymmetric information, and externalities. The government officials and business leaders recognise the importance of environmental protection and the benefits it yields. The Environmental Protection Agency (1991) estimated that compliance with existing environmental regulation would cost each person in the US nearly \$750 a year in the year 2000 or a total of \$185 billion annually, representing 2.8 per cent of GDP. Any new programmes to meet other environmental goals, such as

approximates the scale of the ecosystem, the assumption is violated. The simple fact is that the scale of resource utilisation by society is now approaching the scale of dynamics of the ecosystem. It is no longer reasonable to assume that environmental feedback is not a dynamic component of the economic. A serious doubt on the assumption that ecological systems can be studied in isolation from economic activity. The most important problem human being will be facing in the next century is how to reconcile our insatiable drive for development with the limited resources of our planet. To solve the problem, we must realise that telling to stop economic development is like telling us to stop breathing air. Likewise, economists must realise that environmental changes are not just irritating externalities. The environment is not an externality, it is the system within which we operate.

Social efficiency requires that the polluter and those affected by the pollution externality take into account the damage from the pollution and the social costs of preventing it. Just as it is not socially efficient to prevent all accidents, it is not socially efficient to prevent all pollution. Pollution control has often taken the form of command-and-control regulation in which regulators order engineering controls such as scrubbers for coal fired electric power plants to reduce sulphur, or require the best available technology for pollution abatement. Command-and-control approaches usually impose uniform controls and standards on dissimilar sources of pollution, resulting in higher-than-efficient abatement costs. Conversely, incentive approaches to pollution control allow firms flexibility in achieving environmental objectives and result in social efficiency by aligning the social and private costs of pollution, thereby

ENVIRONMENT WATCH

Capricious climate



A wave crashes in the Guilvinec port during a storm on October 15. Rescue workers were called more than 150 times, following the storm which hit the western French coast of Brittany.

World risks water shortage by 2025: report

WASHINGTON

If action is not taken soon the world could face enormous problems from dwindling or poisoned fresh water sources as early as 2025, according to a report released Wednesday.

Two non-profit environmental research groups - the Washington-based International Food Policy Research Institute and the Pretoria-based International Water Management Institute - used sophisticated computer modelling to project the fate of the world's fresh water sources and the repercussions of their disappearance.

The institutes found that by 2025 the world could see annual losses of up to 350 million tonnes of food, slightly more than the entire US annual grain crop, from lack of fresh water.

"Unless we change policies and priorities, in twenty years, there won't be enough water for cities, households, the environment, or growing food," warned Mark Rosegrant, lead author of the report and senior research fellow at the Food Policy Institute.

"Water is not like oil. There is no substitute. If we continue to take it for granted, much of the earth is going to run short of water or food - or both."

At the current rate, the study predicted that water consumption would rise by 62 per cent from 1995 to 2025 as the world's population grows, and more water is needed for agriculture.

That number is higher - 71 per cent - for developing countries which will produce less and less food as water dwindles, according to the study.

By 2025 the developing world will increase their food imports from 107 million tonnes in 1995 to 245 million in 2025 - if they can afford it.

"For hundreds of millions of poor farmers in developing countries, a lack of access to water for growing food is the most important constraint they face," said Frank Rijsberman, director general of the Water Management Institute.

"If countries continue to underinvest in building strong institutions and policies to support water governance and approaches to give better access to water to poor communities, growth rates for crop yields will fall worldwide in the next 25 years, primarily because of water scarcity."

The diminished food supply will cause grain prices to rocket. The authors predicted rice would cost 40 per cent more, wheat 80 per cent more and corn more than double its current price.

The study also predicted that the short supply would cause water prices to skyrocket. The rising expense of basic food and water would contribute to rampant malnutrition and disease in hundreds of millions of poor people.

"However a crisis 'is not inevitable,'" Rosegrant said. "The world can both consume less water, and reap greater benefits."

"To achieve sustainable water use, we must act now. The required strategies take not only money and political will, but time as well," he added.

Archaic law tells on Indian timber

SHIMLA, India

Environmentalists in the northern Indian state of Himachal Pradesh have urged the government to amend laws covering the felling of trees, after discovering that villagers are exploiting loopholes in the law to sell the timber.

The deodar is one of the most majestic and valuable varieties of cedar pines found in the Himalayas ranges in the states of Himachal Pradesh, Uttaranchal and Kashmir, growing at altitudes of between 5,000 to 9,000 feet.

The tree, which has drooping branches and dark bluish-green leaves, attains a height of 120 feet in the first 100 years of its life and can live several centuries.

However, the provisions of an archaic law last amended in 1915 allows peasants to cut the stately Deodars and sell them at throwaway prices, said Billy Malhans, a prominent green activist based in Himachal Pradesh's commercial capital Shimla.

"While the market value of deodar wood is to the tune of 80,000 to 100,000 rupees (1,600 to 2,083 dollars), a villager exercising his age-old timber distribution (TD) rights, can fell deodar and other cedar varieties and carry it home for just three to eight rupees (6 to 16 cents).

"It's laughable," said Malhans. Officials acknowledge that each year around 125,000 cubic metres (4.375 million cubic feet) of timber is sold to peasants living in and around forests in the higher reaches of Himachal Pradesh, Uttaranchal and Kashmir.

"Although TD rights are traditional rights enjoyed by

peasants for carrying out building and repair of their houses, according to one estimate close to half of this wood finds its way outside the villages for commercial construction," said Yoginder Chander, an environmentalist and local legislator.

"Clearly, successive governments have failed to enforce the law and check this gross misuse," he said. According to Malhans, the law states that TD rights can be exercised only if its holders help in conserving the forests.

"But we are not sure that is happening. Besides over a century ago if a tree was valued at five rupees, the peasant had to pay one rupee which was a lot in those days. But surely its ridiculous to charge the same rate today," he said.

Malhans pointed out that the popular hill resort Manali, some 218 miles from Shimla had about 475 hotels, most of them made of wood.

"And most of this wood comes from peasants who sell it after felling the trees under the traditional rights provision," he said.

Official data reveals that the demand for timber under the TD rights was 63,000 cubic metres in 1966, with virtually no pilferage or misuse.

But since then, not only have the number of claimants of TD rights increased, the demand for wood, too, has shot up sharply.

Environmentalist Chander said the lack of rules specifying periods of time for logging or the supply of timber at forest department depots, made pilferage and misuse easier.

Himachal Pradesh chief minister Prem Kumar Dhumal agreed that there is "definitely a need for... large-scale changes in the law."

But environmentalists said despite promises by the administration to act against the culprits no action had yet been taken.

"A committee had recommended revision of rates, freezing the number of TD rights holders and regulation of its periodicity, but the government has been sitting on this for almost two years now," Malhans said.

Central Europe's largest lake is drying up

BALATONFENYVES, Hungary

The water level in central Europe's largest lake is dropping, leaving officials and residents worried about damage to both the environment and tourism.

The water in Lake Balaton, 100 miles southwest of Budapest, was as of last week 30 centimetres (about one foot) below its normal level.

"To get a picture of what this means, imagine a corridor 70 metres by five metres with water only two millimetres deep," said Rudolf Keresztes, an enthusiastic wind surfer.

Keresztes said he feared that the water in Lake Balaton could drop so low that there will "no longer be enough water to windsurf or to swim."

"You've already got to walk," he said, pointing to a 150-200 metres long sandbar in the water.

The experts are also worried.

"This lack of water will sooner or later have a deadly effect on the quality of the lake," said Karoly Kutics, an engineer and researcher at the Balaton development council, an umbrella organisation for several communities bordering the lake.

"Precipitation is very localised in Hungary so that even with the flooding of recent years, there has been practically no rain over Balaton for three years," Kutics said.

He said the falling water level in the lake could cause a host of problems.

"Algae could grow in shallow water, and algae can become slimy and foul-smelling in a layer that easily warms and becomes the ground for yet more algae," Kutics said.

This would affect the quality of the water and hurt not only boating but tourism, he said.

Tourists are already staying away, but this is mainly due to high prices and poor service in the region.

In 2002, Lake Balaton had one of its worst tourist seasons.

Hungary's Environment Minister Maria Korodi, however, is not worried about the lake's environment.

"It is true that the water level is low but this has already happened in previous decades. The water quality is good," Korodi said.

Kutics has proposed channelling water into the lake through the Raba, Drava or Mura rivers.

A study of the "ecological effect of mixing 'foreign waters'" is to be made in November.

Kutics favours using the Raba river but its water flow varies from year to year, particularly during the summer.

Kutics said a "solution must be found based on strictly scientific criterion."

He said he hopes that two Japanese hydrology experts due to arrive later this year will bring some new ideas.

Meteorologists, ecologists and government water officials met earlier this month to discuss the issue.

A study being drawn up by the government's water office concedes that Lake Balaton lacks "120 million cubic metres of water", but describes this more as a social than an environmental problem since the low water level is not yet having an environmental impact.

A local mayor, Gabor Lombard of the town of Balatonfenyves, said a low-cost and rapid solution might be to drain nearby beaches and then to drop the dredged-up mud in the middle of the lake.

France, Greece, Italy worst for summer smog

PARIS

Greece, France and Italy faced the worst smog levels in Europe this summer, while the air was cleanest in Scandinavia and the Baltic countries, the European Environment Agency (EEA) said Wednesday.

Under European Union law, governments must inform the public whenever air pollution exceeds 180 micrograms of ozone per cubic metre of air, averaged over one hour.

In the April-August period, this threshold was exceeded in 11 out of the 15 EU member states and in six out of 12 non-EU countries which supplied data, the EEA said in a statement.

Greece had the highest number of days (68) where pollution was above the threshold, followed by France (56), Italy (52) and Spain (48).

Bulgaria, Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Norway, Romania and Sweden were the cleanest, all remaining below the threshold.

The highest ozone concentrations recorded this summer was 391 mg/cu3, at Puertollano in Spain.

The measurements relate to ozone, a molecule of oxygen that is created at ground level when sunlight reacts to exhaust pollution, and so is highest in warm, sunny weather.

It can damage crops and trees and human health, especially for the old and young and people with respiratory problems.

From next year, EU countries must respect a second threshold, of 240 mg/cu3.



The number of electronic items only in the US to be recycled is projected to grow from 12 million in 2000 to 25 million in 2005. Many more are thrown out each year. It is estimated that between 1997 and 2007, 500 million pieces of electronic equipment will be discarded, containing 1.5 billion pounds of lead, 632,000 pounds of mercury, and three million pounds of cadmium, all toxic substances. The US cannot handle all of this waste, so this hazardous waste is "recycled" by selling it to countries like China and India.

pollution. One might ask whether e-waste trade is economic boon or ecological disaster? In India IT is a billion, probably trillion, dollar business and in Bangladesh IT is a thriving sector. Growing industrialisation on the bank of major river systems of Bangladesh has resulted in considerable increase in water pollution. About seven thousand different industries are discharging solid or liquid wastes directly and indirectly into the water bodies. Additionally water bodies of Bangladesh also receive large amount of pollutants from the neighbouring countries. Some 50 million TV sets are projected to be sold in India by 2010, though most of them are not colour TV. However, 5-10 million computer monitors are expected to be disposed, dismantled apart from the imported ones from the US. Since no clear-cut hazardous waste policy exists in these countries or even exists it is not strictly implemented.

Computers, their monitors and keyboards, television, cellular phones and other electronic devices contain a host of toxic ingredients including lead, beryllium, mercury, cadmium and brominated flame

nated by quartz and feldspars. Illite and kaolinite are the major clay minerals and occur in almost equal proportion in bed sediments. Although the sediments of the GBM river system in the Bengal basin has the potential to trap contaminants because of their grain size and mineralogy. They are not contaminated at the moment but considering the population density, projected PCs and TVs selling can be very potential to be contaminated in the near future.

Global concern for the environment extends beyond industrial pollution and hazardous waste disposal to include issues that focus directly on consumer products. The growing public and political pressure to control solid waste is a strong incentive for compliance. An issue of growing importance the world over and especially in Europe and the US is green marketing. Europe has been at the forefront of the Green Movement with strong public opinion and specific legislation favouring environmentally friendly marketing. Green Marketing is a term used to identify concern with the environmental consequences of a variety of marketing

addressing global warming, would add to that cost. The high cost of environmental protection has raised concerns ranging from who should bear that cost to its effect on the international competitiveness of US firms. It is thus imperative not only that the environment be protected but that is be accomplished as efficiently as possible. Although there is widespread agreement about protecting the environment, there remains considerable disagreement about how much protection is appropriate and about the distribution of the burden of that protection. These disagreements generate the politics of environmental protection.

As long as economic activity remains small and local, the assumptions of isolated economic and ecological theory are reasonable. A small-scale assumption underlies the neo-classical market mode. A change in the supply will not destabilise the underlying environmental system. The assumption is valid as long as the scale of the dynamics is small in both space and time. When the scale of the economic system

causing polluters to internalise the externality. These approaches also decentralise pollution-control decisions because the generators of pollution rather than regulators have the responsibility for evaluating alternative emissions control technologies and abatement strategies.

We now realise that there is a significant trade-off between economic growth and environmental quality. Will global development veer toward a world of impoverished people, cultures and nature? Or will there be a great transition toward a future of enriched lives, human solidarity and environmental sustainability? Conventional development is perilous, while the notion of reform path to a sustainable future is snaggy and equivocal. Progressive elements of civil society, government, international organisations, and business can forge a new sustainability paradigm, an alternative vision of globalisation centred on the quality of life, human solidarity, environmental resilience, and an informed and engaged citizenry.

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