



Computer Pollution: A Global Turbulences to the Environment

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Abstract

Man is an integral ingredient of Physical and Biological World in which he lives. In a broader sense, we may define this physical and biological world as 'environment' which consists of biotic (Living) and abiotic (non-living) components. All the physical and biological aspects of human survival involve some kind of interaction with his environment. The objectives of these paper are to study the concept of global turbulence, 2) To study the present status of Global Environment, 3) To study how computer becoming growing course of Global pollution. Qualitative analysis method was used for the present study, The data collected through the secondary resources like Books, Journals, Magazines, Websites. The problems of Global environment is desertification biodiversity population explosion, Global warming & Urban pollution. The most important thing is computer pollution is a growing cause of global pollution.

Keywords :Desertification, Global warming, Urban pollution, Computer pollution, pollutants in computer

INTRODUCTION:

The interaction between man & nature the present status of the Global Environment is discuss from following way.

1) Desertification :-

Forty percent of the Earth's lands are already deserts and continued soil mismanagement, erosion and overgrazing is further accelerating desertification. Some estimate that nearly three-quarters of all rangelands worldwide are in danger of desertification. An estimated, 70% of the world's beaches are eroding. The seas have been rising due to human activities including global warming which is contributing to the melting

of ice caps and glaciers. Industrial toxic pollutants and residential wastes released in freshwater lakes, rivers and streams eventually find their way to the coastal waters and cause eutrophications and marine ecosystems damage and coral bleaching.

2) Biodiversity

The biodiversity is the ultimate source of human sustenance. Yet we are endangering the universe richness of species and a reduction in the genetic variety of crops.³ and wild species could seriously effect human welfare (Solbrig-1991). The extinction of a species is like torn out pages from an unread book, in other words, the gene pool of an extinct species is lost for ever. It appears ironic to see diminishing gene pool especially at this time when through genetic engineering we can manipulate the genes of totally unrelated species and thus help mankind by finding cures for many deadly diseases, improving livestock and food crops to feed overpopulated world (Singh-2004). Increased public awareness of humanity's depletion of biodiversity is necessary to stimulate diversity in the ecosystem's function.

3) Population Explosion

Today the number of years it takes to add 1 billion new people to our population has decreased from 130 years in the 19th century to a low of 12 years (Tobin and Dusheck 2004). Our growing population raises many questions, such as, our impact on other organisms as well as on ourselves. How large can the human population become before it destroys the biosphere that supports us or a population size that the Earth can sustain? We must design and implement a smooth transition to a non-growth situation — a global equilibrium, which is in accordance with our Earth's physical limits. From the standpoint of both biocentrism and sustainability, only self-limitation can stem the population tide, and the only voice we have in this matter is whether it will be done involuntarily by nature's undesirable stresses, or consciously by us not allowing our kind to exceed an optimum carrying capacity. Therefore it appears extremely important that each country must determine its carrying capacity based on food habits of its people and natural resources of that country and maintain stable population size by using family planning methods which are in harmony with their culture and religion (Singh-1978).

4) Global Warming

Earth's temperature is on the rise and so are incidents of severe weather and heat-related health problems. The global warming has accelerated and exacerbated by air pollution is affecting societal health and well being. Coastal erosion in Florida, the destruction of Alaskan forest by the spruce beetle, the depletion of Montana's glaciers, the decline in North

Pacific salmon, rising sea levels that threaten to engulf the world's small islands, increased in smog-related asthma, and the spread of malaria with the highlands of Africa, Madagascar, and Peru are all being chalked up to significant changes in ocean and air temperatures.

During the 1990's climate change emerged as one of the major potential threats to biodiversity. The IPCC (2001) concluded that climate change could lead to severe adverse impacts on the ecosystems. Some ecosystems might disappear, while others could experience dramatic changes in species composition.

5) Urban Pollution

Pollutants are substances which, when present at high enough concentrations, produce harmful effects on people and/or the environment alternatively we can say that Pollution is in its self is a wide term it has effected not only our lives but also our society and the environment around us. Therefore we can broadly divide it between urban and rural pollution. Urban Pollution is the pollution caused by the effect of the pollutants produced by the urbanization and it is growing by leaps and bounds.

Types of Urban Pollution

Urban Pollution is of many types like

1. Air Pollution
2. Water Pollution
3. Noise Pollution
4. Gulf War Pollution
5. Maritime Oil Pollution
6. Ocean Pollution
7. Soil Pollution

To the above given types the latest name that has been added is the name of Computer Pollution.

Objectives :

The study were taken up with following objectives in mind.

- 1) To study the concept of Global turbulence
- 2) To study the concept of computer pollution
- 3) To study how computer becoming growing course of Global pollution.

Study Method :

Qualitative analysis method was med for the present study.

Data collection and analysis :

The data collected through the secondary sources like Books, Journals, Magazines, Websites was taken subjected to qualitative analysis.

Computer Pollution : A growing Cause of Global Pollution

Computer as we all know is becoming need of every section of the society as it has multi-dimensional approach but at the same time it is also a hazard to the Environment. This Article is exploring the potential threat of computers to the environment i.e. a Computer as a pollutant.

United Nations research group states that worldwide efforts are needed to reduce the environmental damage caused by computer equipment The biggest cause of computers being a potential pollutant is its short lifespan which leads to its wastage (as we know that with the change in technology the system gets changed). As computers become smaller and more energy-efficient, their environmental burden might be expected to decrease - but the study suggests that the opposite is happening. It is found that manufacturing a 24 kg PC with monitor needs at least 240 kg of fossil fuels to provide the energy, and 22 kg of chemicals. Add to that, 1.5 tones of water and your desktop system has used up the weight of a sports utility vehicle in materials before it even leaves the factory.

Here we can have a simple comparison with cars or refrigerators, which use only between one and two times their weight in fossil fuels, and it is clear that making more than 130 million computers worldwide has a significant impact. According to a study making the average PC requires 10 times the weight of the product in chemicals and fossil fuels. According to a study people could be exposed to health risks at both ends of the short lifespan of computer equipment.

Pollutants in Computers

Chemicals such as brominated flame retardants and heavy metals including lead and cadmium pose potential risks to factory workers and users of water supplies near landfill sites where old computers are dumped.

Below given diagram points out which part of computers have which type of pollutant.

As we can make out from the above stats that more than 700 chemicals are used to manufacture a PC, about half of them toxic. For example, plastic computer casings are coated with toxic fire retardant. A computer monitor contains roughly 2 1/2 pounds of lead, most of it in the glass. If thrown into a landfill, the lead might not necessarily leach into the soil. But many communities rely on incineration rather than landfills. Incinerating computer remains can release dioxin and heavy metals into the atmosphere, contributing to acid rain.

Disposing of Computers becoming a Global Concern :

Disposing of computers becoming a global concern as there's the problem of a lack of infrastructure to deal with it. There are some recycling firms but they pick up computers from commercial centers only because as a general rule, computers retired by big companies are more likely to be newer and more valuable than those retired by small businesses and homeowners, for example a report suggests that in the Boston area, there are 13 computer recycling firms that will haul away old computers, but it's all commercial business. A state survey found none of the firms had ever picked up a computer from a household.

The world is rapidly becoming awash in computer junk, and no one knows what to do with it. The problem, experts say, is only expected to get worse.

Computers become obsolete in 18 months or less. In US alone manufacturers are selling 36.7 million new computers a year, about 80% of them for domestic consumption. This has made presence of old computers, printers and related equipment everywhere.

The problem may increase significantly with every passing year, as it is predicted by industry and environmental experts that, millions of computer owners decide it's cheaper to buy a new personal computer rather than try to make their old one Y2K compliant.

A new study by the National Safety Council estimates 20.6 million PCs became obsolete in 1998 in the United States alone, but only 11% - about 2.3 million units - were recycled. Another 1.3 million old pieces of computer equipment were refurbished, mostly by charities.

This problem may become grave if we don't learn how to manage it. So where are all these old PCs, laptops, printers and other computer-related equipment going? No one knows for sure, but the indications are that most are gathering dust in closets, attics and garages because their owners don't know what to do with them, as most old computers have a net negative value.

Not only is there no market for selling them, it's getting increasingly difficult to give them away. Few people want a computer slower than a 486 model because it won't run up-to-date software and isn't capable of surfing the Internet.

A survey by the Massachusetts Department of Environmental Protection of computer owners in that state found 40 percent had a PC stop working in the past year and 33 percent of them had simply put the machine in storage. Only one percent put the computer out with the trash.

Effects of Computer Pollution

Hundreds of millions of pieces of electronic equipment will reach the end of their useful life over the next five years. Equipment that is land filled, crushed, broken, shredded or incinerated can potentially release toxins and carcinogens into the environment. For example, an estimated 40% of lead in landfills comes from leaded glass of CRT monitors, lead soldering on circuit boards, and other discarded electronics. Among other toxins are mercury in flat panel monitors, printed circuit boards, mobile phones, batteries, relays, and switches; cadmium in semiconductors, chip resistors, and infrared detectors; and brominated flame retardants in circuit boards and plastics. Need not to mention that such waste can cause human life and environment the irreparable loss.

Practical Problems

There are some practical problems which needs attention like:

Disposing of Matter

Millions of used plastic disks also are gathering dust in desk drawers and closets because companies and consumers are concerned that throwing them away is not only environmentally unsound but could result in the unauthorized disclosure of sensitive information. '

Computer hard. drives present a similar problem. Killing a file doesn't always mean it isn't retrievable. For example, there was a commotion in Lincolnshire, England, recently when used PCs from a government agency appeared on the second-hand market still holding details of local child abuse cases.

Another problem down the road is an estimated 250 million television sets that will become obsolete at the end of 2005 when broadcasters switch from analog to digital transmissions for new, high-definition TV sets (HDTV). Like computer monitors, TV sets are not easily recyclable and have cathode ray tubes with significant amounts of lead.

Designing Products and making New Laws

Designing recycled products is one of the alternatives but the government has to make laws for that which will affect both the company as well as consumers like consumers taxpayers to pick up the cost of disposal, in America the Government and US manufacturers are fighting the directive, arguing that it is an illegal trade barrier. If the directive is adopted, US manufacturers would most likely be forced to adopt the European standards by default because most computer products are made for a global market.

According to manufacturers if government imposes certain regulations on designing products it might affect the trade and will have adverse effects on manufacturers and it could be hard for them to compete in the international market.

Therefore making laws and implementing them is still a problem. Still, various countries are making legislation like coming into force this year in the European Union requiring the electronic industry to take responsibility for safe disposal of used equipment, but it says the environmental benefits will depend on how it is implemented.

If such legislations are followed by the Governments all over the world then the potential threat of pollution by highly consumable item, i.e. Computer can pollution can be greatly reduced.

Individuals can also do a lot to cut down on computer waste. Every computer user has a role to play therefore Users should think carefully about whether they really need to buy a new computer, if upgrading the existing machine could serve the same purpose. Promptly selling old machines to the used-product market is also important. And although modern computers use relatively little electricity while they are being operated, a huge amount of energy is wasted because equipment is left on permanently, often overnight. Even energy-saving devices which automatically switch devices into standby mode can be deceptive, says the study, as they are frequently “woken up” by traffic from servers if they are connected to a network.

Recycling a Paid Service

Even if you want to recycle your computer then you should be prepared to pay for it for instance In Denver, Technology Recycling Consultants charge \$100 to recycle a personal computer (monitor, CPU and keyboard) and won't haul away any less than five computers at a time, which restricts their pickup service primarily to larger businesses. Ordinary consumers can bring their old computer to a drop-off center and pay the \$100, but there's a limit of three computers per household.

Storage Costs

Many companies pay the cost of doing nothing by continuing to store out of use equipment. Tying up valuable office and warehouse space in this way is an expensive proposition in terms of rent and real estate taxes.

Measures to be taken to Check Computer Pollution

We can conclude from the above discussion that computer pollutants are a serious threat to the society and the same time proper management of computer waste is necessity of the hour. Here we are exploring the ways by which we can check this problem

Re-using Computers

A report says that the both manufacturers and computer users across the world should be given greater incentives to upgrade or re-use computer hardware instead of discarding it.

Owning the problem

There is need to carry extensive research at various levels as still we need to work out on the effects of computers specially on mankind. Currently little research on these impacts has been carried out, and there are several law suits pending from workers at semiconductor plants who claim their work is linked to birth defects and cancer. The rector of the UN University in Tokyo, Hans van Ginkel, said: ‘This study clearly shows that our current understanding of the health and environmental impacts of computers is inadequate. We can no longer ignore the potential for serious long-term problems.’

Computer Recycling as a growing industry

In the recycling process, out of use electronic equipment is manufactured (taken apart), and its base metals, plastics, and chemical components become reusable materials for smelters, refiners, and chemical companies. Instead of entering the waste stream or contaminating the environment, the equipment becomes feedstock for manufacturing new products.

Electronics recycling is an emerging industry; both its physical and legal infrastructure is in the process of being built. The basic business model, however, is straightforward. The recycler's freight, storage and labor costs are measured against the value of the base components that they process, and clients are charged accordingly. True electronics recycling does not usually come free and the expense should be factored into total cost of ownership.

Our goal is in adopting recycling for end of life assets is to be released from all liability. Be sure when selecting a recycler, do thorough due diligence by verifying that the vendor internal practices that support that goal. Securely wipe the hard drives of PCs destined for retirement. Designate an area to temporarily store and track end of life equipment Establish an audit trail for each piece of equipment that you send out for recycling, and get a Certificate of Recycling from your vendor for all of your equipment that they process.

When selecting a recycler, do thorough research with due diligence by verifying that the vendor:

- Works within an ISO 14001 Certified Environmental Management System
- Uses refiners, smelters, and other business partners who work within environmental guidelines
- Can give excellent client references
- Uses clean manufacturing methods that do not release toxins into the work environment
- Does not allow parts or equipment to be land filled or exported to Asia
- Provides a Certificate of Recycling for all items processed
- Has regular audits of their facility by a third party

The expense of electronics recycling must be measured against the potential costs of penalties, litigation, negative publicity, or data security breaches resulting from improper e-waste disposal. An environmentally sound end-of-life strategy will pay off in risk mitigation and company goodwill, not to mention the positive impact on our global environment.

Recycling of computers should be made free of cost or should be done at nominal amount so that more and more consumers can be encouraged to recycle computers rather than dump them.

Entrepreneurs are coming up with innovations that can help. For example, Conigliaro Industries, Inc. of Framingham, Mass., has developed a process that breaks down old computer housings and uses the plastic pellets as pothole filler. Green Disk of Redmond, Wash., wipes used, high-quality computer diskettes clean of information and then labels and repackages the disks for sale. The company recycled 30 million disks last year.

Eyeing both the computer and television problems, Massachusetts recently became the first state to impose a ban on the disposal of cathode ray tubes. South Carolina is considering a \$5 tax on the tubes, with the proceeds going to a trust fund to deal with the problem.

According to David Isaacs, director of environmental affairs for the Electronic Industries Alliance, which includes most computer and computer-related equipment makers, acknowledged that computer trash is growing but insisted that “it is still relatively small in the scheme of things. It’s not like there is any kind of emergency.”

Designing New Computers

The industry can respond to the problem primarily by trying to design new computers so that they are more easily taken apart for recycling. Most major manufacturers have made adjustments in their products. Many leading computer makers have already taken this in practice like - IBM announced in March that it will start shipping a new line of personal computers in which the plastic in the central processing unit is 100 percent recycled.

The industry is also studying ways to reduce use of toxic materials, but in some instances there may be “no technically viable substitutes,” Isaacs said. For example, the flame retardant used on computer casing is required by law. The lead in computer monitors is to protect users from dangerous radiation.

The European Union has issued a draft directive that would make computer and other major electronic equipment manufacturers responsible for recycling used products. It would ban the use of some materials, including lead.

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