VOLUME 5 ISSN 2456-9704

TECHNOLOGIES DEVELOPMENT, CLIMATE CHANGE – HUMAN HEALTH AND WELFARE ISSUES

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ABSTRACT

TECHNOLOGIES DEVELOPMENT, CLIMATE CHANGE – HUMAN HEALTH AND WELFARE ISSUES

I stand before you not as an expert but as a concerned human being one of the 4 hundred thousand billion who maren in the streets of their homeland who want to solve our climate crises. Lets us compare ourselves with actors because mostly people of our generation sees that as a compliment. An actor plays a fictitious character often solving fictitious problems, I believe mankind has seen the problem of climate change in the same way, as if it was a fiction, as if pretending that climate change weren't real but somehow make it go away, but I think we all know better than that now. Every week we see new and undeniable climate events, evidence that accelerate in climate change is here right now. Droughts are intensifying; our oceans are polluting, methane in fumes rising up from the ocean floor, we are seeing extreme weather events, west Antarctic and Greenland ice sheets melting in an unpresidental rate, decades ahead of scientific prediction. None of this is retric and none of these are hogwash, these are facts. The scientific community knows it, industries know it, and government knows it. The chief of the U.S. navy specific command admiral Samuel said that "climate change is our single greatest security threat". My friends, this body, perhaps more than any other gathering in human history now faces this difficult but achievable task.

You can either make history or you will be vilified by it. To be clear this is not about telling people to change their light bulb or buy a hybrid car, this disaster has grown beyond the choices that individuals make, this is now about our industries and our governments around the world taking massive large scale action. This must be our moment for action. We need to put a price tag on carbon emissions and eliminate government subsidies on oil, coal and gas companies, we need to end the free right that industrial polluters are given in the name of free market economy, they do not deserve out taxes, they deserve our scrutiny, for the economy itself will die if our ecosystem collapse.

The good news is, renewable energy is not only achievable but it's also a good economy policy. This is not a debate, it is a human want, clean air and livable climate are valuable human rights, and solving this problem is not a question of politics but the question of our own survival. This is the most urgent of times and the most urgent of messages. People, actors pretend for living, but you do not. The people make their voices heard on Sunday around the world and the momentum will not stop, but now it is our turn. The time to answer human kind's greatest challenge is now. I beg of you to face it with courage and honesty.

Introduction

In the last decade, discussions of environmental economics and policy have

become increasingly permeated by issues related to technological change. An understanding of the process of technological change is important for two broad reasons. First, the environmental impact of social and economic activity is profoundly affected by the rate and direction of technological change. New technologies may create or facilitate increased pollution, or may mitigate or replace existing polluting activities. Further, because many environmental problems and policy responses thereto are evaluated over time horizons of decades or centuries, the cumulative impact of technological changes is likely to be large. Indeed, uncertainty about the future rate and direction of technological change is often an important sensitivity in "baseline" forecasts of the+ severity of environmental problems. In global climate change modeling, for example, different assumptions about autonomous improvements in energy efficiency are often the single largest source of difference among predictions of the cost of achieving given policy objectives (Weyant 1993; Energy Modeling Forum1996).

Second, environmental policy interventions themselves create new constraints and incentives that affect the process of technological change. These induced effects of environmental policy on technology may have substantial implications for the normative analysis of policy decisions. They may have quantitatively important consequences in the context of cost-benefit or cost-effectiveness analyses of such policies.

They may also have implications for welfare analyses, because the process of technological change is characterized by externalities and market failures with important welfare consequences beyond those associated with environmental issues.

Our goals in this are to summarize for environmental economists current thinking on technological change in the broader economics literature; to survey the growing literature on the interaction between technology and the environment; and to explore the normative implications of these analyses. This is a large task, inevitably requiring unfortunate but necessary omissions. In particular, we confine ourselves to the relationship between technology and problems of environmental pollution, leaving aside a large literature on technological change in agriculture and natural resources more broadly.1 Because of the significant environmental implications of fossil fuel combustion, we include in our review some of the relevant literature on technological change and energy use.

Human impact on the environment

Human impact on the environment or anthropogenic impact on the environment includes impacts on biophysical environments, biodiversity, and other resources. The term anthropogenic designates an effect or object resulting from human activity. The term was first used in the technical sense by Russian geologist Alexey Pavlov, and was first used in English by British ecologist Arthur Tansley in reference to human influences on climax plant communities. The atmospheric scientist Paul Crutzen introduced the term

"Anthropocene" in the mid-1970s. The term is sometimes used in the context of pollution emissions that are produced as a result of human activities but applies broadly to all major human impacts on the environment

Causes

Technology

The applications of technology often result in unavoidable and unexpected environmental impacts, which according to the I = PAT equation is measured as resource use or pollution generated per unit GDP. Environmental impacts caused by the application of technology are often perceived as unavoidable for several reasons. First, given that the purpose of many technologies is to exploit, control, or otherwise "improve" upon nature for the perceived benefit of humanity while at the same time the myriad of processes in nature have been optimized and are continually adjusted by evolution, any disturbance of these natural processes by technology is likely to result in negative environmental consequences. Second, the conservation of mass principle and the first law of thermodynamics (i.e., conservation of energy) dictate that whenever material resources or energy are moved around or manipulated by technology, environmental consequences are inescapable. Third, according to the second law of thermodynamics, order can be increased within a system (such as the human economy) only by increasing disorder or entropy outside the system (i.e., the environment). Thus, technologies can create "order" in the human economy (i.e., order as manifested in buildings, factories, transportation networks, communication systems, etc.) only at the expense of increasing "disorder" in the environment. According to a number of studies, increased entropy is likely to be correlated to negative environmental impacts.

Agriculture

The environmental impact of agriculture varies based on the wide variety of agricultural practices employed around the world. Ultimately, the environmental impact depends on the production practices of the system used by farmers. The connection between emissions into the environment and the farming system is indirect, as it also depends on other climate variables such as rainfall and temperature.

There are two types of indicators of environmental impact: "means-based", which is based on the farmer's production methods, and "effect-based", which is the impact that farming methods have on the farming system or on emissions to the environment. An example of a means-based indicator would be the quality of groundwater, that is effected by the amount of nitrogen applied to the soil. An indicator reflecting the loss of nitrate to groundwater would be effect-based.

The environmental impact of agriculture involves a variety of factors from the soil, to water, the air, animal and soil diversity, plants, and the food itself. Some of the environmental issues that are related to agriculture are climate change, deforestation, genetic engineering, irrigation problems, pollutants, soil degradation, and waste.

Fishing

The environmental impact of fishing can be divided into issues that involve the availability of fish to be caught, such as overfishing, sustainable fisheries, and fisheries management; and issues that involve the impact of fishing on other elements of the environment, such as by-catch and destruction of habitat such as coral reefs.

These conservation issues are part of marine conservation, and are addressed in science programs. There is a growing gap between how many fish are available to be caught and humanity's desire to catch them, a problem that gets worse as the world population grows.

Similar to other environmental issues, there can be conflict between the fishermen who depend on fishing for their livelihoods and fishery scientists who realize that if future fish populations are to be sustainable then some fisheries must reduce or even close.

The journal *Science* published a four-year study in November 2006, which predicted that, at prevailing trends, the world would run out of wild-caught seafood in 2048. The scientists stated that the decline was a result of overfishing, pollution and other environmental factors that were reducing the population of fisheries at the same time as their ecosystems were being degraded. Yet again the analysis has met criticism as being fundamentally flawed, and many fishery management officials, industry representatives and scientists challenge the findings, although the debate continues. Many countries, such as Tonga, the United States, Australia and New Zealand, and international management bodies have taken steps to appropriately manage marine resources.

Irrigation

The environmental impact of irrigation includes the changes in quantity and quality of soil and water as a result of irrigation and the ensuing effects on natural and social conditions at the tail-end and downstream of the irrigation scheme.

The impacts stem from the changed hydrological conditions owing to the installation and operation of the scheme.

a) the downstream river discharge is reduced
b) the evaporation in the scheme is increased
c) the groundwater recharge in the scheme is increased
d) the level of the water table rises
e) The drainage flow is increased.

These may be called direct effects.

Effects on soil and water quality are indirect and complex, and subsequent impacts on natural, ecological and socio-economic conditions are intricate. In some, but not all instances, water logging and soil salinization can result. However, irrigation can also be used, together with soil drainage, to overcome soil salinization by leaching excess salts from the vicinity of the root zone.

Irrigation can also be done extracting groundwater by (tube) wells. As a hydrological result it is found that the level of the water descends. The effects may be water mining, land/soil subsidence, and, along the coast, saltwater intrusion.

Irrigation projects can have large benefits, but the negative side effects are often overlooked. Agricultural irrigation technologies such as high powered water pumps, dams, and pipelines are responsible for the large-scale depletion of fresh water

resources such as aquifers, lakes, and rivers. As a result of this massive diversion of freshwater, lakes, rivers, and creeks are running dry, severely altering or stressing surrounding ecosystems, and contributing to the extinction of many aquatic species.

Agricultural land loss and soil erosion

Lal and Stewart estimated global loss of agricultural land by degradation and abandonment at 12 million hectares per year. In contrast, according to Scherr, GLASOD (Global Assessment of Human-Induced Soil Degradation, under the UN Environment Programme) estimated that 6 million hectares of agricultural land per year had been lost to soil degradation since the mid-1940s, and she noted that this magnitude is similar to earlier estimates by Dudal and by Rozanov et al. Such losses are attributable not only to soil erosion, but also to salinization, loss of nutrients and organic matter, acidification, compaction, water logging and subsidence. Human-induced land degradation tends to be particularly serious in dry regions. Focusing on soil properties, Oldeman estimated that about 19 million square kilometers of global land area had been degraded; Dregne and Chou, who included degradation of vegetation cover as well as soil, estimated about 36 million square kilometers degraded in the world's dry regions. Despite estimated losses of agricultural land, the amount of arable land used in crop production globally increased by about 9% from 1961 to 2012, and is estimated to have been 1.396 billion hectares in 2012.

Global average soil erosion rates are thought to be high, and erosion rates on conventional cropland generally exceed estimates of soil production rates, usually by more than an order of magnitude. In the US, sampling for erosion estimates by the US NRCS (Natural Resources Conservation Service) is statistically based, and estimation uses the Universal Soil Loss Equation and Wind Erosion Equation. For 2010, annual average soil loss by sheet, rill and wind erosion on non-federal US land was estimated to be 10.7 t/ha on cropland and 1.9 t/ha on pasture land; the average soil erosion rate on US cropland had been reduced by about 34% since 1982. No-till and low-till practices have become increasingly common on North American cropland used for production of grains such as wheat and barley. On uncultivated cropland, the recent average total soil loss has been 2.2 t/ha per year. In comparison with agriculture using conventional cultivation, it has been suggested that, because no-till agriculture produces erosion rates much closer to soil production rates, it could provide a foundation for sustainable agriculture.

Meat production

Environmental impacts associated with meat production include use of fossil energy, water and land resources, greenhouse gas emissions, and in some instances, rainforest clearing, water pollution and species endangerment, among other adverse effects. Steinfeld et al. of the FAO estimated that 18% of global anthropogenic GHG (greenhouse gas) emissions (estimated as 100-year carbon dioxide equivalents) are associated in some way with livestock production. A more recent FAO analysis estimated that all agriculture, including the livestock sector, in 2011 accounted for 12% of global anthropogenic GHG emissions expressed as 100-year carbon dioxide equivalents. Similarly, the

Intergovernmental Panel on Climate Change has estimated that about 10 to 12% of global anthropogenic GHG emissions (expressed as 100-year carbon dioxide equivalents) were assignable to all of agriculture, including the livestock sector, in 2005and again in 2010. The percentage assignable to livestock would be some fraction of the percentage for agriculture. The amount assignable to meat production would be some fraction of that assigned to livestock. FAO data indicate that meat accounted for 26% of global livestock product tonnage in 2011. However, many estimates use different sectoral assignment of some emissions.

Environmental specialists Jeff Anbang and Robert Goodland with the IFC and World Bank, have put the GHG associated with livestock at 51%, pointing out the FAO report failed to account for the 8,769 metric tons of respiratory CO_2 produced each year, undercounted methane production and land use associated with livestock, and failed to properly categorize emissions related to the slaughtering, processing, packaging, storing and transporting of animals and animal products.

Globally, enteric fermentation (mostly in ruminant livestock) accounts for about 27% of anthropogenic methane emissions, Despite methane's 100-year global warming potential, recently estimated at 28 without and 34 with climate carbon feedbacks, methane emission is currently contributing relatively little to global warming. Over the decade 2000 through 2009, atmospheric methane content increased by an average of only 6 Tg per year (because nearly all natural and anthropogenic methane emission was offset by degradation), while atmospheric carbon dioxide increased by nearly 15,000 Tg per year. At the currently estimated rate of methane degradation, slight reduction of anthropogenic methane emissions, to about 98% of that decade's average, would be expected to result in no further increase of atmospheric methane content. Although reduction of methane emissions would have a rapid effect on warming, the expected effect would be small. Other anthropogenic GHG emissions associated with livestock production include carbon dioxide from fossil fuel consumption (mostly for production, harvesting and transport of feed), and nitrous oxide emissions associated with use of nitrogenous fertilizer, growing of nitrogen-fixing legume vegetation and manure management. Management practices that can mitigate GHG emissions from production of livestock and feed have been identified.

Livestock production, including feed production and grazing, uses about 30% of the earth's ice-free terrestrial surface: about 26% for grazing and about 4% for other feed production. The intensity and duration of grazing use vary greatly and these, together with terrain, vegetation and climate, influence the nature and importance of grazing's environmental impact, which can range from severe to negligible, and in some cases (as noted below) beneficial. Excessive use of vegetation by grazing can be especially conducive to land degradation in dry areas.

Considerable water use is associated with meat production, mostly because of water used in production of vegetation that provides feed. There are several published estimates of water use associated with livestock and meat production, but the amount of water use assignable to such production is seldom estimated. For

VOLUME 5 ISSN 2456-9704

example, "green water" use is evapotranspirational use of soil water that has been provided directly by precipitation; and "green water" has been estimated to account for 94% of global beef cattle production's "water footprint", and on rangeland, as much as 99.5% of the water use associated with beef production is "green water". However, it would be misleading simply to assign that associated rangeland green water use to beef production, partly because that evapotranspirational use occurs even in the absence of cattle. Even when cattle are present, most of that associated water use can be considered assignable to production of terrestrial environmental values, because it produces root and residue biomass important for erosion control, stabilization of soil structure, nutrient cycling, carbon sequestration, support of numerous primary consumers, many of which support higher trophic levels, etc. Withdrawn water (from surface and groundwater sources) is used for livestock watering, and in some cases is also used for irrigation of forage and feed crops. Whereas all irrigation in the US (including loss in conveyance) is estimated to account for about 38% of US withdrawn freshwater use, irrigation water for production of livestock feed and forage has been estimated to account for about 9%;other withdrawn freshwater use for the livestock sector (for drinking, washdown of facilities, etc.) is estimated at about 0.7%. Because of the preponderance of non-meat products from the livestock sector only some fraction of this water use is assignable to meat production.

Impairment of water quality by manure and other substances in runoff and infiltrating water is a concern, especially where intensive livestock production is carried out. In the US, in a comparison of 32 industries, the livestock industry was found to have a relatively good record of compliance with environmental regulations pursuant to the Clean Water Act and Clean Air Act, but pollution issues from large livestock operations can sometimes be serious where violations occur. Various measures have been suggested by the US Environmental Protection Agency, among others, which can help reduce livestock damage to stream water quality and riparian environments.

Data of a USDA study indicate that, in 2002, about 0.6% of non-solar energy use in the United States was accounted for by production of meat-producing livestock and poultry. This estimate included embodied energy used in production, such as energy used in manufacture and transport of fertilizer for feed production. (Non-solar energy is specified, because solar energy is used in such processes as photosynthesis and hay-drying.)

Changes in livestock production practices influence the environmental impact of meat production, as illustrated by some beef data. In the US beef production system, practices prevailing in 2007 are estimated to have involved 8.6% less fossil fuel use, 16.3% less greenhouse gas emissions (estimated as 100-year carbon dioxide equivalents), 12.1% less withdrawn water use and 33.0% less land use, per unit mass of beef produced, than in 1977. From 1980 to 2012 in the US, while population increased by 38%, the small ruminant inventory decreased by 42%, the cattle-and-calves inventory decreased by 17%, and methane emissions from livestock decreased by 18%;yet despite the reduction in cattle numbers, US beef production increased over that period.

Some impacts of meat-producing livestock may be considered environmentally beneficial. These include waste reduction by conversion of human-inedible crop residues to food, use of livestock as an alternative to herbicides for control of invasive and noxious weeds and other vegetation management, use of animal manure as fertilizer as a substitute for those synthetic fertilizers that require considerable fossil fuel use for manufacture, grazing use for wildlife habitat enhancement, and carbon sequestration in response to grazing practices, among others. Conversely, according to some studies appearing in peer-reviewed journals the growing demand for meat is contributing to significant biodiversity loss as it is a significant driver of deforestation and habitat destruction.

Current Environmental Issues

It is high time for human beings to take the 'right' action towards saving the earth from major environmental issues. If ignored today, these ill effects are sure to curb human existence in the near future.

Our planet earth has a natural environment, known as 'Ecosystem' which includes all humans, plant life, mountains, glaciers, atmosphere, rocks, galaxy, massive oceans and seas. It also includes natural resources such as water, electric charge, fire, magnetism, air and climate.

Many of the technologies we use every day consume a lot more resources and power than they need to, and using and manufacturing them can create a mess. Here are a few of the ways that technology can harm the environment:

Pollution - Air, water, heat and noise pollution can all be caused by producing and using technology

Consuming resources - **Non-renewable resources**, including precious metals like gold, are used to make technology. Many others, such as coal, are consumed to generate the electricity to use technology. Even some renewable resources, like trees and water, are becoming contaminated or are used up faster than they can renew themselves because of technology.

Waste - Manufacturing technology creates large amounts of waste, and used computers and electronics get thrown out when they break or become outdated. Called "**technotrash**," these electronics contain all sorts of hazardous materials that are very unsafe for the environment. They need to be disposed of using special methods.

Disrupting ecology - Clearing land where animals used to live to build factories and allowing pollution to contaminate the food chain can greatly affect the environment's natural cycles.

Health hazards - Using **toxic** materials that can harm our health can cause cancer, and technology addiction can lead to other health problems like obesity and carpal tunnel syndrome.

You can encourage manufacturers by choosing to buy more energy-efficient and less hazardous electronics and by supporting companies that make protecting the environment a priority. You can also do your own part to reduce **environmental impact** by not being wasteful and disposing of your electronics safely and properly.

Carbon Emissions

Carbon emissions, mostly carbon dioxide and carbon monoxide, are **greenhouse gasses** that are produced by people. Greenhouse gasses are gasses in the atmosphere that trap and reflect heat and

radiation back to the planet's surface. It is believed that over the last century, the amount of greenhouse gasses in the atmosphere has increased due to carbon emissions and that they are contributing to **global warming**.

Carbon emissions get released into the atmosphere from things like cars, air planes, power plants and factories. They also get released by people like you, when you use a vehicle or electricity created from burning fossil fuels. The computer you're using to read this is using electricity, and so is your mobile device and video game system. We're all guilty of enjoying things that aren't exactly eco-friendly, but if we're smarter about how we use technology, we can reduce our **environmental impact**.

Toxic Technotrash

Technotrash also called electronic waste or e-waste, is any broken or unwanted electrical or electronic device, and is currently the most rapidly-growing type of waste.

If you just throw away technotrash with the regular trash, it usually **ends up in a landfill**. Most electronics contain non-**biodegradable** materials, and heavy metals and **toxic** materials like**cadmium, lead and mercury**. Over time, these toxic materials can leak into the ground, where they can contaminate the water we drink, the plants we eat and the animals that live around the area. Many European countries have even banned technotrash from landfills.

These toxic materials can cause all kinds of bad effects including nausea, diarrhea, vomiting and even cancer. If you keep eating and drinking contaminated food and water, these toxins can build up in your body. If you eat animals that have been contaminated, you're getting a double dose of toxins. What's even worse, your body can't properly process some of these metals and so they might take years to get out of your system.

To help protect the environment, don't put technotrash in with the rest of your household's garbage. Check with your local recycling centers to see if they take technotrash, or enter the type of trash and your zip code at **Earth911.org** to look for other recycling places nearby. You can also ship it to a company that specializes in disposing of technotrash, like **GreenDisk**.

Tips for Recycling Technotrash

Sanitize your Hard Drive

Before donating a machine, be sure to remove all of your **files** and data from it. Most people will just try to drag everything to the trash can or recycle bin, but this only partially erases the information! **Cyber criminals** can find this "deleted" information and use it however they want. To really protect yourself, you need to run a program that "**sanitizes**" your hard drive. These programs, which can be found online, work by replacing all your data with a jumble of useless nonsense. That way, your information is safe, and your good deed goes unpunished!

Consider Donating your Mobile Device

There are actually a LOT of great things your old **mobile devices** can do for people. Whether that means helping soldier's overseas talk to their families or helping victims of domestic violence, they can be a lot more than clutter for your junk drawer. Here is a **list** of several worthwhile charities.

VOLUME 5 ISSN 2456-9704

Raise Some Funds

Because electronics contain precious metals including gold, silver and copper, **technotrash** can actually be worth a little money. Why not hold a community fundraiser to collect and dispose of everyone's technotrash? You'll be helping both your community and the environment at the same time!

Reuse Those Ink Cartridges

Many locations that sell new printer ink cartridges will refill your old cartridge for a fraction of the cost. Each cartridge you throw away takes anywhere between 400 and 1,000 years to decompose, and on average, there are 11 cartridges thrown out every minute across the globe! Not all cartridges can be refilled, and even cartridges that you've filled in the past will eventually break down after continual use. When this happens, take them to the store where you bought them and recycle them. Sometimes, the store will even give you a discount on your next ink cartridge.

Just a note to our international readers: using refilled ink cartridges can cancel your printer's warranty, so be careful. If you're in the US, don't worry about it. It's illegal for the manufacturer to cancel the warranty because of used ink cartridges.

While some of the **impact** of computers and the Internet has unfortunately been negative, much of it has also been positive. Here's just a few of the ways that technology is helping to improve the environment:

a) It helps us develop and produce new materials and technologies that are sustainable and do not harm the environment, so we can eventually stop using ones that do harm it
b) It allow us to monitor and study our environment to better understand how it works and the impact of our actions on it
c) It helps us create smarter technologies that respond to how we use them and adjust themselves to reduce their environmental impact, such as lights that can sense when no one is in the room and automatically turn off
d) It allows us to have a worldwide virtual laboratory, so that experts from all fields can share their research, experience and ideas to come up with better, smarter solutions. Not only does this allow people far away from each other to work together, but it also reduces the environmental impact people would normally cause from traveling to meet with each other
e) It allows for paperless communication like email and online bill paying to **reduce the amount of trees cut down**
f) It allows companies to **reduce shipping and manufacturing impact** and to reach a broader audience

Sometimes people can get so excited about using a new technology that they overlook the negative impact on the environment. But, it's very important that we use technology in the smartest and most responsible manner, so that we are solving problems, not creating more for the future

Technology has bad effects on environment

Industrialization coupled with technological advancement has continued to affect the environment in a negative way. Industrial benefits resulting from technological adaptation in major activities has indirectly contributed towards higher living standards though bad part on technology manifest

VOLUME 5 ISSN 2456-9704

more. This is evidenced by increasing international discussions and consultations through conferences and meetings. A major theme in such meetings is on environmental violations resulting from technology. Complaints and issues associated with effects of technology are arising globally (Ausubel & Sladovich, 1999).

Environmental degradation is a growing concern as continued industrialization is being witnessed mostly in developed countries. There are three major negative impacts of technology on environment discussed in this essay. First, environmental pollution resulting from waste output is a resultant factor of technology. Contribution to global warming is the second effect of the growing technology. Lastly, depletion of natural resources and ecological imbalances experienced today result from technology.

To start, environmental pollution occurs as a result of technology mismanagement and lack of control measures. Technological improvement in recent years has seen production of more machines, weapons and automobiles. Increased consumption of improved facilities triggers demand which in turn influences supply of required quality of products that are major effectors of industrialization using improved technology. Importance of technology in such cases is attributed to satisfaction of human wants. Though adverse pollution of environment due to increased production in the manufacturing and processing industries, weapons testing and high usage of automobiles such as cars. Air pollution, water and noise pollution are the key components of an environment that has been continually polluted as a result of technology. Emission of large quantity of gases such as CO2 in the air by large industries causes air pollution which in turn has degraded environment immensely. Again, disposal of waste into the rivers and water systems by industries and other institutions is an environmental hazard through water pollution. Similarly, a lot of noise pollution from weapons testing and usage, industries in their routine production processes and automobiles is causative of environmental dilapidation (Ausubel & Sladovich, 1999).

Furthermore, technology contributes towards depletion of resources. Development and usage of technology is contributing to increase industrial activity that requires raw material from natural resources such as coal, timber and wild animals. As well, extensive agricultural activities as experienced in Bangladesh is beneficial in terms of productivity but depletion of natural resources such as forest cover, water and soil fertility and its organisms composition is a likely event. Farming activities such as burning of bushes, deforestation and usage of chemicals to enhance soil fertility is an environmental exploitive. As well extensive mining of gold, diamond and other minerals is an activity that is contributing towards depletion of resources at an alarming rate. Overexploitation of fossil fuel and other resources ceases to be beneficial and becomes an environmental threat.

In addition, ecological systems imbalances and disruptions result from technological advancements in the modern world. Collapse of ecological life and extinction of organisms from their natural habitats is a direct probable result of technology. Wildlife extinction from their natural habitat to create more space for farming activities and home for increasing population is an

evidence of how technology causes ecological imbalances. Availability of improved technology causes people to device convenient ways of satisfying their basic needs and increased productivity requirement. Human embark of activities such as deforestation, extensive farming activities, environmental pollution which lead to changes in the natural lifecycles that maintain ecosystem. Though ecosystems can rebound from these negative effects, continued of environmental degradation through destructive human activities affected by technology will eventually lead to collapse.

Lastly, current issues on global warming are negative effects of technology and environmental factors. Unchecked technology advancement and utilization specifically in areas causing air and water pollution leads to atmospheric gases imbalances (Ausubel & Sladovich, 1999). Emission of harmful gases such as CO2 in large amounts forms greenhouse effects that are the major components of global warming. Green house gases result from activities such poor farming methods, transport systems, manufacturing processes and renewable power generation activities especially using coal. Fossil fuel extraction through burning and clearing of farming lands through burning concentrates harmful gases hence affecting climate.

In conclusion, higher percentage of environmental problems is a direct result of technology mismanagement by innovators and users. A small portion of environmental issues relate to economic, social and natural changes resulting from human activities. Environmental pollution, ecological systems disturbances, depletion of natural resources and climatic changes resulting from global warming are technological influenced. Technology is significant in development and increased productivity to satisfy human need, but uncontrolled technology impacts environment negatively.

Sustainable Development

Sustainable development, at present time is a most concern phenomena. Globally every country including most developing country like India and China thinks very much about it because they realize that their future generation must be suffer to lack of resources which is obviously most central to survive. This phenomenon comes after Second World War. The concept of sustainable development is not related only future generation but also with the present generation. Firstly it is important to know the conceptual meanings of sustainable development. It is a way of thinking by which we can secure our present and future generation. The right to development means the right to improvement and advancement of economic, social, cultural and political conditions that can be improved the global quality of life. Improvement of global quality of life means the implementation of changes that ensure every person's life of dignity and at same time citizens realize their human rights. These changes must include the eradication and alleviation of widespread conditions of poverty, unemployment, and inequitable social conditions. In this context the statement of Mrs. Indira Gandhi would like to quote in which she was emphasized on environmental security for sustainable development. At the UN Conference on Human Environment at Stockholm in 1972 she said that, the removal of poverty is an integral part of Environment at Stockholm in

1972 she said that, the removal of poverty is an integral part of the goal of an environmental strategy for the world.[1],

The needs of Sustainable development:

In the 1970s the debate on development was safely mortizat between the issue of environment and development. This decade saw a major revision in the thought of development itself and that has presented a major challenge to the conventional consensus on economic development. New expressions such as 'sustainable development' have added new dimension to development debates. The problem today is not primarily one of absolute physical shortage but of economic and social mal-distribution and misuse.' Thus United Nations Environment Programmed (UNEP) 1975 explains 'environmental management implies sustainable development'. Since then the challenge as expressed in the Brundtland Report also as 'the process of economic development (which) must be more soundly based on the stock of capital that sustains it.'

Importance of Sustainable Development:

Let me begin by quoting Terri Swearingen, recipient of the Goldman Environment Prize in 1997, for organizing the protests against Waste Technologies Industries toxic waste incinerator.

"O Earth, in the villages, forest, assemblies, committees and other places on Earth, may what we express always be in accord with you".

We all are aware about the pace at which the world is developing. We have come a long way from the time when the society consisted of very small, closely- knit nomadic groups, where the respect for kin men, environment and individual brilliance was ingrained in the very societal structure by means of customs, traditions and usages developed over the period of time. We very well know the value of resources. But somewhere during this race to develop rapidly, we have become oblivious to the effect of this development on these resources.

During the Earth Summit of 1992, held at Rio De Janerio, Brazil, United Nations stated that any definition of development must include a notion of sustainability.

Now the important question is, what is **'sustainable development'**, and why it is central to any understanding of true development. Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present but also for generations to come. The term was used by the Brundtland commission which coined what has become the most often- quoted definition of sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."[2]

Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing

[1]Study by Surendra Kumar Gupta, Research Scholar, Deptt. of Economics, BHU,Varanasi on "Strategies for Sustainable Development in India (With Special Reference to Future Generation) P. 2-3

[2]Paper Presented by Pravin H. Parekh, Senior Advocate S.C. of India on "Global Environment and Disaster Management: Law and Society" P. 1-4

humanity. As early as the 1970s "sustainable" was employed to describe an economy "in equilibrium with basic ecological support systems" Ecologists have pointed to the limits to growth, and presented the alternative of a "steady state economy" in order to address environment concerns conceptually, sustainable development can be conceived of as integrating three "pillars"

[1]. International environment law,
[2]. International human right law and
[3]. International economic law

The integrated structure of sustainable development is such that it requires support from each of the pillars.

Sustainable Development Future Generation:

The term "sustainable development" is defined as development to achieve the **n**eeds of present generation without compromising future generation's needs, while we are misusing the resources in a very vital manner, which is not good for the present generation and as well as to the future generation. 'Future Generations' is mainly related to the environmental problems of resource consumption and pollution and their distribution over long time horizons. In this paper we focus on strategies for sustainable development which are necessary for survival of and our present generation as well as coming generation. And also emphasize on how to improve the quality of life of both current and future generations, while safeguarding the earth's capacity to support life in all its diversity[3].

Growing Awareness of Sustainable Development:

The United Nations Conference on the Human Environment in 1972 recognized that the rapidly expanding human population survived off a finite pool of resources. Without careful management, resources such as food, energy and water could be exhausted, leading to obvious global crises.

The conference also led to the establishment of many national environmental protection agencies and, most importantly, momentum behind the movement that included politicians, government agencies and international organizations. Eight years later, the International Union for the Conservation of Resources published the World Conservation Strategy, a document which stressed the inter-dependence of development and environmental protection strategies.

Conclusion

The term "sustainable development" is defined as development to achieve the needs of present generation without compromising future generation's needs, while we are misusing the resources in a very vital manner, which is not good for the present generation and as well as to the future generation. 'Future Generations' is mainly related to the environmental problems of resource consumption and pollution and their distribution over long time horizons. In this paper we focus on strategies for sustainable development which are necessary for survival of and our present generation as well as coming generation. And also emphasize on how to improve the

[3] Study by Surendra Kumar Gupta, Research Scholar, Deptt. of Economics, BHU,Varanasi on "Strategies for Sustainable Development in India (With Special Reference to Future Generation) P. 1

quality of life of both current and future generations, while safeguarding the earth's capacity to support life in all its diversity.

Problems of sustainable development are rooted in issues of resource use and their pattern of distribution and ownership. Thus a policy towards sustainable development cannot be framed in isolation to politics and state regulations. The world community is confronted by a chicken and egg controversy; economic problems aggravate resources crisis and environmental despoliation and this leads to constrained economic revival due to which nations find it more difficult to solve problems of unsustainable use of environment. In a world where progress depends on a complex set of national and international economic ties, any step towards sustainable patterns of growth involves unresolved problems and challenges.

In fact, local stakeholder consultation is a highly neglected subject in the Indian mining industry. Except for one-time public hearing in the environmental impact assessment process (prior to start of mining operation); there is no meaningful consultation between mining enterprises and communities living in mining project areas. The mining law also does not require or encourage such consultation. Transparency in communication, sharing of information with local communities and accountability are also major problems in most mining areas.

Governance failure in mineral administration is a major problem. Duality of state and federal control and multiplicity of state and central agencies with inadequate budget and staff appear to be the major reason for governance failure in India's mining sector. Political interference and institutional graft further complicate the problem.

Though the mineral sector's contribution to India's GDP in 2011 was around 2.6%, its importance arises from the fact that it supplies basic and strategic raw materials for the country's industrial and economic development. Due to the sharp rise in prices and demand of a number of mineral commodities, the production of many minerals has shown steady increase, both in quantity and value since 2004-05 and it has led to simultaneously greater exploitation of resources.

Two main pre-conditions for achieving sustainability are the existence of good governance and self-regulating mining enterprises which are economically viable, financially profitable and technically efficient.

A large number of small mines (including quarries for extracting minor minerals) operate in most mining states. These present difficult challenges for sustainable development as their financial, technical and managerial limitations restrict their ability to take effective corrective measures against negative consequences of mining.

'Sustainable development', an all-inclusive, somewhat ambiguous concept basically means economic and social development that endures over the long-term and its core ethic is intergenerational equity. Sustainability principles have application for all stages of mine life cycle – exploration, mine planning, construction, mineral extraction, mine closure and post-closure reclamation and rehabilitation. These principles include elements such as intra and inter-generational equity, the precautionary principle, scientific mining, management of environmental and socio-economic impacts,

VOLUME 5 ISSN 2456-9704

creation of substitute capital in the form of social and physical infrastructure and stakeholder engagement.

This is a critical moment in earth's history, a time when humanity must choose its future. Our planet earth is perhaps the only human habitat in the vast universe and we owe it to posterity to preserve the divine heritage of our biosphere without pollution, degradation and destruction. While progress towards sustainable development has been made through meetings, agreements and changes in environmental governance, real change has been slow. The long term perspective for sustainable development requires the broad-based participation of various stakeholders in policy formulation, decision-making and implementation at all levels in particular of issues of biological diversity and this must be encouraged. To effectively address environmental problems, policy-makers should design policies that tackle both pressures and the drivers behind them. Economic instruments such as market creation and charge systems may be used to help spur environmentally sustainable behavior.

It is true that in order to improve and protect the environment from pollution sustainability must be there between environment and development. The concept of sustainable development based on the notion that natural resources should be exploited for the benefit of both present and future generation. As we know that increased industrial activity worldwide requires the use of natural resources which are depleting day by day. It is also true that the need for resource conservation, efficient use of resources and environment friendly corporate policies and behavior has now been recognized worldwide. The country needs an Environmental policy and planning, while being globally sensitive must be based on local needs. Finally, if sustainable development has to move from mere wishful thinking and slogan-mongering into a reality, the world (developed and developing) as a whole has to move towards a new world order in which new economic and technological orders are dovetailed. Such an order has to be aimed at benefiting the poor because in the chain of sustainable development, the weakest links are poverty and inequality. Last but not least, if the principles of sustainable development are followed then definitely with the economic growth and industrial development of a country environment protection can be maintained.

Mining enterprises undertake socio-economic local development works in their respective mining projects areas as part of their corporate social responsibility (CSR) activity. The level of commitment and the nature and extent of activities differ from one enterprise to another. Major mining companies have set up 'trusts', 'foundations' and 'societies' to take up socio-economic development projects in their mining areas.

Our objective with Marble Peaks Ranch is to be commendable stewards of our land. While we have legal ownership of the land, we view it as guardianship, with a responsibility to care for the land and its native inhabitants. We are committed to sustainable, low-impact agricultural practices.

Waste management is most important on marble and limestone industry. Waste that originates from processing activities, as mentioned earlier, includes scrap, chips and sludge. Scrap and chip particles of bad quality can be re-used the same way quarry

wastes are used: the production of construction materials or aggregates. Good quality dry wastes can be alternatively exploited to give higher value products like floorings and coverings for exterior applications as mentioned previously. Sludge on the other hand is a special case since it contains water in an amount of 20 to 28 percent of its weight and when it comes from granite block cutting, iron in an 8-10 %. The options for re-using sludge are given below while the actual applications follow.

Recommendations:

The procedures for various approvals and monitoring including those for environmental and forest clearances should be streamlined in order to improve the efficiency and effectiveness of the system and to reduce the time taken to clear a proposal.

Mineral development in a region should be carried out within its available social and environmental 'carrying capacity' and infrastructural infrastructure facilities at a given point of time. Appropriate administrative and procedural arrangements should be made in order to ensure this outcome.

A separate legislation for mine closure should be formulated providing for, among other things, close and continuous community consultations, legal obligations of the mining lease holder for land reclamation and rehabilitation and strict implementation of the provisions.

Both the government and industry need to take a comprehensive view of sustainable development in mining that beside environment should cover other dimensions such as stakeholder engagement and consultations, local area socio-economic development and transparency in communication and accountability.

The new mining law (now under consideration) should provide for mining enterprises to engage in consultations with local community stakeholders at all the stages of mine life cycle.

The new law should also lay down a mandatory obligation on mining concessionaires to undertake socio-economic development projects in their mining project areas as a part of their corporate business obligation (CBO). This should replace CSR activity which is voluntary and optional in nature.

Preparation of a socio-economic assessment report for a mining project to be followed by the formulation and implementation of long-term and short-term development projects should be made a part of the permitting process for the grant and administration of mineral concession to a mining enterprise.

Local socio-economic development works should preferably be executed by mining enterprises rather than government and semi-government agencies (such as the District Mineral Fund proposed under the Draft MMDR Bill 2011) in order to avoid the problems of inadequate capacity, political manipulation and corruption. Also, simply doling out cash to affected persons is not a sustainable solution.

In order to alleviate the limitations of small mines in carrying out sustainable development activities, consortia of small mining enterprises in a region should be promoted. Technical advisory services should be made available to them in the relevant areas.

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