Green Clean Guide

For the Changing Planet

2013

A Compendium of Essays

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About the Article

This article is a compilation of participant submissions for the essay competition organised by Green Clean Guide in 2013. Barring the first and second prize winner, essays in this article are arranged in no particular order. The order of arrangement does not in any way represent the position essays achieved at the competition.

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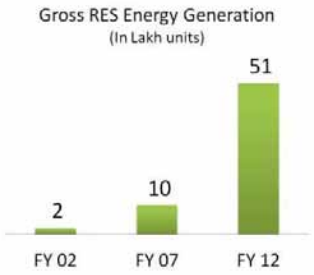
Content

1

Five Policy Changes to Achieve the NAPCC Target

By Ashish Tikhe

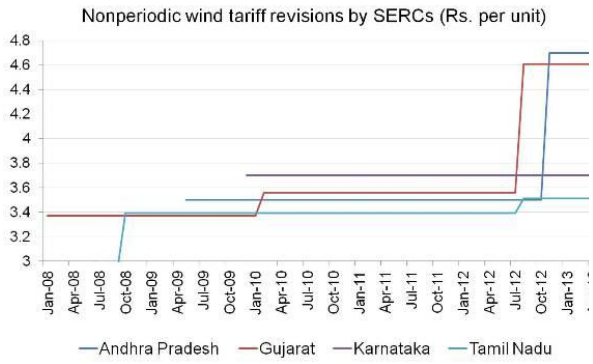
India sources about 5% of its total energy from renewable sources. It has a target of sourcing 15% of its total energy from renewables by 2020 under the National Action Plan for Climate Change.



Despite rapid growth in renewable energy generation by India in past few years, at current capacity addition, the target seems a distant dream. However, few policy decisions by the government can help boost capacity addition and thus achieve the said goal.

5. Adopting CERC framework for Preferential Tariff determination

National Tariff Policy, 2005 states "It will take some time before non-conventional technologies can compete with conventional sources in terms of cost of electricity. Therefore, procurement by distribution companies shall be done at preferential tariffs determined by the Appropriate Commission". As per this clause, State Electricity Regulatory Commissions determine the preferential tariff for the renewable energy projects to be commissioned in the state.



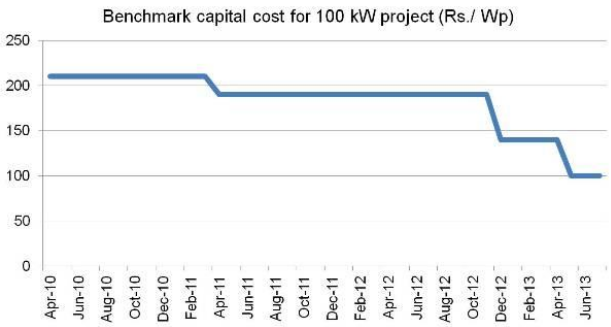
Source: SERC orders on preferential tariff

CERC has developed the framework regulations for annual tariff determination of renewable energy projects as a guide for SERCs. However, most of the SERCs follow their own methodology by adopting only part of this framework. Following CERC framework in

entirety will ensure that investors get promised returns as per dynamic market conditions. This will also benefit central government by reducing the load of unnecessary subsidies such as Generation Based Incentive.

4. Continued support to the off-grid solar

MNRE provides 30% capital subsidy for installation of off-grid solar power projects. It has revised the benchmark capital cost by reducing solar module cost.

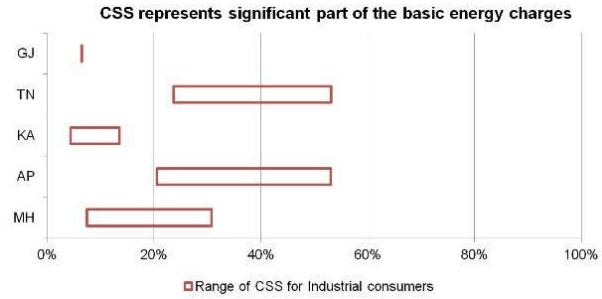


Benchmark capital cost for 100 kW project, Source: MNRE

Installed capacity of off-grid solar power projects as on 30th June 2013 was 132 MW. As more and more developers apply for the limited subsidy, there is uncertainty that the subsidy will be received after application. To provide confidence to investors, government needs to provide long term visibility on the subsidy and benchmark capital cost. Subsidy can be reduced gradually till substantial installed capacity is achieved.

3. Open access charges and regulations

To increase the consumption through open access, renewable energy needs to be cost competitive with the consumer tariffs and conventional sources of energy. Per unit levelized cost of renewable energy (except solar) is already lower than industrial tariff in most of the states. However, when open access charges are added to this cost, sourcing renewable energy becomes unfeasible.



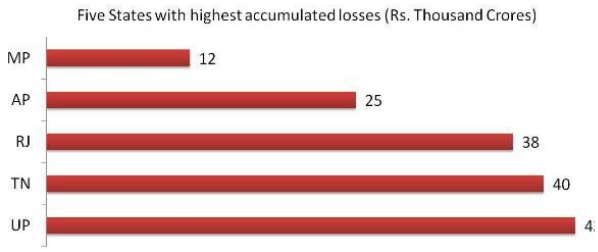
CSS represents significant part of the basic energy charges, Source: SERC orders

To promote capacity addition, renewable energy needs to be made competitive with other sources of energy. This can be achieved by providing concessional open access charges for renewable energy projects. Also, banking facility needs to be provided to the infirm sources such as wind and solar which hold the largest potential.

2. Depoliticize the electricity sector

Power Ministry released the integrated rating of Discoms on March 2013. As per this report, Cost coverage ratio for most Discoms has remained low

(<0.90) due to substantial increase in expenses primarily on account of higher fuel cost, employee related expenses and interest cost whereas increase in tariffs have not been adequate enough to compensate for the higher costs. Cumulative losses of Discoms exceeded Rs.1.9 Lakh Crores by March 2013.



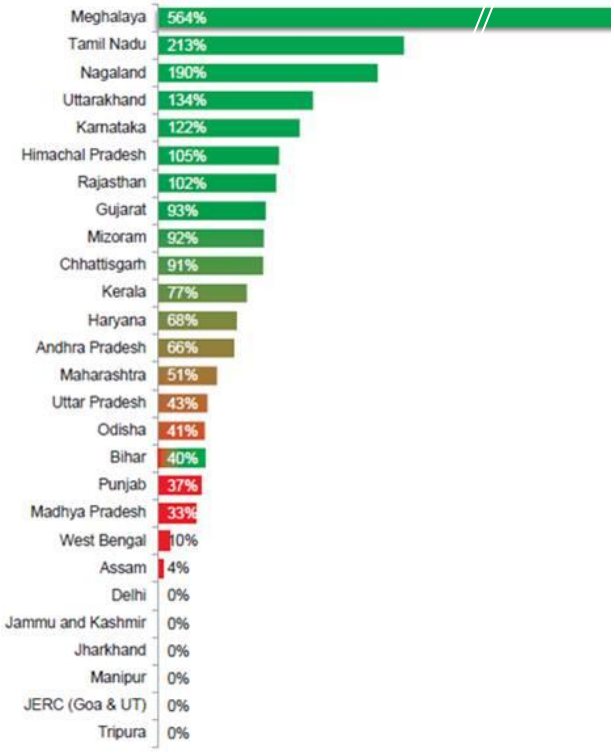
Five States with highest accumulated losses, Source: Business standard

While Cost of Supply has increased rapidly, tariffs have not been increased at the same rate due to political sensitivity of the subject.

Govt. has managed to successfully distance itself from petrol, diesel and LPG prices. Same action needs to be repeated for ensuring the viability of Discoms so that they are in a position to purchase power from costlier renewable energy sources.

1. Enforcing Renewable Purchase Obligation

RPO is an Indirect tax levied on the consumers for promoting renewable energy installations in the country. Discoms are expected to recover the cost of this tax through consumer tariffs. The following table shows the RPO fulfillment by various states in India for FY 2012-13.



RPO fulfillment by various states in India for FY 2012-13, Source: Greenpeace and InfraLine

As it can be seen from the graph, Discoms in only few states have successfully fulfilled RPO targets for FY 2012-13. While it may seem to be a uphill task, ERCs need to show courage to enforce RPO even in the worsening financial situation of the Discoms. This will help the country's power sector in long term.

Author's Bio

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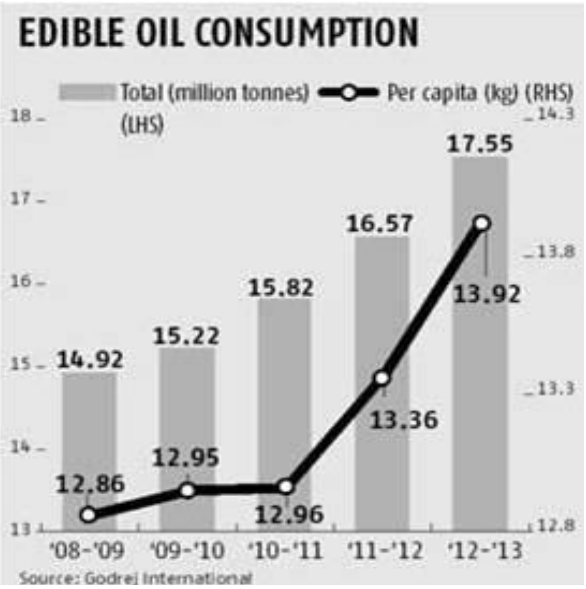
2

Waste Cooking Oil: A plausible answer to India's Fuel Security concerns?

By Arpita Bhagat

We live in a country replete with contradictions in almost all aspects. Consider poverty and rampant food insecurity that most households have to live with in India. On the other side is the huge consumption of vegetable oils, *ghee,* palm oil etc., in our kitchens. And this *consumption* continues to steadily rise with time.

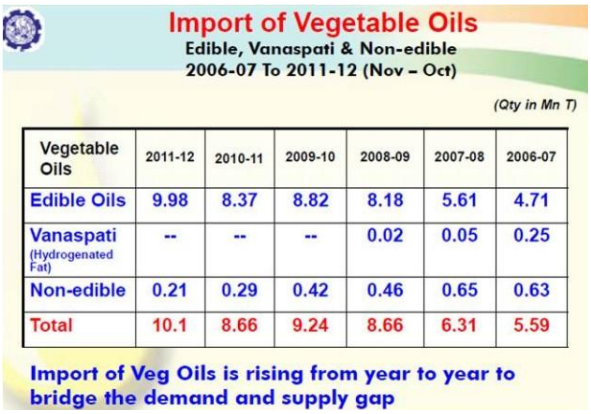


We are a nation of food lovers. We love our spices, *mithai* and curries. We especially love the roadside *chat, pakode*and*parathas.* But never do we realize, the immense weight behind this. They are all made with vegetable or cooking oils in different proportions.

But that's not all, more often than not, in our kitchens, restaurants and *dhabas*alike, we reuse this *already used* oil. Okay, we learned in our classes that "re-use is good" but not in this case, not at the cost of one's health.

Unfortunately, with the rising requirement of edible oil, the corresponding oilseed production is actually declining and consequently, oil imports are increasing.

As per recent reports, cooking oil imports by India, the world's second-largest buyer, climbed for the fourth



Vegetable Oils	2011-12	2010-11	2009-10	2008-09	2007-08	2006-07
Edible Oils	9.98	8.37	8.82	8.18	5.61	4.71
Vanaspati (Hydrogenated Fat)	--	--	--	0.02	0.05	0.25
Non-edible	0.21	0.29	0.42	0.46	0.65	0.63
Total	10.1	8.66	9.24	8.66	6.31	5.59

Source: SEA

straight month because of rising consumption and declining global prices, keeping reserves at a record.

A direct repercussion of this is the generation of Waste Cooking Oil (WCO) which is difficult to manage since:

1. There is no systematic waste disposal system for cooking oil in India.
2. It is often dumped into wastewater which pollutes water bodies, fresh water resources and soil.
3. Oil is lighter than water and tends to spread into thin and broad membranes which hinders the oxygenation of water. Because of this, a single litre of oil can contaminate as much as 1 million litres of water. Also, oil can congeal on pipes provoking blockages.
4. Reuse of edible oil is rampant in India since ages which poses serious health problems.

Meanwhile, India is world's third largest Greenhouse gas emitter and also plays a critical role in climate change talks. However, it still remains a country striven with the challenges of poverty, malnutrition with the largest concentration of people living below the World Bank's international poverty line of US$1.25 per day.

The Alternative

Biofuel provides an alternate source of energy produced from living organisms such as Biodiesel and Bioethanol. Increasing demands for fuel security has driven their production. Biodiesel is synthesized by the trans-esterification process using animal fats, vegetable oils, soy, rapeseed, Jatropha,palm oil, and algae etc.

However, in case of India, food security takes priority over fuel/energy security and the diversion of land from agricultural production to the cultivation of oil-forming crops such as *Jatropha* (primarily used for biodiesel production in India) is still debatable.

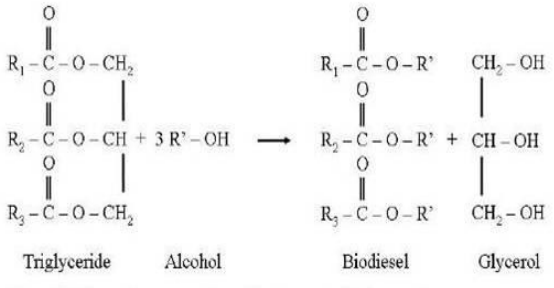
Use of WCO as a potential alternative clean fuel poses a great possibility for India to meet its rising energy requirements without compromising agricultural land.

Waste Cooking Oil (WCO) or Waste Vegetable Oil (WVO) as a Climate Change Mitigation strategy

At the individual level, WCO generated from the restaurants and/or households can be collected to be used directly for transportation as alternate fuel with

slight modifications. After collection, this needs to be filtered and processed to reduce its viscosity.

Since WCO has higher viscosity than petro-diesel, it has to be first brought down. This can be accomplished in 2 ways; by adding a heating mechanism to the fuel line or tank. This is a fairly simple change which also helps save money while reducing the carbon footprint and disposal problems.



Schematic representation of the transesterification reaction

At the community level, the second option, modifying the oil, means using WCO to synthesize biodiesel is more feasible. Using a fairly simple process that applies lye to remove the coagulating properties of the oils. The byproduct of biodiesel processing is simple glycerin or glycerol, which can be composted or used to make your own soap.

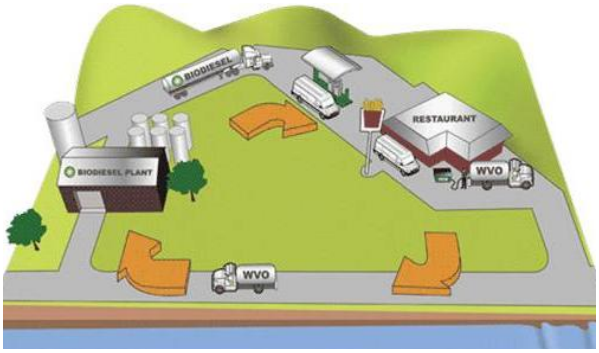


Diagram showing four steps of WVO or WCO recycle process, WVO are first collected from restaurants, and then recycled into Biodiesel which is transported to Power Stations for use. Image *Source: www.glbiofuels.com*

Feasibility in India

Recently, the Indian Government has started studies to develop a system for converting used cooking oil into bio-diesel which would then be tested on vehicles on an experimental basis at the National Institute of Renewable Energy. The data collected would be employed for developing a long-term national policy.

According to Sudhir, Sharma and P.Mohanan (2007), biodiesel derived from waste cooking oil (WCO) is the greenest liquid fuel available because of the primary ingredient being a post-consumer waste product. WCO biodiesel when used in compression ignition engine has shown an impressive performance and emission characteristics. These are:

Performance of the pure WCO-biodiesel was only marginally poorer at part loads compared to the base line diesel performance.

- At higher loads engine suffers from nearly 1 to 1.5 % brake thermal efficiency loss.
- Thermal performances of WCO biodiesel closely bear a resemblance to the performance of fresh oil biodiesel.
- From emission standpoint, the NOx, CO and CO2 emissions were approximately same as that of base line diesel emissions.
- Hydrocarbon emissions of WCO biodiesel fuel were lower than base line diesel operation.

Also, as per conversion company Greasecar, emissions testing of WCO shows that it produces lower levels of CO and PM (particulate matter) than diesel when tested in the same vehicle.

WCO generated biofuel can provide an effective climate change mitigation strategy in India, both at the community and national level due to its easy availability, cost-effectiveness and fuel efficiency. Once the resources for its implementation are in place, it eventually boils down to community acceptance and a slight lifestyle change to effectively adapt to WCO generated biofuel and its use.

Government of India incorporating WCO strategy in the next Climate Change Action Plan would bring India a step closer towards benefiting from it.

References:

http://www.bloomberg.com/news/2013-04-12/cooking-oil-imports-by-india-jump-on-growing-demand-lower-price.htmlhttp://umpir.ump.edu.my/167/

http://www.mnn.com/green-tech/transportation/questions/do-you-have-to-modify-a-diesel-engine-to-run-it-on-vegetable-oil

http://www.academicjournals.org/ajmr/fulltext/2011/16Nov/Cenciani%20%20et%20al.htm

http://www.hindustantimes.com/India-news/NewDelhi/Soon-your-car-will-run-on-used-cooking-oil/Article1-1023773.aspx Sudhir, C. V., N.

Y. Sharma, and P. Mohanan. “Potential of waste cooking oils as biodiesel feedstock.” *Emirates journal for engineering research* 12.3 (2007): 69-75.

www.greasecar.comhttp://www.nature.org/greenliving/gogreen/everydayenvironmentalist/run-your-car-on-vegetable-oil.xml

Author's Bio

A passionate writer/poet**, Arpita Bhagat** has a Masters degree in Environment Management from FRI, Dehradun and Bachelors in Life Sciences from Delhi University. She can often be found writing on poetry, art and various social as well as environmental issues.

3

Switch the Green On, Shall We?

By Dr. Mittali Sethi

We love to eat, isn't it? All of us, almost, without exceptions. And no matter how developed or technologically "smart" we become in the times to come, there is no underscoring of the fact that we would not function in the same capacity without the food that we eat.

Yet, we are ignorant, flagrantly ignorant, and it is time when the dungeon that we choose to keep ourselves in, will no longer protect us from the sunlight. The dreams will be devoid of the all so beautiful world if we don't wake up even now and start unscrambling the puzzle of dilapidation around each one of us.

If not for the second Green Revolution that Mother Earth is craving so buoyantly for, there might not remain the so called delicacies of the world so fondly built by us.

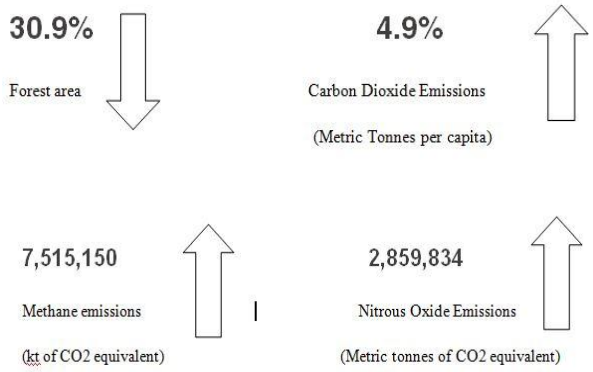
An overview – From where we stand, is it that bad?

The world we live in today is as united as divided. The continents are no barriers any longer, and transmissions and transfers are at their seamless power. Apart from the fact that everything today, from a pin to an elephant, can travel to almost any part of the world from almost any part of the world, the most beautifully ironic certitude is manifested by the way in which ideas have started flowing. Countries have started sharing political philosophies, the technological innovations and research expertise, along with of course, the anxieties about the life on the planet.

The Fifth Assessment report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) therefore, comes as no surprise. The increasing climatic changes pose a threat to the sensitive crops, and there is an estimated global reduction of about 2 percent with respect to food production. In a country like ours, where food security is already an open ended circus, it is left to nobody's wonder, then, what the effects of the above said will be.

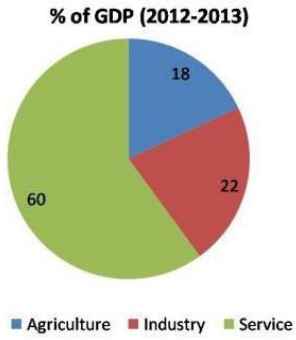
This, as everyone agrees, is just the beginning.

World Bank data indicates the pollution that is attributable to agricultural practices, and looking at the data, it is not surprising that the levels of nitrous oxide, a major harmful greenhouse gas, are booming so rapidly.

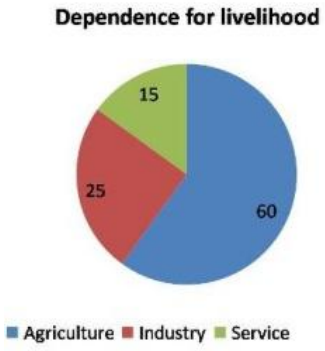


The worse has not happened yet, and we still hold the key to at least partially, if not fully, reverse the possibility of turmoil enveloping us vigorously. Before we look into what can be done, it is essential to understand, what led us here in the first place.

From where we were to Here, Today, and Now…



India was a land of rich and variable agriculture before the British colonization happened. And while the colonizers could not take away the natural gifts of India, they left us in a state where Mr Jawarhal Lal Nehru and other political leaders were faced with a dilemma, whether to give importance to agriculture, or industry in the planning of the economy. After a lot of mind meddling, and borrowing from the world point of view at the time, the Indian leaders decided to make the Industry the prime motivating force behind the country's economy.



While the economists blame that decision for the "market failure" India is commonly called, the fact remains that various constraints led us to take that decision and made India one of the fastest growing economies in the world scenario. The bare

fact today, however, is as disturbingly amusing as shocking. The primary sector (agriculture) contributes as little as 18% of the GDP of the country, but 60% of the population depends on the same sector for its livelihood! The question looms large in front of us.

So, were we always like that? I thought we are a self sufficient country?

Now, we all tend to be happy in the fact that there has never been a dearth of food in supermarkets. And that our country is capable enough to support its population. That in part, is largely attributable to the Green Revolution so dearly remembered which made us the proud producers of our food. Firstly, the truth about the Revolution is far from known. And more so, going by the Malthusian philosophy, at the rate the users are growing in number and volume, a drastic change somewhere in production is imperative.

Green Revolution; was it really Green?

Let's keep aside the fact that Green revolution did not reach every Indian farmer. (Although of course, the repercussions of the regional disparities and rift between rich and marginal farmers created are felt till date, evident by the high rates of suicides in rural areas by farmers).

The biggest, and probably the most invisible and under talked effect of Green Revolution was the ecological imbalance it perpetrated. Based on a lot of studies by Vandana Shiva, Mr. Rao, and the Planning Commission, there is no doubt in the fact that it led to

1. Soil degradation
2. Lowering of water table
3. Environmental degradation
4. Deforestation

Which led India into an ecological crisis, and

- A vicious food chain cycle partly attributed to the seepage of fertilizers and pesticides in lake and river waters.

So what has and can be done – To do, or to die?

The answers are obvious. The big question is when we will start seeing them. India especially needs to see the concepts of;

1. Organic farming and increase in productivity, rather than land under farming.
2. The concept of "Cost Cut", and hence, the importance of technology, related directly to research and development.

The Government – The Big Boss

The legislature is hardly the problem in India. Implementation and executive is.

Accomplishments:

1. The Eleventh and the Twelfth plan (in the process) has set aside a major component of expenditure for agriculture, and agriculture has been made the prime motivating force for the economy.

2. National Mission for Sustainable Agriculture (NMSA) started functioning from 2011-12 and is focusing on resource protection and technological innovation, to make the crops climate resilient.

Areas to focus on:

1. Institutional/Infrastructure building facilities to farmers, along with development of irrigation, telecommunication and marketing networks.
2. Awareness rising, especially in rural areas about the various marketing schemes, insurance proposals, and Futures stock programmes.
3. Decentralization of the schemes, and removal of middlemen from in between the government and farmers.
4. Setting up various regulatory bodies at lower levels to supervise implementation of programmes.

The farmers – The heroes of economy!

1. Diversification of crops to be practiced, so as to enrichen the soil and not drain it of the nutrients; using bio fertilizers and bio-pesticides.
2. Variety introduction in the form of Horticulture, Pisciculture, Sericulture, ushering in what is known as the true Rainbow Revolution.
3. To be more aware of the market schemes and well informed about provisions and rights provided to them.

The usurpers – The common man

1. To cut down food wastage as much as possible.
2. To cut down corruption and keep a check on those who can't.

From where I see, it is still green. And I hope to see it greener tomorrow.

Author's Bio

Dr Mittali Sethi is a Consultant Orthodontist by profession, and works as a senior lecturer in a Dental College. She loves to read, write, and photograph in leisure time. Her writing tries to amalgamate common understanding with the various simple ways to make life better and meaningful. She can be contacted at –

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4

Essay on Environment, Sustainability and Business

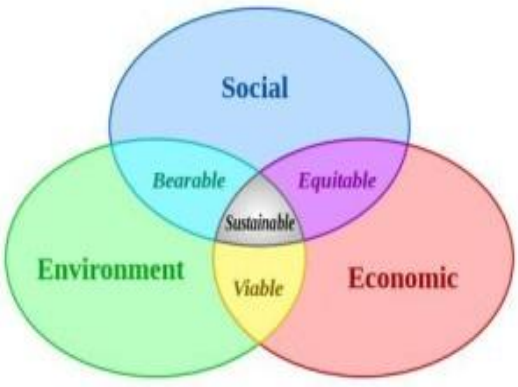
By Ms. Aastha Singhal

Environment can be wisely described through the words of Mr. Walt Disney –

“Landscapes of great wonder and beauty lie under our feet and all around us. They are discovered in tunnels in the ground, the heart of flowers, the hollows of trees, fresh-water ponds, seaweed jungles between tides, and even drops of water. Life in these hidden worlds is more startling in reality than anything we can imagine”.

And sustainability is simply everything that we need for our survival and well-being, either directly or indirectly from our environment. Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations.

Environmental sustainability involves making decisions and taking action that are in the interests of protecting the natural world, with particular emphasis on



preserving the capability of the environment to support human life. It is an important topic in the present time, as people are realising the full impact that businesses and individuals can have on the environment. Environmental sustainability is about making responsible decisions that will reduce your business’ negative impact on the environment. It is not simply about reducing the amount of waste you produce or using less energy, but is concerned with developing processes that will lead to businesses becoming completely sustainable in the future.

Currently, environmental sustainability is a topical issue that receives plenty of attention from the media and from different governmental departments.

Businesses now are wary of quick fixes and short-term gains. They want to grow in a manner that's mindful of all their stakeholders, including global and local communities, economies, and the environment. In other words, they want to practice business in a more sustainable fashion. Businesses are expected to lead in the area of environmental sustainability as they are considered to be the biggest contributors and are also in a position where they can make a significant difference.

Businesses can potentially cause damage to all areas of the environment. Some of the common environmental concerns include: damaging rainforests and woodlands through logging and agricultural clearing, polluting and over-fishing of oceans, rivers and lakes, polluting the atmosphere through the burning of fossil fuels, damaging prime agricultural and cultivated land through the use of unsustainable farming practices etc.

For much of the past, most businesses have acted with little regard or concern for the negative impact they have on the environment. Environmental sustainability forces businesses to look beyond making short term gains and look at the long term impact they are having on the natural world. You need to consider not only the immediate impact your actions have on the environment, but the long term implications as well. For example, when manufacturing a product, you need to look at the environmental impact of the products entire lifecycle, from development to disposal before finalizing your designs.

Many large and small organizations are guilty of significantly polluting the environment and engaging in practices that are simply not sustainable. However, there are now an increasing number of businesses that are committed to reducing their damaging impact and even working towards having a positive influence on environmental sustainability.

As a business priority, environmental management is on the rise. Enterprise is already preparing for a future in which green regulations are mandatory, green consumers are the majority, and green IT is a requirement. Environmental management can help enable companies to make efficient use of energy and material resources, as well as help them implement strict controls on greenhouse gas emissions and other environmental contamination.

You might expect the recession would end that trend. But the recession has actually motivated many of our customers to implement more cost-effective, environmentally friendly improvements such as consolidating data centers, upgrading networks to fiber optics, and using hosted and managed services. Some are taking things a step further by investing in

environmental and energy management software. It's these companies that are looking to gain deeper insights into their environmental impact, as well as seeking to monitor reduction actions on an automated basis.

To create a more sustainable business, these efforts will need to continue. However, only when companies move beyond technological efficiency—and begin to critically examine their current business practices and required resources—will they approach authentic sustainability.

Environmentally sustainable businesses may also have a competitive edge when it comes to attracting customers and investors. Modern consumers are aware of social and environmental issues and keep themselves informed about which businesses are acting responsibly in the community. Investors are equally aware of these issues and there is a trend developing towards investing in environmentally sustainable companies. Many countries like Australia have been taking many initiatives to support the businesses caring for environmental sustainability. The Australian Business Award for Environmental Sustainability recognizes organizations that implement policies and/or execute initiatives that demonstrate leadership and commitment to the enhancement, preservation and protection of the environment.

Admittedly, the process of changing corporate mindsets and culture to embrace sustainability can be a challenge for some enterprises. But even so, the underlying concept shouldn't be too unfamiliar. The contemporary idea of sustainable business is, at its heart, merely an extension of principals that underpin value and wealth. After all, maintaining an environment that enables continued prosperity is imperative for any organization's survival and growth.

But to achieve authentic sustainability, companies may need to broaden their view of resources that are critical to business. Once that shift occurs, it will be natural for companies to anticipate how decisions may impact both current and future stakeholders—because they recognize that those decisions will ultimately impact both their current and future business.

Technology will be an important part of the solution. But only partly. The key will be to nurture a culture that has the discipline, patience, and courage to look beyond short-term solutions and opt for business practices that can offer the greatest positive impact and longevity. "The great challenge of the twenty-first century is to raise people everywhere to a decent standard of living while preserving as much of the rest of life as possible."

Author's Bio

Aastha Singhal.

5

Are we Wasting Food?

By Mr. Harsh Agarwal

"*Where is there beauty when you see starvation and deprivation?"*

In India, we not only produce an abundance of food, we also waste an enormous amount. Food waste is not only unfortunate in terms of the lost opportunity to feed hungry people but also in terms of the negative effects on our environment. The literal meaning of 'Food Loss' refers to the decrease in edible food mass throughout the *part of the* supply chain that specifically leads to edible food for human consumption. It may take place at any one of the three stages namely- production, post-harvest and processing stages in the food supply chain. The issue of food losses is of high importance in the efforts to combat hunger, raise income and improve food security in the world's poorest countries. Food losses have an impact on food security for poor people, on food quality and safety, on economic development and on the environment. The exact causes of food losses vary throughout the world and are very much dependent on the specific conditions and local situation in a given country.

food wastage

[fu:d] [weɪstɪdʒ]

noun

The act of discarding raw or cooked food as it is deemed no longer fit for consumption or desirable. This includes i) "unavoidable" food scraps, such as peels and bones, and ii) "avoidable" food scraps- ranging from plate waste to overproduction waste.

"Love food. Hate waste."

Does it matter that we are wasting more food, than that could have been otherwise consumed? It is difficult to compare the amount of food that is wasted today to that in the past. Ironically the increase in environmental control has coincided with a rapid growth in the amount of waste. Despite the bounty of our agricultural production, one of the most complex and serious health problems is Hunger. Eliminating hunger is a moral issue driven by

put this wholesome food where it belongs — *in the mouths of the needy people*.

"Only when the last tree has died, the last river has been poisoned, and the last fish has been caught will we realize that we cannot eat money!"

compassion for others as well as a practical issue involving the long-term future of millions of our countrymen. Hunger is also an economic problem, increasing government and family spending on health care, reducing the productivity of nation's workforce and hampering the ability of our country to compete in the world economy.

Right now about one billion people suffer from chronic hunger. The world's farmers grow enough food to feed them, but it is not properly distributed and even if it were, many cannot afford it because of the escalating prices. If merely 5% of food discards were recovered, 4 million additional Indians could be fed each day. In today's world, where so many people wake up in poverty and go to sleep hungry while so much food goes to waste, each of us can ask: *"How can I help?" The* unserved and/or unsold food can go towards the feeding hungry children, seniors, and families instead of being thrown away in landfills. More and more of us should become a part of such various food programs, shelter and human service agencies to

Food Recovery to feed the hungry is a Win-Win solution. We individuals should make efforts at our very own level to help in the fight against hunger and demonstrate commitment to the community. As it is said "Take care of the small things and big things will automatically fall into place" so we can start by donating the excess prepared and processed food from our sides or from special events to local food recovery programs. We should take the help of electronic media such as radio, televisions to spread awareness regarding the food disposal. Local tours and demonstrations should be carried out by the school, college students with the necessary help and support of the State and municipal officials to provide wholesome food to the needy families of the community. Beyond the environmental and cost savings benefits of donating food, a person enjoys the satisfaction of knowing the fact that he has helped feed someone's empty stomach when he becomes a part of such endeavours.

When will we take charge of ourselves?

"If *we want to see the change we need to be a part of that change."* Most of us are always complaining about the deteriorating environmental situation in our country. We also blame the government for its inaction. However, how many of us actually do anything about our own environment? We can think about the things that can support the environment in our daily lives, in our professions and in our communities. We can make others follow our environment friendly actions. A famous dictum is to *'Think globally and act locally'* to improve our own environment. 'We' can make a difference to our world. For instance we should plant more trees of local or indigenous species around our homes and workplaces. We should encourage our friends also to do the same. Whenever and wherever possible we should try to prevent the trees from being cut down, or if it is not possible for us to prevent then we should report it immediately to the concerned authorities. When shopping, we should choose the products in limited packaging. We should always keep looking for ways to reduce the use of paper. **"***To live a pure unselfish life, one must count nothing as one's own in the abundance."- Buddha***.**

By 2050 the world's population will increase by two billion or three billion, which will likely double the demand for food, according to several studies. We must guarantee that all seven billion people alive today are adequately fed. It must the double food production in the next 40 years and it must achieve both goals while becoming truly environmentally sustainable. The world's food system faces three incredible, interwoven challenges simultaneously: End hunger, Double food production by 2050, and do both while drastically reducing agriculture's damage to the environment. *Could these simultaneous goals possibly be met?* Feeding more people would be easier if all the food we grew went into human hands. Although completely eliminating waste from *farm to fork* is not realistic, even small steps would be extremely beneficial. "Change does not roll in on the wheels of inevitability, but comes through continuous struggle."

Reference and Image credit;

"Textbook of environment" by Dr K.M. Agrawal ,Dr P.K. Sikdar and Dr S.C. Debnath , Publishers – Mcmillan publishers

Article entitled 'Dirty secrets of a food paradise' available at http://foodwasterepublic.com/

Article entitled 'How much food is wasted in total across the UK?' available at http://england.lovefoodhatewaste.com/

Article entitled 'Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill' available at http://www.nrdc.org/

Author's Bio

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6

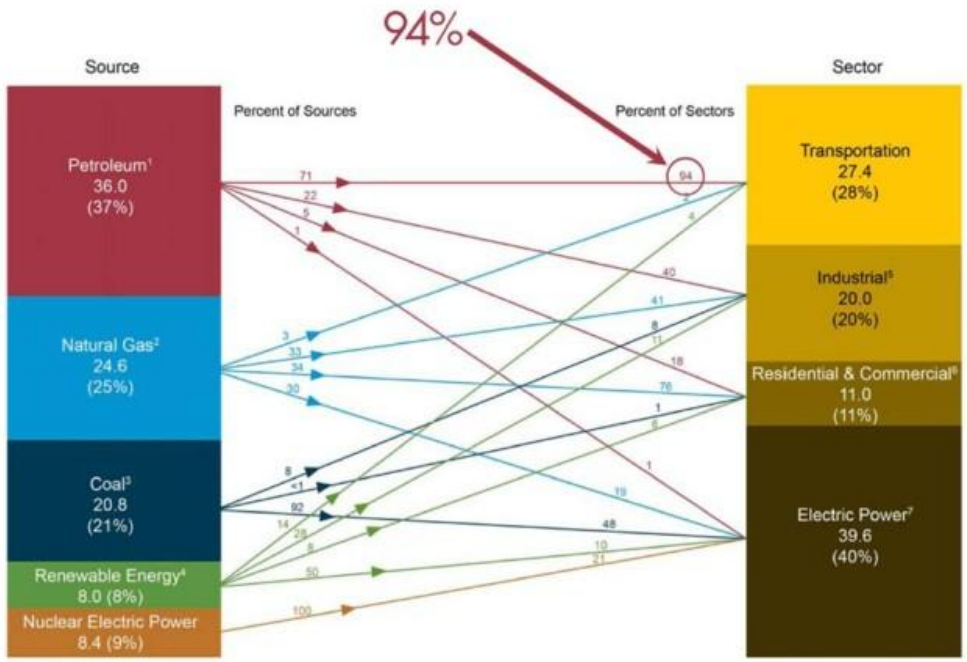
Let's Rejuvenate with Renewable Energy!

By Mr. Arijit Goswami

Man has always had an insatiable thirst for energy, since the day he first stepped on the earth. From thermal energy of fire to rotational motion of the wheel to even the power of flowing rivers giving life to earliest farms, energy has been the driving force behind creating and nullifying civilizations. It was energy responsible for breathing life into industries of 17th century and even for inducing several wars. In short, energy has helped shape mankind's ascent to primacy on the earth like nothing else.

Brief peep into history:

Of all the fossil fuels, oil has perhaps been the most indispensible, the most vital. It is liquid and it was found to be light and energy dense, making it perfect for use in transportation. With the utilization of these fuels, man built steam engines and bigger than



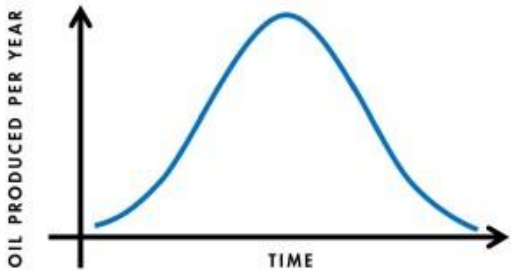
Source: U.S. Energy Information, Annual Energy Review 2010

ever industrial belts. As the society progressed, oil penetrated more and more into our lives. So much so that today in the US, nearly 94% of all transportation energy comes from petroleum. From the times when coal was discovered till this date, coal and fossil fuels have been powering our ambitious endeavors.

So, where does the problem lie? Why can't we just relax and keep on walking forth on our road to modernization?

Peak oil

Oil is definitely the fuel not just for our machines but also for our futuristic undertakings. But we can't expect to be extracting oil indefinitely. It has been observed that this is the shape of the curve of oil production over time.

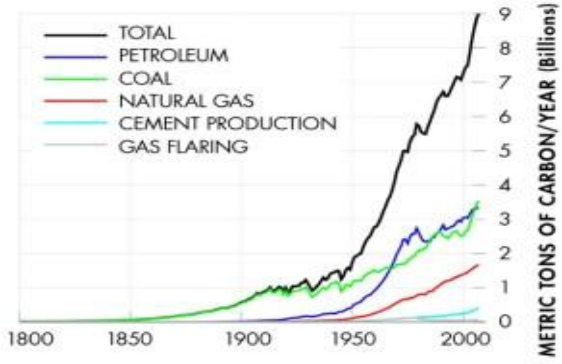


Source: Introduction to sustainability, open courseware by University of Illinois

Oil production increases as exploration uncovers new sources and improved technology extracts more oil. Oil production then declines, as oil is a finite resource – less new reserves are uncovered, and old fields are exhausted. Peak Oil, sometimes known as "Hubbert's Peak" is the point in time when oil is extracted at its highest rate. The Society of Petroleum engineers estimate that oil would last about 40 years from now.

Global warming

The use of coal and fossil fuels belch forth tons of toxic gases in the atmosphere. These gases, mainly Carbon Dioxide and Methane, are supposed to be responsible for trapping the heat of the sun after it gets reflected from the earth's surface, thus leading to an overall increase in global temperatures, fall in food production, accompanied by high incidence of diseases and inundation of many lands due to rising sea levels.



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Renewable energy

Renewable energy is defined as energy that comes from resources which are continually replenished on a human timescale such as sunlight, wind, rain, tides,

waves and geothermal heat. Renewable energy is non-polluting, secure and sustainable. Moreover they are expected to supply human civilization with energy for the next 1 billion years. Let's have a look at each of the major renewable energy sources and discuss their advantages, scope and limitations.

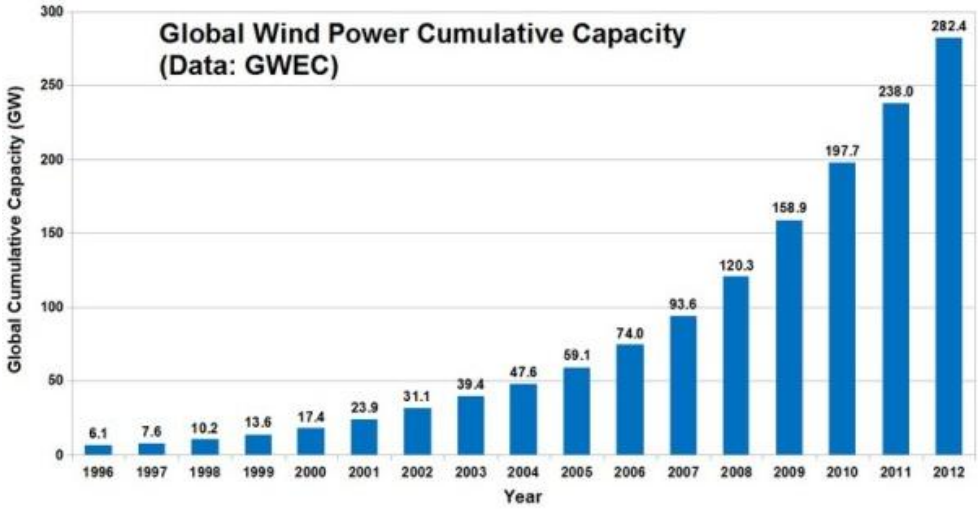
Hydro power: Hydroelectricity is perhaps the largest single source of renewable energy. The first use of the kinetic energy of flowing water was perhaps made to help ships sail on the seas. Water is about 800 times denser than air. The potential of flowing water has been well understood and well utilized by man. Several dams and hydro-electric power plants have been set up around the world, majority of them in rural and remote areas, bringing to these areas electricity crucial for their development. Besides providing water for irrigation purposes, dams don't create any thermal or air pollution. However, it has also been observed that dams destroy the ecology of the surroundings as large chunks of lands are inundated, displace native tribal populations and also trigger earthquakes like the Hoover dam in USA.

Over the years man has learnt to compare the sources of energy on a scale of EROEI (Energy Returned On Energy Invested). Hydroelectric power plants have EROEI of 100, i.e. 1.25 times greater than that of coal and oil.

Solar Power: Solar energy refers to the energy from the sun in the form of solar radiation which can be used to harness heat or to generate electricity.

However, it has been calculated that the EROEI factor for solar power is abysmally low. It is around 6.8. However with the recent advancements in the solar PV technology, the scenario is improving. The nascent Zenith technology not only captures the sun's light energy but also the solar heat energy to generate electricity.

Wind power: Wind power is growing at the rate of 30% annually, with a worldwide installed capacity of 282,482 megawatts (MW) at the end of 2012, and is



Data source: GWEC, Global Wind Statistics 2012

widely used in Europe, Asia, and the United States. With EROEI of 18, more and more green-sector companies are investing in wind power. The histogram below shows the growth of wind power in the recent few decades.

Bio-fuels: Recent research has also shown that solid biomass like rice husk, farm residues etc. can be instrumental in producing fuels, called biofuels. These fuels provided nearly 2.7% of world's transport fuel in 2010. However, EROEI of biofuels has been found to be close to 1. That means they don't have any significant competitive advantage over their counterparts, fossil fuels.

Other sources: The heat energy rising from underneath the earth and the kinetic energy of the tides in the seas and oceans can immensely help mitigate the looming energy crisis. Moreover, nuclear energy also is being used to generate clean energy. However, the nuclear waste generated and the fear of nuclear fallout have lead to the phenomenon of NIMBYism (Not In My BackYard), wherein the people support the establishment of nuclear plants but not near their locality.

Challenges

There are a number of other challenges that are currently being faced by renewable energy sector. First is that they are land intensive. It takes a lot of land to set up a wind farm or a solar farm, which can otherwise be used for some other equally fruitful activity. Second is the disparity in the availability of the required resources, like abundance of solar power in deserts but not at the poles. The landlocked countries can never think of using tidal energy for energy security of their nation. The nations which are bereft of most of the resources have to depend on other nations. This can lead to monopolization of energy by some countries to dominate over the other.

Moreover, it has been observed in a research work conducted by Archer and Jacobson that setting up wind farms slows down the winds passing by, thus creating a wind shadow in the regions following the wind farm. Reduction of wind speeds can play havoc with global climates in the distant future.

Conclusion

Renewable energy resources hold a lot of untapped potential to alleviate the looming energy crisis. Hydro-electricity along with solar power and wind power are areas where maximum development is possible. The exigency of the hour is to rise up to the occasion and devise ways to make optimal utilization of these eternal sources of energy.

Author's Bio

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7

Essay on Environmental Pollution Control

By Mr. Vivian D'Souza

"The architect of the cosmos is not a common man but He is supernatural, super-heroic and un-earthly"

The above dialogue light-footedly tells us that the maker of the entire universe is The Fabricator and we all are mere janitors of it. But do we truly live up to this…? In today's world of crime, animosity, hatred, destruction, etc., do we really follow this….??? It's a thought to ponder upon.

Industrialization took birth around the 18th century. This is when man became self-absorbed and started the exploitation of the nature. The need for the sustenance of the biotic world marred the abiotic world. Industrialization gave nativity to urbanization and this in turn forced people from villages to move towards the cities in search of livelihood. All this led to ecological imbalance and thus resulted in environmental pollution.

Environmental pollution is categorized into three viz. air, water and land. The emission from industries and manufacturing activities, burning of fossil fuels, household and farming chemicals, etc. are the root causes of air pollution. Common air pollutants are carbon dioxide, carbon monoxide, nitrogen dioxide, so on and so forth. Government should invest in wind energy and solar energy, as well as other renewable energy, to minimize burning of fossil fuels, which cause heavy air pollution. We should encourage our family to use the bus, train or bike when commuting. If we all do this, there will be fewer cars on road and less fumes. Recycle and re-use things. This will minimize the dependence of producing new things. Remember manufacturing industries create a lot of pollution, so if we can re-use things like shopping plastic bags, clothing, paper and bottles, it can help. Wise usage of energy will cut down the amount of pollution we create.

We call water a life giving source. But do we ever think of it when we pollute it…? Industrial waste containing asbestos, phosphates, nitrates, sulphur, etc., sewage and waste water, oils, ocean and marine dumping, underground storage and tube leakage are the primary agents of water pollution. The control of water pollution requires each individual's participation and involvement. We should not litter the beaches, pools, riversides with garbage. We should use environmentally safe cleaning liquids for the use at home and other public places. They are less dangerous to the environment. Water should be used wisely and one should never keep the tap running. Proper treatment of chemicals and medicines should be ensured before letting them into the lakes and rivers. Over-use of pesticides and fertilizers should be stopped. In many developed cities, waste or sewage treatment is very efficient, and designed to minimize pollution of water bodies.

We Indians treat soil as our mother but not when it comes to preserving it. The mainspring for land pollution is oil refineries, deforestation, garbage and waste, mining sources and agricultural sources. In order to subdue land pollution, people should be educated and made aware about the harmful effects of littering. We should discuss with friends and family and talk about it. Buying of biodegradable products is quintessential. We should switch to organic foods that are grown without pesticides. Personal litter should be disposed properly. We can separate household waste at home for recycling. The best way to curb land pollution is following simple three R's, they are Reduce waste, Re-use things and Recycle things.

Under the pollution control approach, attempts to protect the environment have especially relied on isolating contaminants from the environment and using end-of-pipe filters and scrubbers. These solutions have tended to focus on media-specific environmental quality objectives or emission limits, and have been primarily directed at point source discharges into specific environmental media (air, water, soil). As environmental pollution control technologies have become more sophisticated and more expensive, there has been a growing interest in ways to incorporate prevention in the design of industrial processes – with the objective of eliminating harmful environmental effects while promoting the competitiveness of industries. Among the benefits of pollution prevention approaches, clean technologies and toxic use reduction is the potential for eliminating worker exposure to health risks.

Earth will regain its beauty, but only if we human perform our duty. "Treat the earth well. It was not given to you by your parents. It was loaned to you by your children". This Kenyan proverb marks the pungent need of the hour i.e. eco-friendly lifestyle. It is high time that we stop the blame game and take initiative and responsibility to conserve and preserve our nature. We all want to extend our generation, then why not gift them an environment that is safe, healthy and free of pollution. Let our future generation see the

exploding palms, clear skies, elegant waves, etc. In short let them enjoy the mesmerizing beauty, the elegance of nature and live in a safe, healthy and uncontaminated environment.

Author's Bio

Vivian D'Souza is 25 years old and an ardent writer and an avaricious reader. He works in the hospitality industry and have rendered three years of service with hotel Sahara Star as a food and beverage team leader. The topic of environment lures him a lot. He can be reached at viv_saggi@yahoo.com

8

Causes behind Global Warming

By Ms. Shaikh Farha Rasheed

Today our mother earth is surrounded by environmental problems such as air, water and land pollution. One of the major problems, the world today is facing is global warming. Now here arises a question as to what is Global Warning? Global warming is the term used to describe a gradual increase in the average temperature of the earth, a change that is believed to be permanently changing the earth's climate. Even though it is an ongoing debate, it is proved by the scientists that the planet is warming. The 29th century is experiencing a continued and tremendous increase of earth's mean atmospheric temperature by about 1.4 degrees F and about two thirds of it has been occurring since 1980. This is global warming; it is affecting the nature's balance and has a huge impact on life because of phenomenon like continued heat waves, and sudden occurrence of storms and floods. Don't we see time to time, the epidemics that are devastating to human life and the flooding of the farmlands that puts our economy in a deep hole?

Now what is global warming is clear but who is responsible for this phenomena and how. The answer to this question is that we human beings are only responsible for this.

Firstly, increase in the greenhouse gases that are produced by burning fossil fuel and deforestation, thus intensifying the greenhouse effect leading to global warming. The four main contributors of the greenhouse effect are, water vapor, carbon dioxide, methane and ozone.

Secondly, mining for coal and oil releases methane in the atmosphere. More ever the leakage from natural gas fields and landfills are additional source of methane. Excessive cutting down of trees is another

factor causing global warming. When deforestation happens the efficiency by which carbon dioxide is stored and oxygen released by the green plants are decreased to a huge rate in turn causing increased concentration of carbon dioxide that leads to increased greenhouse effect.

Thirdly, nitrous oxide from fertilizers, gases used for refrigeration and industrial processes are other factors that cannot be forgotten as the cause of global warming.

Fourthly, another source of methane is methane clathrate, a compound containing large amounts of methane trapped in the crystal structure of ice. As methane escapes from the arctic seabed, the rate of global warming will increase significantly.

Fifthly, the burning of wood (should be reduced to a greater extent) releases oxidizable carbon to the atmosphere whose presence in greater amount causes the elevation of temperature. There is strong evidence that emissions of chlorofluorocarbons (CFCs) were the major cause of the recent abnormal warming. Like carbon, CFC's do not trap heat but in the presence of UV rays the chlorine gets detached from CFC, drifts up into the stratosphere and this unattached chlorine catalytically convert ozone molecules into oxygen molecules depleting the ozone layer.

Humans contribute to all of these greenhouse gasses whether they know it or not. They mostly contribute to the carbon dioxide levels in the atmosphere. They do this through the burning of fossil fuels such as oil, coal, and natural gas which is derived from old dead plants. These three fuels are what we use to run just about everything. Cars, generating electricity, factories, heat our homes, and many other things. All of these things supply carbon dioxide into the atmosphere and thicken it. One other leading contributor to the rising levels of carbon dioxide in our atmosphere is deforestation to clear land for farming and new developments. This releases all the carbon trapped in the trees and also reduces the amount of things that can convert carbon dioxide into oxygen. Humans contribute to the levels of methane by raising cattle, coal mining, drilling for oil and natural gas, rice cultivation, and garbage sitting in landfills. All of these things contribute to the amount of greenhouse gasses and global warming in our atmosphere.

Where is the proof? The substantiation of global warming is all around us. The largest amount of verification is the fact that all of the glaciers, no matter where they are on earth, are melting at a rapid pace. So rapid in fact, that some scientists predict that they could drown certain countries partially. This, of course, would be catastrophic and we would be in some real trouble.

Now what is our moral responsibility being the citizens of this beautiful world, what can we do to help the

cause of stopping or at least slowing the effects of global warming? We can encourage the use of alternative energy. Hydro power is currently in use for only about six percent of the world when we have so much water to take advantage of. Wind power is another quite successful way of producing energy. Solar energy is also easy to take advantage of. And Europe even uses nuclear energy quite successfully. All of these energy sources produce no greenhouse gasses. But, by the time we start to fully convert over to these it hopefully won't be too late. We need to take action now.

Global warming is authentic whether you recognize it or not. Most scientists even predict that in the current children's lifetime the temperature will raise anywhere from 2 to 6 degrees. What about their children and children's lifetime the temperature will raise anywhere from 2 to 6 degrees. What about their children and their children's children? Will the kids of the future never know what snow was like? At last I would like to conclude my essay by saying a few lines being written by Winston Churchill,

"The era of procrastination, of half-measures, of soothing and baffling expedients, of delays, is coming to its close. In its place we are entering a period of consequences."

Will we be experiencing the consequences or will we leave it for the generations to come? The resolution is ours.

Author's Bio

Shaikh Farha Rasheed, Aurangabad (Maharashtra)

9

Water Pollution Control

By Ms. Bhavika Sharma

Water is the main factor that helps to sustain life on earth. While we are aware of the fact that about 70% of the human body is comprised of water and so is the earth's surface; still we do not put in efforts to save this essential element which although is freely available but is so scarce that some people walk miles every day simply to fetch it.

With freshwater resources being only about 2.7% of the water present on earth, ground water is the most important source, forming a mere fraction with 0.5% of the total water. Rampant use of ground water especially through pumps and tube wells for irrigation purposes has led to its receding levels. Other problems associated with ground water include seepage of residual pesticides into it as a result of use of pesticides at a high rate. The need of the hour is to learn from countries which have made advancement in the field of agriculture, one such country is Israel which in spite of the harsh land conditions has managed to maintain the agriculture sector very well. The use of sprinklers (preferably overhead), organic farming and green manures & bio pesticides should be promoted which would not only help to conserve water, but also improve the quality of yield.

There is a need to impose strict laws and penalize industries which do not abide by laws related to the disposal of waste. At individual level, we can help by making use of equipments which use less water such as small faucets in toilets and sensor based taps and showers. Rain water harvesting is another method which is a boon, especially in water scarce regions or regions with poor water supply.

Rivers on the other hand, face problems like eutrophication and presence of heavy metals resulting from the dumping of untreated wastes into rivers by certain industries.

Eutrophication, caused as a result of excessive nitrates and phosphates owing mainly to the organic waste (including sewage) is detrimental to the survival of fish and other aquatic organisms because of reduced Dissolved Oxygen (DO) and it also makes water unfit for human consumption. The increased level of pollutants in water bodies poses a serious threat to the ecosystem. The polluted water not only affects human health but even the small creatures residing in it; one such example being of a pesticide DDT which was earlier used at a large scale. The bio magnification of DDT from the small fish to the proceeding trophic levels and ultimately to the humans is an apt example of how the pollutants increase in concentration and affect every organism in the food chain. The problems associated with the use of pesticides have been efficiently penned down by author Rachel Carlson in her book “Silent Spring”.

Another problem associated with water pollution is deforestation. Since trees hold the soil particles with their root system, they prevent landslides and thereby the deposition of mud, pebbles and other smaller particles in the water bodies. With rapid industrialization and uncontrolled urbanization, trees are felled off without proper planning. Illegal constructions in eco sensitive zones are being carried out. A very distressing incidence of Uttarakhand recently falling prey to the ire of nature is well known. It has killed thousands of people and destroyed property worth millions. Many pilgrims are still missing. The uprooting of plants made the soil prone to landslides. The natural calamity along with human activities wreaked havoc at a large scale. Taking lessons from such incidents, there should be regulation of massive construction in such eco sensitive regions and land use pattern should be considered.

To prevent the further deterioration of this vital resource, we must all pledge to render our services to save this precious source of livelihood by making small efforts like avoiding dumping wastes in water, not doing regular chores near the water bodies, by planting more trees and by creating more awareness regarding the importance and threats related to depletion of precious water resources.

Author's Bio

Bhavika Sharma: A research Scholar at Himalayan Forest Research Institute (HFRI), Shimla specializing in the subject of Ecology and Environment. She did her masters in the field of Environment Science & her graduation in the field of Microbial and Food Technology from Panjab University, Chandigarh. She is currently working in field of air pollution and is a key member of an NGO

10

Go Green to Save Mother Earth

By Ms. Aditi Das

First thing which came to my mind before I sat to write on this topic was 'Are we extravagant?'

'Are we?'

Yes, of course, the way which we have used our limited resources and contributed to its loss. On your way to movie theater or activity, it's easy to grab a cold from the shop, right?

Have you ever imagined the fossil fuel used to make bottle utilizes almost so much of fuel that can be used to cook food for three days? And for every seven water bottle we use, only one make to recycle bin according to the study by National Geographic Channel.

Several other small examples can be set to define us extravagant. Water we let go off in our house hold work mindlessly can contribute to several to several lakh gallons of water a year. Mere wasting of extra food we order in a party takes several acres of cutting down of forest to fill the lands with such waste. Every one of us acts as a 'point-source' of pollution in terms of environmental science and measures are mandatory from every citizen on earth to control this.

Environmental pollution is a serious menace to our existence. India has been ranked at the 125th spot in terms of tackling pollution and natural resource management challenges.

There are various ways in which our environment is getting polluted, such as, Industrial pollution,

deforestation, urbanization, domestic wastes, sewage, plastics, radioactive elements etc.

Land pollution, in other words, means degradation of earth's surface and soil, directly or indirectly as a result of human activities are conducted citing development, and the same affects the land drastically we witness land pollution; by drastic we are referring to any activity that lessens the quality and/ or productivity of the land as an ideal place for agriculture, forestation, construction etc. The degradation of land that could be used constructively in other words is land pollution. This has lead to a series of issues that we have come to realize in recent times, after decades of neglect. The increasing numbers of barren land plots leads to soil erosion for they can never be made fertile again. Forest cover is also decreasing at an alarming rate. The effects of land pollution are very hazardous and can lead the ecosystem to jeopardy. When land is polluted, it directly or indirectly affects the climatic patterns which take a heavy toll on us.

Water bodies are being constantly polluted all over the worlds by various dangerous chemical and biological wastes. Water pollution is a major concern in the third world countries. The most common factors that contribute to the contamination of water would be sewage, radioactive wastes, improper disposal of waste on land, and many more. For example when sewage and fertilizers are released into the water, the nutrients from these waste leads to an abnormal growth in water organisms like the algae and water plants this blocks the waterways and create a layer at the top surface of the water thus blocking the oxygen in the water which would harm the other fauna in the water bodies, who too requires oxygen just like we humans do. Another example is the Minamata disease sometimes referred to as Chisso-Minamata disease is a neurological disease caused by severe mercury poisoning. Minamata disease was first discovered in Minamata city in Kumamoto prefecture, Japan, in 1956. It was caused by the release of methyl mercury in the industrial waste water from the Chisso Corporation's chemical factory which continued from 1932 to 1968. This highly toxic chemical bio accumulated in shellfish and fish in Minamata Bay and the Shiranui Sea, which, when eaten by the local populace, resulted in mercury poisoning. While cat, dog, pig and human death continued for thirty-six years, the Government and the Company did little to prevent the pollution symptoms. Another source of water pollution is radioactive substances found in oils and factory sewages. They damage the water eco system as the temperature in water rises when factory wastes like coolants are disposed into water and this rise in temperature leads to total discomfort to water life. If this present scenario of polluting water is not considered seriously, then it would lead to great danger in the future.

Air pollution affects a far larger number of people than does water or land pollution. It is an unwanted change in the quality of earth's atmosphere caused by

emission of gases due to burning of fossil fuels, out pouring of ashes and gases from the particulate matter due to soil erosion. Polluted air contains CO2 , CO, NO2, SMP, SO2 and oxides of lead. Excessive rise of gases and chemical pollute air. These are all poisonous gases which cause incurable diseases like lungs cancer, pneumoconiosis, etc.

A great tragedy took place in Bhopal in December 1984 with the accidental escape of forty-five tons of methyl isocyanate (MIC) gas from the Union Carbide Factory. The cool night time north wind spread this poisonous cloud over nearly all of Bhopal. But the concentration was densest in the 1.5 km radius of the factory, resulting in the death of about three thousand people, and lifelong debilitation and untold suffering for sixty thousand more. Another major disaster which took place was a catastrophic nuclear accident on 26th April 1986 at the Chernobyl Nuclear Power Plant in Ukraine. An explosion and fire released more than a hundred times the radiation of the bombs dropped on Hiroshima and Nagasaki into the atmosphere which spread over much of western USSR and Europe. Thirty-one people died shortly after the explosion.

There are seventy thousand different types of chemical entering our mother earth as a point source or continuous source. It is rather impossible to control every of these chemicals. We have to work categorically and take small steps in day-to-day activities to control such hazards. Scientific studies are on going to determine the global burden of such environmental imbalance, but policies employed to cut down these waste loads are not proving beneficial. To say, Government is responsible or to say individual, is absolutely wrong. It is our duty collectively to go green and make people aware about the 3R's i.e. Reduce, Reuse, and Recycle. Measures are being taken to control the rate of pollution and studies are being done to calculate the indices of pollution. But the paradox lies in the fact that with developing society the average pollution rate has increased. Nature is in no mood to stand any more abuses and excesses. Thus man must realize the continual growth can lead only to destruction.

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11

Renewable energy policies by the Government of India

By Mr. Ram

Renewable energy sources are being used all over the world. Brilliant minds have devoted their lives to finding resources that do not leak greenhouse gases into the atmosphere, or cost large amounts of money. In the Video entitled “New Energy Revolution,” it shows some of the renewable energy sources being used all over the world. For example, wind energy, solar power, Hybrid cars and using methane gas for stove fuel. These are all excellent examples of renewable energy as they are all affordable and convenient as well as being efficient. The question is, will people use them, or stay with the atmosphere damaging fossil fuels of today?

Solar power is an excellent energy resource. The sun gives us free rays, so why not use them as a power source. The video shows Japan as a country which is educating their people about the risks of over use of natural resources and benefits of renewable energy sources, like solar power. Solar power is set out in a row of panels (Solar PV) which take in the sun’s energy and provides electricity for homes and other things. Cars can now be solely power by solar panels, creating huge possibilities for less or zero carbon intensive transportation. If solar energy was used worldwide, along with other renewable sources, the world would be cleaner and more pleasurable to live in, knowing that the greenhouse gases are under control.

Hybrid cars are the cars that run on both electricity and gasoline or CNG. The Hybrid car was invented to cut down the gaseous pollutants that are emitted by normal cars. The Hybrid car emits around 90% less greenhouse gases than the normal car and inventors want to make it 100% efficient. Toyota is leading in the production of usable and affordable Hybrid car. The car is charged at places similar to petrol stations with an electric charger that easily plugs into the front of

the car. This marvelous invention can pick up the speed of 100 Km/h or more. It means, these cars are excellent for city use. If more people can invest in Hybrid cars, there would be less pollution than the conventional cars of today.

India has aggressive renewable energy targets and industrial energy efficiency policies, but facing significant infrastructure challenges which may derail the otherwise good policy, according to a new report by Climate Policy Initiative (CPI), a U.S.-based global policy effectiveness analysis and advisory organization.

The topic entitled 'The Policy Climate', which was released recently, says that despite the rapid economic growth, India represented eight per cent of the increase in global energy-related CO2 emissions between 2000 and 2010, while China's contributed by 68 per cent.

The report finds that, in China, closure of inefficient coal-fired power plants saved the equivalent of more than 100 million tonnes of coal, while renewable electricity grew 661 per cent between 2000 and 2010. Still, renewable electricity sources in China only produced the equivalent of 0.68 per cent of the electricity from conventional sources by the end of 2010.

In India, as compared with China, most new energy generation since 2000 came from conventional sources (particularly coal), though the past decade saw exponential growth in renewable energy generation (especially wind, which grew 1,250 per cent from 2000-2010). The report says that implementation of policy relevant to climate change and its impact accelerated markedly over the last decade, despite the slow pace of international climate negotiations. The study presented three decades of evidence from five key economies — India, China, Brazil, the European Union (EU) and the U.S. which together house slightly more than half of the world's population and account for nearly two-thirds of global greenhouse gas emissions.

In the U.S. and India, renewable energy targets have been given to the States, even as the national governments develop policies to incentivize it while China experiments with special economic zones, incentives, and regulation for its low carbon cities and low carbon provinces, according to the report. In India, both emissions and power generation have increased dramatically, more than doubling in 15 years, the report points out.

Recently, under the Electricity Act 2003, Government of India enforced Renewable Purchase Obligations – mandatory obligations to buy renewable energy by Electric utilities and other eligible entities in the states. As of 2010, these State-wide targets translated to an approximate 5.5 per cent nationwide target for renewable energy.

Since the early 1990s, industrial productivity has tripled, but emissions have gone up by about 70 per cent and while the Indian industry largely improved its efficiency, performance at a sectoral level was mixed. The steel industry emissions intensity increased due to an increase in primary steel production v/s scrap, the report notes.

The good news is that in 2012, India was the world's fourth-largest market for new wind power projects, it has ambitious solar energy targets, and it has significant government programmes focused on energy efficiency (Global Wind Energy Council 2012). On the flip side, the report says that because it is also about improving energy security, reducing energy imports, improving the nation's balance of payments, creating new and profitable industries, India also pursues the largest build-out of coal-fired power plants, coal mining, and related infrastructure anywhere outside of China.

The report says that India's climate policy challenge, and one shared by the other rapidly developing countries in this study, is to ensure that it can realise the full long-term economic benefits of low-carbon development, without sacrificing short-term growth.

Outlining the challenges of low-carbon development in India, the report says that, the particulars of the Indian economy and frequent change in financial markets will transform the way policy will act and this could make low carbon investment more difficult.

The key sectors driving emissions in India are power, industry, and agriculture, the report says. Rapid growth in electricity demand mirrored rapid economic growth in China and India. In both countries, the most readily available source of indigenous fuel was coal. China was better at exploiting its coal resources, while India had to rely on imports.

As far as agriculture sector is concerned, the consolidated emissions have been increased, driven mainly by an increase in fertilizer use. For India as well as Brazil, exports might have driven increased cropland expansion or agricultural intensification. Despite rising fertilizer use, nitrous oxide emissions didn't rise dramatically, the report adds. Regrettably, while agriculture and forestry are important emission sources in India, there is little policy focus on these sectors.

India's renewable energy contributes around 11% of total installed capacity. Renewable sources of energy vary widely in their cost-effectiveness and in their availability across the world. Although water, wind, and other renewables may appear free, their cost comes in collecting, harnessing, and transporting the energy so that it can do useful work.

On the other side Renewables themselves are non-polluting, while the structures built to harness them can have positive or negative environmental impacts. For example, dams may affect fish migration but may also create wildlife habitat.

Author's Bio

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12

Why so much negligence towards Sustainable Environmental Practices?

By Dr. Maniprakash Aravelli

India, the traditional hub of the world is always showing the sustainable path for achieving development with less damage incurred to Environment. No doubt we are eating chemicals traditionally, scientifically, chemically and biologically since 'day one'. But it is ridiculous to learn that in the name of natural items, we are consuming chemicals like preservatives, colours, synthetic materials and different kinds of acids etc., We proudly claim that we are 21st century wizards of technology, yet are in a pathetic situation wherein we consume item and also the items that are being administered in our houses for cleaning, cooking, maintenance etc., in the name of business.

Human being's every move is connected to Environment, but without realizing the same we are destructing it. The Green technologies that are used are not cheap. India is known for its "sustainable approach" as manpower was wisely and mostly used for completing different physics tasks. May be this approach increases the work hours, but will certainly provide continuous food for the human and reduces the 'machine power'. Economically speaking using computers may reduce human interference, but it also requires power. Machines were meant for reducing human interference, but they cannot do small things like digesting food, producing blood, taking care of kids, eating food, automatically giving relief from wounds, producing new skin, producing vital fluids and giving birth to kids etc., like a human body. The process of mechanization is not sustainable and thus we can expect a sooner or later change in this approach.

Combined family concept of India is quiet sustainable. Even though one person earns less, the other will compensate and vice versa. Economically speaking, it is better way of living too. But in today's nuclear family system, families suffer problems like lack of financial freedom, poverty, theft, social status, lack of nutrition, lack of values, lack of elder's presence and guidance, unemployment etc. High paid jobs are not the solution as the pressure will be more. Even the husband and wife who are working professionals are admitting after some time, that they are becoming bored with the work and do not know what to do with the money earned!! As they are loosing family values and thus ignoring the children and becoming mechanical. This is another example of diversion took place in the sustainable Indian family system.

Marriage is such a sustainable environmental technology consisting of various concepts related to microbiology, hygiene, food safety, food distribution, chemistry, sociology, economy and psychology and other areas, where in it is being ill treated by simply avoiding the events in it. So many marriages are leading to misunderstandings rather than sustainable living. The family ethics are being followed strictly in our country, that's why even foreign people are coming to India and getting married. Of course, we as Indians are unable to find time even for getting married as they have become more commercial. In the name of busy schedules and work pressures, we are not giving much preference to the members of family and thus loose the taste of family relations.

The festival of lights was celebrated for victory of Good over Evil. Just because there is availability of light in forests, the sounds were made through bursting crackers. That technology was nicely adopted because there was enough space and the sound waves used to disperse and absorbed by the forest tress and simultaneously scared away the animals which got attracted to the lights. Whereas, the latest technology crackers will make such a high range noise that the vibrations will bombard with the concrete jungles thus leads to resound in these man made 'jungles'. This process makes such traditional festivals a scaring experience. We shall understand such sustainable festivals in order to respect the Environment.

The traditional distribution of 'Prasadam' (food) related to god is a very good and nice sustainable technology being adopted by Indians. The Indian culture is known about sharing and caring of the life forms. Through Rangoli we are trying to feed the ants, through construction of religious structures we are providing shelter for various life forms (both plants and animals) during and after natural calamities. In the form of the deity the rocks and other minerals are being protected. In the name of rituals/pooja we will be cleaning the rocks and other mineral based deities of the God. In the name of God we will go for fasting, we will feed fruits/ food to the cattle, we will distribute our money to others. The distribution of Prasada (food) to everyone is the real meaning Indian culture. If one closely observes the preparation of and distribution of

Prasadam or the seed/grain said to be liked by the God is the real technology to make sure that no body dies of hunger. It is also the best technology opted for reducing nutrition related disorders among living organisms. What ever the caste or creed of India, the charity or distribution of food becomes the part of their religion. Even the food will be distributed in the name of god for subsidized price. When ever festive season comes the high calorific valued and most nutritious food will be prepared and will be distributed in order to have better health for everyone, this sustainable practice is there in the culture and tradition of India. Though religious places show some of the business traits, yet it is the way to run the system as the resources there should circulate.

Though we belong to the technological era, we are not offering 'Pizzas' and 'Burgers' to God. This is because God never wanted these 'processed' foods and he always wanted the 'natural' products only in their natural form. A coconut, a flower, a twig, fruits in their natural stage and shape etc., The natural items always cost less compared to processed and foreign foods. As the religious places can become shelters to people in distress and during natural calamities thus we can understand that these religious places and offering of food, money, shelter for better sustenance for us. This is a great sustainable way of living with less expenditure!!

Nowadays many synthetic products are coming up in the market for reducing the obesity, healthy living and hygienic living space etc., but we shall not forget that without all these products which are purely 'chemicals' our elders lead their lives. The phenols which are used for cleaning out toilets need to be replaced with a better toilet technology, the chemical and high calorific valued food items need to be replaced with indigenous and local and traditional varieties of food grains, the artificial flavours and colours need to be replaced with natural flavours and colours, the fastest devices and super fast computing devices need to be replaced with more use of natural human brains. It is pathetic to understand that even "smell in our own house" is being commercialized with artificial flavoured scents.

The best food is available in packed form, the best water is available in packed/bottled form, the best meat is available in packed form, the best vegetables are available in only costly 'Malls' in packed form, the best clothes are available in costly shops like this… we think that only when they are high priced, packed and tagged with some brand names only they are secured. It is pathetic that we are unable to find time to purchase and cook what we want, as foods are available in ready-to-cook or ready-to-eat format. We shall understand that the cooking process in India is a sustainable one and makes the food microbial free and makes it not only delicious but also hygienic and high calorific. But still we are after 'processed' foods that are dumped from other countries like cheese, breads, pizzas, burgers, pastas etc., which are not easily digestible. It is a fact that 'at the end of the day'

we only get satisfied with the traditional food and it only satisfies our hunger.

Because of the food we eat and conditions we live, we are unable to think positively. This is a serious issue to be thought and act of. We shall at least tell the future generation that apart from other pollution and environmental problems, ***lack of knowledge about the Environmental problems and sustainable Environmental practices is the biggest problems*** and we shall also see that the traditional knowledge that is given by our elders passed to the next generation so silently just like we are following our traditions and keeping them alive (infact, we are following the scientific procedures behind the culture and traditions and promoting them). Each and every citizen of India should start thinking about the traditional practice and should observe the modernization of the same. As we are loosing human relations, family relations, sensitivity towards pathetic issues and sensitivity towards other life forms (animals and birds), we are prone to loose humanity, so if we can realize and practice sustainability in every part of life, or simply follow the sustainable traditional practices of our elders, it becomes easy for us to become Green human beings. There is no need for spending Crores of rupees or there is no need to place machines to make us happy.

One should understand that the mother earth is silently observing what ever destruction or disturbance that we are creating. We, the human beings feel that we are controlling the Mother Nature, but infact, the Mother Nature is bearing us, bearing our mistakes, but if she thinks for one second to react, that is the end of our era. Mother earth need not do much damage, it can just stop for a while, it can shake itself for few seconds and it can turn towards sun and move a little further (few kilometers), it can stop spinning. So, we can understand that sustainability is in the mother earth, not with our thinking and works. So, make the earth a better place by following sustainable Environmental practices.

So, it can be aptly said that “IT IS BETTER TO ACT BEFORE THE ENVIRONMENT REACTS”

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Natural resource management and development

By Mr. Omkar Shukla

The management of natural resources to meet people's requirements has been practiced since the pre-Vedic era. Natural resources such as biodiversity, water, land, biomass, forests, livestock, etc– the very foundation of human survival, progress and prosperity, have been degrading fast, and the unprecedented pace of their erosion is one of the root causes. The demographic and socio-economic pressures notwithstanding, the unmindful agricultural intensification, over use of marginal lands, imbalanced use of fertilizers, organic matter depletion and deteriorating soil health, extensive diversion of prime agricultural lands to non-agricultural uses, misuse and inefficient use of water, depleting aquifers, salinization of fertile lands and water logging, deforestation, biodiversity loss and genetic erosion, and climate change are the main underlying causes. The international debate on natural resource management are in the humid topics revolves around forest, deforestation or forest conservation. In a real sense, every culture of a social system, traditionally, is the result of people's action to survive and their attempts to optimize the use of available resources, i.e., soil, water and vegetation. During the last two decades, primarily through the watershed programmes, considerable emphasis has been placed on natural resources management.

The Natural Resource Management (NRM)-specific policy and action challenges notwithstanding, equally formidable other challenges directly impacting sustainability and productivity of natural resources are: technology fatigue, huge technology transfer/adoption gaps, collapse of the extension system and serious knowledge deficits and gaps, poor institutional credit

and insurance supports, non-remunerative prices and highly inadequate marketing infrastructure and regulations, huge post-harvest losses and negligible value addition, worsening input-risk-output imbalance, non-existent and/or ineffective enabling mechanisms and regulatory frameworks, and capital stock depletion and inadequate investment.

Natural resources are particularly important for the poorest and most vulnerable communities in the world. The poor are more heavily dependent on ecosystem services and therefore most severely affected by deteriorating environmental conditions and factors limiting resource access. While climate change is not the only threat to natural resources and livelihoods, climate-induced changes to resource flows will affect the viability of livelihoods unless effective measures are taken to protect and diversify them through adaptation and other strategies. For the poorest and most vulnerable, these strategies should include ecosystem management and restoration activities such as watershed restoration, agroecology, reef protection and rangeland rehabilitation. In fact, these activities can represent –win-win‖ approaches to climate change adaptation, as they serve immediate needs and bring immediate benefits to local communities while also contributing to longer-term capacity development that will create a basis for reducing future vulnerabilities.

If adaptation strategies should reflect the dynamics of peoples'livelihoods, then adaptation must be seen as a process that is itself adaptive and flexible to address locally-specific and changing circumstances. The responsibility for adaptation lies with those who stand to gain the most. While those with the least capacity to adapt are the most vulnerable, they are also the most likely and most motivated to take conscious adaptation actions. For the poor and vulnerable, the actions that they take will be constrained by their limited assets and capabilities, but they will also be the most appropriate given the specific local manifestations of climate change impacts. These actions should be supported by external agencies to build up the asset base of the poor.

In the last decade there has been an increase in understanding of tropical rain forest ecosystems and greater recognition of the interdependence of the environment and the economy. Concern over the loss of tropical rain forests and their biodiversity, and its implications for potential global climate change, has led to increasing political awareness of the serious consequences of human development and forest mismanagement.

References and further readings:

IISD, http://www.iisd.org/pdf/2003/natres_livelihoods_cc.pdf
CERMES Technical Report No 48, http://cermes.cavehill.uwi.edu/Technical_Reports/Fernandez_2011_livelihoods_vulnerability_capacity_adaptation_climate%20change_Union%20Island_CTR_48.pdf

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14

People's Deaf Ears to Earth's Silent Tears

By Ms. Gayatri Viswanathan

Earth is our home or rather, it is our only home. For the last two-hundred years, we have been trying our best to conquer nature. Now, we are beating her to death. For so many years, we have seen our fellow human beings plundering Earth. Sarcastically speaking, Earth is charred beyond recognition. Despite committing so many crimes and attempting to conquer Earth, we have failed big time. It is said that 'fighting nature is fighting one-self' and how true it holds! Breaking nature apart to build concrete jungles has its own negative impact. What we might not realize is that for whatever we do, there is an equally forceful reaction from Nature, and those consequences we will have to suffer, and so will our posterity. Much has been said about the responsibilities we ought to fulfill to make Earth a secure planet. To begin with, one must realize the need of the hour. It has to be understood that we have to unitedly do some simple things to ensure a future for this divine planet. Natural Resources Management is the topic that needs complete attention from people globally. Here are a few things we can do to help ourselves.

1. Think effectively: Try to visualize a condition where there is not a drop of pure water to drink, not a tree to provide shade in scorching heat, not even an edible particle of food to eat. Hard to imagine, isn't it? This would be the condition of our exquisite planet if things continue to worsen this way. It's time to think of a CHANGE and educate people about it.
2. Act: Simply thinking would lead us nowhere. Doing things in reality makes all the difference. For instance, we throw lavish parties and spend a lot of money on birthdays and other events. Instead, if we plant a sapling and resolve to take care of it, the world would be a greener place. Bill Gates had said, "The best time to plant a tree was twenty

years ago. The second best time is right now." So, act wise and most importantly, act immediately.

3. Water: This simple word denotes life. Our charming planet is two-thirds water. Imagining Earth without "aqua" is next to impossible. However, this dreaded phenomenon might prove to be true if conditions continue to deteriorate. Water is the most vulnerable substance to get wasted. Whilst wasting water, think of the Arab countries for whom water is more precious and sacred than oil or gold. It is very necessary for us to understand the need to save water before Earth gets parched.
4. We must try to protect our choked atmosphere. As ordinary citizens, we wouldn't be able to do much to improve the quality of air we inhale. We can keep in touch with authorities and fund the projects planned by the government. Join hands with NGOs and environmentalists and support with all your might.
5. Reduce, Reuse, and Recycle: Practice these simple words in your day-to-day life and see the change it brings. For instance: we can use a one-

The Earth is silently weeping… We need to roar and let others know that we care for our land. As the famous quote goes, "As people alive today, we must consider future generations. A clean environment is a sided print-out paper to scribble our home-work or schedule. Most of us are aware of these practices, but never really implement it. Its time for us to change that mentality.

human right like any other. It is our responsibility towards others to ensure that the world we pass on is as healthy as we found it."

Author's Bio

Gayatri Viswanathan is a student of FYJC, Arts. She plans to pursue Law after completing her 12th Board Exams. In her free time, she writes political satire, stories or humour poems. She has worked with Times Of India NIE for 14 months, where she learnt the art of writing and journalism. Some of her poems have been published in DNA, Navi Mumbai.

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Global Warming must be seen as an Economic and Security Threat

By Ms. Hiba Habeeb

It is true what KOFI ANNAN has said,

"Global Warming must be seen as an economic and security threat "

From these renowned words, it is quite clear that global warming has become a scientific issue of 21st century's global society. Global warming is regarded as a scientific concern which encompasses social studies and individual's choice of lifestyle. Scientists believe that for the past 2000 years global warming is responsible for warming earth at a faster rate.

The Earth creates its own natural greenhouse effect which does not harm human life .Greenhouse effect is blanketing effect of green house gases. Naturally occurring greenhouse gases include water vapor, carbon dioxide, methane and nitrous oxide. Absence of green house effect may cause earth's temperature to be at least 35 degree colder. But human activities create harmful greenhouse effect called global warming .In simple words, global warming is the rise in average temperature of earth's atmosphere. Global warming caused by massive increase of carbon dioxide emissions. The level of carbon dioxide began to rise in atmosphere since beginning of industrial revolution. Past climate studies reveal that carbon dioxide has caused waxing and waning of ice ages. The 1st major source of CO2 is burning of fossil fuels and 2nd major source is land use changes. Fossil fuels are burnt for energy production which accounts four-fifth of global CO2 emissions .Land use changes include deforestation for urbanization, which accounts for one-fifth emissions.

According to International Energy Authority Projections between 2000 and 2030, the world will emit more CO2 than those of 1750 and 2000.This situation arise due to energy –hungriness of industrialized economics.

Impact of global warming with increasing global average temperatures;

1-2 degree Celsius	Major impacts on ecosystem and speciesIncrease of heat waves, droughts, floods and infectious disease Large impact on agriculture and water resources Up to 74 cm sea level rise in next 100 years Terrestrial carbon sink becomes source, accelerating global warming
1-3 degree Celsius	Greenland ice cap starts to melt (7 m)
1-4 degree Celsius	North Atlantic circulation collapses
3-4 degree Celsius	Major species extinction
2- 4.5 degree Celsius	West Antarctic ice sheet collapses (5 m)
4-5 degree Celsius	1-3 billion people suffer from water scarcityGlobal food production plummets Fifth of world population effected flooding Significant increase in human death Due malnutrition and disease.

Scientist believes that a cut of carbon dioxide emission between 60% and 80% should be implemented to prevent the worst effects of global warming. Intergovernmental Panel on Climate Change (IPCC) is recognized as the most authoritative scientific and technical voice on climate change. As a result, they provide frequent reports on abrupt change in temperature.

Developing use of Alternative renewable or clean energy like low carbon energy source to great extent can reduce harmful effects. Biofuels is an intermediate solution to fight to reduce global carbon emissions.. Implementing the use of geothermal sources to pump water is an excellent carbon –free source of energy. Removal and storage of carbon dioxide during industrial processes will cause 5% – 10% increase in power production costs, which are later used by food manufacturing ,oil industry and metal processing industries. Around 13% of greenhouse gas emission with respect to transport can be reduced by increasing the use of alternative fuels like biofuels, Methane, alcohol fuels propane etc. Another notable development is use of hybrid cars which has a combination of petrol engine with battery system; this can cut down carbon emission by 50%.

Geo engineering referred as techno fixes or geohacking aims at removing carbon dioxide by building artificial trees or by stimulating the oceans to take up more carbon .Molding a Zero – carbon economy by realizing our building ,neighbor

hoods ,transport networks and cities will help us to change the world .Global warming is regarded as a scientific theory which make us examine whole basis of modern society .As economic development is based on energy usage enough funding should be provided for developing cheap and clean energy production .

So it is very much true that

“Global warming threatens our health, our economy, and our natural resources and our children’s future .It is clear we must act.” – Eliot Spritzer.

Thus we have to act united against this evil and take a pledge to love, care nature like a baby without interrupting its silence with our activities and preserve it for the future.

Author’s Bio

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16

Essay on Energy, Economy and Environment

By Mr. S. Rajkumar

"If you wish to bear fruits you must go to your roots."

The core question arises in our mind that society lies in the roots of 3E (Energy, Economy, and Environment). Society needs to keep all energy options open to satisfy the growing demand. The industrial and consumer flow of energy and their effects on the environment is higher. They influence the economic, political, regulatory, and social factors of the country. So that the economy of the country is directly rely on the transformation and utilization of resources.

The energy sources are primarily carbon-based fuels, hydro and nuclear power. Because of their cost, performance, availability and use, fossil fuels will remain a dominant energy source, along with nuclear and hydro. The other renewable energy sources such as wind and solar power, biomass energy and are likely to grow significantly in importance. We have to create awareness about energy conservation and their role in the economic growth and the environment using the T.E.A.M approach (Teach, Enforce, Advocate, Model). Shifting our focus to industrial ecosystems for better status of Energy – Economy – Environment. So our target is to maximize energy efficiency by reducing environmental wastes. Having concern for the environmental impacts of energy developments by identifying the opportunities for reducing carbon emissions and promoting sustainable manufacturing growth and practices and reduction of business costs by developing economic new sources of supply and innovative technologies, developing the delivery infrastructure to meet changes in demand and supply, improving energy efficiency and finally

reliability in production, delivery, and customer end use.

We should directly focus on industrial ecosystem to attain the benefits of complete energy- economy – environment. The progress toward environmental and economic goals is achieved by meeting environmental and economic goals and by achieving organizational carbon reduction. There will be a significant cost savings result from increased process efficiencies and reduced waste and profitable sustainability practices. Enabling frameworks for energy efficiency, utilizing market forces, promoting open trade and investment, avoiding trade-restrictive measures, fostering research, development and deployment of energy efficient technologies, emphasizing international cooperation, encouraging mutual recognition of voluntary energy labels and standards, integrating efficiency with climate change, security, access and other aspects of energy policy, and finally by developing and utilizing rigorous and reliable metrics, and life-cycle oriented approaches.

The Waste water Treatment, reduces the Environmental Impact. Commonly the sludge on a yearly basis of newspaper, bio and natural waste, agricultural refuse, concrete and metal waste can be resold after cleaning for recycling. Thus introducing the industrial ecosystem in India will result in drastic effect in the form of the 3E's. The forecasting results are economic, environmental savings of energy sources, coal and water, reduced emissions of CO_2, SO_2, NO_2 and finally reuse of waste products (fly ash, sulfur, gypsum, nitrogen in sludge). The monetary benefits are realised from the production costs (purchasing unwanted by-products from others at bargain prices; selling its own by-products), Energy consumption (less transportation), waste management (on-site, or even being able to sell what would otherwise be waste) and finally by costs of compliance and cost of some R&D (shared with other companies).The Societal benefits are better health, more jobs, cleaner air and water and healthy economy etc. Always industrial ecosystem paves the way for sustainable development.

Clean energy options should be developed by reducing the nationwide carbon-dioxide emission, increasing the share of low carbon energy in electricity generation systems and by securing stable energy supply by building a secure energy supply system to meet economic development goals. The framework structure consists of cleaner energy supply and energy demand. The cleaner energy supplies can be fulfilled by restructuring energy mix and improve energy efficiency, developing carbon-free renewable energy and effectively explore its power generating potential. We can also increase the utilization of low carbon natural gas and energy supply diversity and by accelerating the replacement of existing power generating units and formulating a power plant efficiency improvement program to require new built units to apply the best available technology. Introduce clean coal technology to reduce the Carbon-dioxide

emission of power generating system. The energy audit is the important step in improving the energy efficiency of a home or building. Audit usually identify and highlighting the energy consumption and energy wastage by organizing resources and data requirement and developing action plan to save the quality and cost. The major steps in the audit are gathering information, description of equipment/plant specification/data collecting hours/day operation, energy consumption per day, and their operational schedule.

Conclusions:

Thus for energy, economy and environmental growth results in enhancing competitiveness for the global evolution towards a more sustainable energy future.

"Save energy today, bright life tomorrow"

"A little energy care makes demand rare"

Improving energy consumption and transformation efficiency, increasing the value added of energy consumption by adopting energy supply methods and consumption practices that ensure low carbon and low pollution. Thus there should be a Low dependence on fossil fuels and imported energy. We are in the position of cat on the wall. The real question is not "What is the policy that will answer all our environmental energy and economy problems?", but rather "Which combination of changes, costs and risks do we want to accept?" This question is vital and urgent, as it will affect our lives and our environment for generations to come. Thus our goal is to identify clear energy action plans that are needed for the economic and environmental growth measures that will work with markets to improve information and lower barriers to deployment of economic solutions. Business supports energy efficiency and given the right way and regulatory frameworks can help governments achieve the triple objectives of energy, economy and environmental improvement.

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17

Business Growth through Environmental Sustainability

By Ms. Priyanka Sawhney

Business is growing incessantly day in and day out and has affected our lives like anything. We have gone mobile ending in our daily labor worth encapsulated in a micro chip. In the whole glitzy setup, most of us have gone purblind not reckoning the effect of growing money crunching machines on the environment where we dwell. The end result of such an imbalance is definitely alarming. This calls for an exigency where we need to set up a mutually compatible relationship with environment which apparently is possible through sustainability.

Businesses can potentially cause damage to all areas of the environment. The common ones include:

1. Damaging rainforests and woodlands through logging and agricultural clearing
2. Polluting water resources causes depletion of aquatic animals
3. Polluting the atmosphere through the burning of fossil fuels
4. Damaging prime agricultural and cultivated land through the use of unsustainable farming practices

To name a few instances in recent times such as the Chinese's Giant Livestock farm which affected public health badly mostly because of stored manure of pigs, chickens etc. Thousands of dead pigs floating past Shanghai owes to growing polluting atmosphere which is no more congenial for living being's survival. Studies have specified that about 8–9% of the total disease burden may be attributed to pollution, but considerably more in developing countries. Hence the vicious cycle goes around wherein man creates business which kills him altogether. Report for the UN into the activities of the world's 3,000 biggest companies estimates one-third of profits would be lost

if firms were forced to pay for use, loss and damage of environment. (Report by guardian).This figure is really shaking and scary.

As a positive move in this path, environment sustainability has shown keen enhancements in order to curb the evil affects of growing stuff without considering its effects on our counterpart.

Environmental sustainability forces businesses to look beyond making short term gains and look at the long term impact they do have on the natural world. For example, when manufacturing a product, the environmental impact of the product's entire lifecycle, from development to disposal is seen and validated before finalizing designs.

Good environment leads to business grooming in a most healthy and profitable way. It reduces risk, lowers costs, improves productivity and enhances reputation. Companies that are adopting these forward-looking practices are accruing benefits now. Alcoa has found that its sustainability track record gives it better access to large markets such as Brazil, where a positive environmental track record is becoming a more important component in selecting products .Companies that integrate the environment into their business decisions and reduce their environmental risk and potential liabilities are in a better position to secure investment and reduce their financial and reputational market exposure. Brebbia and Pineda (2004) claim that financial savings are one of the most significant factors that influence the implementation of environmental initiatives in a hotel. Green programs can provide a competitive advantage to leaders as long as green activities continue to be voluntary. Over time, however, green practices in the industry will become a baseline requirement, particularly as the cost of non-renewable energy continues to increase, regulatory pressure increases, and consumers become more demanding. Over the past 25 years, there has been a shift in the expectations and demands of consumers. Customers are more concerned about environmental issues such as recycling bottles, cans and paper at home as well as making greener lifestyle choices, such as organic food or fuel-efficient vehicles. Considerable examples show that profit can be aligned with environmental sustainability.

There are many initiatives in this direction taken by many companies and subsequently the world leaders are aligning by these so as to inflate growth and visibility. The famous CDP is directed towards the same mission following the concrete vision of sustainable development. It works with market forces to motivate companies to disclose their impacts on the environment and natural resources and take action to reduce them. CDP now holds the largest collection globally of primary climate change, water and forest-risk information and puts these insights at the heart of strategic business, investment and policy decisions. These initiatives play crucial role in encouraging

companies to take the first steps in that measurement and management path.

However, if we fail to act now and environmental sustainability becomes more heavily regulated by governments, there could be significant costs involved. For example, regulators may begin charging businesses based on their negative impact on the environment, leaving you to play catch up and incurring expenses in the process. There may also be incentives and reward schemes introduced that will benefit businesses that operate at better than the minimum standards in relation to environmental sustainability, providing businesses that are sustainable with a clear advantage. Reference: Tony Hall, founding Director of GreenBizCheck, available at tonyhall.com.au)

There may be few key barriers that prevent companies from truly integrating sustainability considerations into their long-term strategies. Countless companies across the world struggle with these obstacles, such as: capital budgeting processes that fail to account for sustainability initiatives' benefits; financial teams whose goals don't align with those of the sustainability teams; and uncertainty about how to implement metrics that properly account for external environmental costs.

To align each goal so as the end result is sustainability the companies should set goals that integrate environmental considerations into core business decision-making. Also the sustainability team should be engaged early in project planning so as to reckon all the pros and cons with respect to the environment. Mainstreaming the best practices—and innovating new ones—can help put the world on a trajectory for a truly environmentally sustainable economy.

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18

Essay on 'Livelihood- A Long Way To Go'

By Mr. Rahul Pasawala

Livelihood is a short eight letter word which has a huge and a wide meaning. Livelihood is defined as "means of securing basic necessities of life such as food, shelter and clothes." We, humans are in constant race of acquiring the so called "livelihood" by any means-by hook or by crook! But pause for a moment and let us think that are we not in the race which should actually not begin only? Are we not following a band wagon? Yes answer's surely going to be in the affirmative side.

When it's a discussion about making a world greener, we must know that livelihood has one of the major impacts on making the world greener and making a place where we can actually live. "Live and let others live." is one of the motto always taught in our blooming school days but we humans on becoming a so called adult, join in the tradition of acquiring each and everything from a pin to plane, besides what livelihood we need. The basic things which are required for a man to maintain his existence is a piece of cloth, shelter and food to survive. Buy today's scenario is a "brother killing a brother" and a person killing his own child for the food. Entering the golden 21st century is this what which suits us? Is it not a big question mark on today's society?

"The world has enough for everyone's need, but not enough for everyone's greed." - Mahatma Gandhi

Yes! The quotation depicts the reality of our today's cement and concrete life. We all for our purpose are destroying the gift of nature-flora and fauna, the natural aesthetic beauty, mountains, rivers, and a long list follows. "Greed eats all" is the proverb which proves to today's man. In the name of urbanization,

industrialisation, etc we all are in a rush to achieve our big dreams forgetting the only earth which we have.

Global warming has its foot on its head, increasing at an alarming rate. Ozone layer depletion is also one of the major problems. Due to global warming the glaciers are melting down which has caused many problems in major part of the world. Do we not think that the Uttarakhand tragedy that happened recently was a man-made destruction? Reports from well recognized institutes show that it was the greed of man for constructing more and more on a small piece of land which led to such a tragedy which spreads shiver down the spine. History is also a witness to many such devastating destruction which changed the map of the world. This is all due to the greed of man in getting more and more quantitative livelihood.

There are some other reasons also for degradation of the nature. Illiteracy is in the sense of not having knowledge about environment, it's importance and ways to protect. Population explosion is also one of the serious issues which need to be thrown a limelight. Due to population explosion, there is an increase in demand which in turn causes harmful effects on the environment. This all forms a part of our livelihood. In our daily life also we throw waste, pollute water and air. Vehicles, industries all play an important role in degradation of environment. Our mentality, orthodox nature and superstition also play a role in causing harm to nature. There are deep roots of destruction of what man has created through his way of living which needs to be eradicated. We normally follow the tag 'Money matters' but we need to think from deep inside is it is true? With money, we can buy everything (materialistic) but can we buy a new world?

So, to cut it in a brief there are many ways through which we can protect and save our environment.

"We never know the value of water till the well is dry"

Better to be safe then to worry is all what I can say. Creating awareness among so called 'illiterate' should be our major target. Use of resources judiciously and forming a habit of using renewable source of energy should be put into practice. In our day to day life also there are some small but effective ways that should be used such as using a public transport system, less use of plastics, use of e-books and lots more. Technology is progressing then why can't we? Yes, technology can be one of the greatest tool through which we can create a minimal of awareness. Science is also growing in leaps and bounds. One of the major focuses should be on environmental studies.

So, last but not the least I would like to say that yes! We have to improve our way of living our livelihood. Each and every body should keep hands in hand and pledge for saving our environment and making it more greener and a better place to live otherwise dooms day is not so far…

Author's Bio

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Ecosystem/Ecology management

By Ms. Anima Chordia

"Earth provides enough to satisfy every man's needs, but not every man's greed."
– Mahatma Gandhi

The 20th century was the century of material development. Industrial development/wealth was regarded as the source of peace and happiness. Consequently, all efforts were made to amass as much wealth as possible. But the prosperity did come at a cost. We paid and we paid heavily. We sold ourselves, we converted Nature into Cash. The natural wealth was not only thoughtlessly exploited, but it was destroyed on a massive scale. Evidently, the forest areas have squeezed, the quality of ground water and other natural resources including air has deteriorated.

Nature has bestowed living beings with three gifts- atmosphere (air), water and earth (soil). The yardstick to measure real development should be the increase in quality and/or quantity of these basic capitals. But the fact is that there has been an increase of thirty percent in green house gases in the last thirty years. The quality and fertility of soil is touching new lows every day and the effluents we have been adding in water lately have not only taken a toll on our health but also on the health of others in the ecosystem.

The dazzle of electric light and the sound of electric fans have finished the common man's thinking power. In return, we pay huge price, addition of poisonous gases in our atmosphere every second.

The other gift of material civilization is the exponential pollution and consumption of water. The eyes of the

farmer glitter with hope to get bumper crops when he spreads urea and other chemical fertilizers in his field. He is astonished when his soil demands huge quantity of chemical fertilizers to produce what he seeks, but he is helpless. His soil has become addicted and therefore needs more to satiate its need to achieve stimulation.

Furthermore, the effect of chemical fertilizers and the pesticides has been even more disastrous on water, not only poisoning the ground water, but also the surface water. Probably the living beings have acquired the capability to assimilate these, but it has definitely affected their vitality, inspiration and freshness.

"Man is a complex being: he makes deserts bloom – and lakes die."
– Gil Scott-Heron

How to compensate Nature for the cost of affluence, which it had to pay during the 20th century? The challenge to find out the answer is before the well wishers of mankind. This should not be the concern of a few for whom the flattering adjective of environmentalist has been used while the others have shirked their responsibility. The basic question is whether we will continue to live under the illusion of accepting affluence as development or will we change the definition of development? It should have continuity and it should not harm even a small minority. Let us examine the mega-dam reservoirs on these lines. These projects claim to solve the water problem- drinking water and irrigation: but for how long? The life of reservoirs is limited due to siltation. Forty-two sq. km. of the most fertile valley has been submerged because of the Tehri dam. The same is true of the Sardar Sarovar project. The life of Tehri dam according to dam builders is 100 years, but according to independent experts it will not be more than 30 to 40 years. Not only the beautiful hill area of 42sq. km, but the livelihood of lakhs of people was uprooted.

The components of chemical fertilizers have given the people the false notion that more production is only due to fertilizers and water. How long will the fertilizers and water accompany men in his pursuit of enhanced production in the absence of fresh top soil? This is a selfish plan to plunder the right to life of the coming generations in order to become prosperous.

Then, what should be the plan for the sustained supply of oxygen, and maintenance of water level and the soil fertility? Its scientific answer is through tree farming. It is also essential to meet the increasing subsistence needs of the growing population. Tree farming can give five to ten **time higher produce** from the same area. Trees rise towards the sky and we utilize the space for production, which is not possible in crop farming. So far seasonal fruits have been given importance as tree products. These cannot be preserved for a long period. So the immediate task is

to find out more durable and nourishing fruits species for different ecological zones.

Among these fruits, the first priority should be given to dry fruits. In the hills, walnuts and chestnut come under this category. The second place goes to cashew-nut and almond, and the third is oilseed giving trees like olive.

It is often asked -what is the alternative to sugarcane? **Because without sugarcane's sugar that is used to make sweets, not only human beings** even the deities are not satisfied. The reply is Honey. Honey is a tree product. In the hills, there is an excellent flowering tree- The Bird Cherry, which has been named as the "divine" tree by the grateful hill folk. This tree flowers in November and December when there are no flowers for the bees to live upon. Then there are the seasonal fruit trees, about whom everybody knows. The need is to find out different species, which may give fruit round the year. When trees are adopted as staple food, there will be less need of hospitals and medicinal drugs because most of the diseases are born in our kitchens where tasty, spicy and fried food is prepared.

"If the bee disappeared off the face of the earth, man would only have four years left to live." – Albert Einstein

Human beings are not the only children of Mother Earth- animals, birds and other living beings are also her children. Trees for fuel (to warm the houses), timber, leaf fertilizer and fiber for clothing will have to be grown. I have given them the name of five 'F' trees food, fodder, fuel, fertilizer and fibre. Such land use will not only conserve the basic capitals of Mother Earth- soil and water- but will also increase these. The economists so far have sung the glory of the increase in capital produced from the exploitation of the wealth of earth, but it was like putting on a gold ring after selling the rose.. There is a need to give ideas the shape of a people's movement and a lifestyle based upon it.

Historically, the 21st century is a psychological event, because it is not only a century but **also** an ending of a thousand years. We have entered a new era, with the achievements and failures of two thousand years of experience. The lifestyle to be developed in these times should not be the carbon copy of the past, but zero based, which may guarantee permanent peace, happiness and satisfaction not prosperity alone-to all the children of Mother Earth.

"How can we be so arrogant? The planet is, was, and always will be stronger than us. We can't destroy it; if we overstep the mark, the planet will simply erase us from its surface and carry on existing. Why don't they start talking about not letting the planet destroy us?" – Paulo Coelho, The Winner Stands Alone

Author's Bio

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Environmental Pollution Control – Water, Air and Land

By Mr. Laxmi Prasad Boda

"Earth provides enough to satisfy every man's needs, but not every man's greed." – Mahatma Gandhi

"This entire planet is our home. We are the only species that systematically destroy our own habitat."- Marianne Williamson

"One person alone cannot save the planet's biodiversity, but each individual's effort to encourage nature's wealth must not be underestimated."- United Nations Environment Programme (UNEP)

Introduction

Pollution prevention is a major global concern because of the harmful effects of pollution on a person's health and on the environment. Environmental pollution comes in various forms, such as: air pollution, water pollution, soil pollution, etc.

Everyone is a stakeholder as we are all inhabitants of this one and only mother earth. Each person can contribute something to advance environmental pollution mitigation measures. Environmental protection means caring for our resources and subsequently for ourselves and ensuring a sustainable future for generations to come will have a better environment.

"If we heal the earth, we heal ourselves." – Wangari Maathai

You and I should therefore accept personal responsibility for the success of the environmental protection programs of our respective community by cooperating and actively participating in making the atmosphere pollution free. Help stop pollution today. Although on an individual basis, we can help combat pollution in our own immediate environment, efficient control can be best

institutionalized through legislation. Thus, most countries have already addressed the issue by passing some form of pollution prevention measures.

Averting the onset of pollution in any area; i.e. be it on air, water or land, could be a start and the simplest preventive solution to the problem. This calls for a conscientious effort to adopt good practices or habits by the people, the passage and the proper implementation of appropriate government laws and strict compliance especially by potential industrial pollutants.

If there are no pollutants, there will be no pollution. And yet, this is easier said than done. Certain bad habits are entrenched and industrial development somehow carries with it the concomitant burden of pollution. The cost to business and its commercial ramifications make this rather simple preventive approach quite complicated and more difficult to implement.

Everyone can help by self education and by adopting good and healthy practices. It is also important that we help raise awareness about the significance of environmental issues, their dire consequences and what can be done.

Every action or inaction of any person in regard to her or his surroundings has an effect- be it good, neutral or bad- on the environment. Nature already provides for our needs. Whatever we do to it gets back to us. If we are friends of the earth, it will also be friendly to us. By becoming aware and doing the right action, we choose to be part of the solution. What comes to mind now to serve as reminders include the following:

- Stop smoking or at least follow the “No Smoking” sign.
- Use unleaded gasoline in your cars.
- Keep your car properly maintained to keep it in good running condition to avoid smoke emissions.
- Share a ride or engage in car pooling.
- Instead of using your cars, choose to walk or ride a bicycle whenever possible. With this eco-friendly practice, you will also be healthier and happier by staying fit.
- Never use open fires to dispose of wastes.
- Adopt the 3Rs of solid waste management: reduce, reuse and recycle. Inorganic materials such as metals, glass and plastic; also organic materials like paper, can be reclaimed and recycled. This takes into account that the proven solution to the problem of proper waste management (especially in third world countries) is proper disposal (in waste bins for collection and not in the street where it could fall into drains), waste segregation and collection, and recycling.
- Start composting brown leaves in your yard and green scraps from your kitchen. It will reduce waste while improving your yard and garden soils.
- Reconnect with nature. Live green by using green power supplied abundantly and freely by wind and the sun. Hang your laundry to dry to minimize use

of gas or electricity from your dryers. Enjoy fresh air from open windows to lessen the use of air conditioning system.

- Patronize local foods and goods. In this manner, transporting goods and foods prepared with GMOs which uses fuel from conventional energy sources will be minimized.
- Use eco-friendly or biodegradable materials instead of plastic which are made up of highly toxic substances injurious to your health.
- Create your green space. Value your garden. Plant more trees and put indoor plants in your homes. They clean the air, provide oxygen and beautify your surroundings. Thus, care for them and by protecting them, especially the big trees around and in the forest, you protect yourself and your family, too.
- Have a proper waste disposal system especially for toxic wastes
- Take very good care of your pets and their wastes.
- Never throw, run or drain or dispose into the water, air, or land any substance in solid, liquid or gaseous form that shall cause pollution.
- Do not cause loud noises and unwanted sounds to avoid noise pollution.
- Do not litter in public places. Anti-litter campaigns can educate the populace.
- Industries should use fuel with lower sulphur content.
- Industries should monitor their air emissions regularly and take measures to ensure compliance with the prescribed emission standards.
- Industries should strictly follow applicable government regulations on pollution control.
- Organic waste should be dumped in places far from residential areas.
- Say a big “NO” to GMOs or genetically modified organisms. Genetically engineered crops are not only bad for the environment since they require massive amount of fungicides, pesticides, and herbicides; but GMO altered foods are also health risks and negatively impact farmers’ livelihood.

Conclusion

Breathing is life. We know that we will survive without food for several weeks and without water for few days, but without oxygen, we will die in a matter of minutes. The oxygen, the air we breathe sustains us. So, let us make today and everyday a good day for everyone. Allow the earth to have more clean air. Help control pollution.

Earth eventually had an atmosphere incompatible with life. Nevertheless, life on earth took care of itself. In the thinking of the human being a hundred years is a long time. A hundred years ago we didn’t have cars, airplanes, computers or vaccines. It was a whole different world, but to the earth, a hundred years is nothing. A million years is nothing. This planet lives and breathes on a much vaster scale. We can’t imagine its slow and powerful rhythms, and we haven’t

got the humility to try. We've been residents here for the blink of an eye. If we are gone tomorrow, the earth will not miss us.

We must help fight Global Warming by doing the following steps:

1. Plant more trees
2. Don't waste water
3. Use cloth bag and don't burn plastic

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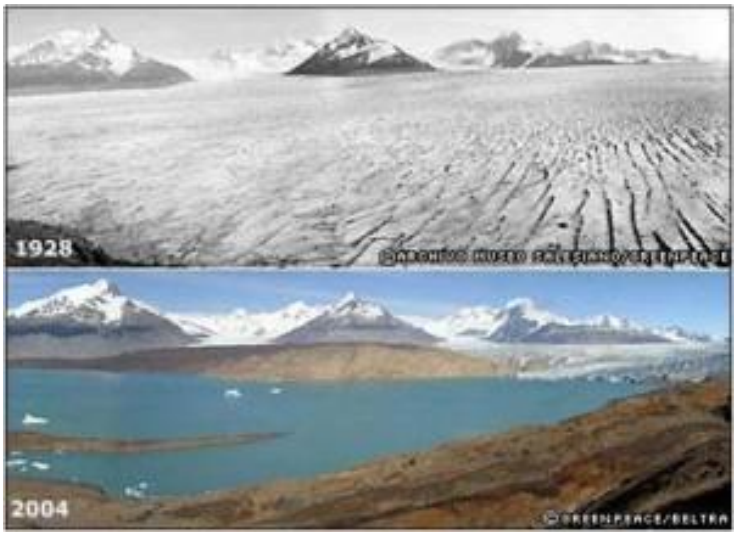
Climate change – Time to hit the Panic Button

By Mr. Kushagra Sharma

'The earth has enough for man's need but not for man's greed."

Never in the history of mankind have these words held more prevalence than now. It might seem a little far-fetched to use the words 'never', 'history' and 'mankind' in the last sentence but by the end of the essay their use would be justified beyond any reasonable doubt.



Climate change was first seen as a hazard in the 1970s. By the 80s and the 90s it became a threat to the survival of the human race. When the twenty first century came around it earned, rightly so, the distinction of a 'global threat'. But somehow as we neared the end of the first decade of this tech centric century climate change got 'lost' in the clouds of oblivion. 'Forced' might be the right word here. You see, in an age where facebook statuses are changed in minutes, where people gain and lose fame at the drop of a hat, where everyday hundreds of people die in terrorist attacks climate change lost its threatening vibe. It was rendered redundant. By our bubble gum memory. By our we-don't-care-anymore-attitude.

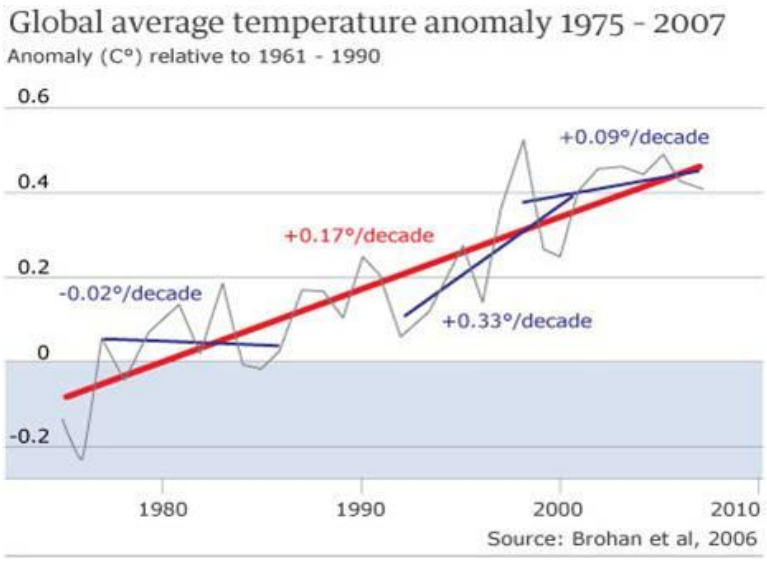
People often use the terms 'Global Warming' and 'Climate change' interchangeably. Although both the phenomena are environment related their C.V. are very dissimilar. Global warming refers to the rising average global temperatures on account of excessive release of green house

gases in the atmosphere whereas Climate Change refers to the erratic change in climate patterns all over the world which include earthquakes, typhoons, tsunamis, volcanic eruptions and other 'natural' hazards. Clearly, Global Warming is a sub set of Climate Change.

'For 200 years we have been conquering nature. Now we are beating it to death.'

Renaissance is credited with the opening of minds of people in general. Many ground-breaking researches and ideas were put forth during that era. Then came along, the industrial revolution. It empowered men to create more from less. It brought with itself revolutionary technologies. Sadly, it also set the base for an unfortunate delusion in our race's mind. That we could conquer nature. Slowly and portentously we deluded ourselves into believing that we were superior to mother earth. Trees were mercilessly cut. Countless polluting factories were set up. Heaps of wastes were irresponsibly dumped into the oceans. All in all we as a race showed complete disregard for the preservation and conservation of our environment. As a result, benevolence was overthrown by business-mindedness. Science crippled self reliance and somewhere in this rat race to make ourselves 'developed' we buried humanity.

What we are seeing and have seen in the past decade is the repercussion of our irresponsibility. Reports show that occurrences of 'natural hazards' like earthquakes, typhoons and tornados have gone up. They have become more frequent and more deadly. The average global temperature has risen at an alarming rate. Studies predict that the arctic may go iceless by as early as 2020. Island nations have started preparing plans to evacuate themselves into other parts of the world fearing the submergence of their country due to rising sea levels. More than 90% of animal species that once existed on the face of this planet have gone extinct. And many lie in the category of 'highly endangered.' Air pollution levels in the cities of the developing nations 'boast' of record high numbers. Ground water level in many Indian cities has fallen more rapidly than the rupee. Countless trees have been cut down; forests have disappeared with the blink of an eye to make way for infrastructural



projects. And the result is in the front of our eyes. It as if nature is taking her revenge. And I don't blame her. Not after the brutality with which her resources have been used and dumped.

Now, some people may argue that the time has passed. That the damage done to a once inhabitable planet is beyond repair. That the time to hit the panic button is gone. And there are some people who have not abandoned hope and believe that if constructive measures are taken we may be able to establish some sort of harmony with nature. Then there are some people who simply turn a blind eye to this grave apocalyptic danger, throw their heads up in a pretentious manner and rubbish the fact that we might have dug up our own graves by a dismissive shake of their hands. It is this third lot of people that saddens me to the core of my heart. And these are the people who will take us to our doomsday.

Cynicism is always better than downright phlegm. But optimism is even better.

May be the cynical are right. May be, the time has gone. May be, our fate has already been written by our careless deeds. May be, we are already doomed. But then I want to ask you this- Are you willing to give up on a bright future for your children and let the world rot under toxic gases because of some unanswered 'may be's?

What has been done can't be undone. And although some people might paint a gloomy picture of what our future looks like we must not forget that there are countless NGOs and other non-profit organisations that work for the conservation of our environment. The world doesn't lack laws or provisions. It lacks their right implementation. When the government of India declares a region to be 'ecologically sensitive' it is expected to be taken care of and left alone by business centric people. Sadly, a greedy bunch of corporate whores turns that same 'sensitive' area into a mall by feeding some officials and administrators. Another thing that is missing from our fight plan is the awareness of the problem at the grass root level. Students at all levels of education need to realise the danger that 'Climate Change' is.

There have been many turning points in the history of mankind. And we are staring at one right now. And it might be the most important one of all. If the urgency of the problem at hand is ignored our planet will die a quick yet painful death. Our generation might end up rendering this planet uninhabitable for any living species. And if corrective and constructive measures are taken to tackle Climate change' we might set an example for the future generations on how to sustainably develop our civilisation. The choice is ours.

'If not us, then who? If not now, then when?'

Author's Bio;

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Essay on Climate Change and Global Warming

By Ms. Sujatha Jagannathan

The city of Copenhagen intends to become the first carbon neutral capital city in the world by 2025 and is already on its way to reduce carbon emissions by 2015 to 20 per cent. The Danish government is already on its way to oxygenate the city by installing green rooftops making the green, the new black of the town. Carbon dioxide (CO_2) being the primary greenhouse gas emitted through human activities is one of the thorniest challenges facing the world today.

The world's biggest cities turn to sunshine, wind, water and waste to bolster energy grids to accommodate population growth and thrive without further accelerating the release of CO_2. Amid the hum of machinery and warm odor of putrefying autumn leaves, the French city's urban waste research development had quoted how three giant fermenters can convert household food waste, trimmings from parks and gardens and the slops from school and hospital canteens into enough methane gas so as to power about a third of the buses in the French city.

San Francisco, US, is the first city to make it a crime to not compost food and waste in city bins, in a bid to cut landfill use to zero. All new and renovated buildings are required to install solar panels to supply at least 60 per cent of the energy needed to heat water in Barcelona, Spain. More Londoners are riding buses and bicycles and congestion fee is being levied at high-traffic areas that have reduced traffic jams and carbon dioxide emissions. Distilling energy from the excrement of citizens, waste from restaurants and the mountains of unsold sandwiches left in supermarket refrigerators is one green way of Lille, France.

In all, it will require these pocket-sized different approaches to whittle down society's impact on the planet.

Now how can India spread her green wings with the World?

One, we must ensure that any political outcome fully endorses the principles and provisions of the UN Framework Convention on Climate Change (UNFCCC), in particular the principle of "common but differentiated responsibilities and respective capabilities". Stripped of its jargonistic flourishes, what this principle boils down to is the principle of equitable burden sharing.

Now those who are most responsible for climate change should bear the larger burden. Those who have greater economic capabilities should make a larger contribution. It is extremely important that this principle be reaffirmed.

Two, what happens on adaptation and technology will depend upon the availability of financial resources from developed countries. With the growing inflation of Dollars, if George Washington makes one facial expression, Gandhiji has to pull 70 expressions at once. The main beneficiaries of public funds are likely to be least to developed economies and small island developing states, rather than a feasible large economy like India. While these may muster as a stop-gap arrangement, the danger is much a diluted outcome for subsequent negotiations.

Three, an important feature of the UNFCCC is that there is a clear distinction drawn between developed countries on the one hand and developing countries on the other. This is not merely rhetorical. It has operational significance. It is on this basis that the germinated lands have offered to reduce the emission intensity by 20-25 per cent up to 2020 and not agree to legally binding emission reductions. The latter would amount to cap on the development.

However, some developed countries have been pressing for a single legal format in which obligations of both developed and developing countries should be reflected, much like the country schedules under the World Trade Organization. This will imply the setting aside of the Kyoto Protocol and its clear distinction between developed and developing countries. This will need to be resisted since climate change remains based on reciprocity and this will weaken the equitable burden sharing principle.

It is the climate change negotiators who have become less about fashioning a truly collaborative global response to a planetary challenge and more about safeguarding and promoting competitive economic interests.

Technology transfer to enable climate change action in developing countries is being resisted for fear of

improving the competitive edge of emerging country rivals. Tendencies for emanation can be reduced either by slowing down economic activity or by various technological steps for replacing fossil fuels by renewable sources, cutting waste of energy, recycling, and thereby increasing forest cover. Just one nation cannot make the mark as “One green foot print on the planet won’t make the whole Globe Green but definitely can be a blueprint for the world”. Now that’s a big if or can for greener pastures!

P.S. In a mission, with the help of very own Global Positioning System (GPS), archiving the third planet from the sun with the atomic number 8

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23

Climate Change is Real

By Mr. Nitesh Katoch

It's hot with temperature being recorded at 55°C. There is moisture in the air and we are losing every last drop of water through our skin. Look towards the heaven and there are clouds hovering upon our heads but it seems as if they'll take years to pour down. Most of the ice glaciers have added reservoirs of water, and there is much more water around us than we actually need but that too is used for wrong reasons and at wrong places.

My nature land, my mother earth dear!
Filled with thoughts of thee, this heart was proud.
But now my heart swims with tears
For all the trees, glen and green,
Have floated away, away like a departed dream.

I am not being a prophet of doom but only stating the stark reality. We are literally hot under the collar. Do you wish for this to happen? Neither you, nor do I want it, but changes in climatic conditions all over the planet, have paved the way, for this catastrophic reality.

Climate change is a long-term shift in the climate of a particular location, region or planet. The shift is measured by features associated with average such as temperature, precipitation and wind-patterns.

Before we proceed further, let me elucidate on the fact that global warming and climate change are two different terms that are often misunderstood and used inter-changeably. Global warming refers specifically to any change in global average surface temperature. The term global warming is still often used by media and others to describe climate change.

Now, let me take you behind the scene and delve deep into the factors causing such changes in climate

green- houses grass such as Carbon Dioxide, Methane, Nitrous Oxides, Chloro-Fluoro Carbons, Ozone, etc. are responsible for a rise in temperature. These gases are released into the atmosphere by various natural and human activities such as burning of fossil fuel, volcanism, cement manufacture etc. These processes also release a large amount of aerosols responsible for the changes in climate. The abrupt changes brought about by the man in the land – use pattern have also contributed to a great extent in this havoc. Another cause of climate change could be variation in ocean currents that can alter the distribution of temperature and precipitation.

These changes in climate are cataclysmic. There is a rise in carbon –dioxide levels. 379 parts per million is the present concentration of carbon-dioxide in atmosphere, highest in six lakh fifty thousand years! This has caused the average surface temperature of earth to rise by about 0.6°C in the past century. Oceans are warming up at about 0.05°C. Glaciers are melting at a very fast rate. The Gangotari glaciers, the Arctic ice, the Antarctic ice, all are continuously receding. And due to all this reason, the sea level is continuously rising which is expected to be 40 cm higher by 2100. This would erode the coast lines and would submerge the coastal areas. Mumbai, Kolkata and Chennai would be under water by 2050. The virtual drying up of Sub-Saharan Africa and a sudden increase in the precipitation in the former Soviet Union Nations is also a result of this climatic change. Diseases like dengue and malaria are expected to be on the rise as changes in temperature make it conducive for mosquitoes to thrive. Nearly 50% of India's total biodiversity is at risk with 25% of the flora and fauna, facing threats of extinction. Ice sheets are collapsing and mountain streams are running dry! Winter is losing its bite! Droughts are frequent and widespread. Thawing permafrost has caused the ground to subside by more than 15 feet as in some parts of Alaska. Floods are frequent, there is saline invasion and due to all these factors what results is a total crop wipe out.

Protect, Preserve, love mother earth more
Mingle with the universe and let the sublime spirit soar.

There is no time to waste. Apocalypse stares us in the face, as Al Gore, a tireless champion for action on global warming says: "This is our only home and that is at stake, our ability to live on planet earth, to have a future civilization."

Stop green house gas emission, increase efficiency in power generation, popularize alternative sources of energy such as wind and solar power, and conserve water. There is a lot that each one of us can do. Halt! Hear the voice of mother earth, but before that try listening to the voice of your conscience.

GHG -Greenhouse gases

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Renewable Energy Scenario In India

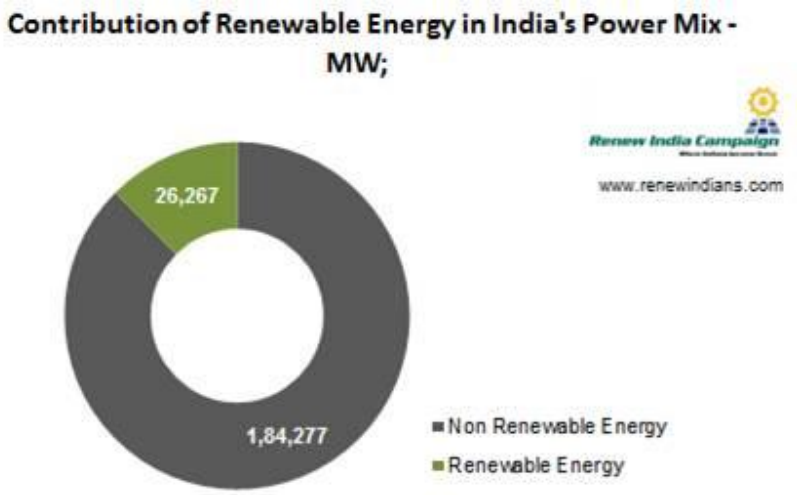
By Mr. Gaurav Pant

A country's economic progress majorly depends upon its energy resources. Highly developed countries like the USA and China have a high energy consumption rate compared to other developing nations of the world. It has been reported that India's absolute primary energy consumption is only 1/29th of that of the world, 1/7th of USA and 1/1.6 time of Japan. However, with the increasing danger posed by pollution, there is an urgent need to shun the excessive use of pollution releasing conventional sources of energy and switch over to environment friendly options like the renewable energy resources.

Renewable energy is the energy that comes from replenishable energy sources such as sunlight, wind, etc. There is a large potential for renewable energy in India. It has been estimated that India's renewable energy production amounts to a total of over 100,000 MW. There is a fully dedicated ministry of New and Renewable Energy, assisted by a number of state nodal agencies that work to enhance India's position in the area of use of renewable energy sources. The ministry works in coordination with various NGOs and village development societies to outstretch the renewable energy programmes to every corner of the country. Moreover there is a separate agency named Indian Renewable Energy Development Agency Limited (IREDA) which works to provide term loans for various renewable energy projects.

Today India has become one of the world leaders in terms of its extensive renewable energy programmes. Various renewable energy schemes have been introduced that covers different energy resources like

the biomass, solar energy, wind energy, hydropower and other emerging technologies. The annual turnover of the Indian renewable energy industry is estimated to be about US $ 10Billion. Much emphasis is being put on to enhance the efficiency of these energy programmes and reduce their investment cost. Power generation using the renewable energy sources has increased by leaps compared to the last decade. India is one of the countries with highest total installed wind power capacity. Wind power alone contributes to a massive 68% of the entire country's renewable power energy production programme. With the success of the Jawahar Lal Nehru Solar Mission, India today stands as a world leader in the decentralized solar energy projects. There are about 300 clear sunny days in a year in most parts of India. This is equal to over 5,000 trillion kWh/year of the solar power. India also stands second most successful country in terms biogas and improved stove programme. The current availability of biomass in India is estimated at about 120-150 million MT/annum. The India made Biomass Gasifier is now being exported not only to developing countries of Asia and Latin America but also to Europe and USA. The Indian Photo voltaic industry has been growing at an average rate of about 25%. Apart from serving the country's economic progress the renewable energy programmes have helped a number of rural folks by meeting their cooking and other energy requirements. India has also started to provide technical expertise to other countries for promotion of renewable energy sources.



Source: www.renewindians.com

Of late the Ministry of New And Renewable Energy is working to replace subsidy-driven programmes with commercialization of various technologies. Emphasis has been put on to increase the efficiency of renewable technologies. Concessional taxes and duties, along with soft loans, have been introduced to encourage these enterprises. The central ministry has also directed the states to create an easy and attractive passage for the purchase of renewable energy technologies. Some states are even providing exemption in the state tax in

order to promote renewable resources. Financial aid is being provided to educational institutes and industries taking up research projects in the area of renewable energy. Foreign sectors are too allowed to form a joint venture with their Indian counterparts for setting up renewable energy based projects. It has been declared that there would be a deduction in custom and excise duty in the import of renewable energy parts or equipment needed for modernization and renovation of the power plants. There is aprovision to provide infrastructure facilities like roads, rivers, cranes and power for the construction of renewable energy projects.

Indian cities have long started realizing the importance of renewable energy sources and efficient technologies. However, there is still a need to introduce effective implementation of the renewable energy programmes at the village levels. In order to accelerate the development of renewable energy programmes, village panchayats and NGOs should organize awareness raising and training seminars. Workshops conducted by the Thane Municipal Corporation in order to promote the use of solar water heating system are praiseworthy in this regard. The 'Energy Conservation Building Code 2006' issued by the government of India provides minimum requirements for energy friendly infrastructure designs. These codes are being extensively used as a criterion for approval of new buildings. Several states have announced guidelines measures pertaining to allotment of land, garbage supply, sale and purchase of power to encourage setting up of waste to energy plants. There has been a growing research on effective implementation of hydrogen and fuel cell technologies. Further the National Geophysical Research Institute, Hyderabad has been involved to conduct study in Satluj-Spiti,Beas and Parbati valley in Himanchal Pradesh and Surajkund in Jharkhand about the effective harnessing of geothermal energy.

India has been ranked fourth most attractive country for investment in renewable energy field by the reputed Ernst and Young magazine. With increasing focus on renewable projects, the renewable energy market is expected to grow significantly. Some of the programmes like the National Solar Mission, National Mission for Enhancement Energy Efficiency, National Mission for Sustainable Habitat, National Water Mission have been widely successful to promote renewable energy technologies in the country. A number of steps are being taken to improve the reliability and quality of renewable energy projects. Renewable energy applications have brought about significant changes in the Indian energy scenario. Apart from power generation programmes, the application of these technologies has significantly helped to reduce the increasing environmental pollution. With the continuing enthusiasm there is no power that can bar India to become the world leader in the area of renewable energy in the coming years.

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Essay on Livelihood

By Ms. Stuti Tiwari

Nature is the birth giver to all living beings existing on earth. Though we are living in an age of cyborgs, we cannot detach ourselves from the environment we live in. Livelihood refers to the means and sources of living which we use in our everyday life. Man, like other natural creatures is born out of natural things and is a natural component. Then why is he living an artificial life today? I would like to examine this question in context of our country INDIA.

"If there is a country on earth which can justly claim the honour of having been the cradle of human race or at least the scene of primitive civilization, the successive developments of which carried into all the parts of the world and even beyond, the blessings of knowledge which is the second life of man, that country is assuredly India" -Friedrich Creuzer

Today, we see that most people criticize the tradition and culture of our country. New generation of India is following the western world without knowing the significance and scientific relevance of our own tradition.

Traditions are knowledge in practice. But today the knowledge in tradition is lost. I think the most possible way to regain the lost treasure is to connect our livelihood with the nature, lead a simple and natural life. The menace of solid waste management in urban areas, over use and rapid encroachment of natural land, excessive use of non-biodegradable substances and etc are evident to prove our honing civilization.

Now I would like to illustrate with examples the livelihood of ancient people of our country who lived in a traditional society which never harmed the environment and the natural ecosystem. Their closeness to nature can be determined in these ways:

A 'Rangoli' in front of the house ensures cleaning the house and provides feed for insects like ants.

The use of panchgavya, agnihotra, turmeric, copper vessel presents the underlying science behind some of these traditions .These traditions have great relevance even today. The United States Patent and Trade Office has granted patent for an Indian Innovation, which has proved that cow's urine can make antibiotics, anti-fungal agents and also anticancer drugs more effective.

Turmeric is used for both treatment and prevention of Alzheimer. In ancient days, use of well water and storage of water in copper and brass container were common. Microbes are destroyed through the heat and radiation provided by the sun. It is one of the traditional ideas of water treatment in this part of the world. The key element is copper which acts by interfering with the membranes and enzymes of cells, eventually killing the bacteria. But today we see that waterborne diseases remain a major cause of illness and death in developing countries.

If we look into Life Sciences we find that Indian knowledge system is the relevance of fundamental ideas across sciences. In Tarka(logic), Mimamsa(hermeneutics)and Vedanta(philosophy)sciences the five senses of perception are applied in identifying and grading the elements of nature. They are space, wind, fire, water and earth.

In Susruta-samhita, Sutra-sthanam, Adhyayaahs, and Paragraph 29 (6th century BCE) the four-fold Flora are given. They are Vanaspati(the large trees), Vriksha(trees), Virudha(herbs), Oshadhi(medicinal plants).

In the West it is only in 1735, that Carolous Linnaeus classified plants in his book 'Systema Naturae'.

In Mahabharatam, Santi-parva,Chapter 184, which was written in 3000BCE it is clearly mentioned that 'just as one draws water up by the mouth and lotus stalk, plant endowed with air, drinks (water)with their feet, by the exhibition of diseases, by the reaction to diseases,(sense of) taste exists in trees.

In medicine, the teachers to whom we owe the survival of the ancient knowledge, Charaka, Sushruta and Vagbhata wrote on each and every aspect of anatomy, embryology, Obstetrics, Surgery, bloodletting, elimination therapy, Pharmacology, Cardiology, Dermatology, Autopsy,Orthopaedics and etc.

Other than this there are several ancient texts which acknowledge us with Mathematics, Physics, Astronomy, Civil engineering, Metallurgy, Chemistry and many other fields. They teach us to lead a Natural life which is never in contrast with environment.

Effects of man's activities in the fields of agriculture, mining, industry, search for material prosperity has degraded the environment to such an extent that it is becoming difficult to regain our natural wealth. It is only through naturalizing our livelihood we can serve our mother earth. People should peep into the ancient texts of India in order to learn the symbiotic relationship of ancient man with nature.

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Future Forests — Mesmerizing Or Shattering!

By Ms. Anpu Mary Zachariah

So you were bored with a paper and pen in your hand and what do you find yourself doing. The very next minute you are drawing trees on that paper. Isn't that ironic? India's paper industries are axing down hundreds of trees and other hundreds will soon meet the same fate. India's paper industry produces over 2000 metric tonnes yearly from more than 300 mills. Fast growing hybrid eucalyptus trees lend a hand in paper making. Measures to grow more of these trees must be made consequently saving the forest.

As toddlers we remember reciting E for elephant when we learned our alphabets. Shortly that will swap to E for endangered. The Indian elephant, Bengal tiger, Asiatic lion, lion tailed macaque and Indian rhino are the few amongst the stretched out list of dying out animals. Hollywood actor Leonardo Dicaprio's foundation promises 3 million dollars for tiger conservation in Nepal. Doesn't that make you wonder what the big personalities in India are doing. The chandaka elephant sanctuary in Bhubaneswar is constructing barriers around the forest to secure and shelter the elephants within the province. If all the elephant sanctuaries had taken small steps like this to conserve elephants these gentle giants would have never been on the dying out list.The mouse deer is also known as the Indian Chevrotain is a petite creature with an introvert nature. With the startling drop off of this speckled organism, the forest department is breeding it in the captivity at Nehru Zoological Park. Small acts like this can erase these animals from the endangered lists.

Each of us are silenced when we catch sight of the beauty and grace of the migratory birds. Their blissful

configuration across the blue makes us in stand in awe. This year the authorities of Point Calimere sanctuary on Vedaranyam coast took wide-spread measures to shield these winged guests following a steady decline in their number. We are to be blamed for not being good hosts for these visitors.

It is indeed alarming to know that India is the world's largest consumer of fuel wood. Rural places of India are consuming the most. Astonishingly many rural places of India still does not have electricity. If electricity is made available to these areas then the fuel wood consumption will reduce to half. This is the 21st century with high decibel entertainment and high calorie food yet the rural areas are still in the dark. Feeling a twinge of guilt?

Forest fire prone areas should be kept under continual watch and new technologies to sense and detect the fire in a forest should be developed. The Government is considering setting up of a National Institute of Forest Fire Management with satellite centres in different parts of India to bring the latest forest fire fighting technologies to India. But it is only being considered . It is not put to action. The word of lip is always there but works of the hand is not seen.

The next time you forget to apply your sunscreen or to take your umbrella should not be the only time you think about the trees or forests. It should always be on your mind like a mantra. Many of us are not aware of the fact that the word Jungle is adopted into English by seeing the wilderness of India.Let's leave the world drooping when they see the rich stunning forest of India.Miracles don't just happen we have to make them happen. So let today be a start.

Author's Bio;

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Breathe Free

By Ms. Anpu Mary Zachariah

"The conservation of natural resources is the fundamental problem. Unless we solve that problem, it will avail us little to solve all others." – **Theodore Roosevelt**

Humming and enjoying one of our favourite songs when our tour bus took a sharp turn and proceeded further. The bumpy road reminded me of the route to my granny's village. I peeped outside the window to have a look; I saw the dark lane ahead with huts on side of the street. Pity, I saw a girl reading a book in dim light of the lantern. That view touched my heart. The funds from government are reaching the rural areas but at a snail's pace.

Life on earth is depended on natural resources. Vast majority of natural resources are exhaustible and hence the need for its management. Fresh water is likely to become scarce in the next 100 yrs.

Conserving of natural resources is of utmost importance as its degradation is making the eco system unstable. Mere speeches and themes on WED – World Environment Day cannot help the remote villages. The core hard work has to begin in rural India. From roots to leaves.

When I get water in my tap once a week, I can imagine the plight of the remote villages where people walk more than 5 km to fetch water. People are not willing to get their daughters married in villages where there is scarcity of water. Farmers depend mostly on rain from sowing the seeds to yielding the product. Deficient rain plays a spoil sport and wreaks havoc in the farmer's life. Unable to pay back the debt they commit suicide. Farmer's suicide rate in India is to a steep rise.

Three R's Reduce, Reuse and Recycle constitute the management of natural resources.

Natural resources were abundant. As the population started growing, degradation of Natural resources began. Over population has given rise to water crisis. Educating the people about rain water harvesting will be effective in the near future. Each individual is equally responsible. Every drop of water makes a mighty ocean.

1. **Reduce -** Taking a shower bath increases usage of water. To reduce usage of water, use a bucket filled with water.
2. **Reuse –** Wash vegetables/fruits in a bowl containing water. This water can be reused for watering the plants or washing vessels.
3. **Recycle -** Sewage water is treated to remove impurities and it is used in industrial cooling and toilet flushing.

Industries should come forward, lend their hand by adopting a remote village and helping them to see a never seen before sunrise. The natural resources like sunlight and wind can be used to generate electricity. Wind mills exist where there is no obstruction, like fields and oceans. Our villages should have wind mills and the electricity generated can be used to pump water to the crops.

Forest maintains the balance of oxygen and carbon-di-oxide. Deforestation in the name of human habitat and industrialization has been a cause of worry. Afforestation has to be the word of the nation.

1. **Reduce -** Print if and only if necessary and use both sides of paper.
2. **Reuse -** Buy recycled paper for your printer. Share/borrow books it saves money and paper.
3. **Recycle –** Waste paper is turned into new paper.
4. **Plant more trees-** Go-green, eco-green.

Minerals are finite and non-renewable. Extraction of minerals from earth's crust is resulting in imbalance of ecology. The byproducts during extraction go wasted and are dumped on land or in water which causes the environment to become polluted.

1. **Reduce-** Extraction has to be done but in moderation. Of course! When People Put the Environment First, Development Will Last.
2. **Reuse -** Mining byproducts can be reused as fuel for power plants and in construction material.
3. **Recycle –** Reduces the usage of fresh raw material.

The exhaust from automobiles is harmful for the environment. Human beings inhale the polluted air. If we want our kids to enjoy a long car drive in fresh and cool breeze then we have to save petrol today. Every drop is precious. Use carpooling and public transportation, it reduces traffic congestions. Imagine 12 cars occupying space, compared to that of a bus.

Walking and cycling is the beauty of life and a way to sound health. It reduces carbon foot prints.

1. To reduce the power consumption at home/office – Unplug/Switch-off the appliances when not in use.
2. Use compact fluorescent light (CFL) bulbs.
3. Solar powered lights – to reduce the consumption of electricity.
4. E-waste management – recycle electronic goods rather than dumping.

If the natural resources are not managed properly the day is not too far when my grand kid might ask me, granny what is the colour of water? Off white or pale yellow.

Act before it is too late.

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Oh My God-The Climate Change!!

By Ms. Diksha Dhyani Kala

June 2013, there was an abrupt change in weather. An unexpected pre monsoon had hit the Northern parts of India giving relief from the scorching heat. It turned from hot to humid and everybody enjoyed the first splashes of rain. It was a typical *chai pakora* time! The fragrance of mud after the first rain, the fresh green colour of leaves, the moisture in the skin, frogs and toads on the roads and off course a happy heart within that kept on saying thank you god.

As they say, if good things come to your door unexpectedly then you should be prepared for the bad ones too. But who cares for the sayings*…Unless one experience it.*The unexpected rain that started in the second week of June didn't stop for next 4-5 days. Now it was not drizzling it was pouring cats and dogs! The excess water was no way under control and was causing hindrances in performing day to day activities.

After the hot dry months there was water all around but it was so much in excess that people specially the farmers were panicked. Finally the week long rain paused with the worst climatic disaster that nobody expected.

The Cloud Burst in Kedarnath- and from thank you god the statement changed to Oh My God!

One of the four Dhams of North, the Kedarnath Dham was completely wrecked! The plight was so miserable that a number of villages in its vicinity completely disappeared. There was no sign of people who once lived in the area. Those who survived luckily or unluckily were almost dead as they lost their homes, their livelihood and most precious, their family members. The symbol of life i.e. water proved out to be demise for them. There was hue and cry all around. The people from plains who went there in summer vacations were

regretting their decision. The beauty of Himalayas that mesmerised the world became a cause of suffering for many.

This episode of nature's calamity once again raised the question, Nature or Science who's the head master? Nature has gifted us all the beautiful and natural things in the world. The ice clad mountains, the dessert, the rivers, the deep seas, the oceans, the islands, the continents, the hot water springs, the sky, the rainbow, the dew drops, air to breathe and off course the living beings are all blessings of nature. Science, no doubt has helped us to unravel the secrets of nature and has also helped us to develop a logical and reasonable approach in our lives. Science gifted us the theories and laws and based on these theories and laws we can see latest technologies, improved commutation, flyovers, bridges, dams, strong buildings and what not. Our dependency on science has made us too insensitive towards nature. We see the future of our country in engineers, doctors, journalists, charted accountants and even BPO professionals but are always unsure with respect to environmentalists. The cloud burst in Kedarnath is a live and sad example in this context.

There are vast geographical differences around the world. Owing to the geographical differences the mountains of The Northern India are too fragile for any solid construction. The construction of dams (like Tehri Dam) in such areas has definitely solved the problem of electricity crises but equally raised the issue of disturbance of nature's equilibrium. Further, due to rain and transportation via heavy vehicles on the fragile roads of Himalayas leads to destruction of the roads every year. In order to rearrange the roads cutting of mountains is a regular practice. Deforestation is an additional problem. Kedarnath is not just one example, there are many. The mountains that are already gifted to us in its weak form by Mother Nature, human is trying to weaken it further by applying his theories and laws. I doubt, how practical, scientific and reasonable is it?

Ignorance can be harmful. We always need the blessings of the almighty. It has the power to create and to destroy. Let us not be too practical to apply science everywhere without thinking of its consequences. We have enough reasons to be happy and we owe a lot to The Mother Nature. So, our acts should be worthy enough to say *Thank You God instead of Oh My God.*

Author's Bio

Diksha Dhyani Kala hails from Dehradun , Uttarakhand . She is very close to nature and is very sensitive to environmental issues. Working as a Chemical Analyst in Geological Survey of India, she believes that vigilance towards environment can help us to maintain it. She hopes that world will be green and clean one day.

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Why should we care about Global Warming?

By Ms. Sanjana Deshpande.

After hearing the term 'Environment' what are the things that strike our mind? Stuff about trees, water, biotic factors, our surroundings, etc. roam in our brains. But do we find our current environment as green as its definition is in reality? The answer is negative. This dream environment existed in primordial time. The literal meaning of the word environment is the thing which surrounds an item. Now-a-days, we find our surroundings in a very pitiable state. The word pollution which was unfamiliar decades ago came into fame. Air pollution, Water pollution, Noise pollution, etc. are some proverbial enemies of our dear environment. Mother Nature has provided us with all our necessities. The services which could once only be dreamt are now available in reality. Mother Nature has granted all the wishes of the human race.

But have we protected our environment? No, we haven't. We have carelessly utilized the resources of our nature .This has led to the devastation of environment. The destruction of nature has given rise to the universal crisis named 'Global Warming'. This term is probably familiar to everyone. We have seen organizations working at various levels to bring down the intensity of Global Warming. But what is this Global Warming? Global Warming is the increase in temperature on the earth's surface due to the greenhouse gas emission. There are innumerable causes of this catastrophe. Some of them are deforestation, Greenhouse gas emission, overuse of fuels, etc. The effects of Global warming are deadlier than our imagination. Global Warming is the root cause of many diseases. Some of these diseases are incurable. The effects of Global Warming prove to

be destruction to the human race. The most hazardous effect of Global Warming is increase in world temperature. The weather in summer season is extreme arid. Temperatures touch to 40`C. The highest temperature ever recorded is 57`C in Death Valley. Another major effect of this global crisis is rise in sea-level. This could result in flooding in low-lying areas. Some tiny island might even vanish completely! One more major problem is change in weather pattern. Many countries experience rainfall at unexpected times. Natural calamities such as hurricanes, storms, floods, etc. are now a routine to people residing in disaster prone areas. The aquatic life is endangered due to change in the temperature of oceanic waters. Chemical industries which release dangerous gases such as CFC, CO2, CO mix up with the atmosphere. This causes the depletion of ozone layer. Greenhouse gases mix up with the rain clouds which give rise to acidic rains. Today, innumerable trees are lying lifeless due to acidic rain. Fire-Brigade personnels control the flumes of fire. Trees perform the same task by lowering the risk of Global Warming. Today hardly 30% of the earth's surface is covered by trees which is an alarm to the residents of the earth.

There are innumerable effects of Global Warming to discuss. But has anyone ever thought of putting a full-stop to these problems? The issue of environment destruction is a famous topic of elders for chit-chatting. But has anyone of them taken up the responsibility to stop this universal crisis? 'Everybody' thinks that 'Somebody' would do this task but in the end 'Nobody' does what 'Anybody' could have done. If we wait for everybody, we wouldn't succeed in our task. We must take up the task of reducing Global Warming with simple precautions. At present we can see many vehicles running on the streets. Have you ever thought about the release of harmful gases by these vehicles? We certainly don't think of such issues. But this is a very serious issue. We can't stop travelling by vehicles but certainly we can opt for CNG as an alternative to petrol and diesel. If we travel by public transport, we can save litres of petrol and also the pollution occurring due to emission of carbon-monoxide. Tree plantation is the key to save our nature. Trees absorb the atmospheric CO2 and convert it into oxygen which is not a greenhouse gas. If every individual plants a tree per year, the population of the trees on the earth would certainly rise up. Burning of fossil fuel leads to greenhouse gas emission. Another solution of this difficult 'Equation' is by using less energy and recycling more products. The solution has numerous benefits.

Lastly, I would conclude by saying that if we put efforts to stop the Global Warming, the following generations wouldn't be familiar with this term only! We are a part of nature and not apart from it. We must take pledge to ourselves to save our dearest Mother Nature who has always cared us like her progeny. If we try to destroy nature, we'll have to suffer double the destruction. Nature's debt is un-repayable.

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Environmentally Toxic Chemicals

By Ms. Rajeshwari Barikar

A withered tendril lily was struggling to grow at a filthy land as it was surrounded by heaps of garbage. Domestic animals having a feast at the food thrown in packed plastic covers. Plastic might get clogged in their intestines. Imagine plastic is not good outside then how bad will it be for the body? Garbage dumped in every nook and corner of the city in the name of keeping the interiors clean. My earth will be more polluted tomorrow than today. The sorry state of the environment is crystal clear.

When I consider buying an apple today I cannot be assured of what chemicals will be going in my body which has been sprinkled on it for its freshness to last long. Pesticides in the name of medicines are sprinkled on plants in order to avoid or kill pests and for better yields. From sowing seed to bearing the fruits and reaching the end user as fresh as it was ripened yesterday, list of the chemicals sprinkled on it is endless. But I am still not assured that it does not cause any side effects to my health.

Toxic substances are classified as naturally existing and manmade. Many products which we use at home like paints and pesticides can have manmade toxic substances in it, which are harmful to health. It can cause serious health issues like skin irritation and can affect any organ in the body.

Large amount of waste products (chemicals) are found near industries which in turn gets merged with water and pollute land and water resources. Ground water is polluted by the toxic chemicals from landfills, causing withered growth of plants to serious health issues like damaging of the liver and birth deformity in

living beings. The waste products from industries/hospitals are dumped near rivers banks affecting the aquatic life, which in turn creates devastation for the ecology.

Burning of plastic releases toxic chemicals in air which is harmful for living beings and exhaust from automobiles makes the air polluted. Because of heavily polluted air, acid rain occurs. The droplets are acidic in nature and it affects fertile land, plants and aquatic life. Acid rain can destroy the infrastructure like bridges and ancient monuments. Developed countries wrap the ancient statues with water proof material during acid rains, in order to preserve the art.

Nuclear power plants are not viable to the environment. Nuclear disaster's like Chernobyl and Fukushima Daiichi can spell dooms days for the environment. Keeping the ecology in mind such projects should be discussed worldwide before giving a clearance. Bhopal gas tragedy is just one of the cases worldwide where the after effects are seen even today like disfigured or still born babies. The plight of the deteriorating health of a dear one is unimaginable; just imagine how devastating the deteriorating health of mother earth would be.

1. Cycling to work is good for health and above all keeps the ecology smiling.
2. Say no to plastic and plant more trees.
3. There should be a detailed plan in industries and hospitals to reduce, reuse and recycle the waste products.
4. Proper Disposal of batteries and electronic circuit boards is of utmost importance as it has high amount of chemicals in it.

Soft grass with dew touching your feet as you stroll in your garden, with clean air being the delight for the lungs is every human beings dream, isn't it yours ?

So strive for a toxic free environment.

Author's Bio;

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It only takes a seed to get started

By Mr. P. Rajesh Ponnappa

India may be the 7th largest country in the world but accounts for only about 2% of the total land mass and is home to 17% of the world population. This bludgeoning population exerts tremendous amount of pressure on our environment and is only getting worse day by day. Hence, there is an urgent need for us to step out of our comfort zone and change our livelihood for a better future.

I remember being taught in schools about the important role trees play in our lives and in the surrounding ecology where their presence is too large to be sidelined. These things had created a strong impression in mind and I was determined to do my part in a city where rapid unplanned urbanization had led to felling of trees, clogged drains, contaminated drinking water, polluted atmosphere etc. which are a part and parcel of every city these days in India. So at the tender age of 9, I had already decided to make a small change by having insisted on planting an Avocado tree in our house and ours was the only house in my street to showcase its very own tree. Having planted a tree with the help of my brother had made me more responsible towards it and taking care of it was a game with all the help I could ever get.

Classes in school further taught me how life in India was eco-friendly and nothing would be wasted as every aspect would have been reused to its fullest before being recycled until urbanization kicked in and changed our lifestyle with plastic instead of fiber or paper, chemical fertilizers instead of organic farming, use and throw instead of reuse and so on. Most of today's problems could be resolved with planning and afforestation if everyone gets involved. Me telling elders to change wouldn't go

on very well as they feel it's the way of life. However, I was determined with my resolve and stuck to nurturing my sapling which was growing rapidly becoming a tree day by day until one day after coming back from school, I found that all its branches were cut down and in its place was a bare naked log of wood with only a few leaves to be spared and the top crown. This did not go down well with me and I vehemently protested against the ruthless cutting down of the branches. This was something that I could not take lightly for it was like a family member for me at the house. I did not repent for long and nurtured it back and waited for the tree to grow back as was told.

Today, it is still the only concrete structure in my street to house a tree as it did grow back and is now continuously provides a shelter to squirrels and beehives. My zeal in standing with the tree did not go in waste as it provides us an opportunity to not just me but the neighborhood to enjoy the avocados every year. This one tree showed us how we are still capable of nurturing greenery at our door step with love and care as good as nurturing a pet animal. The other thing that I have learnt is that for humans to become more responsible it is very necessary for a thought to be embedded in our mind right from a young age. If just like me, there was a kid who was given a chance to nurture a plant right from the beginning at every household or in school, that kid would not only strive for greenery later in life but would also become more caring, responsible and also GREEN at heart. For humanity to change its livelihood, we have to start from the roots where every child learns his or her role towards planet Earth and all this takes is a seed to get started.

Author's Bio-

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