Environmental Pollution & Control

Environmental Problems & Challenges: the way forward

VIDEO
https://www.youtube.com/watch?v=V6u3e59tVnA
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Introduction (at 2.05 minute)

This is our home; it looks the same as it has done for thousands of years. But if you get a bit closer, you can see we have made a few changes. We have transformed the planet by exploiting the complex system that produced us. Our ability to control our habitat has resulted in rapid population growth and our dominance as a species. Today our effects can be seen across 80% of the Earth’s landmass. Our world is becoming a manmade world. Wherever you look, you can see the scale of this supersize transformation. Our generation is changing the face of the planet as never before, building faster than ever, transforming whole landscapes in the blink of an eye; we are opening up the Earth and conquering the sky, making it a place we can call home. Our ingenuity and ambition have enabled us to move around the planet in previously unimaginable ways. We can travel further and faster than at any other point in human history. We connected the far end edges of our world and made travelling easier than ever before. The oceans are now bustling highways filled with thousands of ships carrying cargo across the globe. These new connections have helped create our modern world. Our machines have transformed the planet. So great is our impact on the Earth that it has been used to define a new geological Epoch, the Anthropocene; the human epoch. If you add together all the landscapes we have altered, our cities, towns, villages and farmland; then 75% of the Earth’s landmass owes its appearance to us. This truly is a human planet.

Anthropocene (at 5.05 minute)

Our society is almost unrecognisable in almost every dimension from what it was like 100 years ago.

“There they are the men in the laboratory; experimenting, testing, discovering. The scientist creates these products with petroleum or natural gas. By shifting and rearranging the molecular structure he creates new materials, replaces old and scarce materials, and finds useful substances never before known to exist. It’s all based on the sound of scientific reasoning, on formulas and more formulas. It may seem somewhat confusing but here let’s eavesdrop on a private discourse in a laboratory...”
Shell advertisement (1949)

Well it’s not so important that you know how these things are done. What is important is that you know the story of the pioneer drillers who sought a new and more abundant source for lamb oil and found a far more valuable substance. A substance destined to be of tremendous importance; as a servant in the home, a hired hand on the farm, a tireless worker in plant and factory and as a means of providing the world with a new freedom of movement. Yes, it’s important too that one of the principle assignments of the petroleum scientist is the constant development of new and better products to make your car and mine run smoother, more safely and more economically. Who knows what even greater achievements lie ahead in the incredible world of petroleum?

Our story (at 8.30 minute)

After 180,000 nomadic years and thanks to a more moderate climate, humans settled down. They no longer depended on hunting for survival. They chose to live in wet environments that are abundant in fish, water and plants. There, where land, water and life combine. The invention of agriculture turned our history on end. It was less than 10,000 years ago. Agriculture was our first great revolution. It resulted in the first surpluses and gave birth to cities and civilisations. The memory of thousands of years scrabbling for food faded. Having maintained the yeast of life, we multiplied the number of varieties and learned to adapt them to our soils and climates.

We are like every species on Earth; our principal daily concern is to feed ourselves. When the soil is less than generous and the water becomes scarce; we are able to employ efforts to extract from the land enough to live on. But after relying on muscle power for so long, humankind found a way to tap into the energy buried deep in the Earth.

In a period of hundreds of millions of years, with enormous pressure and heat, the Earth formed petroleum from decayed living matter. And in less than 150 years, by many estimates we have depleted the planet of half of its oil. We have extracted roughly 1 trillion barrels of oil since the late 19th century.

America is the first to harness the phenomenal revolutionary power of “black gold”. In the fields machines replaced men. A litre of oil generates as much energy as 100 pairs of hands in 24 hours. In the USA only 3 million farmers are left; they produce enough grain to feed 2 billion people. But most of that grain is not used to feed people, here and in all other industrialised nations, it’s transformed into livestock feed or biofuels. The pocket of sunshine’s energy chased away the spectre of drought that stalked farmland. No spring escapes the demands of agriculture which accounts for 70% of humanity’s water consumption.

In nature everything is linked. The expansion of cultivated land and single-crop farming encouraged the development of parasites. Pesticides, another gift of the petrochemical revolution, exterminated them. Bad harvests and famine became a distant memory. The biggest headache now was what to do with the surpluses engendered by modern agriculture. But toxic pesticides soaked into the air, soil, land, animals, rivers and oceans; they penetrated the heart of cells similar to the mother cell,
which is shared by all forms of life. Are they harmful to the humans that they released from hunger? These farmers in their yellow protected suits probably have a good idea.

Then came fertilisers, another petrochemical discovery. They produced unprecedented results on plots of land thus far ignored. Crops adapted to soils and climates gave way to the most productive varieties and are easiest to transport. So in the last century ¾ of the varieties developed by farmers over thousands of years have been wiped out. As far as the eye can see, fertilised below, plastic on top. The greenhouses of Almeria in Spain are Europe’s vegetable garden. A city of uniformly sized vegetables waits everyday for the hundreds of trucks that will take them to the continent supermarkets.

**Other related problems** (at 14.37 minute)

**Aral Sea**

Aral Sea was at one time the fourth largest lake in the world but the diversion of water from the rivers for cotton irrigation has caused it to dry up. Irrigation has resulted in the loss of approximately 900 cubic kilometres of the Aral Sea. By the 1980s water feeding into the Aral sea had become so scarce, that the sea was evaporating away. The sea’s water level dropped more than 50 feet by 1989. After the breakup of the Soviet Union, regional governments tried to conserve water and forestall the demise of the sea, but their efforts were poorly coordinated and so by 2000 the sea level declined by a total of 125 feet. The shoreline narrowed considerably; the sea divided first into smaller pools, then narrower lakes; the Northern Aral Sea and the Southern Aral Sea. They were over three times as salty as the original one. Fish and other life died off, isolated islands on the sea that were once secured sites for soviet-German war tests, became vulnerable to land access as water evaporated away. Salt and industrial chemicals, once dissolved in the water, were carried as dust in the land causing disease.

**Soil depletion** (at 15.55 minute)

Soil is a mixture of minerals from broken-down rocks and nutrients from organic matter. It takes more than 500 years to create just 2 cm of it. In China, deforestation and overgrazing, means soils are being degraded 30 times faster than the planet’s natural processes can replenish them. In Australia, clearing large areas of bush from farmland has allowed salt to infiltrate the topsoil damaging around 60,000 km².

In some parts of Madagascar the erosion is spectacular; whole hillsides bear deep gashes hundreds of meters wide. Thin and fragile soil is made by living matter, with erosion, the fine layer which took thousands of years to form disappears.

On the hills of Haiti only 2% of the forests are left; nothing holds the soils back, the rainwater washes them down the hillsides as far as the sea, and what’s left is increasingly unsuitable for agriculture. Once the pearl of the Caribbean, Haiti cannot feed its population without foreign aid. Charcoal is one of the population’s main consumables; over two billion people, almost a third of the world’s populations still depend on charcoal. Deforestation is the last resort to survive.
In total 25% of the world’s farmland has now been degraded as an inadvertent consequence of our drive to increase food production.

The more a country develops; the more meat its inhabitants consume. Faster and faster, like the lifecycle of livestock which we may never see. Manufacturing meat faster than an animal has become a daily routine and in the areas with cattle not a blade of grass grows. A fleet of trucks from every corner of the country brings in tons of grain, soya milk and protein rich granules that will become tons of meat. The result is that it takes 100 litres of water to produce 1 kg of potatoes, 4,000 litres for 1 kg of rice and 13,000 litres for 1 kg of beef.

We have forgotten that resources are scarce. 500 million humans live in the world’s desert lands - more than the combined population of Europe. They know the value of water, they know how to use it sparingly; here they depend on wells replenished by fossil water, which accumulated underground in the days when it rained on these deserts 25,000 years ago. Fossil water also enables crops to be grown in the desert to provide food for local populations. The field’s circular shape derives from the pipes that irrigate them around a central pivot. But there is a heavy price to pay; fossil water is a non-renewable resource. In Saudi Arabia the dream of industrial farming in the desert has faded, as if on a map the light spots show abandoned plots, the irrigation equipment is still there, the energy to pump water that also. But the fossil water reserves are severely depleted.

**Colorado River** (at 23.30 minute)

This is part of the Colorado River system. Along its 2,000 kilometre length, it has over 20 dams. So much water is diverted to the cities and farmland of the American West that most years it no longer reaches the sea. The biggest city it supplies is Los Angeles. Freshwater is delivered across hundreds of kilometres of desert via a network of aqueducts, canals and pipelines. This system delivers 90% of the city’s freshwater. Without it LA wouldn’t exist. The veins and arteries of our water supply are the lifeblood of our civilisation. And the human version of this planetary cycle operates at a global scale. We have altered the planet’s water cycle to such an extent that five times as much freshwater is stored in reservoirs as flows in all of world’s rivers.

**Urbanisation – Urban population growth** (at 24.53 minute)

Faster and faster; in the last 60 years the Earth’s population has almost tripled and over two billion people have moved to the cities.

And there is China...

For the first time in the country’s history, urban residents outnumber rural ones. In 1978 only 18% of Chinese lived in cities, this rose to 30% in 1995 and to nearly 40% in 2002. But this is still far lower than Europe’s urbanisation rates of more than 75% or America's of 80%. Another 350 million Chinese could move into cities over the next two decades. That’s the equivalent of more than America’s entire population.
China’s construction of cities from scratch is just about alleviating crowded living conditions. China is obsessed with economic growth. It has been doing this by constructing massive infrastructure projects. But the pace with which people are moving into cities means we do have to build things quite quickly. And again in China, they have solved this problem. This 30-storey skyscraper was constructed in just 15 days.

Faster and faster, distances are no longer counted in miles, but in minutes. New suburbs are shaped where every home is a castle with safe distance from the city centres and where neat rows of houses huddle around dead-end streets. The model of a lucky few countries has become a universal dream preached by televisions all over the world. Even here in Beijing it is cloned, copied and reproduced in these formatted houses that have whipped Pagodas off the map.

Planned obsolescence (at 29.21 minute)

In the 1920s light bulbs lasted 2500 hours, today they last only 1000 hours. What happened? The first nylon stockings in the market were made to last. What happened then? What is the dirty secret of millions of IPods that landed Apple in court? The answer is a hidden mechanism at the heart of the consumer society. Planned obsolescence - the desire on the part of the consumer to own something a little newer a little sooner than is necessary. Planned obsolescence is not only about deceiving the consumer; it also threatens the planet with a growing stream of toxic waste. Posterity will never forgive us, posterity will suddenly find out the truth behind people’s lifestyles in the advanced countries.

Faster and faster; the more the world develops the greater its thirst for energy. Everywhere machines dig, pour and rip from the Earth the pieces of stars buried in its depths since its creation, minerals.

We can slice the tops of mountains and dig holes big enough to bury a city. In a single year we now move more earth and rock than all the natural processes of erosion put together. Our machines have transformed the planet.

Dubai is a sort of combination of the western model, a country where the impossible becomes possible, building artificial islands in the sea for example. Dubai has few natural resources but with the money from oil it can bring million of tons of materials and workers from all over the planet.

Dubai has no farmland but it can import food. Dubai has no water but it can afford to expend immense amount of energy to desalinate water and build the highest skyscrapers in the world. Dubai has endless sun but no solar panels.

History tells us that we do not tend to run out resources, instead we invent new ones, but that is a lesson from human history. The planet’s history has perhaps a more important lesson for us. It’s a lesson about the most dramatic human influence on the planet; the speed and scale at which we are changing the atmosphere. Levels of carbon dioxide and methane are higher than in any time in the last 50 million years. We can already see some of the effects, the thickness of our glaciers is almost half, some of the extra carbon dioxide we pump into the atmosphere has been absorbed by the oceans. This has increased their acidity by 30% threatening the growth of marine creatures, like corals. In the last few decades the frequency of extreme hurricanes has doubled in some areas. We
are at the beginning of a dramatic period of change. At the heart of it is the greenhouse effect, a
global warming caused by the gases we release.

We are not changing our model, oil might run out, we can still extract oil from Canada. The biggest
trucks in the world move thousands of tons of sand. The process of heating and separating bitumen
from the sand requires millions of cubic litres of water. Colossal amounts of energy are needed; the
pollution is catastrophic.

Nigeria is the biggest oil exporter in Africa and yet over 70% of the population lives under the
poverty line. The wealth is there but the country’s inhabitants don’t have access to it. The same is
true all over the globe.

Half the world’s poor live in resource-rich countries. Let’s think about that, a perfectly even
distribution of global wealth, all living people equally divided. Now let’s see how much wealth it
actually has. 80% of the Earth’s people barely have any wealth. It’s hard to even see them on the
chart. Meanwhile the richest 2%, they have more wealth than the rest of the world. Let’s take the
whole world’s population, all 7 billion of us and reduce it to just a representative of 100 individuals.
Poorest people on the left, richest people on the right (figure 1). Now let’s see how the world’s total
wealth, roughly $223 trillion is distributed.

![Figure 1: Distribution of wealth in the world](image)

The vast majority have practically nothing, nothing with which educate their children, nothing with
which to pay for medicine; while the richest 1% they have accumulated 43% of our world’s wealth.
The bottom 80% of the people, that’s 8 out of 10 individuals have just 6% between them. But even
this doesn’t show how extreme things have become. The richest 300 people on Earth have the same
wealth as the poorest 3 billion. So the number of people it takes to fill a midsize commercial aircraft
have more wealth than the populations in India, China, the US and Brazil combined.

You can’t explain inequality in the world by looking at poor people. If you had that attitude, you kind
of think to yourself, well there is something that poor people could do that would make them less
poor, that’s just not true. The reason poor people are poor is because another group of people, rich
people and powerful people, who generally have a lot of control over social policy. So here in New
York City thousands are calling for an alternative approach to regulate the financial institutions
responsible for the economic meltdown and tax the wealthy.
Our modern development has not fulfilled its promises. In 50 years the gap between rich and poor has grown wider than ever. Today half the world’s wealth is in the hands of the richest 2% of the population. Can such disparities be maintained? They are the cause of population movements, the scale we have yet to fully realise. The city of Lagos had a population of 700,000 in 1960 and that will rise to 16 million by 2025. Lagos is one of the largest growing megalopolises in the world. The new arrivals are mostly farmers forced off their land for economic or demographic reasons or because of diminishing resources. This is a radically new type of urban growth driven by the urge to survive rather than to prosper.

All over the planet the poorest scrabble to survive on scrubs while we continue to dig for resources that we can no longer live without. Our oil tankers are getting bigger and bigger, our energy requirements are constantly increasing. We try to power growth like a bottomless oven that demands more and more fuel.

Now, most of the remaining oil on earth lies underground in less industrially developed countries. In order to get that oil and to get it as cheaply as possible, Western companies have devastated environments and caused terrible human suffering. People in western societies are largely unaware of the harm caused from oil extraction. We are unaware because it goes unreported. And as oil becomes scarce and prices rise, the environmental destruction and human suffering will likely increase and the competition for oil will get more aggressive.

Thom Hartmann, Author “The last hours of ancient sunlight” (at 40.07 minute)

One of the most common questions that people ask is: do you think that this is going to cause a global catastrophe? And my answer is: it already has. There are people dying right now as we are speaking, there are people dying right now over war, and there are governments being twisted, changed, and seized over oil. The climate is changing because of oil and there is a small group of very wealthy who are getting richer and richer because of oil.

We are moving from cheap abundant oil to expensive scarce oil and we absolutely are, with technology, without technology, where the peak is where the peak is not and that change is a major change in the industrial history of the world. And that change is going to be huge. Is there a possibility of conflict? Absolutely. I think the danger is not only between large powers that are consumers of oil, I think the danger is that there will be more invasions to secure oil and I also think that there is an increasing, huge danger of civil conflict and civil war inside oil exporters themselves.

Speech from the Great Dictator (at 42.30 minute)

I’m sorry, but I don’t want to be an emperor. That’s not my business. I don’t want to rule or conquer anyone. I should like to help everyone - if possible - Jew, Gentile - black man - white. We all want to help one another. Human beings are like that. We want to live by each other’s happiness - not by each other’s misery. We don’t want to hate and despise one another. In this world there is room for everyone. And the good earth is rich and can provide for everyone. The way of life can be free and beautiful, but we have lost the way.
Greed has poisoned men’s souls, has barricaded the world with hate, has goose-stepped us into misery and bloodshed. We have developed speed, but we have shut ourselves in. Machinery that gives abundance has left us in want. Our knowledge has made us cynical. Our cleverness, hard and unkind. We think too much and feel too little. More than machinery we need humanity. More than cleverness we need kindness and gentleness. Without these qualities, life will be violent and all will be lost....

The aeroplane and the radio have brought us closer together. The very nature of these inventions cries out for the goodness in men - cries out for universal brotherhood - for the unity of us all. Even now my voice is reaching millions throughout the world - millions of despairing men, women, and little children - victims of a system that makes men torture and imprison innocent people.

To those who can hear me, I say - do not despair. The misery that is now upon us is but the passing of greed - the bitterness of men who fear the way of human progress. The hate of men will pass, and dictators die, and the power they took from the people will return to the people. And so long as men die, liberty will never perish. ..... 

Soldiers! Don’t give yourselves to brutes - men who despise you - enslave you - who regiment your lives - tell you what to do - what to think and what to feel! Who drill you - diet you - treat you like cattle, use you as cannon fodder. Don’t give yourselves to these unnatural men - machine men with machine minds and machine hearts! You are not machines! You are not cattle! You are men! You have the love of humanity in your hearts! You don’t hate! Only the unloved hate - the unloved and the unnatural! Soldiers! Don’t fight for slavery! Fight for liberty!

In the 17th Chapter of St Luke it is written: “the Kingdom of God is within man” - not one man nor a group of men, but in all men! In you! You, the people have the power - the power to create machines. The power to create happiness! You, the people, have the power to make this life free and beautiful, to make this life a wonderful adventure.

Then - in the name of democracy - let us use that power - let us all unite. Let us fight for a new world - a decent world that will give men a chance to work - that will give youth a future and old age a security. By the promise of these things, brutes have risen to power. But they lie! They do not fulfil that promise. They never will!

Dictators free themselves but they enslave the people! Now let us fight to fulfil that promise! Let us fight to free the world - to do away with national barriers - to do away with greed, with hate and intolerance. Let us fight for a world of reason, a world where science and progress will lead to all men’s happiness. Soldiers! In the name of democracy, let us all unite!

What is human nature? Are we humans what the elite would have us believe? Stupid, greedy creatures who have left to our own devices and so far our own good must be ruled to us by a self appointed elite or are we naturally caring and creative. I believe that when people are healthy and have what we need to survive, we can create a world based on integrity, freedom and compassion, a world where everyone can thrive. Which of these two views will shape our future? That’s our choice, NOW.
→ Social interdependence of all humankind that we are human only through the humanity of other human beings.

→ We can speak about the essential goodness of all human beings. We have been through rough times, but bad and evil doesn’t have the last word. It is ultimately the goodness and laughter and joy and caring and compassion. Those are what will prevail in the end.

→ The path of forgiveness instead of revenge, the path of reconciliation.

→ I believe that in the end it is kindness and generous accommodation that are the catalysts for real change.

Elisabet Sahtouris, Evolutionary Biologist (at 48.57 minute)

This is like the last effort of a particular phase of civilisation and now we often use the metaphor of the caterpillar becoming the butterfly, because the caterpillar crunches its way through the ecosystems, is very destructive, eats 300 times its weight every day until it is bloated and hangs itself up and goes to sleep. What is important about that metaphor is that the old and the new coexist for a while and the job of the caterpillar is to preserve its life. Governments are controlling oil in the Middle East and they are now trying to control nuclear energy and all these things. They know better but they have to have the role of protecting themselves, it’s their job. And if you love butterflies you don’t go around stepping on caterpillars. So we can’t hate them, it doesn’t do any good, but if you want alternative energy, you don’t ask an oil economy administration to produce it for you. We have to produce it. We imagine ourselves that is more cheap, efficient and effective.

It’s too late to be a pessimist. Worldwide 4 children out of 5 attend school. Never has learning been given to so many human beings. Everyone from richest to poorest can make a contribution. Lesotho which is one of the poorest countries is the one that proportionally invests most in its peoples’ education. Qatar one of the richest oil states has opened its doors to the best universities, culture, research and innovations are inexhaustible resources. In the face of misery and suffering millions of NGOs prove that solidarity between people is stronger than the selfishness of nations.

In Bangladesh a man thought the unthinkable and founded a bank that lends only to the poor. In thirty years it has changed the life of a 150 million people. Antarctica is a continent with immense natural resources that no country can claim for itself, a natural reserve devoted to peace and silence. It’s a treasure shared by all humanity. It’s too late to be a pessimist. Governments have acted to protect almost 3% of the world’s territorial waters. It’s not much, but it’s ten times more of what is was 10 years ago. The first natural parks were created just over a century ago, they cover over 13% of the continents, and they create spaces where human activity is in place. This harmony between humans and nature can become the rule, no longer the exception. In the USA, New York has realised what nature does for us, these forests and lakes supply all the water the city needs. In South Korea the forests have been devastated by war. Thanks to a National Reforestation Programme they once covered 65% of the country. More than 75% of paper is recycled. Costa Rica has made the choice between military spending and the conservation of its land. The country no longer has an army. It prefers to devote its resources to education, eco-tourism and the protection of its primary forest.
Gabon is one of the world’s leading producers of wood. It enforces selective logging, not more than one tree every hectare. Its forests are one of the country’s most important economic resources, but they have the time to regenerate. Programs exist that guarantee sustainable forest management, they must become mandatory.

There is no longer any doubt that we would have to rethink the way we live on our planet. We already keep track of what we spend and buy at home, at works, in factories and in the society. But we don’t do is keep track of the planet’s resources, that are consumed more quickly than they can be generated. Instead we need to Rethink how to Reduce, Reuse, Recycle and eventually Resource our way of living. Then it will be possible for 7 billion people or even 9 to live on one planet.

We know the demand for resources is continuing to grow, so we will need to do a lot more than simply using our resources more efficiently; we will need to bring together main solutions and ideas, such as maximising the environmental and health benefits of investments in clean technology, appreciating the free services that nature provides to us and recognising the importance of social and cultural values. But perhaps most critical is that people will need to see that by changing the use they use resources, they will also improve other aspects of their lives.

Given the situation in which we currently find ourselves, perhaps the four most powerful steps we can take are:

- Bringing population into balance with the Earth and other live forms.
- Reducing our energy consumption.
- Supporting local organic foods that use little or no fossil fuels.
- Making our voices heard to awaken our politicians to these issues.

Turns out that when you look carefully at it, you find that the one variable affecting why the population explodes is the power of women in the culture.

Kavita Ramdas, President, Global Fund for Women (at 55.04 minute)

_If you make sure that there is justice and economic opportunity for people in the poorest countries, people would choose to have fewer children there and if people were consuming less and were sharing more of what they had with the rest of the world, you actually do begin to get the outcomes that actually do address consumption around population as well as environmental sustainability._

_We are without doubt the most invasive and powerful creature on the planet. We are so successful we have hijacked the whole world for our own ends._

We have even extended our scope into space; this is a pivotal time in the Earth’s history. Look at the planet as satellites do and we see that we have become a global force ourselves. Seen from space humankind’s influence can be considered a natural process, the gases released by ships and aircraft,
cars and power stations are caused by an animal the Earth itself produced, but there is one key difference. Unlike volcanism, the movements of the oceans currents or the oxygen released from forests and plankton blooms, we have a choice of what we do. Satellites don’t only allow us to understand our impact on the world; they enable us to make informed decisions about our continued consumption of its resources.

Consequences of our voracious life are spiralling out of control. Are we pushing the natural world towards a crisis? Where do we go from here?

For consumers and producers justice is an opportunity to be seized, when trade is fair, when both buyer and seller benefit, everybody can prosper and earn a decent living. How can there be justice and equity between people whose only tools and their hands and those who harvest the crops with the machines? Let’s be responsible consumers, think about what we buy. It’s too late to be a pessimist. I have seen agriculture on a human scale that can feed the whole planet, if meat production doesn’t take the food out of peoples’ mouth. I have seen fishermen who take care of what they catch and care for the riches of the ocean. I have seen houses producing their own energy, 5000 people live in the world first eco-friendly city, Freiburg Germany. Other cities partner the project. Mumbai is the 1000th to join. The governments of New Zealand, Iceland, Austria, and Sweden have made the development of renewable energy sources top priority. I know that 80% of the energy we consume comes from fossil energy sources. Every week two new coal fired generating plants are built in China alone, but I have also seen in Denmark a prototype of coal-fired plant that releases its carbon into the soil rather than the air, a solution for the future. Nobody knows it. I have seen in Iceland an electricity plant powered by the Earth’s heat, geothermal power. I have seen wind farms off the coast of Denmark that produce 20% of the country’s electricity. The USA, China, India, Germany and Spain are the biggest investors in renewable energy. They have already created over 2.5 million jobs. Where on Earth doesn’t the wind blow? Everything on Earth is linked and the Earth is linked to the sun; its original energy source. Can humans not imitate plants and capture its energy? In one hour the sun gives the Earth the same amount of energy as that consumed by all humanity in one year. As long as the Earth exists, sun’s energy will be inexhaustible. All we have to do is stop drilling the Earth and start looking to the sky and learn to cultivate the sun. All these experiments are examples but they testify to a new awareness. They lay down markers for a new human adventure based on moderation, intelligence and sharing.

Can we do it? “Authority knows best” is a slogan that guides our conventional wisdom. We, meanwhile, are left to mind our own business, go on with our lives and attempt to live happily ever after; as long as we conform to the norms forced upon us. From cradle to grave we are led to follow the guidelines of what authority defines as a state-of-the-art system. Success seems to begin and end within the running wheel of education, career performance, debt management and retirement. A vibrant economy is the ultimate priority of our global hierarchy. A vibrant planet, the respect of all live forms, healthy foods, peaceful ways and conscious actions seem to be a mere subject of conversation often turned into a few fundraising campaigns, with very little or no impact at all.

We have got to convince people that given current trends we are headed for disaster. That’s the bad news. This new knowledge gives us the possibility of acting in ways that create a brilliant future for
all of us. So we need as environmentalists, as good economists, as concerned citizens, to begin to understand that a brighter future begins from making changes.

There are clear signs of hope from around the world. We do have the intelligence and ingenuity to adapt to a changing world. We can work hand in hand with nature to solve the problems we face. In India we train fig trees to make living bridges and we team up with elephants to extract valuable timber without trashing the whole forest. We can think as a community and plan ahead. When we work together it’s incredible what we can achieve. We have such spirit and such bravery in the face of adversity. The destiny of our planet is now in human hands.

Today our relationship with the planet is a different one; we are now a geological force to rival the Earth’s natural forces. The ultimate test will be how well we use that power. As a species we like to think that we are special, well this is our chance to prove it.

- **Ultimately I foresee for the 21st century a tenfold improvement of resource productivity.**

- **We need to decouple the rate of economic growth from the rate of resources. If the two continue to climb together we are going to hit natural limits.**

- **Of course everything has to be based on lifecycle analysis where you compare the advantages of possible and the disadvantages of recycling versus use of primary resources.**

- **If we were to live more sustainably, we need to do a lot more than simply use our resources efficiently. It is time for the world to come together to change the way we live on this planet.**

- **We have got to now see how we can get full satisfaction for human fulfilment by finding new ways to make us better human beings without having to continue raping Mother Earth.**

For the MSc in Environmental Technology

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