

Eternal

Bhoomi

FOR FOOD, COMMUNITY AND SUSTAINABLE LIVING

BANGALORE

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GAIA ~ Our Living Earth

Interview with Wangari Maathai - Satish Kumar

Earth Rights - Dr. Vandana Shiva

Our Life as GAIA - Joanna Macy

How Organic Farming can Feed the World - Kathik Kumar

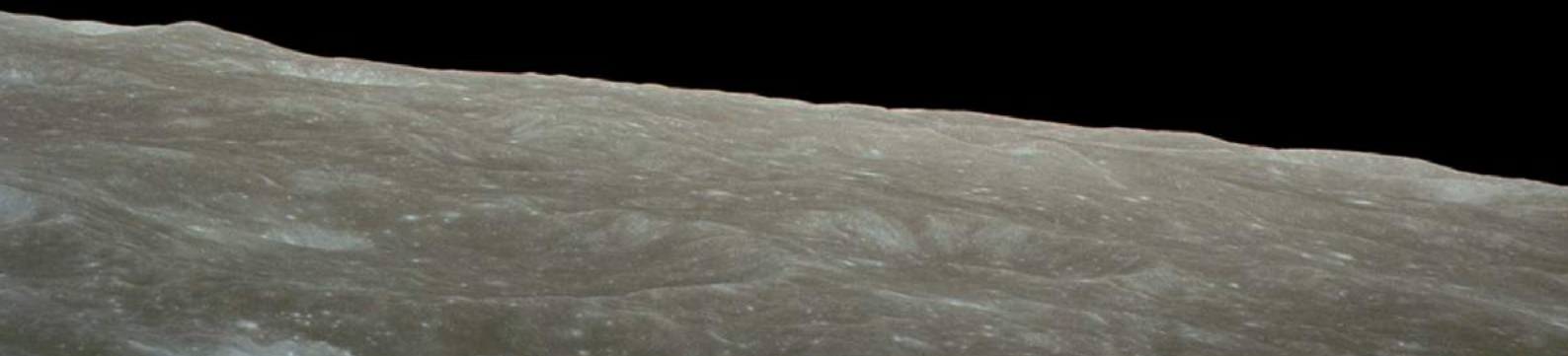


‘The size and age of the Cosmos are beyond ordinary human understanding. Lost somewhere between immensity and eternity is our tiny planetary home. In a cosmic perspective, most human concerns seem insignificant, even petty. And yet our species is young and curious and brave and shows much promise. In the last few millennia we have made the most astonishing and unexpected discoveries about the Cosmos and our place within it, explorations that are exhilarating to consider. They remind us that humans have evolved to wonder, that understanding is a joy, that knowledge is prerequisite to survival. I believe our future depends powerfully on how well we understand this Cosmos in which we float like a mote of dust in the morning sky.’

‘Cosmos’, 1980

Carl Sagan

Astronomer, Cosmologist, Writer



Economics to suit Gaia



Gaia, the Greek Earth Goddess came into prominence in recent years after James Lovelock wrote his path breaking book of the same name. In beautiful, often lyrical prose, and with painstaking holistic science, Lovelock wrote of the miracle of Gaia. We felt we owed Gaia a Bhoomi issue in her honour. The concept of Gaia not being very well known in India, we hope our readers would enjoy this issue of understanding and celebrating our “living” planet Earth.

As we go to print, it is ironic that the world is still reeling with the tragic earth quake, tsunami and nuclear plant catastrophes in Japan. Ironic, because of James Lovelock’s controversial belief in the importance of nuclear power for the future of our civilization, which he felt was doomed because of its dependence on fossil fuels. The possibility of a different development path did not occur to him, a path using renewable energy and with more non-materialistic growth.

The possibility of a more sustainable development path is not taken seriously by our political and corporate leaders either.

In the recent World Economic Forum, during a panel discussion on growth in developing countries like India, there was not a word about climate change or dealing with any kind of ecological degradation. Our Finance minister, who was one of the panel members, said that unfortunately in the Agricultural sector there cannot be more than 4% growth, hence the answer to higher growth lies in more people moving over to the Industrial and Service sectors so that the percentage of our population engaged in Agriculture reduces from the present 62%.

What happens to food production in the long run? The answer probably would be more industrialized farming with even more chemical fertilisers, pesticides and GM crops. Cannot we learn from the U.S. which has 1% of the population in farming, huge mechanized farms for both

meat and cereals and 93% processed foods, all of which have contributed to one in three Americans being obese, diabetic or suffering from heart disease or cancer?

A recent newspaper headline says “Capitalism is working fine in reshaping the world”. The words were spoken by Warren Buffet, supposedly the world’s third richest person, at a CII meeting in Bangalore. The headline is merely an example of the continuing refusal of the rich and powerful to see the writing on the wall. In the same meeting there is more talk of losses in Japan being uninsured and that Japan’s tragedy “is not a super catastrophe from a financial standpoint”

One wonders, why is it that other ‘standpoints’ are not taken seriously? Such as focusing on renewable energy and a more low-energy lifestyle and accepting human limitations of dealing with nuclear accidents? Environmentalists began hoping that there is now more substantive support for the anti-nuclear power movement. But with hardly any soul searching or reflection, the powers that be seem to be arming themselves with more and more reasons why nuclear power plants in India will be more earthquake proof than in Japan.

We have become used to piece-meal solutions which create more problems, like pesticides causing cancer or our choice of nuclear energy causing irreversible radiation. Following a different development path would mean that we respect Gaia as our essential life support system, and work on a paradigm around Gaia’s ecological principles. Gaia’s web of life is eclipsed for most of us by a man-made web of modern life. The scales of modern life that blind us need to fall so that we can design an economic system that suits Gaia. In this issue of Bhoomi, Wangari Mathai, Vandana Shiva, Joanna Macy, Karthik Kumar and others talk of ways to live lightly and responsibly on Gaia.

Seetha Ananthasivan

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Letter to the Editor

I have just finished 3 weeks of volunteer work at Navdanya Organic farm in Dehradun. I came upon your magazine in the library. I did my degree in Environmental Science and have spent the past 9 years teaching Environmental Education to children and adults in New Zealand, England and most recently Thailand

Everytime I visit Bangalore (where my parents have now moved back to) it pains me to see how much unsustainable development is occurring. I wish I could do more and that more people would be aware of these issues. I really loved your magazine...by subscribing to it I hope to get my whole family and relatives to read it.

Ankit Rao

Cover Design by Chinmay Dholakia;

We are thankful to Rev Steve Harms of the Peace Lutheran Church, for permission to use photograph of the mosaic on page 3 and for inspiration for our cover illustration. Richard Caemmerer, Jennifer Michelle and Rev. Margareta Dahlin Johansson were creative artists / designers of the mosaic, in which 15 different inter-faith communities participated.

Eternal Bhoomi Magazine welcomes articles, poems, photographs and illustrations for publishing, as well as concise letters from the readers commenting on the articles published in Bhoomi.

Send your letters to:

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Our Life as Gaia

Re-living our collective journeys on earth,
as *earth*, can help us break free of our
limitations as individuals and as a species

by Joanna Macy

Come back with me into a story we all share, a story whose rhythm beats in us still. The story belongs to each of us and to all of us, like the beat of this drum, like the heartbeat of our living universe.

There is science now to construct the story of the journey we have made on this earth, the story that connects us with all beings. There is also great yearning and great need to own that story – to break out of our isolation as persons and as a species and recover through that story our larger identity. The challenge to do that now and burst out of the separate prison cells of our contrivings, is perhaps the most wonderful aspect of our being alive today.

Right now on our planet we need to remember that story – to harvest it and taste it. For we are in a hard time, a fearful time. And it is the knowledge of the bigger story that is going to carry us through. It can give us the courage, it can give us the strength, it can give us the hilarity to dance our people into a world of sanity. Let us remember it together.

With heartbeat of the drum, we hear the rhythm that underlies all our days and doings. Throughout our sleeping and rising, through all our working and loving, our heart has been beating steady, steady. That steady sturdy inner sound has accompanied us all the way. And so it can take us back now, back through our lives, back through our childhood, back through our birth. In our mother's womb, there was that same sound, that same beat, as we floated there in the fluid right under her heart.

Let that beat take us back farther still. Let's go back, back far beyond our conception in this body, back to the first splitting and spinning of the stars. As scientists measure now, it is fifteen billion years ago we manifested – in what they call the Big Bang.

There we were, careening out through space and time, creating space and time. Slowly, with the speed of light, in vast curls of flame and darkness, we reached for form. We were then great swirls of clouds, gas and dancing particles – can you imagine you remember? And the particles as they circled in the dance, desired each other and formed atoms. It is the same desire for form that beats now in this drum and in our hearts.

Ten billion years later, one of the more beautiful swirls of that swirling mass split off from its blazing sun – the sun we feel now on our faces – and became the form we know best. And our lifetime as Gaia began.

*Touch our Earth, touch Gaia.
Touch Gaia again by touching your face,
that is Gaia too.
Touch Gaia again by touching your sister
or brother. That is Gaia too.*

In the immediate planet-time of ours, Gaia is becoming aware of herself, she is finding out who she is. How rich she is in the multitudinous and exquisite forms she takes.

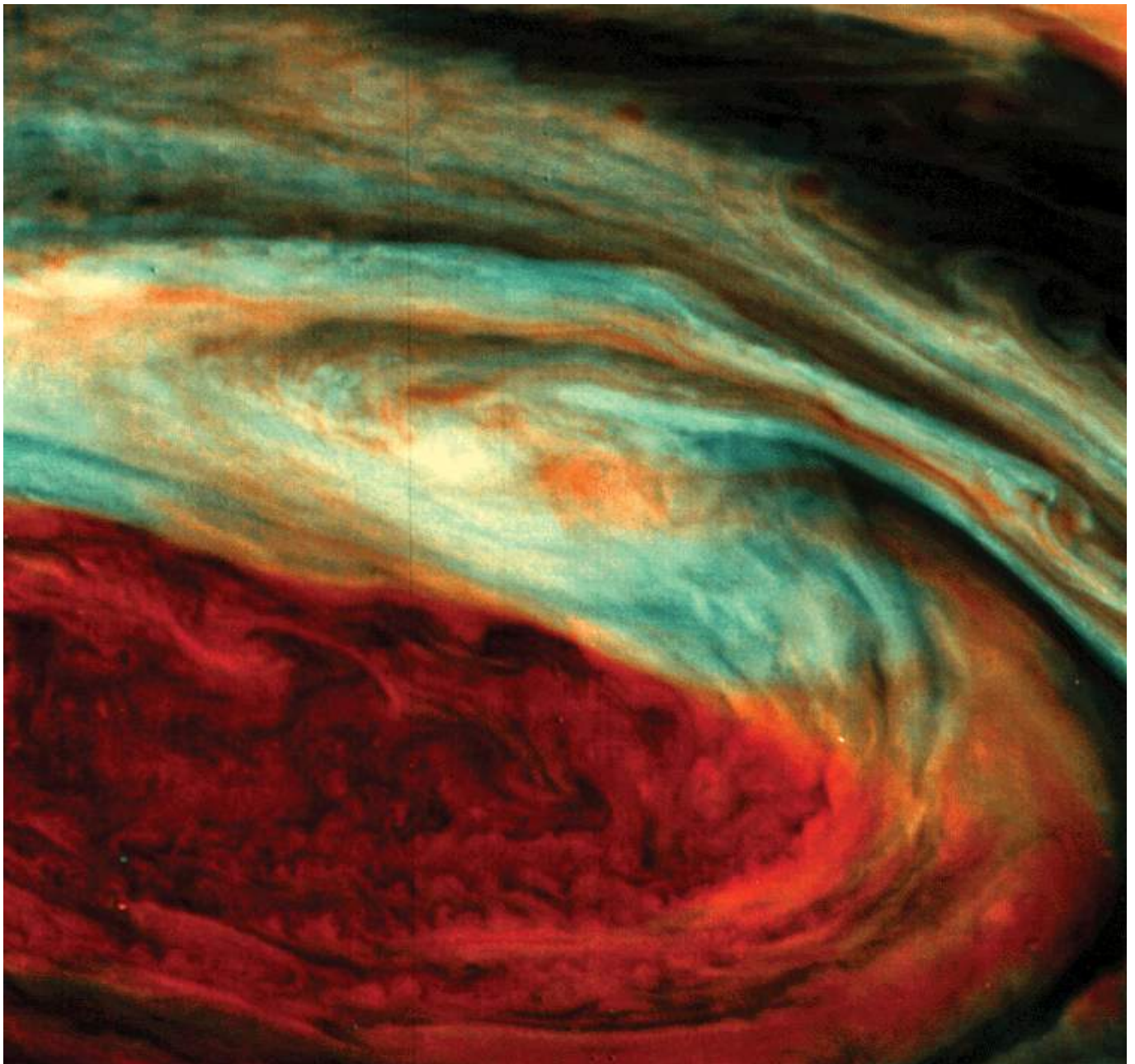
Let us imagine that her life – our life as our planet – could be condensed into twenty-four hours, beginning at midnight.

Until five o'clock the following afternoon all her adventures are geological. All was volcanic flamings and steaming rains washing over the shifting bones of the continents into shifting seas – only at five o'clock comes organic life.

To the heartbeat of life in you and this drum, you too, right now, can shift a bit – shift free from identifying solely with your latest human form. The fire of those early volcanoes, the strength of those tectonic plates, is in us still. And it may well be, if things continue the way they are going, that we will all return for a spell to non-organic life. We'd be radioactive for quite a while, but we are built to endure.

For now and in these very bodies of ours, we carry traces of Gaia's story as organic life. We were aquatic first, as we remember in our mother's womb, growing vestigial gills and fins. The salt from those early seas flows still in our sweat and tears. And the age of the dinosaurs we carry with us, too, in our reptilian brain, situated so conveniently at the end of our spinal column. Complex organic life was learning to protect itself and it is all right there in our neurological system, in the rush of instinct to flee or fight.

And when did we appear as mammals? In those twenty-four hours of Gaia's life, it was at 11.30 P.M.! And when did we become human? One second to midnight. Now let us take that second to midnight that is our story as humans and reckon that, in turn, as twenty-four hours. Let's look back through the twenty-four hours that we have been human.



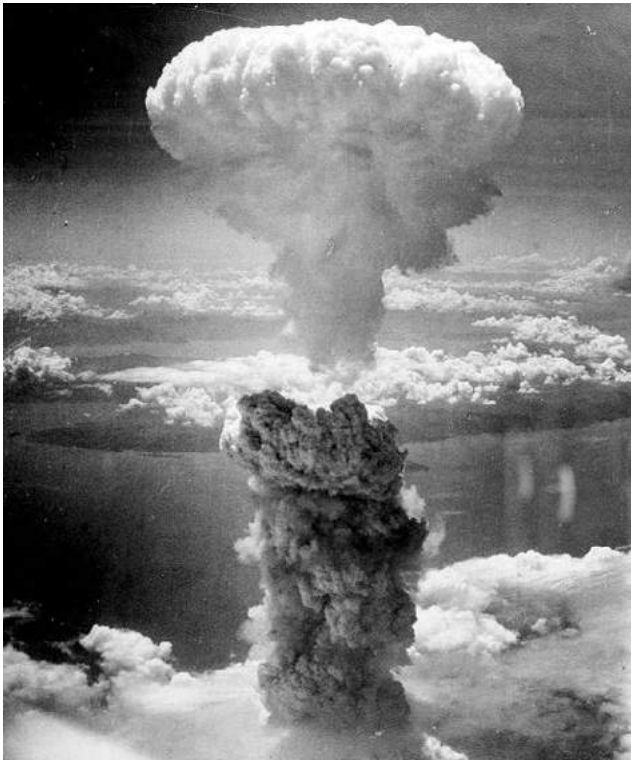
Let us imagine that her life – our life as our planet – could be condensed into twenty-four hours, beginning at midnight. Until five o'clock the following afternoon all her adventures are geological. All was volcanic flamings and steaming rains washing over the shifting bones of the continents into shifting seas – only at five o'clock comes organic life

Beginning at midnight and until two o'clock in the afternoon, we live in small groups in Africa. Can you imagine you remember? We feel pretty vulnerable; we haven't the speed of the other creatures, or their claws or fangs or natural armour. But we have remarkable hands, opposable thumbs to help shape tools and weapons. And we have in our throats and frontal lobes the capacity for speech. Grunts and shouts turn into language as we collaborate in strategies and rituals. Those days and nights on the verge of forests, as we weave baskets and stories around fires, represent the biggest hunk of our human experience.

Then in small bands we begin branching out. We move across the face of Gaia; we learn to face the cold and hunt the mammoth and name the trees of the northern forests, the flowers and seasons of the tundra. We know it is Gaia by whom we live and we carve her in awe and fear and gratitude, giving her our breasts and hips. When we settle into agriculture, when we begin domesticating animals and fencing off our croplands and deciding that they could be owned as private property, when we build great cities with granaries and temples and observatories to chart the stars, the time is eleven fifty-eight. Two minutes to midnight.

At eleven fifty-nine comes a time of quickening change: we want to chart the stars within as well as those we see in the skies; we want to seek the authority of inner experience. To free the questing mind we set it apart from Gaia. We make conjectures and rules and heroes to help us chart our freedoms to think and act. The great religions of our planet-time arise. At six seconds to midnight comes a man called Buddha and shortly after another called Jesus of Nazareth.

What now shapes our world – our industrial society with its bombs and bulldozers – has taken place in the last few



Photograph from Wikimedia

Right now on our planet we need to remember the story of Gaia – to harvest it and taste it. For we are in a hard time, a fearful time. And it is the knowledge of the bigger story that is going to carry us through. It can give us the courage, it can give us the strength, it can give us the hilarity to dance our people into a world of sanity. Let us remember it together.

microseconds of the day we have known as humans.

Yet those few microseconds bring us right to the brink of time. And each of us knows that. Each of us, at some level of our awareness, knows that we are doing ourselves in – that Gaia herself, our self, is in danger. And at some level of your consciousness that is why you are here. Oh yes, you may think you are here to heal yourselves on the personal level and find your power in terms of your individual lives. True enough. But we are also here because we know our planet is in danger and all life on it could go – like that! And we fear that this knowledge might drive us insane if we let it in.

Much of the time, it is hard to believe that we have come to this – to such an apocalyptic moment. Even those of us who work hard to stop nuclear weapons have trouble really believing that they exist. After the millions of years of life on earth, after the millenia of our civilizations, after Ishtar and Shakespeare and Gandhi and Dorothy Day, we find it hard to credit the

fact that we are deliberately manufacturing and deploying these weapons, targeting them at great populations, poisoning them on hair-trigger alert, leaving them liable to go off on a computer malfunction...

So we are now at a point unlike any other in our story. I suspect that we have, in some way, chosen to be here at this culminating chapter or turning point. We have opted to be alive when the stakes are high, to test everything we have ever learned about interconnectedness, about courage – to test it now when Gaia is ailing and her children are ill. We are alive right now when it could be curtains for conscious life on this beautiful water planet hanging there like a jewel in space. Our foremothers and forefathers faced nothing quite like this, because every generation before us took it for granted that life would continue. Each lived with that tacit assumption. Personal death, wars, plagues were ever encompassed in that larger assurance that life would continue. That assurance is lost now and we are alive at the time of that great loss.

It is not the loss of the future. It is the loss of the certainty that there will be a future. It affects everyone, whether they work in the Pentagon or the peace movement. And the toll it takes has barely begun to be measured.

In so-called primitive societies, rites of passage are held for adolescents, because it is in adolescence that the fact of personal death or mortality is integrated into the personality. The individual goes through the prescribed ordeal of the initiation rite in order to integrate that knowledge, so that he or she can assume the rights and responsibilities of adulthood. That is what we are doing right now on the collective level, in this planet-time. We are confronting and integrating into our awareness our collective mortality as a species. We must do that so that we can wake up and assume the rights and responsibilities of planetary adulthood – so that we can grow up! That is, in a sense, what we are doing here.

When you go out from here, please keep listening to the drumbeat. You will hear it in your heart. And as you hear it, remember that it is the heartbeat of the universe as well, and of Gaia your planet and your larger Self.

When you return to your communities to organize, saying no to the machinery of death and yes to life, remember your true identity. Remember your story, our story. Clothe yourself in your true authority. You speak not only as yourself or for yourself. You were not born yesterday. You have been through many dyings and know in your heartbeat and bones the precarious, exquisite balance of life. Out of that true knowledge you can speak and act. You will speak and act with the courage and endurance that has been through the long, beautiful aeons of your life story as Gaia.

Excerpted with permission from 'Thinking Like A Mountain', New Society Publishers, 2007

Eco-philosopher Joanna Macy is a scholar of Buddhism, general systems theory, and deep ecology. A respected voice in movements for peace, justice, and ecology, she interweaves her scholarship with four decades of activism. She has created a ground-breaking theoretical framework for personal and social change, as well as a powerful workshop methodology for its application. Please visit her website <http://www.joannamacy.net/>.

“A diverse ecosystem will be resilient, because it contains many species with overlapping ecological functions that can partially replace one another. When a particular species is destroyed by a severe disturbance so that a link in the network is broken, a diverse community will be able to survive and reorganize itself... In other words, the more complex the network is, the more complex its pattern of interconnections, the more resilient it will be.”

- Fritjof Capra





Sea Anemones

Photograph by Pooja Nayak

We are Gaia

By Seetha Ananthasivan

In the entire universe, the presence of life and a planet that supports life is so rare that we are literally living on an incredibly complex and mysterious miracle. Or rather, we are part of the miracle.

Life is not only rare – life is fussy and demanding. The temperature, amount of oxygen, the alkalinity, the formation of clouds and salinity of oceans, have all to be regulated within a narrow range on earth, so that life on it can be supported. A mind-boggling balancing act indeed which we take for granted in our daily lives.

Gaia is the idea of the earth as a self-regulating, single, unified, cooperating and living system – a superorganism that regulates its physical conditions to make the world a place where life has continued to be possible over three billion years. Many cultures have understood Gaia, intuitively, perhaps with more than a dash of reason. Also many are the civilizations which have

overlooked Gaia's unstated demands and paid a price with their very survival.

According to Ayurveda, everything in the universe, every cell, object and creature is composed in an infinite variety of ways, of the Panchamahabhutas – Akash (Space), Vayu (Air), Jal (Water), Agni (Fire) and Prithvi (Earth). Constantly changing and interacting with each other, they create a situation of dynamic flux that keeps the world going – another way of looking at Gaia.

The Red-Indian Chief Seattle in his famous letter to the white man said, “*We do not own the web of life, we are merely a strand in it...*”

Perhaps it would have been a ‘better’ world if human ‘progress’ could have been governed by such an intuitive understanding of Gaia and through living harmoniously with all the zillions of other elements and creatures of Gaia. But from where we are today, living in an age of reason as we do, a scientific view is essential, in addition to a poetic or spiritual understanding of Gaia, which by themselves just won't do.

Such a scientific view is what James Lovelock provides in his book ‘Gaia’ written originally in 1979 – and since then the idea of Gaia has become a great way to express one's wonder and caring for the incredible complexities and ‘being’ of our planet earth.

Gaia became one of the most hotly-debated topics within the scientific community – which is understandable, since Lovelock goes far beyond reductionist science – you need your chemistry, physics, geology, oceanography, geography, history and much more to get a deeper understanding of Gaia.

In Lovelock's words, *The entire range of living matter on Earth from whales to viruses and from oaks to algae could be regarded as constituting a single living entity capable of maintaining the Earth's atmosphere to suit its overall needs and endowed with faculties and powers far beyond those of its constituent parts...* Gaia can be defined as a complex entity involving the Earth's biosphere, which includes the atmosphere, oceans, and soil including all life and all its inter-relationships, forming a self-regulating or cybernetic system, which seeks an optimal physical and chemical environment for life on this planet. Evolution, therefore is the result much more of cooperative rather than competitive processes.

What does this optimal physical and chemical environment and self-regulation really mean?

Cybernetics and Holistic Science

Lovelock writes of the need to go beyond reductionist science and linear thinking. While he rues the then scientific establishment's dismissal of his work as fiction and myth, he emphasizes the need to use science to make the argument for the Gaia hypothesis more compelling.

He explains the way Gaia creates an optimal environment for life using holistic thinking and the circular logic of cybernetics – the branch of science concerned with self-regulating systems of communication and control in living systems and machines. One of the many examples he gives to illustrate cybernetics is the simple thermostat – which controls the heat exceeding a set level, when the electric current is cut off; and when the temperature is cooler than the set level, the current is switched on to make the heat increase again. But such a thermostat is not an external intervention – it is in-built in Gaia as it is in the human body.

Several micro-organisms as well as gases in the atmosphere, chemicals in the soil and ocean, etc. are in a perpetual cybernetic dance to ensure that critical variables of oxygen, temperature, alkalinity, etc., which are essential to sustain life are maintained.

Amazingly, or perhaps quite naturally, there are significant similarities between optimal physical and chemical environment for the earth and for our own bodies (and other organisms as well). We *are* gaia, not only in the sense of being *part of* gaia, but also in being *similar to* gaia.

Let us look at some of the similarities – in self-regulation of temperature, oxygen, acid-alkaline balance, the salinity of its oceans and balance of iodine.

1. Temperature

Our bodies maintain a certain temperature – usually around 98.4°Fahrenheit. When the temperature outside is very high, the body sweats and brings down the temperature. Where the temperature outside is low, the shivering that ensues increases muscular activity to generate more heat by burning more body fuels. This self-regulating property of the body is called *homeostasis*.

Similarly, the Gaia hypothesis sees life regulating the surface temperature of Earth, using a far more complex process of

homeostasis.

The earth began its existence 4.5 billion years ago and life on earth began about 3.5 billion years ago. After organic life began, the earth's temperature has been maintained between a narrow range of 10 and 20°C, even when the sun's heat has increased by 25 degrees over the last 3.5 billion years. 3 billion years ago, a mere 2 degree decrease in temperature would have been enough to establish an Ice age and wipe out most of life.

And this regulation of temperature has taken place for over three billion years – else life could not have evolved at temperatures lower or higher than this range. How did this happen? Unlike a planet like Mars where there is great variation in temperature, the earth's average surface temperature is kept constant in multiple ways including by varying the amount of carbon dioxide and methane – now made notorious through the climate change crisis. And these gases were cycled through the atmosphere by the ceaseless activity of life – of predators and prey and of diverse food chains.

Another form of temperature control is through dimethyl sulphide (DMS). A group of microscopic algae called



Coccolithophorids: They help regulate the temperature of our biosphere

coccolithophorids that thrive in warm seas, release DMS into the air, which become nuclei for cloud condensation. These nuclei help to produce thicker clouds, blocking more of the sun, and cooling the oceans. This in turn reduces the coccolithophorids, which reduces the DMS released. We then have fewer clouds blocking the sun, and the temperature rises. How little do we know of microscopic organisms that keep the earth a livable place for us!

2. Oxygen

An all important and ceaseless regulation required by Gaia is of oxygen. Oxygen in the atmosphere has to be high enough to keep oxygen-breathing animals alive. But instead of around 21%, if the atmosphere had about 25% oxygen, life on earth would be wiped out because with such a level of oxygen even green leaves would burn and all forests would soon go up in flames.

The atmospheres of our two nearest neighbors, Venus and Mars, contain 0.00 percent and 0.13 percent respectively, of free

oxygen. On Earth, however, Dr Lovelock suggests that Gaia is at work to keep the proportion of oxygen in the atmosphere within a narrow range. Through the Oxygen cycle, photosynthesis and innumerable yet to be understood processes, the oxygen in the atmosphere is maintained to support life.

3. Acid - Alkali balance

The troposphere i.e. the denser layers of the atmosphere near the surface of the earth are “*a curious mixture of reactive gases forever in flux and chemical disarray, yet never losing their balance*”. Hydrogen, oxygen, ozone, water vapour, carbon dioxide, nitrous oxide, methane, ammonia and much more are constantly in movement or transformation, between themselves and with the biosphere. A simple example known to a school child is of plants absorbing carbon dioxide and giving out oxygen which is then absorbed by other organisms.

The biosphere produces a great deal of ammonia, which seems to be just sufficient to sustain a rainfall pH of 8, i.e. ammonia helps the biosphere be alkaline enough for life. Without ammonia, the pH of rain will be close to 3 – creating highly acidic rain which can kill life.

Gaia’s cybernetic control system keeps the ammonia production and acids in balance – but this balance is beginning to be disturbed in parts of the world such as North America. As fossil fuel-burning releases sulphur into the atmosphere, it is brought down as sulphuric acid; the rains, known as ‘acid rain’ deters the growth of life.

4. Oceanic Salinity

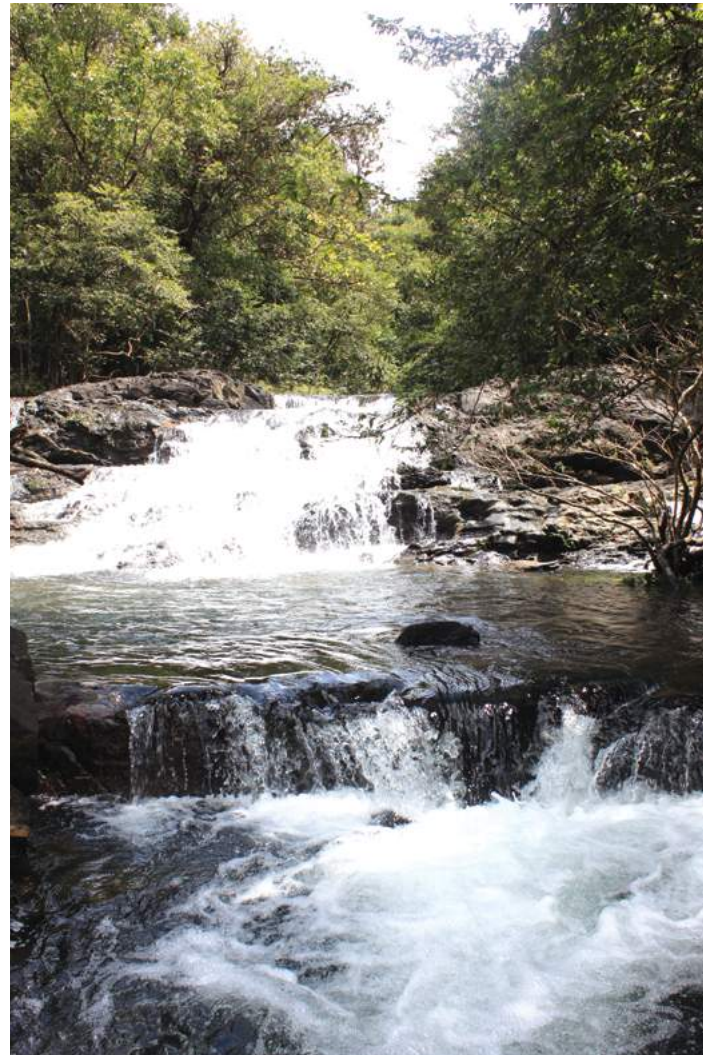
Natural geological weathering releases salts washed off from the lands into the oceans too fast for life to adapt at the same rate. At the same time, geological evidence indicates that the oceans have remained at a constant salinity of less than 3.4% saturation for millions of years. Salt flats, which are hosts to dense patches of bacteria, may be removing the salt from the oceans. The bacteria, surviving in water too salty for any other life, trap salts and other minerals to form a sheath within which the bacterial colonies live. As for our bodies, like Gaia we too need just the right amount of salt – not too much and not too little.

The Mystery of Life

It seems almost as if our galaxy were a giant warehouse containing the spare parts needed for life... If we can imagine a planet made of nothing but the component parts of watches, we may reasonably assume that in the fullness of time – perhaps 1000 million years – gravitational forces and the restless motion of the wind would assemble at least one working watch. Life was thus an utterly improbable event with almost infinite opportunities of happening.

Lovelock goes on to liken life to a sandcastle built on the beach and says that if Gaia’s “*partners in life were not there, continually repairing and recreating, as children build fresh castles in the beach, all Gaia’s traces would soon vanish.*” Life then can be called a distribution of molecules, which is sufficiently different from the background state to be recognizable as an entity.

But now that life has been established, another affirmation of Gaia is that life would be very difficult to end! The partial or complete removal of the ozone layer, or the simultaneous explosion of all the nuclear weapons on earth, may destroy



Photograph by Ananth Somaiyah

“Gaia is related to the Earth’s biosphere as a person is related to her body”

-James Lovelock

the larger animals and plants. But it is doubtful if unicellular organisms which are the most essential parts of life would even notice such an event.

In fact Lovelock’s passion and eloquence about micro-organisms will change the way you look at life forever. He takes digs at various human propensities – for instance, at many being revolted by the violence of hunting but with no concern for the death and dispossession wrought by the bulldozer or the plough in destroying habitats of our partners in Gaia.

About 70% of the Earth’s surface is water. The oceans and the myriad self-regulatory chemical reactions in them play a major part in keeping the Earth habitable for life. The drama of the sulphur cycle, the iodine cycle, the role of other elements important for life such as selenium and phosphorus all require the great oceans with various algae and other life forms. Also, the oceans have more to them than the dazzling variety of life forms that they hold – about half of all living matter. The oceans are a reservoir of dissolved gases which help regulate the air we breathe.

Gathering information about the seas, their chemistry, physics and biology and their interacting mechanisms should come right on top of mankind’s priorities.

About Gaia theory

The idea of Gaia presented a new and radically different model of our planet. In contrast to conventional belief that non-living matter is merely a backdrop for life, Gaia theory argues that the rocks, the air, and the oceans are part of Gaia just as the shell is part of a snail. Gaia has continuity with the past back to the origins of life, and extends into the future as long as life persists. Gaia, as a total planetary being, has properties that are not necessarily discernible by just knowing individual species or populations of organisms living together. Lovelock says elegantly, differentiating between Gaia and the biosphere: Gaia is related to the earth's biosphere as a person is related to her body.

While 'Gaia' is considered a classic work, certain of his statements do not seem very credible. He exonerates multinational companies of any major role in the fast degradation of our world, and holds tropical agriculture more culpable. Lovelock believed that industrial pollution was no great problem – it only needed to be put to good use. Prohibiting pollution to him was as idiotic as legislating against the emission of dung from cows.

He certainly does not mention any understanding of the political-corporate nexus or how the compulsions for profit making and expanding markets seem to lead corporations to completely sweep aside ethical considerations, and pollute the earth with impunity. Only a Gaian perspective of long-term life seemed to matter for him.

What is most unacceptable to thinkers and environmentalists is his enthusiastic and unambiguous encouragement of nuclear power. While he recognized the problems of fossil fuel burning and climate change, he saw no need to change humankind's present development path.

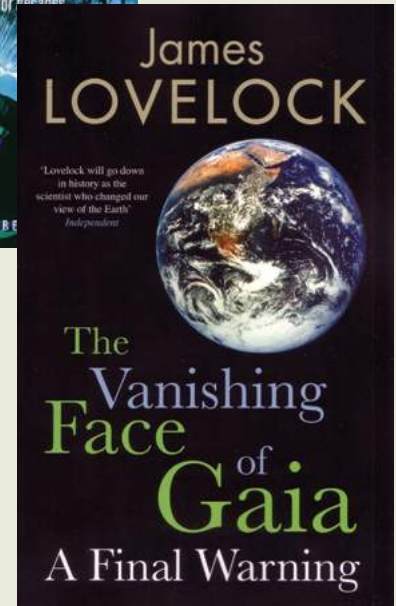
Overall, there are many messages for us. An important lesson for the world of education and economics is that Gaia theory poses an argument against Darwinian hypotheses of survival of the fittest and competition. If we look at all the self-regulative processes of Gaia, evolution is primarily a result of cooperative not competitive processes.

According to the Gaia theory, humankind is the most powerful species in this web and is also its biggest threat. We need to establish a right relationship with the planet as a living entity in which we are embedded – and to which, in the final analysis, we are all accountable. We are persuaded to drop the western belief that only the good of mankind mattered...he says, *"I began to see us all, as part of the community of living things that unconsciously keep the Earth a comfortable home, and that we humans have no special rights, only obligations to the community of Gaia."*

The book inspires the reader to connect with a profound sense of the value of the Earth, and to discover what it means to live as harmoniously as possible as sentient creatures of planetary proportions. We need to love and respect the Earth with the same intensity that we give to our families and our tribes.

To quote The New Scientist, Lovelock "is to science what Gandhi was to politics. And his central notion that the planet behaves as a living organism is as radical, profound, and far-reaching in its impact as any of Gandhi's ideas."

Seetha Ananthasivan is the Director of Bhoomi Network for Sustainable Living and the Editor of the Eternal Bhoomi Magazine. She conducts workshops for personal and institutional transition as well as on Food, Health and Sustainable Living



James Lovelock's books, *The Revenge of Gaia* and *The Vanishing Face of Gaia*, both talk about the interconnectedness of climate and life

In *The Vanishing Face of Gaia*, Lovelock argues that the earth is lurching ever closer to a permanent "hot state" – and much more quickly than most specialists think. There is nothing humans can do to reverse the process; the planet is simply too overpopulated to halt its own destruction by greenhouse gases

In order to survive, Lovelock says mankind must start preparing now: and we will only be able to do this in the far north and south of the planet. Canada, Great Britain and Tasmania will have to host a large majority of our population. Many will perish.

Lovelock again makes his controversial plea for more nuclear energy as well as for more 'aggressive' agricultural development. *The Vanishing Face of Gaia* offers an essential wake-up call for the human race – but if a further 'aggressive' approach is the answer is questionable

The Revenge of Gaia: Earth's Climate Crisis & The Fate of Humanity. The key insight of Gaia Theory is that the entire Earth functions as a single living super-organism. But according to James Lovelock, the theory's originator, that organism is now sick. It is running a fever born of increased atmospheric greenhouse gases. Earth will adjust to these stresses, but the human race faces a severe test. It is already too late, Lovelock says, to prevent the global climate from "flipping" into an entirely new equilibrium that will threaten civilization as we know it. But we can do much to save humanity. In the tradition of *Silent Spring*, this is a call to address a major threat to our collective future.

Earth Rights

Vandana Shiva writes about the inevitability of recognizing the Rights of Mother Earth, if we are to really pay heed to issues of human rights.

We need a new paradigm for living on the Earth. An alternative to the present paradigm is now a survival imperative for the human species. And the alternative that is needed is not only at the level of tools or technologies: it is at the level of our worldview. How do we look at ourselves in this world? What are humans for? Are we merely a money-making and resource-guzzling machine? or do we have a higher purpose?

The world order built on the economic fundamentalism of limitless growth and on the technological fundamentalism that maintained that there is a technological fix for every social and environmental ill is clearly disintegrating.

The collapse of the economic system in 2008 and the continuing financial crisis signal the end of the paradigm that put fictitious finance above real wealth created by Nature and humans, profits above people, and corporations above citizens. This paradigm can only be kept afloat with limitless bailouts directing public wealth to private rescues instead of using it to rejuvenate Nature and economic livelihoods. It can only be kept afloat with increasing violence to the Earth and people. It can only be kept alive as an economic dictatorship.

This is clear in India's heartland, where the limitless appetite for steel and aluminium for the global consumer economy (and the limitless appetite for the profits generated by the steel and aluminium corporations) is now clashing head-on with the rights of tribal people to their land and homes, their forests and rivers, their cultures and ways of life.

Tribal people are saying a loud and clear 'no' to their forced uprooting. The only way to get the minerals and coal that feed the 'limitless growth' model in the face of democratic resistance is the use of militarized violence, and operation Green Hunt has been launched in the tribal areas of India with precisely this purpose – even though the proclaimed public objective is to clear out the 'Maoists'.

More than 40,000 armed paramilitary forces have been placed in tribal areas that are rich in minerals and where tribal unrest is growing, demonstrating that the current economic paradigm can only unfold through increased militarization and the undermining of democratic and human rights.

The technological fundamentalism that has externalized costs, both ecological and social, and blinded us to ecological destruction has also reached a dead end. Climate chaos – the externality of technologies based on the use of fossil fuels – is a wake-up call: a warning that we cannot continue on the fossil-fuel path. The high cost of industrial farming is running up against limits, in terms of both the ecological destruction of the natural capital of soil, water, biodiversity and air, and the creation of malnutrition, with a billion people denied food and another two billion denied health because of rampant obesity, diabetes and other food-related diseases.

We are all members of the Earth family, and our first and highest duty is to take care of Mother Earth: Prithvi, Gaia, Pachamama – however you name her. And the better we take care of her, the more food and water, health and wealth we have. 'Earth Rights' are first and foremost the rights of Mother Earth. Earth rights are also the rights of humans: the right to food and water, health and a safe environment and the right to rivers, seeds, biodiversity and unpolluted atmosphere.

I have given the name Earth Democracy to this new paradigm of living as an Earth Community, respecting the rights of Mother Earth.

Earth democracy enables us to create living democracies, which enable democratic participation in all matters of life and death: the food we eat or do not have access to; the water we drink or are denied through privatization or pollution; the air we breathe or are poisoned by. Living democracies are based on the intrinsic worth of all species, all peoples, all cultures.

Earth democracy protects the ecological processes that maintain life and the fundamental human rights that are the basis of the right to life, including the right to water, the rights to food, the right to health, the right to education, and the right to jobs and livelihoods.

Ahimsa or nonviolence is already the basis of many faiths that have emerged on Indian soil. Translated into economics, nonviolence implies that our systems of production, trade and consumption do not use up the ecological space of other species and other people. Violence is the result when our dominant economic structures and economic organization usurp and ring-fence that space.

According to an ancient Indian text, the Isha Upanishad "The universe is the creation of the Supreme Power meant for the benefit of all creation. Each individual life form must, therefore, learn to enjoy its benefits in close relation with other species. Let not any one species encroach upon others' rights." Whenever we engage in consumption or production patterns that take more than we need, we are engaging in violence. Non-sustainable consumption and non-sustainable production constitute a violent economic order.

Earth Rights are the basis of equity, justice and sustainability. On Earth Day 2010, the President of Bolivia, Evo Morales, organised a conference on Rights of Mother Earth. The idea is to start a process for adopting a Universal Declaration of the Rights of Mother Earth on the lines of the Universal Declaration of Human Rights. Without Earth Rights there can be no Human Rights.

Dr. Vandana Shiva is a world-renowned scientist/ activist/ writer. She writes on issues of globalization - farmers' rights, economics, science and the interconnectedness of our life on Earth.

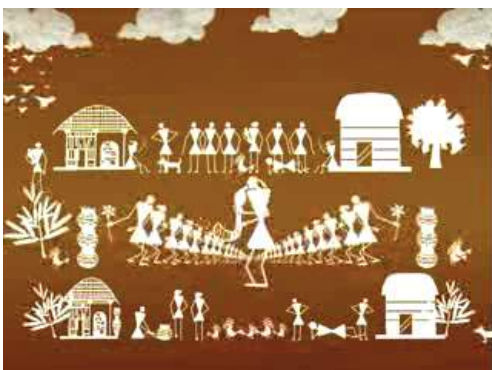


Gaon Chhodab Nahí

(We will not leave our village!)

This tribal song, inspired by Bhagwan Maaji, a leader of the Adivasi struggle against bauxite mining in Orissa, encourages tribals and indigenous communities to protect all that is part of their lives, to unite and fight for forests, rivers and villages where they have been living peacefully for centuries.

(www.actionaid.org). The video is available on Youtube.



We will not leave our village!

Nor our forests

Nor our Mother Earth!

We will not give up our fight!

*They built dams, drowned villages, and built factories
They cut down forests, dug out mines and built sanctuaries.*

Without water, land and forest, where do we go?

Oh God of Development, Pray tell us, how to save our lives?

*Dry is the Jamuna River, the Narmada River and the
Suvarnarekha River*

Ganga River is a dirty drain and

Krishna River – but a black line!

You may drink your colas and bottled water

How shall we quench our thirst, with such polluted waters?

Were our ancestors fools that they conserved the forests?

Made the land so green, made the rivers flow like honey?

Your greed has charred the land, looted its greenery

The fish are dead, the birds have flown, who knows where?

*The minister has become the industry broker,
snatched away our lands*

Armed platoons protect them

The officer is a king and the contractor is a millionaire

Our village is their colony

O Brother! Their colony!

*Birsa (legendary adivasi leader) calls upon you to unite
and break this silence*

Fisherfolk, dalits and adivasis unite

From fields and mines arise

Sound the Nagara (drum)

Listen, people of the country,

Struggle's the only way out

We will not leave our village!

Nor our forests!

Nor our Mother Earth

We will not give up our fight!



Photograph by Pooja Nayak

Potent Places

By Liz Hosken

In October 2008, custodians of sacred natural sites and territories from the four continents declared that the whole Earth is sacred. They gathered prior to a World Conservation Congress to examine the growing threats to the Earth and to sacred natural sites. All agreed with Danil Mamyev, a shaman from Altai in Russia, when he said: “The whole Earth is sacred and there is a network of especially sacred areas like acupuncture points around the body of the Earth. Each has a Guardian who ensures that the local community practice to protect these sacred places, and to guide the community to live according to the law of the territory. The guardians are dying out, and it is urgent to rediscover and work with them to revive their vital role.”

THE EXPERIENCE OF the Earth as sacred was universally shared by diverse human cultures for most of history until, over the last few hundred years, the modern idea of materialism triumphed. The shared wisdom of the sacredness of life is based on the understanding that the physical world is animated by a spiritual force – all energy or intelligence – which imbues all forms of life and natural features. This intelligent universe has an order, into which humanity is born. This order is sacred, in that it must not be disturbed or violated. It is this order that maintains the integrity of life. Humans need to abide by the law of the universe, which is the source of true law. If we violate this order and its inherent energetic qualities, we suffer at all levels of our being.

Indigenous peoples have been warning those involved in the military-industrial complex that the accumulated effect of constantly breaking spiritual, energetic and ecological laws will lead inevitably to social, economic and ecological chaos. Pre-industrial societies, such as the Mayan civilization in Central America, which destroyed their ecological foundations also collapsed. The difference now is that the industrial mind, which recognizes nothing as sacred, has colonized the Earth. Hence, for the first time in human history, we face multiple planetary-level crises.

SHAMANS FROM the Colombian Amazon have been sharing their insights into this crisis with African civil society leaders since 2004. Their message is clear: the level of destruction of the planet is so huge that we need to follow a disciplined path of potency to heal our world. Two essential elements in guiding this path are sacred natural sites and the associated Guardians and Elders, who are able to communicate with the spiritual world and understand these special sites as a network of potent energy points on the body of the Earth. These play a vital ecological and energetic function in maintaining the resilience of the Earth and human communities. It is essential to protect these sacred sites against the growing ravages of commercial and military forces, as their health is a primary condition for some level of recovery from the last few centuries of violations.

Five years on and the leaders of six African countries are rediscovering and working with their Elder knowledge-holders, who have resoundingly similar views to the Amazonians, North Americans and Russian Shamans. These Elders identify that their absolute priority

is to revive and protect their sacred natural sites, in order to bring back the traditional social order. They are clear that the deepening “sickness” which Africans communities suffer – from HIV/Aids to youth violence and material poverty – are all consequence of disrespect and violation of traditional norms within their territory, and especially their sacred sites. Chief Tshivhase from Venda, South Africa said, “If the Earth is sick, how can humans be healthy? We are responsible to our ancestors and to the future generation to maintain the health of our territories. Our norms teach us respect for all life. If we lose respect, we lose everything. This is why we are suffering – we feel the pain of the Earth each day, as we witness violence to the earth and among our people.

IT IS COMMONLY understood by traditions across the world that ceremonies associated with sacred sites play a central role in energizing these places of potency. They bring the community together at key moments in the ecological calendar: the planting season when the first rains come, the harvest season to give thanks, rain-calling ceremonies, and so on. In so doing they maintain the order of the human community in its relationship to the wider Earth Community. Children learn to respect the Earth, her cycles, the knowledge holders, and the roles and the roles and relationships in society and with Nature. Respect is understood as a way of being.

Sacred natural sites for most traditional societies are thus at the heart of their ecologically centred governance systems. By reinstating the role and potency of sacred places, order is brought back to both the territory and the human community. This order is the foundation of resilience, which is an essential characteristic especially required at a time of crisis and instability. The role of ecosystems and biodiversity in maintaining the Earth’s climatic, hydrological and energetic equilibrium is one of the central laws that knowledge of sacred sites teaches. These sites are also essential in traditional practices related to climate mediation.

AS THE BREAKDOWN OF global economic and trade systems deepen, so the opportunities grow for rethinking and reordering the chaos that has been created at every level of human and Earth relations. Cultural historian Thomas Berry foresaw that the collapse of industrial civilization was imminent and inevitable, as is the case for any society that destroys its life support system. The

biggest challenge we face, however, is to shift from an anthropocentric worldview to a more Earth-centred understanding of life. These last few hundred years have removed us from our ecological embeddedness so that we no longer recognize our total dependency on the earth. Our obsession with human-created ideas, things and places removes us from this reality.

THIS IS WHY Berry advises us that our two sources of inspiration are the Earth, as the primary giver of life, and Indigenous traditions, which hold the memory of our origins and our role in the web of life. Our challenge is to reconnect with our own Indigenous path – in other words, with our own origins and the inherent laws that govern life in the place where we live. This is the only true reality. When human-created ideas and objects fall away, what is left is the need for meaning, food, warmth and community – both the human and the Earth Community.

The crisis we face gives us this opportunity – or rather imperative. Now is a time to return to the first principles of life. Let us refer to the perennial wisdom in each of our own traditions, where we will find resonance with other cultures. And, as we are rapidly learning, there are limits to our self-centred hubris, and the Sacred Earth ultimately has the last call. There are non-negotiable limits beyond which we cannot go. Humility, respect and the willingness to learn from universal principles that have outlived the industrial path by multiple centuries are surely the first steps in the journey to finding our way back to an authentic, meaningful, healthy and non-violent life.

GIVEN THE COMMONLY HELD experience of sacred places as potent energetic centres of governance, learning and transformation within the sacred body of the Earth, we can – with the required attitude of humility, respect and willingness – befriend sacred place near home and discover what it has to teach us

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Liz Hosken is the Director and the co-founder of the Gaia Foundation, working on ecological and social justice. (<http://www.gaiafoundation.org/>)



Photograph by Martin Crowe

An interview with **Wangari Maathai**
by Satish Kumar, Editor of Resurgence Magazine

For many years, before humanity became aware of the dangers of climate change, Wangari Maathai was advocating the planting of trees. Her work was based initially in her home country of Kenya in order to redress the imbalances created by the imposition of a Western paradigm of progress on a country and people whose inherent wealth and wisdom went unrecognised. Wangari's intuitive understanding of ecology began when she observed a pristine stream in her childhood village become dry and barren as the forests around her home were cleared; she realised that the wellbeing of her people depended on the wellbeing of the natural world. This innate understanding of the interconnectedness of all life led her to found The Greenbelt Movement in Kenya, which has in the intervening years planted millions of trees. I asked Wangari if she felt The Greenbelt Movement was a model that could be replicated throughout the world.

"The fact that trees can sequester carbon is really a miracle," she replied, "but when we started planting trees, that was not foremost in our minds. But the more I now think about climate change, the more I know for sure that trees are our best friends in the global effort to mitigate climate change. So, yes, at Copenhagen (in 2009) we will be strongly advocating that forests must be part of the solution."

Despite Wangari's Nobel Prize and her high-profile work (and that of many others) to save the world's remaining forests, the message still seems to fall on deaf ears. "How is it", I asked, "that well-educated politicians and economists still cannot see the link between healthy environments and healthy people and economies?"

"Part of the problem is that the underpinning science is very abstract and the majority of people don't quite understand it," Wangari explained.

'Trees
are
the
Answer'

"What is needed is to have the science translated into a language that people can comprehend, so that we can create a movement of citizens who understand that the planet is under threat and who are willing to take action and put pressure on politicians to make the right long-term decisions.

"We also need to educate politicians and business leaders. President Obama is promoting a lot of excellent initiatives, and it was very encouraging to see the US Secretary of Energy, Dr Steven Chu, at the recent Symposium on Climate Change convened by HRH The Prince of Wales. Dr Chu attended the conference from the beginning to the end and that is clearly a demonstration that, at long last, the US government is committed to addressing climate change.

"But once we understand the nature of the problems we face, then we need to do

two things. Firstly, we must change our own lifestyles because unless we practise what we preach, no-one will listen to us. We have to 'be the change we want to see in the world'. And secondly, we must put pressure on our governments to take action and to commit to supporting that change via policy and economic infrastructure.

"I think that, ultimately, it is the collective conscience of citizens that will eventually change the politicians' minds. Politicians respond to public opinion and unless public opinion is informed, it cannot put pressure on politicians. So, education for politicians and the public alike is of the utmost importance. The more people who get to understand the science, the more people who get to commit, the more we create a critical mass or movement for change that puts pressure on the government to commit politically but also financially."

Wangari's work to educate people about the link between our cultural values and the wider environment is backed up by an initiative called the Billion Tree Campaign, launched in Nairobi in 2006 in association with the UN Environment Programme (UNEP). By the time Wangari went to the Climate Conference in Bali the following year, a billion trees had already been planted. Now, she tells me, more than three billion trees have been planted worldwide as part of this campaign.

"Achim Steiner, the Executive Director of UNEP, has just launched a Seven Billion Tree Campaign," says Wangari. "That's seven billion trees by the time we reach the Copenhagen Climate Conference in December this year, as a way of mobilising public opinion and raising awareness. But it's also a way of saying that we can all help in the fight against climate change – by planting a tree. Everyone can do this, and every tree that is planted sequesters atmospheric carbon. It means that anybody – poor or rich, man or woman, educated or uneducated – anybody can plant a tree.

"I also encourage the protection of standing trees. We have not yet appreciated the true value of the tree: it stabilises the soil; it gives us shade; if it is a fruit tree it gives us fruit. The tree fixes carbon for us; gives us oxygen; regulates the composition of the air... Trees are a wonderful gift to humanity!

"Trees also have spiritual meaning. I come from a tradition where our ancestors prayed and made offerings to trees. My people were particularly respectful of the fig tree. To them it was a symbol of



Women readying saplings at the Tumutumu Nursery in Kenya

Photograph by Ariel Poster

Firstly, we must change our own lifestyles... and secondly, we must put pressure on our governments to take action

the power of god – a gift that god gives. And trees are a symbol of plenty. In most other traditions around the world, trees have always been symbols of plenty. In the Bible it's a symbol of knowledge. So a tree is a wonderful gift.

"The Greenbelt Movement has been going for thirty years now, and as people can see the reality of improved environment and lifestyles thanks to trees and forests, there has been an upsurge in interest in this campaign – not only in Kenya but in many other parts of Africa and elsewhere in the world. In the beginning people thought we were a little bit crazy! But now people realise that there is wisdom in what we are trying to do.

"It is because of the work of The Greenbelt Movement that I was able to speak with Gordon Brown recently about the plight of the second largest forest in the world, the Congo forest, which is approximately twice as big as France. Prime Minister Brown pledged fifty million pounds from the British government to help us in our multifaceted work to help protect this forest region, and he also talked to his colleague in Norway, who gave another fifty million pounds. My work with The Greenbelt Movement and the precedent we have set in reforesting and protecting forest habitats were fundamental to that agreement. We have now established a Congo Fund, based in Geneva, which will continue to negotiate strategies with the international community to value and protect this critical ecosystem. I know that

if the politicians accept and include this and similar models of forest protection as part of the climate solutions at the Copenhagen conference, then we stand a real chance of mitigating climate change."

Wangari's ultimate message is that forests must be part of the solution, and a financial mechanism must be established so that it is no longer economically viable to cut forests down. She believes that the governments of forest nations must commit to monitoring to ensure that there is no misuse of the potential remuneration packages intended to reimburse the economies of countries that have agreed to keep trees in the ground, providing ecosystems services for all of humanity in perpetuity rather than destroying the forests for the short-term financial gain of a rich elite. But her message is also that trees are the givers of life, the teachers of wisdom, the gifts of god, and our greatest allies in the race to mitigate the effects of climate change

By the end of 2009, more than 7.4 billion trees were planted as part of 'the Seven Billion Tree Campaign' in excess of the 7 billion target. For more information visit www.unep.org/billiontreecampaign

Professor Wangari Maathai is Founder of The Greenbelt Movement and 2004 Nobel Peace Prize Laureate. www.greenbeltmovement.org

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What do we consider sacred? How do we value it? Can we look at a thing for what it is? Can political will be reasoned with? These are some of the fundamental questions explored in 'Taking Root: Vision of Wangari Maathai'. The one hour twenty minute documentary depicts the evolution of the Green Belt Movement in Kenya, from the days of struggle of its iconic founder and its transition into a source of strength for the people of the country through the seemingly simple act of planting trees.

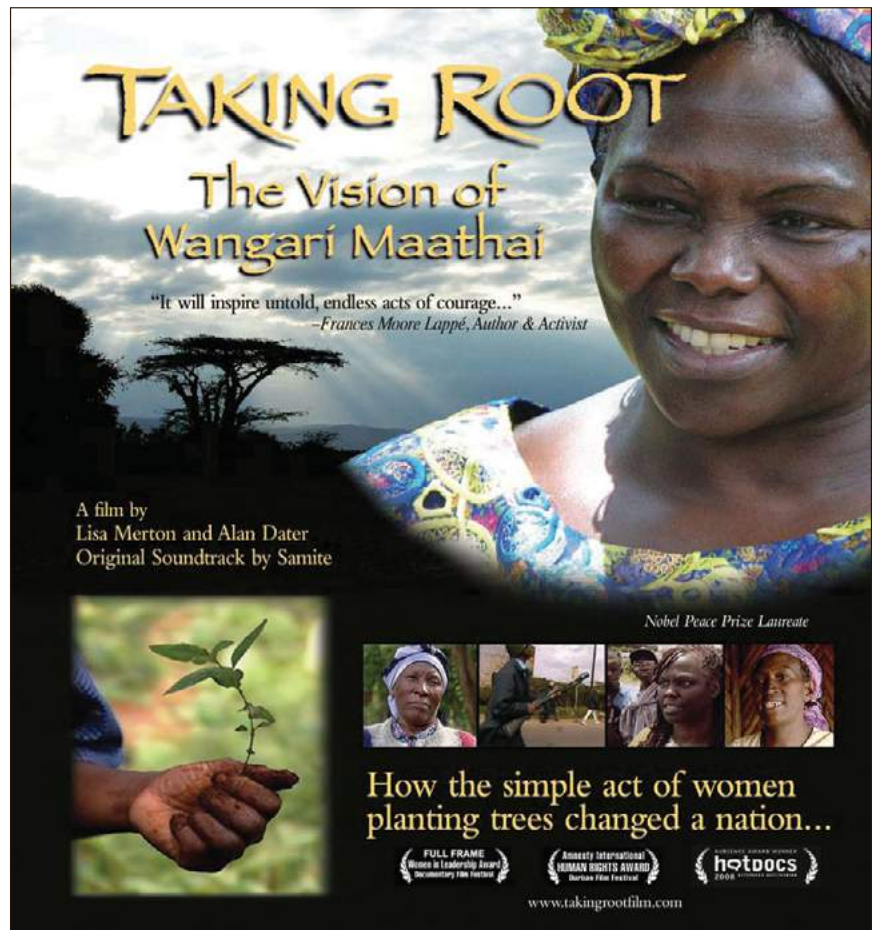
Narrated by Wangari herself, it begins with her experiences and memories as a child in Inhite, Kenya, where she spent a lot of time frolicking in the streams, learning to respect the fig tree that grew beside it, and gazing in awe at mountains that surrounded the area. In the 60s, her understanding of what had changed since her childhood came after she realized that the place of God was relegated to that of the Church, in a building, within walls. And this, she points out, took away the reverence one attached to trees, the protection of streams and nature from our everyday lives.

Wangari's stint in the Nairobi University entailed field work, and through her subsequent interactions with rural women, she saw that many of the native indigenous species had been replaced with mono-varieties, that the land was degraded, there was deforestation, it was impacting the livelihood, that growing only cash crops like cashew and tea were harmful to the once-fecund soils, and the women were having to walk further to fetch firewood.

Planting trees was her answer, and that had significant repercussions; for promoting democracy, upholding human rights and safeguarding the environment.

The film uses archival footage and in-depth conversations with members of the Greenbelt Movement – lawyers, professors, activists and rural women – to depict the political discordance in Kenya in the 1980s and 90s, and the determination of the members of the movement to extend their support to what was taking place across the country. Rare photographs from the times of colonialism give an idea of the diversity of tribes that once inhabited the region, and how they were driven out to inhabit the British settlers.

The context of the documentary is easy to identify with here in India, where we have a significant rural and tribal population with their own rituals, beliefs



By Pooja Nayak

"Culture is coded wisdom...wisdom that has been accumulated for thousands of years and generations. Some of that wisdom is coded in our ceremonies, it is coded in our values, it is coded in our songs, in our dances, in our plays."

Wangari Maathai

and customs that are largely Nature-centric, and their fight for rights in diverse places – whether the struggle for Independence from colonialism in the early half of the 20th century or to a more contemporary struggle against the nuclear plant in Jaitapur in Maharashtra, displacement due to the Sardar Sarovar Dam in Gujarat or a mine in Niyamgiri in Orissa.

One of the many important messages that the documentary conveys is that sanctity emerges through kinship, and that relationship in turn, nurtures its people and their surroundings. The second is, compelling issues like human rights, democracy, environment, social justice, and poverty need to be viewed through a single lens, the symptoms and causes that unite them need to be addressed together. In Kenya, planting trees functioned as the 'lens' which ensured that communities could rally themselves around various causes while at the same time addressing

issues of daily sustenance and land degradation. And the work Wangari did was built on encouraging the wisdom that had existed for so many years. *"There was something in our people that had helped them conserve those forests. They were not looking at trees and seeing timber. They were not looking at elephants and seeing ivory. Or looking at the Cheetahs and seeing the beautiful skin for sale. There was no such economic value of these animals so they let them be. It was in their culture to let them be."*

Filmmakers Lisa Merton and Alan Dater believe *'Wangari's story is organic, her rural roots connect her deeply to the Earth, and despite her education and years in academia, she had never lost that connection.'*

Pooja Nayak is the Assistant Editor of Eternal Bhoomi Magazine.

Walking in the 'Abode of Clouds'

By Pankhuri Singh

*A journey in search of old traditions, wisdom, culture,
love, innovation, creativity and humanity in Meghalaya*



Illustration by Pankhuri Singh

In the city, every time I put my feet on the ground I remain oblivious of the connection I have with the earth beneath my shoes. The concrete and the thick layer of tar obstruct my senses from going deep down. When I walk, I walk with heavy and unmotivated steps, with a strong desire to reach the destination as soon as possible. The eyes look in the same direction always. The ears are used to cars honking and people screaming. The nose breathes in the pollution and breathes out a sigh of sadness and distress, the heart fears this world of competition and hides itself deep inside me...People of this world see hope only in separation.

The crazy, violent and distracting city life didn't appeal to me anymore. Lost in the glare of meaningless, luxurious lifestyles in cities, we detach ourselves from a very important bond. Instead of experiencing ourselves as a part of nature, we act as an outside force destined to exploit nature when we want and then declare ourselves as the saviors of nature when we fear that our survival is under threat.

If there is anything I have learned, it is this – caring for nature should not come from the fear of human extinction. The motivation to preserve the planet should evolve from the realization that we are a part of everything around us, inextricably connected to every living and 'non-living' thing. As John Muir has so evocatively



Photograph by Pankhuri Singh

*Meghalaya's root bridges are made by using the roots of the *Ficus elastica* tree. This tree grows commonly along the riverbanks, and is also found perched atop big boulders. In fact, these roots entwine themselves around these large boulders in order to create a firm connection with the earth.*

said, "When we try to pick out anything by itself, we find it hitched to everything else in the universe."

So, to inspire myself, I decided to continue my walk in the East Khasi hills of the state of Meghalaya, in the North East of India. Meghalaya in Hindi means 'the abode of clouds'. The inspiration to do this journey on foot came from an article I had read by Bill Bunn, where he aptly stated, "When we walk we stop killing. We take our place in nature and restore our humanity." And so I walked, to reconnect, rediscover and re-establish my bond with nature.

Walking for Learning

I joined a group of diverse people from different parts of the country and all over the world, choosing to walk in search of old traditions, wisdom, culture, love, innovation, creativity and humanity in this land. This journey by foot, called 'Shodh Yatra', is always headed by Prof. Anil Gupta, and is a scouting, networking and dissemination programme of an organization called SRISTI. Shodh Yatra aims at unearthing such traditional knowledge and grassroots innovations that have not only enriched the lives of

men, women and farm labourers but have also significantly contributed towards the conservation of biodiversity.

Another aim of the yatra is to create exchange and sharing between farmers from different geographical locations. The journey is an interesting one, because I had an opportunity to experience four different kinds of learnings: From within, from each other, from nature and from the local people.

The walking pilgrimage happened over eight days and it began from village Laitkynsew Sohra (Cherrapunjee) to

Smit near Shillong, which is the capital of Meghalaya. We trekked through the forests and stopped by every village enroute. We had conversations with the farmers about the different methods they had developed in organic farming. The conversations also entailed mutual sharing of creativity and different innovations that villagers had developed over time. There were competitions held to test the wisdom of the young students of the villages about different medicinal plants found around the village. These activities were also, in a way, to inspire the young generation to sustain their fast disappearing traditional wisdom. Women were encouraged to share their most nutritious recipes with the objective of making people aware of the unique nutritional value of the indigenous crops and their importance in maintaining the agro-ecological diversity.

Walking for Connectedness

Often, though a trip is planned with ecological aims, the very fact of travelling by a vehicle contributes highly to one's carbon emissions. In comparison, walking helps drastically minimize one's ecological footprint during the trip. On a vehicular transport, our pace is fast but observation is slow. We see many things, but miss seeing things 'through'. Walking thus enables a closer look at what is going on around us - little ants scurrying around doing their work, birds zipping past in search of the next meal, an eagle soaring gracefully above in the open blue sky, a snail moving even more slowly than I am but with a persistence that is inspirational.

And then we walked some more, through the undulating valleys and steep trails. We continued walking deeper into the valleys and visited remote and isolated villages. At times when we struggled in adverse conditions, we drew inspiration from people and animals going about their daily lives.

Seeing how the local people coped with the difficulties and hardships of living in such remote areas, taught us a lot. It was interesting to see how people who live in such difficult terrain, manage to do so in a much more sustainable manner. We observed that the local people were closely connected to nature and were very content as a result. They did not complain about what they did not have; instead, we saw instances of how they met their requirements with things available around them and used them efficiently.

In most of the houses, we noticed

that old truck tyres were used as pots to grow small medicinal and kitchen plants. They would also use these tyres to stack different kinds of tools. In one house, we discovered a four staged 'Chulha', which was created for the optimum use of heat energy generated from burning firewood. This is a fireplace with different levels that have different functions, which optimize the use of heat. On the first rack above the fire, sit big pieces of wood to dry; the second rack holds pieces of meat being preserved, and the top rack houses seeds inside a cloth bag to preserve them well.

Walking for Inspiration

As we continued to trek further, we found the magnificent old Khasi Living Root Bridges in the village of Nongriat. Instead of using cement, the villagers, using their ingenuity, have created

The motivation to preserve the planet should evolve from the realization that we are a part of everything around us, inextricably connected to every living and 'non-living' thing. As John Muir said, "When we try to pick out anything by itself, we find it hitched to everything else in the universe."

wonderfully functional and aesthetic living root bridges. These bridges are made by using the roots of the tree called *Ficus elastica*. This tree grows commonly along the riverbanks and is also found perched atop big boulders. In fact, these roots entwine themselves around these large boulders in order to create a firm connection with the earth.

Another clever technique the villagers use is to direct the roots of this tree through the hollow trunk of the areca nut tree. As the bridge begins to take shape, flat stones are laid over the roots and they gradually become embedded into this living growing frame of roots to form a strong walkway

over the river. Over time, these roots form strong bonds with each other and a living root bridge comes into existence. Some of these bridges are over two hundred years old and perfectly usable even today. In fact, villagers claim some of these root bridges can carry over 50 people at a time. They have even made a double-decker root bridge for the fun of it!

What a contrast this makes with urban ways of living! Our hugely expensive city bridges made of iron, cement and mortar tend to grow weaker with time, needing constant and ever-increasing maintenance. The Living Root bridges in the Khasi hills, on the other hand, have continued to grow even stronger with time. In fact, they can be sustained for long periods with minimum maintenance and inference from us. Moreover, they cost nothing to make.

When I look deeply at these amazing root bridges, the incredible waterfalls, the resourcefulness and creativity of the children, I feel a strong sense of identification with the environment. It is visible when one sees how the Khasis are still preserving the natural sacred groves from which they do not take anything, thereby allowing them to grow sustainably and without interference.

Like Stephen Harding explains in the context of deep ecology: "This identification is a heightened sense of empathy and an expansion of the concern with both human and non-human life. We then understand that other beings, ranging from microbes to multicellular life-forms, from ecosystems to watersheds, in fact to Gaia as a whole, are engaged in the process of unfolding their innate potentials. We realize how dependent we are on the well-being of nature for our own physical and psychological well-being. As a consequence, there arises a natural inclination to protect non-human life."

Pankhuri Singh has worked with WWF-India as a researcher studying human-wildlife conflict in the Terai Region and EIA of large hydro-power projects in the North East Himalayas. At present, she is working in the fields of theatre, art, ecology and education. She can be contacted at pankhuri.ses@gmail.com. Her artwork can be accessed on www.awaraaart.wordpress.com

CYCLES OF NATURE

By the Daily Dump Team

There's magic in the air and everywhere...

Photograph from Daily Dump Team



It is that time of the year again, a time when everywhere we look; we find piles and piles of leaves shed by trees. For many urban dwellers, the sheer volume of these leaves and the constant need to sweep and collect them is a nuisance. And that is one of the numerous limitations of our urban blinders. If only we were able to see that, the shedding of leaves is perhaps the simplest and most direct way for us to experience the magic of Nature's cycles.

Due to their ability to photosynthesize, plants are the only living things that produce their own food as well as food for other living things. They take in carbon from the air in the form of carbon dioxide, produce carbohydrates (like glucose) and release oxygen, which keeps life on Earth going. And when the plants shed their leaves, they are decomposed by millions of soil microorganisms to release carbon to the soil and air, which is absorbed by a new plant again. The cycle thus continues so more food can be produced. This forms part of the 'Carbon Cycle', one of the many essential cycles in nature. In fact, the same carbon atom can move through many organisms and even end in the same place where it began. This is the magic of the carbon cycle; the same atoms can be recycled for millions of years!

The 'Nitrogen Cycle' is another example of the fascinating coordination and inter-dependency between the various biotic and abiotic elements in nature. Nitrogen found in the atmosphere cannot be used as such by plants and animals. It is converted by bacteria present in soil and water to more usable forms. Animals then get their share by eating plants/plant products, and humans get theirs by eating animals/plants/plant products.

When animals and plants die, and when plants excrete, they release inert nitrogen, which is once again converted to complex forms by microbes to a form that continues the cycle. And why, one might wonder, is the nitrogen cycle so important? The answer lies in the fact that nitrogen is the most important part of the building blocks of life – proteins. That all these cycles continuously occur on their own is indeed fascinating.

When we begin to engage with life around us, we realise that size does matter. We humans are but a small part of the Earth. It is the millions and millions of microorganisms and other small creatures that ensure life is continuously engaging with one another. Perhaps, a walk in the garden or park or forest with a magnifying glass, would offer us a glimpse into a completely new world primarily inhabited

by these microbes that sustain life on earth. As Geoff Lawton, a permaculture consultant and designer explains in his film (40 Tons of Life in One Acre of Soil), “there can be as much as 40 tons of life actively at work in an acre of soil, and let’s not forget that that life is almost completely restricted to the top few inches of top soil”.

Microorganisms like bacteria, fungi and other larger organisms break down leaves, twigs, grass clippings and all organic matter to a rich resource—compost; in the presence of air and water. The whole process of decomposition is truly like magic. One cannot see the microbes in action and yet the result is evident. A pile of organic matter will, over time, heat up, shrink in volume and convert to dark, rich compost. Further study of this process reveals that this happens thanks to an amazingly well-defined hierarchy and role definition among the microbes. Through this biological process that returns organic matter to the soil, the composting cycle becomes part of the earth’s biological cycle of growth and decay and ‘compost itself is thus a symbol of continuing life.’

Nothing new can ever be added on Earth, except the energy of the Sun. It is therefore critical that living things be able to reuse the existing matter repeatedly. This means that things have to be continuously recycled. Which is why, the cycles of Nature like the carbon cycle, nitrogen cycle, and soil fertility cycle are so important for all of us. So, if we take efforts to fertilise our land (gardens/parks/soil) by composting organic matter around us, not only would we be completing a key link in the soil fertility cycle, we could also be an integral part of the magic!

A simple poem in ‘Long Live Earth’ by Meighan Morrison (Scholastic Publication, 1994) sums it up thus:

***If you can, plant a tree
or a garden to suit.
Be good to the soil,
and the seed will bear fruit***

The Daily Dump team keeps itself busy trying to find ways and means to make waste beautiful and visible; and to address waste-related behaviour. We feel lucky to be working so closely with composting – a key part of the magical cycles of nature. Get in touch at www.dailydump.org or dailydumpcompost@gmail.com

Bhoomi Recommends...

Home



The most appropriate way to understand ‘Home’ is to just watch it, to let the stunning visuals wash over you, lulling you to a near-meditative state, in a way that pictures of the Earth, our Home, never have before. Produced by Europa Corp and directed by Yann Arthus-Bertrand, this documentary was released on Earth Day, June 2009, and was simultaneously screened across many countries, free of cost, despite the enormous expense incurred for producing the movie. It is available for download on its website or from YouTube.

Home articulates on-screen issues that countless activists, organizations, and individuals across the world have been fighting for years, that the time to be apathetic or even pessimistic is long gone; that if a reversal of the current exploitative paradigm has to change then ‘moderation, intelligence and sharing’ need to be the themes we embrace in our daily lives.

The movie has been shot in slow motion, with special cameras, and provides an aerial view of images from different parts of the Earth. From the rocky wastelands of volcanoes with plumes of smoke renting the skies where the earliest life forms on

Earth were born, to the gleaming ice-sheets of the Arctic that teem with life underneath, the glaciers in the Poles that preserve close to 20% of the fresh water available today, the virgin swaying forests of the Amazon, the elephants and hippos snaking their way sinuously through the marshes; and then the belching industries, human cities and cattle ranches in deserts reinforcing the mirage of unending growth – the movie depicts the best of what that has survived despite mankind’s unending quest for progress, and the worst that is still being perpetuated in the name of it.

The bird’s eye view gives us a different perspective, it allows us a chance to step out of the frenzy of everyday activity and examine how surely, and steadily, we’re changing the face of our planet, not only for us but also for the millions of species that share this home with us.

A great movie to show students in schools and colleges, Home depicts the whole picture, the bigger picture, not merely the bits and pieces of information that we are used to.

Watch it @ www.home-2009.com

What Religions say about Mother Earth



Common persons need wood for fuel. They will continue to cut trees till the forest is destroyed. But, a wise person (Muni) thinks about the importance of forests in relation to Nature. He thinks about the balance of natural agencies. He thinks of relationship of Forests and Climate.

- Bhagwad Gita

(Chapter 3, Sloka 29 - Sanskrit verse translated into English)

"A tree is equal to ten sons. The ten gifts of the tree are - Oxygen, Water, Soil, Food, Cloth, Energy, Shelter, Medicine, Fodder and Shade.

And What a son! The tree wants care and water but for five years, and needs no milk, no nurse."

- Upanishads

Sanjaya to Dhritarashtra: "There is no place like Mother Earth. Everything is born out of this Earth and finally goes back to Her. She is the father, mother, son, space, heaven, and everything. Whatever may be your faults, She regards everybody with equal affection."

(The Mahabharata, Bhishma Parva, 10-74)

*Just as the nature of Earth is one
While beings each live separately,
And the Earth has no thought of oneness or
difference*

So is the truth of the Buddha

- Avatamsaka Sutra

Human use, population, and technology have reached that certain stage where mother Earth no longer accepts our presence with silence...

Because we all share this planet earth, we have to learn to live in harmony and peace with each other and with nature. This is not just a dream, but a necessity.

- Dalai Lama XIV

Understanding unity helps to solve humanity's biggest challenges. There is no such thing as an isolated problem. By injuring any part of the world's system, you injure yourself... Think of life on this planet in terms of systems and not detached elements. Broaden your field of vision and assimilate the knowledge you have.

- Za Rinpoche





If you have men who will exclude any of God's creatures from the shelter of compassion and unity, you will have men who will deal likewise with their fellow men.

- St. Francis of Assisi



“Assuredly the creation Of the heavens And the earth Is a greater (matter) than the creation of men: Yet most men understand not.”

The Qu’ran (40:57)



“And the earth We have spread out (Like a carpet); set thereon Mountains firm and immovable; And produced therein all kinds of things in due balance. And We have provided therein Means of subsistence,—for you And for whose sustenance Ye are responsible.”

The Qu’ran (15:19-20)



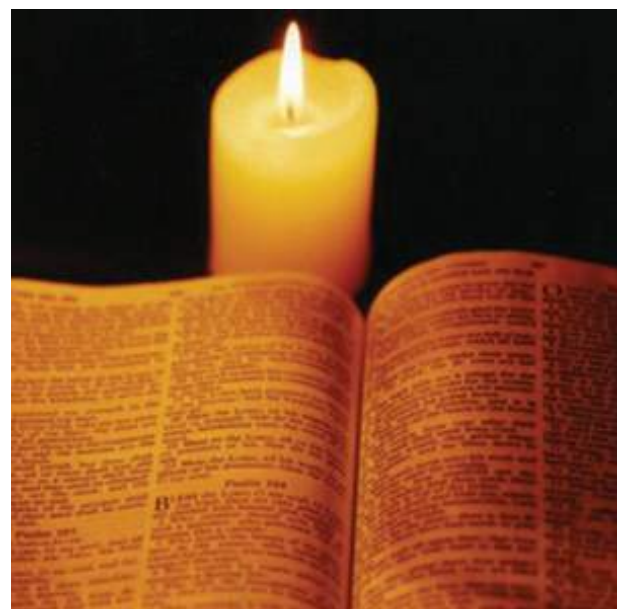
God wills the interdependence of creatures. The sun and the moon, the cedar and the little flower, the eagle and the sparrow: the spectacle of their countless diversities and inequalities tells us that no creature is self-sufficient. Creatures exist only in dependence on each other, to complete each other, in the service of each other.

*From CATHOLIC CATECHISM
on the Integrity of Creation, Providence
and the scandal of evil, 339 & 340*

The seventh commandment enjoins respect for the integrity of creation. Animals, like plants and inanimate beings, are by nature destined for the common good of past, present, and future humanity. Use of the mineral, vegetable, and animal resources of the universe cannot be divorced from respect for moral imperatives. Man's dominion over inanimate and other living beings granted by the Creator is not absolute; it is limited by concern for the quality of life of his neighbor, including generations to come; it requires a religious respect for the integrity of creation.

All creatures, therefore, tried to give their love in return to the saint and to reply by their own gratitude according as he deserved; they were glad when he caressed them, they agreed when he requested anything, they obeyed when he commanded anything.

*- Celano, Historian and
Companion of Saint Francis*



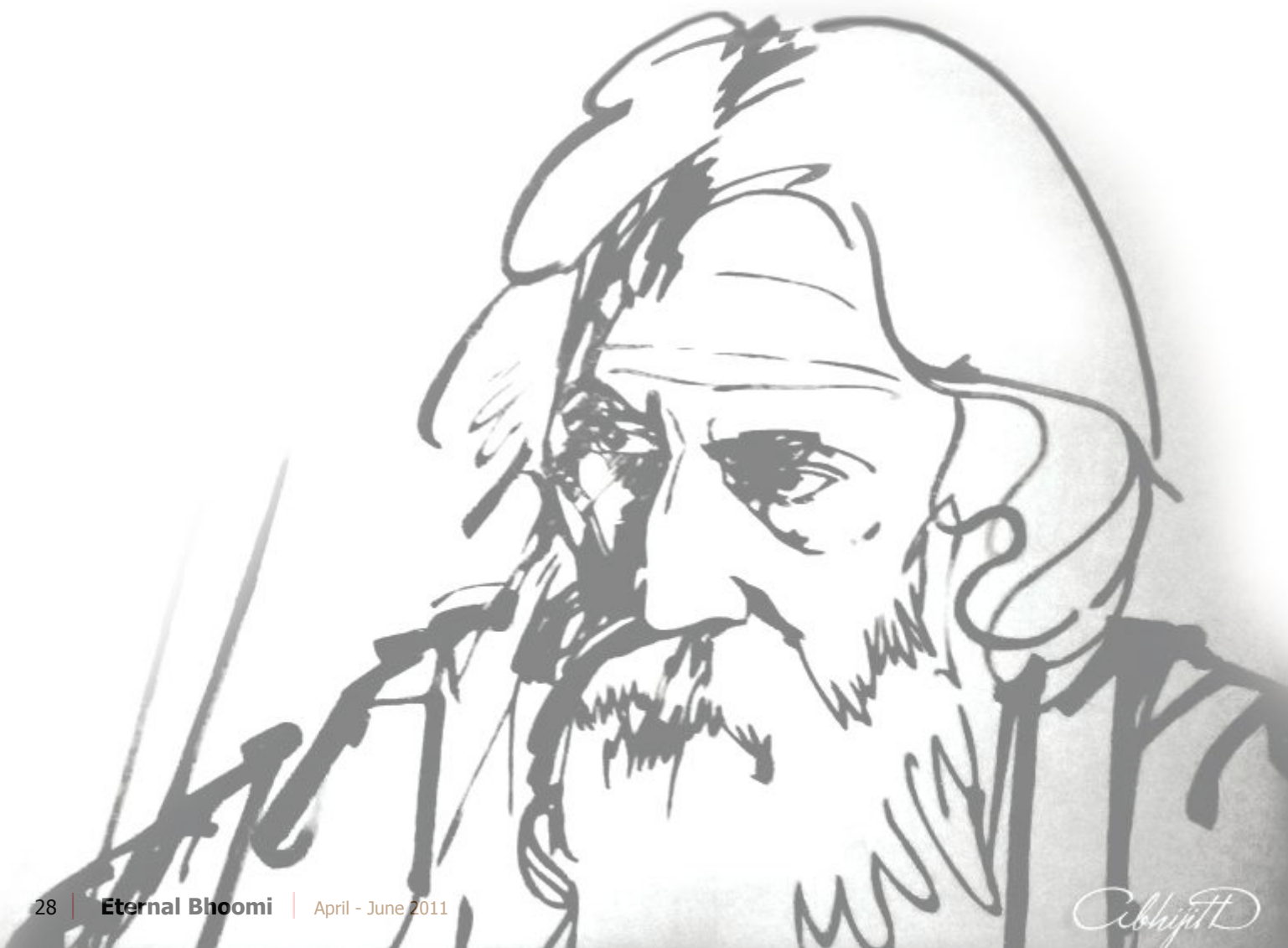
*The same stream of life runs through my veins night and day
runs through the world and dances in rhythmic measures.*

*It is the same life that shoots in joy through the dust
of the earth in numberless blades of grass and breaks into
tumultuous waves of leaves and flowers.*

*It is the same life that is rocked in the ocean - cradle of birth
and of death, in ebb and in flow.*

*I feel my limbs made glorious by the touch of this world of life
And my pride is from the life-throb of ages
dancing in my blood this moment.*

Excerpt from Gitanjali, Rabindranath Tagore



BIODIVERSITY

What is Biodiversity?

Biodiversity is the collection of all living species on earth, including all ecosystems within which life – plants, animals and microorganisms – exists and thrives. Biodiversity may also be described as the degree of variation of life forms

within a given ecosystem. To a large extent biodiversity is determined by the climate of a place. Tropical forests for instance are rich in biodiversity while deserts are not.



The total number of species on earth is estimated to be between 3 million and 100 million – a huge range of uncertainty indeed, which indicates how little we know of the biodiversity of Gaia! The Convention on Biological Diversity has said that there are some 13 million species of which some 1.75 million have been described. About 70% of the world's biodiversity has been discovered and described in just 12 countries - Australia, Brazil, China, Colombia, Costa Rica, the Democratic Republic of Congo, Ecuador, India, Indonesia, Madagascar, Mexico and Peru.

Loss of Biodiversity

Loss of biodiversity is taking place at a much more rapid pace than ever seen before. Rapid environmental changes typically cause extinctions. The IUCN Red List of Threatened Species has estimated that the number of species threatened with extinction is close to 17,000. This includes one in four mammals, one in three amphibians

and one in eight birds. Experts say that by 2050, 1/3rd of the species of the world today will be extinct.

The current pace of change and loss of biodiversity is 100 times more than previously recorded, especially in the Amazon, South and South-East Asia and Africa. This loss of biodiversity is primarily due to deforestation for conversion of land for agriculture.

Impacts of Loss

Biodiversity is an indicator of the health of an ecosystem. It cannot be limited to an economic value or seen as a provision of raw materials; it does much more than that. An enormous range of species and habitats maintain the balance of the entire earth. The loss of biodiversity has effects on human well-being, food security, energy as well as on social and cultural relations.

The marginalized are much more affected by the loss in biodiversity – they are more directly dependent on ecosystem services. A study conducted by The Economics of Ecosystems and Biodiversity (TEEB) has put together the economic value of biodiversity as in the order of multi-trillion dollars.

Biodiversity plays a major role on human well-being – evident though our poetry, our epics, our stories and the reverence for Nature since ancient times. The entire system of Ayurveda is based on the diversity of plants and animals that exist around us. Our role as individuals is also dependent on our diversity and our ability to think and act differently. We cannot take this loss of biodiversity lightly.

Source: www.scidev.net, www.greenfacts.org/en/biodiversity

This poster is an attempt to showcase some of the smaller fauna that abounds on Earth. We thank photographers Tom Forward, K. Srikanth and Ananth Somaiah for sharing their stunning photographs! Many thanks to Chinmay for design and layout.



Photograph from Wikipedia



(Photograph by Tom Forward)

Biodiversity of Gaia ~ our living Earth

Gaia, our living Earth has over 5500 species of mammals, over 2900 species of snakes, about 15,000 species of butterflies...



(Photograph by Tom Forward)



(Photographs by Ananth Somaiah)

... about 10,000 species of birds, over 2 million species of insects and more than 5000 species of frogs...



(Photograph by Tom Forward)



“In pushing other species to extinction, humanity is busy sawing off the limb on which it is perched”

- Paul Elrich

All photographs in this page by Srikanth Kashyap

Nature seems to have gone crazy creating millions of species, not one of which can be created by humans... Why is it difficult for modern humans to delight in all these creatures and live cohesively with them?



Gharials & Gaia



Photograph by Clifford, Wikimedia

Over 100 gharials mysteriously died in the Chambal River recently, possibly poisoned by toxins. This points to the fact that wildlife conservation will simply not survive if we concentrate only on a few islands called 'protected' areas.

By Ashish Kothari

Amongst the recent top biodiversity stories are the release of the national estimate of tigers, and revelations of the possible causes of the mass deaths of gharials in central India. Both stories point not only to the failure of our wildlife conservation strategies, but to the dangers of a path to 'development' that fragments and poisons nature. Both are indicators of the increasing collapse of ecological systems that will ultimately backfire on humans themselves - unless we do something drastically different, and dramatically fast.

I won't deal here with the tale of the tiger, as it is well known and many commentators of various hues have

already brought out its various dimensions. I'll concentrate instead on the crocodile, which normally takes up much less media space than the striped cat.

In December-January 2008 came the shocking news that over 100 gharials had been found dead in the Chambal River. This river is one of the few remaining strongholds of the species, distinguished from the more common muggercrocodile by their long snouts often ending in large knobs called gharas. India, as a whole, has perhaps only 1,000 adult gharials left, and in the Chambal maybe around 300, so the death of over 100 gharials was bound to send shock waves through conservation circles. The Principal Chief Conservator

of Forests of Madhya Pradesh, P.B. Gangopadhyaya, is reported to have asked the central government to declare this a 'national conservation emergency'.

Scientists from India and abroad immediately got into the act, and at the time of writing this, their tentative conclusion is that some toxins are responsible for the mass deaths.

But what toxins? And from where? And why have the deaths been restricted to gharials? Or are they? Are smaller aquatic fauna also dying, without being noticed? Answers to these questions may be some time coming, as investigations proceed. But there is at least one inescapable conclusion that can already be

derived, and it points to dangers not only for species like the gharial but to all life forms, including humans. And it is this: chemicals and other toxins introduced into one part of the planet might travel to a completely different part and affect species and ecosystems there.

Actually, this is not a new concept. Four decades ago, when traces of the pesticide DDT were found in penguins in the Antarctic, it became clear that long-lasting chemicals used by us anywhere on earth could land up halfway across the world and affect life forms there. That was a dramatic illustration of the Gaia theory – that the earth is one living entity, and what is done to one part of it affects other parts.

The gharial incident may not be as dramatic as that of the DDT - poisoned penguins, but it nevertheless points to the same connectivity. Dr Fritz Huchzemeyer, Vice-Chairman of the World Conservation Union (IUCN) Crocodile Specialist Group's veterinary advisory group, said that the most likely cause of the gharial deaths was toxins carried by the tilapia fish found in the Yamuna river (tilapia itself is of serious conservation concern, as it is an African fish introduced here, leading to displacement of indigenous fish). Most of the deaths occurred in a small stretch near the confluence of the Chambal and the Yamuna. Whether this is the cause, or some other poisons from elsewhere, what this means is that wildlife conservation will simply not survive if we concentrate only on a few islands called 'protected areas'. The stretch of the Chambal where the gharials were found dead is a wildlife

Chemicals and other toxins introduced into one part of the planet might travel to a completely different part and affect species and ecosystems there ... a dramatic illustration of the Gaia theory – that the earth is one living entity, and what is done to one part of it affects other parts.

sanctuary, duly protected under the Wildlife (Protection) Act. Not only that, the gharial is protected across the country from hunting or capture or any other form of harm. Yet, over 100 individuals of a completely protected species died within a completely protected area, within a few days of each other.

This points to the need to look at conservation well beyond the borders of protected areas, into the entire landscape that surrounds such areas. In the case of rivers like the Chambal, this is actually plain commonsense. If someone is introducing toxic elements upstream of a sanctuary, a legal boundary downstream is not going to protect the species within in any way.

For over a decade now, international conservationists have been talking about 'landscape-level conservation'. They point to the need to understand the ecological connections within river basins, through mountain ranges, amongst the seas, and so on. Coral reefs in many parts of the world are being smothered by the outflow of soil from inland areas where forests are being cut down. India's biggest coastal lake, Chilika in Orissa, was shrinking

at an alarming rate due to siltation from deforested catchments further inland; so much soil was deposited that its mouth to the sea was virtually closed off. At grave threat were half-a-million fisherfolk and hundreds of species of wildlife. Only a major engineering operation to open another mouth, combined with afforestation in the catchment areas, offers hope that the lake may yet survive.

In fact, a Chilika Development Authority was set up precisely to solve a problem that could not be solved by dealing with the lake alone but by looking at the entire landscape and seascape it was connected to. It brought on board all the relevant government agencies dealing with development, welfare, and conservation, and had the mandate to also involve fishing communities and independent experts. Not all is well with its functioning, or so we hear, but at least someone got the idea right.

The gharial incident also displays an alarming twist to the old saying: what goes up comes down. Throw something in one place and it will end up affecting someone somewhere up the food-chain, down the river, or thousands of kilometres

Human activity on the Chambal River, M.P.



away where the sea waves have carried it. I remember my utter horror when I saw huge piles of plastic and metal waste washed ashore on the otherwise pristine beaches of southern Great Nicobar Island; thrown there not by the local tribal population but by ships passing dozens of kilometres out into the sea, or maybe even by inhabitants of more 'developed' societies somewhere around the Indian Ocean. Ever seen pictures of seal pups choked by the plastic holders of soda cans thrown away by careless drinkers maybe hundreds of miles away? Search the web, you'll see one, and then the full force of the Gaia effect will dawn on you.

And if even that does not move you, here's something that might. It was recently found that children in the Caribbean were suffering much higher rates of asthma than before. The cause? Dust blown all the way over from Africa, where land mismanagement and an increasing incidence of drought, possibly brought about by climate change, was drying up lake beds at an alarming rate. For millennia, the interconnectedness of the earth has been a boon for life; increasingly, we are turning it into a curse.

Clearly, action is needed on a much larger scale to understand the intricate web of nature and what we are doing to it, and to take conservation action across entire landscapes and seascapes. In the case of the gharial, it will be crucial to look at the Chambal and the Yamuna as a whole, and at their catchments. If there are industries throwing their effluents into these rivers (or their tributaries), or farmers spraying pesticides that are leaking into the groundwater and from there into the

rivers, or if there is deforestation and unsustainable land use leading to siltation, these need to be dealt with. Saving the gharial, and other inhabitants of the Chambal, could actually become the rallying point for an entirely different way of looking at river basins, and to think of their development in a truly sustainable manner. An unlikely rallying point, I admit. But then we need out-of-the-box ideas in such desperate times.

A Yamuna-Chambal River Basin Authority, if set up, could take the health of key species like the gharial as a crucial indicator of the health of the basin as a whole. It would direct resources to essential research on ecological parameters such as water quality, toxins being released into the rivers, the state of catchments, and so on. It would do this with the full participation of those living along the rivers, and in particular, fisherfolk and others most directly dependent on the basin's natural resources. It would hopefully be able to prevent the mass deaths of aquatic species, or at least respond with alacrity if any such events did occur. And it would ideally even be able to resist disastrous plans like those of linking up all rivers, by being able to demonstrate how this would play ecological and social havoc.

One seemingly outlandish idea has emerged in many countries—that of aligning political constituencies with ecological boundaries and connectivity. It's called 'bioregionalism' or 'ecoregionalism'. Current decision-making is based on political and administrative boundaries (districts, states, countries) that cut across river basins, mountains, and other natural entities. It is not surprising that these

decisions are insensitive to the ecological needs of the landscape, or to the needs of those communities most dependent on natural ecosystems. For instance, if people living dozens of kilometres downstream of Delhi were to be involved in deciding how Delhi should deal with its wastewater, decisions to invest in comprehensive water treatment plants would have been taken long ago.

Or to stretch the imagination a bit further, if the gharials of Chambal were to be asked how cities, industries and farmers upstream of them should behave, they may have used their gharas to knock some sense into our planners. The use of toxins may have been strictly prohibited, and safer alternative products found.

Of course, gharials can't speak. Or maybe they can? The 100 dead gharials of the Chambal have spoken eloquently, if tragically, to us. It is for us to heed their voices.

Ashish Kothari is a well-known biodiversity expert and the founder-member of Kalpavriksh, a 30-year-old environmental research and action group. He has been a member of people's movements against destructive development projects including the Narmada dams. He co-ordinated the Technical and Policy Core Group to formulate India's National Bio-diversity Strategy and Action Plan.

This article was first published in InfoChange News & Features, February 2008.

Photograph by Yann, July 2010





How Organic Farming can Feed the World

Photograph by Rishi Denuz

By Karthik Kumar

Organic farming is coming under attack from many quarters, even as awareness spreads that it is integral to a more sustainable and healthier way of life. Criticism ranges from doubts about its lack of capacity to feed the world, to, bogies being raised about people having to return to the 'dark ages' of food shortage and starvation unless recourse to intensive chemical farming is taken forthwith.

It is time that grains of facts shift the chaff or propaganda and fear-mongering to prove that, in fact, organic farming is the real alternative to sustainably producing enough food for the growing world.

Organic farming can feed the world and still have enough food left over!

An extensive study carried out in nearly 50 countries, both developed and developing, by a group of eight eminent scientists (from the University of Michigan and Michigan State University) concluded that the available food production was more than sufficient for humankind. They estimated the calorific value of all the food supply to be 2,786 kcal per capita per day, for the total volume of food supply available in 2001. The average calorific requirement for a healthy adult is between

2,200 and 2,500 kcal per day. Astoundingly, they also went on to prove that, if the same land had been farmed organically, then the calorific value available in 2001 would have in fact been much higher, i.e. 4,380 kcal per capita per day! Their data is summarised in Table 1.

More Yield, Less Land

The scientists referred to above show that organic farms in general tend to produce more crops per unit of farm than non-organic farms. For example, their study showed that organic farms yield 1.312 times more grain products (Table 2) than non-organic farms.

It is also significant that organic farms in developing countries have yields that are higher by 57% to 400% compared to non-organic farms, as a glance down Table 2 shows.

In developing countries, many of which are land-starved, the fact that organic farms have higher yields is a signal-call, if at all one is required, that they should forthwith switch to organic farming.

In Ethiopia, local communities and their local administration are in fact doing just that, under a project started in 1996 under the supervision of the Bureau

of Agriculture and Natural Resources (BoANR) of Tigray in partnership with the Mekele University. Project Tigray, as it is known, demonstrated that the introduction of ecologically-sound organic principles had very quick positive impacts on the productivity and well-being of farmers with small land holdings. The project also demonstrated that for farmers, particularly those in marginal areas, who were not able to afford external inputs, "an organic production management system offered a real and affordable means to break out of poverty and obtain food security."

In addition, the oft-cited argument that organic farming requires more land holds good only for cash crops. This is a conclusion reached by the FAO at a conference in 2007 where it observed higher yields through non-organic farming were seen mainly in cash crops grown in ideal conditions.

Organic farming uses less energy and mitigates global warming

Organic farming is often criticised as being energy-intensive with consequent impact on global warming as a reason to switch away from organic farming. Reality belies this.

Organic farming uses natural or naturally available means for farming. The farm is tilled by oxen; growing legumes, practising inter-cropping, rotating crops, composting, vermiculture, etc., help retain moisture, fertilise the soil and protect the crop against pests. Energy use is at its minimal with organic farming. Further, it has been demonstrated that effective watershed management techniques practiced in organic farms use less water to raise crops and increase the water table. Moreover, one may add, they do not poison the soil with chemical residues.

Contrast this with the energy used in 'modern' intensive farming – assorted farm implements such as tractors, threshers, harvesters which use internal combustion engines, pump-sets that dredge up massive quantities of water in irrigating the lands, the massive factories which make the fertilizers and pesticides that poison the earth, the clean up that needs to be carried out to replenish the soil, the effort, money and energy spent in building canals, dams, etc. The list is endless!

In light of all this, the proposition that organic farming is more energy-intensive than non-organic farming is laughable. It can be argued that even organic

farming uses mechanisation, for tilling or transporting produce to the market, for example. Notwithstanding such usage of energy, the total volume of energy consumed by organic farming per se, is lower than for non-organic farming, when all factors are considered.

The FAO Conference cited earlier went even further to say:

“Agricultural production methods specifically adapted to microclimates, production of diverse products, and cropping methods emphasizing soil carbon retention are most likely to withstand climatic challenges and contribute to food stability, particularly in those countries most vulnerable to increased climate change.”

It is time that policy be decided by genuine public interest rather than, disguised 'scientific facts', dictated by vested interests.

Are we asking the right questions about land use?

We have already seen that food supply through organic farming requires far less energy. And, if organic farming were to be practiced exclusively, we can use less land for agriculture without any major impact on food supply.

Today approximately 40% of the world's land area is being used for agriculture. This indeed is an awful lot of land! However, 70% of this agricultural land is used for cultivating crops to feed animals, i.e. 28% of the world's land mass is used for feed crops! All this meat provides just one-fifth of the energy required by human beings and only one-third of the proteins required by human beings. And, now with the increasing clamour for bio-fuels, land for non-food crop farming is only going to increase, creating more pressure on finite land resources!

Today, several studies and books show that a plant-based diet, with a lower level of meat, will result in the consumption of far fewer calories, and better health. Doing so would mean less land area required for growing fodder, and then perhaps there will be enough land to feed all, humans, animals

Table 1

Category	2001 (Actual organic + inorganic supply)		2001 (Model forecast if only organic food was produced)	
	Food supply (MT)	Actual per capita supply (Kcal/day)	Food supply (MT)	Actual per capita supply Kcal/day
Grain Products	944,611	1335.3	1,370,435	1937.2
Starchy roots	391,656	146.8	881,559	330.4
Sugars & sweeteners	187,040	247.7	283,565	375.6
Legumes (pulses)	32,400	53.8	124,099	205.9
Tree nuts	7,736	8.9	10,587	12.3
Oil crops & vegetable oils	110,983	326.4	166,010	488.2
Vegetables	680,802	72.7	1,213,027	129.6
Fruits (excl wines)	372,291	77.8	771,443	161.2
Alcoholic Beverages	199,843	64		64
Meat and offals	247,446	211.1	358,909	306.2
Animal fats	19,776	61.2	26,561	82.2
Milk excluding butter	479,345	119.7	836,434	208.9
Eggs	50,340	32.3	78,323	50.2
Seafood	95,699	27.4		27.4
Other aquatic food	8,514	1.4		1.4
Total		2,786.4		4,380.6

Summarised data from study by Michigan State University and The University of Michigan.

Table 2

Category	Average yield ratio (Organic: Inorganic)		
	World	Developed countries	Developing countries
Grain Products	1.312	0.928	1.573
Starchy roots	1.686	0.891	2.697
Sugars and sweeteners	1.005	1.005	
Legumes (pulses)	1.522	0.816	3.995
Oil crops and vegetable oils	1.078	0.991	1.645
Vegetables	1.064	0.876	2.038
Fruits (excl wines)	2.080	0.955	2.530
All Plant Foods	1.325	0.914	1.736
Meat and offal	0.988	0.988	
Milk (excl butter)	1.434	0.949	2.694
Eggs	1.069	1.069	
All animal foods	1.288	0.968	2.694
All plant and animal foods	1.321	0.922	1.802

From study of yields of organic farms by Michigan State University and The University of Michigan

and plants too, without necessarily having to poison our environment.

Land can be fertilised without fertilisers

The main limiting macronutrient for agricultural production is biologically available nitrogen (N) in most areas. In 2001, the global use of synthetic Nitrogen fertilizers was 82 million metric tonnes. However, 140 million metric tonnes of additional nitrogen could have been fixed by the additional use of leguminous crops – i.e., 58 million metric tonnes more than the amount of synthetic N in use.

Organic food need not be more expensive

Food production and distribution today are very heavily subsidised as is well known. Organic food, since it does not receive any of these subsidies, in comparison, comes across as being expensive.

It is reasonable, therefore, to assume that organically grown produce can be cost competitive if it receives the same subsidies given to non-organically grown foods, and is perhaps likely to be cheaper in view of its inherently superior yield!

So how does this affect us living in India?

A recent newspaper article opined that the per capita availability of food in India is a little over a fifth of the American average and little under a third of the European average. What the author did not touch upon was that 63% of Americans are overweight with 31% being classified as obese. Obesity trends in Europe are similar too. These data show that the additional availability of food rather than being a boon in America and Europe is in fact, a bane creating serious public health issues in its wake.

The moot point is, do we need to go through the tortuous process of obesity and its consequent public-health issues, or be smarter, and learn from the American and European mistakes, to continue to be a healthy India. The other major concern for India could be the ineffective public distribution systems that exist and the increasing lifestyle diseases that seem to be on rise in the urban areas.

Anecdotal evidence of the Indian experience suggests that Indian farmers too reap the many benefits of organic farming and many have begun calling it 'Indian Farming'! Thus, widespread adoption of organic farming in India is unlikely to materially impact the availability of food. Given our relative scarcity of land, large farmer population and fragmented land holdings, the benefits of organic farming appear uniquely suited to the Indian condition. So, perhaps, the time is right

to make a push into adopting organic farming in right earnest given the very many benefits it has, to both the producer and the consumer. The FAO too supports this point of view.

It is time that policy be decided by genuine public interest rather than, disguised 'scientific facts', dictated by vested interests.

Karthik is a concerned citizen of India. He is an independent strategy consultant with over 30 years of business experience in India.

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the Corporation

a film by Mark Achbar, Jennifer Abbott & Joel Bakan

By Sinduja Krishnan

The corporation is a nameless, faceless entity, has the characteristics of a psychopath, takes over the commons to extend control, and has the single-minded aim of profit – that, in essence, is the story behind Corporations of the world.

With commentary from critical thinkers, scientists and philosophers like Milton Friedman, Howard Zinn, Noam Chomsky among others, this movie examines the role of the corporation from many different angles – the good, the bad and the ugly.

The movie tracks the evolution of the ‘Corporation’, which grew out of the Industrial Age after the Newcomen Steam engine – a predecessor to the steam engine – was invented in 1712 to the current day Corporation. The purpose of the steam engine was to pump water out of coal mines in Britain, to reduce the time spent physically filling buckets of water. It was not just about helping the labourers, but about increasing productivity per man hour. The early corporations were supposed to be a gift from the people to serve the public good – to build a bridge across a river, to lay good, sturdy roads. However, very soon, the corporation became something other than benevolent.

The documentary brings to light the various ways in which corporations function – undermining governments, societies and communities. Citing the example of water privatization in Bolivia, the documentary illustrates a corporation’s attempt to extend control by taking over the commons, which should in reality be the right of every individual. Corporations approach it with disguised generosity, bringing hope to make a country’s resources better. Eventually, they take control, and access to clean water and air – a fundamental right – is now something that has to be paid for.

This not only includes goods, it also includes human rights and essential services. There are also those who advocate the owning of all commons as the only way to conserve them. One is forced to introspect and ask questions: The survival of our planet is dependent on the survival/ availability of the commons. How

then, can we be so unconcerned that we bequeath our commons to private ownership? Will we see a day when we pay for every drop of water that we drink? Already, in the case of land – earlier a commons – we see acres and acres increasingly owned by individuals and corporations.

The most significant fact that emerges is this – today, a corporation has come a long way from merely being a loosely knit group of individuals; it has now become an entity like ‘a person’. According to Noam Chomsky, the corporation is a “special kind of person”; one only concerned with its stockholders and not with its stakeholders i.e. the public. This is enshrined in law and hence not questioned by anyone.

If the Corporation is a person, what are his/her qualities? With the help of criteria laid down by the World Health Organization, used by behaviour analysts to determine disturbed individuals, the film explores this question. These criteria which determines the behaviour of a psychopath include 1) Reckless disregard for the safety of others. 2) Callous unconcern for the feelings of others. 3) Incapacity to maintain enduring relationships 4) Deceitfulness - repeated lying and conning others for profit. 5) Incapacity to experience guilt. 6) Failure to conform to social norms with respect to lawful behaviour.

And the results are damning - for the scores substantiate that on all the above counts the corporation is no less than a ‘psychopath’. Interestingly, even when a corporate executive may be considered highly respectable and ethical in his behaviour as an individual, as a corporate role holder he often becomes capable of psychopathic behaviour, such a marketing a known dangerous product and not feeling guilty about it. The key here is the way large numbers of employees can be converted into unethical instruments of the corporation.

Interesting contradictions are also examined: though slavery is abolished, the film argues that the practice has assumed the form of sweatshops across the third world. Ironically, many of these companies claim to be socially responsible by funding some other human justice/rights cause, when, a look at their own manufactories are examples of injustices. Experts are talking of ‘Corporate Social Responsibility’ as the current response to a ‘market need’; it has little to do with altruism.

Monsanto – the infamous biotechnology firm – also finds prominence. Their long run of creating chemicals that they claim are safe, which are then proven false, dates back to Agent Orange. We then hear of them creating rBGH, a growth hormone administered to cows to produce more milk, which made the cows sick and now Bt. Are we going to stand by and wait till it is proven hazardous?

The documentary succeeds in shedding light on the insidious ways in which the Corporation functions. Though the movie is lengthy (two and a half hours) and the narrative tends to get slightly repetitive, the facts are interesting, relevant and point out patterns already articulated by movies like ‘Capitalism – A love story’. Importantly, it is a chance to examine the current paradigm that is dominating our world and its repercussions on humanity and the planet.

Sinduja Krishnan is an ecologist with a passion for travel, who wants to visit New Guinea as she is curious about the customs of the local communities there.



Sowing Seeds of Consciousness

By Sangita Sharma

Biodiversity of our agriculture is a planetary heritage, aided by the work of hundreds of generations of rural farmers... we need to create a network of seed growers, from home gardeners to farmers.

Did you know: the estimated diversity of beans varieties is 2,000; that of tomatoes are 6,000; while that of rice is a staggering 20,000? Sadly, we have access to only a few commercially grown vegetables – so uniform, pesticide-laced, waxed with chemicals and deceptively attractive. The loss of biological diversity, particularly in the "gene-rich" countries of the Third World, undermines the very essence of sustainable agriculture, as it destroys choices for the future and robs people of a key resource base for survival.

India may have only 2.4 percent of the world's land area, but it has over eight percent of the world's biodiversity, and is one of the seventeen mega-diverse regions in the world. The National Bureau of Plant Genetic Resources has collected 3,02,348 accessions of crops of which 18, 862 are vegetable accessions only. In India, there are 51,000 plant species, and only about 30 percent has been accessed so far; the remaining 70 percent lies untapped.

Seeds embody Life

This unassuming potent gift of life – that which is most sacred to us – is under siege and assault. We, at Annadana, have been consistently bringing into focus, the importance of safeguarding our traditional organic seeds. Seeds form the very kernel of life itself, the source of our food, and when contaminated, have

an adverse effect on our health and the health of our planet – resulting in a very sick society, which we can see, is the state of affairs in the world today!

As far back as the Rig Vedas, there are instances of women guarding a standing field, and these guardians of the seeds were called '*Kalamgopis*'. Harmony and balance prevailed in society due to sustainability. For, a woman, like the seed, symbolizes fertility. The soil is akin to an expectant mother, into whom all nourishing nutrients are carefully administered. The seeds are her children, to be nurtured with care and devotion. The 'seeds belong to no one; it is a gift of life to life itself'.

Seeds embody Health

Not too long ago, each day was an occasion for celebration, and was built around Nature. Compared to the grandeur and mass commercialization of festivals these days, those like Sankranti, Baisaki, Pongal and many more were about marking the changing seasons and giving thanks to Nature for her abundance; an occasion to serve home-made nutritious food made of aromatic healthy produce. Possibly one reason why chronic diseases were far and few in number! And importantly, also because the soil and traditional seeds were nurtured with so much care and devotion. Both the soil and seeds, once rich in minerals and micro-nutrients, have fast disappeared thanks to the diktats of the Green

Revolution. The control over our food chain now rests with a handful of seed giants and MNCs.

Medical experts are unveiling more and more diseases, a scenario further exploited by the pharmaceutical industry. Large sums of money are spent on medical research to provide remedies/cures and through advertising drugs to combat pain and suffering. Lifestyle diseases like cancer, diabetes, heart disease, etc. are becoming commonplace. The norm seems to be to pop a pill for small ailments like headaches and colds. We do not give our bodies the time to heal, and give ourselves the power to self-regulate.

The ground reality is that most such drugs provide short-term relief, which in turn reduces immunity. They suppress the disease, only accelerating the cause and making it chronic because the food we eat does not give us the required nutrition. When the soil and seed are infected, the food is toxic, devoid of nutrition, which poisons us in the bargain. There seems to be a growing feeling of apathy amongst the general populace, for we do not question the source of our food, nor do we have the time to connect with the source.

Seeds embody Freedom

Often, the freedom to stay alive is at stake. Seeds cannot be imprisoned by the yoke of legality or become the property of a handful of corporations, to be patented by laboratories, to be modified or sterilized by transnationals. It is beyond doubt that “food integrity is impossible without seed integrity” and that any hybridisation, or genetic manipulation of seeds will destroy our heritage of seed integrity that evolved through centuries...

Unfortunately, the objective of the greed-driven seed corporations has eroded this long-standing tradition, only to make the farmers dependent on them. Every year, the farmer has to purchase sterile seeds along with its corresponding chemical fertilizers and pesticides at obnoxious costs. Mounting debts and deaths is primarily the outcome of farmers having to adopt these intensive corrosive methods.

Even after 60-odd years of Independence, the monthly average income of a farmer remains a paltry Rs. 2,200, far below the poverty line (Source- NSSO). Yet, he is expected to purchase industry-driven manipulated seeds, not replicable and that too, at unaffordable costs. To quote Devinder Sharma, a Food and Trade

analyst, “A chaprasi (clerk) in a government office is far better off than a farmer. He earns a sizable amount of Rs. 10,000 per month with perks like medical, bonus, leave benefits, thanks to the sixth pay commission. But the backbone of our economy – the farmer who feeds this nation – is not considered worthy of any State benefit but expected to live off credits.”

Agriculture is no longer sustainable. With a faulty seed bill, designed to fill industry coffers, farmers are left with little choice but to walk away from their fields. Neither food security measures nor the overall health of the nation is of any consequence to policy makers. And who suffers, apart from the ones producing it? Again, it's the consumers!

Adopt a Seed

Not all is lost. If consumers and farmers are to take charge of their food chain, they have to be re-skilled to become farmer researchers, seed savers and breeders. In order to do so, introduce an innovative approach for each one of us to become a seed guardian. Adopt a seed.

We can sow seeds of consciousness amidst each other. An enterprising home gardener could save a seed in her balcony or kitchen garden, and invite all other friends in her building or colony to join in. Conserve a vegetable variety to ensure its varietal purity, and then deposit the seeds in a central pool. One can then create a network of seed growers from home gardeners to farmers. For instance, if there are 20 traditional brinjals native to our region, each one could nurture and conserve a particular variety, and make them available to many more... This way each one of us becomes responsible for securing food and conserving biodiversity.

Open-pollinated seeds are genetically diverse treasures that have been passed on from generation to generation. When we buy and plant open-pollinated seeds, we help protect our health, environment and conserve this valuable resource for the future. Join us in our endeavor.

Sangita Sharma is a self-contained organic farmer and a seed guardian based in Bangalore. Her trust Annadana Soil and Seed Savers conserves 150 varieties of organic open pollinated seeds. “From Soil to Seed” workshops are conducted regularly. Contact sangita@annadana.com for details.

Get started today!

Karnataka, Tamil Nadu

Annadana Soil & Seed Savers: www.annadana.org

The Green Foundation: www.greenconserve.com

Pebble Garden: Auroville,

email: pebble-gardenforest@gmail.com

Maharashtra

Navdanya: www.navdanya.org

Andhra Pradesh

Deccan Development Society: www.dds.org

Timbaktu Collective: www.timbaktu.org

Websites:

Seed Savers: www.seedsavers.net

Kitchen Gardeners International,
www.kitchengardeners.org

For more information, do visit

Organic Farmers Association of India,
www.ofai.org

Please write to us at bhoomi.magazine@gmail.com if you know of existing seed networks that could be included in this list. We are aiming to provide this resource on our website soon.

Salt to Taste

Aruna Kalahastri

It is of the oldest known and used spices, and the African and European explorers were known to have traded an ounce of salt for an ounce of gold, and salt was literally worth its weight in gold. Unfortunately, we are today paying heavily for it – excess salt intake is related to many degenerative diseases like high blood pressure, heart disease etc. Indians are said to be more genetically prone to obesity, heart diseases, high blood pressure and diabetes, when compared to other nations - hence we need more caution.

Indians score heavily over others in their dietary salt intake, because our food usually contains high salt accompaniments such as upinkais (pickles), chutneys, our snacks like murrucus, kodbeles, samosas, kachoris, bhujias, namkeens, potato chips and golgappas; and today's instant noodles and pizzas are loaded with salt.

We can broadly classify edible salt into sea salt, rock salt, black salt (volcanic salt) and processed salt.

Processing & Production of Salt

Salt is produced using three methods: rock salt mining, solar evaporation, and vacuum evaporation. Processed table salt has 97.5 percent sodium chloride and 2.5 percent chemicals such as iodine and moisture absorbents, dried at over 1,200 degrees Fahrenheit. This high heat alters the natural chemical structure of the salt. By contrast, unrefined salt has 84 percent sodium chloride and 16 percent other naturally occurring minerals, including many trace minerals like silicon, phosphorous and vanadium.

Effects of processed salts on us

Inorganic sodium chloride in the form of processed salt can keep you from an ideal fluid balance and can overburden your elimination system.

Every gram of excess sodium chloride that your body has to neutralize, uses up 23 grams of cellular water. Hence, eating too much common processed salt will cause fluid to accumulate in your tissue, which contributes to: water retention in the body, unsightly cellulite, rheumatism, arthritis, gout, kidney and gall bladder stones.

Other effects of taking in too much sodium include excessive thirst, anaemia, acidity, reduced absorption of calcium from food causing osteoporosis and affecting eyesight.

Processed salt will also often contain potentially dangerous preservatives. Calcium carbonate, magnesium carbonate, and aluminum hydroxide are often added to improve salt's "pourability." Aluminum is a light alloy that deposits into your brain - a potential cause of Alzheimers disease.

Hyponatremia or low sodium in the body is a rare occurrence because of naturally occurring sodium in many foods, but avoiding salt altogether must be done with caution.



Photograph by Adam Davis

Knowing your sodium intake.

Naturally occurring Sodium - Some foods naturally contain sodium. These include celery and other vegetables, and dairy products such as milk, meat and shellfish. While they don't have an abundance of sodium, eating these foods does add to your overall sodium intake. Apart from these, many recipes call for salt, some people also salt their food at the table. Many other condiments contain sodium too

Sodium Additives in processed foods- There are more than forty known sodium additives ranging from the excitotoxin monosodium glutamate and others like sodium saccharin used as artificial sweetener, Sodium Acid Pyrophosphate as a sequestrant, Sodium Alginate or Sodium Carboxymethyl Cellulose as a stabilizer, Sodium Benzoate as flavoring and anti-microbial preservative, and many more

How Much Salt We Should Consume?

An individual should consume not more than 2.3 gms of sodium per day, including sodium from natural foods, other sodium additives in processed foods. One teaspoon of salt contains 5 gms of Na Cl, which has 2 gms of Sodium.

It is safe therefore to have no more than one teaspoonful of salt per person, per day. So a family of four should have only gms of common salt per month, if the whole family eats at home all the time. We have to keep in mind that all processed foods and restaurant foods usually have a high salt content. Adding salt towards the end of cooking gives a salty taste without 'hidden salt'. Check it out, are you exceeding your limit?

Cabbage Roll Salad

Ingredients:

Cabbage / Lettuce leaves

1/2 kg raw yellow pumpkin grated

1/4 kg carrot grated

1 cup of grated fresh coconut

1 tbsp of roasted sesame seeds/ sunflower seeds/ flax seeds

optional: 1 or 2 tbsp powdered jaggery

1 tsp finely chopped chillies

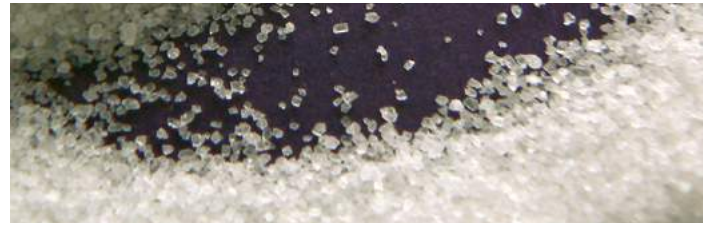
Lime juice to taste

Method:

Boil water and blanch the cabbage leaves in water. Add the grated pumpkin, carrot and coconut. To this add roasted sesame seeds, powdered jaggery, chillies and a dash of lime juice. Roll the ingredients in a cabbage leaf.

How Sweet is your Sugar?

Aruna Kalahastri



Photograph by Jade Gordon

Sugar – pure white, deliciously sweet and nutritionally useless. As we pass through the supermarket aisles, ice cream parlours and mithai shops perpetuating another generation of dental decay, obesity, weakened bones, diabetes, hyperactivity, emotional imbalance and dysfunctional immune systems, we must ask ourselves the compelling question of why we consume sugar, and especially, why we give sugar to our children.

First, let us understand the term ‘sugar’. Dextrose, also called “corn sugar”, is derived synthetically from starch. Fructose is fruit sugar. Maltose is malt sugar. Lactose is milk sugar. Sucrose is refined sugar made from sugar cane and sugar beet.

As Dr. William Dufty, author of the best selling “Sugar Blues” says, to use the same word ‘sugar’ for both glucose and table sugar or sucrose, which have different chemical structures and different effects on the body is misleading. Glucose is certainly an essential element in the human body. Sucrose addiction is something new in the history of the human animal. This confusion has helped only the sugar industry, not people, he says.

All the cells in our body need glucose to function. Many of the foods in Nature - fruits, vegetables, cereals etc. - provide glucose for the body along with vitamins, minerals and other nutrients. But sugar provides only empty calories with no vitamins, enzymes or any other useful nutrients for the body. On the other hand, sugar leaves acid residues in the body which needs to be neutralized by borrowing electrolytes containing calcium, magnesium, etc. from other parts of the body, thereby paving the way for various diseases.

Raw Papaya Salad

Ingredients:

2-3 raw papayas, peeled and grated
6-8 green beans, chopped and steamed
3-4 chopped ripe tomatoes
½ cup crushed peanuts/ sesame seeds/ sunflower seeds

Dressing:

1 tsp grated ginger,
Green chillies to taste
Juice of 1 lime/raw mango/ gooseberry
1 tbsp jaggery
1/3 cup chopped coriander/ parsley/ oregano

Method:

Mix all the ingredients and serve.

Salad recipes by A. Santhilakshmi

Unfortunately since this is a slow process, diseases, such as osteoporosis, show up after several years or even decades, and we tend to ignore the ill effects of sugar. Primarily, sugar is not a natural food for the body.

Processing of Sugar and its Effects

Sugar has been in existence in the world for just about 170 years. It is processed as follows: the juice of sugar cane and sugar beets is diluted, heated and lime added to it; sugar is crystallized, refined and bleached snow-white more often than not by the use of charred animal bones.

During the refining process, 64 food elements are destroyed. All the vitamins, amino acids, fiber, and all other nutrients are destroyed. To a lesser or greater degree, all refined sweeteners such as corn syrup, maple syrup, etc., undergo similar destructive processes.

Sugar and Diabetes

Carbohydrates like whole wheat, unpolished rice and other whole cereals release glucose slowly into the system. However, table sugar and ‘refined’ flour like maida quickly release sugar into the system. The body responds with a rush of insulin to neutralize its effects – and this leads to low sugar in the blood. Again the body tries to self regulate with tiredness or the need to eat. If we continue to eat excess sweets with sugar and polished cereals (as in most bakery products and Indian mithais), the cycle continues, laying an excellent foundation for diabetes. Excess Fats in the cells (intramyocellular lipids) add to the problem by inhibiting the action of insulin to let cells absorb glucose.

How much sugar is permitted?

None – if you really wish to take charge of your health! The United Nations and the World Health Organization released guidelines in 2003 that say sugar should account for no more than 10% of daily calories – which works out to about 10 teaspoonfuls. But we do not know how much these world bodies are influenced by the sugar lobbies or by just the submission to the almost universal sweet tooth. Permitting sugar as an incidental additive rather than a daily compulsion or addiction may be a sensible approach.

What are the alternatives?

Why do we like sugar? Many writers on food and nutrition say that we have been natural fruitarians for millions of years and hence our fondness for sweet foods. Eating more fruits with all their healthful enzymes and vitamins – especially in the morning – is said to reduce our craving for sugar. To reduce table sugar intake, do it gradually, increasing the amount of fruits, dates, honey and jaggery in your food.

Any processed / chemical alternatives like Aspartame are extremely harmful to health. Jaggery is rich in iron and other minerals and much healthier than processed cane sugar. Honey is also a healthy substitute when used moderately.

Sources: “The Sugar Trap & How to Avoid It”, by Beatrice Trum Hunter; “The Reverse Diabetes Diet” by Dr. Neal Barnard, website of Dr. William Dufty.

SPIRIT OF CYCLE YATRA

By Ramawtar Singh

I was a social worker for many years, often going from village to village, telling the people who live there how to 'better' their lives. My work involved talking a lot of jargon, pointing out 'problems' and how we could go about 'improving' them. In all that time, I never contemplated my own weaknesses, for I considered myself an educated and aware young man. I fell prey to what consumes most of us who like to call ourselves educated – conceit, which stops one from learning.

For, though I visited innumerable villages, never once did I make the effort to learn or understand questions that should be a part of such journeys. What is the knowledge that people in the villages have? What skills do they have? How can they be used for the benefit of communities? It was unthinkable that a trained social worker could learn from a population often referred to as 'backward and illiterate'.

This worldview was not unique to me, many of my social worker colleagues seemed to have similar mindsets; the predominant idea was 'saving them' in the name of empowering the community. I had begun to realize that something was terribly wrong with this picture, and directed my reflection inwards after liberating myself from the formal social work rigour. I began asking myself - How aware am I in my own life? What are my strengths? What skills do I have? What are the things I like, and what are my dreams? I realized, in dismay, that I was ignorant about things essential for living a daily life, from my food to my lifestyle. I was unprepared. It hit home how little I actually knew.

Seeds of Yatra

My actual learning began after joining the Shikshantar movement. Shikshantar is an effort towards radical systemic transformation, in order to facilitate the development of Swaraj, throughout the country, through encouraging 'walkouts' from formal learning systems, and exploring other learning/doing options that exist including creating one's own options.

In 2005, I started travelling around the Mewar region of Rajasthan. I went to several villages and met wonderful traditional healers. Most of them were labelled 'illiterate' and 'uneducated' because they didn't know how to read text! Uday Singhji, one of the healers I met, advised me to stay with him for a longer period and learn by exploring the neighbouring jungle and villages.

A few months later, some of us at Shikshantar thought it would be fun to explore an area by cycling, and we decided to make this a learning journey without modern conveniences like mobile phones, cosmetics, extensive luggage and most importantly, without money! We shared the invitation with our friends who were interested in cycling, learning from villages and enjoying new challenges. Since then, I have been a part of several cycle yatras in different parts of Rajasthan, especially in the Mewar and Hardouti regions.

The yatras are an opportunity for me to travel to different villages and open my mind

to new ways of life, along with others who are on similar quests. The journey is unlike any other – there is no competition of any sort nor is there a specific message or theme. Over one week, we tackle new challenges and make it a point to do without our gadgets, consumer items that we are addicted to.

Learning Journeys

My first lesson in the yatra was to respect work that was done by hand. As we earned our food and stay by doing physical labour, I tried my hand at several things that villagers do in their farms and houses. My father was extremely surprised to see a photograph of me carrying a gobar-basket on my head, but he was happy to know that I was trying to get back to my roots... I soon realized how my school system had uprooted me from my traditional knowledge, culture and language.

Earlier, I used to feel insecure about the future of my kids, because they don't go to school. My friends and relatives would often ask me about how my children would be able to make their "future" if they didn't get a degree or a job. These yatras instilled confidence in me and all the experiments helped me trust the decision to un-school my children.

In the course of various journeys, I learnt how much money we really need to make our living – the answer is not much! After a few of these cycle yatras, I did several experiments with attempting to live on as little money as possible. I took up little challenges (I would call them 'fast' or 'vrat') – eating only raw food every Thursday, eating only local food (locally grown and prepared) every Saturday, spending a week without



electricity, sometimes without money and even living without cooked food. I also began making natural products and using them – daily items like herbal soap, toothpowder, hair oils etc. and using them daily.

Spirit of 'Spirit of Cycle Yatra'

The spirit behind every journey we undertake, is this -

- We go manual for transportation, and burn off some calories that we have so lovingly consumed despite being cholesterol-conscious
- We go slow, instead of breezing through in fast cars, and therefore get a better chance at appreciating nature and rural life
- We interact with the local people (rather than just buy stuff off them with money power) in the course of creatively managing our board and lodge
- We get to experience village life firsthand and in the process, learn skills that we have lost by virtue of being part of the 'developed' society, and also share any skills we have
- We develop an appreciation for local knowledge and skills and the ability to thrive with what nature has provided
- We develop some trust in the ability of nature to take care of us and in the goodness of human beings rather than having to constantly struggle for one's existence as if it is one long battle against nature and other human beings.
- We get some time to reflect on our own lives
- We loosen a little, the tight stranglehold that money has over our minds and learn that alternative ways to live might exist
- The most important bit is to enjoy nature, create music, dance, theatre, games and have a fun-filled adventure! It is a real chance to reconnect to the gift culture.

Lessons in Sustainability

Through the journeys, the attempt is to build relationships and bonds with people, work with them, learn from them the daily tasks that we take for granted, and learn and appreciate peoples' traditional knowledge and wisdom, while picking up some skills along the way.

Our experience so far has been that solutions to grave problems of environmental change that face us, are present in the villages - prominently, through their ecological way

of life and strong sense of independence, or 'swaraj'. For example - Hardouti area (where we had a cycle yatra in October 2010) is called the 'most backward' region of the state, in terms of nutrition, health, education and 'living standards'. However, all of us yatris experienced that the region was so rich in these very areas, but that people who come from outside are just unable to see and value this richness as they always measure it in their own terms. The people in the villages we journeyed through had so much knowledge about medicinal plants, nutritional plants (which we call 'weeds' now), natural eco-friendly housing, cooking without electricity, etc.

The interpersonal relationships they share, the connections that they forge with Nature, along with the strong sense of community and collective values, still form an important part of their lives. And these are the small things that make the Cycle Yatra truly enjoyable.

Many portions of this article have been translated from the original in Hindi by Ramawtar Singh.

Ramawtar is interested in self-healing practices, including herbal medicines, acupressure, and Reiki. He has been involved with 'Swapathgami Network' – a youth network which encourages learners to create their own paths of learning for the past 7 years. He has recently moved to an organic farm called "Krushni Teerth" in Madhya Pradesh, along with his family, to learn 'Natu-eco Farming'.



Natural fractal pattern - Air displacing a vacuum formed by pulling two glue-covered acrylic sheets apart. The air travels in the direction the horns are pointing, creating dendritic structures into the glue in an effort to equalize the pressures in the room and between the sheets. Source: Wikipedia.

‘Chaos, Fractals and Self-Organization’

A Book Review

By Kaushik Ramu

Author: Arvind Kumar
First edition: 1996
Latest reprint: 2009
Publisher: National Book Trust, India

There has been something unconvincing about orderly shapes like triangles and squares: we find them in textbooks, in the way children in schools are made by teachers to assemble and disperse, but never in life itself. Life is actually wild, messy and labyrinthine, no matter what sort of lens we view it through. The branches of a tree are bit like its roots – and also like the path of a river and the inside of our lungs. The question of form, of patterns of patterns, becomes a suddenly universal one, at once abstract and extremely realistic. You suspect there’s a revelation there, a momentous and fundamental epiphany, and yet there seems nothing to grasp. How does one get into all this? Do we all have to do PhDs in non-linear mathematics to know more about how leaves grow or how thoughts mutiny within us during meditation? Should we merely declare that nature works in mysterious ways

and leave it at that? Meanwhile, Euclidean shapes continue to be taken for clarity and civilization, whether in Powerpoint, manicured gardens or in the normative ironing of clothes.

This is the sort of challenge that Dr. Arvind Kumar tries to help us with in a small book first published fifteen years ago. He introduces it as a 'semi-popular book'; one feels that this is not to sit on the fence between the lay audience and the scientific, but because his own fascination for the subject has its source as much in his daily experiences of living as in science. Kumar refers to chapatis and snowflakes as comfortably as to iterative formulae and thermodynamics. At the very beginning, he describes the book's three dedicatees as "strange attractors of a chaotic existence" and that reveals, right-away, the charm of the subject for him: words like 'chaos' do mean something to us even before we roll up our sleeves for the details, but for a reader with serious exposure to contemporary science, these words, as are others like 'string', are charged with elusive secrets – indeed, there may be no experience that is not simultaneously scientific and subjective.

What perhaps gives the subject a special place among other equally fascinating concepts that scientists could write about for the lay reader are (1) that examples are all around us, if we care to pay attention and (2) high-powered computing has made possible projections that would have been left to guesswork only decades earlier, and in that sense it's an exciting and revelatory time when we're beginning to grasp what we might once have sensed intuitively at best. The radical ecologist or Gandhian is left with a troubling implication: that you might need to clear rainforests for an economy that allows for the technology that can help you appreciate how a rainforest emerges...

Chaos is introduced through the well-known example of the butterfly effect in weather-prediction: a small change in initial conditions can, in a complex system, lead to greatly different outcomes – and of course initial conditions can never be known perfectly. We've seen how, in our own lives, that one move or moment of hesitation has changed everything, seeded entire chapters in our stories; chaos, like the weather, is somewhat like that. Kumar helps us distinguish this meaning from that in common parlance: chaos describes not a random, free-for-all frenzy, but rather our inability to predict outcomes precisely despite knowing, more or less, how a system behaves – because even the very tiny things of the world matter.

At times, readers will be segregated into at least three categories: those who resign the moment they see an algebraic symbol, those who persist doggedly and even jot down the equations on paper so as not to get derailed, and those for whom algebra is as much a language as is a simple text-sentence. This only reminds us that it's difficult to be inclusive in such non-fiction. In this book, for instance, those who haven't studied science may not understand how the swinging lamps that Galileo was watching have, after doses of bristly math embedded in English, "turned chaotic", and may then approach with a renewed mistrust the more accessible points on chapati-making. Despite his enthusiasm, Kumar's language periodically betrays his grounding in academic papers and textbooks. We must not expect the flair of a Bill Bryson – but it's a respectable attempt nevertheless. Better illustrations would certainly have helped: barring the odd sketch, the book has the look and feel of an NCERT publication, and some of us have had enough of that sort of thing for a lifetime...

What Kumar does consistently is maintain the bridge between the old and the new: he does not dismiss linearity for non-linearity, or Newtonian physics for Quantum Physics, or Euclidean shapes for fractals. In that sense, he never asks for a leap of faith, but rather works through what we know. Even the progression from non-life to life is explained as within the same continuum, rather than as creation. But his respect for the classical seems limiting at times, in questions such as "can this paradigm...offer a scientific resolution of the enigma that is life?" that we must be careful with.

Another problem the professor hints at is the casual simplification of scientific methods in the minds of dilettanti, especially those looking for alternative views: that Newton was wrong, that Quantum Theory is finding out what Buddhists and Taoists already knew: that things have now been settled: holism is in, reductionism is out; faith is in, rationality, quantities and algebra are out.

"The new science has not yet penetrated the inner mysteries of...nature. But it has made the silhouettes of our ignorance... sharper. We now know... a little better, what ... we do not know."

Kumar questions this polarizing of the holism and reductionism, and this thrust is, if anything, understated in his book – it seems too important to be left to one chapter near the end. Opponents of reductionism, Kumar implies, create a straw man and then take it apart: reductionism is not merely 'the whole as the sum of its parts': what defines it, rather, is an assumption of upward causation. What he calls 'sensible reductionism' is, he says, not as different from holism as it is made out to be.

There are moments of great feeling in passages such as the tribute to the quest for the universal – this doesn't, Kumar says, necessarily mean trying to control and predict everything – or the thrilled descriptions of Feigenbaum's discovery of period-doubling with a constant ratio of bifurcation-spacings and of how Prigogine's opening up of Physics to Biology led to his work on dissipative structures.

The numerous examples of self-similarity he later provides, from earthquakes to the fluctuations of stock-prices, only heighten our interest: the idea of recursion begins to reveal the universe's mind. There's an uneasy awe that begins to flow beneath our reading, a sense of our lives dismantling, a confusion of things we're taught to see as separate, as 'it' and 'you' and 'me'. The bronchial network in our lungs has a fractal dimension of 3, while for granite and basalt it's closer to 2.5; a line segment, if you split it perpetually, yields what is called 'arithmetic dust'; and by now you begin to feel that everything is a metaphor for everything else, and to consider this is to feel that our histories, if you go back far enough, are also biology, chemistry, geology, all of that and...chaos

Kaushik stepped out of his management career to try and reclaim what it means to be alive. He has since been a wandering student with no affiliation or address, and many questions. You can write to him at kaushik.ramu@gmail.com

Going Local

What do I miss from my old life?

I miss out on bank statements, utility bills and traffic jams.

By Mark Boyle

I am now seven months into my experiment of living without money and fossil fuels for a year, and my journey so far has been fascinating. When I first decided to go money-free last year, I set about putting in place the basic infrastructure I would need to survive. The first essential part of this jigsaw was shelter. For this I turned to an amazing project called Freecycle, and through it I found a caravan that someone else didn't want any more. However, I also needed somewhere to put my new home, and so I decided to go and volunteer for three days a week with a local organic farm in return for a place to park my humble abode. If I had equated this in terms of my previous salary, it would be like paying penthouse-apartment rent for what is effectively a little tin box. That is the type of thinking, however, that I am trying to get away from.

Having no means of paying bills for a year, I was going to have to be completely responsible for producing all my own energy, and so my next challenge was to set this home up to be completely off-grid. For heating, I installed a woodburner that I had converted from an old gas bottle, using a flue pipe I salvaged from the skip. This I fuelled using wood from trees coppiced on the farm, meaning fuel miles became fuel metres.

Next on my list was a cooker, so a local member of the Freeconomy Community showed me how to make a rocket stove from a couple of old olive-oil catering tins that were destined for landfill. This meant that for the next twelve months I was going to have to cook outside. At first I felt a touch overwhelmed at the thought of cooking in the snow, rain and northerly winds that inevitably come with the British winter. But, surprisingly, it became one of the joys of my life. Whilst feeding the stove with old broken-up vegetable boxes, I would watch the moon rise in the winter, and the sun set in the summer, in the length of time it took to prepare my evening repast. The birds that inhabited

the trees surrounding my new kitchen became my 'iPod', and observing the local wildlife taught me much more about Nature than any documentary I'd ever seen on the television.

The one thing I did spend money on before starting the experiment was a solar panel to supply me with enough electricity for a light, my laptop and a phone on which I could only receive calls. I understand that this may seem ironic to some. However, I see money as I do fossil fuels: that we should be using what we have now to build a sustainable infrastructure for the future. Solar power isn't ideal, because of the embodied energy involved in producing the panels, but I accepted that I was at the start of what would likely be a lifelong journey and that I couldn't

expect perfection straight away.

That aside, the solar panels work reasonably well, providing me with ample light, but I found that in the winter my phone and laptop time were severely restricted, which I did find frustrating – but only because my expectations were based on having infinite energy at the touch of a button.

The last piece of this off-grid puzzle was a compost toilet. This wonder of appropriate technology should be the symbol of the entire Transition movement, in the same way that the spinning-wheel became a symbol of Swadeshi in Gandhi's India. It represents sanity and a respect for the Earth. I made my alternative loo out of old pallets from a nearby hardware store. As I can no longer buy toilet roll, I relieve the local newsagent of some of the newspapers that fill its bins every day and use them instead. It may not be the height of luxury but it quickly becomes normal. In doing so I not only get to save the odd tree and reduce the energy burden we place on recycling companies, but I also get to keep up with the daily news, albeit a little late!

APART FROM MY basic infrastructure, food was my only



I was going to have to be completely responsible for producing all my own energy.

other real necessity. There are four ‘legs’ to the ‘food for free’ table. Growing your own is the first of these, which is what I have been doing at the organic farm where I live. My preferred leg is wild food foraging, as it is nutritionally exceptional and without question the most gentle on the Earth. The third leg – using waste food from local restaurants and shops – is an incredible resource to draw on; whilst I am not comfortable with the fact that its existence is dependent on the waste of industrialised society, I feel I have an obligation to use this before I use any other form of energy to produce food. The last leg of this food table is barter, which involves using my skills or any excess food I’ve produced to meet any needs not met by the other methods.

My normal lunch has each of these legs represented in it: waste bread topped with a jam I made from a combination of plums from my old allotment and apple juice from our orchard. Along with this I have some salad I grow on the farm together with sprouts I grow from rye grain I bartered for. All this is washed down with a fresh nettle and cleavers tea that grew within three metres of my alternative cooker.

One of my major realisations so far, though, is that in a moneyless world everything takes much more time than in the world of modern conveniences. Hand-washing my clothes in a sink of cold water, using laundry liquid I made by boiling up some nuts on my rocket stove, can take two hours of labour from start to finish, instead of the normal twenty minutes or so using

a washing machine. Cycling the thirty-six-mile round trip to the city obviously takes a lot more time and energy than driving or catching the bus or train. This does, however, provided me with a practical alternative to my old gym subscription, and I find cycling much more enjoyable than using motorised vehicles.

Finding stuff in skips – such as the steamer I cook with – takes longer than popping out to the shops for it. Sorting out the compost toilet is a lot more hassle than flushing it ‘away’. And the list goes on. The key point, however, is that I would rather have my time consumed making my own bread outdoors than kill time watching some ‘reality’ TV show in the room that we call ‘living’.

PEOPLE OFTEN ASK me what I miss most about my old life. I tell them I miss out on bank statements, utility bills and the inevitable traffic jam on the way home from my old stressful job on any given Monday. Oh, and a pint of organic ale with my mates down at the local.

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Mark Boyle is the Founder of The Freeconomy Community.
www.justfortheLoveofit.org

The Ahimsa Way

The ahimsa way of life embraces simple living – whether that is a non-accumulative life, a non-possessive relationship life, or a life that desires to live in harmony and justice.

By Usha Jesudasan

My 16-year-old friend's eyes gleamed with joy. She had just bought a new pair of shoes. Her older sister wanted to try them on. "Don't touch them, they are mine," screamed the little sister. The mother stood by helplessly, consoling the older girl by saying, "Don't be upset, you can have one too." Between the two girls, they had almost 30 pairs of shoes and although they had the same shoe size, they never shared them. Why do we as adults encourage such 'himsa' behaviour?

We live in an age of gross accumulation. Shoes, handbags, cell phones, clothes, cars – it is not enough to have the latest model, we must have varieties of them – and all for ourselves alone. One of the subtle forms of violence today is the tyranny of accumulation. Modern culture, based on productivity, greater profits, and pounding advertisements, keeps giving us false needs. To live well, we must have more and more. And while we have more, we must make sure that those around us don't have more than we do. Living this way makes life very complicated and makes us himsa people as we spend time and energy guarding the things we accumulate with such violence.

Apart from the many things we insist on owning, the himsa way of life also makes us relate to people as possessions. Just as we cling to our clothes, perfumes and handbags, we also become possessive about our relationships. Once someone has offered us friendship, affection, love or care in some way, we want more and more of the same thing. So we cling to the person who gave it to us, forgetting that they too are human with similar needs. When they share their goodness with others, or are unable to give us more of what we need, we become himsa people – attacking, accusing, abusing and discarding them.

The ahimsa way of life embraces simple living – is a non-accumulative life; when we avoid accumulating things, possessive relationships and try to live in harmony and fairness with everything and every one around us.

Defining simplicity

Today we struggle to define simplicity. To one person, it is living frugally, rarely buying new items, making things last as long as possible, re-using plastic bags etc. To another, it is living in a beautiful house but being minimalist, with a few expensive, classy things; and to yet another, it is wearing khadi, eating vegetarian food and travelling by public transport.

Each of us has to make our own commitment to living the ahimsa way (living simply) — whether it means asking ourselves do we really need another sari or pair of shoes, or giving away what we don't use or need, or sharing what we have with others.

Living simply, I learnt, is an attitude. An attitude that embraces the good things of life, without making us dependent, addicted or possessive about them.

However, simple living is not just **about** ; **living without** fewer material things. It is also about living compassionately, and with love and being sensitive to the millions around us who do not have half the things we do.

20-year-old Ambrose, from an orphanage in Kenya, taught me one of the most important lessons in living simply. He was "dad" to the 30 orphans there. As I followed him around, I noticed the many ways in which he took care of the children there. He would wipe the noses of the little ones. Kick a ball back to one who was standing in a corner, tell a joke and make everyone laugh. All of this was done with a huge smile, a big hug and such love in his face and body language. One day the children were singing on stage. One little girl had a beautiful, new hairband, but she had



The Ahimsa way means living contentedly. Contentment is about being happy with what we have. And being content with what we have, gives us the power to say, “Enough.”

worn it the wrong way. Ambrose was sitting beside me when he noticed it. “Oh dear, she will be so upset when she see the photos,” he said. So he unobtrusively went back stage, mingled with the group singing and dancing with them and quietly adjusted the girl’s hair band so that she looked like everyone else. I remember thinking, “What a lovely simple man.”

Ambrose’s own possessions were very few. But just like other youngsters he liked branded clothes and shoes. “What would you like the next time I come from India?” I asked him. “Calvin Klein underwear,” he said very seriously. Each one lives simply in their own ways, I realised; and chooses their own bits of non-simple living! Living simply, perhaps is an attitude. An attitude that embraces the good things of life, without making us dependent, addicted or possessive about them.

As we pursue the simple way of life, according to our own paths, we realise that experiencing the inward reality of simplicity, taught by all our scriptures, liberates us outwardly too. Speech becomes truthful and honest. The need for status and position slowly disappears because we no longer need them. We give up showy extravagance. Our possessions become more available to others.

Our world is not getting simpler, but more complex everyday, which is why we desperately need the discipline of simplicity. A simple lifestyle where ‘others’ needs are as important as ours demands that we think about those who have no food, education, health care, while we have plenty. This may be hard for many

people, because thinking and living this way means giving up a selfish, greedy lifestyle which we have become used to. To change to the idea of simple living after a lifetime of selfish living is very hard to do, yet we must pursue it with all our hearts.

Changing ourselves

To truly live the ahimsa way, each one of us needs to make lifestyle changes. We need to think about where and in which area of our lives we could begin and make positive changes. We can ask our children to give away a pair of shoes or their clothes when they buy new ones. Or we could buy a sack of rice or dal for our maid or driver when we buy one for our family; or empty our minds of anger, frustration envy and greed when we seem ready to burst with all the negativity.

The Ahimsa way also means living contentedly. When the commercial world tells us to want more and more - contentment is not about getting more and more, it is about being happy with what we have. Being content with what we have, gives us the power to say, “Enough.”

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Usha Jesudasan is a writer and journalist who has spent much of her life working at the grassroots, bridging the gap between people, cultures and faiths. She has traveled extensively and worked with people and children who have suffered violence.

Japan's Nuclear Disaster: India going into Denial?



The earthquake and tsunami in Japan have caused a major catastrophe at the Fukushima nuclear plant. The effects of radiation have crossed national boundaries and are expected to leave their scars across generations.

Japan has declared a National Emergency and is struggling with containing the damage -despite the country's technological prowess and preparedness for disasters.

Indian politicians and officials of the Nuclear Power Corporation of India Limited (NPCIL) or Deptt of Atomic Energy (DAE) have gone into overdrive to persuade the Indian population, particularly in Jaitapur that the proposed nuclear plant in India are far better and safer. For example, Mr. Srikumar Banerjee, Chairperson of the Atomic Energy Commission(AEC), said on TV that what happened in Japan was only a chemical explosion and not a nuclear explosion, that there was no radiation as a result in the vicinity of the plant. Yet we get reports that fruits, vegetables and fish have been highly affected by radiation in certain areas.

Nuclear Power is inherently risky

E A S Sarma, a former Energy Secretary, Govt. of India says: This is not a time to defend nuclear technology when many Indians have watched with consternation the events unfolding in Japan. The following are extracts from his blog:

Japan has had a long track record of nuclear accidents irrespective of such unusual events as the tsunami. Nuclear power technology is inherently risk prone he says and gives the following examples:

- ▶ Out of 104 nuclear power plants in USA, 27 power plants have been found to cause contamination of the local ground water sources with radioactive tritium.
- ▶ An accident at Tokaimura nuclear power plant in Japan in September, 1999 resulted in an uncontrolled chain reaction that led to serious radioactive exposure to 439 persons.
- ▶ At Mihama nuclear power plant, in 2004, extreme heat caused a pipe burst killing four persons and injuring seven.
- ▶ Almost all countries that have nuclear power plants have several similar accident filled track records.

India cannot feel complacent that earthquakes and tsunamis are rare in India – we can see that there have been nuclear disasters because of a range of reasons.

Insufficient Regulatory Bodies

India has embarked on a nuclear adventure by opening the floodgates to foreign reactors being set up, without ensuring that matching arrangements exist for an independent regulatory supervision. Atomic Energy Regulatory Board (AERB) which is supposed to regulate the activities of the Department of Atomic Energy (DAE) is subordinate to the very same DAE.

The Atomic Energy Act is an outdated piece of legislation, as it has many non-disclosure and secrecy clauses that preclude public consultation. Unless AERB becomes independent and the Atomic Energy Act is modified to support open public consultation, India cannot be said to be ready for nuclear power.

While the Prime Minister has said in Parliament that a 'safety audit' of all the atomic reactors in India had already been completed, no reports have been disclosed to the Parliament and the people of India. through the websites of Nuclear Power Corporation of India Limited (NPCIL) or other bodies. The PM has not yet talked about providing autonomy to Atomic Energy Regulatory Board (AERB) and making it accountable to the Parliament directly. No amendments to the Atomic Energy Act have been initiated to make it more people friendly by bringing in public disclosure clauses.

The EPR reactors being proposed at Jaitapur are untested, despite all the misinformation that is being disseminated by DAE, as the first 660MW EPRs being set up in Finland are yet to go into operation. Irrespective of what DAE may say, there are genuine safety concerns about EPRs. The European Union's reports bear testimony to it. So is the case with the other nuclear power complexes proposed, especially the American reactors being proposed near Kovvada in AP.

Do we need Nuclear Power?

Switzerland, Germany and a few other countries promptly announced a freeze on additions to nuclear power. India needs to announce a definitive action as these countries have done. Particularly the Jaitapur and Kovvada plants should be put on hold.

The basic questions that should be asked are: Whether India will require nuclear power on such a large scale; whether such large base load power is needed; whether such large electricity capacity additions are required at all. To any one with a rudimentary knowledge of energy and power planning, the answers to these questions are clearly in the negative. We need to reinvent our energy planning approaches. We cannot afford an energy strategy that is unsustainable, and destructive of both the ecology and livelihoods of the people.

As Kumi Naidoo, Executive Director of Greenpeace International says, even if existing nuclear power is quadrupled by 2050, the proportion of energy that it provided would be still be below 10% globally. This would reduce carbon dioxide emissions by 4%... ***and Nuclear energy will be vulnerable not only to natural disasters and human error but to terrorism too...***

The Indian public too needs to wake up at least now after the Japan disaster. While electrical energy is useful, what is the price we are willing to pay for it? It is time for everyone to voice their concern and work to freeze all new nuclear projects in India.

Sources: www.thesouthreports.com/profiles/blogs/;

The Hindu, The Deccan Herald and blog of EAS Sarma.

Swedish City Cuts Fossil Fuel Use

Kristianstaad, a city in Sweden has not used fossil fuels to heat itself in almost 10 years now! Until 20 years ago, all of Kristianstad's energy needs came from fossil fuels. In an attempt to mitigate fossil fuel usage and to counter the price rise, the city – which is also known as a farming centre – is using material that is most readily available to it: potato peels, manure, animal waste/remains and even used cooking oil to convert into methane. This gas is then burned to create electricity or heat, to supply to buildings, and is refined to be used as a fuel for cars.

While burning natural gas and biogas, both yield emissions, they are far less than those created from burning coal and other fossil fuels. Earlier, the landfills piled with biological waste would putrefy and release methane gas into the atmosphere (a gas much more potent in terms of emissions than carbon dioxide), adding to the emissions. Here, it is being used to produce energy.

The more remote areas of the city use wood pellets as a source of energy. These pellets are created by first reducing the organic waste to fine particles, and then highly compressing them. The material is then pushed through a press to create the pellets. The advantage of burning wood pellets is that the nitrogen oxides and sulphur oxides emissions are much less compared to coal or oil, also leaving very little ash as residue.

Having tackled its fossil fuel dependence, Kristianstad is ready to move on to other challenges. By 2020, they aim to have reduced their emissions by 40% of the 1990 level, be fossil-fuel independent and have zero emissions.

Source: Using Waste, Swedish City Cuts Its Fossil Fuel Use, By Elisabeth Rosenthal, NY Times, December 2010, www.nytimes.com



Photograph by Jonas Lovaas Gjerstad

Hook up your car to a cow!

Researchers are doing all they can to find alternative sources of fuel. From a report in MSNBC, researchers are conducting experiments to study the microbes inside the cow rumen with the potential to break down cellulose into usable sugar, which can later be converted to ethanol. The ethanol was produced from corn, for the cultivation of which more deforestation was required.

Bacteria that break down cellulose from plants in the rumen of the cows were studied to provide possible solutions to the rising issue of fossil fuel shortage. Switchgrass was packed in nylon bags and inserted into the gut of the cow through cannulas (holes in the side of the cow) and the digestion after 72 hours was checked. These holes in the sides of the cows are used in bovine research to study reactions within their gut.

In the research process many thousands of gene sequences were identified and large amounts of data was collected showing that there are 27,755 'candidate genes' within the cow gut, where more than half of those have the potential for breaking down cellulose. The microbes will be studied and their reactions mimicked in the laboratory as a first step to create cellulosic biofuels. Hopefully this is not more reductionist science that causes more problems in the long run.

Source: http://www.msnbc.msn.com/id/41233543/ns/us_news-environment/



Papier-mâché to the rescue?

Each day, approximately 15 million plastic milk bottles are used in the UK, which contributes to a huge chunk of the problem of waste disposal and recycling. Most plastic is not biodegradable and plastic milk bottles take about 500 years to decompose; each year accounting for 130,000 tons of UK landfill waste. However, an inventor from Suffolk, in U.K. believes he has the answer to this burgeoning problem of plastic.

Martin Myerscough has designed and made the prototypes for the 2-litre milk bottle, called the 'GreenBottle'. The bottle is made of a hard paper shell – similar to the technology used for packaging eggs – moulded into the distinctive bottle shape, which holds a plastic bag containing the milk.

According to Myerscough, the bottle is completely 100% recyclable. The paper is compostable/biodegradable, while the inner lining of plastic can be sent to recycle. When dumped in a landfill, it takes up less than 0.5% of the space occupied by a regular plastic bottle.

Source: <http://www.greenbottle.com/>

Calorie labeling doesn't change fast-food orders

Do labels and calorie-information stop us from gorging on addictive fast foods? Not really, according to a new study conducted in the *International Journal of Obesity* in the US, the calorie labeling in fast-food restaurants has no effect on the food purchases of parents or teens in low-income neighborhoods.

The study mentions that though the calorie labels increase awareness of calories, they do not necessarily influence food choices or the number of calories consumed.

Researchers from the New York University School of Medicine surveyed customers and collected their purchase receipts at four major fast-food chains — Wendy's, Burger King, McDonald's and Kentucky Fried Chicken — in July 2008, before New York City's implementation of a new calorie-labeling regulation, and again at the same locations one month after labeling began.

The 349 participants were children and adolescents ages 17 and under who visited the restaurants with their parents (69 percent) or alone (31 percent). The study found that just over half of adolescents and adults noticed the calorie counts after labeling began — but only 9 percent of adolescents and 16 percent of adults who saw the information said it mattered to them.

It also found that people bought food items with the same amount of calories before labeling began and after — for adolescents, it was about 725 calories, and for adults, about 600 calories.

Under a federal law passed last year, restaurants and stores nationwide that have at least 20 locations will be required to post calorie counts on menu boards and in stores and have nutrient information available in writing upon request.

Source: www.suntimes.com



Chicken or Egg?

Eggs in Britain are showing signs of contamination with the cancer-causing chemical, dioxin. Dioxins are environmental pollutants that are known to be harmful and whose accumulation in the food chain is rampant and dangerous.

Since market globalization, eggs travel over long distances, and it becomes difficult to pinpoint the origin of the contaminant. The dioxins are actually accumulated in the fat of the hens and their eggs, from cheaper commercial feed, soil, plants, worms and insects that are also carrying high doses of dioxins in their body tissues. The Food Standards Agency in the European Union has already issued a statement about how there is “no danger” from this contamination.

The eggs from factory-farmed hens are shipped to a company, which subjects the eggs to high temperature. This process (pasteurisation) kills harmful bacteria and in the process also destroys the vitamins in the eggs. This pasteurization actually gives the eggs a longer shelf-life and can be stored for months or even years. The objective of the food industry has been increasing the shelf life of the product, at the cost of public health. In the attempt to find cheaper ways to produce food, our Industrial food system is pushing us towards potential health scares. This dioxin contamination has been reported in Britain, Germany and Netherlands.

Source: *The Ecologist*

Mango Goodness

For a large portion of the population, summer means mangoes. Yellow and sweet or green and tangy. There is a reason that the mango is well-known as the ‘King of Fruits’.

The mango tree grows for many years, sometimes up to 300 years and will still continue to yield fruit. Mangoes are native to the Indian sub-continent, but are now cultivated all over the world. An average-sized mango has up to 40% of daily fibre requirement, which is protective against degenerative diseases, helps prevent cancer because of the high content of phenol and even lowers blood cholesterol. Some of their other properties are listed below:

- Mangoes are excellent sources of Vitamins A and C
- They help to replenish lost potassium
- In Ayurveda, they are said to improve the appetite and build resistance against diseases
- They are excellent blood cleansers
- Mango has been found to be effective in treating acidity and poor digestion



- It has also found use in healing bacterial infections, treating heat stroke and even morning sickness.

The best way to eat a mango is fresh. They can also be combined with other fruits in juices or smoothies. Pickles and chutneys are another way of using the mango's excellent qualities.

Source: <http://health.learninginfo.org/nutrition-facts/mango.htm>

Become a Bhoomi Network Member Today!

Join a Network of people who enjoy learning and sharing perspectives about sustainable living.

If your membership number on the address label had 'Jan' or 'Apr' included, it is time to renew your membership!

As a member you are entitled to

- 4 issues of Bhoomi Magazine per year
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Membership Rates	1 year	2 years	3 years
Within India	Rs. 350	Rs. 700	Rs. 1050
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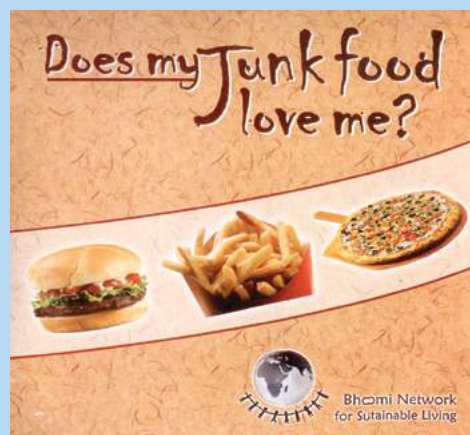
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The following can be ordered by you for use in schools, colleges, NGOs, housing colonies and for sharing with friends

A. Docu-drama for students/ parents:

"Does my Junk Food Love me?"

(1 Video DVD on how chemicals and ingredients of junk and processed foods can harm children)

Rs. 200

B. Powerful and Inspiring Talks

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1. Satish Kumar – *on Food, Health & Climate Change*
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4. **Devinder Sharma** - *Making sense of a complex world*
5. Nandita Shah - *on Nature, Health & the Body Beautiful*

Bija Vidyapeeth, Dehradun

Bija Vidyapeeth, started by Dr. Vandana Shiva is an International School for Sustainable Living. It offers residential programmes by renowned thinkers, scientists and others.

October 3 – 5, 2011

Bhoomi and the Gift of Food - Building Earth Democracy and Food Justice

As the assault on the Earth increases and the threat to human survival intensifies, new paradigms and movements for Earth Democracy and defense of the rights of Mother Earth are emerging. Simultaneously the growing food crisis and hunger is demanding food justice so that the Right to Food for all can be ensured. The course will cover this emerging worldview and experiences and movement in the context of food.

November 7 – 12, 2011

The Ganga Yatra: A journey to witness India's Lifeline under Threat

Ganga is India's lifeline spiritually, culturally and materially. However, this lifeline is today under serious threat. The building of dams and hydroelectric projects and increasing pollution is destroying the Ganga. Save the Ganga Movements are emerging to create awareness on the threats to the Ganga and to find ways to protect the Ganga - our living heritage and life support. The Yatra will begin from Dehradun, travel through Tehri and Uttarkashi and end at Rishikesh with the Ganga Aarti.

See www.navdanya.org for more details

Trek in the Sharavathi Valley – May 16th - 19th, 2011

Gaia Wilderness Learning Center has been set up with the aim of fostering consciousness about a 'living' Earth along with adventure and experiential ecology activities.

Gaia's programmes are designed to provide rich experience of Nature and foster an understanding of the web of life and our part in it.

We are professionally trained outdoor enthusiasts with several years of experience in the Western Ghats and are committed to experiential learning beyond the class room, along with interactions with local people of the area we visit.

Look forward to an exciting & meaningful programme in May, 2011

Sharavathi Valley is part of the Western Ghats - one of the Biodiversity hotspots of the world, a region for all of us to experience, explore and cherish. The trek in Sharavathi Valley will include breathtakingly beautiful routes along the Sharavathi River as well as interesting historical sites like the 600 year old Kanoor Fort and the Jain temples of Chathramukhi Basti.

For details email Ananth Somaiah at ananthsomaiah@gmail.com or Call - 09035388221



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for Food, Community and Sustainable Living

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Water Privatization

In his argument against granting India her Independence, Sir Winston Churchill had ominously said, “*Power will go to the hands of rascals, rogues, freebooters; all Indian leaders will be of low caliber & men of straw. They will have sweet tongues and silly hearts. They will fight amongst themselves for power and India will be lost in political squabbles. A day would come when even air & water would be taxed in India.*”

It has taken only 64 years for this prophetic statement to come true... Today our water is taxed. What is more scary is that our water is allowed to be owned by private corporates. Water, which might have been a cloud, a part of the ocean or the river, in our plants or as dew drops, or as sweat of people and which filters into our water tables can today be owned by corporates?

We are part of a generation that holds immense faith in market forces and allow ourselves to be subdued by the same. It has become globally acceptable to treat water as a commodity, which can be bottled, branded and bartered. Now a multinational organization threatens to deny our constitutional right to water.

In the month of February, there was a campaign in Bangalore against the continuing support of the Government of Karnataka to the ‘Policy of **Commoditisation** and **Privatization** of Water’ by a broad coalition of NGOs and individuals under the banner of ‘People’s Campaign for Right to Water’.

Agencies connected with the Urban Development Ministry of Karnataka, such as the Karnataka Urban Infrastructure Development Finance Corporation (KUIDFC), Karnataka Urban Water Supply and Sewerage Board (KUWSSB) and Bangalore Water Supply and Sewerage Board (BWSSB) are actively preparing to receive a delegation of 16 American Corporations. These Corporations are advocating that **water resources that are allocated to the agricultural sector be minimized as part of water conservation efforts** and are intending to exploit business opportunities to provide **safe water for personal consumption and for industrial use**. All this is considered a part of the intention to capture the proclaimed US\$50 billion water market in India.

The Mission Statement of the US Water Trade Mission to India 2011, which backs this visit, intends to exploit opportunities that “*bypass the inadequate municipal system*” so that “*US water and waste-water technology companies initiate and/or expand their exports to India... (and) find best opportunities in sanitation, urban water supply improvement, rainwater capture, and municipal waste treatment.*” In this way the Trade Mission doesn’t take our Constitution or constitutionally-elected bodies seriously.

Bhoomi Network brings this column for students and teachers in particular, to focus on issues which concern the well-being (and possibly, survival) of all human beings, and about which decisions are made by a very small minority of our population. The Right to Water is one of the most fundamental rights of any citizen of a country. Aruna Kalahastri writes about the dangers of privatization of our water.

The Campaigners met with Mr. Suresh Kumar, Urban Development Minister and senior officials from KUIDFC and BWSSB on 23 February 2011. In this meeting, Shri. Kumar categorically stated that he was **opposed to privatization of water**, also asserting that the ‘*Karnataka Government would never allow commoditization and privatization of drinking water.*’

Politicians have often been clever with words. In a recent blog post on this topic, Mr. Kumar attempts to distinguish between privatization of water and private participation, stating that the latter must be considered if a ‘quality service’ needs to be provided to society. Reading between the lines, one wonders how long it would be before private corporate organizations assume control under the guise of ‘participation’.

Where is the Public?

When the government intends to take up private partnerships, it is turning itself into a corporation seeking business opportunities. In this case, its ‘capital’ is our tax money. This then automatically gives the public absolute right to participate and decide (even without constitutional rights). Why has there been no public hearing invited by the government on such decisions?

Thanks to a sensible minister like Mr. Jairam Ramesh, who set the precedent to involve the public, there has been at least a moratorium (if not a ban) on issues such as the introduction of Bt Brinjal. How can such decisions about the commons be taken without the participation of us citizens, who are the financiers in this case?

Even if in some sense the urban populations were to gain through better service and infrastructure, the markets would still undermine the rights of farming communities and others dependent on these water resources. Let us not forget that water is the single major variable resource for 70% of our population.

What can we do?

- Join campaigns
- Spread awareness
- Build pressure on the government through public forums
- Or make sure you add your voice to petitions at <http://www.ipetitions.com/petition/opposewaterprivatisation/>

For further details you can contact anyone of the following members of the Peoples Campaign: Rajendran Prabhakar - 9449820566, Issac Arul Selva - 9480452037, Kshithij Urs- 9845452242, Leo Saldana of ESG Minister’s blog: <http://nimmasuresh.blogspot.com/2011/02/privatisation-of-water-needless.html>

Connect with Mother Earth

We can make a beginning to connect with Mother Earth in several ways - through the food we eat, the joy of gardening - especially with children and learning from being in wilderness areas... Bhoomi Network and Gaia Wilderness Learning Centre offer programmes where we can get together, share learning and discover more ways to live harmoniously on Gaia.



Bhoomi Programmes for 2011 – 2012:

April -	16th and 17th 20th to 26th	Sharavathy Valley Trek Program on Inner and Outer Ecology
May -	19th to 22nd	Sharavathy - Rainforest Adventure 28th and 29th Sharavathy Trek
June -	11th 18th and 19th 25th and 26th	Organic & Terrace Gardening Conscious Nutrition Conscious Kitchen
July -	9th 23rd	Bhoomi Project - Earth bag construction Reversal of Diabetes
August -	13th 20th and 21st 27th and 28th	Organic & Terrace Gardening Conscious Nutrition Conscious Kitchen
September -	10th 24th	Reversal of Hyper-tension Organic & Terrace Gardening
October -	1st 2nd	Bhoomi Festival & Seminar Farmer's Market on Gandhi Jayanti Day

- ☛ Become a member of Bhoomi Network and receive 4 issues per year of the Eternal Bhoomi Magazine...
- ☛ Participate in Bhoomi Programmes and Gaia Wilderness Programmes
- ☛ Join and enjoy the Bhoomi Festival on October 1st and 2nd, 2011
- ☛ Be part of a network of people who wish to make a difference



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We can feel

A new kind of freedom...

A release from stressful, soul-less work

A quiet substantiveness within

When we discover the joy of living lightly on Earth

