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**The Ecological Society**

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## Foreword

It is our great pleasure to present to our readers the 25th issue of the Journal of Ecological Society. The issue mainly includes articles written by our students of our one year postgraduate course in Sustainable Management of Natural Resources and Nature Conservation. It is gratifying to see that the students have chosen to express their opinions on this course and they aver that the course has changed their attitude, has brought almost a change in their outlook towards life. Students are the strength of the Society and have always inspired us to work harder. We wish them success in their work and efforts and hope they will continue to work for the betterment of nature, for the uplift of human and nonhuman beings.

There are many NGOs in Maharashtra who concern themselves with social uplift, trying to bridge the widening gulf between rural and urban life and find new ways to provide employment and better the condition of the poor.

The Society however, has taken the position that unless radical changes are brought into the economic structure, unless the very basis of the economy is changed no improvement in the present situation is possible. Neither will it be possible to reduce poverty and social and economic inequalities. Changes in the basis of economy mainly involves protection to and proper management of various natural ecosystems to achieve the betterment of human and nonhuman beings resident and migratory in India.

We have, in some previous issues of the Journal, explained in detail, what kind of changes are necessary in government policies and social and economic spheres. They involve, taking care of nature, natural resources and ecosystems. It was pointed out that

massive and productive employment will result from such changes and will create national assets ensuring long term benefit to all.

We had, in the past, invited eminent personalities from different fields to discuss these fundamental issues and evolve a consensus. The results are not very heart-warming. The experts probably failed to grasp the fundamentals because of the influence of technology in our life; while the Society does not shun technology, the emphasis today of technology on the use of fossil fuel and the ego the use of technology confers human mind are to be avoided.

We need to clarify what technology means and what it involves and how it affects our minds. We need to change the very basis of our technology which will initiate a different approach and quite different policies.

The Society will continue to work in this direction and hope that it could rally around this position a grater body of public opinion and draw the attention of policymakers.

We salute our readers and wish them success in their efforts to improve the condition of nature and people alike!

Editor and the Ecological Society Team

## The Laws Of Entropy Or The IIT

### My Background

After my training in engineering I took up dealing in technological products as my profession. I was impressed by advances in technology and believed that technology can provide solution to most problems in human life. At the age around 40 years, I was puzzled by fallacy that advances in technology are increasing work-loads, pressures and tensions in life, not reducing them. Safety, security situation are worsening, not bettering. What use I am offered a lot of money, gadgets and avenues for entertainment when I have not enough freedom and peace of mind to enjoy through them. Then . . .

I purchased some agro-land near Pune to try to stand on my own feet independent of high-tech driven economy. Except leveling, fencing of land and bore-well, I tried all urban mind-set methods such as traditional agriculture, horticulture, plantation, non-conventional energy, open-well and a farm-house. I watched my inputs, not only in money terms but also in energy, efforts put-in and harm suffered by me. Nothing proved successful and useful except the last one - owned place for outing. I was puzzled again.

### The Course

It was a revelation for me that we live by natural diversity of non-living and living. In my formal education and in my professional or personal life I never learnt importance of landscapes and bio-diversity, forming ecosystems that support our lives. For better and sustainable living we should look for ecological solu-

tions and I saw them practised at Hivre-Bazar (visit arranged by the Society). Puzzled amazed. Besides classroom course, I gained a lot from Prakash Gole's deliberations during camps and in private meets.

### **My Research Work after the Course**

Economy is about goods and services i.e. matter and energy. Technology also deals with matter and energy. Physical phenomena in nature (we use for our purpose by technology) are explained by science. Hence I revisited science – matter, energy, and the universal laws of nature. Explanation to my above mentioned puzzle is summarised below.

My study of the universal laws of nature also revealed that 'diversity' and 'uncertainty' are the most probable features or the characteristics of nature (as corollary of The Law of Entropy). No wonder, humans adapted to living with bio-diversity and diverse landscapes or ecosystems, the lowest (effort and harm) cost system providing us necessities of life including protection (by resilience) against uncertainties in nature.

In comparison, non-diversity or uniformity based technological solutions are inherently inefficient. They deplete resources and create huge waste (as per The Law of Entropy). Users suffer enormous effort and harm costs jeopardising their own sustainability. Ecological solutions (for the same benefit of secured and comfortable life) use naturally existing ecosystems for free and therefore the effort, harm costs and energy requirements are very small. Sustenance is better. Reduced work-load, pressures and tensions in life or enough freedom and peace of mind can lead to sustainable enjoyment.

Since there are no known exceptions to the universal laws of nature, it is wiser to join (be in tune with) the laws, why are we trying to beat (violate) them by removing diversity and trying uniformity. Thus the course content is on sound and strong scientific footing.

### **My View on Social, Economic and Political Scenario**

Over thousands of human generations technology is extra-somatic adaptation for

- 1) Security – shelter for reducing fear and storage measures to overcome uncertainties,

2) Comfort - tools and processes for reducing body effort and burden of work-loads,

3) Entertainment - toys for refreshing abilities and communication for sharing enjoyment supposedly in this order of priority as survival, better living and enjoyment instincts.

### **Everywhere Hard Use of Technology : Hard-Tech**

Most main-stream human population is dependent on hard-tech for living. Almost all goods and services available through hard-tech have a monetary price and hence, earning money becomes an absolute necessity of life. Working with commitment of time and/or human services for monetary gains is employment. We are in direct/indirect employment of governments and corporations (all such non-human entities controlling money supply) and live on money received from them. Though never accepted, our real commitment is earning money. Commitment is loss of freedom and employment is selling freedom.

Everyone is slogging in employment. Current scenario summarised by Mrinalini:

“Erstwhile persons sacrificing sleep, friends, family and leisure eating, joking, fooling, frolicking or laidback lives were called saints; today they are known as good employees”.

Most real bodied people are working for virtual bodies (governments and corporations) earning and storing money (a virtual source) in hope of perpetual availability of real goods and real services.

Human society has to pay effort and harm costs for using any technology. As per The law of Entropy, every technology is inherently inefficient. Are benefits more than the costs?

How are we bearing technology costs?

For technologies involving direct use of heat, costs are small, bearable by a smaller group of individuals. Costs for current energy conversion technologies are high and rise rapidly with the scale of technology application. Many more people are required to share rising costs. Some people can/are made to share some efforts and/or harms better or more than others. They are glorified as skilled and professional so that they carry burden of effort and harm with dignity. But professionalism or skill development augments inequality in humans and social repercussion thereof.

Sharing of costs then takes the form of human-services-ex-

change. Goods for exchange of services (barter) can work only with friends, relatives and in the neighbourhood. Metal coins and paper money systems linked to finite resource (Gold) assume importance as area of operation grows larger. Costs keep rising due to depletion of low-entropy-resources and proliferation of Inherently Inefficient Technologies (IIT). Result is either increase in stake-holders to share the costs - growth in number of people or no hard-tech.

Promoting employment generation is for accommodating more people for sharing effort and harm costs. Though majority gets less, they too have to share in products and services available through hard-tech. This stirs a multiplier effect. Hard-tech? more people to share costs and benefits? more hard-tech? stimulating human population growth.

Scale and interrelations of operations and number of processes increase these costs as technology occupies all spaces of human life. Rising costs of hard-tech necessitate either close down or further growth - formation of companies, then corporations by mergers of companies, multinational corporations by acquisitions and/or out-sourcing, vendors, etc.

Society-chieftains (kingdoms) also have to grow into bigger governments simultaneously. They support corporations as provider of hard-tech, a tool very effective for governance.

Unequal, imbalanced growth limits itself as also the limits to resources (as per the law of conservation). No increase in number of people to share costs necessitates rising money compensation to retain people. Hard-tech reduces physical labour but increases mental labour and psychological problems - pressures and tensions due to risks or fear of harm. Psychological solution: people are ready to put in more effort/time and bear increasing harm in exchange of money - image of goods and services. Money linked to finite resources does not suffice and therefore, money is delinked to resources so that it can be unlimited. Rise in number of people and rise in money supply (growth or inflation) are indicator of and necessity due to incapability to bear effort and harm costs of hard-tech.

Costs are unevenly divided over human society; time-wise, location-wise and situation-wise. Some bear effort and harm physically, others bear mentally and psychologically. Who bears what, when, how much and also what one feels about it can only be

guessed. The essence of sustenance of hard-tech is that majority feels that they are better off than others. Today, costs start affecting right from the childhood. Education (investment for employment) encroaches on children's freedom. What use our average life-expectancy is higher if time in life with vigour and capacity to enjoy freedom is bogged down in employment commitments? What fun stretching incapacitated old-age?

### **Expected Benefits**

**Security:** No. Original cause of fear has changed from the "environment" to situations arising out of "hard-tech". Uncertainty too is not over. Unreliability of hard-tech services arises out of entropy. Providing redundancy for reliability increases effort and harm costs.

**Comfort:** No. We have heavy work-loads, 3D work, pressures, tensions and hardships.

**Entertainment:** Yes, but peace of mind, freedom and leisure necessary for enjoying our entertainments are missing. What use are a lot of gadgets and avenues of entertainment?

People in this situation adapt themselves to enjoy insecurity and loss of freedom/comfort. They enjoy by possessing gadgetry, vehicles, valuables, structures, investment, travelling, etc by hard work, busy time schedules and clockwork discipline. If they enjoy them at others' cost then they create a security problem for themselves. Enjoying rising numbers, competition, power over others, taking risks, adventures, consumption of unhealthy or unsafe stuff is enjoying insecurity and discomfort of hard-work. In other words, they enjoy loss of freedom and peace of mind. Education, media and policies (socially) engineer such enjoyments as status. Criticising, complaining their non-achievement or non-compliance is pastime entertainment. Longer old-age as status norm amounts to enjoying helplessness.

### **How I Visualise Immediate Future**

Cells form human body and work for the body. Cells struggle, suffer, sacrifice, replicate for the survival of the body. But the converse is not true. A group of cells that forms conscious mind has very little control over functioning of the whole body. This group helps body to protect from the environment by technology. But in hard-tech it is by making some cell suffer before others.

(Muscle cells suffer less than brain cells. This group's own trouble is reduced by alcohol, tobacco or drugs making other cells say that of liver or lungs suffer.) Though with the same DNA, diversity in cells (by functions) makes them impossible to decide on one-course action on the body. Body is largely subject to entropy increase and the environment.

Exactly similarly real bodies (human individuals) form and work for the virtual bodies (governments and corporations). Individuals struggle, suffer, sacrifice and replace for survival of the virtual bodies. But the converse is not true. A group of ministers that form policy-makers have very little control over total functioning of virtual bodies. They can at the most decide which section of human society suffers the IIT costs before others. Though all humans, diversity in individual's up-bringing, education, skills, roles, functions, psychology, environmental conditions, etc makes it highly improbable that all of them decide on one-action plan in any of the hard-tech evolved governance systems. Most virtual bodies are subject to external conditions.

Unlike body cells, human individuals can decide on their own well-being. I must look for alternatives not only for us but also for our perceivable future generations.

### **My Line of Action**

● A fundamental change in life-style with theme: from technological to ecological solutions

● A planned slow but steady change in stages enjoying better security, comfort and entertainment at every stage, sustainable for my perceivable future generations.

- Restoration of land and wilderness (by protection)
- Soft-tech: Little effort and low harm, simple long-life and easy maintenance, operating on local material inputs, auto-reset low wastages. So far successful
  - In water management: potable water, recycling of grey water, waterless toilets
  - In cooking fuel, domestic work, heavy load and UV protection managements
- Food: Reducing interference in ecosystems

Only few people (like unicellular organisms) change themselves. Their actions look just palliative but I am into it for three

reasons.

1) Doing (in my opinion) correct things is a matter of self-respect or status for me. I live not alone by food and shelter; self-esteem is equally vital. With Amol and Mrinal I am enjoying transformation from backward urbanite to modern junglee.

2) Few takers but it serves model for others, particularly younger generation, to copy.

3) We are slowly adapting to the correct life-style for the future. Slow change is easier.

### **My Impressions on the Course**

Focus to be on "all aspects of our living" (not just information of academic interest) e.g. Bio-sciences: how plants, animals, insects and micro-organisms live and their importance in our living to know what should we do and what not to do (not scientific names, etc). Physical sciences: role, advantages and limitations of technology, geology in our life.

(Choice of technology and materials, local stones for what use, etc)

Our camps are more of tourism than study tours. They are good for social interaction among participants. Can we not use photographs, films and experts' narrations instead? (I am of the opinion that earth is damaged mostly by industrious people and tourists.) Social interactions for exchange of ideas and cooperative action (if any) during and after the course can be locally arranged, may be along with veteran past students.

Girish Abhyankar

BE, MBA / Entrepreneur, Energy Expert

## Experiences And Impressions During The Course

The course TES was an important event in life. Though aware of ecology and environment from studies during graduation and there after practising some of it during profession such as eco-friendly construction, the view of these concepts was quite narrow. After undergoing the course, interdependence of all the spheres of life and impact of human actions on environment were better understood. Most important insight sought through lectures of Gole Sir ( and also Girish Abhyankar) was that there cannot be technological solutions to today's problems of environment.

Better understanding of Biodiversity was possible through the extensive field trips and Sunday visits. A very deep understanding of plant life would not have been possible without Mahajan Sir's interactive lectures.

Another aspect was of restoration of disturbed ecology. It was realised that the earlier impression of human driven greening/ aforestation as solution is not the right direction. Slow and natural restoration leading to a biodiversity should be the path to be taken. This again is in line with the concept of allowing nature to function which was impressed upon during the course. These restoration efforts were seen at some of the sites developed by Ecological Society. However, based on this biodiversity, the possible livelihood generation for many people appears to be a remote possibility in current economic system.

I have attended Saturday Sunday batch and hence there were limited contact hours for interaction. Towards the end of the course there were several discussion sessions in the class instead of lecture. These discussion sessions were most useful. Though

the discussions are taking place during regular lectures, participation is limited. Lecture followed by discussion could make the entire process more interesting.

One thing that was available but could not be made use of was, accessing the extensive collection of books at Ecological Society office. Probably the access could be given to past students after completion of the course (if necessary on chargeable basis)

### **Line of Action Taken after the Course**

Fortunately, immediately after the course was over, I got a chance to work on a project of ECO-Park proposed by Maharashtra Knowledge Corporation Limited (MKCL). The project was intended to be hands on learning experience in environmental science for school children from 5th to 10th standard. A site was chosen in Solapur district where environmental education was to be imparted through working models and participative exercises in aspects such as eco-systems, water conservation, energy, etc.

MKCL aims to establish a network of such Eco-Parks throughout Maharashtra. All of them are to be planned in line with some basic educational principle. The theme would be relevant to local conditions and needs. The experience would be fun filled and would allow students to express through various means such as games, posters and paintings, models made while on tour of the eco village. The knowledge imparted and experiences gained would be complementary to schools

The present compartmentalized educational system is causing our social divide. This has wider societal implications. It cuts off village based schools from mainstream and is unable to provide meaningful village based livelihoods. In developmental projects ecological knowledge is in great demand and its possession at the grass-roots level will confer village teachers and schools a stature and status which alone will prevent the present mass migration from rural to urban areas.

While working on planning, and designing of the Eco Park many principles learned during the TEC course could be applied.

My pursuits on working with sustainable construction system for rural and semi-urban housing continue as profession and hobby. The course has helped in broadening the perspective in this field also.

### Thoughts on future

Today's social and economic system is driven primarily by urban demands. Globalization in early nineties led to opportunities in service industry as well as manufacturing. These two sectors are predominantly urban phenomena. This led to job opportunities in urban centres and the rural areas in the 40 to 50 kilometre radius of the urban centres also depended on Urban centre for livelihood. Hinterlands remained primarily agricultural. The food pricing has always been skewed in favour of Urban population. Urban centres have been subsidized through cheaper food, milk, vegetables coming from hinterlands. The resources available in rural areas such as land and water were exploited by cities. Though the prices of commodities were not cheap in absolute terms, the costs at which these were purchased from unorganized rural producers are not meeting their input costs. In order to survive the resources of rural areas get over-exploited degrading the water and land resources. Even construction materials such as wood, sand and stones or aggregates come from the rural areas and there is over exploitation of river beds.

Cities being over crowded are leading to collapse of infrastructure. Water resources meant for agriculture are getting diverted to cities for consumption. Water used by cities is let into rivers, mostly untreated, degrading the water resource further.

It is time to change this resource subsidy to urban area. Cities should be cross subsidizing rural areas. The resource footprint of urban individual is many times more than that of the rural individual. Urban population should pay the correct price for enjoying these resources. In turn the rural population would get incentives for staying in hinterlands and living on lower footprint.

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## A Journey Towards Ecological Realization : Sir And The Society

"Types of ecosystems, thousands of micro-climates, tropical economy, India's exceptional biodiversity, sustainability and holistic approach towards economic development . . ." The presentation proceeded. I was fascinated with every passing slide. While the slides rolled on further, things were more comprehensible to me on that sultry summer afternoon. This presentation was done by none other than Shri Prakash Gole and organized by Dr. N.H. Antia, founder of FRCH where I worked then (in 2003) as a social researcher. It was my first ever job in research field after completing Ph.D. in political science, international relations.

Until I attended this presentation Gole Sir was well known to me only as an ornithologist. However during that presentation I got introduced to him also as an ecologist. There was a substantial core in his lecture that led me to meet him personally after. I told him that I was enthralled with his lecture and what shall be the way to adapt this approach in day to day life? He flashed his famous grin and enjoyably said, "Why don't you join our course then?" I candidly said, "Always being an arts and humanities student would it be possible for me to undertake the ecology course he has designed?"

The answer he gave was going to be a turning point for me. My whole thinking process got a new direction when he said, "that's even better! You will understand ecology very well as you need not have to unlearn the stereotypes of science based education. The course is not only for science students but basically an interdisciplinary one." My self-confidence boosted with his words. Later slowly I realized how many fields he has travelled around and that reflects through his exemplary ability of innovative think-

ing. The self-reliance given by him that time made my day and later I realized that it was the first step I took forward in the journey of ecological realization! The man and the institution instrumental for it were the one and only Gole Sir and his Ecological Society!

I'm sure the similar sort of feeling is cherished by many other Society students who sincerely pursued the course and thereafter remained in touch with Sir, the Society and by and large with nature.

Subsequently, I joined the course by getting enrolled in the immediate batch. This opened the gates of a whole new world for me. The course Sir had designed was matchless in every way, the content, the substance, the methodology and the manner in which it was conducted. This proved to be a remarkable opportunity for us to get introduced with a number of new topics, concepts, ideas and people. The insight Sir gave us through this course is unparalleled.

It is an equally delightful experience to travel outdoors with Sir. During that time we had project compulsory as a part of the course. Since I was interested in doing a wetland ecosystem project Sir personally came with our group in search of a suitable project site. He took us to various directions in the outskirts of Pune. As a perfect teacher and a guide he is always very caring about his students. That time too he was very sensitive in choosing the site for us so that it would be accessible and approachable for us while doing the field work throughout the year. That's why though there were good wetlands towards east of Pune he was not very keen in selecting them due the risky Pune-Solapur road.

Finally he selected a nice small wetland located near Pirangut in village Ghotawade to the west of Pune. This road was much safer and easier for us to make frequent site visits. Initially we were four of us in this wetland project group. However within next two months the other three girls could not manage to visit the project site and I was the only one who was left in the group. It was only due to Sir's motivation I could pursue it further and completed the project by visiting the site every fortnight throughout the year. It was through Sir, I learnt how to complete given tasks with sheer perseverance. This was my exclusive experience hence has become a memorable one. On this background, it wasn't very surprising that despite of my busiest schedule during that

time I could complete the course successfully to Sir's expectation. He personally checked all assignments and project report. Yet I was very scared with his evaluation and wasn't very sure about his reactions! Sir was so strict then that he had bluntly told all the students, "There will not be any course completion certificate given without satisfactory performance." I still remember that till the previous day of certification ceremony he did not disclose the secret list of successful students! Only after Bhavana's invitation call came from Society's office I was assured of my result! Receiving certificate was not the issue but getting felicitated by Sir certainly was. It was an honor to me and I do cherish it always close to my heart.

When people ask me why did I shift my career focus from political science, international relations towards environment and ecology? This phenomenal shift in my personal life though unknown to them is very logical for me. Just recently in Global Alliance's Faculty meeting when I was asked this question again, I publicly said that it was only after my Ph.D. I met Gole sir and came across Ecological Society! If this had been before things would have been certainly different.

Sir is more than an inspiration for me . . . as if a timeless source of insight . . . This indeed is a journey to remember.

I also took few of my birding lessons while travelling with Sir. There is one marvelous incidence I often like to share. Once when I was travelling with Sir to Vinchurni grassland project and he suddenly stopped on the way. He parked the car on the road side and started gazing up above to the sky and said, "Oh it seems to be a pair of Bonelli's Eagle." That time I could not see anything more than some dark spots gliding in the sky! I was so very amazed with his birding skills and that triggered my interest in birding so much that it slowly became my passion.

This isn't only a personal depiction of experiences with Sir though it apparently sounds so. As I am pretty convinced that there is some or the other memorable element has been inculcated by Sir in each and every true student his. Hence the facts in this write up may be personal but the feelings of respect for Sir and the spirit behind it could be completely universal!

"Sir and the Ecological Society" is some such bond that we all past students share through all these years and that cannot be aptly described even. It has kept us connected with Ecological

Society and also with the topic of environment in general. Especially for me, Sir and his theory of ecology has influenced everything . . . the way of thinking, the way of interacting with people, the way of convincing our family members for reducing needs by adapting "reduce, recycle and reuse" mantra . . . in a nutshell the way I live.

I found myself to be a completely different person after the course. The ecological learning has cast a deep impact on my whole thinking process and acts like a theoretical cushion while doing any activity or taking any decision! The erstwhile anthropocentric approach towards life has undergone a major change. Since then the holistic approach towards nature along with the constant tune of "conscious consumer" always rings at the back of my mind. The love for nature is not restricted just as a personal liking but it has become a way of life. I look at this as yet another progression in the journey towards ecological realization.

After the course I slowly shifted the focus of my career towards nature based activities that includes creative writing, film making, editing, script writing, photography, our nature related website <asahee09.ning.com> and research related activities. Similarly I constantly try to reduce the gap between practical life and ideal nature fronted life. These are very small and humble efforts but consciously taken to a definite direction. Spreading the message to the wider people through all possible creative mediums has become my objective. However, there is a sting of an unfulfilled dream. A dream of making ecology related rich content based yet visually delightful film on Sir, his life and works. After completing the course I tried a lot in this direction but the dream has yet to come true. I do hope it will come true in near future.

I always found me connected with the Society as a whole due to social scientists parents and a researcher husband having a creative mind with a lot of insight. These facts have contributed towards the newly gained vision of naturecentric approach. Being a social researcher I always want people to feel that nature friendliness is in the larger interests of human beings. Instead of understanding this simple fact people make their lives much complicated. How come the economics, political science, sociology, history, or any other ideology for that matter can remain separate from nature? If human beings are solely dependent on environment, the eco-systems, the climate, the natural resources,

the biodiversity then why is it not connected with our everyday life? Is it not a gross blunder we are making by pretending nature to be disconnected from our daily lives? This is an inherent contradiction of modern life style based on energy intensive technological solutions to everything. As conscious human beings we must adapt a natural approach towards life and we owe it to all the living beings on this planet. Human beings are the most dependent creatures on this earth and our forefather realized this fact and they came up with a more sustainable way of life that was in tune with the natural constraints humans faced. However unfortunately in modern science based hi tech era the people have lost the sense of traditional wisdom and surrendered to an excessively dependent technology based life style. This phenomenal shift has destroyed the natural balance. As Sir has taught us, the things produced locally should be consumed locally with only marginal surplus can be distributed outside. However, this basic principle of sustainability has been shattered to the self destructing methods of market economy and globalization. We Indians as beholders of world's fantastic biodiversity and tropical climate must understand that the western concepts of globalization and privatization are not at all suitable for us. These are the clandestine western ways of exploiting rich natural resources from all over the globe. Western countries themselves are short of natural resources and their life style demands are beyond their natural possessions. Thus market based economy is their only rescue. Energy intensive life style is the worst gift they have given to the world. Especially India doesn't really require this life style but we seem to be in much hurry to catch the West. Neither our policy makers nor our social leaders are aware of this self destructing mistake.

We often quote Gandhiji for saying "Nature has enough for everyone's need but not for greed". However long back we have forgotten the thin line differentiating our needs and the greed. While Gole sir rightly says, India being a tropical country it should have tropical economy with tropical soft technologies. Why is that we are overpowered by market economy based on western ideology? Are we falling prey to a wider conspiracy and getting ourselves robbed from our natural riches? With the blind following of Western development model, disparity in India is growing very fast. Due to this disparity the gap between rich and poor,

urban and rural has widened beyond imagination. To quote P. Sainath, "The collective net worth of 311 Indian billionaires is now Rs. 3.64 trillion. This has gone up by 71% within one year, when it was Rs. 2.13 trillion and at the same time the people below poverty line have gone up to 34 percent."

Surprisingly this fact is not limited only to India but it is similar even in US. For instance, few years ago 1 per cent of people in the US had 9% of U.S. wealth and in 2011 they had 24%. Thus here comes a question, is really the Western economic model working?

It looks like that we are overenthusiastic in copying the West while West itself has lost its direction. Consumerism cannot be the freedom of choice as it is often portrayed. It is a wrong notion for the simple reason that it is not sustainable. Harold Laski rightly says "Liberty is a system of restraints." Controlling our unscrupulous consumption in good time is the only sustainable way to continue life on this planet.

Sir has time and again said that, "If the nature is preserved and natural resources are safeguarded, then it certainly provides reasonable standard of living to all."

It is high time we brush up our basics of traditional wisdom and respect nature's bounty without taking it for granted. It is well said that, "not what you gather is important, but what you scatter that tells what kind of life you live".

This knowledge gained in the journey of ecological realization through Sir and the Society often reminds me Dalai Lama's famous quote. He says, "Remember, the universe is the echo of our actions and our thoughts."

Dr. Medini Dingre

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## My Eco-Journey . . .

Monsoon evening 2001 . . .

With several questions in my mind, I am riding my bicycle towards Aksharnandan school on Bhandarkar road . . .

A Classroom in the school was dimly lighted . . . so was my heart . . .

Coming from a small town Chalisgaon, I was a little nervous but curious. Gole sir started with environmental economics and I was just amazed at his perspective to look at life! Somewhere deep in my heart I realised that I am going to gain something very unusual from this old man which I had never thought of. In drizzling rains very gaily I rode my bicycle back to hostel. Next day I got up early, got my first PMT bus in time, got in and out of the office before all others . . . I was so excited . . . just to take my next lesson from Gole sir . . . It took me quite a while to get in tune with his thought line and then learn...

I was working in an e-publishing company in Koregaon Park just to make myself survive in Pune. Salary would pay for the rent, mess + a T-shirt from some tapri shop. I was happy with the salary but not with the work that I used to do at that company. 8 hours in the company used to be very depressing for me just doing proofing of e-books . . . but didn't have courage to leave this job and try to get another. It was quite a hard earned job . . . that reminds me of one of the fantastic coincidences in my life . . .

I came to Pune in 1999 to improve my acquaintance with drama as I wanted to appear for NSD - National School Drama interview. I was carrying just enough money to sustain myself in Pune for 2/3 months so agenda was also to get a job. 2 months passed by but there was no job. So to minimize frustration I got

myself engaged in one performance of poetry reading to be performed in the memory of Late Smt Padma Gole ! Finally the day of performance came; I had two hundred rupees in my pocket just to take the ticket back to Chalisgaon. After this performance, Mr and Mrs Gole (That time I had no idea what they could be to me!!) handed over an envelope to each of us, with one thousand rupees ! It was just a nice gesture for other performers, but for me it was one more month in Pune... And with that money I could extend my stay and I got the job !!

So...it was difficult to fire it. At that time I was not really sure what to do in life. So was literally dragging myself. Then all of a sudden I found this ray of hope in this course... After two years of gap after double graduation, for the first time, I was doing something which was really making me happy. Everyday there used to be a small session at my hostel about this new perspective to look at life. All my dear friends used to enjoy my excited talk. Besides a depressing job, that was the best period in my life. Had friends from various states, various religions, caring for each other, sharing every single bit of experience that all of us were having in the new city. It was more than a family for us. I was finding myself lucky to earn enough to be here. I might have thought to continue this way of life forever but that time I did not know what I don't know...

With this background, I was listening to Gole sir.. getting amazed everyday with his comments and views on day to day life. Even today to remember one incident... It was inaugural day of Dinanath Mangeshkar hospital. Everybody in the city was feeling very proud of Lata Mangeshkar who made this happen. But Sir had very different opinion about it . . . He said more n' more hospitals in a city is a very negative sign . . . that means your health is deteriorating very fast and nobody seems to take effort on mitigating the cause that makes us ill. We need to avoid people to get admitted in the hospital and make them healthy. I thought that, it is not that one would not want to do such things but it is just that we don't know this way to look out; we are not trained to do so. But oppositely we follow all conventional, technology based solutions which might cure problem temporarily but we never try to erect systems which would not create problems . . . Such a basic and simple thought but we are never cautious enough to look at life in such a simple way . . . All of a

sudden I felt like some corner in my brain is getting enlightened ...

The other week the other old man came in the picture. With his lecture on evolution of earth, we just fell in love with him, earth, plants, atmosphere, everything in nature ... it was beloved Mahajan sir. Ohh ... the way he taught us botany, various facts about plants and most importantly its significance in life, in restoration work, it was just enlightening. This was very different than the botany I learnt back in my college. Every time after his lecture I used to tell myself, in life I should be able to teach like him ...

Throughout the year both these teachers were sowing seeds in our minds that are growing forever! The Course was full of enthusiastic classes, field tours, guest lectures which kept on enriching my experience and knowledge to look at nature. Then it was Gole madam who used to explain abiotic factors and its linkages with biotic using nice diagrams. I am very thankful to these teachers who helped me frame my thoughts, vision and goal for life. I was eager to apply this knowledge somewhere ... was kind of in hurry to make it happen. But had no idea how am I going to do it. Me and Mrunal used to discuss it so many times that how it can be taken forward. Mrunal had completed the course two years before me so with her experience we decided to set up an ecological consultancy. Manasi also joined in. But since we were not sure of earning money immediately I decided to do it part time ...

Again another coincidence was waiting for the better ... My company fired almost 1500 employees. Id no. 1331 was one of them! I was very happy as I would be able to work for consultancy for full time. I could realize am not the same as I was 6 months before. With the New Year we formed consultancy named 'The Ecological Services'. Later we renamed it as 'Oikos for ecological services'. So the work was started on a small patch of an acre. We tried to develop habitats over there, did plantations, which gave positive results within a year. Meanwhile we also got a huge task in Varasgaon catchment. We had to survey 3000 acres in a year. So we developed a best schedule, to be on site for 4 days a week! It was really a feast for all of us to spend four days a week in western ghats! With recently learnt forest ecosystem, we could easily analyze the landscape but were facing little difficulty to

design restoration techniques. So we took Gole sir over there just to take advance course in practical implementation of restoration. Since labor was readily available we could implement restoration techniques or other green activities, but then we realized that we still had to learn the costing, budgeting, estimations of quantities of materials, specifications etc. which is necessary for execution at large scale.

I was quite enjoying the work but was little shy against my urban partners. They could look at it as business very easily, but I took quite a while to understand it and also them . . . we would only speak about projects, business, money, work. With my hostels background, I always used to think that we need to be good friends to work together than just partners. For the first time in my life I was watching neutrality in individualism so closely.

Passion to work for nature and little experience in it got us few new projects, which were mostly of planning kind. We still were not much confident to execute any restoration work on our own, though we would design the restoration plan perfectly. But simultaneously our expertise to analyse nature, recognise its potential and understand its problems was increasing.

In 2005, Mrunal decided to set up a different consultancy for carbon trading. It was quite a big change for us . . . quite upsetting situation for me. Out of curiosity I searched for carbon credits and it really made me think a lot again . . . about this field, what I like about my work, my vision and ways to take it ahead or improve it . . . till date I was just engrossed in doing work the way it was coming to me. I was using my brain, not heart. Obviously something was missing . . . So now I decided to go by my heart . . . And all inner values started peeping put which were suppressed against some strange fear . . .

I also tried to know the significance of our work once again. Is it really the right way to work for nature? Then I also critically looked at the problems happening around me at local as well as global scale. Of course there were many problems in each sector like education, health, environment, agriculture, energy, but with Gole sir's lessons in the back of my mind, I could see mainly two problems i.e. increasing consumption and change in land use pattern. First problem was leading to all human related problems at personal and societal level and was also destroying more and more natural resources. Though this problem was not new, it's

rate was increased incredibly within a short duration, especially in metros like Pune, Mumbai, Bangalore etc., may be due to sudden increase in buying power of an individual working for information technology and related fields. Those were the years when the trend of call centers was getting established, which would give job to individuals with basic education and pay them high salary. I don't know if it is related or just coincidence but this has really set a trend to pay highest salaries even in other fields. Result of all this is increasing consumption of goods which cannot be called as our need and also increase in consumption of energies of various kinds. Source for both the entities was nature, so environmental problems also got highlighted. This could be because somebody was also getting highly paid to put up this problem so that another industry would rise to solve it! I thought carbon trading could be one of them. Also many other industries related to environment were getting established which mitigate problems with lot of expenditure of energy, and pollution, if not at local level but somewhere else. That year one new Eco bike was introduced. People were happy that pollution will be zero due to electrically charged vehicle, but nobody was really concerned about the pollution caused at source where electricity is generated, nobody was concerned about the pollution of the batteries once its life is over. Then how such solutions could be ecologically friendly? Consumption just increases.. Be it so called 'Eco-friendly' products or any other product . . . Everybody was craving for various goods . . .

The other problem in the decade was change in the land use pattern. How natural and rural areas could be saved from the hit of globalisation. Against ever increasing establishment and growth of industry, demand for mining, mega projects like power plants were changing the natural landscapes to a great extent. Now farmers, for whom agriculture was never a profit making business, also started selling off their lands to urban people, developers. That would get them handsome money which would get spent on the same stuff due to lack of education and vision for future. Actually even if education is there, right application of education is never taught. So be it rural or urban, every person craves for short term comfort more than a long term need. And having comforts is unending so also the production of goods imparting comforts. How can we stop this ever increasing pro-

duction against limited resources and energy?

Looking at these problems, I thought how can I best deal with these problems or try to dilute it? Looking at my likings, experience, capacity, I decided to work to minimise impact of change in land use pattern . . . YES . . . restoration of degraded lands and integration of ecologically apt techniques and ecologically apt management in various projects could be one of the appropriate solutions, which we had already started. It is just that I wanted to reconfirm it. Of course there is need to change education system, policies, laws etc. to see a better future . . . I decided wherever possible I would love to take this subject ahead at all these levels . . . And I just thought that I would enjoy it and would be satisfied if I put my best to it. Now I could just see a very clear path for my business or work I should say . . . business, in conventional sense, is too hard word for this.

I shared all my suppressed thoughts with Manasi. We started with new understanding of each other and with the same old perspective. Got new projects . . . Very few of those were pure restoration projects, most of them were integration of restoration in conventional projects. We thought, such integration would also change psyche of people to look at nature in a positive way, which ultimately might be expressed in less consumption of resources, less expenditure of limited storages of energy and wise use of unlimited storages of energy. But when it used to come to execution of restoration, since this was new kind of work, no contractor or engineer would know about it. So we had to develop specifications on our own. We started physically trying out certain work at site, so we could estimate the duration, required man power etc. due to which today we can help people easily with specifications for execution of restoration techniques along with its budgeting. Manasi's engineering background was of great help. Today we also have a small team for execution for such kind of work.

In 2008 I happened to be a member of Pune tree authority and I got to see bureaucracy and politics little closely. There are 15 ruling corporators and 15 nominated members. Tree act says that member should be an expert. But it is not mentioned what kind of expert, with which degree, how much experience etc. So maximum members are just tree lovers who are not able to analyse/judge the situation scientifically and rationally. There is

a competition in between corporators of various parties, so, many times, if one would propose to save a tree other one would just oppose. There is no rational judgment . . . Me and Tasneem, (the other member of PTA and also a Society student) used to wonder at it, how such an important authority can function like this. Everybody knows that corruption is everywhere but I had never imagined that it would be also at a small scale and that of a tree. We had to spend five years over there so there was no point in going against them, as they were 28 and we were 2! So we decided to work in a friendly way, we developed a rapport with few of them. And I realized, they are getting paid very minimally, as compared to the private sector. So obviously to enjoy the market goods and facilities, that much money is not enough. Negative things start happening many times very easily if you have power in hand. If they are paid enough, and also if they are educated rightly, to survive happily, they might work in a better way. But how much is enough? Big question . . . What I think is government should have very well designed policies (most of the times those are good) along with systems to implement precisely. For better future of the nation, government needs to work with ecological experts to come up with ideal land use plan for town, state, nation. Local economy based on consumption of local resources should be encouraged. At least day to day needs should be satisfied through local resources and local energy. Thanks to Gole Sir for making us realize about the problems and its ecological solutions . . .

But how to achieve it practically? What is the process for this change? Am sure, many of Gole Sir's students have changed themselves individually but how to apply it to this ever increasing population, without going much against nature? How to reach out . . . ? Another article would start here . . .

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## My Introduction To Life!

Feb, 2012. It's been 10 years since we started working as 'Ecological consultants'. Today if I think of the past, what was the trigger that ignited the wish to be in this field? As I remember, I always admired animals, wildlife since childhood. But the love for animals is not enough to work for nature. It could have remained just as a hobby or may be I would have continued to work as a volunteer for NGO like 'WILD' I was associated for 4-5 years.

I should say I was destined to join the Diploma course by Ecological Society in July, 2001. I had been planning to do the course since it's beginning, but the best period for me was 2001-02. The evening classes at Aksharnandan were becoming more and more interesting as Gole sir started taking subjects like History of civilisation, effect of surroundings on human behaviour and development, changes occurred due to industrialisation, evolution of man from hunter-gatherer to agriculturist. Though we have learned few of these subjects during schools, it comes as an eye-opener when Sir used to link the human development to environment.

The sessions on 'Environmental economics' were a kind of shock treatment. They were very interesting when one hears them from Gole Sir and we all felt that 'oh yes, this is so true'. But the subject is also little difficult to digest n' explain, it's like one understands clearly in the class, but you can not explain it to others or write it down in your own words. So, we had even requested sir to take revision of Economic classes. It took more than 3 years to digest this subject after actually working for land and restoration. After each lecture, I could understand the failure

of current economic system, hype of technology, and that it had actually made human life miserable... really? When I heard his sentences, firstly it started a thought process, how this could be true, what is the definition of development, or happiness, are we on a right track, or there should be some change in life. I am sure each student must be getting a shock of life that all those years of education, working, were actually going in a very wrong direction. Then? When we learn this it creates lot of frustration and again thinking starts, what next? How we can avoid the ill effects on nature due to our development or even turn around to a better life? If the life that we are leading and aiming is damaging nature so much then what could be the best alternative?

These first 2-3 months gave a real understanding of life, a perspective to look at Nature, and realisation of the wrong direction of technological development.

This re-introduction to life created many questions. Here the dilemma always remains that 'Is the easy, technologically advanced modern life giving us peace of mind?' 'Are we able to cope up with the fast changes and urban life style?' 'Are we not forcing ourselves to earn more for more physical comforts?' 'If the comforts that we gain could soothe our mind then why we feel the crave of going to calm village settings for peace?'

We were also fortunate to have Prof Mahajan to teach us about Earth's evolution, and plants. He is a wonderful teacher and adorable human being. The basic knowledge about plants, their interaction with soil, growth, species in different ecosystems was taken in detail by Mahajan sir. All the love and knowledge about plants acquired in later years during field work was due to his teaching.

After this, was time for learning the life support systems. The natural resources, interrelations, food chains, energy patterns, laws of nature, thermodynamics, various ecosystems. Here it was important to know about variety in ecosystems and biodiversity of India, the various components, stresses due to human development, and finally the measures to bring it back to the healthy state, 'Ecological restoration'. So, this is the cure for weakened resources and systems in nature, 'To restore the land for sustainable future that considers man's basic needs and protection of biodiversity'. So, it is the co-existence which was actually the way of life of our ancestors that we have now lost totally in modern,

over consumptive lifestyle.

Learning about restoration, its techniques was possible due to the Field stations on which Gole sir have worked for years, the Panshet forest and Wetland restoration and the Phaltan grassland restoration, the open laboratories. Visionaries like Gole sir think ahead of time which is actually not understood by masses.

While learning the linkages of Man – Nature, I was becoming more assured that this is the field of my liking and would like to work in any way for ecology. Again it was Gole sir who triggered a new stream of work in our minds. It was Dec 2001, people had started purchasing land in countryside areas, and developing these lands for farm houses, cultivation was becoming popular. But this was not at all in tune with nature. Few of them also wanted to do some things on land for nature, birds, so planted trees. But this process of 'conventional land development' even though aimed for nature was neither in a planned manner nor proved good for Nature. So, Sir had suggested that we should contact these land owners and give them ways to conserve nature on their land. This initiated our business in this field of ecological management in Jan 2002. At every step of our work, we would constantly remember the teachings of Gole sir, Mahajan sir and Gole madam that helped us to take this non-conventional work ahead.

Throughout these 10 years of ecological land management work at 'oikos for ecological services', we have always been supported by all the three 'Gurus' very positively and still seek their help in work.

The course basically gave me a perspective to look at life differently. It developed a balanced and neutral outlook towards technology, its use as a tool, its limitations. And most importantly it developed a thought process 'how much is enough and what is right or wrong'. So I could analyse each small and large decision in life based on its real need in my life. This really reduces our dependence on market, technology, modern amenities. Most balanced view is, technology is a tool, it should not become our life. Today when we travel to remote parts, in hilly villages, I always feel that in India technology have erupted suddenly out of no where and is changing lives of thousands. Our people are not competent enough to accept the change and use this tool wisely.

As quoted by Gole sir, each person should become a 'Consci-

entious consumer', only then will the problems of environmental degradation reduce to some extent. So, at personal level I always try to become one who can make difference between the need and greed. I felt very happy when my parents shared the same view and tried to change few things in their lives and thoughts. It is important that the eco-friendly actions by us influence other people, only then this movement will increase. And when one is proud of doing an eco-wise practice, people tend to follow. So, simple living should become a status symbol to have large scale change in community.

Similarly, we try to follow the 'decentralisation' principle in our work. Use local knowledge, local technology, local plants, local resources, materials . . . though this is against globalisation and world trade, ecologically this is the best practice to achieve.

I now feel that it is our responsibility to take ahead our teachers' thoughts, vision and dreams. The strong thought-base both sirs have created in our mind always keeps me on track when working on land for conservation and restoration. Fortunately we got good land owners who had faith in us and we could work on many interesting projects.

As rightly said by Gole sir, it is important to change our education to accommodate the eco-perspective. Today the education revolves around increasing wants and needs of people so as to flourish the market economy. Our economy aims at increasing consumption of 'intermediate' goods. This will change if our young generation knows the ill effects of over-population, high speed development and rampant increase in technological development on environment and human health. Sir dreams of starting an eco-school where the subjects will have strong base of ecology and students will learn to take care of their natural resources first.

I am sure that every student who joins the diploma course and understands these connections strongly feels that there should be some change in the whole system. What I take from here is we should re-unite and start taking actions in our small group for 'widening the circle', start an eco-movement. There are so many ways that will give us a chance to work for nature and satisfy our souls. Right from policies to everyday living, our eco-group can work together to make a difference. When I think of taking a career in this subject, I immediately imagine different areas of

work, like teaching, nursery, best of waste, research in ecology, restoration, resource persons, green architecture, policy advisors, and many more . . .

In the speed of rampant development, efforts by few like us make no impact on a greater scale. Now what I see ahead as my responsibility is to create examples or models of ideal eco-development, eco-life that can be referred to in future. So it's important to make a start! I have already made few steps in this direction . . . I know that one day I will make a better living place for nature and me, though on a small scale . . .

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## In Search Of Ecology!

It was the end of the course of master degree on May 2004 and I heard about a society studying ecological aspects of the environment development directed by a well known ecologist and ornithologist of India. He and his professional crew along with many other ecological researchers were conducting a course on one of the most controversial environmental issues of the current world titled 'Sustainable Development of Natural Resources and Conservation'. I always was concerned about natural resources conservation then became fascinated with the course and its unique team of education.

It was the first time that I practically engaged in a restoration project and perceived that by changing our view on development activities we can expect more natural rehabilitation around us, a concept which was improving our knowledge about environmental development. The most important thing during the course and specially its field studies was to find ways to know how to look at nature around and how to use it for development purposes but in the highly sustainable way, a very deep ecological view considering all biotic and abiotic factors in the same value and in a very deep relationship. I've learned that in any environmental studies I must consider whole 'landscape' which may include many different ecosystems. This view transmitted to me by training programmes with fieldworks in different ecosystems. During the programme I was enlightened by scientists from various fields of natural studies; ecology, ornithology, geomorphology, botany, etc. Having all these precious sources of sciences around, in field visits helped me to have a panoramic view of environment around me and to better understand the "human

urge to green". It was a very unique experience which I really miss it!

In the restoration project I attended every week visit on a hill degraded through quarrying activities. Area was a part of Pune city and I could imagine how it was fascinating before damage and I noticed how it would affect the microclimate of the area after restoration practice. We learned for restoration of a degraded land we should sow it with native plants, weed it by hand, reseeded the area and remove the exotic invaders and so on. It was amazing when I understood during regular visits of the site, that nature was trying to rehabilitate it and how we can help to speed up ecological succession.

Travelling about 40km far from Pune city to monitor and study on Panshet dam catchment area, made me more familiar with the subtropical species besides increasing my knowledge about social aspects of India. A restored forest which you praise, all activities had done by society's team to restore it and give it a new life. I still remember such unique tranquility and calm that I experienced whenever I had visited the area.

Amazingly biodiversity was a ubiquitous concept in all fields that I visited during the course especially in Western Ghats, and this was a great opportunity for an environmental apprentice like me. I never forget when I suddenly observed a camouflaged beautiful green bird on the tree, the Green Pigeon (maybe *Treron bicincta*), or watching Crocodile (*Palustris palustris*) patrolling around our boat, a bamboo forest, charming white epiphytic orchids and attractive scenes of Western Ghats nature, beautiful and very clean villages with traditional dishes using banana leaves, starry nights and of course all my friends.

I visited places and people with models of sustainably practices of alternative development; a well developed husbandry on one side and on the other improving grass land which was responsible to degrading, or a bamboo factory that was planning for less impact on nature . . . .

I should mention about other aspects of the course which was free access to a small but satisfactory library at the Ecological Society office which was kindly provided by chairman of the society to participants. That was another lesson for me and I decided to dedicate my sources for public awareness.

After the programme, because of all the variable tasks I was

assigned, I have learned critical skills that I am taking with me wherever I work. I joined many developing projects studying anthropocentric activities and their impacts on natural resources. The penchant of humans to have more comfort and efficiency with its concomitant deforestation and degradation of natural habitat for thousands of species made me more concerned about the impact assessment and how to manage more sustained and less harmful line of progress.

Pune is the largest city in the Western Ghats and the second largest in the Maharashtra after Mumbai. As far as I know Ecological Society and other NGOs at Pune in the field of ecology and environment have played an important role in both research and education, not only in the city and Maharashtra state but even their scientific experiences imported by Central Government. Pune has a reputation for being the Oxford of the east, with highly educated people and therefore more potential to understand the life's problems and also participation in any activities regarding restoration of what we have degraded and preserving what we less touched. We know about patterns of human response to indoor and outdoor environments. People are not passive in outdoor settings; their activities and behaviour are based on their understanding and processing of environment-based information and this information should be conveyed by environmental awareness, which I think goes on in many sectors of Pune city.

Since this course is a dynamic programme with always new knowledge of the world, I hope to get another chance to participate in it again as many students have tried it for many times.

Mandana Nezmi  
M.Sc. Environmental Science

## A Catalyst To Enlightened Minds

### The Ecological Society Course

I came to know about the Ecological Society and its course in 2006 by accident. The course content seemed very impressive. By this time, I had already begun reading about environmental issues. I was thrilled to know about a course that covered fields as wide as economics, social sciences, geology, botany, and eco-restoration and immediately wanted to join.

The journey through the course was fascinating and humbling. Here I was, knowing a lot of things about global finance, Fortune 500 companies, technology, and management, but if someone was to ask me to identify a tree or a bird in my neighborhood, I couldn't do it. Throughout the course, it was disappointing to learn that along our quest for technological knowledge and so-called progress, man has forgotten a lot of wisdom about nature.

This humbling of one's knowledge or this disappointment about our 'progress', is very characteristic of the course and it happens to most students who take it. But it is valuable, for such frustration is the foundation for a lot of self-directed learning by the student. This learning, along with further reflection, and ultimately action, will lead to sustainability.

'Experiential learning', from field trips and camps, is another important feature of the course. Apart from the course content, I was very impressed by the course faculty. All of them are not only highly knowledgeable about their respective fields, but also are teaching advanced-level students in those fields for years. Yet they didn't mind teaching us the ABCs of rock or river formation, ecosystems, or village economics in India. They take great inter-

est in interdisciplinary teaching, are very approachable, and really want their students to develop a passion for understanding sustainability issues.

The most interesting aspect of the course is it refrains from directing students to a fixed set of actions or dogma about how sustainability is to be achieved. Rather, it lays out all the facts and encourages the students to connect the dots and reflect. Even if a student may not become a sustainability practitioner immediately, this thinking continues in the background, and students make choices about work and lifestyle more meaningfully in their lives.

### Some thoughts

This course and further reflection helped me develop a framework with four imperatives that can be used to understand progress towards sustainability.

- **Unconsumption** : We need to cut down consumption drastically as it is a root cause of the environmental problems we have. If consumers simply stop consuming goods/services that are directly or indirectly harming the environment, producers will automatically stop producing them. Unconsumption is akin to attending Alcoholics Anonymous or to the painful financial 'deleveraging' that is expected to happen globally.
- **Ecological Restoration** : All sorts of unconsumption will still not be enough, because we have damaged ecosystems to a point where many of the 7 billion humans are already short of basic resources like water. Enormous loss of biodiversity has also happened. So active restoration of ecosystems needs to be a major part of the solution. As Prof. Gole says : "Everyone needs to be an environmentalist now".
- **Economics and Business 2.0** : We need to revisit the traditional paradigm about work, wages, business, technology, and trade so that the damage done, particularly from choices made over the last 160 years, can be reversed. Consumption-centric economics, as taught by capitalist powers, needs to be either shown the door or moulded very differently. Business and work needs to move away from the masculine extreme it follows today and explore timeless feminine values to make it more purposeful and less stressful.
- **Spirituality** : Given man's pleasure-seeking mental make-up,

the above three objectives are hard to achieve by becoming completely rational. Spirituality will help us 'see' why we need to consume less, restore nature, and work and trade differently. Throughout history, spirituality has been a force in restoring balance whenever man's actions swayed to the extreme.

The interesting food for thought is that there are links between all of the above. Achieving all of them together will be wonderful. These four imperatives are not theoretical but can be used to guide real choices at individual and societal level. Many sustainability proponents are likely to find their passion in one or more of these four areas.

Based on the above and the environmental movement around us, I also reached these conclusions :

- Sustainability is a journey. There is no point fretting for a 'desired end state' because it is certainly not coming in our lifetimes. The best we can do is to form a set of guiding principles and use it to direct choices as an individual and as a community, and hope that future generations carry the torch.
- Sustainability is a deeply personal journey, like Satyagraha or Buddhism. There is a lot more that an environmentalist can demonstrate through his/her personal choices, than holding global conferences to talk about environmental issues to no end.
- Rather than being constant and vocal critics to impact policy-makers' decision-making, environmentalists should focus on making the policy-makers more educated about sustainability and help them in sorting through the constraints they face. Criticism has its value, but education and coaching is even more valuable at this stage.
- Sustainability education is a major part of 'passing the torch'. Virtually every one of us needs to be involved in such education in some form or another. All schools, not just 'alternative' ones, need to make true sustainability education a significant part of the curriculum, probably from Grade 3, all the way to University. Kids first need to truly love nature, before we can expect them to protect it. Most importantly, parents will have to demonstrate adherence to sustainability through their actions, not just rely on school education.
- Expanding the concept of carbon footprint to 'natural resource footprint' and further to 'extended resource footprint' will be

key. These terms need to be a part of civil society dialog on a mass scale. People need to be aware that virtually any consumption decision has a direct or indirect footprint. Take the simple example of fitness. On face value, going to the gym to stay fit has nothing to do with the environment. But notice that by simply going to the gym, we :

1. Increase carbon emissions if we use a personal vehicle
2. Increase carbon footprint if we use gym equipment that uses electricity,
3. Indirectly support polluting industries like mining and plastics, because all that gym equipment needs metal and rubber to produce.

To minimize this indirect footprint, one needs to then focus on alternatives like Yoga and running which do not need any equipment. And finally, burning calories while planting trees or restoring a stream or even plain housework (e.g. washing clothes as an alternative to using washing machines) is better than doing Yoga in a room because it has the added advantage of achieving unconsumption/ecological restoration. The pursuit of true sustainability is going to need this kind of self-scrutiny from almost everyone.

- Business leaders is another group that environmentalists need to approach and educate methodically about sustainability issues. If an entrepreneur starts a company that grows to 1,000 people, he is responsible for creating a 1,000 jobs, which is often considered good for the society. At the same time, he is also responsible for all the direct resource footprint of the business he created (e.g. carbon emissions from the flights that the company's employees take), as well as the indirect footprint (e.g. the 1000 employees commuting to work, food miles of all the food that gets transported to the company's canteen, and so on).
- 'Middle class morality' is an interesting sociological force. When sustainability enters collective middle class morals in a major way, we will experience an inflection point.

Only when our individual and collective crimes towards the environment sink deeply into our psyche, we will see some change in terms of challenging tightly held values like GDP growth, business scale, or career success.

### **My (slow) march to sustainability**

At the personal and professional level, I started using a track-

ing tool to measure progress on sustainability. It has 4 categories as below and as examples I have included some decisions and failures, on my part.

### **'Big things' than I could achieve**

- Personally: Stayed away from typical trappings like a 'farmhouse', bigger car, more gadgets, more vacation trips, more clothes, furniture, interiors, etc because they all are non-essential consumption and fatten our resource footprint.
- Professionally: I had started a market research company and to develop it would mean 1. To visit clients in US/UK often to get more business and 2. To hire more employees in India to do the work. However, the above framework helped me to challenge a lot of this traditional thinking which would have led to more trappings on the business front. e.g. All those overseas marketing trips would mean more carbon emissions on flights. As an employer, if I hire employees to come to a far-away place, I'd be indirectly responsible for their carbon emissions when they commute. At one point, all this felt like 'paralysis by analysis' and it was clear that business growth would suffer due to such self-imposed constraints. But over time, I refrained from expansion and continued to earn wages alone as a professional. Eventually I gave up an office and started working from home, thus avoiding any significant carbon emissions related to work.

### **'Small things' that I could achieve**

- As a family we started systematic sorting and recycling of all our dry waste and brought it down by almost 80%.
- We ran trials to process organic waste or make an organic garden, but had to give it up due to space and other constraints. At this point, we are separating the organic waste and providing it to PMC.
- We started consuming organic vegetables and having a larger variety of grains in the food, rather than just rice and wheat.
- Making children more aware of nature, ecosystems, and the environmental problems we face.
- Stopped accepting plastic bags and carrying cloth bags instead

**'Big things' that I have not achieved as yet**

- To give up all personal vehicle emissions (at least in the city) is very important but we have not managed to do it. Though we cut down on many discretionary trips, we have had to rely on a car considering the distances in the city, the time wasted in catching a bus, bus routes, and other constraints.
- To actively participate in a real Ecological Restoration project is on my wish list but somehow not yet managed to do this.
- Getting rid of electricity guzzlers like refrigerator, microwave, and washing machine, without which it is possible to live, just by making a few adjustments

**'Small things' that I have not achieved as yet**

- Cutting electricity and gas use by a significant % should be possible, by utilizing alternatives like eco-friendly stoves, traditional lamps, and manual labor, but somehow we have not yet taken enough small steps to do this.
- Use of natural alternatives to things like toothpaste, soap, and washing powder
- Something as simple as moving milk out of the refrigerator long before heating it, so that less cooking gas is utilized
- Many more...

(Note that 'small' and 'big' decisions will be relative, and vary from person to person).

As evident, this tool can help anyone assess in an honest, transparent way their real progress towards sustainability, not just intellectual awareness. Particularly, listing the failures is a constant and useful reminder on how much more an individual needs to do. It is clear that plain lethargy is a culprit in most of the inaction towards environment.

**The future**

There is a group of thinkers believing in 'rational optimism', which means: Since mankind somehow overcame all problems in history (thanks to science, technology, globalization, etc), there is reason to believe that we will also overcome the environmental crisis through such tools and just by being rational.

I disagree with this thesis. Our history shows that emotions have ruled our decisions as much as reason and we have often

come to the brink of disaster because of emotions. E.g. Prior to the recent financial crisis, the global financial system did have all types of checks and balances in theory (e.g. Big banks had risk management systems). However none of this worked in the face of overwhelming psychological forces like greed, competition, herd behavior, ignorance of complexity, and "this time it's different" types of mentality.

But I also feel optimistic that we will eventually overcome the environmental crisis, not because of reason, but exactly because we are emotional animals:

- All the guilt about messing up the ecosystems will finally enter the common psyche.
- In the worst case scenario, a lot of people may lose their loved ones to climate change disasters. This will create a sense of loss and shock at our actions and self-control will be finally triggered.
- Whatever spirituality and love for nature that's left in the average person's mind will be appealed as we lose nature and biodiversity at an unprecedented rate.

Sustainability will not spread via policy-making. The fractured progress of Kyoto at the global level and countless failures to protect environment at the national and local level are testaments to this.

Sustainability will spread via stories, as it always has: Stories of principled individuals and families sacrificing materialistic 'progress' to control their resource footprint, Stories of businesses proactively measuring themselves to the highest environmental standards, Stories of NGOs relentlessly spreading the green message over decades, Stories of leaders going against the establishment to bring environment to the top of social agenda.

It is up to each one of us to write our story.

In Ayn Rand's "Atlas Shrugged", talented entrepreneurs and innovators exit the bureaucratic, corrupt world when they do not get the recognition and freedom for their ideas. They set up a separate community where it's a free market, ideas are implemented freely, and due credit and respect is given for them.

Ironically, Ayn Rand would be very happy today. Her ideals, namely respect and freedom for individual ideas and their innovators, capitalistic free markets, and domination of man over nature to create new "man made" things, have all been realized.

Entrepreneurs and industrialists are today's Gods while environmentalists are considered a nuisance.

It might be interesting for environmentalists and sustainability proponents to consider the same tool to make the society realize the value of their ideas. "Exit the world" and head to far-away communes/eco-villages where you can show sustainability in practice and live your values. Let the world realize your importance the hard way. When the world collapses under the weight of material pursuits, it will have no option but to come to you and take your values seriously.

Yogesh Pathak

BE (Univ. of Bombay), MS (Michigan State Univ.) and  
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Management consultant

## About Ecological Society

Ecological society, this institute played a very important role in my life. It all started with "want to do something new", "want to learn something different" and ended up here. When I joined I did not have a very clear idea of what the course is going to cover but it was not far away from our day to day lives. At the end 'It' was about perceptions.

We all love being with nature, trees, birds, sea, landscape. But that's about it. Nature is getting destroyed day by day and it is very visible from our changing surrounding. Can we do something? The question was unanswered. At the end of course some of the questions were answered and for a few answers we need to introspect our day to day life and our profession.

We had started home-stay in Ratnagiri which is known for its natural beauty. We decided to develop this small venture. By that time I had joined the Ecological Society's course. As an interior designer I had always thought, am destroying nature very badly by using lots and lots of wood for my designing. What should I use? Metal? All of us would say "oh yes metal, we should use metal to save our trees". How wrong I was. Trees grow fast and can be used in next 20 years. But metal needs energy and essentially consume fossil fuel. Fossil fuel can never be created by humans, in their life time. That does not mean, cut the trees however you want to. But at least you can do farming of good quality wood and use more "bio mass" than fossil fuel. So we decided to use natural traditional materials, local materials. Like bamboo, wood, grass, earth tiles for roofing material, and plain simple handmade cow dung flooring and that itself saved our cost, time, and also all local villagers got work. It also saved our

air-conditioning expense.

Earlier I had always loved structures which were building with natural material . . . but Society 's course made me realize that it's so much of cost and energy saving.

We had always (incorrect) believed that Nature means trees and more trees. What is biodiversity? It's such a simple thing which is all related to humans. Just imagine we all humans would look exactly same like each other . . . height, skin colour, weight, voice, . . . its all same . . . we don't even want to think that . . . its the same with nature, combination of different trees, shrubs, grasses . . . How monoculture is affecting the environment!

I will give you one simple example . . . when we see a nice lush green tree we all say . . . wow . . . it's such an amazing green big tree . . . and as soon as the leaf gets old and fall on the ground it's garbage? How come leaf become garbage? Even I use to think similarly. But then it all changed by the time we finished the course. Rather than 'green deserts of an array of single beautiful looking trees', I started appreciating the value of biodiversity and self sufficiency nature establishes with biodiversity. Now I create awareness in my guests, telling them about how self sufficient our villages are.

Tourism should be increased but it should be responsible one. We all city people want to spend some good time every weekend. So we always try to travel for the places which are full of nature. But how many of us travel responsibly. We have started few things at our Home stay like "no plastic waste zone", save some electricity, water, No mineral water policy which is been followed.

This a bit of all which I learned in the course. There are lot of other elements which this course make you think and do practically like conservation of land, about sea etc., in day to day lives. Overall I can say the course has given a complete different viewpoint to look around things in my profession and I know it is just a beginning.

Medha Sahastrabudhhe  
Diploma in Interior Design / Owner of  
Home stay resort "Atithi Parinay"

## Understanding Instinctive Connection With Nature

We have an instinctive connection with nature. The course made me understand how that works.

In times of lost identities, the course gave me a sense of belonging, a sense of stakeholdership in this beautiful planet we call home. While ecology turned out to be a study of how our home works, economy became a lesson in home management.

The evolution of the planet blurred the difference between living and non-living. The accident of life united us all beyond time and space boundaries.

Understanding ecological processes taught me about cyclic nature of evolution and extinction, as it also tends towards equilibrium. Biodiversity and inter-relations between species brought forward the values of humility and neutral co-operation.

Geological processes brought a new dimension to the scale of time and space.

Understanding of energy flow in eco-systems demonstrated efficiency of nature. The concept of energy brought forth the impact of anthropogenic activities.

Concepts of internal and external sources of energy became clear. The laws of Thermodynamics provided a basis to evaluate current technological system vis-a-vis systems from earlier modes of human habitation like hunter-gatherers, pastoral nomads, and prevalent agricultural settlements.

The course presented the diverse working patterns of different eco-systems. It connected anthropogenic adaptation to biodiversity. The course brought forth the concept of bio-economies, an ecological basis for development.

We were exposed to restoration efforts in grasslands, wet-

lands and drought-prone areas.

We were inspired by role-models who have worked in the field of conservation, rural development and lifestyle solutions.

Amongst the most important facts of sustainability I learnt at the course, was the classification of needs. Most of our lives, urban citizens work to fulfill needs which are intermediate ones. The basic needs are left to external agencies to be generated. This formed a major part of my action plan after the course – the basic needs.

Materialistically, the basic needs would be food, clothing and shelter in that order. I learnt that community living, harmonious co-existing with other species and a life of spiritual growth are as basic and important as the natural needs.

Of the material needs, I have been closely involved in the study of shelter. As an architect, understanding sustainable habitat and its inter-relation with ecological balance in the planet has been a subject of research throughout my training and professional career. So I set out to research the other two – food and clothing.

During the course we organized a Seminar on various aspects of food. It covered research on traditional concepts of healthy food, diversity of food in relation to diversity of biogeographic zones in Maharashtra, cooking systems, farming alternatives, organic farming, city farming and forest food. It also gave us to cook and enjoy food like a community, staying overnight at a farm.

The research opened new avenues for many of us to get sustainable returns of their basic need. I went on to attend a workshop on parraculture.

After the course, I set out to look at various sources of sustainable food generation. My search introduced me to the Organic Farmers Collective near Pune.

In the sphere of sustainable shelter, my outlook has been greatly influenced by the pioneer of cost-efficient housing in India, Shri. Lawrie Baker. I have trained under him in Kerala for a year and have been practising on similar lines for the last ten years. For the initial years of my practice, I had focussed on reducing the consumption of energy-intensive materials like cement and steel. Since I have loved the course and understood earth and timber better, I am now able to design and build build-

ings without any cement or steel at all. We can replace these with mud, liane and wood.

I owe my learnings to some teachers in my training years and to the many nameless teachers in the form of craftsman of regional architecture. The knowledge of vegetation helped me significantly to reduce consumption of timbers like teak, sal, etc. Documentation of regional construction revealed the varied use of timbers for varied puposes.

A timber roof in the Kokan could have as many as 6 different secondary local timbers used as per their strength, insect resistance and availability.

Also this ensures the measured use of wood from the first and does not promote mindless lumbering and monoculture.

I have worked in Maharashtra, Goa, Gujarat and Madhya Pradesh responding to the local climate, topography and biological resource. Apart from material needs and resources, I have found that this culture forms an important parameter to shape the shelters for people of a particular region.

We have largely reduced our dependence on computers for our professional work. We orient our working team and the climate about a sustainable approach in all aspects of the project.

My interest in pedagogy lead me to share my experience with students of architecture. After the course, I modified my teaching syllabus to an ecological basis, and soon, I started discussing a subject which discovered the relation of Ecology and Architecture. In this weekly elective, we get exposed to the basic theory of ecology. Students are introduced to various eco-systems around Mumbai. The city is analyzed with a perspective of natural resources and natural boundaries. The forest and lakes in the heart of Mumbai are a unique eco-system and the coastal eco-system presents good biodiversity to study.

Students look at biodiversity through diversity in lifestyle, culture and finally architecture.

We study the linkages between Watersheds and human settlements. We study Architectural patterns in the native regions where the students come from. This links them to the natural ecosystems, livelihood of people based on biodiversity of the region and its reflection in their basic need of shelter, which translates into regional Architecture. We are preparing bilingual booklets which archive these studies. There would be a handy resource for

students in Maharashtra and India, to understand Regional Architecture in more dimensions than what is popularly discussed.

The effects of current development patterns are discussed to generate an opinion and a plan of action for the social and political spheres.

We also study sustainable and progressive efforts in the field of restoration, conservation, education and architecture.

Based on these principles, I am making improvements in my everyday life, in basic needs as well as intermediate ones. These initiatives are noticed and my family and friends do get influenced, even if very slowly. I work with as much humility as I do with vigour, both of which are invaluable lessons I have learnt from nature and nature loving people. And it is the course at Ecological Society that made it possible for me.

Malak Singh

Diploma in Architecture, Professional Experience with  
Ar. Lawrie Baker / Practicing and sharing knowledge  
on sustainable Architecture

## Making Of An Eco-Entrepreneur

"There's no journey that does not change you some." David Mitchell, novelist.

My journey into Nature started way back in 2003. I can still vividly recall that day when I met a friend at Garware College in Pune. It was a meeting that perhaps, changed my whole outlook about Nature and the environment. We talked shop for a while, interspersed with the usual banter, and about what we were doing with our respective professional lives. Gradually, the conversation veered towards the rampant air and water pollution in Pune and how things were getting worse. We talked about how our natural resources were being misused, abused and mismanaged. Why wasn't somebody doing something about it? He then causally mentioned about a year-long course conducted by The Ecological Society of India. This course, he guaranteed, would be an eye-opener.

In retrospect, after completing the "Sustainable Management of Natural Resources and Nature Conservation" course in 2004, I am of the view that the course was not an eye-opener. That would be putting it very mildly. This course opened my eyes, heart and mind. It opened up every knowledge-seeking pore within me. I realized that only I had answers to my questions.

The one year that I spent doing the course at The Ecological Society (TES) was a journey in itself. From the very first session, I was hooked. I would travel 26 kilometers every alternate day and never missed a single class. I couldn't afford to miss a single class. Every lesson, every lecture was a revelation made possible only because of the experience of Mr. Prakash Gole, founder of TES. His extensive knowledge about the environment and its

intricate association with economics made me understand our natural resources with a whole a new perspective.

Other visiting faculty for the course included the inimitable Prof. S. D. Mahajan, whose in-depth knowledge of botany and lucid, interactive style of explanation would make anybody fall in love with plants and trees. Then there was eminent scientist Dr. Pramod Moghe, who explained about how to implement the knowledge gained during the course in our daily lives.

The field trips to various locations and hands-on explanation of each ecosystem helped me develop a trained eye. I began to see birds, animals, and trees in a new light, now knowing that each had its own purpose in ensuring the well-being of human-kind. After successfully completing the course in 2004, I joined up with a few students of my batch to start Ecoscapes, a company that provided ecological services. However, we had to wind up because of the professional commitments of our jobs due to which we could not give it all of our time.

But Ecoscapes sowed the seed of enterprise in me. I knew that I had to start my own environment-related business, one that would provide an array of solutions to the problems that plagued our towns and cities.

Next, I heard of a course in entomology conducted by the famed Bombay Natural History Society or more popularly known as BNHS. I immediately enrolled and successfully completed the course. I also enrolled for the first batch of the ornithology course jointly conducted by the ELA Foundation and Garware College, Pune.

I realized that these courses had given me a unique macro as well as micro perspective of Nature, its ecosystems and related flora and fauna. I now had a clear picture of what I wanted to do. I also knew that some alumni friends from The Ecological Society had set up Oikos, a company that provided ecological services. This proved that there was a demand for such services.

In 2008, I resigned from my job with a software company to set up my own environment-related business. It took me two years to complete the groundwork for my business. In March 2010, I registered my company, Bluewiss Environment Enrichers Pvt. Ltd. with the Registrar of Companies. The journey that started that fateful day in 2003 had now borne fruit. And the journey had only begun.

Bluewiss Environment Enrichers Pvt. Ltd. provides products, services, and concepts that help people enrich the natural environment. Bluewiss focuses on maintaining, restoring, and enhancing the local biodiversity and promoting a sustainable way of living.

Today, in both urban and rural homes alike, adopting sustainable methods of living has become a challenge. However, Bluewiss believes that sustainable living in an urban area is no more a myth. Their idea of a sustainable home is one that has a provision for clean and safe drinking water, chemical-free food, appropriate use of energy, optimum waste management and as a result, a healthy mind and body. A sustainable home not only reduces pollution and waste and is always in sync with its surroundings but also uses the surroundings to replenish and enhance it.

To fulfill these basic requirements of sustainable living, Bluewiss has designed tools and techniques that can be easily adapted in our day-to-day lives. The company provides a range of products, services and concepts for sustainable living; from natural methods of water purification to growing your own food within your homes, composting toilets that save water and provide nutrient-rich compost to bricks made out of waste paper.

The rapid economic development leading to a hectic lifestyle and more resources in the hands of a few has left little room for eco-friendly living. However, Bluewiss believes that the ever-increasing costs of fuel, healthcare services, raw material, food, water and public amenities will compel people to look for simple, inexpensive and healthy alternatives such as the ones provided by Bluewiss.

One of the first activities that I started after The Ecological Society course was a bird survey in Viman Nagar where I lived. My intention was to capture data about the bird species found in my neighbourhood. I started maintaining a log of the birds that I could see from my apartment. Over a period of three to four years, I was able to observe 36 different species, some resident while others were passing by during their temporary migration phase. This data was an important indicator of the biodiversity around Viman Nagar.

Now that I had this information, I began to think about how I could share it with other residents in the area. And thus was

born the concept of "Sundara Vasundhara: A Window to Your Local Biodiversity." This was an event that showcased the natural wealth of an area to its own residents. A realty development company in the area provided us space in the atrium of their centrally-located mall for the event.

In 2010, in the first year of Sundara Vasundhara, Bluewiss mapped the biodiversity of Viman Nagar and displayed data about the trees, birds, insects, and mammals found in the area. In the second year, Bluewiss conducted a census of the trees in public places in Viman Nagar. The census provided us information on the number of native and exotic species. When we presented this data to the residents, they were pleasantly surprised to know that the green cover in Viman Nagar had actually increased though the balance was heavily tilted in favour of exotic varieties. But most importantly, the residents who attended the festival are now aware of their natural wealth and the need to maintain, restore, and enhance the local biodiversity. And that, for Bluewiss, is success.

Bluewiss is only two years old but these two years have revealed a treasure trove of information on how people perceive the environment. My journey has really come a long way and there has been a lot of change. The environment may not have changed for the better but I certainly see hope that sustained efforts will bear fruit sooner rather than later.

Niranjan Upasani

B.Com. / Run Bluewiss Environment Enrichers Pvt. Ltd.

## **Don Quixote Was Right After All! The Truth About Windmills**

*"This year, your company successfully installed 12 windmills in the Satara district. This has reduced the carbon footprint of your company by xx units and contributed in the state government's endeavor to increase the installed capacity of electricity generation in the state".*

Companies want to shout out these activities to the world. It's common to see such statements in annual reports. It's common to see windmills on the horizon. It's common to feel that everything's right with the world when the wind produces our electricity. We believe what we are made to believe. Windmills save precious fossil fuels. Windmills take nothing from nature and turn it into electricity for us. Nothing short of magic. Government subsidies help corporations put up more windmills which produce electricity out of nothing. More benefits to the society, more sops for corporations, more windmills being produced..... the world's a happy place. Generous support from government means regulations bent to order, utility companies made to buy from producing firms and green credits traded. After all, windmills do no harm to the environment, need no inputs from nature and no waste is thrown out. Utopia.

### **Windmills – The inconvenient truth**

"Now get ready to hear this. Windmills harm the environment in many other ways than one. Wind farms are known to cause health problems to some who live within its vicinity. Windmill blade manufacturers have been consistent defaulters of US environmental laws. It is expensive to treat pollutants and dust from the blade manufacturing process. It is simpler to have workers don gas masks on the shopfloor. The size of the modern

windmill requires large construction equipment, huge amounts of piling and foundation and modern machines to make all this equipment. The windmill is a product of industry. It requires energy, natural resources and fossil fuels for manufacture and installation. Giant wind farms demand large landscapes. Top it all up with the bitterest fact – wind power is an unreliable, intermittent source of energy. Most windmills produce on an average just about 20% of their installed capacity.”

### **Installing these Friendly Wind Mills**

Digest this : A 1.5 MW wind turbine has a tower about 80 meters high. The blades and hub weigh about 20 tons. The nacelle, which contains the generator component, weighs around 50 tons. This behemoth needs a foundation of about 20 tons of reinforcing steel and more than 150 cubic meters of concrete. The base is about 15m in diameter and more than 2m thick near the center. Modern windmills have blades of 20 meters or more, cutting a vertical air space of up to 2 acres. Hundreds of liters of oil are stored at the top of the tower. The whole assembly weighs 100 + tons. Can you imagine what it means for installing these giants on hill tops of Satara district?

Large earth moving equipment, gigantic cranes and huge foundation craters are needed for these wind turbines. Wide and straight roads need to be cut up on hills. The roads cannot have turns like normal roads since trucks bringing in the 21 meter blades can't turn like a Nano can. Construction of these roads needs earth moving equipment, stones, gravel, bitumen and of course fossil fuels! Giant craters are dug up on these hills which may need blasting through the bed rock. These holes are later filled up with reinforcement steel and cement concrete. Wind mills need a minimum separation distance. This spreads them out requiring felling of trees. The construction of roads and craters destroys habitat of the local flora and fauna. Alteration of the landscape and the subsequent erosion ensures continuous destruction for the years to come. The government argues that wasteland is converted to wind farms, so there. The government does not tell you that 'wasteland' is for industry – in nature, there is no such thing as a wasteland. There are thriving ecosystems even in places which man has no use[i].”

Do the annual reports mention the quantity of fossil fuel

required to produce the construction equipment, steel, oil, copper, and wind mill equipment, road making machines, bitumen, cement, stone crushing equipment and cranes? How about the electricity consumed in producing blades? How much pollutants were released in the air for making the blades?

Do the annual reports mention the financial impact of cutting down age old trees, altering landscapes, destroying habitat and displacing wild life?

Hills divide the rain into watershed areas. When there is such large scale alteration on the hilltops, water flows are disturbed. This increases soil erosion, can induce water logging, alters the water table in that area and consequently precious soil is lost forever. When roads are cut on hills, the debris is thrown on the slope side of the new road. The debris is rock and gravel, no soil. It would take years for anything to grow on these new slopes. Roads and cement pavers do not allow rains to reach underground streams.

### Producing these Friendly Windmills

This is what The New York Times[ii] reported on 25th December 2009:

*GUYUN VILLAGE, China — Some of the greenest technologies of the age, from electric cars to efficient light bulbs to very large wind turbines, are made possible by an unusual group of elements called rare earths. The world's dependence on these substances is rising fast.*

*Just one problem: These elements come almost entirely from China, from some of the most environmentally damaging mines in the country, in an industry dominated by criminal gangs.*

Wind blade manufacturers are perennial defaulters of environmental laws in many countries[iii]. In 2009, Suzlon manufacturing facility in the US faced a fine of \$ 490,000[iv] for pollution norm breaches. Such cases are unlikely in India, since we do not have strong and updated pollution control regulations and very poor enforcement, if at all any. Thus there is a spurt of wind blade manufacturers in India.

### Operating these Friendly Windmills

For a better wind efficiency, there should be no trees around the turbines. Vegetation is discouraged by use of herbicides – poison for the soil and water.

It is not difficult to imagine the impact of a wind turbine farm on birds and bats[v]. Recently, there was disturbing news that over 200 flamingoes were killed in flight in Gujarat due to the presence of new power lines. Such power lines crisscross the area. Indians have already endangered several species. Windmills do their bit in the process of elimination of the species. It is not hard to figure out why wind turbine farms are devoid of animal and bird life.

Hear this about the noise created by wind mills. The mechanical parts, air cutting noise and the electrical hum, together produce a unique low frequency sound which is carried far. To be fair, engineers have improved the movement of gears and bearings, but there's still nothing much they can do to the noise of electrical generation. The chopping sound of blades cutting through air is hard to ignore. This has triggered many complaints from wind farm neighborhoods in the US. The noise they say is unnatural and hard to live with. It gets especially annoying during the night. Doctors agree to health problems caused by wind farms – disturbed sleep, stress, hypertension and dizziness are just some of them. A recent book "Wind turbine syndrome[vi]" documents some of the health concerns of people living around wind farms. Some governments have acknowledged this correlation and are promoting a 'buffer zone' between wind farms and habitation.

It would be worthwhile to read this report on safety of windmills. Available here : <https://netfiles.uiuc.edu/mragheb/www/NPRE%20475%20Wind%20Power%20Systems/Safety%20of%20Wind%20Systems.pdf>

### **Power Generation from the Friendly Windmills**

Most of the wind mill industry reports including the GWEC, EWEA report the "installed capacity" of wind generation. This means nothing. Wind on the wind farm is not guaranteed. Climate change has set in further unpredictability in weather. We have seen wind patterns change in the last 20 years. The "capacity factor" is the ratio of the electrical energy produced in a given period of time to the electrical energy that could have been produced at continuous maximum power operation during the same period. Wind farms all over the world are run at around 20% capacity factor.

Wind energy is thus unpredictable and intermittent. And yet, the entire infrastructure needs to be created on the basis of "installed capacity" which may never be realized in the life of the farm.

### The Way Ahead

It is hard to publish such views. Someone with even wee bit sympathy towards the environment is made out to be against progress. Don't get me wrong – windmills harm environment, yes. But that's today. We have every reason to believe that man can turn them into giant friends which would prove Don Quixote wrong.

The point I make is that there is no need to go overboard and incentivize corporations to install them. Today, that would only benefit corporations and harm environment. Especially for India, we must exercise environmental regulations in the production of windmill blades; else it would not be far that only India produces these for the world. Regulations about land use for windfarms – we need that too. Many countries have already put windmills offshore in the sea. This seems (at least now) to be better than wasting precious land.

We do not know the consequences of large scale wind farming. We cannot predict how nature will react to them. All we can do is to keep a check on our greed, acknowledge the existence of non-human beings and leave a bit of earth for them. We have enough already.

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## Assault On The Bottom Of The Economic Pyramid

The discovery of the huge untapped potential market at the bottom of the economic pyramid (BOP), is a recent one. The market always existed – more than 4 billion people all over the world, earning less than \$2 a day. Yet, multinational corporations (MNCs) did not touch these markets principally because they were assumed it would be difficult to reach, they would be less brand conscious and overall far less profitable to serve. In the last ten years, several MNCs have proved these apprehensions to be wrong in many countries.

C.K.Prahlad and S.L.Hart drew the attention of MNCs to the fortune at the Bottom of the Pyramid in their article which appeared in a business magazine. Since then, corporations have responded to this clarion call and are deploying resources for getting a share of this huge pie. The authors showed that MNCs have long ignored the largest markets in the world. These consumers in emerging countries like India, Brazil, Mexico among others, offer a huge unexploited potential, also Prahlad argued, that it could benefit the poor consumers when they are offered good quality choices.

Prahlad's book- 'The fortune at the Bottom of the Pyramid – Eradicating poverty through Profits' followed in 2004. This was an account of his years of research in the economically poor markets of the world, India featured dominantly in it. The book illustrates with examples how multinationals have been serving the BOP successfully in many countries. Corporations were quick to sense this opportunity and responded with a deluge of products and services aimed at this segment. One of the great successes often discussed in this context and in numerous

management journals is that of the 'single serve sachet revolution'.

The inconspicuous little plastic sachet was created which served products in single-use quantities. With uncertain incomes, the poor could not buy and stock products for tomorrow but could afford to pay for today's consumption. The single serve sachet precisely addressed this issue with the one-time consumption quantity. This created price points which could easily be bought by the poor. Very soon rural Indian shops were bursting with 'malas' of single serve sachets – shampoos, detergent powders, tea, sauces, jams, candies, chewing gum, toothpastes, hair oils, fairness creams - goods that were out of reach for the BOP were now being lapped up by these very consumers. As their prices range between Rs. 0.50 and Rs. 5, their annual demand in India has today reached over 1 billion sachets of all products put together. The format is now so popular, that even high profile brands cannot afford to overlook this. It makes perfect sense for the MNCs – serving up products in affordable portions, so that consumers use their brands. The volumes and profits grow. Shops get in additional business with low cost inventory and consumers enjoy products they would never have bought. Thus started an assault of products on the economic bottom of the pyramid. Growth in a free market economy thrives on consumption and here was a tool for furthering the consumption cause. 'Sachet marketing' is now an accepted term in B-schools.

### **The Repercussions**

There is one vital aftermath to this assault on the BOP market – the consumed sachets end up in our countryside. Management gurus don't tell you this – in India, many of these single serve sachets are consumed in open or public spaces – villagers wash clothes or bathe by a river, candy and 'namkeen' are often consumed out of the house, gutkha is nearly always. What does that leave us with? All the empty sachets left where consumed. The other fact not mentioned by corporations and management gurus is that sachet packaging uses between 2 to 50 times more packaging materials than its larger unit pack counterpart!

Most of urban and rural India lacks any effective garbage collection and disposal process. This backdrop creates a frightening dimension to the ubiquitous single-serve sachet. It is glar-

ingly visible all over the country. In many cities there exists an informally organized rag-picking industry which contributes in its own little way to recycling. This is not seen in rural India and certainly not in our magnificent mountains. During a recent study tour to Chakrata in the lesser Himalaya, we saw even small villages of about 50 households littered with these sachets. We trekked from one village to another through a thickly forested route by a stream – here too sachets coexisted with the biodiversity. Mind you, this was not a mainstream tourist track; it was used only by the two tiny villages it connected. Nor was there any road connection to it. In the trans-Himalayas too things are no better. I have been pained to see the gulls in Pangong Tso munching on plastic packets. Man leaves these calling cards as high up as Khardung La. The story is the same in the other parts of the country. And who is to blame – it is second nature for us Indians to drop off a packaging where we open it.

It would only be foolishness to suggest that the poor do not need these products and are better off without them, when the consumers higher up in the economic pyramid make their lives easier with them. Of course the poor should have access to quality and safe products, and of course they need to be packaged in a way that would keep them free from contamination and counterfeiting. The rural and the poor have aspirations which can rival their wealthier counterparts – they see the very television programs that we see, are exposed to the same ads as we are, live in the same society which creates wants in the economically better off. And they are equally brand conscious. The natural response then, to these affordable single serve packs, is to buy them. MNCs were able to stimulate 'consumption' in the BOP with this little wonder.

### Steps Towards a Solution

So where is the trade-off? Will these plastic sachets soon cover the face of our countryside? Can we do nothing at all? Improved waste collection? Sensitizing the BOP through education? Penalizing the offenders? MNCs will likely agree to all the above and suggest a few more ways. Their corporate social responsibility (CSR) programs would perhaps include community cleaning activities and such. And yet this is just treating the illness. What we seek is freedom from this illness, not a treatment.

When we address this problem with the constraints at hand – that the poor will buy more of these packets and that garbage collection may not happen in our lifetime, it leaves us with one viable solution – making the firms who make these products devise packaging solutions for India. They are the ones who can afford to pay for the development – they get to eat the pie. What stops us from enforcing such packaging norms? The Supreme Court has already taken the first step by ordering the gutkha makers to pack their stuff in paper sachets. The gutkha companies fought this directive and lost. It may not be as simple with the MNCs. They are a collective force to reckon with. They have far more legal power and influence in our government than our home-bred gutkha barons.

It would be naïve to expect MNCs to get into such packaging development by themselves. We need this legal enforcement which will trigger this development activity. Adam Smith's entrepreneur – morally right, socially responsible and ethically correct – remains but a utopian dream in modern competitive free market economy.

The BOP theory also suggests that this would be an opportunity for the private sector to contribute towards alleviation of poverty. It is not easy to see the logic. For corporations, eagerness to serve the BOP will always be driven by the size and profit potential of the markets – not by benevolence. An organization is unlikely to serve markets with low profit potentials, when its growth drivers lie in the stock market. Do its shareholders want to make more money or save the planet while serving the poor? As the great BOP dream is pushed ahead, it will sooner or later crush the very environment on which it was created. While MNCs talk of environmental concerns, only a few have demonstrated actions which would lead to a sizeable impact in the future. Proctor and Gamble for instance examines its products for their definition of 'Sustainable innovation products (SIP)', which is (according to P&G) a product which has over a 10% improvement on the previous version, without negatively impacting the sustainability profile of the product (a) Energy (b) water (c) transportation (d) amount of material in packaging or product (e) substitution of non-renewable energy or materials with renewable ones. P&G's SIP list for 2010-11 consists of 10 products of which 8 products talk of reduction of packaging material. We

need manufacturers in India to follow this path.

### Packaging Research

Education and research is one area where the government has been successful – the IITs, IIMs, NIDs, IISc and others like these. Why can it not replicate this with packaging institutes? India needs far more schools like the Indian Institute of Packaging in Mumbai. We have just one with four regional centers. None of our education creates any environmental sensitivity towards packaging – add to this the fact that no product can be sold without packaging – and you have a monster staring at you in the face. Ironically, technology tells us that there is no reason to believe that we cannot find a solution for these gruesome sachets. Measuring the sustainability of packaging is by no means a simple task. It is complicated by a number of industry-specific factors. This necessitates that before addressing the larger problem, we start with a few small steps:

1. *Clearly defining terminology.* This is perhaps the most important step towards the beginning. In absence of specific definitions, titles such as 'green packaging' and 'environmentally friendly' can be and have been misused. The terminology must be non-ambiguous and quantifiable.

2. *Assigning metrics.* It is common knowledge that 'what's measured improves' and thus we need to start measuring things first. Wal-mart for example, helps its suppliers evaluate themselves on what they call as the "packaging scorecard" The score card has metrics which allow suppliers to determine how their packaging innovations, environmental standards, energy-efficiencies and use of materials match up against those of their peers. It would be wise to define some key metrics for India specific packaging. Like for example : "> Product to package ratio – a lower ratio would mean less package and more product transported per truck"> Percentage recycled content in the package – a higher percent means less new material goes in"> Recyclability of the package – break up the package into components and mention their recyclability"> Bio-degradability index for composite packaging materials – can be developed for commonly used materials

3. *Setting guidelines for corporations on disposal, collection, reuse and recyclability of their packages.*

4. *'Green' packaging design firms* Recently, there has been a

spate of firms engaged in sustainable packaging design and manufacture. These firms employ principles of green design: use more sustainable material, increase material recyclability, generate designs which reduce plastic use and energy and similar such initiatives to reduce the environmental impact of packaging. Many MNCs have been successfully using their services. Unilever USA, for instance engaged Sonoco Global Plastics, a global packaging firm, to redesign one of its shampoo bottles. Sonoco added a curve to the sides of the bottle, improving strength and reducing plastic resin use by nearly 16%. Sonoco was named as the top 'green packaging' company by Newsweek in its recent 2011 Green rankings[1]. Be Green Packaging designs and manufactures packages for food and consumer products. These are tree-free and compostable. P&G Europe hired Be Green Packaging for its Fusion ProGlide Gillette razors packaging. The new package developed by Be Green reduced plastic by 57% which it replaced by fiber made from bamboo, sugarcane and bulrush. GreenBox designed a Pizza delivery box which can be hand torn to make four serving plates, and after this, can be refolded into a smaller box for the leftover pizza storage. These examples not only show that it is possible to find packaging solutions for the BOP market but that it is profitable to do so. It is a question of when do we start this. Demands on engineering and development have always been driven by consumers – what we need is the environment driving it now. It is not enough for businesses to create economic value for consumers. They must provide ecological, social and economic value. The concept of the triple bottom line – People, Planet and Profit is now optional. We cannot afford to wait for nature to make it mandatory.

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## Health Economics – What Is And What Could Be

We, the people, continue to look at the advances in health sciences, pharmacology, medicine and surgery. We continue to discuss vehemently about whether the government should or should not subsidize healthcare. Our current economic model strives for more growth at all costs. Interestingly, more expenditure by the healthcare industry would create more jobs, more drugs and GDP growth. We might say, this is exactly what we want. We, however, miss the other side of the story completely in the process.

Let us take a sample case of obesity statistics in the US. The numbers are : two children out of every three are obese – says the finding. What does this mean to the economy? These children eat more than what they need and they eat food that they do not need. All this is good to the economy in today's parlance. Food industry benefits, may be makes money, may be creates more jobs. What happens to the healthcare industry? Healthcare industry also does well in the process; these children need more of doctor's attention and need more medicines, increasing the pharmaceutical industries' revenues and margins and possibly jobs that the industry can provide. For an economist – who cares for the economy and not for people, "all is well"! What happens to people in the process? Children live a suboptimal life, do not enjoy the way they live and are at best miserable. While this scenario flourishes in the US and the western world, many of those is the developing world – especially those below the poverty line do not even have sufficient food to eat and could well die of hunger. And this is just one of the many significant challenges haunting the food and health industry.

What does all this mean? Can we easily say the food and health industry – in the name of making profits and growth - has forgotten the “why” of their existence? This industry is supposed to serve people and keep them healthy. It seems very clear that relationship between “health” of health and food industries and “health” of people is inversely proportional! You can almost be certain that people are doing badly if the health industry is doing well? That is not why this industry was born in the first place – I’m sure.

One might argue about tremendous progress in these sciences and therefore benefits are being delivered to humanity. Let us look at some very practical observations. Most deaths and diseases across the world are caused by bad water and bad air. In ecological terms – this means, the planet is losing its capacity to provide these ecological services. Destruction of ecosystems across the world through serious human intervention is making it harder for nature to provide us these “free” services. In economic terms even if we divert a small % of money locked up in drug discovery and high end research on “rare” diseases and use this for making clean drinking water available to the masses, possibly using ecological restoration, we would have done yeomen service to the wellbeing of the humanity. The leverage for funding clean water projects through projects such as restoration of stream and river ecosystems for example - is so high compared to exotic drug research that anybody wanting to do any good to human beings will not even think twice. However the current economic model does not allow us to see that it can happen, economics overrules common sense!

Same is true with airborne diseases! Especially those related to air pollution. Our economics wants more roads (destruction of habitats and ecosystems), more vehicles on road (even more destruction of ecosystems as we mine more iron) and more use of these vehicles - more exploitation of natural capital - i.e. Fossil fuels. This leads to growth of automobile industry, leading to more jobs and is good for people one might say! This is leading to high GHG emissions and the mega challenges like the Climate change. This leads to more airborne diseases with more polluted air. This means more people take more medicines, good for the pharmaceutical industry, which can benefit and create more jobs! What happens to more people getting sick and Nature getting

sicker and exhausted is nobody's bother.

There are many more examples that we can cite – and that does not need anything more than common sense. It certainly looks like there is something seriously wrong the way our current day economics works. While it provides unlimited luxury to the few – at the expense of nature and other people, it robs nature of its very capacity to provide us with “eco-services”, and large part of humanity their right to live.

It is very likely that many a common man like me is indeed thinking of what I have tried to put down in writing. Most might even believe that the argument makes some reasonable sense. The difficulty we all run into – is what do we therefore do? Is there any option in which one can go back to wellbeing of the planet, her ecosystems, diversity and therefore health of human beings? Are there any ways in which one can change the way we look at the current “economics” and more specifically health economics to find some lasting solutions? Do we have the right measures of health? As Scientists would always argue, all depends on what you measure. You will be able to monitor and control – if at all this is the right term to use – what you measure and the basis of your measurement. How true, I say! What we measure (read diagnose) is not “how healthy a person is” but whether he has any disease. Health is certainly not absence of disease. There are no attempts specifically made to measure how healthy a person is. The limits and measurements always tell you about how you are NOT healthy - that is say your Cholesterol level  $> x$  means you have a problem. There are no active measures of suggesting to a seemingly healthy person, how she can be healthier! Moreover the current economic model to keep the people healthy (if it does that at all) is quite flawed. Health services revenue - the way these are essentially structured today will add to the “health” of economy as it treats more and more patients and more and more difficult to cure diseases. A strange measurement I must say. The health of the human race must be measured by % of healthy population rather than (say) length of life! Today, in almost all the places on earth - doctors get paid more as more people get sick. A few exceptions would be those who focus on diet, nutrition and exercise for example. The incentive for doctors to do well - is when there are indeed more and sicker people as it is true for pharmaceutical industry. The focus

is very clearly on curative medicine, rather than preventive and health encouraging practices. If the Doctors get rewarded for keeping the people healthy (before they become patients . . .) and are punished when these people become sick, doctors will naturally have a strong economic reason to care for patients' health – proactively. While this looks simple and logical this has not been practiced ever in modern history. This has indeed been a practice adapted by ancient Chinese doctors.

May be we will change the incentive structure for doctors but what will we do when patients have to breathe the same polluted air and drink the same polluted water? The question then goes back to the current economic model – which I argue is substantially flawed. If the model encourages the industry to “exploit” more of what we would like to preserve and provides “free” access to the natural resources, we cannot expect anything to be different. It is time to look at ways and means to make a transition from the current model to a model which will work and can take us to sustainable future.

As we know more and more about the tipping points around maintaining the health of the planet, we must look at alternative ways of how our business and industry functions. If we are able to measure (e.g.) the cost of diseases due to polluted water and air, or unavailability of water altogether and decide to correct the root cause, we indeed can take efforts in that direction. If restoring water sources is the least expensive way to eventually get access to good quality water round the year – that might be the way to go! If restoration of ecosystems is going to help us provide improved air quality, that is what we must do in order to improve air quality. If restoration of natural habitats is going to help improve earth's ability to absorb waste, let us not allow the vultures to die. These seem to be the fundamental actions that we must take to be able to meet some of our big challenges.

We seem to be locked into an economic system, which is making even a conscientious individual have limited options. Do we need to therefore rethink our economics in a more holistic manner? Economics is supposed to help us live well and not be a standalone “operating system” which thinks about the means but not the ends. If we consider happiness arising out of good health, good food, being part of the community, being part of the family, wholesome entertainment, being with nature and peace

are desirable end points as they certainly are - let these end points drive our economic system rather than the weird economics of today, which seems to be making all these end points harder to reach!

Human well being is so closely linked to well being of the planet - that they are almost inseparable. It looks like we have forgotten the first principles of science and the cause and effect relationship. Economics has transgressed the rationale - is the only conclusion we can draw in the process!

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## **Integrating Environmental And Social Sustainability In Business Design**

### **Need for Paradigm Shift**

Economic paradigm of consumption growth driven economics (CGDE) has outlived its time already for the western economies. Moreover the emerging economies will do more harm than good to the population at large if they decide to continue on the same economic paradigm. It is clear that the CGDE paradigm is insufficient to be able to create the level of consumption (if it were a parameter of wellness) in new economies like India and China – simply due to lack of resources to achieve a level of traditional wellness parameter of consumption! Most existing businesses have adopted the “continuous growth” approach so far – in direct relation with the CGDE paradigm. With our material economy transgressing the natural limits, we as a human race and the entire biosphere is suffering from dysfunction. Destruction of “continually working” ecosystems, which have been working for providing soil and keeping the air and water clean for the biosphere including us humans – is causing enormous stress on their collective function. Unless we look at ecosystems as enabler of basic inputs for life – namely soil, water and air, we will fail to understand their importance. There is a need to align our policy to this need of ecological restoration and conservation. The CGDE paradigm is also responsible for gross inequitable distribution of resources available for countries and their peoples. Apparent markers are inequitable incomes and purchasing power across all over the world, more starkly so in the emerging world. It seems quite evident that this indeed stems from the CGDE paradigm.

### Shifting the Economic Paradigm

It looks like there is an urgent need to operationalize a new economic paradigm which will create a much better and sustainable situation for people, businesses, natural ecosystems and the biosphere at large. This paradigm could be named Wellbeing Growth Driven Economics (WGDE). It is established that Humans depend on nature for not only resources consumed by the businesses and therefore people but also for basic ecological services – which come free if we are interested in keeping the natural ecosystems working! If we consider this as a very basic tenet and integrate that as part of how the business should look like, we will hugely help as much our own future as of this planet and therefore of future generations.

We have two challenges that we will need to address.

First : How do we transform the existing businesses running on existing CGDE paradigm and

Second : How a new business today must look like to cross the boundaries of traditional business and be a sustainable business?

We may have to look at the strengths and weaknesses of today's business design and explore how we can keep the strengths and overcome the weaknesses to make way for a new business design, which may retain some key strengths but will do away with possible weaknesses.

Let us look at this Strength and Weakness analysis for typical existing business

1. Primary objectives of a business today are increased revenue and margins
2. Cost base increases year after year in both labor and materials
3. Businesses dish out products and want to sell more widgets to push the resource limits even further.

Like economic policy (such as CGDE) influences how the businesses behave, the business behavior also impacts and will impact the economic policy. We need to create new business and transform existing businesses for the new paradigm of Wellbeing Growth Driven Economics (WGDE) by replacing the CGDE paradigm by sustainability paradigm such as WGDE.

Existing businesses have learned optimization at large, which

is wonderful, however, what they are optimizing today are the historically important parameters of Revenues and Margins. It looks like we will continue the capability and skills associated with how to optimize; we may have to change what we optimize. As elucidated above, what we indeed want to maximize is wellbeing and minimize the cost associated with such maximization (Let us call Cost of Wellbeing like we used the term Cost of Revenue). Today's businesses need to further apply their knowledge to minimizing resource use and select those resources to use, which can be replenished and renewed. Not just that but actually factor in the replenishment of these resources, not just in cost of replenishment per say but through actual action of replenishment.

Clear weakness of today's business is its obsession for growth in revenues and margins, irrespective of the natural capital constraints. While we are good at constrained optimization, we have to understand today's constraints better than going by yesterday's constraints.

Let us understand the reality very well. We need to reduce our "energy" dependence substantially. Fossil fuels must be used extremely conservatively if these must be used at all. Our aim should be understand what services does energy deliver, whether these services are really necessary, if they indeed are, are there any other ways of provisioning them without the use of non-renewable energy sources?

### **What can Businesses Do?**

What gets measured gets managed goes the saying. If the end results of our current economic paradigm – a la CGDE are not what we thought we should get, there is ample room to ask ourselves a question! Are we measuring right things? On some investigation, I have come to believe, we are probably measuring the wrong things and if the measurement parameter is right the direction is probably exactly opposite of what this should be. As an example, we measure GDP growth – which is a direct measure of added load on resources. However, we know today that we are striving to reduce load on resources and not increase this. Something is certainly going wrong. We are treating urbanization as inevitable outcome of current model even while we realize, it is causing more problems than solutions. It is pushing us further

down the road to unsustainability. We still believe creating better "infrastructure" in cities will help solve some of these problems. However, this is leading to the "unsustainable pull" to the cities.

As a business, we measure revenues and margins as indicators of Business wellbeing – without really worrying about whether the business is bringing in a positive impact on ALL the stakeholders of the business, namely – owners, employees, customers, society and environment. If ALL these stakeholders benefit from such a business, we can possibly say that the measure of revenue and margin to judge the business is appropriate and could lead to sustainability of the business ecosystem and associated natural ecosystem. Today the "SIZE" of business is considered an important parameter for success. Bigger is better per our current paradigm. More "growth" and bigger business is a clear indication of accelerated need for natural resources under the current paradigm.

#### **Here are Some Questions that we must Ask Ourselves**

Can we conceive of a business which "grows" by reducing the load on natural resources?

Can we completely eradicate the need for "centralized power" in large businesses?

Can we redefine vision of the business to start looking at ALL the stakeholders?

Can we redefine the success of a business by moving away from conventional parameters of success?

Can we create completely different measures for success of businesses?

Can we therefore influence the user of goods and services to behave responsibly and at the same time create improved wellbeing for her and others?

Can we overhaul development measures from those like increased energy use, increase in GDP, increase in water supply -to-more service oriented measures?

Changing increased use of energy to say improved illumination?

Moving from increased number of cars or trucks to improved mobility and transport?

Moving from selling more air conditioners to improved comfort?

Moving from increased food supply to improved health for all?

Moving from consumption growth to wellbeing growth?

As we start thinking deeper, we realize that all this is a distinct possibility. The book "Natural capitalism" provides an excellent basis for many of these thoughts. If we add the important aspect of ecological wellbeing we should be on our way to a good business design. Once businesses start looking at correct measure in assessing their business, they will naturally focus on the right things that the business does – business and wellbeing will then be aligned and not be at odds.

### **Economics of the Future**

Economics has, over a period of time stood alone and has drifted away from being a "Social (and environmental) Science". The new economic paradigm will have to move away from being hard science and get integrated with other sciences, social sciences and become a science of "well being" from being a science of "growth".

### **Connecting Business Decisions with Foot Resources**

Many a time today's typical business drifts so far away from physical reality that it starts believing that the business is about services and has no relation with resources and does not impact the natural world in anyway. This is very far away from truth. It is like saying that Lion's do not impact the natural ecosystems because they do not need trees and vegetation to survive on! Sometimes, businesses up the pecking order are more likely to impact the ecological systems in an adverse way than those closer to the direct use of natural resources.

If we develop a way to trace a decision to direct (and hopefully indirect) impact on ecosystems and natural environment as much as impact on all other stakeholders, we should be able to make some prudent decisions on how we use the available resources. In fact – once design of your business policy is based on such sound principles, you will automatically have the individual decisions made in line with the policy.

What should such parameters be, which must be looked at to make sure the underlying objective of maximizing wellbeing is met? If the base resource availability is depleting rapidly, it is a

clear indication of deteriorated ecosystems health. Increase in waste generation is a direct marker of wrong measurements which are leading to incorrect decisions and therefore disproportionate waste generation. It is not about how well we dispose of waste, it is all about the need that our waste generation is within the ecological boundaries of recycling. Any more than this – and we are eating into the available ecological space further. Eliminating overflow waste must be one of the overarching objectives of a sustainable business. If we understand today's businesses better – there is a very large part of business, which could just be done away with and the remaining could well be restructured. This means that these parameters at the ground level must be aligned with preservation and restoration of "natural capital" and not depleting this at a rapid pace, as we are doing today.

Let us also look at the social angle a bit further. If we study needs and aspirations clearly, we can easily see that an average person is happy if she has access to all the basic set of services she needs. These could be basic food, place to live, ease of mobility, vibrant community life, strong connection with the native place, availability of clean air, good clean water in enough quantity and good places for cultural recreation. The person needs to live healthy life, should have access to good affordable healthcare and good entertainment.

One of the drivers of aspiration for most human beings comes through "bench marking" with successful individuals. This definition of "success" needs to change – which certainly can - through appropriate policy shift. The symbols of success today are largely associated with material wealth rather than well-being and happiness. If we are able to change the benchmarks against which success is measured, it will not be too difficult to change the perceived needs by most people.

One of the arguments that current day economists continue to play on is we provide what people want. The truth is businesses no more serve needs; they create wants and drive them through the pounding advertisement culture to change the perception of people as to what is good for them. This being the case, media has a yeomen responsibility to help businesses make this change - if not naturally, then because media starts influencing the people positively and move them towards the right behavior.

In conclusion, the author believes that it is certainly possible

to create businesses which will align themselves with ecological and social wellbeing. Businesses which truly align with such wellbeing will be successful businesses. One has to examine nature of such businesses and what of modern day businesses actually can align at all with the wellbeing parameters. Such businesses which do not align with the principles of social and ecological wellbeing, will then have no particular reason to exist.

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## इकॉलॉजीच्या चिंतनामुळे सामाजिक भान

निसर्ग सान्निध्याची आवड, ट्रेकिंगच्या छंदामुळे विनासायास भिळणारे निसर्ग सान्निध्य आणि व्यक्त-अव्यक्त स्वरूपात, कधी कधी शब्दांतही मांडता न येणारे पण मनात सादून राहिलेले असंख्य प्रश्न हीच मला वाटतं, हा कोर्स करण्यामागची माझी प्रेरणा असावी. १९९८ ची या कोर्सची माझी ही पहिलीच बॅच. या अभ्यासक्रमाच्या दरम्यान तुकड्यातुकड्यांनी अनेक गोष्टी मिळत गेल्या, कळत गेल्या. निसर्ग जसा सतत बदलता आणि उत्क्रांत होणारा आहे तसाच हा अभ्यासक्रमही असल्यामुळे दर वर्षी संधी मिळेल तेव्हा पुनःपुन्हा व्याख्याने ऐकत राहिले, त्यातून ज्ञानाचे अनेक तुकडे जोडले गेले, आकलनात पडलेली पोकळी भरत गेली. मानवी जीवन आणि निसर्ग यांच्याविषयीची एक नवी, जास्त आरपार बघणारी दृष्टी विकसित होत गेली.

सरांच्या अर्थशास्त्रावरच्या व्याख्यानांमुळे अर्थशास्त्र हे पर्यावरणाशी, निसर्गाशी किती निगडित आहे हे कळल्यावर तर अक्षरशः साक्षात्कार झाल्याची भावना मनात उत्पन्न झाली. माणसाच्या तथाकथित प्रगतीचा फोलपणा, क्षणभंगुरता जाणवली. असं वाटलं की हे ज्ञान जास्तीत जास्त लोकांपर्यंत जर एकाच वेळी पोहोचलं तर खरोखर काही चांगला बदल घडून येईल, पण या विषयावर इतर ठिकाणी बोलताना या वाटण्यातला भावडेपणा चांगलाच कळून आला.

माणसाच्या जीवनपद्धतीकडे बघण्याची माझी दृष्टी जशी बदलली होती तशी ती इतरांनाही मिळावी या इच्छेपोटी काही बोलण्याचे, सांगण्याचे किंवा काम करण्याचे जे काही छोटे-छोटे प्रयत्न मी करत होते,

त्यामुळे विविध प्रकारच्या लोकांच्या मिळणाऱ्या प्रतिक्रियांमुळे माझं एक वेगळ्या प्रकारचं शिक्षण होत गेलं. त्यातून मला कळलेलं वास्तव हे आहे की काही अपवादच वगळता निसर्गाविषयी, माणसाच्या सुखोपभोगाविषयी विवेकबुद्धीने, निसर्गाला अनुलक्षून विचार करण्याची सहनशक्ती समाजात उरलेली नाही.

कित्येक शतके भारतातला मध्यमवर्गीय, निम्नमध्यमवर्गीय समाज आपल्या इच्छा, आकांक्षा आणि अस्मितेला दडपत राहिलेला होता. नेहमीच गरिबीचे खोटे उदात्तीकरण आणि नीतीमूल्यांचे ओझे समाजातल्या या घटकावर लादले गेले. परंतु स्वातंत्र्योत्तर काळामध्ये आर्थिक उलाढाली विस्तारत गेल्या. व्यापाराव्यतिरिक्त औद्योगिकीकरण, व्यवसायीकरण आणि आता जागतिकीकरण अशा टप्प्यांमधून या मध्यमवर्गाच्या हातात पैसा खेळला पाहिजे अशा आर्थिक धोरणांचा परिणाम म्हणून आजवर संकोचून राहिलेला हा मोठा वर्ग हातात पैसा पडताच जमेल त्या प्रकारे त्याचा उपभोग घेण्याच्या मागे लागला. सर्व मूल्ये त्याने झुगारून दिली. त्यामुळे कुठलेही नवे विचार ऐकून आणि समजून घेण्याच्या मनःस्थितीत तो नाही. आजवरच्या त्यांच्या रहाणीमानाला, बऱ्याच अंशी निसर्गानुकूल असणाऱ्या जीवनपद्धतीला इतर पर्याय नव्हते, ती अपरिहार्यता येत होती म्हणून ते तसे जगत होते का? कारण पर्याय निर्माण झाल्यावर आपली जीवनशैली झपाट्याने सोडून जिथले ज्ञान तिथेच सोडून लोकांनी जास्त पैसे मिळवून देणारे मार्ग चोखाळले.

यामुळे निसर्गाबरोबरच भाषा, संस्कृती आणि ज्ञानाचाही ज्हास होतो आहे. मला वाटतं की सद्यस्थितीचे आकलन होण्यासाठी, अर्थकारणाचे वास्तव लक्षात घेण्याची मानसिकता तयार होण्यासाठी, तंत्रज्ञानाच्या अतिवापराचे परिणाम जाणवण्यासाठी आणि ते मान्य करण्याची परिस्थिती निर्माण होण्यासाठी अजून काही वर्षे जावी लागतील.

या अभ्यासक्रमाचे, वैचारिक परिवर्तनाचे परिणाम माझ्या व्यक्तिगत जीवनात झाले. त्यांचा सरळसरळ संबंध या कोर्सशी कदाचित जोडता येणार नाही, पण या अभ्यासामुळे विचारांना चालना मिळून जे अनेक धुमारे फुटले, अनेक शंकांची उत्तरे शोधताना खोल खणता खणता

वेगळीच सत्ये गवसली ती सांगणे मला आवश्यक वाटते.

धर्मातला फोलपणा, दुटप्पीपणा, धार्मिक मूल्यांमधील व्यर्थता, अशास्त्रीयता फारच टोचू-बोचू लागली. कर्मकांडात बुडालेला धर्म समाजाला अधिकाधिक अंधश्रद्ध, कर्तृत्वहीन, असमंजस, निष्क्रीय आणि संवेदनाशून्य बनवत आहे असं दिसलं. माणूस जितका धार्मिक तितकी त्याची वेगळे, योग्य, काळानुरूप बदलणारे विचार समजून घेण्याची इच्छा आणि कुवत कमी होते का? आपली जबाबदारी ढकलण्याची, टाळण्याची आणि झटकण्याची वृत्ती धर्मांमुळे जोपासली जाते आहे का? धार्मिकता माणसाला विवेकापासून, निसर्गापासून अजून लांब खेचते आहे का?

एक प्रकारची अंतर्मुखता गेली काही वर्षे मी अनुभवू लागले. नाटक, सिनेमा पाहताना आणि विद्वानांची व्याख्याने, भाषणे, लेख वाचताना, ऐकतानाही पर्यावरणीय दृष्टिकोनातून सगळ्यांचे विश्लेषण होऊ लागले. शिक्षण वेगवेगळ्या विभागांमध्ये आणि कर्ण्यांमध्ये दिले जात असल्याने तथाकथित विद्वानांचे विचारही एककल्ली, अपुरे आणि फारच पुस्तकी वाटू लागले.

एका गुपमध्ये निसर्गाच्या पुनरुज्जीवनावद्दल मी बोलत असताना ज्यांनी चर्चेत भाग घेतला त्यांचे विचार मी थोड्या शब्दांत मांडत आहे. त्सुनामी, पूर, वादळे, भूकंप अशा नैसर्गिक आपत्तींनी होत्याचे नव्हते होत आहेच की. माणूस स्वतःच्या बुद्धीने ज्हास ओढवून घेत आहे हे मान्य केले तरी नैसर्गिक संकटांपेक्षा ही प्रक्रिया हळूहळूच चालली आहे. माणसाने चालवलेला बुद्धीचा असा वापर हीसुद्धा नैसर्गिक प्रक्रियाच का नाही? यावर थोडी चर्चा होऊन असा मुद्दा पुढे आला की पहिल्यापासूनच माणूस हा कुणाचेच भक्ष्य नाही. कालक्रमाने जर त्याची संख्या वाढत चालली आहे तर बुद्धीच्या जोरावर तो जगण्यासाठी जे करता येईल ते करित राहणारच. ऐहिक सुखोपभोगाची तंत्रज्ञानाच्या जोरावर गाठलेली परमावधी हा यातूनच निर्माण झालेला एक पैलू आहे. मग जे घडत आहे ते का घडू घ्यायचे नाही?

ही चर्चा तशी विस्तृत होती. इथे लिहिताना मी थोडक्यात शब्दांकन केले आहे. याउपर हे सगळे प्रश्न आणि त्यांची उत्तरे समजून घेण्यासाठी अशा तऱ्हेच्या अभ्यासक्रमाला प्रवेश घेण्याची मानसिकता तर कोणाची

नाही हे मला कळून चुकले.

तरीही एक छोटा वर्ग जागृत झाला आहे. या कोर्सच्या अनुषंगाने मांडले जाणारे विचार समजून घ्यायची इच्छा त्यांच्यात निर्माण झाली आहे. पण त्याच वेळी समाजातल्या वेगवेगळ्या स्तरातील लोक खूपच वेगळ्या परिस्थितीमध्ये, वेगळ्या वातावरणामध्ये आणि वेगळ्याच मानसिकतेने जगत आहेत. त्यामुळे काही बदल घडण्यासाठी, जाणीवपूर्वक निसर्ग समजून घेण्यासाठी थोड्याफार फरकाने समाजाची जी एक समान वैचारिक पातळी येणे गरजेचे आहे, ते कसे होणार? हा प्रश्न माझ्या मनामध्ये नेहमीच येत असतो.

एक ताजा अनुभव सांगून हा लेख मी संपवणार आहे. मी नुकताच एव्हरेस्ट बेस कॅम्पचा ट्रेक केला. एक डॉक्टर दांपत्य आमच्या ग्रुपमध्ये होतं. नामचे गावातून बाहेर पडताना माझ्यापुढेच असलेल्या त्या डॉक्टरांनी काही तरी खाऊन टिश्युपेपरला पुसून त्याचा बोळा रस्त्यावरच भिरकावला. मी अर्थातच त्यांना त्याबद्दल बोलले. त्यावर त्यांचं उत्तर होतं, 'काय टिश्युपेपर तर आहे.' म्हणजे प्लास्टिक नाही असा त्यांचा मुद्दा होता. मी त्यांना म्हटलं की आपण आत्ता बारा हजार फुटांवर आहोत. या तापमानाला तुमचा टिश्युपेपर कुजायला किती काळ लागेल याची तुम्हाला कल्पना आहे का? आणि ते सगळे पर्यावरण वगैरे तर आपण बाजूलाच ठेवू. असा बोळा या स्वच्छ सुंदर रस्त्यावर कसा दिसतो याचा तरी विचार कराल की नाही? तुमच्या सॅकच्या कप्प्यातच तो बोळा ठेवा ना. एवढ्या माझ्या बोलण्याचाही कणमात्र परिणाम त्या माणसावर झाला नाही उलट तो मला 'शट अप' म्हणाला. आमचं जोरदार भांडण झालं. त्याने त्याचा आडमुठेपणा सोडला नाही.

मला वाटतं हे एकच उदाहरण आपल्या मनात असंख्य प्रश्न उभे करायला पुरेसं आहे.

भारती केळकर

B.Com. / Translator

## पर्यायी जीवन

जागतिक जनमानसावर तंत्रज्ञानाचा पगडा बसण्यामागे युरोपमध्ये जे एक तत्त्वज्ञान १७ व्या आणि १८ व्या शतकात विकसित झाले ते प्रायः कारणीभूत आहे. त्यामध्ये व्यक्तिस्वातंत्र्यावर भर दिला गेला. विशेषतः प्रत्येकाला आपल्या आवडीनिवडीनुसार मागणी नोंदविण्याचे स्वातंत्र्य असले पाहिजे यावर भर दिला गेला. त्यामुळे जी उत्पादनपद्धती प्रत्यक्षात आली तीमध्ये उत्पादनवाढीवर आणि त्यापासून अधिकाधिक नफा कसा मिळेल यावर लक्ष केंद्रित झाले. याच वेळी कोळसा आणि लोखंड या खनिजांचे साठे सापडले आणि त्यापासूनच्या ऊर्जेवर चालणारी यंत्रे प्रचारात आली. इंग्लंडमध्ये याच सुमारास कुळांकडून शेती काढून घेऊन ती मोठ्या प्रमाणावर करण्याची प्रथा पडली. या बेकार झालेल्या कुळांना नवीन निघालेल्या कारखान्यात नोकरी मिळाली पण ती कमीत कमी वेतनावर. पर्यावरणाकडे दुर्लक्ष झाल्यामुळे कारखान्यांच्यामुळे जी शहरे मोठी झाली त्यावर काळ्याकुट्ट वातावरणाचे आवरण बसले.

व्यक्तिस्वातंत्र्याचा प्रत्यक्षात परिणाम म्हणजे संपत्तीचे केंद्रीकरण, कामगारांची अवनत स्थिती आणि बिघडलेले पर्यावरण असा झाला. याविरुद्ध मार्क्सने आवाज उठविला आणि कामगार हेच संपत्तीचे मालक झाले पाहिजेत ही गोष्ट हिरीरीने पुढे मांडली. मात्र प्रत्यक्षात त्याचाही परिणाम कम्युनिझमद्वारे सत्तेचे केंद्रीकरण होण्यातच झाला. कामगारांची स्थिती सुधारण्यासाठी कम्युनिस्ट सत्ताधाऱ्यांनी देशातील साधनसंपत्तीची मालकी सरकारी केली. पण त्यातून निर्माण झाली हुकुमशाही. भांडवलशाहीला (Capitalism) पायबंद बसला तरी कामगारांचे कल्याण

साधले गेले नाही. व्यक्तीला मागणी नोंदविण्याचा जो अधिकार होता तो पूर्णतः दडपला गेला. राष्ट्राचे बळ वाढविणे म्हणजे अधिकाधिक विनाशकारी शस्त्रांची निर्मिती करून सरकारी सत्ता वाढविण्याचे प्रयोग केले गेले. यातून मार्ग काढण्याचा, एक प्रकारे मध्यममार्ग आचरणात आणण्याचा प्रयोग भारताने केला. महात्मा गांधीसारखे महान व्यक्तित्व तंत्रज्ञानाच्या विरोधात असल्याने प्राथमिक तंत्रज्ञान, खेड्यातील जीवन सुधारण्यावर भर, जनतेच्या प्राथमिक गरजा भागविण्यावर भर दिला गेला आणि पहिल्या पंचवार्षिक योजनेच्या अखेरी त्याचे सुपरिणाम दिसूनही आले. पण त्यानंतर मात्र भारतीय वैशिष्ट्यांचे हे भान सुटले आणि कॅपिटॅलिझम, कम्युनिझम (सोशॅलिझम) यांचा बोलबाला पुन्हा सुरू झाला. भांडवलशाहीला मर्यादित क्षेत्रे खुली ठेवून सरकारीरीत्या तंत्रज्ञानावर आधारित प्रचंड गुंतवणूक केली गेली. त्यामुळे राष्ट्राच्या तिजोरीतील परकीय चलन गंगाजळी रिती होऊन (Sterling balance) सरकारवरील कर्जाचा बोजा वाढतच गेला. मात्र किंमतीवर सरकारी नियंत्रण असल्याने खाजगी उद्योगांचे स्वातंत्र्य मर्यादित राहिले आणि त्याचा फायदा सर्वसामान्य जनतेला मिळाला. इंदिरा गांधी सत्तेवर असेतो ही स्थिती टिकली. त्यानंतर मात्र उदारीकरणाचे वारे वाहू लागले, सरकारी नियंत्रणे शिथिल झाली, पर्यावरणाचे संरक्षण करणारे कायदे निष्प्रभ होऊ लागले आणि १९९० नंतर उदारीकरणातून पाश्चात्य विचारसरणी आणि तंत्रज्ञानाचे प्रभुत्व आपण पूर्णपणे स्वीकारले. याचे दृश्य परिणाम म्हणजे सतत वाढती महागाई आणि श्रीमंत व गरीब यांच्यातील संदावणारी दरी. एक सक्षम मध्यमवर्ग निर्माण झाला खरा - तंत्रज्ञानाचे वर्चस्व असणारा - पण तळागाळातील लोकांची संख्या वाढतच गेली.

वरील विवेचनावरून एक लक्षात येईल की कॅपिटॅलिझम, कम्युनिझमसारखी पाश्चात्य तत्त्वज्ञाने मुख्यतः औद्योगिक उत्पादन आणि संपत्तीची निर्मिती यांवर भर देतात. संपत्तीचे योग्य वितरण करण्याचे तंत्र त्यामध्ये बसविलेले आढळत नाही. याउलट म. गांधींचे तत्त्वज्ञान संपत्तीच्या वितरणावर आणि त्याद्वारे साधणाऱ्या सामाजिक उन्नतीवर भर देणारे असले तरी ते ज्या पद्धतीने समाजात पसरविले गेले, ती पद्धत

नवीन उदयास आलेल्या मध्यम वर्गास, सुशिक्षितांना आणि त्यांच्याच विचारांचा पगडा असलेल्या राजकारण्यांच्या पचनी पडली नाही. परिणामी ते पुन्हा पाश्चात्य तंत्रज्ञानाकडेच आकर्षित झाले आणि कम्युनिस्ट सत्ता कोलमडल्याने आता तंत्रज्ञानाधिष्ठित पाश्चात्य तत्त्वज्ञानाचाच बोलबाला आपल्या देशात पुन्हा सुरू झाला.

यावर तोडगा काही आशियायी राष्ट्रांनी शोधून काढला आहे, उदा. सिंगापूर, मलेशिया, श्रीलंका, तैवान, दक्षिण कोरिआ, फिलिपिन्स. त्यांना आज Asian Tigers संबोधिले जाते. सुधारणांची सुरुवात त्यांनी जमिनीच्या मालकीचे विकेंद्रीकरण करण्यापासून केली (Land Reform). त्याचबरोबर त्यांनी सार्वत्रिक शिक्षणाकडेही लक्ष देऊन जनतेला सुशिक्षित बनविले. भारताने या गोष्टींवर अजूनही भर दिलेला नाही, हे लक्षात घेतले पाहिजे.

भारताने अनेक पंचवार्षिक योजना राबविल्या खऱ्या पण अनेक मूलभूत गोष्टींकडे दुर्लक्ष झाले. भारत उष्ण कटिबंधातील देश आहे, म्हणजे नेमके काय, याचे थेट उत्तर आपल्या शिक्षणात दिले जात नाही. अलिकडच्या संशोधनातून दिसते की जगाच्या भूमीपैकी २ टक्के भूमी भारताने व्यापली आहे, पण भारतात जागतिक जैवविविधतेपैकी (Biodiversity) ८ टक्के विविधता उपलब्ध आहे. भारत हा जैववैविध्य असलेला देश आहे. आणि या विविधतेने माणसाला जगण्यासाठी अनेक पर्याय दिलेले आहेत. या पर्यायांचे ज्ञान अदिवासी (Tribals) जमातींना जेवढे असते, तेवढे सुशिक्षितांना नसते. तंत्रज्ञानाचा स्वीकार केला की विविधता लोप पावून एकसारखेपणा येतो. पर्याय नष्ट केल्याची जाणीव होते. अवर्षण झाले, नैसर्गिक आपत्ती आल्या की त्यांना तोंड देण्यास तंत्रज्ञान अपुरे पडते.

निसर्गाचा सम्यक् विचारही आपल्या शिक्षणात नाही. आपण सोयीसाठी निसर्गाचे विभाग केले आहेत : उदा. भूशास्त्र, वनस्पतिशास्त्र, प्राणिशास्त्र, पक्षिशास्त्र वगैरे. भौतिकी (Physics), रसायनशास्त्र, गणित, संख्याशास्त्र तसेच भूगोल, इतिहास, समाजशास्त्र, वंशशास्त्र, वैद्यक यांच्याशी सांगड घातली जात नाही. परिणामी विद्यार्थ्यांस निसर्गाचे एवढेच नव्हे तर मानवी जीवनाचेही सम्यक् आकलन होत नाही. शिक्षण

हे निरनिराळ्या शास्त्रांच्या परस्परसंबंधांवर आधारित हवे. तंत्रज्ञान हे सर्वास पूरक ठरणारे एक अवजार आहे, हे आपण लक्षात घेतले पाहिजे.

आज या परिस्थितीत सुधारणा होणे जरूर असेल तर शिक्षण सर्वांसाठी आणि सम्यक् (Holistic) दृष्टीवर आधारलेले हवे; व्यवसाय, नोकऱ्या, संशोधन हे मुख्यतः जैवविविधतेचे, निसर्गाचे संरक्षण, संवर्धन यांतून प्राप्त झाल्या पाहिजेत; आणि तंत्रज्ञानाचा वापर एक अवजार (Tool) म्हणून झाला पाहिजे.

आजच्या परिस्थितीला पर्यायी व्यवस्था सुचवायची झाली तर तिचा पाया व्यक्ती आणि व्यक्तिस्वातंत्र्य हाच असेल. मात्र व्यक्तिस्वातंत्र्य म्हणजे अनिर्बंध आवडनिवड नव्हे. व्यक्ती जी निवड करील त्यावर समाजाचा अंकुश हवा. असा अंकुश राजकीय सत्तेने लावला तर हुकूमशाही निर्माण होते, हे इतिहास सांगतो. हा अंकुश विवेकावर आधारित हवा आणि हा विवेक स्वयंसेवी संघटनांकडून प्रतीत झाला पाहिजे. याचाच अर्थ असा की समाजातील प्रत्येक व्यक्तीने आपल्या आवडीच्या स्वयंसेवी संस्थांचे सदस्यत्व स्वीकारले पाहिजे. या संस्थांनी आपल्या सदस्यांसाठी एक आचारसंहिता तयार करायला हवी की जिच्याद्वारे सभासदांच्या आवडीनिवडीला विधायक वळण लागेल. समाजविघातक विचारसरणी, आचार आणि आवडनिवड यांना थारा मिळणार नाही. राजकीय सत्तेचे हे काम राहिल की अशा संघटनांद्वारे समाजविघातक विचार, आचार आणि आवडनिवड प्रसृत केली जात नाही हे पाहणे.

या स्वयंसेवी संस्था व्यवसायावर आधारित असतील, विशिष्ट विषयातील संशोधन आणि चर्चा यांवर आधारित असतील, व्यापार आणि देवघेव यांवर आधारित असतील, कलाकौशल्ये यांवर आधारित असतील, विशिष्ट विधायक मतांचा प्रचार करणाऱ्या असतील, धर्म व पंथ यांवरही आधारित असतील. मात्र त्या विधायक कार्य करीत आहेत, टोकाचे विचार प्रसृत करीत नाहीत, हे पाहणे सरकारचे कर्तव्य असेल. त्यांच्याकडून मुख्य अपेक्षा अशी की त्या जी आचारसंहिता स्वीकारतील त्यातून सदसद्विवेकबुद्धीवर आधारित उपभोग व उपभोग्य वस्तू यांच्या उत्पादनास चालना मिळेल.

व्यक्तीला ज्याच्या त्याच्या उत्पन्नानुसार आवडीनिवडीचे स्वातंत्र्य असेल पण अशी आवडनिवड विधायक असेल, समाजविघातक नसेल, हे या संस्था पाहतील. त्याचप्रमाणे ज्याच्या त्याच्या बुद्धिमत्तेनुसार, कौशल्यानुसार, शिक्षणानुसार संपत्ती मिळविण्यास, खाजगी मालमत्ता जमविण्यास व्यक्तीला स्वातंत्र्य असेल पण ती अवैध मार्गाने जमविली जाणार नाही, हे या स्वयंसेवी संस्था पाहतील. तसेच नैसर्गिक साधनसंपत्तीवर एखाद्या व्यक्तीचा हक्क असेल, तर तिचा विनियोग करण्याचे तिचे स्वातंत्र्य स्वयंसेवी संस्थांच्या आचारसंहितेनुसार ठरेल किंवा मर्यादित होईल.

आर्थिक व्यवहाराचा पाया मुख्यतः जैवभार, जैवविविधता आणि जैविक ज्ञान असा असेल. तंत्रज्ञान नव्हे. तंत्रज्ञानाचा उपयोग मुख्यतः नैसर्गिक साधनसंपत्तीचा दर्जा सुधारणे-वाढविणे, निसर्गाकडून ज्या सुविधा सर्वांना फुकट मिळतात, उदा. ऑक्सिजनयुक्त वातावरण, क्रीटांद्दारे बीजवहन, गोडे पाणी, सुपीक जमीन, वने, गवताळ प्रदेश असे नैसर्गिक अधिवास, किनाऱ्याला लागून असलेला समुद्राचा भाग व खाड्या वगैरे. या सुविधांचा दर्जा राखणे-सुधारणे (प्रदुषणापासून त्यांना वाचविणे) असा असेल. यामुळे समाजात संपत्तीचे वाटप समप्रमाणात होण्यास मदत होईल आणि आज जे महत्त्व निव्वळ पैशाला आले आहे, ते नैसर्गिक साधनसंपत्ती आणि नैसर्गिक सुविधा यांना येईल.

समाजातील व्यवसाय, उद्योग, नोकऱ्या या मुख्यतः निसर्ग, नैसर्गिक साधनसंपत्तीचा दर्जा व जैवभार, नैसर्गिक सुविधा यांची राखण, दर्जा वाढविणे व त्यांचा चिरंजीवी उपभोग घेणे, यांवर आधारित असतील. कोळसा व तेल यांसारखी ऊर्जेची साधने या सर्वांची देखभाल, तंदुरुस्ती आणि पुनरुज्जीवन यांसाठी मुख्यतः वापरली जातील.

निसर्गाच्या पुनरुज्जीवनातून अनेक व्यवसाय व नोकऱ्या तयार होऊ शकतील यात शंका नाही. पुनरुज्जीवनामुळे राष्ट्रीय संपत्तीत सतत भर पडेल आणि महागाईचा भस्मासुर नाहीसा होऊन समाजकल्याण साधले जाईल.

याचा अर्थ कारखानदारी अजिबात नको असा नाही. पण ती लहान प्रमाणावर, विकेंद्रीत स्वरूपाची आणि सर्वसामान्यांच्या गरजा पुरविणारी

हवी. नवनवीन अलिशान मोटारी बाजारात आणणारी नको. त्याचबरोबर जमिनीची मालकी वैयक्तिक पण त्यात कोणती पिके घ्यायची, त्यासाठी पाणी, खते, अवजारे यांचे वाटप कसे करायचे हे गावपातळीवर, ग्रामसभेत विचारविनिमय होऊन ठरले पाहिजे.

शेती उत्पादनात प्राधान्य असावे स्थानिक जनतेच्या गरजा पुरविण्याला. त्यानंतर जी जमीन व इतर साधनसंपत्ती (Resources) शिल्लक राहतील त्यांचा उपयोग बाजारपेठ आणि निर्यात यांच्या गरजा भागविण्यासाठी व्हावा. तसेच खनिज तेल, कोळसा यांचा वापर समाजाच्या गरजा पुरविण्यासाठी प्रायः झाला पाहिजे. उदा. वीज व पाणी पुरवठा, सार्वजनिक वाहतूक, प्राथमिक आणि माध्यमिक शिक्षण की जे निसर्ग, नैसर्गिक साधनसंपत्ती आणि नैसर्गिक सुविधा यांबाबत शाखाधारित ज्ञान व त्यांचा योग्य वापर कसा करायचा हे धडे विद्यार्थ्यांना देईल.

कोळसा आणि तेल यांचा वापर अनिर्बंध वैयक्तिक आवडनिवड, केंद्रीभूत तंत्रज्ञान आणि निव्वळ पाश्चात्यांचे अनुकरण, असा होता कामा नये. म्हणजेच भौतिक शाखांच्या नियमांमुळे ज्या मर्यादा येतात, त्यातून पुष्कळशी सुटका होईल आणि उत्पादनापेक्षा कचरा माल जास्त तयार होणार नाही.

राजकीय सत्ता लोकशाही तत्त्वावर असणे योग्यच आहे. सरकारची कर्तव्ये मुख्यतः कोणती, हे वेळोवेळी सांगितलेच आहे. वैयक्तिक मालकीचा उपयोग साधनसंपत्तीचा साठा करून तो दाबून ठेवणे, त्याच्या विक्रीवर किंवा खरेदीवर थोड्या लोकांची किंवा छोट्या समूहाची मक्तेदारी असणे, यांचा बंदोबस्तही सरकारला करावा लागेल.

वचत आणि संपत्तीची निर्मिती प्रायः वैयक्तिक बुद्धिमत्ता, कौशल्य आणि उद्यमशीलता यांवर अवलंबून असेल आणि भांडवली गुंतवणूक मुख्यतः स्वयंसेवी संस्था आणि त्यांचे मार्गदर्शन यांवर ठरेल. तसेच साधनसंपत्तीच्या वैयक्तिक मालकीतून योग्य ते भाडे आकारून व्यक्तीला उत्पन्न मिळविता येईल. मात्र यांमध्ये सद्भावजी आणि अवाच्यासव्वा भाडे आकारणी होत नाही ना, हे सरकारला पहावे लागेल. सरकारी धोरण आखताना नैसर्गिक साधनसंपत्तीबाबतचा सखोल, शास्त्रीय ज्ञानांचा

आधार आवश्यक मानला जावा. तसेच लोकसंख्यावाढीवरही नियंत्रण सरकारचे असणे आवश्यक आहे.

अर्थव्यवस्थेचा गाभा निसर्ग आणि निसर्गसंपत्तीचा योग्य वापर व तिचे पुनरुज्जीवन असा हवा. निसर्गाची विभागणी करून (उदा. शेती व वने) त्यांपैकी काहींना प्राधान्य आणि इतरांकडे दुर्लक्ष ही परिस्थिती बदलली पाहिजे. सेंद्रीय शेती, ऊर्जेसाठी हायड्रोजनसारख्या नवीन स्रोतांचा उपयोग यांवर संशोधन केंद्रीत केले पाहिजे. सूर्यऊर्जेचा उपयोग पाणी तापविणे, घरे उबदार किंवा थंड राखणे, कपडे वाळविणे असा होईल तरच पुन्हा भौतिक नियमांपासून तिची सुटका होईल. पवनऊर्जेचा उपयोग असाच विधायकरीत्या होऊ शकेल. मात्र त्यासाठी प्रचंड आकाराच्या पवनचक्क्या उभारून केंद्रीभूत ऊर्जा निर्माण करणे टाळले पाहिजे कारण अशा सर्व गोष्टी कोळसा व खनिज तेल यांच्या वापराविना शक्य होत नाहीत. पाश्चात्य देशांमध्ये अनेक लहानसहान जनसमूहांनी अशी साधी, कमी गुंतागुंतीची पण अर्थपूर्ण आणि समाधान देणारी जीवनशैली आचरण्यास सुरुवात केली आहे. त्यांनी राष्ट्रीय अर्थव्यवस्थेपासून फारकत घेऊन स्वतःचे चलन (Currency) ही वापरात आणले आहे. एकमेकांना सेवा-सुविधा पुरविण्यावर त्यांची अर्थव्यवस्था आधारलेली आहे.

आज पर्यायी अर्थव्यवस्थेचा सर्वांनाच विचार करावा लागत आहे कारण कोळसा व तेल यांचे साठे केव्हा ना केव्हा संपणार आहेत. निसर्गसमृद्ध भारताला अनेक प्रकारची साधनसंपत्ती आणि ती वापरण्याचे अनेक पर्याय उपलब्ध आहेत. गरिबी पैशावर ठरत नाही तर असे अनेक पर्याय नष्ट झाले तर बहुसंख्यांना जीवनच अशक्य होते आणि ते गरिबीच्या खाईत लोटले जातात. हे पर्याय जोपासले म्हणजेच निसर्ग समृद्ध केला तर चंगळवाद, गरिबी आणि कमालीची सामाजिक विषमता यांपासून आपली सुटका होईल.

प्रकाश गोळे

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