Regaining Paradise

towards a fossil fuel free society

T. Vijayendra

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PREFACE

The only possible paradise that we know for real is planet Earth. Human species started the process of losing it by exploiting his own kind and exploiting nature. The former being conspicuous, met with dissent from time to time. The accumulated scars of the latter began to appear only in the last couple of centuries. Presently, the extent and intensity of the phenomenon is such that it now endangers all life on Earth.

This book is about regaining this paradise. Hence it is about ending exploitation of man by man and exploitation of nature by man. The two being inseparable, neither can be achieved in isolation.

This book is about humility. It is about humility to accept we are part of all forms that belong here; to accept coexistence; to accept that science can assist us to live in harmony with nature, accepting and adapting to her ways.

This book is about struggle. It is about struggles to stop the exploitation of man and of nature.

And finally this book is about rebuilding communities. Being a social species, our survival is dependent on cooperation. This is possible only when there is individual freedom and mutual respect.

There is no copy right on this little book. It is copy left. You are welcome to use it in any way you like.

In writing this book I have received help, encouragement and love from innumerable friends. It is perhaps not possible to thank them all and if some names are left out it is unintentional.

To begin with I must thank Sagar Dhara of the Hyderabad Platform. It is his knowledge and constant concern on these issues that has inspired me to write this book. Usha Sriram, who managed the finances for the book, has been a constant source of support and a good critique of everything I do. Nyla Coelho has shown enormous patience and a sense of humour in making the text readable with her editing skills. Suresh Kosaraju has taken the entire responsibility of publishing including the cover design.

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I thank them all.

T. Vijayendra
November 11, 2009

New Ecological Understandings

Circumstance: the age of exuberance is over, population has already overshot carrying capacity, and prodigal Homo sapiens have drawn down the world's savings deposits.

Consequence: all forms of human organisation and behaviour that are based on the assumption of limitlessness must change to forms that accord with finite limits.

William R. Catton

Overshoot: the ecological basis of revolutionary change, 1982

INTRODUCTION

The world is going through a major crisis. Many have called it the biggest crisis after the 1929 depression. Several factors have come together to herald this crisis. First is environment degradation that has now reached a crisis point in the shape of global warming. Every one agrees that it is a very serious crisis. If carbon emissions continue at present levels, then the time will arrive when the tipping point will occur. That is, reversals will not be possible, that global warming itself will create more global warming. No one knows when such a point may be reached. Some say it has already occurred; some give it 10, 20, 50 or 100 years. The second factor is peak oil, peak gas and peaking of several mineral resources. Peaking means that after the particular point has been reached, production will not rise, but will fall. The reason is that there is only a finite quantity of these minerals and when half of it is taken out, the production starts falling. Often because, the cost of extracting from leftover, lower grade, remnant sources, is much higher in terms of energy and money. The third is the economic crisis which began in the U.S.A. with the housing crisis in September 2007 and got full blown in the financial melt down of September 2008. Broadly, there is no disagreement on these facts. The differences are in the response to these crises.

The response of the government and the ruling class follow a particular trend. Primarily all these crises are not considered together. Each is treated separately. The financial crisis is tackled by a bail out kind of response. Global warming is treated by international agreements of reducing emissions. The response to Peak oil and peak gas is to opt for coal and nuclear energy, supplemented by alternatives like solar, wind, bio fuel etc.

Most people are aware of the different aspects of this crisis in a piecemeal manner. Thus for the economic crisis people want job security. People hope that these international agreements will manage to tackle global warming. While many oppose coal and nuclear based energy sources, they all hope that either alternatives like solar, wind etc. will happen or some new technological innovation will solve the entire problem.

This book addresses these issues in a different manner. One cannot rule out the possibility that this approach is wrong; that any of the above approaches may prove right; or that, the future being unpredictable, problems may be addressed in an altogether new manner.

All the same, based on study and concern for the future, this book outlines a different approach. First, in the opinion of the author, this is the most unprecedented crisis in human history. For the last 10,000 years or so, human society has experienced an increase in available energy through technological innovations and exploitation of man by man and exploitation of nature. This energy availability kept on increasing. And, in the last 200 years of industrial revolution it has increased enormously. The author believes that for the first time in human history we will face a decrease in available energy.

It is taken as a given that it is not possible to estimate when global warming will reach a

tipping point. However, peak oil and the related economic crisis may actually reduce emission; it is possible that global warming will be arrested, even though effects of past warming will continue to create problems. The real solution then will be to learn to live with reduced levels of energy.

There are two kinds of challenges involved. Society cannot go back in time from its modern or present sensibilities. The challenge is how to have a modern society with reduced energy. A fossil fuel free society implies a drastic reduction of available energy for mankind. This makes the present social system of capitalism unviable. However this does not mean that humans are going back to the Stone Age! More than half the energy used in the present system is irrational. The war industry, tobacco, narcotics, alcohol, much of the medical industry, a lot of the finance industry, bureaucracy etc are totally unnecessary. The alternative sources of energy would be sufficient for this reduced need of energy and still allow man to live comfortably with modern sensibilities and modified/improved modern technologies.

The second and more immediate problem is that the ruling classes are not going to give up voluntarily. People all over the world are struggling to save their livelihood, land, water and air from the sharks of the industry. The agents of change, therefore, will be organised people who are carrying out these struggles. People will not agree to a solution where they will continue to be poor, oppressed and exploited. So the final solution may lie in reduced and equitable access to energy for all. Finally, human society has encroached on nature much beyond its share at the cost of other living beings. Human society will have to restore these resources so that all forms of life can survive. Otherwise, human society itself will not survive.

This book is in three parts. The first, ‘The party is over’ describes the nature of the problem; the second, ‘Where do we want to go?’ describes a vision of the future; and the third is, ‘What then should we do?’ In it the strategy proposed is: 1. Halt the juggernaut of dying capitalism - coal based power plants, huge hydro-power plants, sponge iron plants, new mining leases etc. This can be done only through local people's organisations. 2. Build regional coalitions of people's organisation to plan and build a new society. To begin with, work towards assured alternative fossil fuel free livelihoods for every one.

In the appendices, a brief description of the Quaker method of dialogue and conflict resolution has been included. Also the script of ‘Village with the Watermills’ , which is an episode from Kurosawa’s film ‘Dreams’, has been included as an artistic and poetic perspective of a fossil fuel free society.

The objective of the book is primarily to provide educational material for activists and non-professionals. The book puts forward the views and action plans in a straightforward, simple and cogent form, without meandering into academic debates. While I checked with professional colleagues that no gross error has occurred in the data presented I have avoided giving references. The references provided at the end of the book are more in the nature of resources.

THE PARTY IS OVER

Human history has moved through several stages designated as primitive communism, slavery, feudalism and capitalism, each era successively having shorter periods. Of course different regions have had regional variations of this general scheme. The current stage, the industrial society/capitalism that began at the end of the 18th century is also coming to end, as the title of this section indicates. Various contributing factors and events are dealt with, the principal among which is the beginning of the end of availability of concentrated form of energy like oil. The chapter on alternative energy discusses that technological solutions alone cannot solve the present crisis and proposes that the real solution lies in a socio-political change based on scaling down of energy use and equity.

WOLF AT THE DOOR

the imminent crisis of capitalism

The Bell is Tolling

In the past, Leftists all over the world have predicted the demise of capitalism many times and have been proved wrong. Now that the demise is imminent - the wolf is actually at the door – the leftists are the last to believe it.

What makes the end of capitalism so imminent is that, there are several crises that have come simultaneously, interacting and reinforcing each other, that have made the present crisis of capitalism probably the last and final crisis of capitalism.

Some of these crises are well known, such as the Iraq war, global warming, the ongoing world wide recession... Others such as peak oil or peaking of world food production are less discussed in newspapers and popular mass media. In India, violence in Kashmir, insurgency in the North East and the Naxalite movement has posed a major threat to law and order. Every one of these is related to capitalism and each has reached its flash point.
/
Ordinary people in every walk of life are deeply conscious that all is not well with the world. Majority of the people are in deep economic crisis, in their personal lives. In India a third of the population is living below poverty line and is forced to deal with food shortage, illnesses and distress in the course of day to day existence. Several thousands of farmers and urban poor have committed suicide. Systems are falling apart. Patients are attacking doctors; students are attacking teachers, and even going to the extent of killing each other! A crisis of this proportion does not emanate from one single cause. When several issues converge in a negative synergistic manner it causes collapse in a system.

Some of these causes are being examined below, followed by an attempt to establish their interconnectedness.

Global Warming

The main cause of global warming is burning of fossil fuels in astronomical quantities by the automobile industry and coal based thermal power plants. The consequent release of green house gases (GHG) is so huge that it far exceeds the earth’s capacity to absorb them.

This consumption of fossil fuel is not evenly distributed across the globe or among the people within a country. An average American puts into the atmosphere 18.5 tons of CO_2

emission per year as compared to a mere 1.8 tons by an average Indian. These averages hide the fact that most of the carbon output is contributed by the 20% rich of these countries and that the poor consume far less energy. Thus, even here, there are extreme inequalities in GHG output within and across countries.

This level of release of GHG is relatively a new phenomenon. For tens of thousands of years, humanity has existed, slowly changing the natural environment and ecology to meet its existential requirements. However, human activities of the present day that lead to increase in greenhouse gases are very specific. They do not pertain to the tribal or community based village life that humanity led in the past and which even today billions of poor people lead. GHG is the direct consequence of coal-based steam technology that saw the creation of the industrial revolution and mass production patterns. In the 20th century oil replaced as well as supplemented coal causing further pollution and global warming.

Why does capitalism need continuous increase in energy consumption? The logic of capitalism is production for sale and profit and not necessarily for requirements. It follows that, to increase profits, one should go on producing more and more create artificial needs and demands through public mind control. All of which necessarily requires consumption of energy.

Thus, global warming is a specific historical phenomenon. It is with the ascendancy of industrial-based capitalism in the past one hundred and fifty years that global warming has occurred in a dramatic manner and increased to a point that threatens to alter the earth's climate and ecology irreversibly.

In recent years, global warming has reached crisis levels because it is exceeding the biological carrying capacity of the earth. One and half earths are required to meet the needs and balance the demands of current human consumption levels. This is inevitably leading to the tipping point, meaning, that we have reached a point in time when global warming cannot be reversed. That is, we have entered a vicious cycle where global warming itself leads to further global warming and no one can do anything about it.

One cannot point with certainty as to when the tipping point will occur. Some even claim that it has already occurred and that humanity will see and feel its consequences in coming years. The assumption here is, it has not yet occurred and we have, say, a window of ten years left do something about it. The reason for this assumption is that changes in human society occur faster than changes in nature.

Many people believe that capitalism can reform. It is true that no big changes occur till all the existing alternatives are tried out. But today, the very material basis of capitalism, i.e., the concentrated form of energy - oil - is coming to an end or is becoming economically unviable. Although coal is still available, as will be seen later, it is the most undesirable source of energy and cannot easily displace oil.

Then, what about alternative forms of energy that don't release GHG to this extent? This

will be dealt with, in greater detail, in section II of this book. Can all of us individually do something? Certainly yes! It will not be to save capitalism but to work towards building an alternative along with major social and political changes. It must not be forgotten that in order to solve the problem the essential need is to roll back energy consumption to at least pre 1975 levels; preferable even earlier to say 1930 levels. I have yet to come across a roadmap that can do it within the capitalist system. I firmly believe that this problem can only be solved by the demise of capitalism. If this does not happen, I have no doubt that we will reach the tipping point in the near future. *So it is imperative that capitalism should collapse within 10 years or so, so that life on earth has a chance to survive.* Therefore one should look at the tendencies that will lead to such an event. One such major tendency is Peak Oil.

Peak Oil

So what exactly is 'Peak Oil'- which is likely to lead to the end of the industrial era? At the present rate of consumption, all available oil will be used up within this century. But peak oil is not about when we run out of oil, but rather, when the production of oil starts to decline, and this is much closer. It may be as close as 2010. Many observers believe that it has already occurred and we are witnessing the effects in the global crash of capitalism! On the other hand, many people believe that Peak Oil is a few years or decades away. This does not change the main argument that follows below as well as the fact that the consumption of fossil fuel is causing global warming and environment degradation in significant ways and therefore its use must be reduced as soon as possible.

How does one predict, 'when Peak Oil will occur'? In 1956 a US scientist, M. King Hubbert correctly predicted that US oil production would peak in 1970. Since then, his methods of accurate predictions have been refined further. Essentially it is based on the fact that all locations of major deposits of oil are known, because, it is easier to locate large deposits. Therefore no new discoveries of large oil deposits are likely to occur. Secondly, since the consumption pattern is known it enables one to make fairly accurate predictions. The dates, however, may be advanced due to several factors. For example, consumption has increased dramatically in China and India. The oil-producing countries in West Asia are using more oil to spend their income from rising oil prices. Finally, the wars being waged primarily to gain control over oil resources - like the Iraq war - are not only consuming more oil but are also proving counterproductive.

Peak Oil crisis starts with rise in petroleum prices. For some time the figure of USD 100 per barrel of crude has been considered to be the turning point. On November 21, 2007 oil price hit USD 99. In 2008 it reached USD 147, ushering in an economic crisis; a recession in North America, Europe and Japan. Many believe that in the USA the economic crisis started with the housing crisis in August 2007. This economic crisis, as we know, is leading to a worldwide collapse of the system.

Transport and power are the backbone of an industrial society and a crisis in either or both can lead to a general breakdown. The rise in transport costs increases all commodity prices. Chemical fertilisers and pesticides are petroleum based products. A rise in their

prices may reduce food production leading to increase in food prices. (In fact, some say the world food production has peaked in 2008 and that there will not be any further rise in world food production!) These processes lead to decrease in relative purchasing power, fall in demand, and recession. The Government of India is trying hard to maintain the subsidy on CNG, LPG and kerosene. Without the subsidy, the price of these commodities would be much higher, making them out of reach of many poor and middle class users. One way to overcome shortfall is to issue petroleum bonds. But this only distributes the risk to a wider range of gullible people; managing only to buy time for a short period. Very simply put, there is no solution to this crisis.

The Iraq War

As is well known, the war in Iraq is for control over oil. After Saudi Arabia, Iraq has the second largest reserve of oil. USA, with about 5% of the world's population consumes 25% of the world's production of oil. Its own reserve is only 3% of the world's proven oil reserves. USA imports 65% of the oil it consumes, 13% of which comes from Saudi Arabia, which has 25% of the world's proven reserves.

For USA, the aim of the war was to control the growing power of Saddam Hussein and to have access to Iraq's oil on its own terms, as with Saudi Arabia and Mexico. While the war caused untold miseries and deaths to the Iraqi people, USA did not fully succeed in its war aims. It controlled Iraq's growing power, but the oil production dropped during the war. In fact it is Iran which has benefited from the war. Its arch enemy, Saddam has been eliminated and in his place is the Shia community dominated government, which is on friendly terms with Iran. As other global events have unfolded, USA has in fact become weaker; going downhill steadily since July 2007. Today, USA is extremely vulnerable and is in the grips of a major recession.

Food Production Peaking

A basic essential for mankind is food. The world population has grown threefold in the last 100 years and so has the requirement for food. Food production is increased by increasing the area under cultivation and increasing productivity by utilising irrigation, fertilisers and pesticides.

The increase in land area for food has a finite limit and it has come now. In fact many non food crops are taking up agricultural land. Historically it was sugar, cotton and tobacco; today floriculture, bio-fuels and ethanol production is eating up existing crop areas as well as forests.

Similarly, increase in productivity also has its limits. After some time, typically after about 30 years or so, land degradation and reduced fertility occur. As a result, more and more chemical fertilisers and chemical pesticides are required to maintain productivity. Salinity of land increases. With oil peaking, costs of chemical inputs also start increasing. In the absence of social support structures and subsidies, farming becomes increasingly unviable. In India, this has led to tens of thousands of farmers committing suicide.

All these factors have led to decrease in rate of growth of production; now that production has reached its peak, it will start to decrease. In India, for the last 7 years production of wheat, *dals* and millets have fallen steadily. The per capita availability of food also has been decreasing. The poor having relatively less purchasing power are starving, dying or taking the extreme step of committing suicide. The world food production has in fact fallen this year (2009). Consequently a billion people are presently facing hunger and starvation.

Inter-imperialist Contradiction

With the depletion and scarcity of resources, capitalist powers are in sharp contradictions with one another over resource control. Russia with large natural resources of gas and petrol and military power is able to confront Europe and the USA. China with its huge economic power is able to purchase reserves of non renewable resources (that is gas and petrol) all over the world and also buy the companies that control them. The USA owes so much money to China that China is converting its dollar reserves into market shares of US companies. Some even say that the US economy is integrating into Chinese economy in the same way as the British economy integrated with the US economy after the Second World War.

In the 20th century, this kind of a situation led to the two world wars. Today a war of that nature is too dangerous because of nuclear weaponry. Hence wars are being waged by the USA directly over countries with resources that are not under its control. Still major confrontations cannot be ruled out. The Pugwash clock which symbolically indicates how close we are to a global disaster has been moved up by 2 minutes; that keeps us only 5 minutes away from such a disaster.

The South versus the North

These terms have come to imply the under developed and the developing countries (the South) and the developed countries (the North), because, as it happens, almost all the developed countries, except Australia, lie in the Northern hemisphere. Now in various international bodies, like the UN agencies, WTO, World Bank and IMF, the South is trying to act as a block to reduce the exploitation by the North. Among the most vocal are leaders from Cuba, Venezuela and Malaysia. Some of the Arab countries like Syria, Lebanon and Palestine are also extremely vocal in their condemnation of the USA. Some of these countries are following extremely innovative policies within their countries. Some of which may help them prepare for the crisis of capitalism and reduce their vulnerability. Alongside, they are also trying to increase their share of holdings of the world's non renewable resources, thus deepening the crisis further.

Anti-imperialist Movements

There are several kinds of these movements.

1. Organised political movements: These are mainly Maoist sort of movements. In Nepal they have won a major victory. In India the Maoist/Naxalites are the most significant anti state organised movement. Besides which, in several countries, communist movements exist and they organise trade unions and peasant organisations. Individual communists also work in several other organisations concerning civil liberties, women's movements, tribal and *dalit* movements and so on.

2. Another organised movement is Al Qaeda sort of groups. It has a mass basis as a result of atrocities committed by the US army against the people of West Asia and the desecration of their religious sites. The movement has tremendous mass support and the ability to hit the US in its vulnerable positions. However, many people in the anti imperialist movement disagree with these organisations claiming they do more harm. Even within the Islamic nations, their support to Taliban kind of Islamic fundamentalism is opposed by many people. Historically, these organised groups had support from the US government, so also from the army and intelligence forces in Pakistan. They were a strong force against the Russians in Afghanistan.

3. There are large peoples' movements against major projects of capitalism such as large dams, large coal based power plants, sponge iron plants, nuclear power plants, special economic zones (SEZs) and so on. They comprise of peasants whose land is at stake, environmentalists and naturalists who fear that these projects will damage ecosystems and citizens' groups. They also have the sympathy, support and involvement of radical academia from among the science and humanities streams as also activists from the peoples' science movements.

4. Finally, there are innumerable locally organised small groups all over the world addressing location specific or larger concerns within their limited sphere of operation. The oft quoted rationale has been 'Think Globally Act Locally'. Politically, they range from anarchists of various hues, socialists, civil rights activists, women, black and *dalit* groups so also some religious groups. While their impact on capitalism and the deepening crisis may not be very significant, their role in contributing towards a possible future vision is very critical.

Why does no one Appear to be bothered?

No ruling class in history ever appeared to be aware of their imminent fall. They are akin to drunken drivers down a slope dimly aware that there is danger luring ahead but nevertheless confident that they will carry through this time! However there are variations, particularly, in 'market' circles and among professionals. Markets in the USA have been jittery over the last two years, ever since the housing bubble burst and more so since the financial melt down of September 2008. Professionals in their journals have been giving warnings. But on the whole, the ruling class comes across as confident. The Indian crisis has not yet reached such a serious level, so the Indian ruling classes and the state appear very confident.

What about the left and leaders of the peoples' movements? The parliamentary left,

particularly CPI-M, being in power, is totally committed to capitalism. Their veteran leader, Jyoti Basu, even said on January 5, 2008 that in the near future there is no alternative to capitalism and that socialism is not possible in the near future.

On the other hand, peoples' leaders have been so busy assisting their people in their struggles for sheer survival against oppression and exploitation by the ruling classes and the State that they have little breathing space to take stock. Then, there are many who are aware of the deepening crisis of capitalism, but feel helpless. The sincere among them continue to work with peoples' struggles in various capacities. And finally, there could possibly be a deeper reason. Eric Fromm called it 'Fear of Freedom'. When one has been a slave so long, it is difficult to imagine and plan for a day when you will be free to plan your own life. The phenomenon is evident in retired people; on retirement, in spite of adequate means of survival, they are unable to live on their own. Some get depressed; a few go to the extent of ending their own life.

But this need not be so. There have been dreamers in the past and revolutions too have occurred in the past. After all, we have nothing to lose but our shackles!

Once we are convinced about the imminence of the crisis; its knowledge should enable us to collectively evolve a viable, fossil fuel independent, low energy usage future with equity among human beings and harmony with nature as the norm.

Such a vision should also help in evolving a practical roadmap for an ordered transition. This ordered transition may necessitate violent confrontations with the ruling classes. The programme could provide guidance to peoples' movements, organisations, trade unions, NGOs, volunteer groups and even to individuals. Such a programme will help dispel the helplessness and defeatism; the sense of fighting a losing battle. It will energise people to work towards a sustainable future, if not for ourselves, at least for the future generations. After all we owe them a legacy of responsible behaviour towards the planet.

What about Alternative

Forms of Energy?

Today, many are ready to accept, devoid much understanding, that the era of coal, petrol and gas is coming to an end. Coal, though available in plenty in China, India and many other parts of the world, is becoming unacceptable because of greater CO_2 emissions and global warming. On the other hand, oil and gas are peaking, that is, their production has reached its maximum (peaked) and henceforth will keep on falling. The thought, however, that always follows is: what about alternatives? What about nuclear, hydro, solar, wind, bio-fuel and so on? There is a genuine lack of knowledge and understanding regarding the nature of alternative sources of energy; of what is possible and what is not. An attempt to deal with this aspect of the question reveals that there are no real alternatives to the present level of energy consumption and that the only viable alternative is to reduce energy consumptions. Implied within this argument is that the present power structure will crumble; that the days of capitalism and industrial society are over.

The above argument may not necessitate going back to the Stone Age. Alternative sources of energy would be sufficient to meet reduced energy needs; will still allow for a life of comfort given our evolved sensibilities and improved low energy technologies. Most people today find it difficult to accept this argument because of rationales based on experiential memory.

The first being, many people believe the powerful will always find a way to remain in power; for example, during the Emergency in India - 1977, people felt that the then Prime Minster Ms. Indira Gandhi would continue to stay in power.

The history of the last 10,000 years or so shows that mankind has increased its access to power through systematic ‘exploitation’ of nature through science, technology, social power, exploitation of man by man etc. Hence it is difficult to imagine or believe that the availability of energy at present levels will decrease.

More importantly, people are not ready to accept a drastic change in their lives. It is akin to accepting a personal tragedy; sudden loss of job; death of a child; self admission of compulsive addictions etc. Similarly, having got used to a certain life style or as George Bush said, ‘we are addicted to oil.’ it is difficult to accept that present lifestyles will have to change; that the era of industrialisation is over; and that one will have to live at a much lower level of energy utilisation. Psychologists use the term DABDA - Disbelief and Denial, Anger, Bargaining, Depression and finally Acceptance to describe the process of accepting the unacceptable. Drawing an analogy - today the world is mainly going through “denial”. Some are angry because of loss of job, scaling down from set life styles etc. Those who are secure today are going through a process of “bargaining”. It is they who are asking the question, but what about alternative sources of energy?

Accepting change is relative to previous experiences. People who have never been inside an airplane are ready to accept a world without aviation. People who have never owned a car are happy to have bicycles and public transport. Thousands of poor or rural dwellers have only seen such conveniences from a distance. When told about it, they are more likely to say: ‘Is that so, well, we can survive!’

Energy Generation

To begin with, the production or generation of any form of energy resource from fossil fuel deposits or from other sources requires an initial expenditure of the same - also known as energy investment. To produce, procure or extract any energy resource whether it is pumping oil out of the ground or building and operating a wind turbine it requires expending some amount of energy. Simplistically communicated it means, energy is required to produce, transport, store and use energy. If the energy return is less than the energy used to produce it, then, it is generally not worth the bother! This significant element - hardly ever considered in popular debate - in the generation of energy goes by the acronym EROI – Energy Returned on Investment.

Comparing different Energy Processes

Given in the table are EROI values for various energy production processes. The break even for EROI being 1.0, any figure less than 1.0, infers a net "loss". The value 0.8, for example would mean a net energy loss of 20%. That is, it would take 20% more to acquire, generate or produce a given quantum, than the energy available for use. O*bviously not a good deal!* In practice, an EROI of 1.4 is generally considered minimum acceptable as there are other losses in using that energy. This is so because all real-life processes are irreversible.

The EROI value in the 1940's for oil and gas stands at greater than 100 for discoveries. Meaning, at the wellhead i.e., where the oil/gas springs out of the ground, the energy returned is more than 100 times the energy utilized for its extraction...*a very good deal!*

Table of comparative EROI values. *

PROCESS	EROI
Nonrenewable Resources	
Oil and gas (domestic well head)	
1940's	Discoveries> 100.0
1970's	Production23.0 Discoveries8.0
2000	Production 11.0
Coal (mine mouth)	
1950's	80.0
1970's 2000	30.0 11.0
Oil shale	0.7 to 13.3
Coal liquefaction	0.5 to 8.2
Geopressured gas	1.0 to 5.0
Renewable Resources	
Ethanol (sugarcane)	0.8 to 1.7
Ethanol (corn)	1.3
Ethanol (corn residues)	0.7 to 1.8
Methanol (wood)	2.6
Solar: Flat- plate collector	1.9
Solar: Concentrating collector	1.6

Electricity Production	
Coal: USA Average	9.0
Hydropower	11.2
Nuclear (light–water reactor)	4.0
Solar	
Power satellite	2.0
Power tower	4.2
Photovoltaic	1.7 to 10.0
Geothermal:Liquid dominated	4.0
Geothermal:Hot dry rock	1.9 to 13.0

*****Source**:** Energy and the U.S. Economy: A Biophysical Perspective
Cutler J. Cleveland; Robert Costanza; Charles A. S. Hall; Robert Kaufmann
Science, New Series, Vol. 225, No. 4665 (Aug. 31, 1984), 890-897.
Figures for the year 2000 are from the internet.

On examining the table, a few things become clear. For both coal and oil the EROI decreases as resources deplete. Translated into economics this means a drop in viability

and production. Being a nonrenewable resource, a stage is bound to come when it is no longer economical to extract or mine the two. In case of oil, we are very near it. The stage is also known as 'Peak Oil'. Liquid Gas may take another decade or so to peak. Coal is becoming unacceptable even before peaking occurs because it is the dirtiest of all fuels -causing pollution. It contributes to global warming more than oil or gas. Thus, producing electricity from coal instead of from natural gas causes nearly 70% more carbon dioxide emissions; apart from the consequent pollution and cleansing costs. However, being 10 to 30 times more efficient, no other form of energy is anywhere near as efficient or profitable as coal and oil. Hence, none can replace coal and oil to the present level of consumption.

Generating electricity will reduce EROI further for coal and gas because energy is required to run the power plant. Except hydro electric power, in all other cases the EROI is not very good and therefore their use will be limited.

Other problems with Alternatives

Some other problems with alternatives to oil and gas are:

- That they are generally only of use in the production of heat and electricity and not the multitude of uses that oil in particular is put to from transport to plastics. Of course wind and flowing water has been used for millennia for transport; for pumping; for grinding; for cooling and ice-making; in agriculture as energy. Solar heat has been used for all kinds of drying.
- Each is accompanied by its own form of pollution
- Even with increasing their harnessing to maximum potential, it would be hard to meet present day requirements.

Fuel Source and Pollution Problems

Pollution problems of different fuel sources may be summarised as follows:

Oil: global warming, air pollution by vehicles, acid rain, oil spills, oil rig accidents.
Natural gas: global warming, pipe leakage, methane explosions.
Coal: global warming, environment degradation due to opencast mining, land subsidence due to deep mining, spoil heaps, groundwater pollution, acid rain.
Nuclear power: global warming (despite what they say), radioactivity (routine release, risk of accident, waste disposal), misuse of fissile material by terrorists, spread of nuclear weapons.
Bio-fuels: effect on landscape and biodiversity, groundwater pollution due to fertilisers, use of scarce water resources, competition with food production.
Hydroelectric: displacement of populations, effect on rivers and groundwater, dams (visual intrusion and risk of accident), seismic effects, effects on agriculture downstream.
Wind power: noise, visual intrusion in sensitive landscapes, bird strikes, TV interference.
Solar energy: sequestration of large land areas, use of toxic materials in manufacture of PV cells, visual intrusion in both rural and urban environments.

A closer look at some of the alternatives

Nuclear Power

Of all the alternatives; inspite of being advertised most, the nuclear option is not acceptable at all! The Indian government is hell bent on getting nuclear energy in spite of opposition from all sides of the debate. Here, I would like to introduce a personal experience.

In the nineteen fifties I was in school. At that time, the U.S. government launched the programme, Atoms for Peace. It used Einstein's famous equation between mass and energy, which implied, one could get enormous energy from splitting the atom as demonstrated by the atomic bomb. It also said that energy would be so cheap that it will not be worthwhile billing it. We were all impressed. And I even decided to work for it!

Many years later (1967-68) I actually worked at the Saha Institute of Nuclear Physics, Calcutta. Here I came across the *Bulletin of Atomic Scientists*. Established in 1945 by scientists who felt guilty about having helped to produce the atom bomb, it aimed at the scientific community readership to inform them about the misuse of science. The contributors to the bulletin were several important physicists and other scientists, many of them Nobel Laureates including Einstein. In 1967, I was a fresh graduate in Electronics Engineering and was naturally impressed by these 'Gurus of my Gurus'. The Bulletin made it amply clear that the nuclear energy programme was essentially a civilian front for the weapon programme and that on its own it is not at all a viable energy programme. So I asked myself, what am I doing here? Soon, I left the Institute and vowed I would never allow my knowledge of science and technology to be used against mankind and nature.

Today no one speaks of 'Atoms for Peace' as it has been demonstrated to be a total lie. There have been campaigns against nuclear arms and energy for decades, the most famous being, *Campaign for Nuclear Disarmament* **(**CND) in England. There is also a chapter of CND in India. They have published enormous literature on the subject and established beyond doubt that:

- In spite all the hype about nuclear energy, the total contribution to electricity generation from nuclear energy to the world is only 15 % and to any country's electricity supply it has never exceeded 20% except in France (78%), Belgium (54%), South Korea (39), Switzerland (37%) and Japan (30%). Not even in the U SA where the first nuclear chain reaction was performed! USA went on to make the first atomic bomb and used it on Hiroshima and Nagasaki in Japan.

- Nuclear power stations have a life of 40 years or so, after which, they have to be decommissioned. The nuclear waste and the old plant have to be then protected from causing radiation damage for the next thousands of years. The myth of electricity produced from nuclear power being cheap holds true to the extent of operating costs only. Even then, the EROI is only 4 as compared to oil, coal and hydropower, which are in the range of 10. When the cost of research,

development, construction, decommissioning, storage and disposal of waste are included, nuclear turns out to be the most expensive conventional energy source.

- Many countries that have a nuclear energy programme also have a weapon programme including India and Pakistan. Some have hidden programmes like Israel and Iran. Countries that do not have a weapon programme but have nuclear energy programmes are decommissioning their plants and are not building new ones. Countries that have a good stockpile of weapons, like the USA have not commissioned a new plant for decades. Accidents at Three Miles Island and Chernobyl have also acted as a deterrent.

- France has a weapon programme and a real energy programme, which contributes some 78% to its electricity requirements. The reason is, France has no coal and oil and it is forced to build nuclear power stations with huge subsidies culled from taxpayers' money. Belgium, South Korea, Switzerland and Japan have a similar problem. However, these countries are rich, have trade surpluses and can afford it!

- In all other cases, nuclear power stations have only if ever, been built with huge subsidies. British nuclear power industry has cost tens of billions of pounds over the last 50 years. Decommissioning old nuclear power stations is costing over £70 billion and rising.

- What it implies is; in all the countries that have weapon programme - open, hidden or potential - nuclear power stations have been built as a civilian front for the weapon programme. Nuclear weapons and nuclear power share a common technological basis. Skilled workers and continuing research are beneficial for both industries. The process of enriching uranium to make it into fuel for nuclear power stations can be a step towards further enriching it to make nuclear weapons. Used fuel (spent nuclear fuel) from nuclear power stations can be separated out to recover any usable elements such as uranium and plutonium through a method called reprocessing. Plutonium is a by-product of the nuclear fuel cycle and can also be used to make nuclear weapons.

- India's nuclear programme, including the deal with the US is problematic. It seems that it will give India the energy at enormous costs and may not give the weapons. Unlike Japan, India cannot afford it. The programme essentially bails out the nuclear power plant industry in the US, France, Russia, their Indian collaborators like the BHEL, and helps the building industry. Even then, its prospect of adding to India's power generation is negligible because the plants have a gestation of 15 years and they end up only replacing old plants which will then be ready for decommissioning!

Biofuels

Bio-fuel is made by converting biomass into a fuel. It is used for running machinery and motor vehicles; and is the only alternative fuel that can almost directly replace oil and gas. The diesel engine after all, was originally designed to run on a variety of fuels and it can be operated using bio-fuels with little or no adjustment.

Bio-diesel is a chemically altered vegetable oil while ethanol - another common fuel - is a fuel-grade form of alcohol produced by grain fermentation and as a profitable byproduct of the sugar industry. However, bio-fuels come with their own set of deterrents; especially where farming is carried out specifically for the purpose.

- Bio-fuels are not cheap. The EROI is less than 2 and can even be less than 1 in which case it is not even worth producing. Growing maize [used to create ethanol in the USA] appears to consume 30% more energy than the end product; leaving eroded soils and polluted waters behind.

- With limited land available it may be prudent to use it for farming or forestry. The grain required to fill the petrol tank of a Range Rover with ethanol is sufficient to feed one person for a year. Assuming the petrol tank is refilled every two weeks, the amount of grain required could keep a few families well fed for a year.

- The irresponsible growing of bio-crops can do tremendous harm. The rise in the production of palm oil for bio-diesel could turn out to be catastrophic; threatening to put more carbon dioxide into the atmosphere than it could save. This is because countries like Malaysia are cutting down vast tracts of rainforests to grow the crop; not only endangering the flora and fauna, but also releasing vast amounts of carbon dioxide trapped within trees.

In light of the above, bio-diesel should not be looked upon as a replacement for oil, but at most, as a temporary measure for a tide over to a more sustainable future. Ultimately we need to travel far less than we presently do if we are to exorcise the twin demons of climate change and peak oil.

Hydroelectricity

Flowing water has been used to generate electricity since the 1880s and has been used to create mechanical power for centuries before that. It is the most advanced, efficient and important renewable source at the moment contributing to about 19% of the world's electricity supply. It has a potential of nearly five times that figure - including areas in Asia and Africa. Although expensive to construct, it is very cheap to maintain, store and release quickly on demand - a quality few other energy sources have. The largest power station today is the Itaipu plant between Brazil and Paraguay, with a capacity of 12 GW-

ten times that of a coal or nuclear station.

It is however not all-good news.

- The damming of rivers can create many serious environmental problems and destroy valuable farmland, which is often found in valleys. Existing inhabitants are often forced to move and the collapse of a dam or even release of water during heavy monsoon can prove catastrophic for those living downstream.

- Dams too have a finite life; their performance begins to downslide in about 30 years caused by silting of the reservoir. This raises the reservoir bed, increases its area and inundates more fertile land. Rise in the bed level also reduces its capacity to hold water. Water may then have to be released during the monsoons, causing heavy floods downstream. Hence, instead of controlling floods, it may become the cause of more floods! Indian scientists in the 1950s cautioned about this possibility when the first dams under Damodar Valley Corporation (DVC) were proposed.

- Today, many studies are available which prove that the harm done by dams far exceed its benefits. The actual performances of most dams are far below their designed capacities.

- Thus, while India is supposed to have huge potential for hydro electricity, there is widespread opposition to it. The Narmada Bachao Andolan (Save Narmada Movement) is one such resistance. While a large number of dams are proposed in the North East and in Uttarakhand, in the face of opposition and the economic crisis, it is unlikely any of these dams will ever be built.

Wind Power

Wind power has seen the largest growth as an energy source in recent years. There are many advantages to wind power. Most countries have large areas where wind blows fairly reliably and stronger winds can usually be harnessed by simply building higher. They do not take up much space as the land beneath the turbines can be used for farming or storage. The fuel for the turbine is free and the environmental ill effects limited when placed in areas of low bird movement.

With a typical modern wind turbine, electricity would begin to be generated at a starting wind speed of maybe 3.5 m/s and the power output would increase with wind speed until it reaches a maximum of say 225 kW at 13 m/s. Any further increase in the wind speeds beyond that would not produce any greater output. Finally, there would be a maximum speed, where after, the turbine would need to be protected to stop it from spinning at dangerously high speeds. This might be at about 25 m/s., these high speeds are rarely reached.

However, with maximum EROI of only 2, wind power is neither cheap nor efficient.

Also space required for generating power from wind is very high. It has limited use in specific areas and its contribution to the total energy resource will be less than 10%. In India while the installed capacity of wind power has already exceeded nuclear power, the actual output appears to be much below design capacity.

Solar Energy

Solar energy is the acquisition of heat or power directly from the rays of the Sun, unlike biomass and ground source heating which use the Sun indirectly. (In the long term, this indirect harvesting of the Sun is the most sustainable form). The amount of sunlight falling on any area of ground obviously depends on its location and the time of year. As the Sun does not shine at all at night in India and is much weaker in the winter when demand is higher, massive batteries would be needed for storage. Again space required for solar power generation is very high. Nevertheless, solar can contribute significantly to reducing energy needs and should not be overlooked.

There are two ways of using solar energy: solar heating and photovoltaic (PV).

Solar Heating

The simplest and practical use of solar power is the solar box cooker. With cooking gas supply decreasing there will be tremendous pressure on the already delicate state of firewood supply. Solar cookers can supply at least half the energy required for cooking. Another similar application is solar driers. They can be used for drying a large variety of household necessities. Larger ones can be used for drying wood.

Solar water heaters are another popular use of solar heating. This usually involves piping water through insulated boxes, which have glass covers and the insides painted black. These act like 'mini-greenhouses'; heating water as it is pumped through the box (known as a 'collector'). This water is then used either directly or transfers its heat to the domestic supply. The heat generated is not likely to do away with the need to use other fuels to heat water, especially as there would be no solar input during the night and part of the daytime. Nevertheless, it could be used to pre-heat domestic water to a temperature of 35ºC or so, thereby reducing overall domestic fuel bills.

On a larger scale, it is possible to use this principle to create a solar power station. This would involve positioning hundreds of mirrors to reflect their radiation onto a boiler at the top of a tower. The liquid in here is heated enough to generate steam and turn turbines to generate electricity. Another option is to create a tall hollow tower in the centre of a vast greenhouse. As the sun warms the air, it rises and turns turbines.

These large-scale power stations are still a rarity as they suffer from the same problems of no Sun at the night and little sun in the winter. However, in sunnier climates like India, Australia or California, they are likely to be more useful.

Photovoltaic (PV)

Photovoltaic known to everybody from solar cells in calculators turns the light of the Sun directly into electricity rather than via heat. However, a calculator uses very little power. Generating enough electricity to make a significant contribution towards illuminating a house or office is another matter altogether.

Initial solar cells were only 4.5% efficient. They grew to about 15% in the 1960s and are about 20% efficient now. A square meter on a sunny day would keep a 100-watt light bulb going. At the moment, PV electricity is one of the most expensive of the renewables. Research on PV is long drawn; solar cells require pure Silicon which is expensive to produce. Land requirement for the power plants is large. No doubt it will become cheaper as production increases and new cells are developed. It remains to be seen how significant the contribution of this energy source will be.

On the whole, passive use of solar energy (solar cookers, driers and solar water heaters) will certainly grow, whereas generation of electricity will be limited. One reason being, the former is a low technology product and can be manufactured locally. EROI for solar power generation is also below 2 and demands superior technology.

Other Sources

It is not possible to discus all the sources of alternatives. In general one can say three things about them.

1. There may be some which have real potential. For them to become viable takes about two decades. There are none such that are ready or in the pipe line.
2. Some fall more into the science fiction category. That is, a competent group of scientists can show that such sources are unviable.
3. Some are pure bluffs or lies. These are used by ‘fly by night operators’ to fool the public with the connivance of government officials to raise money, and then walk away with the money by declaring that it was not a viable project.

The case of hydrogen fuel cells illustrates this very well. A fuel cell combines hydrogen and oxygen and produces electricity and water. For the last few decades this emission-free hydrogen fuel cell was held to be the solution. And yet today the verdict is ‘Neither government policy nor business investment should be based on the belief that hydrogen cars will have meaningful commercial success in the near or medium-term.’ And, ‘fuel cells provide a multi-decade lesson in high-tech humility’. The problem that never got solved was to evolve a pollution free source for hydrogen itself. Most hydrogen today is obtained from fossil fuels. And yet, there are many companies in the world that are surviving on government subsidies through false promises.

We began by saying that, ‘we are used to a certain life style’ or as George Bush said, ‘we are addicted to oil’. It is difficult to accept that all this will change; that the era of industrialisation is over, and that, we will have to live at a much lower level of energy.’ However, if we remove the irrational use of energy then it is entirely possible to continue to have modern sensibilities and even ‘comforts’ with alternative forms of energy along with a judicious mix of fossil fuels in small quantities.

The main purpose of this essay is to prepare a basis to accept the inevitability of the change. Once we accept this; it may be possible to plan a transition that will be smooth and may even be exhilarating - as we have seen in Cuba.

For a smoother transition, one basic rule is that the transition be incremental. As a general policy we can

1. Say ‘No’ to every new coal, gas and nuclear energy project.
2. Reduce energy consumption through energy auditing.
3. Reduce waste due to ‘Transmission and Distribution’ losses.
4. Develop the alternatives – solar, wind, wood gassifiers, micro hydel etc. to their full capacity. Concentrate on low power local projects.
5. Reduce consumption of petroleum by using more public transport and reducing personal automobile transport vehicles.
6. Reduce use of fossil fuel (LPG) in cooking by using solar cookers, bio gas and even wood fuel.
7. Change over to organic farming to reduce use of chemical fertilizers and pesticides.
8. On the whole move towards using much less net energy in a more equitable fashion.

Given the present social system, the rich and powerful have a greater resistance to change and they will continue to carry on the irrational social, political and economic system. The reality however is that, technological fixes alone do not solve problems. The solution will have to be holistic and will be carried out by the victims of the present system, that is, the working people. Only the organised working people with a rational plan can bring about such a transition. For this, peoples’ struggles against inequity and injustice will have to continue and at the same time an implementable plan for a rational fossil fuel free society will have to be executed. The incremental changes mentioned previously can only be carried out in the context of such struggles and plans.

WHERE DO WE WANT TO GO?

What will be the alternative vision for a post industrial/capitalist society? The dominant alternative in the 20th century was Marxism. Today it probably will be a synthesis of Marxist and Anarchist visions enriched by ecological, feminist, regional, ethnic and host of contemporary people's movement. The technological basis for such a society will be based on mainly harvesting the Sun's energy biologically. To day Cuba provides a living example of the transition to such a society.

THE VISION FOR A FOSSIL

FUEL FREE SOCIETY

Critics of Capitalism

The events of the past have shown that capitalism, as a system, is the main cause of the present crisis of global warming and other related crises. It is also empirically evident that within capitalism no alternatives will work.

If the burning of fossil fuels causes global warming, then the alternative must be a fossil fuel free society. How does one go about it? As Albert Einstein once said, “You cannot solve a problem with the same mindset that caused it”.

The mindset that caused global warming is capitalism or more generally industrialism. This mindset is a product of the Industrial Revolution, which among other things, believed in conquest of nature. So any solution offered within this system will fail. Hence there cannot be a solution within the capitalist system.

From the very beginning there have been critics of capitalism, both within the Industrial Revolution mindset as well as outside of it. Among the former the most important of course is the Marxist tradition. Although both Marx and Engels had many deep insights into the ecological damage done by capitalism, they were not opposed to industrialism and ‘progress’ as such. While their view may not help us for an alternative vision, their view on who will carry out the change, namely the proletariat, cannot be rejected. It is the victims who have a maximum stake in change and therefore the victims of global warming, the poor and oppressed of the world, through their organisations like trade unions, peasant associations and a wide variety of people’s organisations will play a crucial role in bringing about a transformation.

The Visionaries

For the vision for a fossil fuel free society, we may need to look at other traditions. These visionaries were not some wooly headed people living in a dream world, moving around with long beards and living an undisciplined life without care. They were highly reputed professionals, well established in the mainstream and through their practice found a critique of their fields and established new and alternative disciplines. Their vision does not actually use the words ‘fossil fuel free society’. This is a wider vision of an alternative society, which among other things, will be based on low energy consumption.

Such a tradition would include Thoreau (Walden), Tolstoy (The Kingdom of God is Within You) Kropotkin (Fields, Factories and Workshops), Gandhi (Hind Swaraj), Albert Howard (An Agricultural Testament), Masanobu Fukuoka (One Straw Revolution),

Schumacher (Small is Beautiful) and Patrick Geddes (Patrick Geddes in India). Their books mentioned in brackets are extremely important path breaking works. A brief description of these books and authors is provided in the appendix.

Mainstream critics call this tradition as ‘romantic’ and in fact, Tolstoy did say, ’How can there be romance with electricity?’ But probably, a more accurate description of this tradition is ‘Pacifist Anarchism’, though probably except Kropotkin none of them called themselves “anarchist”; but then, Kropotkin was not a pacifist! Anarchism has a large number of different variations and it is difficult to define it. However in general:

1. They are anti state. ‘The State has never been good to poor and never will be”. At best they would consent to having a minimal small state wielding low political power.
2. They believed in freedom, co-operation and mutual aid rather than competition. Their motto: a free association of free people. They believed in small communities federated with other similar communities.
3. As a rule they believed in ‘Respect for Nature’ and not in ‘Conquest of Nature’. Their approach was deeply ecological.

Thoreau, Kropotkin and Tolstoy laid the foundation of a powerful critic of capitalist and industrial society and were the principal visionaries for an alternative anarchist society. Each represented a different perspective. Thoreau emphasized the importance of self-reliance, solitude, contemplation and closeness to nature in transcending the crass existence that is supposedly the lot of most humans. Kropotkin's emphasis was on local organisation, local production, obviating the need for central government. Kropotkin's emphasis is also on agriculture and rural life. Tolstoy speaks of the principle of non-resistance when confronted by violence and advocates non-violence as a solution to nationalist woes.

However it was Gandhi who translated many of these concepts into action first in South Africa and later in India. His influence spread far and wide. Martin Luther King and Nelson Mandela are some of the important examples of his reach beyond Indian shores. Gandhi was well aware of the writings of Thoreau, Kropotkin and Tolstoy and even corresponded with Tolstoy. He blended his own unique vision in the booklet Hind Swaraj. Swaraj is a kind of Individualist Anarchism. It warrants a Stateless society, as according to Gandhi the overall impact of the State on the people is harmful. He called the State a "soulless machine" which, ultimately, does the greatest harm to mankind. "It is Swaraj when we learn to rule ourselves." The booklet is a severe condemnation of ‘modern civilisation’. He was equally critical of modern technology and its ‘craze for labour saving machinery’- the impetus behind which is not philanthropy to save labour but greed. He advocated self-sufficient villages based on rural industry. He had an integral and holistic view of agriculture, animal power, industry, education and health care. Today the problems arising from industrialisation and its reliance on fossil fuels have shown his ideas to be far sighted and possibly appropriate for the post fossil fuel age.

Around the same time, there were others who were also expounding similar ideas in

specific fields both in theory and practice. In agriculture, it was Sir Albert Howard, the father of organic farming movement, Masanobu Fukuoka of 'Natural Farming' fame and Patrick Geddes in town planning. E. F. Schumacher gave a critique of economics and Gross National Product (GNP) and developed concepts of human level small and appropriate technologies.

The Vision

If we take all these authors collectively, their work and ideas offer a powerful critique of industrialism and capitalism and provide an alternate vision. Kropotkin, Gandhi, Howard and Fukuoka also offer a very concrete way of how to go about things. One common thread that runs through all of them is a strong ethical attitude. Kropotkin was called 'An atheist saint'. Gandhi is famous for his, 'The earth can provide for everybody's needs but not for their greed' and so on. Needless to say, they had countless followers both among working people as well as professionals, social scientists and artists.

So why did they not succeed or why did capitalism triumph in spite of them? A short answer is: they were ahead of their times. The material basis of capitalism i.e. concentrated source of energy resource like coal and oil appeared inexhaustible. The trade union movement was able to wrest some benefits for itself in the midst of this phase. Today several crises of capitalism have come together and are feeding into each other. These are global warming, peak oil, food production peaking, inter-imperialist contradictions escalating, and the anti-imperialists struggles - both at organised level as well as large small scale movements all over the world. The era of industrialism is coming to an end.

The collapse of the capitalist system does not automatically bring a new society. For example in Myanmar (formerly Burma) Burma Shell took its last drop of oil more than sixty years ago leaving an empty 'Shell' behind. But even today, Burma is in wilderness. Nearer home, capital flew from West Bengal in the 60s and 70s. The Left Front instead of following Cuba's example, which it admires, is bent on bringing capitalism back at any cost!

Today we face three tasks. First, is to articulate clearly the vision for a fossil fuel free society in its entirety. Then engage with workers unions and other mass organisations to evolve a concrete programme. Unless the ideas are gripped by the masses, they will not, as Mao has said, become a material force. The programme should give a concrete activity at the organised level as well as an ethical base for an individual and a small group to live and act. Thirdly we have to continue the struggle against damages capitalism continues cause, such as big dams, thermal power plants, new mining leases for coal and iron, SEZs and so on. These struggles will be empowered by a positive vision of the future.

What would a Fossil Fuel Free Society look like?

It is neither possible nor desirable to synthesize the views of these great people mentioned above. It is best that we read them in their own words and absorb what we

need. Let there be diversity. However they do provide a basis for a few principles and help us to visualize what the future society may look like.

It is of course difficult to predict the future. We can only have dreams and visions about it. One way to begin is by addressing the question: what would we like it to be? And then take the discussion towards what its implications would be for today's society. A few non negotiable guide lines to build on could be:

1. Human beings are a part of nature; they have to live with it and not off it.
2. Within human societies there should be equity.
3. Resist the scheme of centralised political power being in the hands of a few; particularly that of the state and government. At best, a minimal small state.
4. Small self-managed societies based on the principle of 'a free association of free people'.
5. The technological base of such a society will be to move towards ecologically sound processes like organic farming, humane use of domesticated animals in farming practices, leather and wood as main raw materials etc. - not at all implying the complete abandon of modern sensibilities, scientific and technological advances.
6. The main agenda for humanity for the next thirty years or so will be to restore the earth's ecological health that has been so severely damaged by capitalistic approaches.
7. A holistic approach to health, education, culture and sciences. They should be integrated with the main agenda of the society while maintaining a creative diversity of approaches.

Possible Reorientations

1. Administratively manageable regional reorientation on the basis of ecological/bio-geographic, cultural and linguistic (dialect) considerations such as Telengana, Vidarbha, Malwa, Bundelkhand, Awadh, Bhojpur etc. As an exercise, one can list nearly 100 such regions within the Indian subcontinent.

2. The above could be federated regionally, again, as large bio-geographic regions such as the Deccan, Western Ghats, Gangetic Plains, North-East India etc. These may be further federated within even larger landmasses such as South Asia. There are already precedents in this direction - the SARCC countries, European Union etc. - with cooperative and collaborative endeavours; even though ecological concerns and sustainability may not have been their common starting point.

3. While there will be rural and urban centers, there will be continuity. Rural regions will have urban facilities and urban areas will not be just concrete jungles. It will be something like parts of present day Kerala.

4. Urban Centres: Each of these administratively independent entities would have a few large and small urban centers with a population of 10,000 to 5 lakhs. They will have institutions for academic pursuits, research, sophisticated health services, art and cultural centers, infrastructure facility for small industrial enterprises related to food processing,

housing, clothing, building material etc. Much of the industrial activity would be related to recycling and maintenance. One of the main activities would be segregating waste at source and recycling of urban solid waste. The bulk of which, being biodegradable would be made into compost to feed into urban vegetable and fruit growing farms and gardens. Thus the cities would be ‘garden cities’ producing their own vegetables and fruits. Many modern aspects of life will remain, such as phones and internet, operating on efficient use of energy from renewable sources.

5. Bulk of the community would comprise of self-sufficient natural/organic farmers, artisans and skilled personnel providing ancillary services to a farm based economy. Industry and services would be in the areas of health care, education, food processing, animal husbandry, leather work, carpentry, smithy, metal crafts, textiles, tailoring, hair dressing, sports, entertainment the arts etc. School, library and cultural centers would be a facility for all children and adults. They will be geared to the immediate agenda of restoring ecological stability.

6. There would be a major worldwide conservation project to save the flora and fauna that has been on the verge of extinction. This would be done principally through restoration of habitat by releasing more land to forests.

Changes that may occur

Many things that we take today as given may not be there in a fossil fuel free society. Demands have been made in the past and the present by individuals and mass movements for such a change. Taken together, it may be difficult to accept them all; also, there is always a quantum of resistance to change.

1. To begin with, one can see movements, negotiations, campaigns, agitations, demands etc. for smaller less powerful states. On the other hand are continued instances of resistance and opposition to mega states with powerful armies, weaponry, capitalistic economies etc. By implication, there is an opposition to armament industry and weapons of nuclear warfare.

2. Likewise, with fossil fuels depleting, the automobile industry would have to scale down, for, there is really no effective solution for automobiles. Instead, public transport such as buses, trams and railways would gain practical significance. This would be coupled with bicycles, cycle rickshaws, horse and donkey carts etc. One great benefit would be that, air pollution will reduce drastically.

3. Hopefully, alcoholism, use of narcotics and tobacco would become negligible since part of the reason for large-scale addiction is alienation in a capitalist society.

4. With better and healthier food, cleaner environment and a less stressful life; the need for health care services - which is the second largest industry today - would reduce drastically.

5. As a combined effect of farming with organic methods and reduced availability of petrochemicals, the chemical fertiliser and pesticide industry would diminish significantly. Bio-fertilisers and bio-pest controllers will become more popular. On the whole less of even these would be required.

6. Commercial agriculture would be reduced and more land will be released for forestry and community common use. Cotton would be the main non-food crop and sugarcane cultivation will decrease.

7. Petrochemical industry as a whole will be reduced considerably and we will be rid of the menace of plastic bags all across the urban landscape.

8. The need for power industry would reduce as armament and large governments consume a lot of irrational power. The reduced power need could be met with largely by decentralised power sources such as solar, wind and mini-hydel projects. They could, however be coupled with a small mix of coal and oil energy. Large mega power projects, which are dangerous to ecosystem and are very heavily polluting would gradually vanish.

9. The demand for iron and steel industry would also come down. A lot of recycling of existing but no longer useful iron and steel equipment and machinery will become important.

10. The demand for minerals would also decrease. No major new mining projects would come and some of the existing mines would be exhausted and close down. Mining water through deep tube wells would come down drastically. Water conservation and rain water harvesting will become important.

10. Higher education and research would be aimed at restoring ecological balances. Thus there would be extensive good research in soil fertility, bio pest controllers, forestry, river systems, ecology, air streams etc. Research and development of alternative renewable sources of energy and low energy nano technology would also play a very crucial role. Fundamental research in sciences as well as in humanities would facilitate in the development of these concepts.

Resistance to change

Normally resistance to change among ordinary people diminishes with time, non-availability and with new generation. However this does not happen with people in power. They oppose it with power. What it means is that powerful classes and nations will continue in their old ways. The scramble for depleting resources of oil and minerals will continue to lead to small and big wars. It can also lead to a world war kind of situation, which, this time around, with nuclear, chemical and biological weapons can destroy almost all living beings. So we cannot slacken in our existing movements of antiwar, antinuclear weapons and energy, opposition to mega dams and polluting power and other industries. Nor should we forget the daily struggle of billions of people just to survive. During the transition period these struggles will be even more painful. We will

face job losses, malnutrition, hunger, illnesses, suicides and so on. What we need to do is to strengthen all these struggles and mass organisations like worker unions, peasant associations and other civil society organisations and engage with them on the themes of a fossil fuel free society.

This is one individual's, that is, my dream. I invite you to join me both in working towards the dismantling of capitalism as well as to dream on your own.

Appendix

THE VISIONARIES

Walden by *Henry David Thoreau (1817-1862)* published in 1854, emphasizes the importance of self-reliance, solitude, contemplation, and closeness to nature in transcending the crass existence that is supposedly the lot of most humans. *Walden* is neither a novel nor a true autobiography, but a social critique of the Western World, with each chapter heralding some aspect of humanity that needed to be either renounced or praised.

Fields, Factories and Workshops is a landmark anarchist text by *Peter Kropotkin (1842-1921),* and arguably one of the most influential and positive statements of the anarchist political position. His inspiration has permeated into the 20th and 21st centuries as a lasting vision of a more harmonious way of living for a new world. To a large degree Kropotkin's emphasis is on local organisation, local production obviating the need for centralised governments. Kropotkin's vision is also on agriculture and rural life, making it a contrasting perspective to the largely industrial thinking of communists and socialists. His focus on local production leads to his view that a country should manufacture its own goods and grow its own food, making import and export unnecessary. To these ends he advocated irrigation for boosting local food production ability. Critics say he is rather optimistic in his works, however the problems arising from industrialisation and its reliance on fossil fuels has shown his ideas to be far sighted and possibly appropriate for the post fossil fuel age.

The Kingdom of God is Within You, the non-fiction magnum opus of *Leo Tolstoy (1828-1910),* is the culmination of thirty years of Tolstoy's Christian thinking. It lays out a roadmap for a new organisation of society based on literal Christian interpretations. Tolstoy takes the viewpoint on "Thou shalt not murder" literally and therefore that all governments who wage war are directly affronting the Christian principles that should guide all life. In the book Tolstoy speaks of the principle of non-resistance when confronted by violence, as taught by Jesus. He advocates non-violence as a solution to nationalist woes and as a means for seeing the hypocrisy of the church. These words had profound influence on Mahatma Gandhi. He wrote in his autobiography *The Story of My Experiments with Truth,* that this book "overwhelmed" him and "left an abiding impression". Gandhi listed Tolstoy's book, as one of the most important modern influences in his life.

For Indians, *Gandhi (1869-1948)* and his booklet *Hind Swaraj* immediately come to mind. It is a manifesto, which is, at once a critique of ‘English civilisation’ (industrial society) and a programme for rebuilding India. The booklet is a severe condemnation of ‘modern civilisation’. He was equally critical of modern technology and its ‘craze for labour saving machinery’, the impetus behind which is not the philanthropy to save labour but greed. He advocated self-sufficient villages based on rural industry. He had an integral and holistic view of agriculture, animal power, industry, education and health care. Today the problems arising from industrialisation and its reliance on fossil fuels

have shown his ideas to be far sighted and possibly appropriate for the post-fossil fuel age.

Swaraj is a kind of Individualist Anarchism. It advocates a stateless society, as according to Gandhi the overall impact of the state on the people is harmful. He called the state a "soulless machine" which, ultimately, does the greatest harm to mankind. Adopting Swaraj means implementing a system whereby state machinery is virtually non existent and the real power directly resides in the hands of people. Gandhi said, 'Power resides in the people, they can use it at any time.' This philosophy rests inside an individual who has to learn to be master of his own self and spreads upwards to the level of his community which must be dependent only on itself. 'It is Swaraj when we learn to rule ourselves.'

Gandhi was undaunted by the task of implementing such a utopian vision in India. He believed that by transforming enough individuals and communities, society at large would change. He said, 'It may be taunted with the retort that this is all Utopian and, therefore not worth a single thought... Let India live for the true picture, though never realisable in its completeness. We must have a proper picture of what we want before we can have something approaching it.'

An Agricultural Testament by *Sir Albert Howard (1873-1947)*, first published in 1940, is credited by some with launching the organic farming agricultural movement. It focuses on the nature and management of soil fertility, and notably, explores composting. At a time when modern, chemical-based industrialised agriculture was just beginning to radically alter food production, it advocated natural processes rather than man-made inputs as the superior approach to farming. In 1924, he set up the Indore Institute of Plant Industry at Indore in central India. Here he developed the concepts of Nature's Farming. He argued that since natural ecosystems are stable over long periods of time, in farming too, we should imitate as far as possible the local natural ecosystem. He observed four principles in nature: 1. Mixed cropping is the rule; 2. The soil is always protected from the direct action of sun, rain and wind; 3. The forest manures itself; 4. Crops and livestock look after themselves. Gandhi was aware of his work and visited him in Indore. He rewrote his pamphlet on composting and published it in the *Harijan.* One of Gandhi's co-workers, Mira Ben, devoted her life to popularising composting methods in remote Indian villages based on Howard's work.

Masanobu Fukuoka, (1913-2008), author of *The One-Straw Revolution*, *The Road Back to Nature* and *The Natural Way Of Farming*, is one of the pioneers of no-till grain cultivation. Fukuoka practised a system of farming he refers to as 'natural farming'. Although some of his practices are specific to Japan, the governing philosophy of his method has successfully been applied around the world. In India, natural farming is often referred to as 'Rishi Kheti'. The essence of Fukuoka's method is to reproduce natural conditions as closely as possible. "Natural farming is not just for growing crops, it is for the cultivation and perfection of human beings."

Small Is Beautiful by *E. F. Schumacher (1911-1977),* originally published in 1973 is a collection of essays that brought Schumacher's ideas to a wider audience, at a critical time in history. Schumacher's work coincided with the growth of ecological concerns and with the birth of environmentalism and he became a hero to many in the environmental movement. In the first chapter - The Problem of Production, Schumacher points out that our economy is unsustainable. The natural resources (especially fossil fuels), are treated as expendable incomes, when in fact they should be treated as capital, since they are not renewable and thus subject to eventual depletion. He further points out that, similarly, the capacity of nature to resist pollution is limited as well. Schumacher's philosophy is a philosophy of enoughness, appreciating both human needs and limitations, and appropriate use of technology. It grew out of his study of village-based economics, which he later termed 'Buddhist Economics.' He faults conventional economic thinking for failing to consider the most appropriate scale for an activity, blasts notions that 'growth is good', and that 'bigger is better', and questions the appropriateness of using mass production in developing countries; promoting instead, 'production by the masses'. Schumacher was one of the first economists to question the appropriateness of using Gross National Product (GNP) to measure human well being, emphasising that 'the aim ought to be to obtain the maximum amount of well being with the minimum amount of consumption.'

Patrick Geddes in India is a collection of excerpts of writings of *Patrick Geddes (1854-1932)* while he was in India. He was a Scottish town planner and was in India between 1915 and 1919. In Geddes's words "Town-planning is not mere town planning, not even work planning. If it is to be successful, it must be, folk planning. Geddes advocates tree planting – especially fruit yielding trees and vegetable gardens as integral to town planning. 'I insist that an enormous proportion of the diseases of children and of men and women-would disappear if there were a substantial increase of fresh vegetables and fruits in their diet. Further, everyone knows that the most destructive of the diseases of India are diseases of the alimentary canal and that these diseases are communicated in two ways, by dust and by polluted water. These planting proposals would greatly diminish both the dispersal of dust and the pollution of water.'

There are three central themes in Geddes work. First is 'Respect for Nature'. His approach is deeply ecological emphasising a city's relationship to its water resources, the promotion of parks and trees, the importance of recycling, and the lessening of dependence on the resources of the hinterland. The second theme is 'Respect for Democracy'. He insisted that the residents of a city must help design plans made for them. The third theme is 'Respect for tradition, 'appreciation of all that is best in the old domestic architecture of Indian cities and of renewing it when it has fallen away'.

NEGATIVE ENTROPY AND SUSTAINABILITY

technology choice for a fossil fuel free society

The most fundamental technological basis of a fossil fuel free society is harvesting the Sun's energy biologically. The theoretical issues of entropy and negative entropy are presented here. Only the example of agriculture will be taken up, though other areas such as energy, housing, transport etc. are equally important.

It is not as if in a fossil fuel free society other sources of energy will not be used at all. Harnessing direct heat from the Sun itself is a different process, that is, it is not harvested biologically. Use of hydropower in the form of water mills or use of gravity in directing water flows is another example. Even metals and fossil fuels may be in use in a limited way.

When people talk of fossil fuel free society or sustainability, often terms like eco-friendly technologies, appropriate technologies using human and animal power and so on are used. Critics often infer to this as talking of going back to nature, being primitive, unscientific and as impossibility. This article attempts to provide logic for eco-friendly, appropriate technologies using human and animal power.

Entropy

In many processes in modern technology, for example, in the conversion of energy from one form to another, the net availability of energy decreases. This decrease of available energy is called entropy. 'Entropy is a measure of that part of the thermal energy of a closed system that is not available for conversion into mechanical work. The law of entropy is known as the second law of thermodynamics. The second law holds that the entropy of the Universe invariably increases with every transfer of energy event. There is always some amount of energy that is transformed into an unusable or unavailable form of energy.' It is on this principle that engines work. All such processes have efficiencies less than one. That is, the net output energy is always less than input. As a rule entropy, that is, the unusable or unavailable form of energy is increasing. We are moving from organization to disorganization or from order to disorder. The entropy of a closed system tends to get higher as time progresses because disorganization increases. The law of entropy is considered to be a basic law of nature and the Universe.

Negative Entropy

However, living things appear to behave in a different manner. All living things attempt to modify their environment for their own needs, by creating what for them is order. In 1943, Erwin Schrödinger, Nobel Laureate in Physics, used the concept of 'negative entropy' in his book 'What is life?'

This book was written for the layman. Today it ranks among the most influential books of scientific writing of twentieth century. It was one of the spurs to the birth of molecular biology and the subsequent discovery of the structure of DNA. It attracted many scientists to biology.

The creation of order is one definition of negative entropy. One of the definitions of life might be the ability of life form to create order. A living system imports negative entropy and stores it. Life feeds on negative entropy! Rocks or other inanimate objects do not possess this property called negative entropy. Death might be defined as the inability of a living thing to continue to create negative entropy for its use. As long as a life form exists, it creates negative entropy, which we observe as the creation of order.

What is the source of negative entropy? The Sun's energy is highly organized and carried by photons. Our Biosphere absorbs this energy and then releases it back to the Universe -the global balance of energy is zero. The black body radiation of the Sun at a temperature of 5800 degrees Kelvin is absorbed by the Biosphere and the black body radiation from the Biosphere and Earth at 280 degrees Kelvin flows to the Universe, which is at a temperature of 3 degrees Kelvin.

How does life steal energy from the Sun? This is done through a process called photosynthesis. In this process the green matter (chlorophyll) in plants converts the Sun's energy to usable energy for the plant growth. Herbivores and carnivores sustain and reproduce themselves by using the Sun's energy through plants. This process is not available to non-living things.

Thus, biological processes creating negative entropy, unlike the mechanical processes, produce more energy than they take. The efficiency is always greater than one. Typically it is about 2.5 (this does not violate the law of conservation of energy - the rest comes from the Sun). That is for one unit of energy (calories) input, say in a 'primitive' sustainable farm in the form of human and animal energy; we get two calories of consumable energy output! How do we get this more output from less input? As we said above, we are not counting the input from the Sun – either for mechanized or traditional agriculture.

Compare this with American 'agribusiness', which in 1976 took 5 calories of fertilizers, tractor fuel and depreciation, human labour and chemical sprays to produce one calorie of food and an incredible extra 20 calories of energy – all from fossil fuels - to clean, package, transport and cook the food ready for eating in the city. Thus the primitive self-

sufficient peasant life is about 50 times more efficient than industrialised food production. The reason being, primitive agriculture uses mainly biological or life processes which have normally efficiencies greater than one whereas industrial processes mainly use non-biological input and processes. (‘The Road to Alto', by Robin Jenkins, Pluto Press, 1979).

Cuban Example

In Cuba, organic farming has been carried out on a large scale. The science of agro-ecology has been highly developed and many scientists in Cuba are turning to this field because this appears to be very important for the future of our Planet. Below is an example of such a research which is relevant to this discussion.

(BOX)

Integrated agro-ecological systems as a way forward for Cuban agriculture

A three-year experiment was carried out to study different agro-ecological livestock- crop systems under different soils and climates, without irrigation and using on-farm resources for animal and plant nutrition. Five farms, four in the process of conversion and the fifth with twelve years of establishment were studied. Eight sustainability indicators (reforestation, total species, food products, labour intensity, production of organic fertilisers, yields, energy efficiency and milk production) were defined. These relate to the main productive and environmental problems faced by the livestock sector due to the specialised agricultural model that has prevailed in Cuba over the last few years. These indicators were measured, represented on a radial graph and evaluated through an analytical description and multivariate analysis.

Biodiversity increased after the establishment of integrated systems. Starting from specialised milk production systems, diversification allowed for between 30 and 40 more products. **The integrated systems increased the energy efficiency from 3 to 10 joules produced per joule of input.** Labour intensity decreased yearly after a greater initial labour demand required for establishing the system. Production of high quality organic fertiliser (2 to 4 tonnes/ha) was a major resource to cover the crop nutrient requirements. **Productivity increased by up to 9.7 tonnes/ha including both animal and crop production.** There was some fluctuation between animal and crop production, but the final result was higher system productivity.

The results of the study show that integrated ecological livestock-crop systems can provide sufficient capacity and potential to sustain intensive production based on available natural resource management alternatives.

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Sustainability

Much of the discussion on sustainability is about planet earth's ability to support life at the present rate of exploitation by man. The main problem is the use of fossil fuels as the main source of energy. This 'dead' source of energy can only increase entropy.

Historically civilizations broke down when the bias towards negative entropy was replaced by a bias towards positive entropy. That is what is happening today. Capitalism has a tendency to increase 'constant capital' that is machinery, and reduce 'variable capital' that is labour. In our terminology the share of entropy generating technology keeps on increasing at the cost of negative entropy processes. This applies to sources of energy, such as fossil fuel as against biological fuel such as wood, charcoal, agro-waste etc. as well as products such as plastic furniture against wood furniture and so on. Today's main crisis, namely climate change and global warming is primarily a result of these entropy-generating processes. If we continue with this, not only the present civilization is doomed, probably the very existence of the human specie is doomed.

Among civilisations only China and India created sustainable agricultural surpluses over centuries and survived continuously until recently. This they did by retaining the fertility of the soil over centuries. This was done by using a mix of crops, crop rotation and using compost. The Indian artisan, weaver, cobbler and potter mainly used biological inputs in terms of raw material and labour processes. Today these civilizations also are taking the same road of capitalism and are facing similar prospects.

Technology Choice

So for sustainability, the technology choice should be such that we maximize biological processes in our technology. This implies organic farming and a host of appropriate technologies that people have been talking about. This does not mean we are going back or that we are being primitive and unscientific.

Science does not mean using the laws of science to 'conquer' nature or 'exploit' it. Such a meaning acquired importance mainly in the industrial era where the logic of capitalism needed more and more production. These together define the 'development' models and 'growth' models that are responsible for much of resource depletion and environmental degradation and global warming. These are essentially unsustainable models.

Science, historically, meant understanding the laws of nature and living in harmony with it. Agriculture calendars were prepared on such knowledge and people organised their agricultural activities on the basis of these calendars. People learned to live with floods and benefited from the fresh soil that was brought with it, instead of 'controlling' floods with building dams and embankments. Life on earth has been sustained by harvesting the fusion reactor in the Sun rather than building a fission reactor on earth itself! Biological sciences are more complex than material sciences. Maximising biological processes in our technology implies more and better science as well as using sensible achievements of

previous generations. This also implies sustainable models of near zero growth.

There are other aspects of using biological processes that cannot be measured so easily. A tree gives fruits, leaves, fuel, timber, provides shade, shelter to birds and a host of insects. It also absorbs carbon dioxide and gives out oxygen. It lets the rainwater reach the earth gently and slowly. When it dies all of it goes back to nature through the activities of insects and fungi and saprophytic flora.

There are aesthetic aspects too. Many of us admire handicrafts that are made from natural raw materials. In all our social and religious functions and marriages most of us prefer decorations and clothes made from natural material.

In sports too we can see this. Bike enthusiasts love the thrill of speed and traversing rough terrain. But horse riding can also give similar thrill and cover even rougher terrains. And the latter is more sustainable.

In Conclusion

Life on earth was sustainable before the industrial revolution and deforestation because the entropy of the Biosphere was decreasing continuously. This was so due to the fact that human beings were still mainly dependent on biological processes for their survival and growth. Stable and sustainable civilization like the Chinese and the Indian, were built on such technologies. The present crisis of climate change, which is leading to the extinction of life on earth, is due to the fact that in the last 200 years, non-biological, entropy increasing technologies have become dominant.

Apart from technology there is much else that is wrong with capitalism. It is mainly irrational production and consumption. Some estimate it to be as much as 90 % of all activities in terms of money. These include the military industrial complex and medico industrial complex, much of the extractive industry, almost all of fossil fuel industry, irrational use of agriculture to support tobacco, alcohol and narcotic industry and so on.

There is a strong correlation between capitalist irrational production and consumption and entropy generating technologies. Of course sustainable technologies will have some non-living things such as metals in hand-tools and some capitalist production such as tobacco can be biological in origin. Hence the promotion of technologies that have high content of negative entropy/biological processes and elimination of irrationalities of capitalist production and consumption can ensure a sustainable future.

CUBA WITHOUT ISMS

road to a fossil fuel free society

Cuba is where “Peak Oil” hit in 1989 - in an artificial manner - because in the world as a whole, there was no shortage of oil. Only the Soviet system had begun to collapse and Cuba stopped receiving petroleum from the Soviets. This was its only source because of the US embargo. Cuba was put to its greatest test and it passed with flying colours! The year 1989, ushered in the ‘Special Period’ in Cuba, a scenario that has hit the rest of the world now. The world, however, is not as prepared to meet it as Cuba was. In the case of Cuba we can see the whole experience of Peak oil, economic crisis and recovery. Even with regards to global warming, which has become a major crisis now, Cuba has achieved all the goals of reducing its carbon emissions. Thus Cuba has lessons for all on how to meet the present challenge.

The word ‘isms’ represents a group of words ending in ‘ism’, like colonialism, neo colonialism, capitalism, socialism, communism and anarchism. Although these words will be used in the text, the idea is that the existing meaning of these words should not bog down the reader. While the Cuban government calls itself ‘A Socialist State’, these words have different implications in different historical contexts. The experience of Cuba is too important to ignore and one should be prepared to learn without these pre-conceived notions.

The special period in Cuba is like a real time model; large enough to prove its viability. However it is never easy to repeat what some one else has done. North Korea too faced the same problem as Cuba did in 1989 but did not take the path of Cuba. Today Zimbabwe is facing the worst economic crisis and one cannot say how the country will deal with the set backs.

The story of Cuba

Cuba is an archipelago, that is, it is a group of islands situated in the Caribbean Sea between the two Americas. There are two main islands-Isle of Cuba and the Isle of Youth and some 1600 small islands, with a total area of about 1,11,000 square kilometres. It has a population of about 1.1 crore (2001) and a density of 100 persons per square kilometer. It is a tropical country like Kerala in Southern India with a rainfall of 1300 mm (52 inches) per year. The main food crops are rice, corn, cassava, beans, plantains and citrus fruits.

Colonialism in Latin America and in Cuba

Modern colonialism in Latin America began with the voyages of Christopher Columbus and Vasco Da Gama in the closing years of the 15th century. Columbus who actually started for India reached Cuba in 1492. While the Americas were rapidly colonised in the 16th century with genocide and mass killing of the bison population, colonialism did not succeed in India except in Goa. It took another 250 years for the East India Company to get the *Diwani* (Rights to collect revenues and taxes) of Bengal in 1765. Another particularity is that local languages were almost completely replaced by Spanish. Spanish is the common language of Lain America (except in Brazil, Haiti and West Indies) and its literary tradition has played a uniting role in the region. The Latin American intellectual therefore often reads the same books, and is influenced by the same thinkers and writers. This difference is crucial to understand why the Latin American countries, and in particular Cuba, in spite of the paucity of resources, has made such rapid advances in social, political, educational and professional spheres. To mention in passing, it also explains partially the difference between Goa and rest of India.

Prior to the arrival of the Spanish, the island was inhabited by Native American peoples known as the Taíno and Ciboney. The Taíno were farmers and the Ciboney were hunters and gatherers. The Spanish colonialists made Cuba the headquarters of their empire. They brought nearly five hundred thousand slaves from Africa as farm labourers, destroyed the traditional subsistence economy and created sugar plantations with slave labour.

Independence and Neo Colonialism

By the 19th century, the USA had grown in power and was contending to expand its influence in South America. The USA fought with Spain and supported independence movements. These 'independent' countries actually became neo colonies of the US with the US capitalism taking over most of the business in these countries. Most of it was mining and plantation. Cuba too faced this and there were attempts to liberate itself throughout the first half of the 20th century. It ultimately saw success in 1959 with the Fidel Castro coming into power.

Revolution and its achievement

Fidel Castro became the prime minister of Cuba in February 1959. In its first year the new revolutionary government expropriated private property with little or no compensation; nationalised public utilities; tightened controls on the private sector ; and closed down the mafia-controlled gambling industry. Some of these measures were undertaken by Fidel Castro's government in the name of the programme outlined in the Manifesto of Sierra Maestra. The government nationalised private property totalling about $25 billion US dollars, out of which American property made up only over US $1.0 billion. Cuba faced opposition from the USA and a trade embargo. Cuba turned to the Soviet Union which helped it to develop. It bought sugar from Cuba at a high price and gave it oil, machinery and food at a cheap price. Even before Castro's coming to power, Cuba already had a well developed economy. With Soviet help and its own revolutionary programme it made rapid strides in education, health and invested in programmes for the

general well being of its people. It also defended itself against efforts by the US to destabilize the government, assassinate its leaders and even invade territory.

Employment and Trade Unions

In Cuba, the National Labour Code legislation comprehensively guarantees workers' rights. It guarantees workers the right to belong to a trade union and the state has the responsibility of finding work for every one over the age of 17 including those with disabilities who are able and willing to enter employment.

Cuba has a work force of 40,00,000 of whom 98% belong to a trade union. Women make up 43% of the trade union membership and account for 58.9% of officials at the regional level. In addition, 2,50,000 pensioners are also trade union members.

In order to form a trade union, no permission from the government is required. Membership is not obligatory and members pay 1% of their earnings each month. In each enterprise there is only one union to represent the workforce.

During the special period, the trade union movement organised workers' parliaments in work places around the country. They gave 1,67,000 suggestions on how to meet the crisis. A large number of these suggestions were incorporated into the government's plans.

Education

Cuba has a long history in education. The University of Havana was founded in 1728. In 1957 just before the Castro regime came into power, Cuba's literacy level according to the United Nations data was fourth in the region at almost 80% - higher than of Spain.

Immediately after the revolution, the government declared a 4 month closure of colleges. The "time off" was meant to be utilized for conducting literacy classes for adults. About 1,20,000 voluntary 'teachers' went out into the hinterlands, and over 7,00,000 people learned to read and write. Thus in one year Cuba attained a very high rate of literacy. Today, school attendance is compulsory from ages six to the end of basic secondary education (normally at age 15) and all students regardless of age or gender wear specified colour school uniforms as per grade levels. Higher education is provided by universities and higher pedagogical and polytechnic institutes. The Cuban Ministry of Higher Education also operates a scheme of distance education; providing an opportunity for agricultural workers in rural areas to attend regular afternoon and evening courses. Education has a strong political and ideological emphasis and students progressing to higher education are expected to have a commitment to the goals of the Cuban government. Cuba has also provided state subsidised education to a limited number of foreign nationals at the Latin American School of Medicine.

Health

Historically Cuba has ranked high in the number of medical personnel; making significant contributions to world health since the 19th century. Cubans benefit from free health care services. Primary care is available throughout the island and infant and maternal mortality rates compare favorably with those in developed nations.

Post revolution, in the 1960s, Cuba initially experienced an overall worsening in health conditions - in terms of disease and infant mortality rates - when half its 6,000 doctors left the country. Recovery occurred by the 1980s. The Communist government asserted that universal healthcare was to be a priority in state planning. Accordingly, appropriate measures were taken in rural areas. However, following the end of Soviet subsidies in 1991 and tightening of the US embargo in 1992, medical care too suffered from severe material shortages.

Cuba has the highest doctor-to-population ratio in the world and has sent thousands of doctors to more than 40 countries around the world. According to the UN, the life expectancy in Cuba is 78.3 years (76.2 for males and 80.4 for females). This ranks Cuba 37th in the world and 3rd in the Americas, behind only Canada and Chile, and just ahead of the United States. Infant mortality in Cuba declined from 32 (infant deaths per 1,000 live births) in 1957, to 10 in 1990-95. Infant mortality in 2000-2005 was 6.1 per 1,000 live births (compared to 6.8 in the USA).

Collapse of the Soviet Union and the Special Period

Before 1989, Cuba was a model Green Revolution farm economy based on huge production units of state-owned farms and dependent on vast quantities of imported oil, chemicals and machinery to produce export crops. Under agreements with the former Soviet Union, Cuba had been an oil-driven country, and 98 percent of all its petroleum had come from the Soviet bloc. At the end of 1991, only 6 of the promised 13 m tons were received, and the short fall in oil began to severely affect the nation's economy.

While oil was critical, other losses were also important, as 85 percent of all Cuba's trade was with the Soviets. Cuba exported 66 percent of all sugar and 98 percent of its citrus fruit to the Soviet bloc, and imported from them 66 percent of its food, 86 percent of all raw materials, and 80 percent of machinery and spare parts. Consequently, when support from the Soviet bloc was withdrawn, factories closed, food scarcity became widespread.

The collapse of the Soviet bloc and the tightened US trade embargo exposed the vulnerability of Cuba's Green Revolution and export oriented economy model. Cuba plunged into the worst food crisis in its history.

In early 1990, a survival economy was put in place as 1,00,000 tons of wheat normally obtained through barter arrangements failed to arrive and the government had to use scarce hard currency to import grain from Canada. The price of food went up and bread had to be rationed. Between 1989 and 1992, overall food consumption was said to have

decreased by 20 percent in calories and 27 percent in protein. To make matters worse, Cuba's efforts to reverse the trend of rural-urban migration over the past decades failed to curtail the increasing tide of rural migrants to the cities, especially to Havana. Shortages of food and medicine and gasoline were driving people to the capital.

Cuba was faced with a dual challenge of doubling food production with half the previous inputs and with some 74 percent of its population living in cities. Yet by 1997, Cubans were eating almost as well as they did before 1989, with negligible food and agrochemical imports. Instead, Cuba concentrated on creating a more self-reliant agriculture. A combination of higher crop prices paid to farmers, agro ecological technology, smaller production units and most importantly urban agriculture.

The Cuban response

The way Cuba responded is an inspiration to the rest of the world. It began with a nation-wide call to increase food production by restructuring agriculture. It involved converting from conventional large-scale, high input monoculture systems to smaller scale, organic and semi-organic farming systems. The focus was on using low cost and environmentally safe inputs and relocating production closer to consumption, in order to cut down on transportation costs. Urban agriculture played a significant part in this effort.

A spontaneous decentralised movement had arisen in the cities. People responded enthusiastically to the government initiative. By 1994, more than 8,000 city farms were created in Havana alone. Front lawns of municipal buildings were dug up to grow vegetables. Offices and schools cultivated their own food. Many of the gardeners were retired men in their fifties and sixties and urban women played a much larger role in agriculture than their rural counterparts. By 1998, an estimated 5,41,000 tons of food were produced in Havana for local consumption. Food quality also improved as people had access to a greater variety of fresh fruits and vegetables. Urban gardens continued to grow and some neighbourhoods were producing as much as 30 percent of their own food. The growth of urban agriculture was largely due to the State's commitment to make unused urban and suburban land and resources available to aspiring urban farmers. The issue of land grants in the city converted hundreds of vacant spaces into food producing plots and new planning laws placed the highest land use priority on food production. Another key to success was opening farmers markets and legalising direct sales from farmers to consumers. Deregulation of prices combined with high demand for fresh produce in the cities allowed urban farmers to generate two to three times as much income as the rural professionals.

The government also encouraged gardeners through an extensive support system including extension service personnel, and horticultural groups that offered assistance and advice. Seed houses throughout the city sold seeds, gardening tools, compost and distributed biofertilisers and other biological control agents at low costs. New biological soil inputs and organic gardening techniques were developed and perfected by Cuba's agricultural research sector, which had already begun exploring organic alternatives to chemical controls. This enabled Cuba's urban farms to become completely organic. In

fact, a new law prohibited the use of any pesticides for agricultural purposes anywhere within city limits.

The introduction of a diversified market-based system for food distribution spurred increased agricultural productivity. The United Nations Food and Agriculture Organization estimated that between 1994 and 1998, Cuba tripled the production of tubers and plantains; doubled the production of vegetables, which further doubled again in 1999. Potatoes increased from 1,88,000 tonnes in 1994 to 3,30,000 tonnes in 1998; while beans increased by 60 percent and citrus by 110 percent from 1994 to 1999. Anecdotal information suggests that thousands of families left cities and large towns to make their livelihood from the land. Other information indicates that thousands of unemployed – including rural migrants – have found employment in urban agriculture.

Transport

When oil supply stopped in 1990, transportation ground to a near halt. There were no cars running; public conveyance collapsed; and the streets were empty. People walked. Around 1993, Cuba imported 2,00,000 Chinese bicycles.

To begin with, trucks were converted to buses by simply welding steps to the back. A skeletal frame of rods and a canopy were added. The concept was refined into the Cuba's mass transit bus the 'Camellone' (The Camel). Built on a long chassis vehicle, it can accommodate 250 persons. For shorter distances there were cycle and auto rickshaws. In smaller towns, horse drawn or even mule drawn 'cabs' were to be spotted. Car-pooling and ride sharing is common in Cuba. There are designated government officials in yellow uniforms who have the right to pull over even government vehicles and seat people in need of transport.

Cuba as a fossil fuel free society

Cuba, it would appear, is well on its way to being a fossil fuel free society. Its agriculture is primarily organic; it has rationalised its transport; and it has achieved emission standards well below the prescribed limit. Cuba also shows that a fossil fuel free society does not mean going primitive. Cuba is a modern society with access to modern science, education, health care and culture.

However, one should remember, it is still in transition. Cuba maintains the second largest army in Latin America. This, it has to, because of the presence of the USA in its backyard. A genuine fossil free society will be achieved only in a world without wars, without armies, without nuclear weapons, in short a world without borders.

From all the indications available, it is unlikely that the powerful nations will take this path without going through another war. All the investments in the capitalist world are flowing to armament industry instead of going into alternative sources of energy or organic farming! In such a scenario, Cuba still has to be on its toes to survive and is far from reaching its full potential.

Reasons for Cuba's success

In the 20th century four great revolutions occurred: The Russian, the Chinese the Vietnamese and the Cuban. Each one of them inspired millions of people all over the world in their struggle against imperialism, against injustice and against inequality. Even today, the revolutionary movement continues to learn important lessons from these revolutions. However while the Russian, the Chinese and the Vietnamese revolution moved significantly away from their socialist agenda, Cuba after 50 years still seems to continue to succeed and inspire not only the revolutionary and the socialist movement, but also a whole range of people who are involved in the environmental and green movements and who are looking towards a post fossil fuel society. What could be the reasons for this?

The main credit of course goes to the Cuban people, their organisations, their professionals and the leadership. They withstood almost half a century of hostility by the biggest imperial power next door. The hostility included not only trade embargo but also a series of attempts to assassinate their leaders, coups and even invasions. On hindsight, this hostility may appear to be a blessing in disguise. It kept the country on its toes and never allowed it to get rich and corrupt. Cuba also had a policy of allowing all those who wanted to emigrate to the US to go. This may have also helped.

There are other reasons too that explain the uniqueness of Cuba and acknowledging these can help us understand the lessons one can learn from Cuba. These are historical; political; economic; and the high level of achievements in education and health sectors.

Latin America and Cuba experienced colonialism way back in the 16th century. Thus they were exposed to scientific and technological advances in Europe that much earlier. They got their freedom in 1898, unlike Asia and Africa where it came after the Second World War. They had free elections in 1940.

Cuba had Latin America's highest per capita consumption/use rates for meat, vegetables, cereals, automobiles, telephones and radios. Gross domestic product per capita had been approximately equal to Italy and significantly higher than that of Japan. Cuban workers enjoyed some of the highest wages in the world. Cuba attracted more immigrants primarily from Europe as a percentage of population than the US. The United Nations acknowledged Cuba for its large middle class. And finally, Cuba already had a good base in education and healthcare.

Lessons from Cuba

Cuba can provide us with a real time model for the future notwithstanding the fact that no model is ever fully or exactly replicable. There were special and unique historical and political reasons that helped Cuba to face the crisis and come out of it with flying colours.

Since many countries in Latin America share the colonial and post colonial history with Cuba, there is a greater appreciation for Cuba there. And learning lessons form it will be relatively that much easier.

For rest of the world; wherever regions share or identify with some of Cuba's features there is a greater chance of implementing these lessons. The most significant being, social awareness of exploitation and oppression; struggle for equity; tradition of democracy in society and in political parties; high level of literacy and education; awareness of environment degradation; global warming, peak oil and its consequences; understanding the current global economic crisis and initiatives exploring alternatives to it.

In India, the West coast, particularly Kerala, coastal Karnataka and Goa have some of features similar to Cuba and may be they will be able to face the current crisis better. West Bengal, in spite of CPI (M)'s present unfortunate policies, may eventually emerge to play a significant role. But no one can predict the future with a decent degree of accuracy - it always has a store of surprises.

WHAT THEN SHOULD WE DO?

So far the issues discussed have been global in nature. While the crisis is truly global, the solutions will differ from country to country; from region to region.

The ‘models’ presented in the previous section can not be replicated just like that. In fact in history there are no models. There are theories and there are experiences. They can inspire and guide but cannot be blueprints for action. For instance, the Russian revolution may have inspired the Chinese revolution but the latter is not a copy of the former. Similarly today, Cuba may appear to be a transition model for a fossil fuel free society; but it can only inspire. Even within Latin America, each country is following a different path. India too is a sub continent. Different regions within India have had and will have different paths of change.

Through out the book, the emphasis has been on reiterating that change can be brought about mainly through the organised struggles of stakeholders. Rebuilding of the community will emerge out of common needs and visions of the community. In this instance, community identity is considered on the basis of biogeography and natural languages.

THE FEDERAL REPUBLIC OF INDIA

region, biogeography and language

A fossil fuel free society implies smaller size of regions and communities federated with each other. What follows is a discussion on the possible basis of which these areas could be defined or demarcated as societies functioning independent of fossil fuels.

Federalism

In the history of 'equality amongst people' as a concept, the political organisation has often been visualized as federal. Federalism means that the constituent units come together to form an organisation based on equality. Each unit itself can be a federation of smaller units such as a village community or an urban locality. Usually the resources of a federal structure are raised through contributions from constituent units. The polity within the unit may be representative or a direct democracy.

The issues of federal concern are generally those that require the collective cooperation of its constituent units, and centralized implementation. Some of these are communication, conflict resolution, trade regulation, vigilance on trade routes for smooth functioning etc. There are tried, tested and very effective mechanisms already in place. The pressing issues of present times are disarmament and decommissioning of nuclear weapons; nuclear energy plants; nuclear waste; environmental challenges; disasters due to natural phenomenon; sporadic outbursts of highly communicable diseases; food security; disintegration of the social fabric in society etc.

Historically there are several examples of federal efforts. The federation of American Indian tribes has, it is claimed, inspired the US Federation. Again, the 1924 constitution of USSR (the later version strengthened the centre under Stalin's leadership) has been considered as a model federal document. On the eve of the independence of India a federal constitution was proposed with limited powers to the centre; but it was not acceptable to the Indian bourgeoisie. They preferred a strong unitary form and opted for the partition of India. Presently there are many "federalists" across the globe espousing a school of thought in the nature of a few thousand small independent states on the planet.

Not very long ago - in the pre-colonial and pre industrial era – there existed functioning tribal or ethnic societies with clear cut traditions of governance. Although these have come under some form of a larger entity- the state; for the purpose of resolving many internal conflicts, they seldom take recourse to laws laid down by the constitution.

All over the world, demand for smaller states or secessionist demands are based on 'identity politics'. Language often referred to as 'dialect' and geographic or ecological criteria form the basis for such demands. Language is not simply a tool for communication but is a central and defining feature of identity as all human thoughts are

conceptualised through language and all human values are pronounced and perceived through it. Very often the emphasis on ecological or bio-geographical regions is reflected in the daily practices of the people and their language. In the world today, out of 6912 living languages about 2500 are endangered to varied degrees and 200 have already become extinct. In India, of the 415 living languages, 196 are endangered and 9 have become extinct. Many of these endangered languages belong to the north-east, the tribal belts of West Bengal and Orissa and to Himachal Pradesh, Jammu and Kashmir and Uttarakhand.

A Fossil Fuel Free India

A fossil fuel free India would consist of about a hundred or so federated units, so delineated, on the basis of language and biogeography. To propose such an idea; it is required we evaluate the short comings in the existing situation.

During colonial rule, the political regions emerged as British power expanded. These regions emerged around Bombay, Madras, Calcutta and were known as presidencies. They covered multilingual regions. Thus, the Bombay presidency had Gujarati, Marathi and Kannada speaking regions and the Madras presidency had Tamil, Telugu and Kannada speaking regions. After independence, the demand for coherent linguistic regions gained strength, some contradictory, and at times, completely tangential propositions. On one hand the demand for large Telugu, Kannada and Marathi linguistic states became powerful while some smaller regions showed a preference for smaller states. The Nagas on the extreme North Eastern border wanted to be independent of the Indian state. Even after the formation of states on linguistic basis, peoples' demand for further delineation based for regional criteria continued; ultimately resulting in the formation of Jharkhand, Uttarakhand and Chhatisgarh. These have further fuelled demands for Bodoland, Gorkhaland, Vidarbh, Telengana etc., which continue to this day.

There is no doubt that these movements will grow. It is entirely possible that more states will be created. However, if these small states are created today, they will go the same way as Jharkhand and Chattisgarh have gone. The mineral rich states of Jharkhand and Chattisgarh are attracting rapacious capitalist sharks. The ruling politicians in these states are not equipped to deal with them and are "selling" the state's resources cheap. This has led to enormous exploitation of natural and human resources. The environment and the ordinary citizens are bearing the brunt and strife is amply evident. The same will most likely happen if demands for smaller states are given into through creation of more states without due perceptive forethought.

One of the reasons for the present situation in the newly created states is the basis on which such demands were made. The rationale being, larger states like Bihar or Madhya Pradesh were benefiting from the resources of these mineral rich areas; that there was uneven development; and these regions were treated as internal colonies. Essentially it meant the local ruling groups wanted monopoly control over this wealth. Very often the local big business house aided them. For example, the Tatas supported the Jharkhand movement. However, Issues such as language, culture, exploitation of local people and

natural resources, receded into the background once the new states were formed.

It may be prudent to note that the basis of these demands ought to be in the interest of people and ecology. The demands for independent administrative identities- such as statehood - are useful only if they are achieved along with socialist or libertarian demands of freedom from exploitation, equality and rational use of resources. Specifically, the demarcation of the boundaries of new regions would be most ideal if based on biogeography and language.

Biogeography

Biogeography deals with the geographical distribution of plants and animals. India has 10 clearly distinguished biogeographical areas. They are:

1. Trans Himalayan Regions 2. Himalayan Region 3. Desert 4. Semiarid Region 5. Western Ghats 6. Deccan Plateau. 7. Gangetic Plain 8. North East India 9. Sea Coasts 10. Islands.

There may be further subdivisions within these areas on the basis of a smaller ecosystem. Thus, Western Ghats has the Konkan strip of Maharashtra, Goa: Karavali in Karnataka; and the Nilgiri Biosphere at the tri-junction of Kerala, Karnataka and Tamilnadu. Again, Deccan plateau which is a huge land mass has been divided into several smaller sub divisions.

A biogeographic region defines its flora, fauna and human society. Thus it also defines a people, a speech community or if you like a common identity. They are unique in the food they grow and consume; houses and architecture; habits; cultural and religious practices; clothing; language.

Language, Standard Language and Biogeography

In the popular terminology, standard language is just called language and other languages are called dialects. Linguists today do not use the term dialect as it connotes hierarchy. For them all 'dialects' are languages. Natural languages have a sharply defined geographic boundary and these also tend to coincide with ecological or biogeographical regions. On the other hand, standard language is a political entity and has an elastic boundary.

The example of Hindi can be used to illustrate this. Hindi represents a set of about 30 languages. These 30 languages are not dialects of Hindi. Standard Hindi is a recent phenomenon dating back to late 19th century only. Whereas, many of the other languages enjoy a much older literary history. Acharya Kishori Das Bajpai referred to Hindi as a term that denotes a commonwealth of languages united by geographic continuity, a common script that is ‘nagari’ and the use of *‘ka’ pratyay (uska, uske liye).* Some of these languages are: Maithili, Magahi, Bhojpuri, Awadhi, Braj, Khari Boli, Kumaoni, Garhwali, Dogri, Mewati, Mewari, Marwadi, Bundelkhandi, Baghelkhandi, Malwi, Nimari, Chhatisgarhi and so on. These languages have a sharply defined boundary and

indeed there are regions which are identified by these names: Mithila, Magadh, Bhojpur, Awadh, Brajbhumi, Kumaoun, Garhwal, Mewat, Mewar, Marwar, Bundlekhand, Baghelkahand, Malwa, Nimar and Chhatisgarh. Examples from other regions would be Santhali, Gondi, and Tulu etc. As mentioned above, these are also biogeographic /ecologically homogeneous regions.

Standard Language

Standard language on the other hand is a historical and political power entity. That is why; it is sometimes called the language with a gun. It can stretch or be imposed on widely different regions. Such is the case of Standard Hindi and English. Children in many 'Hindi' regions fail in their Hindi examination because they make ‘mistakes’ in the use of standard Hindi as used in school. People from many regions are looked down because they cannot speak ‘proper’ Hindi. Sometimes people from these regions themselves say that they do not speak proper Hindi. Standard Hindi has made people second-class citizens in their own land. The irony is that standard Hindi itself came into being as recently as the mid 19th century in Western Uttar Pradesh! Whereas Braj was a link language for religious groups throughout the mediaeval period in North India! Other standard Indian languages are Assamese, Oriya, Bengali, Tamil, Telugu, Kannada, Malayalam, Marathi, Gujarati, and Punjabi. A few other languages like Maithili, Chhatisgarhi, Konkani and some languages in the North East can also claim this kind of status.

Link Language

Link language is a language, which spreads over a well defined large biogeographic region due to trade, travel, religious and cultural communication. As opposed to the standard language it spreads on its own democratically and is not imposed from above.

Dakhni can be taken as an example. Dakhni is the lingua franca of the Deccan. The Deccan is roughly the area between the Narmada and Tungabhadra or Krishna. On the east it is bound by the Mahanadi and on the west by the Western Ghats. It is the great Southern Indian plateau. Politically it comprises of Vidarbha, Marathwada and Khandesh regions of Maharashtra, Telangana and Rayalseema regions of Andhra Pradesh, and the Hyderabad Karnataka and Northern Bayaluseeme regions of Karnataka. The Deccan Plateau as a biogeographic region, as such, is a bigger entity. In the present context it is limited by the spread of Dakhni language.

Dakhni is the common lingua franca of all Muslims in the Deccan region, and is the link language of the region and is understood by almost all people and spoken as a bilingual language by most urban dwellers. Dakhni has borrowed vocabulary from Marathi, Kannada and Telugu in varying quantities in the different sub regions. These languages in turn have borrowed phrases and words from Dakhni in the Deccan region.

Another example of a link language is Nagpuria or Sadan spoken in Chhota Nagpur/ Jharkhand region. Although linguistically it is quite different from any of the tribal

languages spoken in the region it is understood by all. And like Dakhni there is a mutual exchange of vocabulary in different sub regions of the area. The actual Jharkhand region is much bigger than the present Jharkhand state. In fact the boundary of Jharkhand region can be defined by the extent of the spread of Nagpuria language.

The Federal States

The basis for the federal states will be linguistic and biogeographic. That is, regions like Mithila, Malwa etc. mentioned above. In the fifties, when the idea of linguistic states was being discussed, Rahul Sanskrityayan had suggested 30 states in the Hindi region on the basis of these 30 languages. He called them Janapad. Here the biogeographic angle is being added to it.

It is estimated that there are about 100 such regions in India. The logic for this number is that there are about 600 districts in India. Now a few of these districts (typically 4-6) form a larger region called a commissionary in the Indian administration. Very often the boundaries of these commissionaries coincide with biogeographic/linguistic regions that are being referred here. Many demands for small states even today have regions as defined above. Officially there is already a demand for 10 such states pending with the central government. They are Telengana, Vidarbh, Gorkhaland, Mithilanchal, Saurashtra, Coorg, Bundelkhand, Bhojpur, Harit Pradesh or Kisan Pradesh (Western U. P.) and Greater Cooch Behar (W. Bengal and Assam).

It is not difficult to identify these 100 odd biogeographic-linguistic regions. Just a while ago, more than 20 of these have been named. Most speakers of these languages know the boundaries of their language, which have existed, more or less unchanged, for a fairly long time. In many cases there is a demand for a separate state justifying this logic. It is ofcourse up to the people to want to have a separate state or be assimilated with neighbouring regions.

Larger regions can be regional federal entities like The Deccan and The Konkan. These would be large biogeographic regions linked by a link language like the Dakhni, Konkani respectively. So, while there can be states like Goa, all the Konkani people, spread over Maharashtra, Goa, Karnataka and Kasargod in Kerala in the Western Ghats can also be united under the Federal Republic of Konkan! Similarly specific regions in Maharashtra, Karnataka and Andhra Pradesh can be united under The Federal Republic of Deccan. However, as has been said above, the logic of a larger local region based on a link language may not hold true for the whole country.

Nor will there necessarily be a demand for them. As of now, only Jharkhand and Chhatisgarh are united by a link language, where different regions of these states have different languages. However only in Chhatisgarh the language Chhatisgarhi has become the official language of the state. In Jharkhand Hindi is still the official language of the state. Ironically a very small part of the urban population can speak this language. It is

akin to Pakistan, where practically no one speaks Urdu and yet Urdu is the national language.

The demands for these identities can give good results only if they are achieved along with socialist or libertarian demands of freedom from exploitation, equality and rational use of resources. Thus it is an issue for the future polity of a fossil fuel free society.

The future state will certainly be small; with limited power; and federated with other states. Even this may be a transitory phenomenon. In the final analysis, who needs a state to rule over us? As Marx said, ‘Mankind is moving from a realm of necessity to a realm of freedom.’ Hence, the real long term future is in self managed communities organized on the basis of, what the anarchists call, 'a free association of free people’!

Regional Initiatives

towards a fossil fuel free society

The Indian scene

Having proposed a fossil fuel free society, how does one go about achieving it? It will certainly not be a demand for statehood under the present constitution following all the political 'wheeling-dealing' that goes on in present day Indian politics. In fact, it may be best to avoid all present day parliamentary political parties.

Since 1984, all the parliamentary parties have abandoned the poor. In 1984, in Bhopal, during the biggest industrial accident in the world, except for SUCI (Socialist Unity Centre of India), none of the parties were on the side of the people. From the 90s, with the advent of liberalisation, privatisation and globalisation, the parliamentary political parties have been brazenly opposed to the poor, displacing them in millions from their homes and resources in the name of development.

On the side of the poor, there are three major forces and a host of small ones. They are the Naxalites, NAPM and the Dalit movement. Among the smaller ones, but nevertheless very important, are the women's movements, anti-communal groups, Christian and Islamic dalits, atheists, rationalists and peoples' science activists. Many individuals, professionals like social scientists, engineers, architects, urban planners are also on the side of the poor. In the struggle for the poor, there are three aspects: assurance, relief and solution. All these groups are a source of assurance to the poor, because they have stood by them under very difficult situations of exploitation and oppression. In giving relief, the Naxalites have been more successful than others. Naxalites have helped to raise wages of the poorest people e.g. tendu leaves collection, beedi makers, miners etc. They also protected the poor from oppression, rape, humiliation, bonded labour etc. As to the solution, none have a credible and realisable vision. The Naxalites offer only a theoretical solution. It fails to address adequately important contemporary issues like gender and caste discrimination, communalism, ecology, climate change and energy.

The United Front of the Stakeholders

Given this situation, how does one begin? One way is to begin at the local level. Local can be as small as the village or a locality in a town and as big as an ecozone or state - as defined above. The next step would be to identify and engage in a dialogue with all the stakeholders.

Who are the stakeholders? They can be individuals, classes or social groups and political parties. Among individuals, there is a large variety. The only criteria for them being: either their previous engagement or their present willingness to engage with the poor in

their struggle. These people may be ordinary people such as school teachers, bank employees, or professionals such as social scientists, scientists, architects, engineers, journalists and authors or any one else. Among classes and social groups there are trade unions and organisations of dalits, women, tribals, victims of development and so on. Although it has been said above that the parliamentary parties have become anti people; recently, due to rise of people's movements, some parties outside the government have shown a slight interest. However, they are likely to switch over the moment they become part of the government. There are several formations like NAPM, which are political and they have been on the side of the people. Naxalites are unlikely to join openly because of their involvement in illegal armed struggles.

What will be the agenda? The main agenda for humanity for the next thirty years or so is to heal the earth of the degradation caused by capitalism. To do this, peoples' struggles against these forces of capitalism will have to continue. Almost everywhere it will also be a struggle against exploitation and oppression; and a struggle for justice and equality. Parallel to this, there would have to be initiatives of designing and execution of regional plans for a fossil fuel free future.

What is proposed here is to take the idea forward through an organisation of the United Front of all the stakeholders. It is not enough just to have an e-group -as is the present trend amongst civil society groups. In terms of effectiveness, its limitations are many. A genuine engagement and ground level action is what is required. Singur and Nandigram in West Bengal have shown the power of this kind of action. Even there, it lacks a concrete alternative plan.

A victory like Singur or Nandigram is a powerful booster of energy for people. Though, there is always the threat that existing political interests will want to gain mileage out of such "victories". Instead of allowing this to happen, there should be a genuine peoples' plan for a fossil fuel free alternative. This plan should be so designed such that it is possible to implement it incrementally with immediate relief and benefit to the stakeholders; particularly those who are adversely affected by the stopping of such anti people development projects. Sections of such people for example are: construction workers, individuals who have lost their lands and livelihoods or so called development refugees. The plans should offer immediate relief and employment so as to avoid trauma and the possibility of rifts amongst the stakeholders.

So what should one do in the here and now to move towards such a future?

The case of one such region, the Karavalis, is taken as an illustrative model. It is undoubtedly a sketchy and tentative proposal. For, a genuine workable proposal can only be prepared by a forum of local skate holders and their facilitators, who have been part of existing struggles.

The Karavalis

The Karavalis include the three districts of the coastal plains of Karnataka. Ecologically and historically the Kasargod district of Kerala has always been part of the Karavalis. The four districts are spread across an area of 20721sq.kms. with a population of 5.56 million and a population density of 360. Kannada is the official language. Most people can speak Kannada and the local languages. The language of Uttara Kannada is Kannada and Konkani. Konkani is also spoken by the Catholics and Goud Saraswat Brahmins (GSBs) all over the region. Tulu is spoken in Dakshina Kannada and Udupi. Malayalam and Tulu are spoken in Kasargod.

District	Headquarters	Population (2001)	Area	Density (/km)
Dakshin Kannada	Mangalore	1,896,403	4559	416
Udupi	Udupi	1,109,494	3879	286
Uttar Kannada	Karwar	1,353,299	10,291	132
Kasargod	Kasargod	1,203,342	1992	604
TOTAL		5,562,538	20721	359.51

The Natural Economy of the Karavalis

The word ‘natural economy’ here does not mean primitive or pre capitalist economy. It is used to distinguish from the economic activity that serves distant interests, like refineries, power plants, naval bases etc.

The basis of the economy is fishing and agriculture. Agriculture crops here are mainly rice, coconut, areca and cashew. Hence, there are rice mills, oil mills and cashew processing factories as major allied industries. Apart from working in these industries, the families of the poor landless supplement their income by rolling beedis. There are big beedi manufacturers - like the famous Ganesh Beedies - whose main work is labeling, packing and marketing. The industry itself works on a ‘putting out’ system. Another source of subsistence is the forest. It provides fuel and a host of minor forest produce that supplement the economy of the poor.

The natural economy has been under stress due to the pressure of neo liberal policies. Cash crops are replacing food crops. This is also because; the younger generations within farming families prefer a lucrative job in the service industry, over the family’s traditional occupation of farming. Many rice fields have fallen fallow; whereas, the production of areca, to provide for the growing gutka market, is increasing. Because of anti smoking laws and the campaigns to raise awareness regarding the hazards of smoking, chewing of gutka is slowly replacing beedis. In spite of heavy rains, one can see sprinkler irrigation in areca plantations. Chemical inputs to agriculture are also increasing. Deforestation has taken place extensively. Monocrops have been introduced and biodiversity has been reduced.

The Extended Economy

The economy while it was self-sufficient did not generate enough money. So education and out migration have been important factors. The region has a fairly old history of Christianity and hence an old history of printing, books and education. The region has a high literacy rate, has produced important literati, and bankers. The region is home to four national banks! Udupi hotels are the other side of the extended economy. When the economy of the Arabian Gulf nations boomed after 1971, there was significant out migration, particularly from areas, with high Muslim populations, like Bhatkal. It is important to remember that conversion to Islam occurred mainly among artisan castes. Hence, there already existed a high proportion of skilled workers among them. However, if taken as a whole, out migration occurred from across the region and from all sections of the population.

The Undesirable Development

The sea port at Mangalore and the naval base at Karwar have been around for some time. In fact the port even has an un-operational barge-mounted power plant. What is worrying to most environmentalists and to the local people is the glut of power plants being planned and to some extent executed.

The close proximity to the sea works in favour of such decisions for the following reasons: 1. Import of coal from Australia. 2. Water is available in plenty. 3. The sea can be used to dump waste.

The opposition to these plants is mainly based on the following arguments: 1. Good agricultural land is being taken away 2. It will cause irreparable environmental damage to one of the most environmentally sensitive regions - Western Ghats. The importance of the Western Ghats as an ecological hotspot cannot be overstated. Apart from its unique flora and fauna, it is the source of all the major rivers flowing eastward, thus, providing water security to the whole of Southern India.

The History of the Struggle

The trade union movement in the region is fairly strong. The fishermen's union, the Beedi workers' union are traditional unions. The Mangalore port workers also have a union. Bank and insurance employees' unions, although a part of national unions, have a strong presence here. By and large the unions have been looking after the interests of their constituency in terms of wages, provident fund, health care etc. The Beedi workers have won impressive gains in spite of being spread so thinly across the region. However, on the whole, there is little concern for the region or the larger crisis of capitalism and future of the society. This is understandable, as it has not been on their agenda; the daily struggles for survival take up all time and energy.

There have been big struggles against refineries, power plants and the Mangalore Special Economic Zone proposals. While the industries have created wealth for the national and local rich, it has come at an enormous expense to the people and to the ecology of the region. People were displaced while building the port; some of them were displaced again while building the refinery and the Konkan Railway. A holistic approach to the struggle was taken by preparing a document called KESA-Kodachadri Ecologically Sensitive Area. It was a proactive move on the part of local stakeholders proposing the area be declared as ecologically sensitive. It was meant to prevent the setting up of ecologically unviable industries in the region under the existing Indian laws.

The process of preparing this proposal was very participatory and democratic. All the stakeholders in the struggle were consulted and were kept in the picture through out. Local and national experts pooled their knowledge and put up a very strong case. The document was presented to the Union and State Govt. Predictably it is hanging fire; while the ecology of the region continues to pay the price. While it was an excellent exercise, it was not thought out fully. It fell short of follow up action at the community level combined with a lack of persistent and consistent follow-up at official levels.

One of the problems was the protagonists' main aim; which was, to engage with the State - asking it to implement its own laws. There was an implicit belief in the possibility and viability of the 'Welfare State'. This also led them to engage with local MLAs and religious pontiffs. While this provided an opportunity to work and engage with many

professionals, it did not help in taking the work forward. So where does one begin?

The Karavali Regional Initiative Group

People can only start with what has already been achieved and go on to build on its strength. In the Karavalis, there are already, several good precedents. The organisation that has been successfully waging a struggle against the power plant at Nandikur for the last 20 years; the struggle against the refinery; the struggle against the Mangalore Special Economic Zone; the consortium of KESA; and a host of existing social and class organisations that have successfully launched various struggles in the past. Some of these organisations and groups are:

1. Beedi workers association
2. Cashew workers' association
3. Tile workers' association
4. The taxi and rickshaw drivers' union
5. Bank and insurance employees' unions
6. Port workers' union
7. MRPL workers' union
8. Dalit Sangharsh Samiti
9. Jamat e Islam e Hind
10. Karnataka Forum for Dignity
11. Jana Jagruti Samiti, Nandikur (movement against the thermal power plant)
12. Krishi Bhumi Samrakshana Samiti, Mangalore (movement against Mangalore SEZ)
13. Jana Para Vedike
14. Parisaraskatara Okkutu
15. Komu Souhadrya Vedike

A Karavali regional initiative group can be started with these stakeholders and it can grow incrementally. It can begin by taking stock of the situation; identifying stake holders; engaging with them; building strategies to carry forward the on going struggles; and start a planning group for the alternatives.
The action plan can be designed to:

1. Encourage and support ecologically unviable industries through a switch over to ecologically sustainable enterprise.
2. Develop a plan to restore the natural economy. The plan should include rehabilitation of the workers of the undesirable industries.
3. In the natural economy, eliminate the neo liberal influences. Thus, increase the food acreage and reduce areca acreage. Reduce chemical inputs and go organic.
4. Increase the forest cover and its bio diversity.
5. Stop overexploitation of the sea through the use of big trawlers for fishing.
6. Develop industries based on local resources like bamboo and timber to replace products based on fossil fuels.

Some Issues

One of the major problems in this work is the difficulty for the people to get out of their present mindsets and think of a future with a changed scenario. For example, the unions have been mainly concerned about improving their lot within the system. Now they have to be prepared to participate in evolving alternatives. This is because; many of their jobs will be redundant soon. Similarly, many young people are aspiring for careers in the service sector, particularly in banking and software. This is proving to be a bubble that has already burst in the advanced capitalist countries. So the group has to work towards building awareness on the issue. Then the plan has to include a list of livelihood opportunities based on fossil fuel free resources. The task of relocation is always painful and the group has to work intensively in preparing workers for alternative jobs; supporting them and their families during the interim period.

As has been said before, this is just one person's vision and the actual plan and activity can only be decided by the local group.

TRADE UNION INITIATIVES

towards a fossil fuel free society

Major changes in society are brought about through the organised efforts of people (sufferers) armed with the vision of a better society. Evidently, along with other organisations of such people, the trade union movement has a very significant role to play. However, the alternative today, represents an alternative to industrialisation itself! Here is an attempt to explore the history of such initiatives and suggest what the movement can do in the context of the present crisis of capitalism.

Trade Unions in the Struggle and Reconstruction

For the last 150 years, trade unions have been in the forefront in the struggle of all working people for their due rights. When revolutionary changes occurred in Russia, China, Cuba, Vietnam and so on, they were in the forefront both in the revolutionary movement as well as in rebuilding of the society post the revolution. In transforming the present fossil fuels dependant capitalist society into a fossil fuel free society, the trade unions have a crucial role to play. As Marx said, capital creates its own gravediggers in the form of organised labour.

Whereas today, capitalism is imploding, crashing down on its own. The rug of concentrated energy has been pulled from under its feet; there is no alternative ready at hand. Organised left all over the world, by and large, is not ready for it in any significant way. A large section of it went the social democratic way, that is, capitalist way under a socialist name. They shared power and it got them thoroughly corrupted. The Indian left has faired no better. It is acting in an authoritarian fashion – where ever it is in power.

The trade union movement world over has also got either corrupted - with the union bosses acting like capitalists - or has been so politicized, that it no longer represents the workers or society's interests. The working class movement and trade union movement, therefore, have to face the challenge in a different way. They have to plan to be free from their own party bosses and learn to act on their own.

Anarcho-Syndicalism

Such a tendency in the international working class movement has been known as anarcho-syndicalism. Anarcho-syndicalism is a branch of anarchism, which focuses on the labour movement. Syndicalism is a French word meaning 'trade unionism' – hence, the 'syndicalism' qualification. Anarcho-syndicalists view labour unions as a potential force for revolutionary social change; replacing capitalism and the State with a new

society, that is, a democratically self-managed society by workers.

The basic principles of anarcho-syndicalism are workers' solidarity, direct action, and workers' self-management. Workers' solidarity means that anarcho-syndicalists believe all workers, no matter what their gender or ethnic group, are in a similar situation with regard to their bosses (class consciousness). Furthermore, it means that, in a capitalist system, any gains or losses made by some workers from or to bosses will eventually affect all workers. Therefore, to liberate themselves, all workers must support one another in their class conflict. Anarcho-syndicalists believe that only direct action – that is, action concentrated on directly attaining a goal, as opposed to indirect action, such as electing a representative to a government position – will allow workers to liberate themselves. Moreover, anarcho-syndicalists believe that worker organisations – the organisations that struggle against the wage system, and which, in anarcho-syndicalist theory, will eventually form the basis of a new society – should be self-managing. They should not have bosses or 'business agents'; rather, the workers should be able to make all the decisions that affect them themselves.

Rudolf Rocker points out that the anarcho-syndicalist union has a dual purpose: 1. To enforce the demands of the producers for safeguarding and raising of their standard of living; 2. To acquaint the workers with the technical management of production and economic life in general and prepare them to take the socio-economic organisation into their own hands and shape it according to socialist principles. In short, meaning, laying the foundations of a new society 'within the shell of the old'.

Up to the First World War and the Bolshevik Revolution, anarcho-syndicalist unions and organisations were the dominant actors in the revolutionary left. After the collapse of Soviet Union in 1990 and China taking the capitalist road, the communist movement lost a lot of its prestige. It led to a revival of anarchist tendency, combining it with newly emerging concerns of race, feminism and environment. Anarcho-syndicalism remains a popular and active school of anarchism today and has many supporters as well as many currently active organisations. A green anarcho-syndicalist perspective visualises workers taking over existing units and transforming them into 'green' alternatives. For the rest of this essay it implies creating a fossil fuel free society.

Trade Unions in India today

The trade union movement in India represents less than ten percent of workers. In terms of number, however, it means something like 3 crores (3, 00, 00,000). This, along with its long history, it still represents, a significant potential force in social change which is far more than its mere strength in numbers. Trade unions have played an important role in the national liberation movement in the colonial context as well as leading the workers and peasants movements both before and after 'independence'. In the last few decades the agriculture and industrial sectors have been on a decline and the service sector has grown enormously. The trade union movement has bases in the first two sectors and with their decline it has weakened enormously. This has resulted in closure of a large number of industrial units, both large and small, and has made millions of workers to move to

unorganised sectors with consequent relative impoverishment. In the agriculture sector, the green revolution and globalisation has made millions of small farmers lose their land and turned them into agricultural labour or immigrants into city slums as unskilled labour. As a rule, traditional artisans have been losing their market and are giving up their trade and joining the urban and rural poor. Majority of Indians today are experiencing decline in their income and living standards. The bottom 30% is experiencing malnutrition, disease and death. Urban and rural suicides among working people have increased dramatically in the last decade.

The trade union movement today is on the defensive. Workers are trying to protect their jobs and maintain their wages in the face of rising inflation. When the units close down they try to restart it and if that fails they try to get their provident fund dues, get compensations and so on. Organisations like Nagarika Manch in Kolkata, Centre for Education and Communication (CEC), New Trade Union Initiatives (NTUI), Labour File, Delhi and many others have documented their struggles and plight. Altogether they are fighting a tough and losing battle. Today, the need of the hour is that they carry their struggle forward in such a manner that it prepares the working people of the country to face the present crisis of capitalism. And it prepares the people to move towards a fossil fuel free society. For that to happen, we must first take a look at the history of such struggles within the trade union movement in India. These combined the elements of 'Struggle and Build' (*Sangharsh aur Nirman*).

The Indian situation

The most important fact today is that all the parliamentary parties have abandoned the poor and particularly the trade union movement. This has not happened overnight. After the two-year drought in 1965 and 1966 and the consequent recession, there was an upsurge in trade union and mass movements. The ruling congress lost the election in eight states and many political parties split and many new movements were born. After the Bangladesh war, Indira Gandhi rode on a nationalist (read fascist) sentiment and brutally suppressed mass movements. In 1974 there was the great national railway strike and Nav Nirman Movement in Gujarat and the J. P. movement in Bihar. To suppress it, the government exploded a nuclear device to once again regain nationalist sentiment. Then the government declared emergency and let loose a fascist terror campaign against trade unions and mass movements.

However, the mass movements continued even though many important leaders were jailed. Finally, the government was forced to lift the emergency; conduct elections. The ruling Congress party lost the election heavily. Even after the emergency status was lifted, the trade union leaders like A. K. Roy and George Fernandes had to fight the election from jail. Only after having won the election were they released from jail.

This 'victory', however, was short lived. The coalition lost through infighting and manipulations by the Congress Party. The ruling party continued its politics of fomenting regional aspirations and manipulations. Finally it backfired and Indira Gandhi was assassinated on October 31, 1984. That year marked the end of support of popular

movements by parliamentary parties.

On a chilly morning on December 4, 1984, when every one was asleep, the worst industrial accident in the world occurred in Bhopal. It killed thousands of people immediately. While it drew international attention and support for the people and workers of Bhopal; not a single Indian parliamentary party (except Socialist Unity Centre of India- SUCI) came out in support of the people! Since then, parliamentary parties have refused to support any people's movement, be it against the big dams; against displacement by 'development' projects; pollution by sponge iron plants; or large-scale closure of industries and the subsequent retrenchment of workers.

By 1991, with India getting on the bandwagon of reform, of liberalisation, privatisation and globalisation, the process was complete. The government, and this time all the parliamentary parties, once again rode on the middle class consent to its development ideas, growth of GDP, prosperity etc. at the cost of environment and people. With oil peaking this year the end of this era has begun.

Sangharsh Aur Nirman

Why do these parties abandon mass movements? A brief answer would be 'power and greed for power'. In 1967, when CPI (M) shared power in West Bengal and Jyoti Basu was the Home Minister, he ordered police firing on the agitating peasants in Naxalbari killing men, women and children. It also gave birth to the Naxalites - the largest anti-parliamentary organised group. Similarly, when these parties tasted power in 1977 they once again dropped their trade union comrades. A. K. Roy, the trade union leader in the Jharia coalfields was suspended from CPI (M) and so was Shankar Guha Niyogi, the trade union leader in Bhilai Steel Plant and iron ore mines.

These events gave rise to independent and creative trade union movements in the 70s. The slogan, *Sangharsh aur Nirman* (Struggle and Build) was given by Shankar Guha Niyogi and he symbolised this trend. Under his leadership, the workers' built the famous Shaheed Hospital at Dalli Rajhara – the mining town in Chhatisgarh. Since then, many such peoples' hospitals have been built. In Bihar, A. K. Roy was leading a red and green coalition between workers and tribal peasants who carried out land reforms and practiced collective farming. Everywhere workers education programmes had begun. In Tamil Nadu a big union of construction workers came into being and today it is building houses for Tsunami affected villagers. A few industries were and are being taken over by workers in various parts of the country.

All these independent and creative trade union movements have had a rebirth in the 21st century. In the beginning of this century the effects of globalisation put a tremendous pressure on the working class; giving rise to a large number of movements. Among these NTUI or the New Trade Union Initiative is significant. Many of the constituents of NTUI are the erstwhile independent trade union movements mentioned above. In its document it says ' NTUI is a national platform of non-partisan left-democratic trade unions in the formal and informal sectors of work that represent workers in agriculture, forest,

construction, manufacturing and services with the objective of forming trade union federation.' In as much as constituents of NTUI are not bound by party affiliation, NTUI has a relatively greater space to look at the emerging issues.

Future Industrial Scenario

In a fossil fuel free society the industrial scene will be radically different. For this, the initiative taken by the workers should on one hand allow them to have a better quality of life and at the same time prepare them for such a society. We first take a quick look at what will and will not be there.

1. Because of the lack of affordable fuel, the first sector affected will obviously be transport. Luxury sectors like aviation are already under huge losses. Both Air India and Private airlines in India are posting huge losses to the order of millions of dollars. The world figure of losses is reported to be of the order of nine billion dollars! Truckers in Europe are facing problems of fuel shortage and prices. This will in turn affect international and long distance trade within the country. Again, this in turn will affect large-scale projects. To begin with, starting of new mega projects - be it in auto, power generation, steel plants, housing… will be abandoned. Existing mega projects will either live their life out or close down. Many of the service sectors will also vanish. Thus, there will be huge loss of jobs.
2. On the other hand, this will also lead to more local economy. Industries that are needed, like food, housing and textiles - the famous '*Roti, kapda aur makan'* will obviously survive, but at a more local and regional level. The technology also will be simpler and often based on biological processes. Related local industries like rice mill, flourmill, oil mill and artisan trades like carpentry, pottery, leatherwork and smithy will survive and flourish. This will generate a large number of new jobs.
3. Food security through restoration of the fertility of the soil and water security through restoration of the forest with biodiversity will be the main agenda of the coming decades. This will create millions of jobs in agriculture, forestry and restoration of water bodies.
4. The science of agro ecology will flourish. This will create new jobs in teaching right from school to university level and open new research opportunities.

Problems of Trade Union initiative

While the future scenario is not all bleak, the actual participation of trade union in broader issues is a difficult one. By and large it has mainly been done with revolutionary political parties (in spite of all that we said about the political parties in India and about anarchist tendencies in the movement).

1. One of the biggest problems, like rest of the society, the unions and workers also find it difficult to believe that the industrial era is over. Except Cuba, no political party anywhere is having such an agenda.

2. We should remember that, although the tradition of anti industrial society ideas of Thoreau, Tolstoy and Gandhi has a history of more than a century, it never had a big presence. Even Gandhi's - who had a big presence in pre-independence politics - ideas never really caught on.
3. The environmental issues of industrial health, air pollution due to industry etc. that affect the workers directly, have had few takers in the history of the working class movement.

So what should be the Trade Union initiative today?

The trade union movement is often accused for demanding wage rise only. This should now be seen in the context of equity. The workers, justifiably, feel they should get a higher share of the surplus value they generate. Why should the bosses/capitalists get such a high share of the produce? In the present crisis, their demand would naturally be: let the employers first take a cut in their earnings - the jobs must be saved. Secondly, the new society and the new technologies cannot succeed unless waste of resources - either by way of employers taking their undue share or by irrational production and consumption of goods - is stopped.

This very correct demand must be combined with initiatives based on regional planning for a fossil fuel free society. We cannot plan in vacuum. It has to be in the context of the actual situation of the region and the issues faced by working people.

The movement today is facing six kinds of situations related to the collapse of capitalism:

1. The capital has abandoned and the units are closed.
2. The industry is running into losses and is planning to close down.
3. The industry is running but it has enormous contradiction with the community due to pollution of land and water.
4. New units are proposed at the cost of tribals, peasants, environment and/or the activity is irrational from a futuristic perspective of a fossil fuel free society.
5. The industry is running as a part of the natural economy of the region and can easily fit into a fossil fuel future.
6. New industrial activity is planned in tune with the needs of a fossil fuel free society.

The Trade Union Response

1. The initiative should focus on the first problem because the need is acute and a new activity can be planned. One of the first things to do will be to claim the resources of the abandoned unit - land, housing colony, building, equipment and stores and cash compensation. The initiative should be centered towards the most distressed section of the working class and start with mitigating the distress. However it should be done through new initiative of mutual aid which would build a sense of community. It can start with ensuring food and shelter for the working people. Community kitchens could be one of the first things to start.

Vegetable, fruit and agricultural activities should be immediately started. At the same time one should enter into a dialogue with the other working people of the region, which includes not only informal sector workers and peasants and artisans, but also professionals, who know the region's potentials in terms of alternatives. Wherever possible support of political organisations and movements should be sought - like Naxalites, NAPM and others. Slowly a collective alternative should be built up.

Of course there will be repression by the state directly and indirectly. This is where the mass support will play a crucial role. Nagarika Manch in Kolkata and NTUI can potentially do a lot of good work in this area. Within the trade union movement regional federation of all the unions may be a new direction that the movement may have to take. Some of the big opportunities we may have probably missed were the closure of Kolar Gold Fields and Sindri Fertiliser Factory. In Kolar, the government offered the whole township to the workers! But, there are a lot many places where the need is urgent.

2. In the past, when an industry was planning closure, the unions tried to stop it. Today it will not be advisable. It is better to move in early to bargain for the workers share in the closing procedure. Like in the case above the union can take over the resources and run a new activity in collaboration with regional stakeholders.

3. The most difficult situation is one where the industry is running and the Trade Union movement is coming in sharp contradiction with the local population and environment groups. A classic example is the Coco Cola factory in Plachimada in Kerala. Here the first need is to start a dialogue between all the stakeholders. One should first come to an agreement on the long-term goals. Then, work towards a path where all the stakeholders' needs are satisfied as well as the goal (closure of factory and alternative 'green' employment generation) is achieved. The case of shifting small-scale industry out of Delhi due to the pollution caused is another such case.

4. In instances where new irrational industrial activities are coming up, the path is quite clear. We have to join other movements which are opposing them and initiate alternate regional planning for a green fossil fuel free society. The coal-based power plant in Nandikur in Udupi district is one such case. So far, the resistance has succeeded in preventing three previous attempts to set it up. The present attempt of setting up the plant appears to be succeeding in so far as building activity is going on. But whether the crisis will allow it to complete construction or not is something that only time can tell. Similarly, the Mangalore SEZ and the SEZs all over the country are facing a big resistance from the people.

5. In cases where the industry fits in easily with a fossil fuel free future, the effort should be to save the industry. One can then move towards, a greater share of worker participation in running the industry; better conditions of work; making

the industry ‘greener’ etc.

6. Finally, wherever new industrial activity is planned in tune with the needs of a future society, the Syndicalist approach can be put to full use. The workers can own the activity in some form of the cooperative run with full cooperation of regional stakeholders.

For the sake of simplicity, I have avoided putting disclaimers throughout the essay. I am aware that one person cannot be prescriptive to a great movement like, the Indian trade union movement is. So, the contents should be taken as material for worker education in the trade union movement.

Urban Initiatives

towards a fossil fuel free society

In tackling problems arising out of acute shortage of fossil fuels, we would need to focus on urban areas because; they consume bulk of the energy derived from fossil fuels. Urban areas are energy intensive on account of being centers of economic, political, administrative power, and often, centers of learning and culture. Demands in rural areas are influenced by trends in urban areas. Also, within urban agglomerates, demands in smaller cities are influenced by bigger cities. Consequently reduced demands in urban areas will have a spillover effect into the other areas.

Urban India

India has an urban population of 300 million, greater than the population of USA, or for that matter, greater than any country except China. This urban Indian population lives in a total of 400 urban agglomerates. Of this urban population, more than half (180 million) lives in 35 cities that have a population greater than a million. The three metros, Mumbai, Kolkata and Delhi have more than 10 million residents. Hyderabad and Bengaluru, have more than 5 million. It will be easier to tackle the problems of 120 million people who live in 365 urban agglomerates of less than a million, and many of the success stories will first come from them. On the other hand, many groups and individuals in bigger cities are more aware and have resources to start alternatives. They can help groups and residents in smaller towns.

The Urban mindset

Before we take up concrete programmes, we should first understand the urban mindset. This is crucial in working out the details of the programmes. In urban areas, individualism or alienation is very significant. People are used to being on their own; not relating with their neighbours. Any solution to urban problems will have to tackle this issue first.

Capitalism breeds capitalist individualism and breaks down communities. What is capitalist individualism? It is the belief that one is free if one has money in one’s pocket to spend as one likes. The more the money, the more the freedom! However, this very money is obtained through jobs; which implies, wage slavery. So, at one level, this freedom is mythical. At another level, historically, it meant getting out of the oppressive bondage of a caste system or a patriarchal family. So, it did mean freedom. Thus the growth of capitalist individualism and the breaking down of communities are one and the same processes. The democratic state also aids the process of breaking down communities through promises of a welfare state and through killing traditions of self-management of local issues.

The real freedom is to get out of wage slavery *and* feudal bondage. On the other hand, the human species is a social species. How do we combine the urge for freedom with the need to be part of a community? It cannot be done by going to the past and building the community on the basis of caste, as Gandhi tried to do. We propose that this be done by disengaging with capital and the state and rebuilding the community on the basis of *a free association of free people*. What does it mean in practice; and where and how does one begin?

The basis of one's freedom is in respecting the other person's freedom. Respecting, loving and caring for the other is the basic principle on which a free association can be built. So, we should get to know each other directly, be they poor or rich, of our caste/class or of another. But our history; our views; inhibits us. Learning to accommodate diversity will be the basis for building community. We start from where we are and move in the direction. We should credit ourselves on how much diversity we can relate to, particularly with the poorest families; people living in *bastes*; servants; so-called untouchables; and so on.

In urban areas, there is a horrifyingly stupendous waste of food because things come easily to the well-off sections. People in urban areas do not produce food. Otherwise, they would have known better. We should reduce both consumption and waste systematically and incrementally.

So when we are discussing concrete projects they are not just technological fixes of public transport versus private; separating solid waste at source; urban gardening; changing incandescent bulbs to CFL bulbs etc. It will require rebuilding the community and that can be done mainly through local associations and trade unions. In most of these initiatives, the size of the community should be on human scale, say a population of 10,000 or so.

Children

In urban areas, children have lost their childhood, particularly in metropolitan situations. They are engulfed in the vicious circle of school, tuition and consumerism promoted by TV channels and peer-group pressures. Organising children's groups play and library at a local level is a very important activity. As far as possible, encourage children to go to local schools so as to cut precious travel time and save transport costs and fossil fuels. We have to pose the question, 'Why can't we make the local school as good as the distant one?' We should actively participate in the management of local schools, be they private; government; or those run by local associations.

Organising children's eco-clubs, either at the school or in the locality can be very rewarding. Children are receptive to new ideas and some of the local initiatives described below can be started at these clubs.

Solid waste disposal and urban gardens

The urban situation implies separation of people from the land. Nutrients are transported away from the crops and farms where they originate; accumulate, in part, as waste in the cities; deprive farm land the nutrient that would have otherwise been recycled at site; progressively deplete farm land soil quality; and are a reason for urban filth. Urban waste disposal methods thus, cut at the very root of the nitrogen cycle by not allowing the biodegradable waste (the nutrients of the soil) to go back to the soil. Hence, separation of biodegradable waste at the source and composting at an individual or community level is an absolute must. Related issues are rainwater harvesting and urban vegetable gardens. These will reduce transport costs - both in transporting waste to dumps outside the city and bringing vegetable to town; provide fresh food; and make for consumption of the compost produced locally. This takes care of nearly 70 per cent of the waste. The remaining waste such as metal, glass, plastics, etc. can be recycled more easily and in greater quantities since it is already separated.

Fuel

Almost all domestic fuel consumed in cities today is of fossil fuel origin. With the cost of cooking gas and kerosene slowly going up, people will be forced to move to wood-based fuels. Where is the wood for this? Our forests are already under great stress. The only solution is to grow fuel wood within the city. Unless we start right now, we will not be ready when the crisis deepens, as trees take time to grow. Also, solar box cookers/ovens can save at-least half the total cooking fuel.

Transport

Transport is the biggest fossil fuel guzzler today. We have discussed children’s school transport, transport of solid waste and bringing in vegetables and fruits from rural areas. There still remains general within-the-city transport. In big cities two wheelers, cars and auto rickshaws create terrible problems of road accidents and air pollution. Recent rise in fuel prices are putting great pressures on two and three wheelers because they are used by relatively lower income groups. Many auto drivers feel that the days of autos are numbered and that cycle rickshaw will come back. Most probably, there will be a phase of sharing autos before they get phased out. Similarly, for two wheelers they probably will go through a phase of battery operated Luna style minis or bicycles. It will all happen first in smaller towns and then in bigger cities. Small towns with distances of 5 km or so don’t need any fossil fuel vehicles. It is just aping the big cities and expression of power. They can easily launch on the path of becoming fossil fuel free straight away. So, as stated before, it will be easier to take the initiative in smaller towns.

Improved cycle rickshaws - lighter and with gears - have been around for some time. In Delhi, Chandigarh, Agra, Mathura and Jaipur several thousands ply. In Maharashtra there is a design where in the rickshaw puller can rearrange the seat and convert it into a bed!

For the bigger cities, there will have to be a more comfortable and rational urban public

transport system. It is a political battle which many civil society groups are waging. Meanwhile local groups can take initiatives in the use of cycles and in bringing back the cycle rickshaws, particularly in the outlaying areas.

Water

The size of any human settlement is determined by the amount of water available. Today almost all the million plus cities and many smaller cities are dependent on water being brought from a distant river or lake. In many cases this was required not only because of increase in population, but also due to pollution of the existing source. There will definitely be conflict over the issues in the future. The aim should be that every human settlement is self-sufficient in water resources. Two initiatives are possible: 1) Water harvesting from roofs of individual buildings, 2) Cleaning up the existing water sources to make water potable. This will require, mandatory cleaning and treatment at the polluting source.

Health Care

Urban lifestyles, pollution, and chemical addiction (narcotics, tobacco, and alcohol) have created severe health problems. Privatization of health care, particularly corporatisation, has made it the biggest direct exploiter of the people. Pediatric and geriatric health care are particularly prone to exploitation as they involve the emotions of people. There is an urgent need to initiate community-based people's health care groups whose aims can be:
1. To move towards informed self-care.
2. To promote healthy lifestyles and preventive health care.
3. To provide professional care service through a trained family physician.

Consumer Co-operatives

Urban life is dominated by irrational consumerism and choices in the market that are not easy to discern. So the basis for the local shop should be a limited choice of reliable products in terms of quality and price. This will reduce inventories and save money both for the shopkeeper and the consumer. The shop can be kept by any one in the community or can be run by a society. A committed membership helps in bulk purchases. The community can also work with one village for bulk purchase of organic products.

Unto the last

In rebuilding the community the needs of the poorest come first. While charity may be needed initially to overcome hunger and starvation, the long-term solution is to create new jobs within the community, such as those of gardeners and compost makers, cycle rickshaw drivers and repair persons, jobs associated with local crèches, local bakeries, community service centers, plumbers, carpenters, masons, tailors, general repair and maintenance workers etc. The goal should be that basic securities of shelter, food, fuel, education of children and health care should be available to all irrespective of income within the community, and with the community's resources.

Get started

One should begin with oneself and start implementing some of the ideas within one's own control. For example, one can start using bicycles, segregating waste at source, buying a solar cooker, planting a tree etc. Then one should start forming a group. The first thing is to educate the group about Peak Oil. Then one can start planning activities given the resources of the group. The aim should be to work within the resources of the micro community one is a part of. Federal links and mutual support with similar neighbourhood groups will come later. As soon as possible, members of the group should join associations and trade unions within the community as well as become members of the existing city groups such as bird society, snake club, horticultural society, environmental groups and so on. This will give access to vital resources within the city.

Talking about Peak Oil can be very frustrating in the beginning. We are all so used to our life style, particularly if we belong to the middle and upper-middle class that it is difficult to conceive life without oil. As Bush said, we are addicted to oil. And like in all addiction cases the first stage is to deny that there is a problem. Then to hope that some magic technology solution will come and so on. Of course events of rising prices do help but it is still very difficult to overcome inertia coupled with the problem of alienation as has been discussed above.

It may, therefore, be easier to work in smaller towns. So if we are living in big cities, it may be worthwhile to develop links with the nearest small town and either move there or develop initiatives there. Finally, it may be worthwhile to look at Cuba's experience.

RURAL INITIATIVES

towards a fossil fuel free society

Rural India

India is a large country with about 600,000 rural communities. Evidently there can be no one type of village. To look at it meaningfully we should think in terms of ecology or biogeographic zones as discussed in chapter 6. These smaller regions define the kind of food grown and hence the kind of village and the village community.

Then one has to look at them in terms of recent history. While the country as a whole has experienced capitalist development and the rural areas have not been unaffected by it, there are regional variations. As a rule Eastern India has seen lower developments of capitalism than the North, West and the South. However, within each of these regions, there are tribal hinterlands that still live on subsistence economy.

Rural issues

Economy

The main result of invasion of capitalism pushed by the state in rural areas is the increased cash needs of the villagers for health, education and transport. This has led to commercial and chemical agriculture. This in turn has meant cash inputs for irrigation, chemical fertilisers, and pesticides. Initially this did increase production and led to further increase in rural consumerism. Soon, however, the cash income due to agriculture became less than the expenditure on inputs and other items. It led to debt traps and the worst-off resorted to suicide.

Rural poverty is increasing although government statistics say otherwise. Acreage, productivity and hence total production of several food crops have been decreasing for the last seven years. Per capita availability of food has also continuously fallen. There has been continuous migration from the rural areas to the cities.

Society

The monetization of the rural economy has broken the social fabric in a big way. Cash in the pocket brings individualism and breaks the community. Since the needs of the community remain, it reasserts in a cash manner. Community functions, births, marriage, deaths, festivals have become increasingly expensive. Annual festivals attract migrants back home and they have to show off by spending money. This increase in cash expenditure together with increased expenditure on health, education and transport has put rural society in great distress. Rural alcoholism and even consumption of narcotics have increased significantly.

Conflicts

Rural India has always faced intense class conflicts and there have been peasant movements and agricultural labour movements and tribal movements all the time. Historically, the Communist Movement in India has played a major role in helping the rural poor. In recent years the issue of development projects acquiring lands has become a major source of conflict. Based on the past experience, villagers no longer want to give land because in the past promises of land, jobs etc. have not come true. While many protests began with river dam projects, today it has moved on to projects involving mines, sponge iron plants, large steel plants, coal based thermal power plants, SEZs and even car projects. While the issue of land and livelihood remain important; the issues of environment degradation and global warming are also becoming serious and several sections of society, rural and urban, are joining the protests. The biggest current conflict is mainly in mineral rich resource areas of Chhatisgarh. Here the State has declared a war on the tribal people, forcing them to migrate out so that power plants and steel plants can be set up. While Maoists are an important group in people's movement, a very large number of other groups and professionals are also part of the movement. These coalitions, coupled with the history of rural reconstruction movement in India, carry the seeds of building a future fossil fuel free society.

Rural initiatives

Aims

The aims of the initiatives can be:

1. To rebuild the community fabric on the basis of equality.
2. To rebuild the rural economy on the basis of a fossil fuel free society.

It is important to remember that the two objectives are inseparable. It is entirely possible to use fossil fuel free technologies, like organic framing, solar, wood gassifiers etc. to support capitalist enterprises. This will not solve the problems and projects like biofuels will even increase the problems.

Guidelines

Some guideline to achieve the aims could look like this:

1. Aim at local control, nurture, and care of natural resources. Seek food, water, and health security on a local self-sufficient and self-managed basis. The aim of agriculture is primarily sustenance of life. Cash crops are only a supplement for obtaining essentials like salt, special medication, books, stationery, specialised tools, utensils etc. As such, they can only be about 15 per cent of the output. All inputs to agriculture should come from the land itself.

2. Another major issue in any community is extremely unequal ownership of resources,

particularly land. One should consider that land does not belong to any one, least of all to the state. The community should collectively control it. The land and other resources should feed all the people. People should be caring towards each other. If that is absent, then we will be participating in the government system.

3. There are some people who are not able to do work. They may be old, sick, handicapped... It should be the responsibility of the union/social organisation or even the NGOs that these people have access to food and healthcare.

4. Health is always an important issue and social organisations have to take an initiative in it. The aim of health programmes should be informed self-care. In dealing with the existing health and education institutions in our community, we should relate with the personnel on the basis of treating them as members of our community and not as 'them'. We should try to get what is available; but more important is to involve them in the community-building process; obtaining relevant education and health care.

5. In as much as village society has more caste and patriarchal hierarchies, good results will be obtained when we work with children. Education can involve a lot of agriculture and nature conservation activity. In fact, that can be the main aim of education - to learn skills and knowledge for sustenance of life. Many schools have nature clubs and eco clubs. The design of activity of these clubs should be such that they follow nature and the agricultural calendar. This activity should be coupled with greater forest acreage, biodiversity and conservation of endangered species of flora and fauna.

Rural initiatives: specific examples

Rebuilding communities

There are scores of examples of rebuilding communities in the Indian experience. To begin with, there are communist experiences in the Telengana struggle and more recently Maoist 'liberated areas'. Here awareness of ideas of equality and end of exploitation of man by man has been the dominant message. Institutional oppression of caste, religion and obscurant ideas has been attacked. Women's rights and women's participation also has been important. Land reforms were carried out and cooperative agriculture has been practised. Community health and education have been stressed. A major problem these organisations face is to have a proper balance between engaging with the state in the form of armed struggle and rebuilding communities. Often the former takes a lot of energy of the organisations and many issues such as environment are neglected.

There has been very important work carried out in this field. Anna Hazare's work in Ralegaon Siddhi, near Pune, combined rebuilding community with anti alcohol and anti tobacco movement, water harvesting and improving agriculture. The village Mendha (Lekha) in Gadchiorli district of Maharashtra became famous with its declaration, 'We have our government in Delhi and Mumbai, but in our village we ourselves are the government'. It is a village inhabited by the Gond tribe. They practice direct democracy, take decisions by consensus and not by majority. They have carried out important work

in rebuilding the community in terms of decision making process, reviving Gotul, increasing women's participation, reclaiming forest etc. Unlike the communists, these groups do not challenge the State and in fact are able to use the State development funds effectively. It has also been argued that without the village people's organisation, state funds usually get misused. They have also worked closely with the NGOs. In both these projects there is high awareness of environment degradation due to 'modern' life. One of the criticisms of these examples is that they have not been replicated either in the neighbouring villages where conditions are similar nor have they inspired other social workers to be able to replicate them.

Many movements also try to carry out new initiatives, although their energies are more needed in the movement. In the Narmada Bachao Movement, they have tried to build alternative school and alternative technology projects and planning exercises.

Fossil Fuel Free Technologies

India has a rich experience of fossil fuel technologies. The world's first biogas plant was installed in Bombay in the 19th century. Albert Howard, father of modern organic farming worked in India upto the 1930s and developed the Indore method. India is the largest user of box solar cookers. Rural India is still a bicycle and bullock cart country. Only the rich in rural India are able to use cement in any significant quantity. Mud houses are still around. Laurie Baker's work in mud houses is well known. Hand spun and hand woven cloth, Khadi is still available all over the country and so on.

Today there is a crisis of chemical fertiliser supply due to peak oil. So, even the government is promoting organic farming in a big way. There are large watershed and joint forest management programme sponsored by the government. A large number of technology institutes have appropriate technology programmes.

However technology fixes alone do not solve the problem. They can even be used to promote capitalism, make the rich richer and poor the poorer. They may even degrade the environment further, like promoting biofuels or carbon trading.

Hence, the twin aims of rebuilding community on the basis of equality and building a fossil fuel society must go hand in hand.

Where to Begin?

In practice one should start from where one is. Ensure that the tiller gets his full share of the labour whether he/she owns the land or not. Absentee landlords should get only what they put in. The bottom line is, no one in the community goes hungry.

We have repeatedly said throughput this book that it is the organisation of people that can really bring about change. Also the fact remains that in most cases the organisations are coming up in the context of struggle against capitalist exploitation of resources and degradation of the environment. So the initiatives, mentioned above, would be taken up

within this real historical context. And the nature of the struggle will determine the kind of initiatives. The guide lines and the examples mentioned above may help to visualise the initiatives.

WHAT CAN I DO?

India has a population of more than a billion or hundred crores. And each individual is different. So how can one write about ‘What I can do?’

One can reduce the problem by assuming ‘I’ to be a reader. So the reader is an educated middle class urban/rural person. She/he already has some exposure to the environment, climate change, global warming, peak oil and the nature of the present economic crisis. The reader has also probably seen articles like ’100 thing one can do to save the planet’ or ‘How to save the planet by putting in 5 minutes every day’. So what can one do? As a general rule the key word is voluntary simplicity at a personal level. It is ofcourse true that one person reducing her/his energy consumption/eco foot print cannot significantly change the situation. As the critics often say, ‘if you don’t use it some one else will use it’. But it does give one the moral energy to go ahead and involve in larger issues in larger contexts. After all one does face the question, ‘What are you doing about it?’ What is your foot print? Secondly it can also be argued that simplicity or going a bit away from the consumer society actually gives one more time to do things.

The key factor in voluntary simplicity is energy, particularly energy from fossil fuel sources. Thus giving up personal car/two wheeler and adopting bicycle and public transport is high on the agenda. The second is fuel, food and water. Using solar cooker to supplement cooking and composting and producing some vegetable/fruit and rain water harvesting are equally high in priority.

A single person on one’s own can do very little because she or he has very little time or resources. Daily life and efforts to survive take their toll on time and resources. Still a person who is aware can make choices and can make significant contributions. Usually such a person can begin with acquiring some experience of environmental movements.

As has been said in the earlier chapters repeatedly, changes occur mainly through the efforts of organised people. So apart from putting individual efforts in one’s daily life, and acquiring some knowledge of environmental movements, one of the first things one should do is to be a part of an organisation. This can be an environmental organisation, a bird watching society or even a film club. Everywhere one will find the current crisis reflected and there is something to learn and something to do.

However, the primary organisations are in one’s work place and in one’s residential area. Some of the ideas presented in the chapters, ‘Trade Union Initiatives’ and ‘Urban Initiatives’ may prove helpful.

Now within an organisation there is always a space for individual initiative. In fact the organisation is strengthened by individual efforts. For instance, within an urban group a person can focus attention on solar cookers, or transport or urban gardens and composting or rooftop rain water harvesting. Then one can work with schools and nature clubs, run

libraries and bookshops and so on.

Some have moved to rural areas, bought land and plan to do organic farming. Some may already be well into it. Many have done very good work and are building local communities around the farm. These readers may benefit from the chapter ‘Rural Initiatives’. For instance within a farm one can focus on composting or seed collection and seed banks. Then one can work on energy projects like wood gassifiers or micro hydel projects. One can work with bamboo or learn how to make ropes or pottery. Then within the community one can work with schools, women, sanitation and health and so on. There is no dearth of work either in an urban or in rural situation once one has grasped the basic situation.

The Author himself, apart from writing these articles and the book has tried out some of the urban initiatives. Needless to say these efforts are puny compared to what is needed.
The author also has worked with many individuals to work out personal paths of incremental change. Again these efforts have had limited success. The author is willing to help any reader in evolving personalized paths for action.

We are all facing a very tough situation and it will get only worse. The efforts in this book have been to show the reader that a better world is possible and there are ways to go about it. In the long run it may be worth the effort.

Appendix

THE QUAKER METHOD

In many places in the book, the need for dialogue between different groups has been stressed. In this context, it may be prudent to acquaint oneself with one of the oldest and very successful method of conducting meetings. The Quaker method has been recognised all over the world. It takes a seat of prominence, in the United Nations, in conflict resolution. Originated in England, Quakers have had a presence of more than a century in India. They enjoyed mutual respect with Gandhi.

The Quaker Method of conducting meetings has proved very useful in political movements in recent times. Quakers' real name is Society of Friends. They are an antiauthoritarian Christian religious group nearly four hundred years old. They do not advertise themselves or practice conversion. You become a 'Quaker by Convincement'. In fact there are Quakers who are agnostics. Quakers can be considered as belonging to pacifist anarchist tendencies, which include the ideas of Tolstoy and Gandhi.

Quakers believe that there is divinity in every individual. This principle translated in secular terms amounts to the idea that every one has access to some aspect of the Truth. In meetings and dialogues, it is assumed that all are searching for truth, that you listen to others carefully and examine your own truth. The objective is not to arrive at a compromise, consensus or agreement, but to realise truth collectively as much as possible.

This method is not unique to Quakers. Quakers themselves observed similar methods in American (Red) Indians. Nearer home, there are reports of Gond tribals in Gadchiorli discussing issues threadbare and reaching a decision only when everyone was clear about it and agreed to it. In recent times in anti-globalisation demonstrations all over the world, groups believing in non-violence and groups believing in 'unconventional tactics' including violence, learned to work together successfully. At the Seattle protest against WTO, the varied groups involved used this method to act in unison.

Collective Intelligence and Quaker Practice

By Leonard Joy <leonardjoy@igc.org>

The ways in which society generally provides for collective discernment and decision-making are ill designed to tap our collective intelligence and do much to explain our collective inability to discern and pursue the common good. The fact that adversarial debate is likely to fail to respect all needs and legitimate interests - and, at best, provides for compromise - is fairly readily grasped. Where not all voices are equally heard, the neglect of some concerns may be acute. And where there is no mutual caring between parts and whole, there is pathology, even death.
I have many experiences of sustained decision-making in which, in my judgment,

collective wisdom prevailed. I shall now examine the practice that supported this and consider whether its preconditions have general application. The practice in question is the Quaker practice of decision-making. The fact that it is approached as ‘a meeting for worship for business,’ in particular, raises the question of its more general applicability. Let me anticipate and say that, approached as a meeting for discerning the common good, the practice stands up well in secular contexts.

The appended extracts from a Quaker *Faith and Practice* describe the practice. They also describe its mystical roots - the belief that ‘there is that of God in everyone,’ and that this can be experienced so that discourse can be ‘Spirit-led.’

The essentials of Quaker practice, translated where necessary into secular terms, are as follows (no special order):

1. Grounding of all participants in the desire for the common good
2. Ensuring that all voices are heard and listened to
3. Respect for all - both participants and those outside (but affected by) the decision making process
4. Respect and caring for the agreed legitimate interests of all
5. Maintaining community-loving relationship - as a primary concern
6. Grounding of all participants in their own humanity and their experience of it during the meeting
7. Sensitivity to interdependence - open systems thinking
8. Speaking out of the silence (the state of being personally grounded)
9. Addressing the clerk/facilitator not one another
10. Speaking simply and not repeating what has already been expressed
11. Contributing personal perceptions and convictions - speaking one’s own truth -without advocating that all should act on it
12. The commitment to air dissent
13. Not using emotion to sway others while being authentic with the expression of feeling
14. Distinguishing ‘threshing’ meetings from meetings for decision-making
15. Preparing factual and analytical material for assimilation prior to meetings for decision
16. The role of the clerk/facilitator in offering syntheses of the ‘sense of the meeting’ that are progressively modified until there is unity
17. The role of the clerk/facilitator in resolving difficulty in coming to unity
18. Decisions are made not by majority vote, nor by consensus, but by unity
19. The organisational structures that bring to bear the voices of many collectivities.

In principle, Leonard Joy’s description of the Quaker Method is a very good guide. However, real life always demands adaptations and practicality. If undertaken from a position of standing on good principles the end result is generally closer to the model.

VILLAGE OF THE WATERMILLS

I had another dream…

The eighth episode from Akira Kurosawa's film 'Dreams'

(1990, Colour, 17 minutes. Director: Akira Kurosawa. Awards: Award of the Japanese Academy Nominated for Golden Globe, USA.)

A young man from the city, with a backpack, in walking shoes, blue denim trousers and a blue cap wanders into an idyllic village with watermills. There are two flowing canals connected by a bridge and flowers everywhere. The village has many huts, each with a watermill of its own. There is a look of wonderment on the face of the young man.

A group of children pass.

Children: Good day!
Young man: Good day!

The children cross the canal; pick flowers and put it on a stone near the bridge.

The young man walks on, with a look of wonder and bewilderment on his face. There are bird songs in the background. He reaches a hut where an old man with a straw hat is repairing a watermill. The old man has white beard, white eyebrows, is dressed in blue working clothes; supposed to remind the viewers of Masanobu Fukuoka.

Young man: Good day!

The old man doesn't hear.
Young man taking his cap off repeats; louder this time.

YM: GOOD DAY!
OM: Good day!
YM: What's the name of this village?
OM: Doesn't have one. We just call it 'The Village'. Some people call it Watermill Village.
YM: Do all the villagers live here?
OM: They live in other places.
YM: There is no electricity here?
OM: Don't need it. People get too used to conveniences. They think convenience is better. They throw out what is truly good.
YM: But what about lights?
OM: We've got candles and linseed oil.
YM: But the night's so dark.

OM: Yes. That's what the night is supposed to be. Why should night be as bright as day? I wouldn't like nights so bright you couldn't see the stars.
YM: You have Paddies, but no tractors to cultivate them?
OM: Don't need them. We've got cows and horses.
YM: What do you do for fuel?
OM: Firewood mostly. We don't feel right, chopping down trees, enough fall down by themselves. We cut them up and use them as firewood. And if you make charcoal from the wood just a few trees can give you as much heat as a whole forest. And, cow dung makes good fuel too.

We try to live the way man used to. That's the natural way of life. People today have forgotten that they're really just a part of nature. They destroy nature on which their life depends. They - especially scientists - believe they can make something better. They may be smart but most don't understand the nature of nature. They only invent things that in the end make people unhappy. Yet, they're so proud of their inventions.

What is worse, most people are, too. They view them as if they were miracles. They worship them. They don't know it, but they're losing nature. They don't see that they are going to perish. The most important things for human beings are clean air and clean water and the trees and grass that produce them.

Every thing is being dirtied, polluted forever. Dirty air, dirty water, dirtying the hearts of men.

The young man looks around, thinking.

YM: On my way here, I happened to see some children placing flowers on a stone beside the bridge. Why?
OM: Oh, That! Long ago, a stranger who died here, is buried there. People have forgotten it but they still put flowers on the grave.

YM: (Listening to the distant sounds) Is there a celebration today?
OM: (Cupping his ear to listen), No, a funeral. You find this strange? A nice happy funeral. It is good to work hard and be thanked. There are no temples or priest here. So, all the villagers carry the dead to the cemetery on the hill. We don't like it when young adults or children die. It is hard to celebrate such loss.

People here live a natural way of life. So they pass on at a ripe old age. The woman we are burying today lived up to 99. You must excuse me; I am going to join the procession. (Gets up to go into the hut, before entering the hut, he turns around) To tell the truth, she was my first love. But she broke my heart and left me for another. (Chuckles) Ha ha ha… The old man goes into the hut and comes out wearing an orange jacket and orange shoes and carrying bells in his right hand.

YM: By the way, how old are you?
OM: Me? One hundred plus three. A good age to stop living. Some say life is hard.

That’s just talk. In fact, it’s good to be alive. It’s exciting.

The old man picks some flowers and holding them in his left hand he moves to join the funeral processions, which has musicians and people dancing. He leads the procession with steps and hands moving with the rhythm of the music. The young man watches bemused. As the coffin passes him, he lifts his cap.

The young man is going back with a happy expression on his face. There are sounds of water flowing, birds chirping and watermills moving slowly. He crosses the bridge, halts, looks back and walks rapidly back. He picks some flowers, places them on the grave as the children had done earlier and walks away.

Calm settles down on the village with streams murmuring and birds chirping. A yellow leaf slowly floats down.

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It is difficult to get writings of Thoreau, Kropotkin and Tolstoy in print in India, but they are available on the internet. All of Gandhi's works are available from Navjeevan Publications, Ahmedabad.

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Chapter 9

1. Many of the ideas discussed above originated in the garden city movement in the early twentieth century. In the Indian context, city urban planning exercises carried out by Patrick Geddes in the 1920s give a good historic perspective. 'Patrick Geddes in India'. 2007, Select Books, 71, Brigade Road Cross, Bangalore 560 001. Price: Rs.250/-
2. Urban Garden: A good place to start would be to contact 'The Horticulture Society' in the city.
3. Solar Cooker: http://en.wikipedia.org/wiki/Solar_cooker. This is a good starting point. The box solar cooker is probably the safest and cheapest.
4. Improved Cycle Rickshaws: http://www.itdp.org/index.php/projects/detail/india_rickshaw_modern/ http://www.eco-web.com/editorial/06554.html
5. Consumer co-operatives: http://en.wikipedia.org/wiki/Consumers'_cooperative. See the section on Japan.
6. Cuba: http://www.i-sis.org.uk/OrganicCubawithoutFossilFuels.php
7. On the net if you type out 'Post carbon cities' 'relocalisation', 'solar box cookers', 'improved cycle rickshaw' 'urban gardens', 'Cuba' etc. you will get extensive reading material and information about these groups and resources.

Chapter 10

For organic farming the best book to start would be Albert Howard's 'An Agricultural Testament'. An abridged edition is available from Permanent Green, an imprint of Manchi Pustakam for Rs. 120/-. Masanubo Fukuoka's 'One Straw Revolution' is available from Other India Bookstore, Mapusa, Goa for Rs. 100/-

General

This book is mainly meant for activist education. The best source for such material in India is the journal *Frontier*. Established in 1968 by late Samar Sen, it has educated a generation of activists who were moved by the crisis in the late 60s. Today in the 42nd year of its publication, Timir Basu, the present editor, is ably carrying out the mission in spite of great hardships.

Contact: *Frontier*, 61, Mott Lane, Kolkata 700 013.
Phone: 033 2265 3202 E-mail: frontierweekly@hotmail.com
Website: www.geocities.com/frontierweekly
Subscription: Annual: Rs. 200/- Life: Rs. 3000/-

NOTE TO THE READER

There are many individuals, groups and organisations engaged with initiatives described in the book. The author will be very happy to hear about them; be associated with them; and help them within his limited capacities. He can be contacted at:

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T. Vijayendra (1943-) is a B. Tech. (Electronics) from I.I.T. Kharagpur (1966). Over the past four decades, his work with the trade union movements, alternative journalism, libraries, bookshops, publishing, socio – political research, health, education, and environment have given him unique insights into India's people and problems. His writings directed towards activist education are published regularly in the weekly journal *Frontier*. He lives on an organic farm in the Western Ghats.

More books by the author

The Losers Shall Inherit the World, 2008, English
The Teacher and Child Labour, 2009, Telugu and English

(Back cover text)

Global warming and peak oil have posed the imminent crisis in capitalism globally. However, most political activists appear to be unaware of the extent, the inter connectedness and the immediacy of the crisis. There seems to be a vague but definite collective subconscious that all is not well, and that, the system is breaking down.

Every crisis of capitalism opens the possibility of far reaching changes. The transition through which, could be ordered or chaotic. Those societies that are prepared with an alternative have better chances of an ordered transition. Today, Cuba is best prepared for such a transition.

This book is an attempt to present; in as simple and straight forward a way as possible, the present crisis. It also offers some solutions that the author believes will help Indians, activists in particular, to prepare for such a transition.

The book is divided in three parts. The first educates the reader on the nature of the problem, the second is a vision document for a fossil fuel free future and the third contains practical ideas for action.