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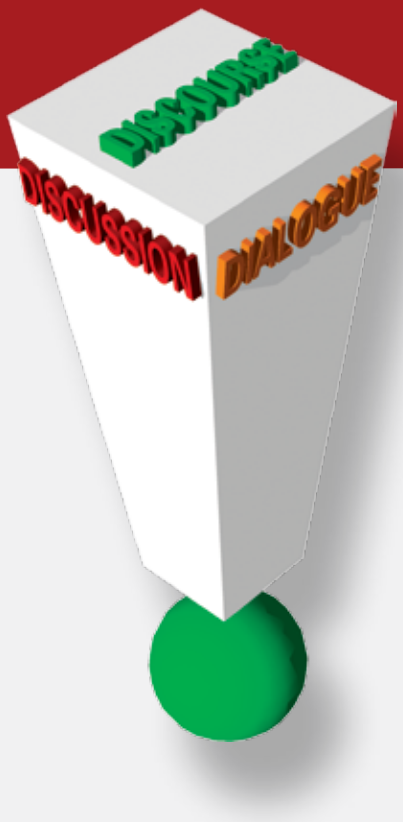

3D... IBA JOURNAL OF MANAGEMENT & LEADERSHIP

Theme:

Situating New Management Philosophy: Nature, Mind and Technology

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Editors' Note

When Nature and Technology Shake Hands

When Nature and Technology shake hands a New Earth comes into being. The New Earth has a new Sastra, the law or the governing principle. Sharma (2012) suggests **EARTH** as an acronym for **E**nlightenment - **A**wakening – **R**ealization - **T**ruth –**H**armony, which is a way of rethinking economics through Integration of Indian thought. Similarly, **SASTRA** consists of **S**cience – **A**rt – **S**pirituality – **T**ranscendental-**A**pproach, which are principle based methodologies in the formation of the proposed *new* doctrine.

Within this doctrine we want to ***situate*** New Management Philosophy. The International Conference 2013 organized by IBA is a beginning in that direction. The articles in this journal are a reflection of situating it in this new context.

In this journal you will come across two types of authors, systemic thinkers and systematic practitioners. Disciplines shed their exclusivity. Thought takes universal dimensions. Nature takes predominance. Technology gives up exploitation of Nature and becomes her servant. Mind's colours of mere black and white change to an enchanting rainbow. It sounds like poetry. It sounds so because there is harmony. Harmony creates orchestra! Yes, so it is: It is the dance of Nataraja on Nature's stage. It is the new creation. Ultimately, it is the Mind that it has all.

Indeed, it is the mind. We - our mind - make the world that we live in. The natural evolution and progression of species happens by chance and the phenomena of mutations; we change the world through our decisive actions for change and take in to aid our mind in that task. In a technologically dominated world, at times, we mistake trees for woods; technology becomes a world in itself and when it so metamorphizes exploitation of the Natural world takes place to unacceptable levels. It is time to scale back, reflect and decisively change the course. It is a new course of relationship between Nature and Man.

Hans Jonas (1903 – 1993), the German born American philosopher advocated that Nature, Man and Technology stand in an economic and ethical relationship to each other. Jonas' work has deeply influenced other fields than Ethics, such as Environment, Political Science, Social Science, Life Sciences and Religion. This is a path breaking opportunity to introduce this new vision in Management. For Management handles Economics and Technology in all of the human endeavours and enterprises in a defining manner. Management, in the final analysis, is a matter of responsibility. Hence, the question of responsibility must be bound inseparably to the art and science of management discipline. Responsibility must be the watchword on the horizons of frontiers of management in the above enunciated Hans Jonas' principle: *Act so that the effects of your action are compatible with the permanence of genuine human life.*

Management is action. The functions of management – Planning, Organizing, Staffing, Leading and Controlling – have a new matrix: **K**nowledge, **P**ower, **C**apital and **L**abour, which in pre-industrial era was manual, in industrial era mechanical and in the new age it is based on knowledge.

New principles arrive and are interpreted in contemporary life situations. The so called, 'environmentally friendly' actually works on a principle called *sustainability.* If it is true then it must last for generations, a trans-generational responsibility. We can be cynical, of course, citing that it is based more on *angst,* the fear that we will wrought wreck with Nature, leaving the future generations to fend for themselves and prove how irresponsible we were. In other words, it is a question of *survival,* fit or otherwise.

Whatever may be the perspective of the environmentalists, those who govern, build cities, plan transport, construct homes, supply money and material have to act beneficially. Benefit or enjoyment of good is how we optimally characterize our lives. The citizens of the developed nations have arrived at a quality of life that the developing envy; rightly so, for they too have those rights to enjoy the fruits of the Earth and of hard labour.

We live in an uncertain world. We cannot afford to please the cynics about an obvious situation. You would agree that when in 2003 the United Nations declared a Decade of Education for Sustainable Development, from 2005–2014, it said that we need to promote and cultivate education consisting of values and lifestyles required for a sustainable future. It stands to reason that it is definitely on the right track. Its logic is in support of economy,

ecology and equity for all, irrespective of nationalities and races – for the whole global community which would include not just human beings, but also animals, mountains, forests, rivers, oceans and the entire atmosphere. The moral responsibility consists in preserving all that which the Nature has endowed us.

Endowment calls for stewardship. We do not own what is endowed, but we bear to it responsibility both to preserve and improve it. It is as though someone gives you a large sum of money and also the freedom to do whatever you please with it. Some do business and earn moderate returns; others conduct mega business and equally enjoy high returns; some just hide it so that it may not be robbed and remain without any returns. Stewardship, thus calls for improvement and innovation, development from the *status-quo.*

In the above triple sense of stewardship, it seems that mankind has failed in all. It could not even preserve the gifts of Nature as would the least of the stewards; it has largely destroyed it. Mere preservation is all about sustainability. The management in new situation has the philosophy of increasing the value of Nature several folds, it goes beyond sustainability.

What is beyond sustainability? It is the Mind. Mind has designs. Mind has designs about the world. We our mind has ideas, an association of idea, all of the world and from the world to create a better world for ourselves. We design our world according to our needs. Our needs are food, shelter and social life. Once the basic needs are provided for we develop new designs and models for comfortable living, aesthetic development and the pursuit of science and technology to realize these aims.

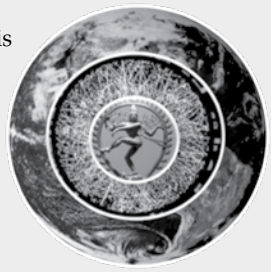
The aims are set higher, and yet again higher. Mind is restless. It seeks more perfect states. It reflects upon itself. It is then able to create a world beyond the physical world. It goes in search of itself, its identity. It discovers that it is beyond the physical. It perceives itself as non-material. Its own discovery, the discovery of the self, unlike the material one, is a transcendental one; a contrary reality to the material one, its nature is spiritual.

The designs of the mind are spiritual. Although we live in this world as part and parcel of all that is physical and perceptible, yet we are able to process these and create designs of spiritual nature.

The spirit manifests itself in what we do. Our work of building a social structure, economic management and cultural excellence are creations of the spirit.

The Indian wisdom marks the designs of the mind as emanating from Shunya, a spiritual singularity. It is an ever expanding creation that creates its own laws, Sastra. Time and again, due to ignorance, the designs of our mind falter and fail. We live in times where we bear the consequences of such failures. Environmental degradation is one of those natural consequences. In the area of social failures the consequences are life threatening since they lead to violence and wholesale war. If technology goes out of control the worst that you can think of is a nuclear catastrophe.

This volume may be summed up in just three words: Nature, Mind Technology. It is hoped that it will contribute towards situating management philosophy within such scope. The following is the significance of this theme:



- *Nature* Image of the Earth, the outer circle – Management by Sustainability Principle
- *Technology* Higgs Boson, the inner circle, one of man's highest scientific achievements – discovery of the very origin of the universe – Technology as management tool
- *Mind Nataraja,* the dancing Shiva, the innermost circle - symbol of ever creative, ever inventive, ever renewing intelligence – Mind controlled responsible management

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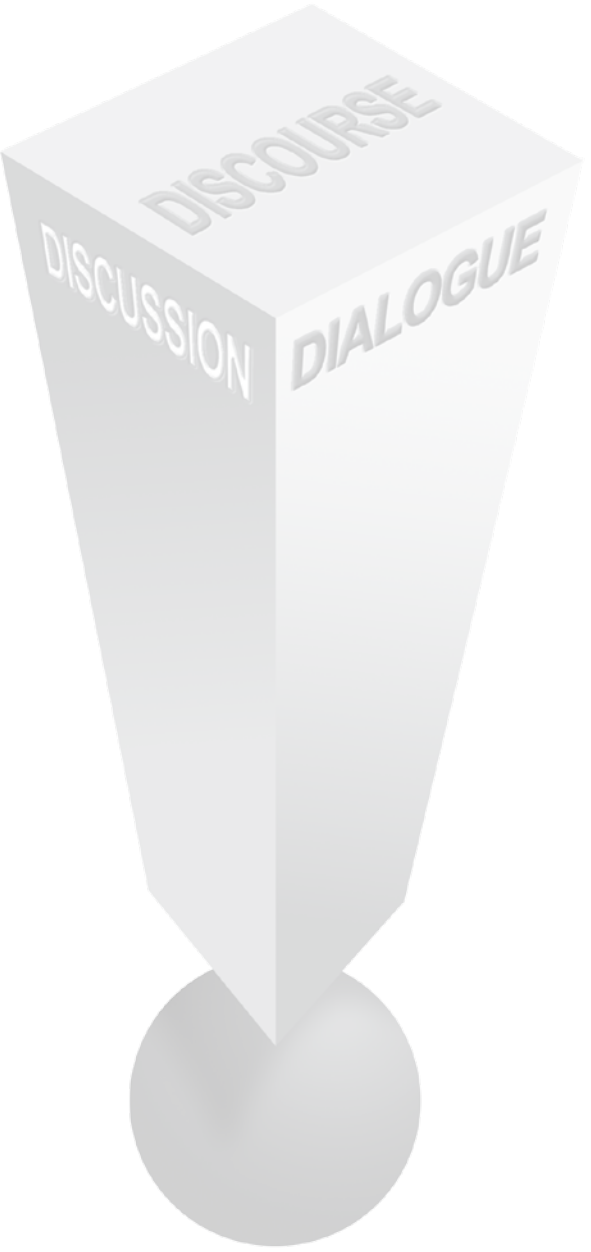
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The Strange Land of Mind and Technology

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The heritage of Indian thought has the opus of a particularly philosophical literature of renown known as 'Yogavasishtha'. In this book, a splendidly argued narrative of the long journey of mind in all its many thoroughfares and byroads displays a quite extraordinary range of diversity. The treatise surprises us appearing almost like a contemporary literary production. It provides the exploratory and theoretical viewpoints through the complexities of interpretations which can be part of a modern literature in the process of turning itself from rigorous debates to a world- wide culture famous as science fiction movies like 'Matrix'. These days we are all familiar with body swaps, the intriguing fictional scenario in which two people switch minds and end up in each other's bodies. This characterization of the technology certainly reflects the mind-transfer devices found in science fiction movies such as 'Total Recall' and 'Avatar'. To the modern world it sounds like a new idea, however, to the Indian religious / mythological scenario it allows a lot of space. For instance, one of the legendary ecclesiastical treatises mentioned Shankara, the ascetic teacher accused by his opponent of seeking a metaphysical life while shirking his responsibility from the ground reality of a house-holder, suggesting that he better found a means to live a life of a married person and then come back to his claim. Shankara is said to swap his body with that of a prince in order to prove himself. Today, the technology, science and management all suppose the possibility of such imagination as reality. Even so, the science fiction movies make for an intriguing, typically natural tension between mind and technology, a contrast which surely appears complex in nature.

It is interesting to remember in this context how both Virgil, the poet, and Swami Vivekananda emphasized what is arguably the most important about mind it's tremendous power. 'Blessed is he whose mind had power to probe the causes of things', wrote Virgil. That mind can with its gorgeous inventiveness demonstrate just how powerful an idea is, is evident from the fact in the way the idea can be transformed to praxis to technology while making one feel that it is independent of mind.

However, if it is argued that the technology thus is an extended expression of mind, the analogy may appear perilously embarrassing but may not totally be untrue. Computer itself is an example to highlight this standpoint. The use of binary logic, of memory to a larger extent by the computer reflects mind's ways of functioning. Further attempts towards this direction are continuously going on to produce computers as perfect replicas of human mind though consequences are well inferable. However, it would be a mistake to think that we are identical with computers though one may, in lighter vein, ask whether it is possible to swap mind with the computer. Or, whether it is possible to have mind-swapping technologies with highly experimental status in which case, the textbooks will need rewriting. For surely, to produce mind like machines can be the reason for great anxiety , because, the worry that these technologies will turn out to be terrible rather than noble, is a source of discredit not of vindication and might be referred to as the 'psycho-technical anxiety'.

While the philosophers believed this account which explained that the power of mind can both elucidate and rationalize, the scientists perceived a more corrosive dimension to technological functioning. One may possibly claim that though the convenient contentious division of mind and technology does not allow us to see the philosophical method that incorporates the truth, yet, Rationalism derives all claims to knowledge from the exercise of reason and purports to give an absolute description of the world uncontaminated by the experience of any observer which should be possible even through technology. Theories of mind argue that knowledge comes through experience alone, there is therefore, no possibility of separating knowledge from the subjective condition of the knower even when he is assisted by his technology. However, Immanuel Kant attempted to give an answer to the question of objective knowledge that was neither as absolute as Leibniz's nor as subjective as Hume's. Therefore, even if there are explanations which predict the persistence of technology as an independent phenomenon and undermine any claim to the truth of intellectual belief they are possibly and essentially explanations of technology from outside, and are not to override explanations from inside the intellectual point of view. Nevertheless, the theme 'Mind and Technology' in this series appears to defend a contrasting conception according to which they do not seem compatible with one another. What we have to particularly note here is that with our continuously changing circumstances, a compelling technology has been developed by experts to process a full range of informative knowledge and activities which serve to explain the plausible validity of the theories and already interpreted classified observations.

Scholars mention that the truth or validity of scientific / technological explanation is best seen not as its objective correspondence to an autonomously determined technological external state of affairs but, rather, as our experience of its consonance with a system composed of already accepted ideas (Smith, 2010). Therefore, it is important to note that foundations are provided for technology as without it verifications to an extent may not be possible. If it is said that in principle anyone should be able to compute the integrals, in practice, completing such calculations require substantial resources of time and skill. Thus, it was not long after physicist and Nobel laureate Hans Bethe prepared his report that the nature of calculation would change forever. However, in the early days of the establishment of the Institute for Advanced Study in Princeton, technological development required in the institution was not up to one's expectation. Beth, in fact, advised a young physicist 'not to expect the find too much going on' there. Even after, Robert Oppenheimer became director in 1947, the institute remained closer in spirit to a monastery than a laboratory - a place far more likely to stack Bierens de Haan's ' Nouvelles tables d' integrals' on its shelves than to host the whirr of lathes and drills.

A 'New Yorker' reported to have observed in 1949 that the institute had a 'little-vine-covered-atmosphere'. It was the legendary mathematician John von Neumann who was motivated not only by curiosity about the workings of mind/ brain phenomenon and the essence of cognition but also needed to know whether various designs for nuclear bombs would go boom or bust.

One of the perceptions of Nature – the real, the given, the ultimate referent of what's-out-there-is, whether Nature is a collective construct. But when preparing technological explanations scientists typically exempt their own activity from this kind of constructivist understanding; they think of it instead as a way of arriving at the objective truth. That is what leads them to think that scientific/ technological explanation trumps all other forms of understanding - an attitude known as scientism. Such approach holds that the operation of human minds can be understood largely through the identification of various subsystems or modules that were formed by some kind of (natural) selection in the distant past, and that are now part of our innate (genetic) heritage (Smith 2010). It is certainly not necessary that there has to be an incompatibility between technology and mind. The alleged priority or over-importance of technology is caused by misunderstanding of science regarding the imaginary potential competition for 'ontological space' between the two. While the philosopher John Locke in his 'Essay Concerning Human Understanding shows much concern with a person's accountability, that a person is concerned and accountable, owns and imputes to himself all actions, our life can radically be surpassing with 'technology participation'. Thus Locke is supposed to have assumed that we are 'thinking things', or subjects of experience which persists through time in a determinate manner (Strawson, 2012). Such responses and the general resistance to myopic consequences of technology-application are not beyond expectation though. Is mind then a human construction as the technology?

Indeed, it appears to be so. David Hume denies the possibility of mind's understanding through reason, since reason cannot operate without ideas, and ideas are acquired only through the senses. The content of every thought must be given, in the last analysis, in the terms of the experiences that warrant it, and so belief can be established as true except by reference to the sensory 'impressions' that provide it's guarantee. This is the general assumption of empiricism. Hume took his scepticism so far as to cast doubt upon the existence of the self, saying that neither is there a perceivable object that goes by this name, nor is there any experience that would give rise to the idea of it. Such scepticism, reaching back into that very point of view from which scepticism begins, is intolerable. In fact, there is no knowledge that does not bear the marks of reason and of experience together. Such knowledge transcends the point of view of the person who possesses it. Then what is the relationship of mind to technology? Technology may appear independent of mind but its character is given by the 'idea' through which it can be known. 'Idea" contains within itself the features of technology and in this sense it may be considered as an ' a priori' since it comes into existence as an idea before it is actually produced as an object. How can I come to know of a particular technology through pure idea/ reflection without recourse to its actual production? According to Kant, there could be no explanation of a priori knowledge that divorces the object known from the perspective of the knower. For instance, one can have a priori knowledge only of the world that one experiences. *A priori* knowledge provides support for, but it also derives its content from empirical discovery. Kant gave as the most conspicuous example for instance, mathematics, which we know by pure reasoning, but not by analyzing meanings of mathematical terms.

There ought to be a philosophical explanation of the *a priori* nature of technology. Because as it is said that 'the world consists of technological equipments which exist independently of

me', or that 'all discoverable objects are in space and time': these propositions cannot be established through experience, since their truth is pre-supposed in the interpretation of experience. Nonetheless, technology has become a commonplace both in academic circles and in the wider society. Mind's crucial role in motivating technologies by thinking carefully about them requires sorting out when and why these matter. At the same time it has increasingly aligned itself with new explorations in technologies which share its confidence in the pursuit of humanitarian considerations. Recently a report on HCG cancer model has astonished the Harvard Business School as the intrigued researchers of the school tried to figure out how this Central Bangalore Hospital has not turned away any poor cancer patient. Its cancer care model is now a case study for the Harvard Business School. What interested them was Dr. Ajaikumar's hub-and–spoke expansion model in which a central hub in Bangalore performed high-end imaging, therapy and complicated procedures at lower cost while the spokes provided basic therapy and follow-ups in the patient's local communities. Using this model, HCG expanded to twenty centres so far. Thus, philosophy does recognize itself as a contingent product of culture and therefore, aligns itself with development of science and technology. Not that it is something strange. A long philosophical tradition, including Aristotle, Hume , Locke and their successors concerns itself with thinking through the implications of a broadly scientific picture of the world and mind reconciling the picture of with what Wilfred Sellars called the 'manifest image' the way the world appears to us in everyday experience. Philosophers of science take scientific investigation as a model of rationality, and try to make sense of the metaphysical implications of theories in physics and biology. More recently, the philosophers of mind have used the empirical findings of the cognitive sciences - especially the neuroscience and social development and evolutionary psychology to formulate and revise claims about the workings of perception and the organization of mental structure (Srinivasan, 2011).

Despite all this Indian philosophical schools seem mostly untouched by the claim that mind as an 'independent faculty'. While this can prompt a huge cultural shift towards an alternate perception agreeable or not it surely is a complex one. For these Indian schools, the standard dialectical form to rebut this claim has always been to debunk mind from its 'ivory tower comfort zone' being aware of its far-reaching power playing crucial role in human life. Almost all the philosophers of 'Consciousness Study' in India have generally treated mind as matter and not 'Consciousness'. Knowing that these categories have implications of their own, any discussion of these here right now warrants deviation. What is significantly central is that most of these philosophers treat mind as material and refrain from the assumption that it has its own independent existence, hence, any reliability of human reason necessarily makes for false beliefs and also is redundant as far as the higher planes of experience related to Consciousness is concerned. It is, however, interesting to note that this resistance towards mind's capability is neither due to their intellectual laziness nor did it arise from a defeatist angle. This perhaps goes some way towards explaining philosophy's growing isolation within humanities. From the perspective of many, philosophy's failure to recognize itself as a contingent product of culture and history makes the discipline seem precious and antiquated at best, dogmatic at worst (Ibid). For Indian schools of thought mind and Consciousness are two different kinds of activity also two ways of trying to understand the nature of reality - the reality that exists independently and may not agree with our conventional belief system. The gulf between these two is said to be profound and the belief that mind can independently deal with objective reality is deluded. According to them mind is supposed to express only relative truth and not the absolute which ensures that it is a human construction that facilitates our

interactions with our environment. 'Prakriti' thus in the school of Sankhya, is the term for' the world of matter', and as mind is one of its evolutes it has matter as its fundamental substance. This does not undermine the gravity of matter though but only offers a serious explanation of the source and working of mind acknowledging the fact that much of our world is a human construction, a technique in some sense. Human beings engage mind as the best technology to understand language, finance, culture, custom, sports and many more things.

The activities in the domain of science support and further this argument showing how the choice of mind as the best computer is reflected in the production of computers anticipating the research needs of academic and administrative communities. A case study of the work of Hans Bethe mentioned earlier makes this issue central to contemporary perception. Beth had become one of the world's experts on nuclear physics in the 1930s, and in 1947, was asked to tackle the problem of shielding for nuclear reactors for which he needed to evaluate integrals of a particular form. This was nevertheless a deliberate demonstration of mind's mastery, a testament to its use as both reason and technology. It is important to note here that critical thinkers in Indian philosophy present their views on the varieties of activities performed by mind with their signature blend of erudition and provocation to generate the debate with a penchant for discussing the travails of mind destined to be both the 'means' and the 'act' as the context demands but never to be an 'end'. Similar perceptions had gripped John von Neumann, the mathematician who was impressed by a vision as remarkable as Charles Babbage's a century before – perhaps one could build a machine to calculate motivated not only by the curiosity about the workings of the mind / brain and the essence of cognition. These days, run-of-the-mill software on an ordinary laptop can evaluate any number of integrals in microseconds. Thus, the computers which have aped the brains functioning are both 'means' /instruments to reach an end and also an 'act' to reach the same end which according to Indian philosophers is legitimate and compatible with one another.

While the evolutionary explanation of the origin of mind from matter (Prakriti) advanced by the Sankhya school explains the premises that may be contested by other viewpoints it is certainly appealing to see how human cognition of the 'full range of processes and activities through which, as embodied creatures we like other organisms, interact more or less effectively with our continuously changing environments, thereby ourselves changing more or less continuously (Smith, 2010). Sankhya's approach to mind appears to be very pragmatic and a constructivist understanding which suggests that mind can be seen to an extent as an 'autonomously' determining agency having the capability of many functions like creating a system composed of ideas regulating , interpreting and classifying observations, engendering perceptual and behavioural dispositions and so on. It appears to be the highest technology we have so far as some of the anthropologists like Pascal Boyer and Scott Atran have directed their perceptions to evolutionary psychology to support this understanding. Their approach holds that the operation of human minds can be understood largely through the identification of various sub-systems or modules that were formed by natural selection in the distant past, and that are now part of our innate genetic heritage. But Gilbert Ryle adds an earnest voice to this discussion, adding an interesting contribution to the debate on the nature of mind. Human bodies, according to him, are in space and are subject to the mechanical laws which govern all other bodies in space. Bodily processes and states can be inspected by external observers. So, a man's bodily life is as much a public affair as are the lives of animals and reptiles and even as the careers of trees, crystals and planets. But minds are not in space, nor are their operations subject to mechanical laws. The workings of one's mind cannot be not

be witnessed by other observers; its career is private. Only I can take direct cognizance of the states and processes of my own mind (Ryle, 13: 1990).

Centering on the specific aspects of mind's working and their wider implications it becomes further necessary to explore new critical insights on its various ways and developments. An indispensable part of the neuroscience research is the 'brain'. Many scientists not only avoid the term 'mind' but also the mind-brain equation since it appears a less scientific approach. Also it may pertly be that the term mind is more apt in the context where cultural predispositions are taken onto considerations, where subtleties and beauties of expression arise from feeling and literatures depend on it. This is no cause for lamentation since not all disciplines in medicine may think this way but harness mind and turn it to their disciplinary ends, like the discipline of psychology. Dr. V.S. Ramachandran, director of the Center for Brain and Cognition, professor of Psychology and Neuroscience, at the University of California, San Diego, in his book, The Emerging Mind, mentions that the greatest revolution of all is understanding the human brain. In fact the brain is like a Pandora's Box which seeks to exhibit the odd, bizarre and exceptional insights and yet remain as the contested space. Ramachandran cites an experiment made by the American neurosurgeon Benjamin Libet and the German physiologist Hans Kornhuber on volunteers exercising free will, instructing subjects to , for example, wiggle a finger at any time of their own choosing within a ten-minute period. A full three-quarters of a second 'before' the finger movement the researchers picked up a scalp EEG potential, which they called the 'readiness potential', even though the subject's sensation of consciously willing the action coincidedalmost exactly with the actual onset of finger movement. This discovery caused a flurry of excitement among philosophers interested in free will. For it seemed to imply that the brain events monitored by the EEG kick in almost a second before there is any sensation of 'willing' the finger movement, even though your 'subjective' experience is that your will caused the finger movement (Ramachandran, 101: 2003).

But can the willpower be the cause if the brain commands begin a second earlier? Then, is the gulf between brain and mind we are trying to explore is profound? Is it possible that the scientists who think they are exploring objectively are disillusioned and does science appears to be equally a human construction? Intervening between these questions Ramachandran brings a deeper understanding of the problem. So we have a paradox, he says, on the one hand, the experiment shows that free will is illusory: it cannot be causing the brain events because the events kick in a second earlier. But on the other hand, the delay must have some function. Otherwise why would the delay have evolved? Yet, if it does have a function, what could it be other than moving (in this case), the finger? Perhaps, our very notion of causation requires a radical revision… as happened in quantum mechanics (Ibid, 104). However, as mind and technology both present challenges in their history we continue to ask what role is of mind in the new technological landscape. There is no doubt that technology is something tangible and therefore perceivable while the same is not true about mind. The perceptive study of Kant reveals the shifting images rendered by mind in the journey of human understanding. While the understanding properly employed, may yield objective knowledge, it also contains a temptation to illusion. It is this temptation that Kant attempts to diagnose and critique in his examination of 'pure reason', and once again his argument has a subjective and an objective side.

The same shifting images are also responsible for the 'discovery of human epistemic arrogance which is allegedly inadvertent. But so were many other discoveries as well: almost everything of the moment is the product of serendipity; Technology is an example of serendipitous discovery. In other words, you

find something you are not looking for and it changes the world. People did not just embark on the project of inventing the wheel and then complete it according to the timetable. Likewise is the case with most inventions. Any idea or knowledge does not progress from tools designed to verify or help theories, but rather the opposite. The computer was not built to allow us to develop new, visual, geometric mathematics, but for some other purpose. It happened to allow us to discover mathematical objects that few cared to look for. Nor was the computer invented to let you chat with your friends, but it has caused some long distance relationships to bloom. The Internet has helped one to speed his/her ideas but this was not the stated purpose of its military designer (Taleb, 166: 2007). Technologies are not invented according to some prefixed equations. The many advances in science made us feel that we are the champions, no more is there any uncertainty and that the 'future was a mere extension of our technological certainties'. Henry Poincare thought otherwise. A mathematics genius and a philosopher of science Poincare explained that there are fundamental limits to our equations.

There can be lengthy expositions about the fantastic technology involving computer, internet, laser and so on, but they were not pre-planned inventions, they were unplanned, and so not a 'Platonic category'. Scholars may talk of emancipator future that hint at a necessary problem solving social transformation but we should also remember to note how rival doctrines that stem from these perceptions may gain precedence reopening the dilemmas of integrity. As a frequent visitor to Kant's philosophy one might find this kind of ambiguity for sure. Kant's assertion that transcendental idealism entails empirical realism is difficult to interpret and understand. He argues, for example, that space and time are empirically real and also transcendentally ideal. This could mean that, if we take an empirical perspective, so to speak, then we acknowledge the reality of space and time; while from the transcendental point of view, these things are nothing at all. However, the idea of a transcendental point of view is, as Kant recognizes, highly contentious. It is not a point of view that is available to us and therefore, not something of which we can have a positive conception (Scruton, 57: 2001). Despite all this being so unpredictable and despite the fact that almost any individual's mind contains a great mixture of cognitive and emotional material that is not fully coherent people begin serious reflections on mind, technology, theories and so on and their proper relationship with the world. Yet the powerful drive towards a consistent overall world-view is based on the widespread conviction that there is a single objective reality within which our multiple subjective perspectives and disparate social creations are situated and that we have the mental resources to advance our understanding of that reality. That means the fundamental questions, such as whether the natural sciences leave any room for the possibility that our existence has a higher purpose, will not go away. And this position is first and foremost a celebration of the art of existing.

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Nature, Mind and Technology: Merging Boundaries

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The 3 E crisis today

Humanity today is at a threshold: of self annihilation and at the same time, a new beginning. The crisis at **E**conomic level, **E**motional level and **E**cological level – 3E - are forcing us to slow down, take a pause and re-look at our journey. **Economic** level we all are aware of the recession impact and the overhauling that banking and financial systems are going through. Management consultants are as much a part of the problem. **Ecological** level the impact of Climate Change can't be refuted any more and awareness strangled by labeling it as 'some activists against progresses'. Mental Health is a major concern for W.H.O. today and the rise in depression, violence due to **emotional** disturbances are waking us at the Emotional level too. How come we have failed in achieving balance between evolution of technology and evolution of our Nature and Mind? We are still guided by survival based emotions of fear, greed, attachment, short term thinking, myopic selfishness, disconnection from Nature and other humans.

Failure of Technology

What is happening? Technologically, we seem to have advanced so much compared to earlier times in our history. As Sadhguru Jaggi Vasudev says, "We have done a lot of outer engineering; it is now time for Inner Engineering." The theme of this conference is apt. The theme I find timely as it prefixes Nature and Mind before Technology. We have disconnected ourselves from Nature, hence our roots are bleeding, and we have become emotionally numb and malnourished at Soul/ Spirit level. Universe and we are not different. We come out of Nature, we are interconnected. However, we have developed technology to overpower Nature without understanding

our relationship. Result, we have destroyed Nature, and are destroying our selves. Technology has not been sustainable. Mind is still mystery to us. We know scientific formulas and distances between galaxies, but do not know how breathing happens in our body to connect with mind, nor do we know the distance between two thoughts in the mind.

Need for Wisdom

Inner and outer worlds have a correlation. Technology in outer world without understanding inner world has not helped us in real sustainable progress and wellbeing. Lack of compass leads to lack of compass-ion. Without compassion we are devoid of sensitivity to others' wellbeing and holistic long-term perspective to Life. Hence technology has proved fatal for us rather than making us healthier and happier society. Technology without compass of Consciousness is misuse of Intellect or living against the wisdom. We realize that 3E crisis is result of this kind of thinking and living. 3 E is result of contamination, virus in our intellect. Reformatting the disc requires purifying the Intelligence. In Ayurveda, any disease is result of 'living against wisdom' – Pragna Aparaadh. Now I find this an amazing definition as right now we are dealing with diseased society and humanity that has certainly lived against wisdom. We need to reconnect with Wisdom of Nature, wisdom of managing Mind. And Yoga, specifically I refer to Patanjali Sutras as cultivating wisdom or Pragna in us at individual and collective level. The conference aims at exploring "intelligent solutions." How is wisdom different than intelligence or intellect?

The Western perspective of IQ as intelligence has been very limiting. It is coping and surviving skills. And unfortunately Management Education is designed and driven by IQ, even in India. Indian perspective of Intelligence is very different where there are levels of Intelligence that have different functions. Also, West sees brain as center of IQ while India sees Heart as seat of Consciousness and different kinds of Intelligence illuminate the brain-mind-body from the Heart. Hence when we say we are looking at 'Intelligent Solutions', our Intelligence has to come from the 'Higher' realms of consciousness. When it comes from higher realms, it illuminates the truth, reveals the truth. Hence there is no manipulation, power politics, selfish games.

Merging Boundaries

At one level I do not like the terms to be generalized as West/East thinking, Modern/Ancient understanding as these seem rather superfluous. However, as I research deeper into Patanjali Sutras I realize that these distinctions do exist. While Shamans, Kahunas, Tibetan Monks, Zen Masters and other wisdom holders in different parts of the world in ancient times did have deep understanding of the Universe, Human Life and Heart Intelligence, the modern 'sciences' do not incorporate this wisdom. Also I am unable to find any text which narrates these in one place like Vedas or Patanjali Sutras from India. It is more of my limitation rather than limitation of the West. So when I refer to West, and modern, it is my personal understanding and I am ready to stand corrected.

At another level, the boundaries of science and philosophy or spirituality are merging with new understanding of Quantum Physics, medical neurosciences and biology. It is sad that Management as science or art is far too outdated in incorporating these new insights in education or day to day functioning. New technologies do get incorporated and innovation is seen as inevitable for business sustainability, however, understanding and developing 'Human Model' of business for sustainability still seems ideal or utopian.

Why Patanjali? Pathway, Practice & Participation

Why am I researching Patanjali Sutras? Patanjali collates from existing Yoga literature

Sutras or steps for healthy-happy living. He shares 3 Ps with us. He shows us the Pathway, gives us Practices and makes us Participate consciously by making informed choices. I find Patanjali as a scientist who has given us 'how to' manual for scientific inquiry and formatting our discs, rewriting programs and playing Life Game at a different level. To me, Patanjali as scientist is sharing with us the Technology of Consciousness to evolve Higher Intelligence.

In this paper I want to elaborate this fusion of Technology and Consciousness by illuminating the Nature of Mind. The advantage can be manifold, but main three that I see eminent are: One, in management education how do we incorporate this technology of consciousness? Two, how do organizations become sustainable by incorporating this technology in their everyday functioning, business strategy and evolving culture? And Three, how do we develop Leadership Model based on Patanjali which is Purity based and not Power based?

Technology and Consciousness – Purity Based Leadership Model

What is the use of technology for managers, leaders and organizations? Obvious utility seems saving time, getting information and communication at finger tips, shrinking geographical distances, and take over functions that human hands and brains have been doing. Technology helps make more informed decisions. However, technology has also created health hazards, pollution, and alienation of human relationships and made our life rather mechanical. On a broader note, let's look at how technology has impacted humanity. In Physics, Fission is the breaking of an atom to release energy and it is the principle used in the atom bomb. Fusion on the other hand is uniting two atoms to release energy. Human beings have used fission to destroy and show power. With advent of consciousness along with technology, fusion to create more positive energy can become a way of life.

When I read The Mother, there are many converging points as Sri Aurobindo also gave Yoga as the only Pathway for evolution. And Mother had lots of expectations from Technology. She understood what technology can do to mankind and how it can be misused or rightly used. She also indicated that "just as this century may be called the electronic or computer age, the next century would be the century of consciousness, where the technology of consciousness would be developed to its fullest."[i]

What is the role of consciousness in our life? Consciousness is purity of brain, heart and mind. Consciousness is awareness and knowledge through direct perception or what we call in India Darshan. Our brain is just like computer- has stored memories called Samskars. What we normally call as thinking is only association in brain of correlating present and past. The memories are contaminated by our past experiences of likes and dislikes. And we see everything through this lens. And mind is the power that connects the outside world to the inside. It also has many layers and is very active all the time. Its like our mobile phone, even when on silent mode, the vibrations may keep on happening. So from mind, we need to reach a state of 'no-mind' to let our intelligence or Pragna play a role. Compare it to computer games. Different levels of game require different skill set and level of concentration. Now even in our own body, the mind has various levels and depending on our concentration, we can go to the next level. Now, the beauty is, mind itself is the barrier in reaching the next level. So, the challenges are at two levels, one, how to silence the mind, or go to no-mind state, and second, how to activate the consciousness through concentration so that Pragna is activated.

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[i] *The Technology of Consciousness, Sraddhalu Ranade, Dipti Publications, Sri Aurobindo Ashram, Pondicherry, India, 1997*

Levels of Intelligences or Pragna

What is the role of Pragna? Pragna is the wisdom that downloads right information from Universe, churns it into insights, and helps us take better decisions. And how is it different than other levels of intelligence? According to Patanjali, there are three types of Pragna: One is Shruta (what is heard) and another is Anuman (what is inferred).[ii] All our education is designed to develop these two. Know is heard, and then the power to infer is cultivated. However, it is important to note that inference is always based on past experience or association. What is heard is knowledge or inferences of other human beings. Therefore these two have their own limitations. They are corrupted or contaminated by limitations of our human experiences. It is very interesting to note how the latest branch of Psychology, called Evolutionary Psychology is illuminating similar insight. It says that "We are out of the Stone Age, but Stone Age is not out of us."[iii]

These stored scripts create conditioning, thinking tracks, behavioral patterns, and association of emotions at sub and unconscious levels. We have moved away from the initial hardships and scarcity of resources, fears of survival, and yet, our modern day psychology is still governed by them. Shruta Pragna creates stories and Anuman Pragna makes us stuck in those stories. This is what Patanjali calls chit vritties due to Samskars. And when he talks of Mukti, we may not just philosophize by saying 'liberation' and keep it high away on pedestal. Mukti is freedom, freedom from old scripts, formatting the disc and re writing a new program. This is technology of Consciousness.

Hence Patanjali talks of third kind of Pragna that develops as result of Vivek. It is sad that we download everything from Western management literature, but do not modernize our own insights. 'Vivek' is a must competency for all of us and can only be cultivated by sustained practices of Yoga. Vivek is the discrimatory power within us that allows us to make right choices- long term vs. short term, selfish vs. selfless, humanitarian well being is result of Vivek. Vivek is must competency for right decision making. When one learns to get into the zone of no-mind, a silence complete, what Patanjali calls 'nirvichar' state,[iv] then this third kind of intelligence, highest truth reveals itself in us. This is called Ritambhara Pragna.[v] Rit is Truth or Law of Nature. Pragna is intelligence or knowledge. Hence this is revelation of the Truth inherent in object, situation or problem. How is it different? When we say Truth inherent is revealed, then it is free from all stories, associations, inferences, and personal prejudices of like/dislike and perception filters of past conditioning or Samskars.

Many of us have had this experience when we get insights, inspiration or just 'know' or 'understand' completely, from very different perspective. This is the Ritambhara Pragna awakened momentarily. It happens due to purity of moment, being in no-mind zone or just being blank and in receiving mode. And when we communicate this truth to others, there is an authenticity of the Truth itself which makes it acceptable, irrefutable. We all have read or heard scholars who talk or write from Shruta Pragna. They are not communicating their own truth, but what they have heard from others. When we need innovation, new ideas, original insights, then Shruta or Anuman Pragna are not effective. We need to be in Ritambhara Pragna state.

Results of Living with Ritambhara Pragna

When we talk of technology, then innovation, continuous improvement are the norms. However, we have not looked at our own

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[ii] *Light on the Yoga Sutras of Patanjali, B K S Iyengar, HarperCollins Publishers India, 2002, Page 95 Y.S. I.49*
[iii] *How Hardwired is Human Behavior? Nigel Nicholson, HBR July-August 1998 page 139*
[iv] *Light on the Yoga Sutras of Patanjali, B K S Iyengar, HarperCollins Publishers India, 2002, page 93, Y.S. I.47)*
[v] *Light on the Yoga Sutras of Patanjali, B K S Iyengar, HarperCollins Publishers India, 2002, page 95, Y.S. I.48)*

brain-mind as instruments or technology that need up gradation. As we upgrade other gadgets, or technology, we need to learn practices that upgrade our consciousness. How do we create higher versions of our own self? In this paper, it is not possible to elaborate eight steps of Patanjali Yoga. However, they are: Basic attitude cultivation through Yama and Niyama, Body discipline through Asana, Cleaning up the mind disc through Pranayama and Pratyahaar, Getting into no-mind zone through Dhyan and Dharna. The ultimate is Samadhi which is connecting with The Motherboard for download. When there is time for an idea to 'manifest', a person who is receptive will be able to connect with it. Therefore, the edge of being 'first' can be achieved. This will certainly be 'purer' or non contaminated idea as to keep us away from the 3 E crisis.

Evolution of technology has led us into self annihilation. However, Technology of Consciousness or Ritambhara Pragna will lead us to intelligent solutions. The era of competition is outdated format. The next era is one of co-operation, compassion and co-existence. Even Patanjali mentions in his Sutras, the 4 fold benefits of Ritambhara as: Maitri, Karuna, Mudita and Upeksha. Maitri is co-operation, Karuna is compassion, Mudita is pure Joy and Upeksha is being neutral to happiness/unhappiness, merit/demerit, etc.[vi] The world of business is realizing the virtues of collaboration and co-operation. Competition is no more an edge in business. Excelling one's own products and services is the edge. And this can be achieved only through people. Hence people have to be upgraded not just in skills and competencies that are job based, but human evolution based. Karuna is compassion and it is fast getting entry as Leadership Competency, in nurturing talent, retaining talent. Compassion is also seen as antidote for stress related diseases. Joy at work has been the latest in organization development interventions. Being neutral to everyday tensions of business results creates equanimity and makes us face life in much more calm, tranquil and stress free way. It increases our emotional resilience. Based on Ritambhara, Leadership Model that is purity based can be developed rather than power based. We have already experienced results of power; now let's give purity a chance to make this world a better place.

Summary

1) We are at threshold of crisis that needs immediate attention and evolution of technology has to be balanced by technology of consciousness. We have lived against 'wisdom' and need to go beyond limited manipulative intellect.

2) Patanjali Yoga Sutras are manual to cultivate this technology by formatting our mind discs, cultivating purity that connects with wisdom or Ritambhara Pragna.

3) Intelligence has levels and Ritambhara is the highest available to us. The others being Shruta and Anuman which are repetitions of stories and patterns.

4) Practices of eight steps of Patanjali help us outgrow lower intellect and reveal the higher intelligence.

5) Cooperation, compassion, Joy and Neutrality are 4 fold benefits of this purity of wisdom.

6) When our technology is guided by this wisdom, humanity will rise above the crisis of survival and evolve to next level of Higher Living.

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vi Light on the Yoga Sutras of Patanjali, B K S Iyengar, HarperCollins Publishers India, 2002, page 80, Y.S. I.33)

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Am I My Brother's Keeper?

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Throughout history there have been many examples of the ideal of being your brother's keeper. If governments talk of welfare and of the 'greater common good' of people, it is often forgotten that it harms the interest of a minority group of several thousands. I am my brother's keeper' is a shorthand for an ideal self-sacrifice and service to the larger group. At least it's supposed to be, both by the Law and in spirit.

When the Bhakra Nangal Dam was built in the 1950s, the interest of the larger urban population was addressed with the sacrifice of the far smaller group of people, of farmers and landowners who were affected by the creation of the dam. The same goes for the many millions who have been affected along the banks of Narmada with the dams built.

At one end it stands for altruism in a sense of the government 'imposing' by force, caprice and an unholy nexus with Bysiness, such sacrifice upon people who are directly hurt and affected. In another sense, and truly so, is it about service that you offer to others out of joy and for its own sake?

The forms of governance that we have seen for 50 years -- across the world with India being only an insidiously corrupt exception - have shown that this phase is more served as parasitism that lies behind every such act of economic in the garb of social development.

Even Obama has described politics as resting on the principle that we have a stake in each other. That I am my brother's keeper and my sister's keeper and what binds us together is greater than what binds us apart.

It is clear he means that the government must force people to support every kind of person who is suffering no matter what the reasons for the suffering are. No matter who, every individual has an obligation to any of the sufferers. You are responsible for them all.

The trouble is that when a person speaks so with the power of the gun or of the bureaucracy, he preaches to us about binding us together and not about doing things that benefit each other.

So when governments act the way they do or when companies act for maximizing gains – more economic than social – are we not acting in merely our own self-interest?

When you set out to do an act of CSR, you are saying, "Please tell me what you want me to do. I am at your service." You are saying, "It is I who will serve you and be at your service."

If helping your brother is a standard of morality, then how does one see the bizarre spectacle of individuals, companies, and senior bureaucrats and politicians forcing helpless and mute millions to give up or sacrifice their lands, their forests, their rivers, and to suffer untold misery in the name of helping one's brother? So what are the solutions you could look at, that could end your being a parasite if you are an urban consumer? That is true CSR.

Public concerns have to become private causes. This means effectively that we need to act as individuals to mitigate some of these challenges of living in cities without having to depend on the hinterland for all our requirements. Can you secure power in your home or office without destroying that forest or coal-bed in Odisha or Jharkhand? Can you secure water inside your home or office without your having to seek them as long-distance supply sources from rivers that are depleting, and without destroying fragile groundwater tables with bore-wells? Can you manage your waste at home in a way that you don't have to dump them in millions of tons in human settlements just outside your city?

We could say that of the extended levels of consumption which require energy - your PC and laptop needs chips that are manufactured with water that comes from 3000 meters under the ground and that depletes very sensitive water strata of the earth; buying a car means a few tons of iron ore that are depleted from our rich forests in order to make the sheet metal or the engines that use aluminium which in turn need bauxite from those beautiful forests that barely survive after the last 100 years of depletion and depredation.

If you look at India and the last 50 years, you will see that we brought the green revolution that poisons soils. Today there are only the hills that remain repositories of biodiversity. You brought a system of centralized energy generation, which means that you produce 10 units in some distant thermal or nuclear or hydro-electric plant for you to consume one unit of such energy centrally generated. Today India has generating capacity of 200,000 megawatts, while actually all her cities and industrial and farm energy requirements is no more than 30,000 MW at end-user levels.

Can you move from such supply/side thinking, which are insensitive to ecosystems and to their vulnerable people, and move firmly toward demand-side approaches where you tell yourself that the only solution for energy deficiency, is not energy generation, but is energy efficiency.

How do you move away from near protection of natural resources with a few CSR initiatives for environment protection and move towards active reduction of abuse of natural resources in every single item of purchase that you indulge in every day - as an individual, a corporate manager, or as a Business leader? How do you move from these market-led central solutions for energy, water, and waste and move towards federal and local solutions within your home, neighbourhood or office block?

In your grandfather's time, as late as the 1950s, your dependence on such central solutions was not even 10 per cent of what it has today become. You did not use bore-wells which needed long distance power; you used the shallow, energy-free open wells for cultivation water. You used water that was harvested from the rains by your village tanks and you did not depend on long-distance supplies.

You ensured until the 1970s that most of the waste that you produced (and that was minuscule by today's terms), was locally treated and used as compost for the farms nearby. We did not have plastic and glass that is not degradable for many million years.

We had not invented many of the chemical compositions that make for these creature comforts that have been designed in the last 50 years.

How do you move today from central infrastructure to self-reliance with from government agencies for energy, water and waste? How do we go back to understanding the very basic principles of life at Tolstoy Farm that Gandhi created or the many examples that Alvin Toffler talks about in his "The Third Wave". How do you understand the anguish of a Prof. Madhav Gadgil when he writes of those heart-rending stories that he documents in "Ecology and Equity?"

How do you move away from a mere CSR to a profit-making enterprise that does not make money as its only objective? If making money was the only such activity for a company, it would be meaningless. How do you make CSR not merely a Sunday absolution of the sins of the rest of the week? How do you ensure that you spend money on brand and public relations in a way that you make your customer a responsible citizen while being, of course, the consumer that s/he has to be in order to support your company's business.

How do you consciously look at your not being merely a benefactor offering a certain benefit to targeted beneficiaries for meeting their wants? How do you morph this into a strategy that meets the customer need while reducing your company's ecological footprint? How do you position your communications with intelligence to ensure that every single strand of thinking in your organization is embedded with this relentless logic of public responsibility?

I have more questions than answers. The purpose is to provoke thought in an India that is today the envy of the world as an economic powerhouse?

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Rethinking On Sustainable Development: Self-Development, Social Transformations and Planetary Realizations[1]

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The response of the "I" involves adaptation, but an adaptation which involves not only the self but also social environment which helps to constitute the self; that is, it implies a view of evolution in which the individual affects its own environment as well as being affected by it.

As a man adjusts himself to a certain environment he becomes a different individual; but in becoming a different individual he has affected the community in which he lives. It may seem to be a molding of the individual by forces about him, but the society likewise changes in this process, and becomes to some degree a different society. ***The change may be desirable or it may be undesirable, but it inevitably takes place.*** *- George Herbert Mead (1934), Mind, Self and Society, pp. 214, 215, 226. emphasis added.*

What is managed under the policy of sustainable development is not the path towards a more sustainable future, but rather the inability and unwillingness to become sustainable. - Valerie Fournier (2008), "Escaping from the Economy: The Politics of Degrowth," p. 530.

Harmony with nature should become a non-negotiable ethic. The rise and fall of great civilizations in the past have been related to the use and abuse of land, water and other natural resources. - M.S. Swaminathan (2011), In Search of Biophappiness: Biodiversity and Food, Health and Livelihood Security, p. 116.

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[i] *This builds on an essay of mine for a special issue of the journal Social Alternatives on sustainable development. I am grateful to Marcus Bussey, the editor of this special issue, for his kind invitation, comments and help. This also builds upon two recent books of mine, Sociology and Beyond: Windows and Horizons (2012) and Knowledge and Human Liberation: Towards Planetary Realizations (2013). I am grateful to Dr. Daniel Alberque for his kind invitation to this book journey and for his patience.*

We need to balance the advances of science with the wisdom of indigeneity. We need education that encourages us to integrate the many aspects of our being. Through meditation and art, we can connect with our mother earth and reaffirm our cooperative nature, recognize the environment as part of ourselves. Planting seeds of peace, turning inward towards ourselves, we can heal ourselves and heal our planet. - Sulak Sivaraksha (2009), The Wisdom of Sustainability: Buddhist Economics for the 21st Century, p. 44.

Introduction and Invitation

Sustainable development is a key challenge of our times but the discourse of it is many a time locked in an existing status quo without foundational interrogation of the dominant and dominating frameworks of economy, polity, self and society. We need to rethink and interrogate such a status-quoist understanding and practice of sustainable development and realize it as a multi-dimensional process of self and social transformations leading towards planetary realizations. In this sustainable development goes beyond the prisons of both nation-state centered rationality, productivisit profit-maiximization and anthropocentrism and contributes towards planetary realizations. Planetary realizations challenge us to understand that all of us including non-human beings, plants and species are children of Mother Earth. Anthropogenic presence in the life of earth has created tremendous pressures on other life forms and matter. We need to conduct ourselves in a responsible way so that we nurture our Mother Earth as an abode of flourishing for all of us (cf. Novacek 2011).[i] So, sustainable development involves responsibility, in fact a process of responsibilization. Sustainable development is also not just a noun, it is also a verb; in fact it is a manifold verb of action, meditation and transformation of self and society. Our engagement with sustainable development challenges us to move towards sustainable flourishing including creative mind works in self, ecology and society.

Fortunately for us, in the shifting discourses of sustainable development, we have some initiatives in new thinking and movements which present us sustainable development as a transformative process. We see this in the works of movements such as the de-growth movement, transition town movements and visions and practices of scholars such as Marcus Bussey and scientists such as M.S. Swaminathan. In this essay, I present a glimpse of their work and then discuss the challenges for transformation of self, society and mind that realizing transformative sustainable development presents for us.

Sustainable Development as a Transformative Quest

The current discourse of sustainable development owes its origin to initiatives such as the classic *Limits to Growth* and the United Nations Conference on Environment and Development in the 1970s (Meadows 1972). But sustainable development did not really challenge the growth paradigm of modernist development as a result of which we have witnessed the rise of a de-growth movement in vision and practice in European societies. While becoming mainstream, "sustainability has been washed out of its more radical questioning of economic models" (Fournier 2008: 530). The de-growth movement challenges the growth paradigm of contemporary development and argues that unless we put a halt to economic growth we cannot realize sustainable development. "The de-growth movement vigorously supports the

[i] *In this context, what Kathryn Yusoff and Jennifer Gabrys write deserve our careful consideration: [..] there is a concurrent geographic imaginary that gestures towards the universal and the epic, that of the Anthroposcene: The Geological Age of Humans. The framing of human activity as a geomorphologic force summons up to the imagination what might be termed, after the French philosopher Michel Serres, 'the plates of humanity.' The destructive nature of these 'plates of humanity' to other forms of life raises questions about how we imagine and understand the collective human condition, the longevity and sustainability of Homo Sapiens, and the impact of humans on nonhuman [..] worlds (Yusoff & Gabrys 2011: 529)*

'post-development' critique" (Martinez-Allier 2010: 1745) and "socially sustainable economic de-growth is a concept that is finding its way into social ecology, human ecology and ecological economics" (ibid). The de-growth movement has also been accompanied by the rise of transition town movements in Europe. In transition towns and ecological villages inhabitants try to live in an ecologically sustainable way. They try to live with solar energy and other renewable sources of energy.

Alternatives emerging in degrowth and transition town movements can be read together with some other important contemporary visions and practices. Marcus Bussey in his work on sustainability presents us a layered concept of sustainability. Sustainable development here is not confined to the field of economic development only and it embraces many fields and aspirations of our lives in self and society. Bussey presents us five categories of sustainability - physical, intellectual, emotional, ethical and spiritual. Bussey links moves towards sustainable development intimately connected with self-transformation as he writes: "The only response is to take sustainability personally, to begin the slow process of remembering who we are and achieving the multi-layered strands that underpin an integrated sustainability that can generate transformative educational practice" (Bussey 2008: 144).

Adaptation is much talked about in the discourse of climate change and it has implication for our vision and practice of sustainability. But like sustainable development, adaptation is not a noun but a verb; it needs to be a meditative as well as transformative verb (Giri 2012). Bussey et al. talk about the need to develop adaptive capacity and for them, "Understanding adaptive capacity as the dynamic potential inherent in context can stimulate thinking about context that is free from habit and conditioning" (Bussey et al. 2012: 387). Adaptive capacity is also a process of creative capacitation in which leadership; technology, imagination and institutions play an important role.[ii] For Bussey and his colleagues, authoritarian leadership is likely to "foster short-term maladaptive responses to climate change. Such leadership tends to reduce creativity and the sense of agency in its citizens, communities and institutions" (ibid: 391).

M.S. Swaminathan is a creative leader in science and institution building who has offered us new pathways of sustainable development. It may be noted that Swaminathan was the pioneer of green revolution in India but now he pleads for evergreen revolution which is sustainable and makes a transformative balance between economy and ecology. He now works for preservation of biological diversity and organic agriculture. In the context of climate change, he now works for a new kind of agriculture such as rice intensification (Swaminathan & Kesavan 2012).[iii] Swaminthan argues for a new sustainability science which resonates with Bussey's outline for a new layered sustainable education. For Swaminathan, "Sustainability science involves both anticipatory research, as for example, in the case of meeting the challenges of climate change, as well as participatory research and knowledge management with rural and tribal communities in order to ensure that the recommended practices are socially compatible and economically feasible" (Swaminathan 2011: 116).

[ii] *We can link this to the vision and practice of capacitation initiated by Clodomoir de Santos in the field of education*

[iii] *Swaminathan and Kesavan write about it: Since rice cultivation makes a large contribution to the release of green house gases, the adoption of a system of rice cultivation that does not require huge amounts of water and chemical fertilizers, with a proven track-record of much higher yields would be an effective solution. This is referred to as the "System of Rice Intensification" (SRI) which holds good for the most of the cultivated rice varieties. Above all, SRI greatly benefits small and marginal farmers with limited/little resources for chemical inputs such as fertilizers, pesticides etc. Mitigation of methane emission from rice cultivation could also be by altering water management, particularly promoting mid-season aeration by promoting nerobic degradation through composing or incorporating it into soil during off season drained period etc. (Swaminathan & Kesavan 2012: 4-5).*

Swaminathan pleads for restoration of soil and making it fertile. He also pleads for a new climate care movement involving all the stake holders in the process. This climate care movement involves "gene care conservation, climate literacy, appointment of local-level Community Climate Risk Managers and promotion appropriate mitigation and adaptation measures" (ibid: 17). From his research foundation, the M.S. Swaminathan Research Foundation (MSSRF), he adopts a community-based approach to sustainable development and creative responses to climate change. MSSRF works on community management and nurturance of mangrove forests in the coastal areas such as Pichavaram in Tamil Nadu. Here in Pichavaram, along with saving of mangrove forests he works on building schools for the children. Thus he writes: "I told my colleagues that saving mangrove forest without saving children for whose well-being their forest were saved made no sense" (ibid: xi). He argues passionately for involving farmers in adopting creative responses to climate change:

Farmers can help build soil carbon banks and at the same time improve soil fertility through fertilizer trees. Mangrove forests are very efficient in carbon sequestration. Biogas plants can help convert methane emissions into energy for the household. Hence, a movement should be started at global, national and local levels for enabling all farmers with smallholdings and a few farm animals to develop a water-harvesting pond, plant a few fertilizer trees and establish a biogas plant in their farms. I reiterate just these three - a farm pond, some fertilizer trees and a biogas plant—will make every small farm contribute to climate change mitigation, soil health enhancement and water for a crop life-saving irrigation (ibid: 11).

In his work on sustainable development and climate change, Swaminathan pleads for a "do ecology" which may also be called practical ecology in which we all practice an ecological way of doing, living and production and consumption. This practical ecology may also be realized as part of what can be called practical spirituality (Giri 2010). Practical ecology as part of practical spirituality can give us what Swaminathan calls an ecology of hope in place of current regimes of destruction and despair (see Ikeda and Swaminathan 2005). Ecology of hope calls for transformation of poverty on the one side and greed and unsustainable consumption on the other. Swaminathan also challenges us to realize biohappiness in place of conventional happiness which leads to unsustainable and uncreative lives which are helplessly bound to contemporary regimes of production and consumption. What Swaminathan writes here deserves our careful consideration:

How can we define biohappiness? I would say it is the sustainable and equitable use of biodiversity leading to the creation of more jobs and income. When the use of biodiversity leads to sustainable livelihood security, the local population develops an economic stake in conservation. It means that growth and progress must be reliable and dependable and maintained at an even and steady pace. In farming it is the production of high yields in perpetuity, without associated social and ecological harm. Sustainable development must be firmly rooted in the principles of ecology, social and gender equity, employment generation, and economic advance (Swaminathan 2011: ix).

In their different ways, both Swaminathan and Bussey plead for cultivation of a new language and new identity for sustainable development. For example, Swaminathan points out that, crops like millets and bazras are called coarse cereals. But these crops can grow in many environments and with less consumption of water. In addition, they provide us more nutrition compared to rice and wheat. For Swaminathan, we should call these not coarse cereals but nutritious cereals (ibid). Resonating with this change of language, Bussey pleads for change of identity from one-dimensional productivist

and consumption-trapped self to a layered self with an ecology of consciousness" (Bussey 2008: 141).

Self-Development

From the above the discourses and practices of a transformative sustainable development, we can realize that sustainable development is linked to creative self-development. It calls for transformation of self and its mode of production, consumption and living. In my related works, I have offered a multi-dimensional conception of self-development consisting of development of all the three overlapping dimensions of self—unconscious, technopractitioner and transcendental (Giri 2006). Sustainable development calls for new imaginations and practices at the levels of all these dimensions. In sustainable development techno-practitioner self becomes a spiritually pragmatic self trying to realize a deeper meaning of life in technology of self, society and science (cf. Giri 2010).

Self-development also calls for the cultivation of a creative mind, self and society. This is expressed in production, consumption, institutional matrix and intersubjective relations. In place of a short-term approach to production and consumption we need to cultivate a long-term perspective. It is through creative technology of self and science that we transform our existing modes of production and consumption. Our creativity helps us overcome our bondage to the existing gods of consumption and find meaning in creative interpersonal relationships and social services. Such relationships help us overcome the tragedy and sufferings of isolated individualism and attendant narcissistic consumption. They constitute the bedrock of what Ivan Illich (1973) long ago called convivial society. Such creativity is linked to the nurturance, recovery and creation of the commons which create commons which is constituted of a plurality of communications that "illuminates the worlds that are generative conditions of personhood—including ecological matrices" (Reid & Taylor 2010: 13). Furthermore, "The commons need to be protected and preserved not only for the humans but also for the plants and birds, and yes, even the rocks and streams" (Cheria & Chungi 2011: 484).

One important aspect of this creativity for sustainability is a new realization of time. In our present epoch time has been made a servant to the production of capital and profit maximization which creates suffering in self and society. We have become slaves of time in which we do not have any time for creative conviviality for each other and society. But for sustainable development we need a new realization of pregnant temporality where time is not our anxiety-creating master as it is in the present systems of life but our mother. Our society and self nurture time in such a way that we are able to be creatively with time and thus give birth to self and other in new ways.[iv] Pregnant temporality can create pregnant spatiality in which we can generate spaces of conviviality and togetherness for sustainable development. This is accompanied by a new poetics and music of sustainable self, societies, communities and cosmos. Furthermore, sustainable development also calls for a new ethics and aesthetics of self and society which may be called an aesthetic ethics of participation (cf. Quarles van Ufford & Giri 2003).

Social Transformations

Initiatives in multi-dimensional self-development find a resonance in appropriate social transformations for sustainable development. Linking to the earlier discussion on community and commons, Prafulla

[iv] *Making the link between a new temporality and sustainable education, Busssey also writes: I try to teach across time and beyond time. I, like the French philosopher Rousseau, have thrown away my watch. [..] The only response is to take sustainability personally, to begin the slow process of remembering who we are and activating the multilayered strands that underpin an integrated sustainability that can generate transformative educational practice (Bussey 2008: 143=144).*

Samantara writes: "Sustainable development is dependent on and therefore should promote service-based commons like food production and consumption, common school education and health. Developing physical natural commons together with reform social organizations and structure of communities is a prerequisite" (Samantara 2011: 124). Samantara is involved with struggles for land rights and dignity of tribals and the marginalized in Odisha, India. Preserving and transforming commons for sustainable development calls for transformation in the very language of commons and our contemporary discourse and organization of property.[v]

M.P. Parameswaran is the founder of Kerala Sastra Sahitya Parishada (KSSP) in Kerala, India. He is an inspiring example of a creative leader that Bussey would consider crucial for sustainable development (see Giri 1998). KSSP started its work in popularizing science and creating a people's science movement in Kerala. It had struggled to save the Silent Valley in Kerala, a storehouse of biodiversity, which was to be destroyed by the building of a large dam in the area. KSSP had protested against this and Dr. M.S Swaminathan whose work we had discussed briefly was the Secretary of the Department of Agriculture of Government of India. From within the Government Dr. Swaminathan lent crucial support to the struggle of KSSP and as a result the Government decided not to build the big dam and the Silent Valley was saved. Recently KSSP has been focusing on sustainable development and organic agriculture. Parameswaran writes about it:

A decade and half ago, the KSSP carried out an experiment: a *sangha swapna* or collective dreaming exercise. About sixty leading activists of one panchayat-Madakkathara village panchayat in Thrissur district—sat together to articulate their hopes and aspirations about the nature of their panchyat 25 years thence. At the end of the dreaming conclave they came up with a written report on their development perspective. They shared this dream with about 2000 citizens, took inputs from them and finally prepared a 25-year perspective plan. This perspective plan envisaged the following [among others: here I am presenting only some aspects of the plan which pertain to sustainable development]:

1. Full utilization of all cultivable land to yield maximum possible production in a sustainable manner
2. Recycle all the locally generated organic waste
3. To procure all the biodegradable waste from the neighboring municipal corporation and convert it into organic manure to improve soil nutrients
4. To have complete and scientific management of water as part of the command area of Peechi irrigation system
5. To go for large scale precision agriculture and thereby increase the efficiency of utilization of organic fertilizers and waters
6. To develop integrated animal husbandry of milk and meat animals like cow and goat; waste to food converters like pigs, poultry and fish and thus become self-sufficient in milk, meat, eggs and fish to ensure food self-sufficiency

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[v] *As Cheri and Edwin tell us: An appropriate vocabulary and language of the commons are essential for the health of the surviving commons. At present the dominant paradigm is so pervasive that the language of property is used to describe and regulate the commons. In many cases, there is no vocabulary to describe and therefore the language of property is imported and deployed. Even those with legitimate constitutional backing term restoration of commons as encroachment or, in the case of MST Brazil, as 'invasions.' These should instead be seen and named as land restoration and liberation. Is is only then that the legitimacy of retrieving the commons for commonness is affirmed with the empowering knowledge of legitimacy. This is the required 'vocabulary of commoning' needed for the active process of returning the resources to the commons and the commons to the community of commoners (2011: 515).*

Cheri and Edwin use the term communing which challenge us to realize commons as a verb and it is in tune with what social theorist Laurent Thevenot calls "composition of commonality: which further challenge us to go beyond the "all-embracing liberal grammar and other grammars of commonality" (Thevenot 2012: 19).

7. To ensure opportunities for economic activities (self as well as wage employment) for all those willing to work so that livelihood related long distance travel is reduced to a minimum and so also transportation of goods of consumption
8. To set up industries to manufacture as many items of daily use as possible within the panchayat, as well as to share with neighboring panchayats items requiring large-scale production
9. To boycott all transnational, corporate products, whereever a near equivalent 'local' product can be produced
10. To stop consuming goods which have only vanity values or destructive values
11. To provide pedestrian walkways and cycle paths
12. To reduce their [people's] carbon footprint continuously to zero by embarking upon an ambitious programme for carbon sequestration (Parameswaran 2012: 93).

The above pathways towards sustainable development emerged out of a project of collective dreaming which reiterate the significance of new collective imagination. But this new imagination calls for transformation of existing systems of production, consumption, economy and polity. These proposals resonate with some of the earlier proposals towards sustainable life presented by Gandhi as well the noted Gandhian economist J.C. Kumarappa who had challenged us to create an economy of permanence (see Bandhu 2011). These proposals also resonate with contemporary articulations for transformations coming from many quarters. Nadia Johanisova and Stephan Wolf argue for instance for the co-operative organization of economy and economic democracy as crucial to realizing sustainable development" (Johanisova & Wolf 2012: 564). They also challenge us to realize the need to nurture diversity of scales and plurality of production modes (ibid). They also reiterate the significance of ecological tax reform: "Ecological tax reform (which entails higher taxation of material and energy capital consumption and lower taxation of work) could help internalize the environmental externalities of large corporations as well as consumer behaviour" (2012:)

Planetary Realizations

Sustainable development calls for a new relationship with our Mother Earth, a new mode of living with our Mother Earth. It challenges us to realize as Thomas Berry had invited us to realize the dreams of our mother Earth (Berry 1990). For Berry, all our modern knowledge systems are deployed to exploit the resources of Mother Earth for our own narrow goals rather than for nurturing and taking care of our Mother Earth. Planetary realizations challenge us to transform such an exploitative relationship and embody a relationship of responsibility and care. This calls for a new way of life what Indian thinker Subash Sharma calls a *New Earth Sastra* (Sharma 2012). For Sharma, a new Earth Sastra brings Higher Consciousness to the world of economics to create "inclusive and sustainable development" (Sharma 2012: 10). It also challenges us to nurture our soil and soul in creative manner so that it creates sustainable flourishing in mind, self and society. But our soil and soul also meet in a tired and wounded sole where feet with which we walk with our Mother Earth are wounded and poisoned by the forces of unsustainable development.[vi] So we would have to heal our wounded soles,

[vi] *The Hindu carried a photograph under the title "Sole of the Nation" on 12 September 2012 depicting the water wounded feet of the people doing satyagraha by standing under water and protesting against the rise of the height of Narmada dam in Madhya Pradesh, India.*

restore our soil and souls as part of a new trigonometry of regeneration of sole, soil and soul for transforming acquiescent sustainable development to a manifold art and mode of sustainable flourishing of life, self and society.

Towards a New Sadhana of Mind, Self and Society

Such a multi-dimensional *sadhana* of flourishing **calls** for a new *sadhana* of mind, Nature, ecology, technology, management and society. This book of ours on Nature, Mind and Technology has been concerned with these multi-dimensional challenges. Our essay on rethinking sustainable development in this dialogical, exploratory and collaborative journey challenges us to further cultivate our mind and ecological consciousness. In our dominant frameworks of modernity, our mind is separated from wider contexts of body, society and Nature. Our mind is isolated and suffers from loneliness and many pathologies such as addictions to money, power, sex, consumption and immediate sensual gratification. In this context, we need to purify our mind with love, compassion, creativity, radiance and vibrant responsibility. Rethinking sustainable development today calls for creative mind works as well as works on self, consciousness and society.

Here our meditations on mind, nature and technology can build upon inspiring classic works such as G.H. Mead's (1934) *Mind, Self and Society* where mind is social in creative ways. Mead urges us to realize how through creative mind work and by creating alternative vibrant sociality we can also make the mind more creative and porous going beyond, for example, the rigid boundaries between left brain and the right brain (cf. Giri 2012). Mead himself writes: "The medieval saint worked out that method of identifying himself with all beings, as did the religious technique of India" (1934: 219). It is in this context that recent developments in creative mind work and neuro-meditative experiments deserve our attention. Building upon his earlier work on neuro-politics which also involves an unspoken project on neuro-spirituality, Connolly tells us: "We should experiment cautiously with body techniques that then find expression in thought and feeling. [..] Such strategies might include visualization, priming dreams by reviewing a perplexing issue before going to sleep, lucid dreaming—meditation, and neurotherapy" (Connolly 2006: 75). Connolly hopes that "as we move back and forth among experiential awareness, media studies, knowledge of body/brain processes, and subtle technologies of body / brain intervention [In Sri Aurodinbo it would be subtle technologies of body / brain transmutation through *Yoga*], we may also gain more insight into how to confront and counteract the politics of cultural revenge that exerts so much of power [..] today" (ibid). Through such experiments we can "tap a latent reserve of compassion," in ourselves, "a reserve that finds expression in future conduct" (Connolly 2006: 73).[vii] For Connolly, this is also pertinent to the "quality of ethical life" in our world today, especially paths of the ethical nurtured by savants such as Spinoza who "deny that goodness takes the form of obedience to universal law, as claimed in the dualist traditions of Augustine and Kant" helping us realize that "command-and-obedience models of morality too often contain within them a drive to revenge against the human condition, finding expression in punitive and accusatory orientations towards the diversity of life" (ibid). In place of revenge Spinoza urges us to practice love.[viii]

[vii] *Recent collaboration between neuroscientists and spiritual practitioners such as Dalai Lama and his followers shows us how creative work with mind makes brain much more porous and open to transformations. See Begley 2007.*

[viii] *There is a world-wide renewal of Spinoza now and in cultivating new paths of knowledge and human liberation we can draw inspiration from him. In our chapter on transforming power and politics we briefly discuss Spinoza especially his work on power and multitude. Here we can also learn from an inspiring work on Spinoza by Chitta Ranjan Das where he writes: "According to Spinoza, love is the mediating link between knowledge and power. Love of humanity, love of the world, a deep faith in the unending possibilities of individuals as well as the collectives. This calls for a higher consciousness which all knowledge should congenially aim at" (Das 2009).*

In our creative works with mind, self, society, ecology, technology, institution building and management we are then challenged to practice a new art of creative love in place of exploitation and many acts of devouring of self, other, Nature and society. New frontiers of management and development with which this journal of ours is concerned calls for creative acts of love. We need a new ethics, politics, spirituality, technology, pragmatics, poetics and spirituality of love to realize sustainable development and for making our mind, self and society a friend of our evolutionary journey rather than an enemy.

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Candle Light Experiment for Inner Invocation: Lessons for Management, Leadership and Creativity[1]

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Introduction

Candle light experiment is an experiential approach for expressing one's creative potential as well as to learn some management, leadership, creativity and spirituality lessons from the candle light. The idea of candle light experiment for inner invocation owes its origin to this author's black out experience in 1997 arising from a power outage.

In India power outage or commonly termed as 'load shedding' or 'power cut' is a common experience. When there is no electricity due to grid failure or any other reason, most people rely on candle to light the room. Candle light creates its magnetic impact in the darkness. This simple experience led to the idea of candle light experiment wherein the basic purpose is to create an environment that leads to inner invocation and thereby realization of one's creative potential. In this paper I am sharing my experiences of conducting these experiments since 1997 when I first hit upon this idea.

In addition to the blackout experience, inspirational cue for the experiment also came from two other disciplines viz. Chemistry and Spirituality (Yoga, Meditation/ Consciousness). In Chemistry Candle experiment is conducted to study some physical and chemical properties. All students of Chemistry are well aware of this experiment. In fact origin of this experiment in Chemistry goes back to Michael Faraday in 1859 when he gave lectures centered on Physics and Chemistry of Candle. In these talks he declared, "There is not a law under which any part of this universe is governed which does not come into play and is touched upon in these phenomena. There is no better, there is no more open door by which you can enter into the study

of natural philosophy than by considering the phenomena of a candle." (source: http://science.pc.athabascau.ca, Candle Experiment, Chemistry 217 – Chemical principles, accessed Nov. 8, 2012). In Yoga and Meditation, Candle light is used for the purpose of concentration e.g. in Trataka meditation. Trataka Meditation also referred to as Gazing Meditation involves candle gazing through concentrated gazing. Bihar School of Yoga, Munger has published several books on meditation that give detailed instructions for practicing Trataka (source: http://en.wikipedia.org/wiki/Trataka). The candle light experiment that I have been conducting draws from these ideas. However it differs from them in terms of the methodology, process and objectives. The objective of the candle light experiment that I have been conducting is to learn about creativity, self awareness, empowerment, team building, leadership and management concepts. Lighting of the lamp is a common tradition in Indian context symbolizing spread of knowledge and removal of darkness. This experiment has also been influenced by the idea of lighting of the lamp. It may be indicated that candle metaphor is also extensively used in stock market analytics through candlestick charts and is known as Japanese candlestick charting technique because its origin goes back to 17th century Japanese candlestick approach to analyze rice prices (source: http://www.incrediblecharts.com/technical/candlestick.php, accessed on Nov. 8, 2012). Thus, candle as a metaphor has a wide ranging appeal and application from Stock market/ Market's Maya to Physics & Chemistry to Consciousness to Celebrations and Spirituality & Mysticism. In my experiments I have applied this metaphor to learn lessons of management, leadership and creativity.

Institutions where the Experiment was Extensively Tested

While the experiment has been conducted in many Management Development Programs and several B-schools, the extensive testing took place in the following institutions:

1. WISDOM (Women's Institute for Studies in Development Oriented Management), Banasthali University, Banasthali, Rajasthan, since 1997
2. Indus Business Academy (IBA), Bangalore, since 2006
3. Indus Business Academy (IBA), Greater Noida, since 2006

Since 1997 all WISDOM students have participated in candle light experiment. WISDOM was established in 1996 and thus from the first batch onwards all MBA students of WISDOM have been through candle light experiment experience. At WISDOM experiment is conducted in the evening on the terrace of the WISDOM building. Moon light, wind and the stars add to the synergistic ambience of the experiment. IBA Greater Noida was established in 2006 and in this case also from the first Batch onwards all students have participated in these experiments. At WISDOM and IBA this experiment is also used to orient the students towards vision and mission of the institution. Experiment has also been conducted in International Workshops such as Practical Spirituality and Human Development, conducted at IBA, Bangalore and Greater Noida, in which senior faculty members and research scholars from institutions such as Madras Institute of Development Studies, Chennai, Management Development Institute (MDI), Gurgaon and other institutions participated. When I was Director at Indian Institute of Plantation Management, Bangalore I also conducted this experiment in Management Development Programs (MDPs) and also with students of its Post Graduate Program in 2001. I also tested it in some of the training programs of Bangalore Management Association, Bangalore. It was also tested with the first batch of Calcutta Business School, Kolkata in 2008. Recently in Dec. 2012, it was also tested at Indian Institute of Management (IIM), Ranchi during the course on Inner Development. In 2009, it was also tested in the Oracle Leadership

Retreat organized by Oracle for senior corporate executives. Since 1997, nearly 3000 MBA students, MDP participants and Workshop participants have undergone this experience. Sometimes batch size is 120 to 150 and it may take more than three hours for giving opportunity to all the groups to make presentations. Thus, over the years there has been an extensive testing of this experiment.

Earlier published documentation of this experiment was done in 1999, 2007, 2010 & 2012. This documentation is available in my book, viz. Quantum Rope: Science, Mysticism & Management (1999, in Chapter titled as Light of Wisdom, pp 127-132), *New Mantras in Corporate Corridors: From Ancient Roots to Global Routes* (2007, in Chapter titled as Corporate Rhymes, pp. 466-471) and Shunya Poems: My Experiments with Corporate Rhymes (2010, p.7). It has also been documented in my article, Atmo-sphere Theory for Management & Leadership: Exploring 'Atmosphere' through ISRON, in proceedings of the Seminar on Indian Psychology, Centre for Indian Psychology, Jain University, 2012.

Methodology and Process

In conducting these experiments I have been assisted by the faculty members and staff of the institutions. At WISDOM, Banasthali and at IBA Bangalore and IBA Greater Noida several faculty members from different functional areas have not only been participating but have also been acting as voluntary observers and they also participate in discussions by providing their observations and comments on the group processes taking place during the experiment.

Experiment involves following seven steps:

Step I: The class is divided into small groups of six to seven members. They sit in a circle formation.

Step II: Each group is provided a candle. Candle is kept in the centre of the circle and each group lights the candle and group members observe it for two-three minutes in total silence.

Step III: Group members without talking to each other write their individual observations, feelings and emotions that flow through their mind during observation.

Step IV: Group members read out verbatim what they have written and thus share their observations, feelings and emotions etc. A group leader is selected and the unique points emerging from the group are noted down. On the basis of discussion group also gives a name to the group.

Step V: Depending upon the availability of time and the size of the class, from each group two to three members share their observations. Group leader presents the summary and declares the name of the group and explains why a particular name for the group was selected and how the leader was identified. During these presentations other groups also participate by asking questions etc. Experimenter high lights the key phrases that emerge from the groups and provides additional insights to observations of the group.

Step VI: Experimenter sums up the observations of all the groups by linking the group observations with various management, leadership, creativity and spirituality concepts that students may have learnt from theory and from their experiences.

Step VII: Experiment concludes with collective singing of the song, 'Light in My Heart' from my book, Creation from Shunya (1993, p.33). This song is now also known as WISDOM Song/ Song of Wisdom light, as it was adopted in 1996, by the first batch of WISDOM students, Banasthali University, Banasthali, Rajasthan. This collective singing creates synergy vibrations leading to an experience of an exalted state of consciousness. Exhibit I presents the song, Light in My Heart – Song of Wisdom Light.

Illustrative Responses

A large database on the responses of the students has been created over a period of time. Following are some illustrative responses. Experiment has also been conducted in Leadership Development Programs for the executives. Exhibit II provides an illustration of responses from the participants of the Oracle Leadership Retreat, Nov. 6-7, 2009 held at Kovalam in which senior level leaders from various well known Corporations had participated. Exhibit III presents experience sharing by Pascal Papillon, Entrepreneur and Trainer from France, who participated in the Candle Light Experiment on Oct. 8, 2012 at WISDOM, Banasthali along with WISDOM students.

Lightened candle inspires us to move from darkness to light. It inspires us to be creative. The main quality of candle is sacrifice because candle itself melts and gives light to everyone. Candle shows us how to give service and it also symbolizes quality of devotion.

***

Candle shows us three S, Sincerity, Service and Sacrifice and 2 D dedication and devotion. I felt a sense of warmth and feel that while giving light it sacrifices itself and felt some enlightenment in my mind.

***

A single candle spreading happiness and hope for a new beginning. A candle symbolizes hope. When all paths are closed, a single streak of light may spread positive energy.

***

A light is spreading light. I was thinking that as the flame of the candle was moving in the direction of the air, similarly we are driven by sorrows and are trying to be stable every time. We reach our ultimate destination by continuously facing ups and downs in our lives.

***

Shadow and light move together. Life is like candle where shadow and light move together.

***

I saw the aura around the flame and it reminded me that every human being has an aura but we can't see it. An abstract question came to my mind, why I can't see the aura of the human being?

***

Flickering of flame symbolizes struggle in human life. Candle shows us path by giving light.

***

Candle fills us with eternal energy. Light flows from our eyes to the mind and from mind to the heart and enlighten the body with spiritual power.

***

Jyotibindu paramatma se, ae meri atma,
ab chal kar kar ley Milan,
Parmanand ka anubhav kart u,
ae meri atma ab chal kar ley milan.

O Candle, what you might be feeling in giving light to others, The little fire in you can burn the evil around us, You spread the transcendence and remove the darkness, The whole process is yet to be known and is a bit mysterious.

***

When wind is blowing candle light is struggling to become stable. In our life we also face a lot of problems but we have to fight with our problems and find creative solutions.

***

By watching light of the candle I came to know that we can experience our mind and soul in a relaxing state.

***

I also want to shine in life in the way of the candle. For me this is the candle light theory.

***

Light is truth and truth is light. Candle radiates light of truth and I experience its meaning as seen by group members. It reminds me the Omega circle view of truth.

***

There are two ways of spreading light: to be the candle or the mirror that reflects it. Be the sun or the moon.

***

Spreading light through spreading values by helping those who are in need may flowers bloom along their way.

***

Suraj na ban paye to ban ke deepak chalta chal. - If one cannot be a sun and provide light to the whole world at least one should be like a candle which can show light to an individual and help to move forward on the path.

***

Here is a lightened candle matching herself to the tune of light.

Typology of Responses

Content analysis of responses from the participants indicates that responses broadly fall in following four categories:

I. **Physical descriptions:** Some participants focus on describing the physical aspects of the experiment e.g. height of the candle, height of the flame, radius of the candle etc. Some focus on the rate of melting of the wax and a few even writes down a formula for the rate of dissipation of heat energy. These are largely left brain descriptions within the 'rationality' approach to life.

II. **Literary descriptions:** Many participants provide a literary description of the candle light. Experience indicates that in every group at least one person writes a short poem expressing her/his creativity. These responses represent the right brain responses to the experience of the candle light experiment.

III. **Spiritual descriptions:** The experiment also bring out the spiritual descriptions of the candle and thereby self. Values such as sincerity, service, and sacrifice are evoked and participants feel oneness with such values.

IV. **Transcendent descriptions:** Some participants experience the transcendent/ mystic dimensions of the experiment. Such experiences are reflected in experiencing a mystical cosmic connectivity with the candle and the surroundings and they reflect it in their write ups.

Above descriptions can also be viewed in terms of B-H-S-H (Body-Heart-Spirit-Harmony) model. Physical descriptions are indicative of the Body-centric perspective of life. Students who focus on such descriptions tend to highlight the Physics-Chemistry view of the experiment. Literary descriptions reflect the creativity and the Heart-centric perspective. Students who provide such descriptions see the creativity aspect of the experiment. Spiritual descriptions represent the spiritual perspective to life and students providing such descriptions view the experiment as a spiritual experience. Harmonic descriptions reflect the transcendental blissful experiences of cosmic connectivity and students providing such descriptions view the experiment as a mystical experience. Some even 'see' the picture of their favorite goddess/ god in the flame. In the group discussions all these perspectives find an integration and synthesis leading to a holistic view of life in terms of B-H-S-H worldview.

This experiment also brings out discussion on some of the problems students are facing in their day to day existence and society is facing in its functioning. Interestingly the solutions to the problems also come from the students. In case of MDPs, managers come out with interesting and creative solutions to their personal and organizational problems. Thus, this experiment also turns out to be a problem solving and creative solution finding lab. Group discussions facilitate mutual learning as group members learn many new ideas from the insights of the group members. Many times poems written by the group members provide some creative and intuitive metaphors to understand reality around us.

Candle light experiment leads to new perspectives of life in terms of Psycho-spiritual dimensions of existence and its linkage with Biological and other aspects of existence. In essence it makes students realize the connectivity between Panchkoshas through Biological (annamaya & pranmaya), Psychological (manomaya & vigyanmaya) and Spiritual & Transcendent (anandmaya) dimensions of human existence. This is reflected in various responses of the participants that can be classified in four levels of consciousness viz. Biological, Psychological, Spiritual and Transcendent levels. It also makes them realize that Psycho-spiritual dimension is at the root of their own behavior and it gets reflected in inter personal relationships. Some students start 'seeing' the play of psycho-spiritual dimension represented by heart, mind and spirit, in every human activity including economic activities/ market and social movements and revolutions.

This experiment also tells us that every concept and idea as well as experience has four levels meaning viz. Physical, Emotional, Spiritual and Mystical. For example, Light has four levels of meaning. In Physics, Light is scalar quantity and is viewed in terms of its nature as wave or particle. In Psychology, Light has an emotive meaning as it invokes variety of emotions represented by its seven colors. In Spirituality, Light has Spiritual and Mystical meaning and it becomes a 'vector' as it guides us in our evolution. Similarly many ideas can be understood at these four levels represented by B-H-S-H. This is an important lesson from the candle light experiment.

The entire candle light experiment process can also be viewed in terms of 'Shunya unfolding'. This unfolding of Shunya takes place in its B-H-S-H forms and thereby an individual realizes his/her full potential through an evolutionary journey just as a tree emerges from the seed and gets ready to provide fruits to others.

Various responses to the experiment indicate creative, reflective, meditative and transformative experiences of the students. Creative experiences find expressions in spontaneous creation of poems and rhymes. Reflective experiences find expression in the sacrificing nature of the candle. Meditative experiences find expression in calmness and serenity. Transformative experiences find expression in realizing the inner potential and greater awareness of one's psycho-spiritual energy and its potential in transforming self and others.

On the basis of experience sharing and discussions each group gives a name to its group. This helps the group members to internalize their group observations and synthesize their experiences in giving name to the group. Some illustrative group names that were generated during various experiments are given in Table 1. Many names generated during these experiments reflect the spiritual and transcendent levels of consciousness.

Table 1: Illustrative Group Names

Soul	Nirvana	Sacred thoughts
Ray of Hope	Light in Darkness	Urja
Tyag	Boddhisatvas	Synergy
Enlighten	Ignited path	Shining light
Sacrifice	Harmony	Altruism
Devotion	Light of Truth	Beacon
Flame of Life	Sanatana	Wisdom candle

Management and Leadership Lessons: Candle Light Model of Leadership

From this simple experiment students learn a number of lessons about management, leadership, creativity and spirituality. Some of these lessons relate to motivation, self awareness, self empowerment, empowering others, team building, human values, spiritual values, spontaneous creativity and related ideas. Through inner invocation, this experiment enhances the psycho-spiritual understanding of the self and thereby it leads to inner transformation. Experiment provides insights into Inner Qualities Development (IQD) and thereby into Human Quality Development (HQD). It invokes lessons for

becoming a good human being who spreads light to others.

Candle light experiment leads us to the Candle Light model of leadership as the candle provides us lessons of sacrifice, service and sincerity. This model can also be represented in terms of following six qualities of a leader represented by CANDLE:

C - Creativity
A - Attitude
N - Nurturing
D - Dedication
L - Love
E - Enlightenment

A leader should be creative as we are now in the knowledge economy that demands high level of creativity. She/He should have right attitude and should be full with positive mental attitude. She/He should possess nurturing qualities to empower others. She/He should be dedicated to the cause or the vision and mission of the organization. She/He should be humanistic and full with love for her/his team members and should be an enlightened individual. Such a Candle leader will spread Light wherever she/he goes. She/he is driven by force field of LIGHT: Love, Integrity, Goodness, Harmony and Truth (Sharma, 2007, p. 108).

Thus, this experiment provides us the 'CANDLE' model and the 'CANDLE LIGHT' model of management and leadership. Such leaders are true CEO (Creative, Enlightened, Organic) leaders. From Candle Light experiment students learn the OMEGA qualities of a leader. The OMEGA model of leadership derived from this experiment is as follows:

O : Oneness (Oneness as represented in OSHA-OSHE Model of human beings. It is also indicative of one's circle of consciousness. As the circle of consciousness expands a leader becomes more inclusive. He/she moves beyond self-interest to enlightened collective interest. It is also indicative of Organic relationship with environment)

M : Mastery (reflecting Professional excellence)

E : Enlightenment (through psycho-spiritual understanding of the self)

G : Goodness (Being a Good Human Being)

A : Action (Be action oriented to convert the dreams represented by enlightened collective interest into reality)

Above qualities of OMEGA leadership indicate that such a leader has organic relationship with environment and the stakeholders and she/he is a CEO – Creative, Enlightened, Organic leader.

Through the Candle Light experiment participants understand the linkages between Management, Leadership, Creativity and Consciousness/Spirituality. They not only get an understanding of the creativity but also get a feel of the higher consciousness that the experiment generates in the participants. Increasingly Management and Leadership thought, theory and practice is recognizing the importance of Creativity and Consciousness. For example the idea of Spirituality in Management is rooted in the idea of consciousness and in the idea of HOPE: Higher Order Purpose of Existence. Candle is a symbol of HOPE and this is an important lesson for management and leadership that participants learn from this experiment. We can also represent the experience of the candle light experiment in terms of the following four stages of the development of management thought since its beginning in 'scientific management'. In the knowledge economy a manager has to evolve into a CEO: Creative, Enlightened, Organic leader.

Management (Manager) → Leadership (Leader) → Creativity (Creative individual) → Consciousness (CEO: Creative, Enlightened, Organic leader)

Once the consciousness of an individual reaches the Creative, Enlightened and Organic level, such a leader is a Candle Light leader and like the candle spread light everywhere to create synergy in the organizations and society.

Candle light experiment is also linked with following three ideas:

Shunya creations: Poems and rhymes written by the students are indicative of shunya creations or creations from shunya. These are spontaneous creative responses coming from the students through invocation of their hidden creativity represented by 'Shunya unfolding'.

facilitating 'Osmotic Meditation' experience through an exalted state of consciousness.

Candle can be considered a metaphor for these three ideas as it invokes creativity reflected through shunya creation and shunya unfolding. Further it leads to inner transformation by making a person aware about his/her psycho-spiritual makeup and latent potential. It also provides an experience of osmotic meditation leading to an exalted state of consciousness. Candle light manifests itself in human beings through these three processes. Fig. 1 presents these linkages in a diagrammatic form.

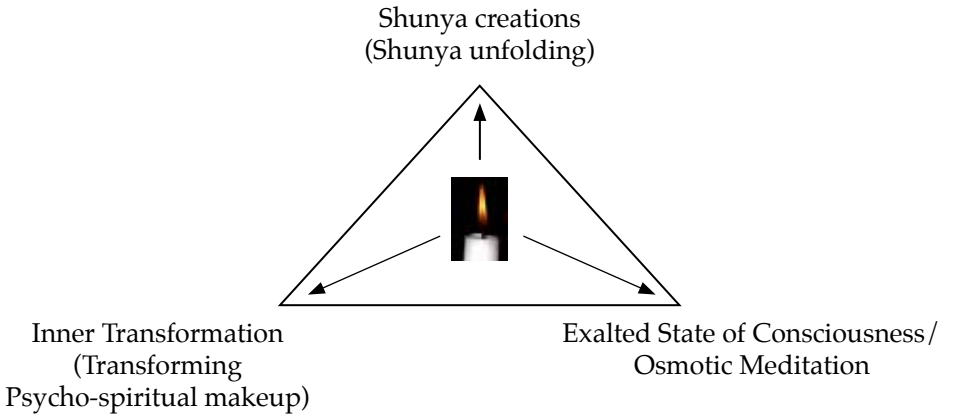

Fig. 1: Candle Light Experiment and its Manifestations

Inner Transformation: Experiment creates conditions for the inner transformation by listening to the hello within and shunya unfolding just like the blossoming of lower or sprouting of plant from the seed. In many it creates an inner awakening about latent potential to achieve one's dreams. Students get an understanding of their own psycho-spiritual makeup leading to inner transformation.

Osmotic Meditation: Experiment creates a cosmic connectivity with the environment and experiencing calmness and peace and thus

Like the candle a leader spreads her/his psycho-spiritual energy to create synergy in the environment. This is also the essence of the idea of 'Enlightened Leadership' that economic, political and social institutions of the society need today. If every leader is like a candle, there will be synergy everywhere.

Conclusion: Light of the Place

Candle light experiment teaches us the concept of the 'light of the place'. Wherever a candle or a lamp is lighted, it provides light to the surroundings. Buddha said, "Be a lamp" and thereby enlighten others.

Management Guru, Sumnatra Ghoshal popularized the phrase, 'smell of the place'. Candle light experiment takes us beyond this idea to the next level viz. Light of the Place. In case of institutions, light of the place is reflected by the ideas it generates and spreads. Light of the place also leads to the spell of the place. This is also true of a nation. Light of a nation is represented by the ideas it generates and spreads leading to its spell and thereby 'spell of the place'. When hundreds of lamps are lighted their combine effect is a Festival of light creating Diwali like impact. One lamp can be used to light other lamps. One candle can light other candles. This is also the message we get from candle light experiment. Lighting of the lamp is a common practice during inauguration of an event. The lighting of the lamp or the candle symbolizes removing the darkness and spreading the light of knowledge – tamsoma jyotirgamaya (from darkness to light). 'Let the light of noble thoughts and novel ideas spread from us in all directions', this is the essence of the candle light experiment.

Notes and References

Candle light experiment presented in this article has been documented in the following writings of the author:

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- http://www.shunyacreations.com/

EXHIBIT I

Light in My Heart*

– Subhash Sharma

There is light in my heart
It is there from the start
Its mystery you want to know, It says hello hello

It gives me a peep
Into things that are deep
It has a beautiful glow, It says hello hello

This light is subtle
It makes a whistle
In the stars and the snow, It says hello hello

It moves through the chakra
It goes for the yatra
It has its own halo, It says hello hello

It shows silver lines
Bending space and time
In nature's beauty show, It says hello hello

This light is divine
It makes us fine
Its flow is very slow, It says hello hello

**In 1996, this song was adopted by the first batch of WISDOM Students, Banasthali University, Banasthali, Rajasthan, and has become popular as Wisdom song. It was first published in my book, Creation from Shunya (1993, p. 33) and it also appears in my other books e.g. Quantum Rope (1999, p, 132), New Mantras in Corporate Corridors (2007, pp. 475-476) and Shunya Poems: My Experiments with Corporate Rhymes (2010, p. 53). I have presented this song in several forums such as Indian School of Business (ISB), Hyderabad in Oct. 2008 during the conference 'Igniting the Genius Within', IIM Shillong in Nov. 2010 and Nov. 2011 during Sustainability Conferences, IIM Ahmedabad in Dec. 2011 in experience sharing session during Golden Jubilee Celebration. Presentations in International forums include presentation at India Trade Seminar, at Los Angeles in June 2008 and June 2011 and at an invited Dinner talk on Spirituality in Management at Curtin University, Perth, Western Australia, in Sept. 2011. Song has also been recorded at Radio Banasthali in the voice of MBA students of WISDOM. In a news report titled as 'MBA students sing rhymes now', Times of India, Bangalore on Nov. 19, 2009 made a special mention of this song. Subsequently on Nov. 23, 2007, TV Channel, Headlines Today carried a news report on the same. The clipping of this news report is available on You Tube under the title, 'From Nursery Rhymes to Corporate Rhymes' www.youtube.com/watch?v=ZeuKArtwVvY. This song of 'wisdom light' has also been popularised by WISDOM students and Wisdomites.*

EXHIBIT II

Candle Light Experiment conducted during Oracle Leadership Retreat, organized by Oracle held at Kovalam, Nov. 6-7, 2009

Sl. No.	Name & Organization	Observations
1	Dhruv Singha, Oracle	Light of Knowledge, Spark of Innovation, Limited life but living life fully
2	R. Srinivasan, Oracle	Feeling of Space, Calmness
3	Subash Nambiar, Oracle	Pure, Peace
4	Akshaya Moondra, Idea Cellular Limited	Observations on Flame which you do not normally observe: Flame does not touch bottom of the wick. There is a small blue portion at bottom before the yellow flame. The top of the wick is brighter (red), but the rest of the wick is black
5	Sudhir Nayar, Sun Microsystems	The whole environment became calm. Everyone was interested in the experiment. The way drops were visible on the candle. Size of the candle reduced. Peace, happiness, together, brighten, nature laws.
6	Ramesh Mamgain, Sun Microsystems	Happy birthday. How can we light the fire of self esteem in each Indian. How can we ignite the brains of all our young children so that we can have a powerful India.
7	Nagaraj Mylandla, FSS	Candle brought fire of us together. Candle brightened the table and made us see each other. Candle light was straight & slogged as the wind flowed. Candle melted & flowed down while the light was upward.
8	Dr. Mehar Sandhu IFS, CCF (FMIS) Forest H.Q.TVM	Candle defying gravity. Transition from material to non-material. Hope, way out. Flame always up even if tilted
9	Arup Das, Genpact	The flame at the top and the shadow at the bottom of the candle. The brighter and darker side of a single object. A object of a limited life and the brightness it gives to to others.
10	Keshore Prakash, Toyota India	Stillness focus silent's our mind. Silent minds start with free flow of ideas. These ideas leads to innovation and creation. Every step to realize ourselves deeply.
11	Sunzay Passari, ISSAR Group	The flame which is so quiet and calm, emitting light in the darkness. A soothing feeling. Changing shape & size. Even colours differ hues and different compositions. Sometimes rhythmic sometimes random. Giving a feeling of "Atma" illuminated & dancing with joy. Though intrinsically absolutely hot-the fire-but radiating such calmness and cooling effect.
12	Anil Lad, Kalyan-Dommbivali Municipal I. Corp	Focusing on the flame brought the mind into the past. The problems that we were discussing on the table before we start today. This might be because I do Trataka everyday
13	Pandurang Desai, WIPRO Ltd.	Providing brightness/light in a dark area for clear visibility which gives comfort/ remove the sense of darkness/non clarity. Calmness in heat
14	Sharada Mylandla, FSS (Financial Software & system-Chennai)	Light from the candle to you straight. Shadow moves in circle, along with flame like a dance -dance of life & death. Light of the candle has concentric , life moving in circles
15	S.T.Sathiavajeswaram, HPCL	Flame lighting to beat the darkness. Benefit to people sitting around who could see in the darkness
16	Hitesh Sanijwaala, Oracle	Enlightens in darkness. Provides the warmth. Demonstrate capacity being circular
17	Ashwin Shah, ESSAR	Opened up with many theories on immediate issues and concentrated mind on lights movement. Mind was calm and concentrated
18	Kapil Sood, Sun Microsystems	The flame looked very determined, it swayed but then quickly came back to its position. The shadow it seemed was trying to dance/run away but was being pushed below. Felt dinner was on the way, association with candle in modern era is with candle light dinners. Eyes were also looking for the god behind the candle. Diya is another association.
19	Kiran Sukhtanka, Oracle	Light and Darkness- Two sides of same object. Hope. Beautiful visual

EXHIBIT III

Experience Sharing by Pascal Papillon, Entrepreneur, Trainer in France & Learner in India

Pascal Papillon participated in the Candle Light Experiment on Oct. 8, 2012 at WISDOM, Banasthali along with WISDOM students. Following are his observations:

I observed -
Movements of the flame, its shapes and colors
The dark circle moves on the ground
Some insects are walking & are attracted
The light is light, not heavy; flame is light, purity and purification, state & process.
In France, I remember we also do that, light a candle, to enjoy or remember one person:
Light is life
Fire is knowledge
I am this fire
Water can stop the fire
Yoga Trataka is another different exercise with the candle, I remember
Calmness & quietness feelings
Fire, flame are life & provides energy, warmth and light
This situation, on the roof, sitting, with one and many groups, at night, under the sky it is a unique, beautiful, amazing moment.

My response to the experiment

- I appreciate the different steps – observe alone the candle, share and interact into my group, present to the other groups, listen the other groups and the comments of Dr. S. Sharma, we all together sang the hello hello song at the end.
- I appreciate the talent of every group through this intuitive approach to describe with perceptiveness, sensitivity the experienced sensations, emotions.
- I appreciate the depth of the thoughts through poems & songs, in English, in Hindi, how the awareness of the situation can bring and support conscience and consciousness.
- Still, irrespective of the age, the talent is fully present. Consciousness has no age.
- Woman sensitivity: If Arjuna had been a woman, and her adviser a goddess, they would have transformed the battlefield into a resplendent radiant brilliant cosmic planet in the universe!!
- My HOPE: Every student's HOPE arises, fulfills, materializes or bears out, so that the world becomes a better world, here and now!
- I feel a link between the 'Candle Light Experiment' and the 'Leadership Capacities'. *– Pascal Papillon*

1Paper presented at Association of Indian Management Scholars (AIMS) International, Tenth International Conference held at Indian Institute of Management (IIM) Bangalore, Jan. 6-8, 2013.

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EARTH Conversations

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The following is a telephone Conversation after the initial pleasantries.

Daniel: Subhash, after I have returned from Germany, I have been reflecting on a philosopher suggested to me by my colleague and friend Peter Kunzmann. The philosopher in question is Hans Jonas who became well known in the West because of his book called *Imperative of Responsibility.*

Subhash: Well, the word imperative is synonymous with Kant's ethics.

Daniel: I suppose responsibility, too.

Subhash: Naturally, ethical action calls for pinning of responsibility.

Daniel: Sure, what is interesting in Jonas is that he is speaking about the future responsibility impinged on us by technology, as it were, which is a kind of consequence due to our carelessness about the Nature and its environment.

Subhash: Oh, this is so timely. *Sothern Economist* in which my articles have been published which are now several, and the intention is to publish these in book form.

Daniel: Great. What is the title? Harvard to Hardwar? *(Laughter)*

Subhash: No, it will be called *Earth Sastra.*

Daniel: Oh, you mean to say New Artha Shastra.

Subhash: Actually, it will be called New Earth Sastra. In it you will find echoes of *New Artha Sastra,* from Bangalore to Boston.

Daniel: I see, I just gave in to usual sounds, Artha Shastra of Chanakya. Well, in *some way,* as the Jaina Syadvada says, you are a new Chanakya. (Laughter)

Subhash: I like Syadvada alright.

Daniel: Give me a glimpse of it, before the book comes out.

Subhash: Kautilaya's Arthsastra was written in the context of managing a Kingdom. In fact, in human history there was a transition from 'natural' to 'social' in the forms of tribes and

later the concept of kingdoms emerged. This transition has been captured in some historical documents across the world including religious books. Kautilaya's Arthsastra was the secular book for the kings to manage their kingdoms. In the world history we find a transition from Kingdoms to Nations and later to Corporations. Contemporary world is now living in the age of Globalization. Thus, we have the following stages of human evolution:

Natural state of existence ⇨ Tribes ⇨ Kingdoms ⇨ Nations ⇨ Corporations ⇨ Globalization

I consider Bible as a document of history that records transition from natural to tribal to Kingdoms stages of human history. With emergence of nations and corporations, humanity is at the threshold of new changes and challenges. Concerns such as environment, gender issues, ethical issues etc. have become critical. We need to think beyond nations and corporations. Hence, the need for a 'New Earth Sastra' with focus on sustainability and holistic development.

Daniel: Some time ago, Fareed Zakaria, the CNN host of Global Public Square (GPS) programme, almost casually mentioned 'Universal Nation' with reference to the convergence of business, politics, law, culture which characterize the present day world that is highly connected and interdependent. Immanuel Kant had gifted the world the concept of 'World Citizen' (Weltburger) almost 200 hundred years ago. Gandhiji was a universal soul. Often this theme is not spoken about; mainly because Indians have nationalized this universal citizen. A world citizen in a universal nation, a couple of decades ago was unthinkable. However, Gandhiji lived like one and we seem to be oblivious to his ideal. We can now think about it; but we think in terms of 'globalization' and immediately fragmentize it 'inter-national'. When and how we shall actualize the universalisation? Rationally it seems to be a matter of time and the collective will of the people belonging to different and diverse nation states. So when you say, we need to think beyond nations, how far beyond can we think – really?

Subhash: For this we again need to take a historical perspective of human evolution thorough Natural, Social and Spiritual stages of evolution. 'In the beginning there was bindu/ shunya/big bang'. From it emerged nature and when human beings 'arrived' they lived in the Natural state of existence Tribes Kingdoms Nations Corporations Globalization. Nature has three aspects viz. violent, vibrant and silent energies. As human beings moved from natural state to form groups, tribes and create social structures, they structured their ideas on the basis of these three aspects of nature. In subsequent history of evolution, Social further evolved in terms of STEP – Social, Technological, Economic and Political. Social evolution evolved in terms of codes of living, commandments and law originating from a sense of right and wrong based on a sense of conscience. Technological evolution has taken us in the direction of cyber revolution and space travel. Economic evolution has led us from barter to trade to multi-national corporations. Political evolution took us from dictatorship to democracy. Now the stage is set for the next stage of evolution viz. Spiritual evolution. Thus, a new view of human evolution emerges in terms of three stages viz. Natural, Social/ STEP and Spiritual. In fact we need to move beyond Kant's 'world citizen' to the idea of 'cosmic being' or 'cosmic citizen'. In human evolution, idea of Nation- state is a transitory idea just like Religion was a transitory idea representing the transition from natural to social. Nation –State represents transition from kingdom to nation and now we know that it carries forward the idea of violence in its structures and ideology. Ideal of world-citizen can be realized only if we create a shift in our thinking from violent dimension of nature and human being to vibrant, silent and thereby non-violent aspects. This needs a new consciousness revolution which will take our existing STEP (Social, Technological, Economic

and Political) systems in the direction of New STEPS rooted in non-violence. It implies reforming existing STEP systems that are rooted in violent and conflict model of human beings to cooperation, connectivity and convergence model. Evolutionary forces will take us in that direction through a new revolution of consciousness. This is also the essence of the idea of 'New Earth Sastra'.

Daniel: You cover here several issues about the genesis and development of the society, from early organizations to complex and widespread modern civilization that needs New Earth Sastra. Speaking about evolution, you may remember the little anecdote that I related to you from one of my European tours. At this particular lecture where I spoke of a subject that has been illustrated in my book Business Ethics, 'the ethical development of corporations' which I explained from an evolutionary perspective. One of my listeners, a good scholar, was not happy with my use of the term evolution to describe ethical development. His point was that evolution has an unknown end; we do not know what end result of evolution. I agreed with him and further explained that he is alluding to Darwinian Theory of evolution with which I have no issue. My concern is the origin, growth and maturity of ethical evolution in an organization. I further clarified saying that just as a mutation is the cause of a higher species and shows natural progress so too, decisions taken by an organization, for that matter the society, is another turn in its growth and maturity. He disagreed and said that decisions have nothing to do with evolution. I replied that decisions are the stepping stones for personal, social or organizational growth. Our life, whether personal or social, is built on the decisions we make, conscious decisions and not involuntary submission to the survival of the fittest.

Your STEP theory is another form of answer to my sceptical and unconvinced scholar. I could think of another STEP such as Social, Theological, Ecological and Political. Let me explain. Among several, two theories of the social origin stand out: Social Contract, the enlightened secular theory of the origin of people's state and Theological, a spiritual basis for the origin and sustenance of a community. I cannot fathom why people fight about these theories and hold their dogmas so strictly as to be only secular or only spiritual. It is the same kind of pigheadedness that is demonstrated by the learned scholar that mentioned above.

The third point in your STEP model is that of Economy which I have named as Ecology. This is merely to emphasise that today's economy cannot be seen independent of ecology. Indeed, Earth Sastra's pivotal point demonstrates ecology as the central dimension. Let me infuse the Natural dimension from your theory. People are part of nature. People are also the exploiters of nature. We are the wilful exploiters of nature. The rest of the living world functions in nature naturally forming a food chain to sustain and to grow.

Now let me combine Economy and your fourth dimension, Politics. Originally, Political Economy has been a single dimension. By definition it is tantamount to managing people's affairs. Politics is governance of the people through policy making. Policy making is nothing but decision making at the government level so that Earth's resources are fairly shared and all the interests of the people are safeguarded. Organizations, whether they are of political or economic nature but their governing principles and decisions of operations must be according to the social norms, which we may term as Ethics.

What I mentioned, earlier on, the notions of secular and spiritual find its conclusion here. Ethical sensibilities are developed through the human experiences of good and bad, through experimentation of what is beneficial and what is harmful, and so, such experiences down the ages, create history, traditions, customs, laws and regulations and are exercised voluntarily or imposed, obeyed or disobeyed, rewarded or penalized as may be the case, thus forming fallible, amendable ever evolving from imperfect to ideal systems.

In contrast to the above, social, ethical and

secular systems which are rationally based, we experiment with spiritual and intuitive systems which arise from the inception of a definite faith, a shibboleth that directs our lives. The spiritual leaders through their transcendental experiences are able to grasp the core of the truth with some form of divine illumination in which people feel comfortable to surrender their will.

Yet another issue that I would like to join with you is that of 'cosmic being.' We have been limiting ourselves to being a citizen, a person from the city, educated, enlightened and urban in the original meaning from the time of city states. The states of course have grown beyond the city walls, and communication technology has reduced the entire world as though to a village. The evolution, hence, has been from citizen to 'netizen'! In cosmological terms alone, physically, man has been able travel into space and has been scientifically able to reach measurements of the universe to a highly remarkable degree. However, I think, your interpretation would be different, metaphorical, to embrace humanity along with the whole Nature, that we are all part of not only the cosmic order but being very conscious of this fact, transforms us into Beings of the Universe.

This brings me to an unusually unique term that you use: 'Consciousness Revolution'. I have been reflecting about this term. I can understand 'Conscious Evolution' to mean how the growth of civilization has evolved our consciousness towards the issues and problems that we face. There was a time when mankind did not face the problems of animal rights and ecological ethics. Today, even the courts of law not only uphold human rights but also animal rights. Violations against environment are severely dealt with. This has been possible because of the heightened consciousness not only towards humans but also other beings and the Nature at large. However, now, in your world view, rather cosmic view, we need a 'Consciousness Revolution.' While I would consider this revolution as having rational dimension, the other one that you advocate as 'Spiritual Evolution' would be based on intuition. I think it is fairly highlighted in the philosophies of Swami Vivekananda and Sri Aurobindo. The former bases his teachings on spiritual intuition and the later on the Supramental Consciousness which dawns on humanity.

In all this you come to the conclusion that only upon one condition it is possible to achieve the status of cosmic being, through non-violence. "All is strife," said the ancient Greek philosopher after observing Nature. He was a thinker with both rational and intuitive dimensions. He also observed that "Everything is in a flux." In other words, change characterizes the Nature, the entire universe. In our own parlance 'conflict' and 'change', 'creation' and 'destruction' – these are natural. How shall we analyse this?

Subhash: In nature we also find 'crucible mutation' in addition to random mutation suggested by Darwin. Crucible mutations are result of cataclysmic natural changes arising from 'natural crucibles'. Thus, there is a combined impact of random mutations and crucible mutations in creating a change. Crucible mutations lead to quantum jumps. Thus, evolution can be viewed as a step by step process facilitated by both random mutations and crucible mutations. This is particularly true of human society. Rebellions and revolutions are like 'crucible mutations' and represent 'crucible moments' and human history is full of the same. In fact history of a nation can be viewed in terms of crucible moments that create turning points in nation's story. Changes in society take place through step by step process of small steps combined with quantum jumps. The idea of crucible has been applied to the field of leadership by leadership guru Warren Bennis and he explains how leaders learn from their crucible experiences. Societies also learn from their crucible experiences and crucible moments of rebellions, revolutions, social movements and crisis. Thus, social evolution is essentially

a combination of evolution and revolution leading us to higher states of consciousness. This process is strengthened by decision making capabilities of the leaders and the society as a whole leading to growth and development of the society and its institutions.

Your interpretation of STEP in terms of Social, Theological, Ecological and Political in a way supplements STEPS model. Usage of the phrase Theological has its own limitations as it has historical baggage of certain faith and assumption about God that are not acceptable to modern secular view points. Theological is also associated with 'codes and commandments'. The idea of ethics has evolved beyond ancient codes and commandments. I would prefer usage of the phrase Transcendental to indicate the 'consciousness revolution' that takes us beyond the codes and commandments approach to structure society. As you have pointed out this is also part of the evolutionary process of human society. Ecological laws were unheard. Now they have acquired a new relevance.

I consider the evolution of human beings from citizens to netizens to cosmizens. Cyber revolution has brought us to the level of netizens, consciousness revolution will take us towards becoming cosmizens. This revolution is not only based on rationality but also on intuition and super-intuition in consonance with B-H-S (Body-Heart- Spirit) model of human being. Our current institutions are based on Rationality (Body-centric) view of the world. Philosophies of Vivekananda and Aurobindo draw upon Heart and Spirit centric view of nature and society. When West was structuring its modern institutions on the basis of rationality during its Enlightenment era, East was awakening to the role of Heart through Bhakti revolution. Consciousness revolution is carrying forward this stream of consciousness by Joining Heart and Spirit (JHS).

From the ancient Greek Philosophers to Darwin, we find the echo of 'all is strife' and 'everything is in flux'. The problem with this world view is that flux in nature and human society is seen only in terms of strife, struggle and conflict. In fact Western world view is based on three fundamental assumptions viz. Binary thinking (black and white view of the world), conflict and strife and selfish gene. This is a limited view of nature as well as society. In nature there is lot of 'Jai Ho' (celebration) as well as existence of 'compassionate gene'. In fact there are three views of life metaphorically represented by 'jungle mei dangal' (strife in nature, a Darwinian view), Jungle Book view of collaboration and cooperation and 'jungle mei mangal' (nature is celebration – nature is a jingle) view of life. These views are reflected in terms of three dimensions of nature viz. Violent, vibrant and silent and interplay among them. We can analyze conflict and change, creation and destruction on the basis of the dynamics between these three aspects of nature. Of course in Indian philosophy this is known as 'guna dynamics' and 'guna analytics' that can help us in a better understanding of nature and society. Time has come to use this analytics in analyzing societies and organizations.

Followers of Darwin want to 'win' at the cost of others while the need is to convert Darwin approach to life into Winwin (that may as well be name of a future philosopher!) wherein one wins with the help of others and not at the cost of others. From sin model (Theology) to win model of Darwin (Secular) to win-win model (Secular with touch of Heart) is a long journey of human evolution and in future it will take us to yin model (Spiritual) of spiritual consciousness. Thus, sin, win, winwin and yin represent an evolutionary journey of human beings taking us in the direction of evolving as cosmizens. This is another way of looking at the idea of consciousness revolution leading us towards 'New Earth Sastra'.

Daniel: Nature and man, an analysis of the place of man in nature and man's development in creating a social world; on the one hand the laws of nature and on the other social laws or values for living has been our discussion thus

far. We have been also able to establish that our life becomes meaningful in so far as we are able to interpret the natural law and apply it, as it suits, to our social existence. Such meaning is derived by our consciousness of ourselves and the external world. We can contemplate on the origin of the natural world and also reflect on our own existence, cooperation and advancing of our life in a social milieu. Our consciousness is able to create a world of our own and set values on our external world. The external world is significant only in so far as our ideas are able to determine and categorise those values in our thought system. This is a kind of Cartesian (Philosophy of Descartes) philosophy.

However, what I propose goes beyond it. While the idea of myself and the external world, according to Descartes philosophy, ushers in the problem of the dichotomy of body and mind, world and self, the concept of consciousness explains the unity of nature and all that is in it, including both external world and the self.

The social world, a creation credited to humans, evolves according to the ideas which are born and grown in the society. Some ideas are violent and result in wars and revolutions; some ideas are peaceful which help develop art and science. The discovery of wheel and the development of technology is one of the biggest ideas of mankind.

In contemporary India *development* is a big idea. Socio-economic development in fact forms the heart of the Indian Constitution. Political platforms use it to the hilt. People, on the other hand, are striving for economic development, improvement of their living conditions, enhanced quality of life, non-discrimination in wages and opportunity for all. What I see is a great disparity in both in understanding and execution of any form of development in any kind of field. The core question is how shall we find a way, a right and sound way, to development?

Subhash: Right and sound way of development is the holistic approach to development. I express it through the catch phrase, 'Development with HOPE and Wisdom'. Development thinking should be linked with Higher Order Purpose of Existence (HOPE) and should be driven by Wisdom that includes the wisdom of the masses. In general development has been a top down approach based on techno-economic approach and has not given any importance to the wisdom of the masses. Such an approach has ignored the capillary action model of development based on local wisdom systems and traditional knowledge. For holistic development of a nation we need to integrate three approaches to development viz. Corporate approach, State driven approach and Capillary action approach. Most policy makers have focussed on Corporate approach or State driven approach. In fact we need to interconnect three roads to development viz. corporate road (advocated by Prof. C. K. Prahlad through Bottom of the Pyramid model), State driven approach (advocated by Amartya Sen and others) and Capillary action road (Rise of the bottom as was advocated by Gandhi and demonstrated by Mohamed Yunus and others). Such an approach within the framework of sustainability, social responsibility and a touch of spirituality will lead us to ORUT (Optimal Resources Utilization Theory). 'Development with HOPE and Wisdom' implies ORUT based development of the nations and the world. In such a world view there will be a proper integration of management thought with development thinking, social discourse and spiritual concerns. Current management thought is devoid of such linkages. Hence, there is a need to expand the horizons of management and social thought in the direction of Holistic Development and Management (HDM). This is also the essence of the New Earth Sastra.

The following is a telephone Conversation after the initial pleasantries.

Daniel: I wonder what you are doing in IIM Ranchi?

Subhash: Indian Philosophy and Management.

Daniel: That is interesting – interesting for me as a student of philosophy.

Subhash: Here at the management institute they want to relate to Indian Philosophy with focus on Inner Development.

Daniel: Well, last September in our workshop at IBA Bangalore the participants had expressed their concern about the lack of adequate courses in philosophy at the universities. Some even want to scrap the course for the lack of funds.

Subhash: Indeed, the long neglect is now getting reflected. In management education we feel the need for philosophy.

Daniel: After all it is the first science.

Subhash: Right. You have heard me speaking about candle light experiment. I conducted it here for the students. The amazing thing that I experienced was that they provided deep and numerous insights.

Daniel: Students, the younger lot, have deeper thoughts. It is when they grow that biases and prejudices and political or religious correctness creep in.

Subhash: Right. Well, I have done this candle light experiment several times, with several groups of students. Of course these are MBA students. Yes, as you say their thoughts get qualified by several aspects that you mentioned. But here in Ranchi it was a totally new experience. I could see clearly the internal and external distinctions, knowledge, unity, diversity and so forth.

Daniel: Well, there seems to be a bulb turned on in my mind too. I will put those thoughts in my next e-mail to you.

Subhash: Good. I will go through it and add my response.

The following is the email correspondence

Daniel: After hundred odd years of relativity theory and the recent Higgs boson experiment at European Organization for Nuclear Research (Cern), *light,* whether it is from a candle or from the theory of the origin of the universe, has penetrated deeper into our consciousness of it. Among common people light is more than that illuminates. Light forms the belief patterns of the common people. It is no more a *science;* people understand mass, light and time in one concept rather than independently of each other. All of these three are transformational.

Our rishis and holy men, there are scores of stories, where they transform themselves into light; or, at times they are incarnations of pure light. It appears to me that as the particle physics advances, we could, trigger ourselves consciously into light and vice versa. The trigger or the igniter is the thought.

(Courtesy: Getty image[1])

In the meditation on light that you refer to is the thought particle, if you like, that races through caverns of consciousness and in an instant it explodes into light and starts expanding. It is a dance. It is a Nataraja at his best who creates/destroys and carries on the limitless expansion.

I think every individual is a laboratory for subatomic microcosm. At this level the distinction between matter and spirit dissolve. No wonder then when sometimes people consider Albert Einstein more a prophet than a physicist. He indeed proved unity between mass and energy but also a unity between

[1] *Courtesy: http://www.guardian.co.uk/science2012*

material and spiritual. This seems to me the result of positive thought.

I think that somewhere some negative thought hinders such unity and hence distinction between matter and spirit, body and mind makes an appearance. Is this the way matter has come into existence?

Thus the eternal origin is thought, a positive one; and a material and transient one is negative. This is a plausible theory. Higgs boson particle theory is perhaps not even probable. For what is it that the particle physicists looking beyond the Cern experiment? More particles. After so much theory and millions of dollars, many feel, it is a dead-end.

I think positive thought is a candle of hope. Light can bring us vitality at the speed of light that could turn us into *light* – both physically and spiritually.

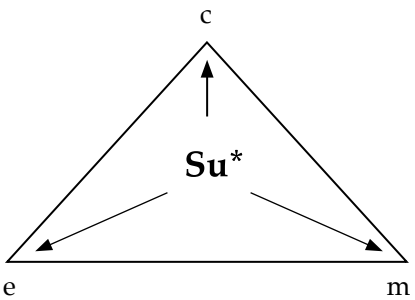
Subhash: Yes over the ages, *Light* has been a subject of interest to all - Vedic Rishis, Mystic, Prophets, Scientists and common people. From the idea of 'Let there be Light' to the realization of the mystic, 'I am the Light', there are several perspectives on Light. Physicist see Light in terms of waves and particles consider speed of light as the ultimate limit. For them Light is a scalar quantity. For the mystic Light is vector in nature as it also guides and thus provides direction. For them 'speed of light' is essentially 'velocity of light'. I consider Higgs Boson as 'shunya particle' for which search has been going on. Viewed from this perspective, CERN experiment is the 'search for the shunya'.

Light is God and God is light. Like colors of spectrum, God has many names and forms. Human beings keep on fighting on names, forms, colors and various descriptions. For Gandhi, God is Truth and Truth is God. When we combine these ideas we arrive at the proposition: Light is Truth and Truth is Light.

Einstein gave us his famous equation of mass energy equivalence, $e = m c^2$, wherein e is energy, m is mass and c is speed of light. This equation also has 'spiritual significance'. In my book, Quantum Rope (1999), I meditated on this equation and extended it to the spiritual realm in the form of a general equation, $e = mc^n$ (n = 1, 2, 3, ...) wherein e stands for energy, m for matter and c for consciousness. It can also be considered as an equation of 'Shunya unfolding'. We can also represent it as follows:

Shunya unfolding ⇨ m ⇨ e ⇨ c

This idea can also be represented in the form of a triad of e, m, c presented below:



*Su: Shunya unfolding

Above presented idea of Shunya unfolding has interesting implications for human beings and society. Broadly this idea suggests three types of Light viz. Physical light corresponding to m (matter), Light in my Heart corresponding to e (energy) and Light of Spirit corresponding to c (consciousness). When these three lights merge, there is light and light and a human being becomes Light (Heavenly light). At this point we are the Light. When mystic declare, 'I am the Light' they are referring to the state of merging of three lights viz. Physical light, Light in the Heart and the light of Spirit. If you permit me I can call this 'shunya light' as 'Subhash light' because through a strange coincidence, these three lights unfolding from shnya, are reflected in my name! Is 'cosmic consciousness' creating this mystical connectivity and revealing itself though a new word or a new mantra or a new voice? I have no answers but I get the following flow of thought current:

Shunya unfolding

(Su) Body (B) Heart (HA) Spirit (S) Heaven (H)

In the Candle Light experiment that I conduct participants feel in varying forms different aspects of the three lights and their merging into Shunya. In 1993, in my book, Creation from Shunya' I concluded my poem, 'Creation from shunya' with following lines:

'From the Shunya we emerge and into Shunya we merge'.

Now I find both material and spiritual significance of these lines through Einstein's famous equation e = mc2 and its modified version e = mcn. Both 'speed of light' and 'velocity of light' become transformational concepts for the human beings and future evolution of human society based on merging of three lights viz. Physical Light, Light in our Heart and Light of Spirit / Consciousness.

The following is a telephone Conversation after the initial pleasantries.

Daniel: So, you are back from IIM Ranchi, with more light after giving the students a new experience of candle light!

Subhash: Definitely, and you will learn more about it in my paper. In fact, essence of Candle Light Experiment lies in understanding Light in its three forms viz. wave, particle and consciousness.

Daniel: One may speak about light and yet the enlightenment could be distantly out of sight.

Subhash: The phenomena are always there, just as apples have been falling before Newton also. He himself may have seen it happen hundreds of times. Somehow, at one particular instant, it is the switched on, and a certain spiritual illumination, if you like, occurs.

In Physics, light is viewed in terms of wave and particle and in Spirituality, light is consciousness. In Candle Light, Physics and Spirituality merge leading us to a new understanding of light in terms of wave, particle and consciousness. In fact, in this form Light provides us Sight (through wave and particle) leading us to Darshan (Direct perception) of reality. This is the LSD (Light, Sight, Darshan) experience that leads us to a moment of enlightenment.

Daniel: The illumination theories abound. In the West since the time of Plato the doctrine of illumination has been in vogue.

Subhash: So also in the East, all our Rishis and holy men & women and philosophers like Shankara and Swami Vivekananda.

Daniel: Well, the creation stories tell us that everything comes from the light. The theory of relativity is nothing but a formula to corroborate that. Everything is convertible from and to light.

Shubhash: Creation from Shunya and merging into Shunya ! 'Shunya-realization' – 'Shunya sampadane'.

'Shunya realization' can be represented by O^n, where O stands for Oneness and n can have values, 1, 2, 3, … indicating increasing radius of O as circle of consciousness leading to nirvana (n). In a similar vein, we can also refer to it as O^m, wherein m implies moksha. Both O^n and O^m experiences represent the moment of enlightenment. O also implies coming together of two semicircles (and). We may call it as Theory O representing the 'fullness of the void' - 'fullness in shunya'.

Daniel: Hope of a new creation!

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Sustainability: A Study of Biodiversity Conservation India Limited (BCIL)

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Be the Change

Heraclitus, the Greek philosopher said, "The only thing that is constant is change." Anything that is constant is easy to be relied upon an eternal support system. These provide a sense of security that any living being generally looks for. As a developing country that imports 70 per cent of its energy, India cannot ignore the need for strategies in the building industry that will reduce consumption by enhancing the country's energy security. Energy security is not primarily about generation as it is about achieving energy efficiency.

It's a fact that abuse of earth's resources for power and water is resulting in energy shortages which cannot go away for we have no feedstock for producing electrical energy in the quantum we need. All that is touched around us comes out of earth. There is nothing that the earth inhabitants breathe or use that does not come from the planet. Our ancestor knew this and so brought deep respect to Nature. This respect for nature is what Zed philosophy is about.

Respect nature and its glory and continue to glorify it with the change in approach towards water, energy, housing, waste management, food, health. T-Zed believes that 'change' is to deal with essentials of life and living with a prudent blend of innovation and the conventional with no trade off between growth and cost effective methods.

To 'be the change' one needs to have the concern for the planet it's sanity, be able to connect with nature with houses having outdoors blend with the indoors, traditional architecture forms that offer an emotional hark back in the mind to one's own grandfather's times. Most importantly change needs courage - courage from within 'the self' to lead or even to follow the change. Never let the self-worth erode. No one can touch the self-esteem no matter what. The same way the integrity of the earth is not to be touched by abusing it or in any other way.

Every voice is as unique as any other person, old or young. One voice supporting the change is all that is required. Be the trigger or the important link in the revolution of change. Be the first to trigger off a set of dominoes or be one among the dominoes that cause the 'domino action' of change.

The first step towards this change is to believe in the existence of a world with no major effort or cost. At BCIL, it's called the Zed world. It is a world that we call 'Zero energy development'. We have demonstrated the exciting possibilities of saving and of redefined comfort for homes; home-dwellers are starting to call it indispensable. Since its inception, BCIL has promoted successful business models that have mainstreamed the 'alternative'. It has shown that governments must first dispel the notion that there is a trade-off between growth and being environmentally friendly.

Today, BCIL is the largest green builders in India. Pioneered innovations at the same cost as any builder company, prices lower than the regular builder with no advantage of brand value.

Sermons on sustainability will not get people's attention benefits will. The benefits we offered were far superior, as many of those early clients admit today. They did not have the foresight to see what was being offered was far beyond its time. Now they know it.

With a project value base that is close to Rs 300 crore, BCIL is gearing up for the next confident stride that will take the organization into the big league. We are training to create about 20 million sq feet of homes by 2020, which will lead the industry with energy efficiency far beyond what is seen even globally. Our customer base is growing. We are by far the leaders in energy-efficient buildings, not just in India but in the world, judging by reports and responses we get.

Today we are recognized as pioneers and technology leaders. We have focused not on size but on substance. We are able to impact and influence change to a point where we see today that there are only two types of buildings into the future: one is called the energy-efficient, green building, the other is called mistakes! If builders are not going to adopt these sets of green guidelines, which reduce energy use by 30%, water use by at least 50 per cent, they will continue to build mistakes! With this bedrock foundation, we have created an entirely new business model in India, for a better world of blissful tomorrow.

ZED Housing Projects

Every BCIL project at the time it was created was unique in its exploration and understanding of state-of-the-art in building management systems. When Trans Indus was created in 1995 over 47 acres, the game

Trans Indus

changer was that it had zero reliance on water from the municipal grid, that it treated all its wastewater in the traditional ways of using soak and leech pits, and dropped down energy and water consumption by at least 40 percent in their homes.

Since then several projects have been initiated and completed as apartment, as row houses, as single family homes. In each of these there have been advancements in the application of systems across the spectrum of architecture, energy management, water management, waste management, as well as the use of water efficient species for landscaping or eco-scaping. The graphs accompanying this article illustrate the approach, the strategy and the process management methods that are employed to achieve different goals at the bricks-and mortar level. Each building and project over the years has demonstrated an improvement in our own collective learning at BCIL. It has also benefited from the growing pool of resource expertise within the organization.

The most acclaimed has been T-Zed Homes, the first of its kind, which was created 30,000 square meters or about 300,000 square feet of residential apartments over a five acre spread in the East of Bangalore. This was created between 2004 and 2007. By the time the systems became operational and settled down into a nice rhythm, it was 2008.

In these homes, built-in, customized environment-friendly (brine based), zero electricity fridge-freezers, fully controlled air-conditioning based 100 per cent on fresh air, and built-in energy-efficient lights are among the features that help to bring down energy consumption in the home while preserving comfort levels and ensuring market value.

Features include air conditioning systems that keep homes dust-free and cool using energy-efficient appliances such as earth tunnel venting systems, nocturnal cooling systems, or the stack effect, which draws ambient air and cools it by convection.

Intelligent lighting systems blend motion sensors, ambient light sensors and timers to ensure that lights are switched off when not needed. Compact fluorescent lamps and light emitting diodes are used, cutting power consumption by up to 80 per cent while protecting lighting efficiency.

Washrooms are ventilated using noiseless, energy-efficient DC and AC fans. DC fans are powered by photovoltaic panels and run from dawn to dusk, while AC fans can be switched on and off as needed.

External walls are built using soil-stabilized blocks; laterite blocks and surface engineering with stone chop plastered surfaces. This ensures that surfaces are non-erodible, need no external paint applications, and are thermally efficient.

Green roofs or 'sky gardens' also contribute to the thermal comfort of the dwellings. These provide a planting space for every home while serving as thermal insulation for adjoining and lower-built spaces. Each sky garden uses lightweight mulch and coir pith instead of heavier soil, and is irrigated via a drip method.

T-Zed Homes

The degree of self-sufficiency enabled by this promotion of urban agriculture also helps to decrease the 'food miles' and encourage more organic urban agriculture.

Rubber timber is used for frames and shutters, and palm wood for decking. Door shutters, flooring and frames are made using compressed coir panels, while bamboo composites provide roofing, flooring and interior woodwork materials. These are local resources which cost less than imported timber and use less energy to produce, thus reducing carbon emissions.

A centralised, district refrigeration system is provided using an ammonia-based chilling unit means that there are no compressors in the individual refrigeration units installed in each home. This in turn enables better management of cooling needs and more space for storage within each fridge.

A self-sufficient and secure water supply system is also provided, using rainwater collected from the roof and stored in a shallow aquifer, through a system of drains, percolation pits, trenches and wells. Trenches are shallow at ten meters, so ground water is not depleted. Water treatment costs are reduced via direct tapping of rooftop rainwater.

Each home also has 'conscience meters', monitoring electric watts and water consumption. As the number of electrical devices increases, so does power consumption. An electric watt meter fitted in each home indicates the wattage used at a particular time and thus allows users to monitor their power consumption and introduce efficiencies. Meters on the kitchen and bathroom taps help to monitor the volume of water used in liters.

This project has won the most number of awards. It has also been the subject of thesis for architects in Carnegie Mellon University in NYU, in UC Berkeley, as well as CEPT and SP&A among other schools of architecture in India and the world.

The closest next to T-ZED is ZED Collective, which has advanced the carbon reducing approach to building construction, and has enhanced building performance for its occupants. The Zed Collective campus offers multiple comfort features, while achieving a one-third reduction in carbon emission. Located to the north of Bangalore, this set of apartments comprises 68 homes designed and built on these principles of sustainable resources.

Zed Collective

Into its operations after people have moved in and made home, the apartment saves as much as 47 per cent carbon emission in use of electricity and water. Features include air-conditioning systems that keep homes dust-free and cool using energy-efficient appliances such as earth tunnel ventilation systems, nocturnal cooling systems, or the stack effect, which draws ambient air and cools it by convection.

Sensitivity for resources starts with the compound wall that has been made using local quarried stone. This when compared to regular carbon emitting conventional ones has saved 19.56 tons of carbon.

Tucked away in the small garden near entry, is an open well which will absorb rainwater falling on the hard surfaces of the roads and open areas at the ground level. The surface water is directed to this percolation tank to strengthen groundwater charge of the land. This tank takes in about 300,000 liters of water over seven rain months of every year.

A gentle mound, near the entry again, in ferroconcrete hides a storage tank of 70,000 litres. It is curved; somewhat tubular form offers structural strength while sharply reducing use of RCC and Steel. This is the rainwater harvest [RWH] tank that feeds about 2.5 million litres a year of clean, soft water that is harvested through a network of pop-up filters and pipes that bring the water to this tank.

Treating waste water - The waste water treatment system for 100,000 litres of daily treatment is unique in that it treats separately silage [or grey water] and sewage [or black water]. Grey water from wash basins, showers, and kitchen water is treated separately to a level of purity that you can even drink.

The treated grey water is directed to all flush tanks at all 136 washrooms by a network of overhead tanks on the terrace. The second part of the treatment system is dedicated only to treating black water from the sanitation lines from all water closets at this campus. The water treated here is pumped back to a network of 4 overhead tanks on the terrace that feed water for gardens within homes as well as the expansive gardens at the atrium.

Plants that sink carbon - The atrium has a variety of flowering and edible species of plants. This area alone has 2,000 plants that will grow over the years to offer a triple canopy of grass, shrubs and plants. Some of them offer high medicinal value; some of them are of deep religious significance.

They do not use much water. They grow without fertilizers and other growth promoters. The plants have been chosen for their color, their texture of leaf, fragrance, seasonality, use at home and for their medicinal properties. They have also been chosen bearing in mind their ability to absorb carbon and exude oxygen, and for their ability to cool the immediate surroundings of each home. The total carbon absorption that these plants offer every year is about 60 tons

ZedLite Roads - The roads are based on BCIL's ZedLite technology for roads. They offer 70 per cent reduction in use of concrete. The technology offers higher dimensional stability of concrete, is more durable, enhances strength, and has zero cost for maintaining annually for nearly 15 years.

Value-engineering Energy - Energy for lighting and for powering home appliances has been carefully planned and implemented at Zed Collective. The simple expedient of avoiding use of geysers in all homes has reduced the demand load by as much as 270 KW. Against the total of 200 KW that is now the demand load designed at Zed Collective, a regular apartment of this size would have had a total of 360 KW as power demand. Every KW of demand load reduced by such private action as BCIL offers, results in reduction of demand load for the Power Corporation or the government of as much as 10 KW thanks to the cascade of savings that comes out of such drop in demand. The residents are expected

not to use incandescent lamps, halogen lamps, or regular florescent tube-lights. This drops energy use at the house by as much as 70 per cent. The reduction in energy bill for a household is as much as Rs. 2500 every year on this one aspect alone.

External Lighting and Daylight Basements - All external lighting consume only 0.5 KW of power per month as against 3 KW of power that is consumed at a comparable enclave. This amounts to a carbon saving of 3.14 tons straightaway every year. BCIL has achieved this through a strategic combination of CFLs or 1 watt LEDs and with motion sensors in common areas that trigger lights on when people pass by.

Designing to ensure maximum amount of diffused sunlight in all times of day is a healthy obsession at BCIL. We extend such concepts to the design of our basements, too. Very rarely would you find basements that are as well-lit as they are in Collective without having the need to light up basement interiors with artificial lighting.

Natural air-conditioning - The centrepiece at Zed Collective is the simple, reliable and efficient system that cools the air in summer and warms in winter. It is inspired by ancient systems for draughting air into homes that have been practised by many civilizations in the past. The earth tunnel ventilation network relies on the natural phenomenon of earth at about 3 metres retaining the average temperature of the region. A planned network of 5,000 metres of pipelines have been installed at the campus to draw ambient air, drive it down these air-lines, and then re-direct the treated, pollen-free air into every single house at the campus. To enhance the quality of air, our designers installed an additional set of air ambiators for every cluster of four homes. These further facilitate the cooling of air by 4 degree Celcius.

We don't use bricks - The walls that you see at Zed Collective are far lighter, offer thermal neutrality thanks to cavities designed in the blocks, and is designed to offer 15 per cent more compaction strength per sq cm than a regular concrete block or bricks. The world built with bricks for 5000 years but the sharp rise and demand for buildings has put to risk top soils near every city of ours. Without top soil bricks cannot be made. Without top soil we cannot grow our foods.

Concrete blocks need cement and sand and heat of up to 700 degree Celsius for their manufacture. BCIL has banned the use of bricks and concrete blocks in all its buildings. Zed Collective has not used a single clay block or clay tile either. All such building materials are high on energy use in manufacturing.

The carbon reduction that has been achieved with just these light-weight blocks at Zed Collective is about 2 million kg or 2000 tons.

Floors that heal - The warm wooden floors of earthy tones that are inviting to your feet, lend rich elegance to the home, and offer therapeutic value. It is a signature feature at every BCIL Zed home. They offer high comfort, save hugely on natural resources at the core of the building, offer solace to rheumatoid and arthritics, is warm in winters and cool during summers. The base board for these wooden tiles employs recycled wooden waste pulp in their manufacture. They are guaranteed to last long, and come with a warranty of ten years for the home owner.

Walls that cool - The surface finishes of all walls at the campus sport a blend of gypsum, an age-old material for wall applications. Its sheer merit above other conventional plastering material that regular builders use, offers several green and sustainable values. The walls of these homes tremendously reduce power bills as gypsum plastering has very low thermal conductivity. These surfaces do not develop cracks—that's a risk regular conventional cement plastering is prone to. These zed walls are lighter in weight, and reduce dead weight of the whole structure. In plastering these walls, we consume no water for curing, either.These walls offer higher

thermal and acoustic properties – they shut out the heat from outside, and provide noise insulation, plus resistance to fire as well.

Solar heating -The thermal drop that you will experience on the set of apartments on the last floor is due to heat-reflective high-albedo paints we have used over the terrace floor. These paints have the capacity to bring down internal temperature by 5-6 deg C in the peak of summer.

The apartment has been provided with solar hot water tanks for each home with no electrical back-up at the central tanks. This saves each home owner as much as Rs 400 a month, and reduces use of fossil fuel-based grid energy. Homes are offered the option to install small geysers and so meet deficits on hot water at their own washrooms.

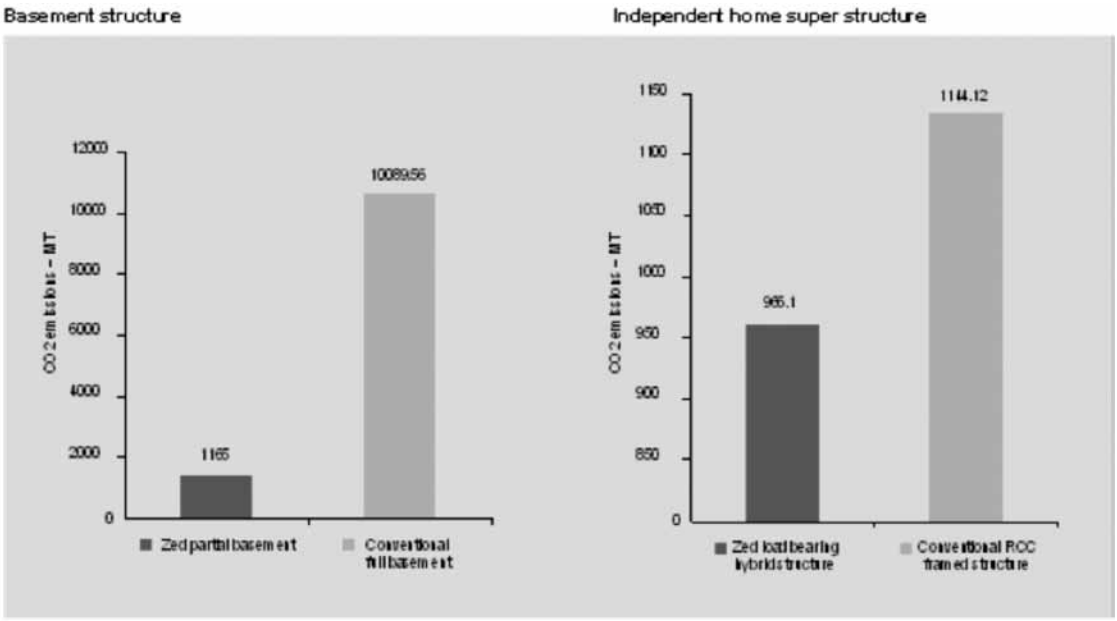
Sustainability not negotiable - BCIL's adherence to these values, as a profit-making company, is non-negotiable. BCIL is about the human spirit; our mission statement, 'mainstreaming sustainability' is no hollow catchphrase. As an organization, we have pushed the boundaries of economic possibility, always knowing that we will not bend to curtail that spirit or the soul of our company.

Currently the company is working on two projects, which have already won the highest platinum rating and five star rating points that are conferred for green buildings. One is ZED Woods, which is an apartment block, and the other is 176 homes enclave, which will truly demonstrate game changing, energy management systems beyond the regular portfolio of water and waste systems and technologies for which BCIL has been renowned.

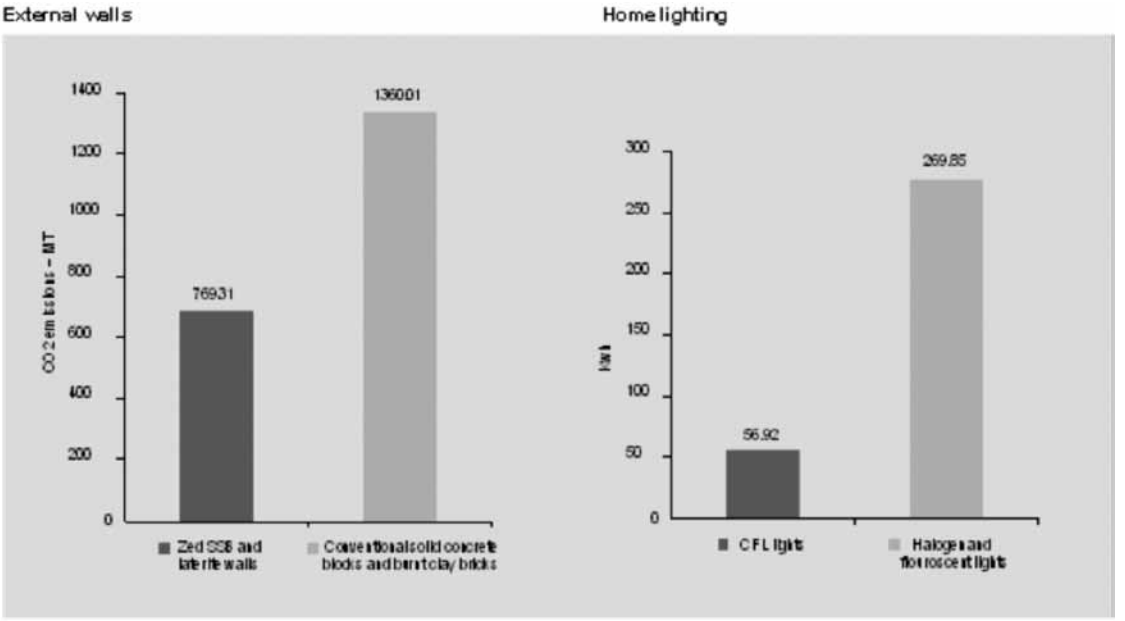
The ZED Experience

When is the right time to invest in a house? It's a lifetime decision. It is the lady of the house who actually takes the call. Some basic questions that can be asked before purchasing: Has the builder got every clearance? Appoint a lawyer for a small fee and get him to validate all required clearances.

How many flats the apartment offers totally? Don't buy anything if it's over sixty flats to an acre, for the pressure on power and water will be so high that there will be a lifetime of shortages.



Source: BCIL



Source : BGIL

Be informed on total water demand and total energy demand for the entire apartment campus? Bore wells can go dry in less than 2 years, if the demand is too high. Is it only water supply board connection? What other solutions are they offering for addressing long term water supply needs?

What has been done to bring energy efficiency in lighting, in pumps, and other energy appliances on the campus? What kind of waste water treatment system the builder has established? Does it offer long term water security?

Buying a home involves not just a decision between location and legal titles. It would be good to be informed and take a decision at leisure to avoid the pain of regretting forever.

The law has come a long way since the days of the FERA (Foreign Exchange Regulation Act) regime, when buying or selling of immovable property was governed by the citizenship of a person. Under FEMA (Foreign Exchange Management Act), the thrust is on residential status. But before going into the details of the law, let's get the definitions straight. An NRI is an Indian citizen residing outside India. A citizen of another country is a PIO (Person of Indian Origin) if he has held an Indian passport at any time or if he, his father or his grandfather has been a citizen of India. A citizen of Pakistan, Bangladesh, Sri Lanka, Afghanistan, China, Iran, Nepal or Bhutan is not regarded as a PIO.

A foreign citizen of non-Indian origin cannot acquire agriculture land/farm house/ plantation property in India without the prior approval of the RBI, whereas a foreign citizen of Indian origin can acquire such properties without the prior approval of the RBI but only by way of inheritance. Leasing of immovable property for a period of five years or less is freely permitted.

Under FEMA regulations, residential status is determined by operation of law. The onus is on the individual to prove his residential status, if questioned by other authority.

A general permission is available to NRIs or PIOs to purchase only residential/commercial property in India. There is no restriction on the number of residential/commercial properties that an NRI or a PIO can buy.

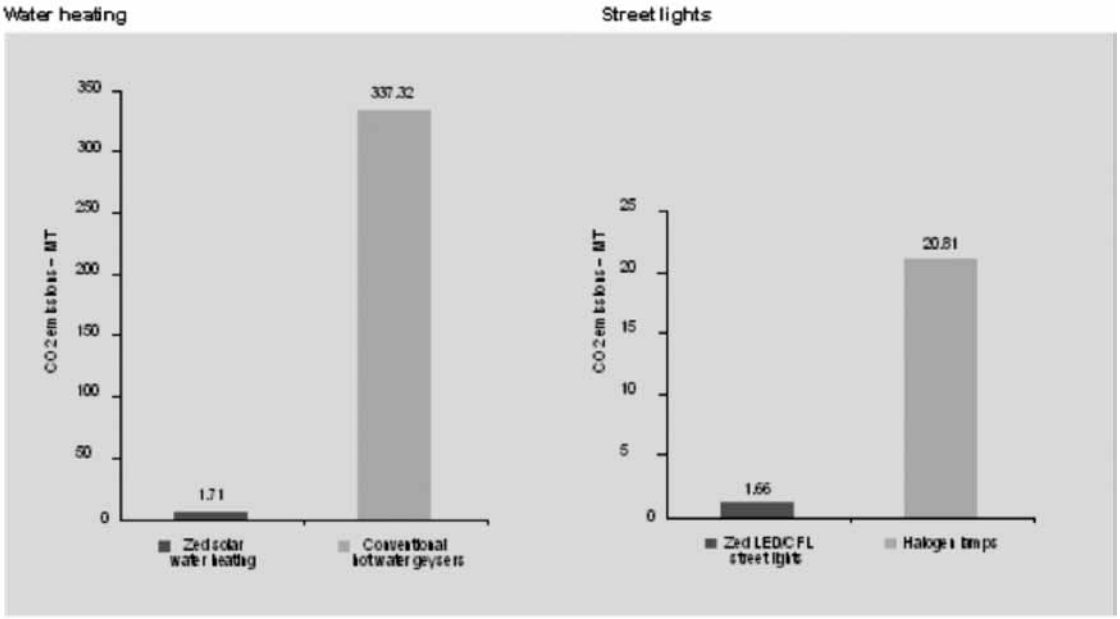
Campus security, water and energy management, housekeeping and basic hospitality services are taken care of with company's best practices in place. The company is committed in every new project for handling aftercare challenges for the first year of occupation.

Many of our overseas customers have found ZED aftercare services very valuable in giving them assurance on upkeep of their property.

Here are a couple of experiences shared by the now contented residents of ZED Habitats, who too had the initial anxiety about ZED residential–

We were the first to move into the place at that time. The building had opened about 6 months earlier. Since my wife has severe chemical sensitivity, we were especially interested in the indoor air quality. We were not disappointed: there were no odours, no 'new building' smells. To secure the platinum rating, the Zed campus had used low-VOC paints, adhesives and sealants, as well as formaldehyde-free cabinets. Well, beyond all these, we know that we'll be living a little more lightly on the planet, or reducing our carbon footprint.

We did about six months of research before we bought this Zed home. That included looking at many other homebuilders. No one had the kind of detail and explanation that Zed Habitats had on how their homes are energy-efficient, and how it saves us money on energy. What we did find is that there's not much of a difference living in a green home compared to a non-green home. And that's the beauty of it: you don't have to sacrifice your lifestyle in any way to live in a green home. The great thing is the lower utility bills so you have more disposable income to go out to dinner or buy things to improve your home.



Source : BCIL

The BCIL Journey

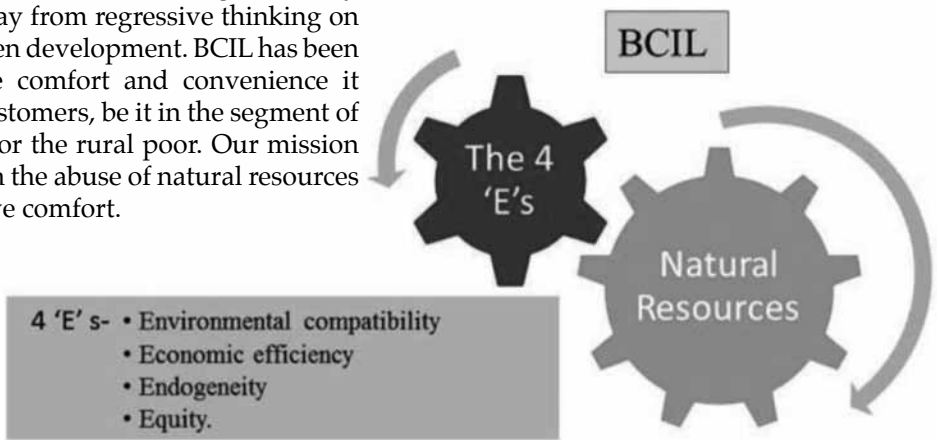
In 1994, a fledgling group of development workers established an enterprise to identify technologies in building, water and energy management that could demonstrate resource-sensitivity while still being financially viable. Today, after 18 years BCIL has shown that sustainability can be a central platform for business growth.

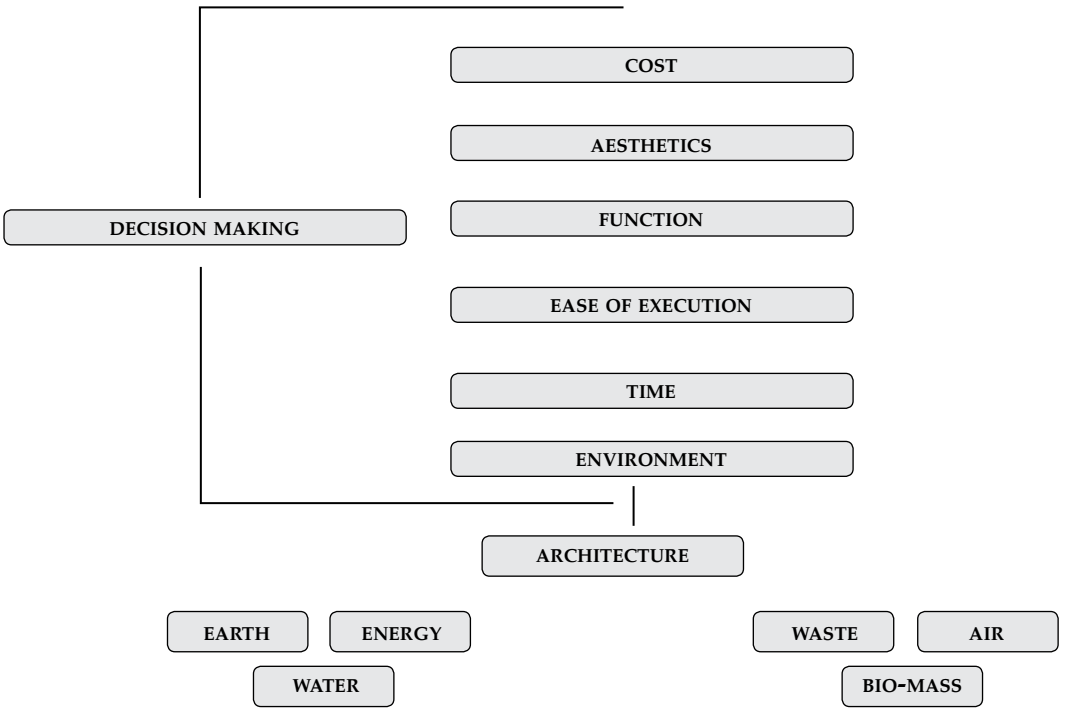
In 1995, BCIL had a business value of USD 500,000. Today, it has become a USD 25 million enterprise. It is a standing testimony for moving away from regressive thinking on 'nurturing' green development. BCIL has been mindful of the comfort and convenience it offers to our customers, be it in the segment of the urban rich or the rural poor. Our mission is to scale down the abuse of natural resources and yet preserve comfort.

BCIL has looked at implementation that pursues the 4 'E's, for natural resource efficiency as seen below:

Decision-making in the organization has been a combination of six factors as seen in the chart below and our architecture adheres to a six-strand approach integrating management of all aspects that relate to earth, energy, water, waste, air and bio-mass.

The organization has also worked in Manila with the Asian Development Bank (ADB)





on urban water supply and sanitation, with ADEME (French Agency for Environment and Energy Management) to examine installation of energy information centers in urban India, with the UN Habitat in South Korea on a study that encompassed 78 cities across 63 nations in Asia , on a consulting project in Rabat, Morocco , of an urban township.

Projects

Over 25 years from 1987, BCIL's different offshoots have worked on watersheds Dahod districts in East Gujarat, Rajkot in West Gujarat, Patan in North Gujarat. It has also worked in Sriganganagar on watersheds in Rajasthan, in the Araku Valley on slash and burn and alternate practices for sustenance farming. BCIL has been a consultant for eco-sensitive tourism in Kerala, Chhattisgarh and Nagaland. In Nagaland, in 2004, BCIL created the first tourism village in a 1000 year village called Khonoma and received national acclaim for being a model that could be replicated by the local Naga communities to promote state tourism.

BCIL's projects in Bangalore and Mysore have succeeded in annually harvesting over 45 million litres of rainwater in campuses created since 1995. The quantum of freshwater demand that has reduced in ZED homes is over 100 million litres. The carbon tonnage savings achieved over these last 18 years of building zero energy developed homes and residential enclaves has been over 10 million carbon tons.

Internationally, over the last 18 years, BCIL has worked in Manila with the Asian Development Bank (ADB) on urban water supply and sanitation. This involved the evaluation of Pilot Demonstration Activity (PDA) projects for the ADB. These were innovation-based in areas of water treatment, freshwater analysis, inventions that could bring easier access to treated water for consumers.

BCIL has also worked on two projects with ADEME (French Agency for Environment and Energy Management). This project was a year study to examine the feasibility of installing energy information centres in urban India

of what the European Union has done since 2004. The exercise was done between 2008 -2009 in India over 6 cities. The data findings were submitted to ADEME for them to take up with the Government of India. BCIL was also involved with the UN Habitat in South Korea on a study that encompassed 78 cities across 63 nations in Asia. That report was submitted to the Seoul headquarters of UN Habitat in 2009.

BCIL has worked on a consulting project in Rabat, Morocco which was in the private sector involving 28 square kilometres of an urban township that was to be created between 2006- 2007. Our report findings were around watershed management practices that the city could take up in a water neutral way.

BCIL has received 27 awards from 8 nations apart from India and has presented papers in Brussels, in Milano at the University, at the NYU in New York City, at BREEAM in London. The Blue Bag seminars were presented in Barcelona for the UN Climate Change Studies Program, in Singapore at the National University, in Bangkok at the Asian Institute of Technology, at the Centre of Sustainable Design & Environment in Singapore, at ADB in Manila among others. In 2006, the IGES in Okinawa, Japan recognized BCIL as the only Indian enterprise to achieve excellence in sustainability. Though the listing seems pretty large, the impact of project creation and community benefits outside India, have not been as substantial.

Training

In planning a future as a career manager or as a business leader, always look at organizations that are not highly dependent on fossil energy for its growth. I am supposed to be a leader in these green directions and so I began talking about what these concerns are and have been for me and will be for you all.

If it's a job, always step into the company officer's shoes when you go for an interview. Always look for businesses that deal with essentials of life that will ensure less marketing and more sales effort.

Dream and realize those dreams. Don't be harsh on yourself when you fail, failures always help you learn. Train yourself to speak with confidence and listen to others. Learn to take criticism. Say 'thank you' as the attitude of gratitude goes a long way.

Money is a mere by-product. It will come if you did your job right. Enjoy what you do.

Introspect and record your thoughts. It will become a rich source of knowledge and learning. Always be perceptive. Not everyone thinks like you.

Never avoid anyone or anything. Know your limitations and work on your strengths. Always build a relation, not just a transaction, in life or in business or at work or with yourself.

Travel. Read. Make notes of people you meet, places you visit. It is the best teacher of things you want to do in life. Always follow Socrates' words, "I know only one thing. That I know nothing."

Research and Publications

BCIL is not in the area of academic research. It is continuous applied thinking that has to run acid test of acceptance in market place. You will therefore not find methodology based research studies and paper.

Here is a listing of several features and articles written around the theme of urban sustainability with an easy to read approach which ensures larger leadership.

- http://yourstory.in/2010/05/chandrasekhar-hariharan-founder-biodiversity-conservation-india-limited-bcil/
- http://www.i-newswire.com/bcil-s-zed-earth-rated-best-in/200397
- http://www.mybangalore.com/article/1210/interview-with-

chandrashekar-hariharan-ceo-of-biodiversity-conservation-india-ltd-bcil.html

- http://www.thehindu.com/todays-paper/tp-features/tp-propertyplus/award-for-bcil-chief/article530805.ece?css=print
- http://www.thehindubusinessline.com/industry-and-economy/agri-biz/article2211612.ece
- http://pressreleasewatch.blogspot.in/2011/07/bcil-and-agro-scientists-of-gkvk.html
- http://www.aecworldxp.com/projects/zed-collective-bcil
- http://www.slideshare.net/BCIL
- http://zed.in/completed-projects/zed-expanse/
- http://www.planmanrealty.com/bcil_zed_earth.html
- http://zed.in/about-us/what-we-do/
- http://zed.in/about-us/eco-pulse/
- http://zed.in/bcil-launches-global-rainforest-research-initiative-in-coorg-karnataka/
- http://zed.in/zed-update-october-2012/
- http://zed.in/about-us/news-coverage/
- http://www.free-press-release.com/news/200807/1216704569.html
- http://millionseedballs.org/content/about-bcil-foundation
- http://www.fullmealsstudio.com/graphic/portfolio.pdf
- http://en.wikipedia.org/wiki/ZED_Habitats
- http://www.planmanrealty.com/bcil_zed_woods.html
- http://ecobcil.blogspot.in/

Conclusion: On a Personal Note

After nearly ten years of development sector exploration, to bring direct, tangible impact to people, I realized around the early 1990s that there are two areas of ecosystems that were screaming for attention: one was the ecosystem of biodiversity in our hilly regions and the other was our growing cities.

The shift came to me around 1993 to move away from donor funds that we, as an NGO were reliant upon, to create a community of families, to inspire a new lifestyle that respects ecology and conserves biodiversity.

Our first residential enclave was launched in January 1995, which was spread over 40 acres to the south of Bangalore. After trekking around the city's edge, with a picture of a montage of Gandhiji's Tolstoy farm, I chanced upon this quiet stretch land. It was a natural watershed with a gentle hillock hemming the north side and I knew this was it! We borrowed a lakh from a local financier that evening drafted a simple MoU and signed up with the landowner. Our plan aspired to have houses that were modest, not large, with the rest of the land left breathing and vegetated.

In the next three years came the pain of developing customer relationship, keeping promises of producing money from thin air as it were! We failed consistently but braved on. In 1998 we very nearly closed up and we overcame. Since its inception in 1995, we had sold only 4 or 5 homes every year. It was a crawl.

We sailed through those hard years as we let go of all 21 people at the organization due to company's financial crunch. We soldiered our way through the project tasks, with new sales team redoubling their vigour to bring sales. By 2000, we had sold all those 60-plus homes and realized about Rs 22 crores.

I learnt that what makes an entrepreneur is an ability to hold onto dear life on a rush-hour suburban commute. If you hung onto the strap successfully, you will get there!

From about 2003, we sought to bring in professional management, but failed time and again. But we grew. In 2004, we took on a project seven times larger than any we had done before .I believed that without size, we wouldn't attract professional talent.

Eight years since then into the middle of 2011, we have professionals who don't believe in rewards for themselves but in the deeper, abiding value of urban sustainability that we have learnt to design and deliver today.

We are today the largest green builders in India and by far the leaders in energy-efficient buildings, not just in India but in the world, judging by reports and responses we get.

BCIL is gearing up for the next confident stride that will take the organization into the big league. We are training to create about 20 million sq. feet of homes by 2020, in a way that will lead the industry with energy efficiency that is far beyond what is seen even globally.

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A case in Nano Technology: Bio Growth Enhancer

Dinesh Chinnappa
Firefly Industrial Design Ltd.

Figure: The fruits of growth enhancer

Bio Growth Enhancer is an *organic foliar spray* that provides essential nutrition to plants at various growth stages. It consists of naturally occurring amino acids, micronutrients and trace elements. It facilitates the synthesis of proteins and the process of photosynthesis. This translates to healthier crops, better growth and improved yield. Bio Growth Enhancer can be used on any kind of grass, cereals, pulses, flowering and fruiting plants.

Foliar nutrition is essentially the absorption of nutrients through the leaf that has been established to be up-to 20 times more effective

than normal root based absorption. The latest development in foliar

Nutrition is the application of *Protein Hydrolysates* i.e. amino acids in liquid form. Bio Growth Enhancer uses *Nanotechnology* to enhance the effect of such foliar applications by splicing the constituent amino acids to nano size. Plant leaves are able to take up free amino acids effectively. Application of amino acids as a foliar spray provides readymade building blocks for protein synthesis, without going through the cycle of amino acid synthesis within the plant. This effect is further highlighted when amino acids are sprayed at vital plant growth stages where higher nutrient demand occurs.

The constituents of the Bio Growth Enhancer are in chelated form that helps save the plant significant amounts of the energy it uses to accomplish natural chelation on its own. Sunbeam Bio Growth Enhancer contains *16 Amino Acids, 9 Micro Nutrients and 4 Trace Elements* that are biodegradable and organic in nature. It works as follows:

- Increases yield by 15 – 20%. is not Phytotoxic
- Enhances the growth of the plant at vital stages of its development
- Helps to guard the plant against setbacks caused by trace mineral shortfall.
- Improves the ability of the plant to absorb water and other nutrients (NPK) from the soil
- Promotes the development of roots and better propagation of rootlets
- Helps in the synthesis of enzymes and the process of photosynthesis
- Improves the overall health of the plant allowing the plant to withstand the environmental stresses like drought, pests and diseases. Reduces immature dropping of flowers, vegetables and fruits
- Is a natural product, easy to handle, safe to the user and to the environment. 100 ml of Bio Growth Enhancer concentrate is mixed in 150 litres of water and sprayed over 1 acre of crop area.

sunbeam nano inside

Bio Growth Enhancer

Plant Nutrition and Growth
Amino Acids Biosynthesis in Plants

Amino acids are essential building blocks of protein. Protein in turn is the energy rich compounds, which are abundantly required for plant growth. The biosynthesis of amino acids in many instances hinges upon the capacity to form appropriate keto acid precursors. It is also well known that amino acids are considered to be the precursors of growth regulators and co-enzymes. It is for this reason that amino acids are important in the plant growth.

Nitrogen Metabolism in Plants

Plants derive nitrogen required for their metabolism from soil. A majority of the soil nitrogen is derived predominantly by biological activities associated with the "Nitrogen Cycle". The two major sources of nitrogen in the soil are in nitrate and ammonia forms. The nitrogen so absorbed by the roots in nitrate or ammonia forms is converted into amino acids and then into proteins, which forms constituents of plant organs.

(RC2O2NH2)N PROTEIN
▲
RC2O2NH2 AMINO ACID
▲
NH3 AMMONIA
▲
NO2 NITRATE
▲
N2 MOLECULAR NITROGEN

In an optimum production system, environmental stress to plants is the most limiting factor to the quality and yield potential of the crop. Environmental stresses prevent a plant carrying out its natural metabolic processes. Hence plants cease production of proteins and carbohydrates, which limits quality and yields. The beneficial effect of amino acids and peptides on plants suffering from physiological or environmental stress such as drought, extreme temperatures, sunburn, transplanting stress etc is well researched.

As a result, amino acid treatments are already standard practice in many countries. Besides their role as components of proteins and in plant metabolism, amino acids and peptides fulfil many other beneficial and useful roles like improved plant health, pollen germination, fruit set, bioavailability of micronutrients, etc.

Foliar Spraying

Plant feeding with foliar spray has become more and more accepted as an improved method of feeding plants. Plants absorb nutrients just as quickly through their leaves as they do through their roots. So while watering plants with nutrients is necessary to ensure that the roots get adequate water and nutrients, foliar spray is also a great tool. Foliar feeding provides an almost instant intake of nutrients. One estimate of the effectiveness of foliar spray is that it can be up to 20 times more effective. Foliar sprays provide nutrients to the plant through the leaves from where they will be readily absorbed.

Amino Acids in Foliar Nutrition

The latest development in foliar nutrition is the application of Protein Hydrolysates (Amino Acid Liquid). Plant organs like leaves are able to take up free amino acids effectively. Application of amino acids as a foliar spray provides readymade building blocks for protein synthesis without going through the cycle of amino acids synthesis within the plant. Foliar application of amino acids is specifically useful and is proved to increase yield and quality of the plant significantly. This effect is further highlighted when amino acids are sprayed at important plant growth stages or at stages when higher nutrient demand exists in the plant. After absorption of amino acids mainly via the apoplasts, they are transported in the plant over a long distance in order to reach all parts of the plant through the phloem. The behaviour of amino acids in metabolism and during the transportation stage may be very different. It is however to be noted that absorption of amino acids is subject to the same conditions as absorption of other nutrients, for example absorption increases under rising temperature conditions.

Bio Growth Enhancer

In light of growing international and local interest in organic food production systems the Bio Growth Enhancer has been developed as a complete organic liquid protein hydrolysate. Bio Growth Enhancer contains purely natural amino acids of organic nitrogen. It contributes in improving the physiological status of crops suffering from a variety of stress conditions. Bio Growth Enhancer is made from natural protein and easily dissolves in water. It is fortified with trace minerals to produce a naturally complex and complete plant food containing free amino acids, polypeptides, and proteins which allows the plant to uptake the food in a much more efficient and rapid fashion. Most commercial plant nutrients only contain fewer nutrients that plants require. Adding Bio Growth Enhancer to the regular plant diet rapidly corrects nutrient deficiencies and generates stronger and healthier plants. It contains L-amino acids including l-threonine, l-valine, l-methionine and semi necessary amino acids such as l-arginine, l□histidine. Through Bio Growth Enhancer application nutrients are rapidly absorbed into plants, significantly improving fertilizer efficiency and plant response times, particularly when the plant is under physiological or environmental stresses.

L-form Amino Acids

The basic management premise for maximizing net photosynthesis and minimizing physiological disorders is to provide the best possible growing conditions for uniform growth throughout the growing season. Uneven growth results from environmental stresses such as temperature fluctuations, frosts, moisture levels, salt levels and chemical damage. Any mechanism or means of assisting plants to maintain more uniform and lasting growth, particularly during periods of intermittent stress, will minimize the chance of yield and quality loss during periods of adverse conditions. Bio Growth Enhancer was designed for this purpose using L-for amino acid based plant bio-stimulation. The action of the L-form amino acids in Bio Growth Enhancer combats stress – induced plant reactions by:

- Regulating osmotic pressure
- Slowing down the photorespiration process
- Increasing net photosynthesis
- Preventing
- Stomatal closure

Chelating Properties of Bio Growth Enhancer

The transporting structure for the minerals into the plant cells is hydrolysed protein. The molecular structure of the carrier is compatible with the plant's internally produced metal chelates. The chelate formed by L-form amino acids and a metallic ion retains the properties of the two compounds of the chelate and maintains its biological activity at the cellular level. Thus once inside the plant, the carrier as well as the mineral is totally available for use by the plant. The chelate has the following features:

- It is not phytotoxic
- It facilitates the absorption of nutrients by increasing the permeability of the cellular membrane
- It maintains iron and calcium solubility, thus strengthening the action and absorption of iron and calcium chelates.

The effectiveness of the L-form amino acid chelates in Bio Growth Enhancer is particularly high at the foliar level and can remedy minor deficiencies in a plant that often have no visible symptoms.

The metallic ion components play an important role in the following respects:

- Copper helps in respiration (interaction with cytochrome oxidase) and effective utilization of Iron by plants. Prevents wilting, shrivelling, malformation and diebacks of new growth in plants.
- Manganese if present in chloroplast helps to produce more food in plants, preventing dwarfing.
- Plants with Magnesium imbalance cannot use the energy of the sun. Magnesium is the central core of chlorophyll, which is required for translocation of food materials from leaves to different plant parts.
- Iron activates formation of chlorophyll and increases photosynthesis. Helps in the absorption of other nutrients.
- Zinc activates formation of hormones and enzymes that promote growth within the plant preventing from stunting and distortion. Used in chlorophyll production.
- Boron is essential in nitrogen and carbohydrates metabolism. Helps in absorption and utilization of calcium and nitrogen by the plant. Also required for the translocation of sugar within the plant and for the production of viable pollen grains. Oddly shaped growth, curled leaves, spotted fruit and poor flower set are symptoms of Boron deficiency.
- Molybdenum is essential for nodulation in legumes to fix atmospheric nitrogen in soil.

Characteristics of Bio Growth Enhancer

Bio Growth Enhancer is a plant bio-stimulant, consisting of various minerals suspended in amino acids that play an important role in the following:

- Facilitates the synthesis of proteins and the process of photosynthesis. This translates to healthier crops, better growth and improved yield.
- Aids in nitrogen assimilation
- Fulfils the requirement for chlorophyll synthesis
- Helps to maintain the water equilibrium and improving cell wall strength. Due to both activities it helps plant to overcome water stress.
- Improves Brix, Specific Gravity & Baume levels in plants and fruit.
- Provides an adequate trace minerals status, giving maximum trace minerals bioavailability through leaf, stem, seed and root.
- Guards the plant against setbacks caused by trace mineral shortfall due to soil unavailability or above normal requirements due to climatic stresses.
- Supplies organic nitrogen (glutamic acid) to the plant & soil

Benefits of Bio Growth Enhancer

Bio Growth Enhancer application results in many benefits to the plant grower as it:

- Enhances the uptake and assimilation of trace mineral to rapidly correct minor micronutrient deficiencies.
- Helps plants for better absorption of water and other nutrients (NPK) from the soil, whereby improving establishment and better plant population.
- Is important in promoting plant growth by working as a bio-stimulator. This gives an immediate plant development boost at the time when it matters most in the vegetative stage, enabling the young plant to make most of its genetic material to maximize yields.
- Contains chelates that have a significant nitrogen sparing effect. This saves the plant significant amount of energy it uses to accomplish natural chelation on its own.
- Improves soil structure, water holding capacity and CEC (Cation Exchange Capacity) levels
- Promotes the development of roots and better propagation of rootlets.
- Is responsible for flower initiation & early fruiting
- Helps to give boost to the synthesis of enzymes and the process of photosynthesis.
- Improves the stress tolerance levels of plants providing strength to the plant to grow fast, and to withstand the stresses like drought, pests and diseases.
- Helps the plants to produce viable pollen grains.
- Reduces immature dropping of flowers, vegetables and fruits. Increases maturity and improves quality.
- Improves fruit & flower color, uniformity and size
- Improves post harvest storage life of vegetables and fruit i.e. increases keeping quality.
- Increases resistance of plant against pests
- Increases yield by 10 to 35%
- Is effective as a foliar spray on a wide range of field crops, vegetables, ornamentals, plantation and fruit crops. It is quickly absorbed by the plant and is effective at lower dosages.
- Is a natural product, easy to handle, safe to the user and to the environment.

Application

100 ml of Bio Growth Enhancer concentrate is mixed in 150 liters of water and sprayed over 1 acre of crop area.

Three such foliar spray treatments are recommended during the crop life cycle

- 1st spray at vegetative stage.
- 2nd spray at bloom.
- 3rd at fruiting.

Specific spray cycles maybe applicable for individual crops.

The following points need to be taken into consideration during application of the spray:

- Concentration of the product in water should not be more than 1ml per 1ltr of water. However adding a little more water than prescribed is acceptable.
- The product requires about 3 days to be completely absorbed by the crop. During this time, it is advised that use of any other foliar or water sprays be avoided as it may wash away the product before the absorption can happen.
- The product should not be mixed with any chemicals, pesticides or other products. The spray should be done with only a water and Bio Growth Enhancer.
- Hard water should not be mixed with the product for spraying.
- No pesticide sprays should be done on the leaves between 3 days before and 3 days after the product spray.
- Water and fertilizers/pesticides may be added to the soil normally and has no impact on the product application.
- It is advisable to spray both the top and underside of the leaves/foliage of the crop to increase absorption area.
- Product is not designed to be added to the soil and as such may have no effect if used in that manner.
- Visible results can be expected only after the third spray so that the crop is given enough time to grow naturally.
- Bio Growth Enhancer is not intended to replace pesticides or fertilizers that are normally required by the specific crop under the existing soil conditions and such applications must be continued even when the product is being sprayed.

The Company:

firefly

Firefly Industrial Designing Pvt. Ltd. was started in Bangalore in 2010 to provide product design and consulting services in Nanotechnology, Nutraceuticals, Energy Saving Systems, Agro-tech and Material Fabrication space. Sunbeam Bio-Growth Enhancer is only one of the products. Some of the highly valued products include the following:

Sunbeam Super Spreader

It s a wetting-agent; a product designed to increase the wetting property of water by reducing its surface tension to a large extent. It helps in efficient use of water in situations where the spreading action of water is desired to be higher. It may also consequently reduce the amount of water required for the particular application area. The product is generally categorized as a surfactant.

Air Conditioners

Air conditioners use only a third of the energy as regular ACs enabling power saving between 30% -50%. These are inverter based systems that optimize load distribution.

Tower Air-conditioner: These are characteristically standalone air conditioners which can be placed on the floor. These are equipped with ionizers, dehumidifiers and Carbon nano filters designed to clean the air, it uses 37% less power than other products in this category.

Portable Air-conditioner

This unique product enables cost-effective migration from inefficient water coolers. The technology utilises ionizers which keep rooms fresh. Its dual functionality allows for heating as well as air-conditioning.

Split Air-conditioner

This product has an in-built stabilizer which modulates power and uses 410a refrigerant

which is three times cleaner than the normally used refrigerant R22.The run-load is 30-35% less than other ACs.

Think Home: This user-friendly technology aids in gathering weather data from standalone base stations. Some of the exclusive features of Think Home are weather alarm modes for temperature, dew-point, air pressure etc. Additionally, it predicts rainfall and alerts you when there is an approaching storm.

ZED Helix Wind Mast: Whilst generating electricity using wind power, the ZED Helix Wind Mast simultaneously charges the UPS thereby adding to the existing power supply and reducing utility bills.

Win Sol: This advanced hybrid system makes use of both wind and solar energy. Both solar and wind energy are harnessed during the day and by night the wind mast takes over. Typically, similar systems require 15 batteries as opposed to Win Sol that uses only 2 batteries.

DeSal: This mechanism converts 80L of saline water to 10L of fresh potable water using a natural process.

Geysers: The key feature of this geyser is that it is compact and easy to install. Using a magnetic field to maximize the heating process, can help you save upto 60% power in one third of the conventional waiting time.

Refrigerators: These refrigerators employ direct cooling systems at only 125 watts and are engineered with a capacity of 121L – 235L. It uses 410a refrigerant which is three times cleaner than the normally used refrigerant R22.

Gossamer Fans: These are custom designed with ABS blades and brushless motors that make them lighter and far more efficient.

Magic Water: Drinking water out of thin air! Using a 5 amp appliance, this device converts water vapour into drinking water. It can generate around 30L to 1000L per day, even in the confines of your own room!

Jal: Jal is a revolutionary instant water filter by way of being compatible with any water source. This mechanism removes 99.99% waterborne organisms, filtering particles upto size 0.2 microns. No chemicals. No electrical power. No batteries. No replacement of parts.

Sunzyme Aqua: Sunzyme Aqua is a unique enzyme blend for aquaculture, which supports in effective digestion of the organic mass within an aquatic system. It can effectively degrade fecal mass, undigested food and other organic wastes that contribute to a built-up of ammonia and bottom solids. Sunzyme Aqua supports the marine environment to maintain its ecology close to nature's own.

Sunzyme Chicken: Sunzyme Chicken is a unique blend of enzymes, suitable for an array of feed stocks. Sunzyme Chicken is specially suited for improved energy performance of feed. It is a special formulation as it supports digestion, increases the energy availability and hydrolyses non-starch polysaccharides resulting in reduction of feed conversion ratio and increase in body weight.

Sunzyme Tea: An enzyme based solution to improve the aromatic quality of tea leaves.

Conclusion

Firefly is dedicated to combining contemporary technology and sustainability. The company's team of experts bring with them a vast repertoire of experience ranging from Aerospace, Nanotechnology, Pharmaceuticals and Energy Auditing to Automotive Technologies to provide cutting-edge design for today's fast growing industries. The mission is to use advancements in science and technology to provide effective solutions to the issues of today's society.

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Design

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Seat of Wisdom, Goa

Design

Design, the term conjures up images infinitely. This paper aims to understand it in five ways and proposes to fuse together Nature, Mind and Technology.

To begin with, anything that has shape and size we consider it as design. When we think of something, we can think only in shape and size. Our thoughts are a kind of designs. We cannot think without design. The ideas that we put into practice are first designed in our thoughts.

Language too is a kind of design. We cannot think without language, some language, a thought language. When we speak we construct these linguistic models and communicate them to others. Just as an architect plans and spans out his design as blueprint, so too language picturizes into words and sets them in a definite context. Natural language, as we speak, a specific mode of language may take the cultural designs of speaking, a spoken language such as English, Hindi, Chinese, Japanese and all of the myriad languages of the peoples of the world. However, the language of the mind is an universal one, the design language.

Matters get complicated, of course, when we decide that one design is better than the other. Whose design is to be adopted, which model serves the end in mind. What is on your mind when you design a design? It becomes complicated because here design suggests the actual intention or intentions one has. When decisions about designs, intentions about their execution for a definite purpose are as many as people think about them, adapt them and follow them, the complexity of designs is infinite. In simple words, there are as many designs as there are as many people multiplied by the number of designs they construe.

Let us make this highly complicated and infinite world of designs simpler. To plan is to prepare, to put into place a model for execution. A pilot has a navigation chart, so too a captain of the ship. You not only plan all that is necessary for the purpose, but also prepare for all the unforeseen eventualities

such as bad weather and forthcoming storm. The future that is uncertain and is in the distant, you prepare for it by putting a plan in place. It is the first thing that man has learnt when he started to manage his life.

An individual speaks of a planned life; a group speaks of planned towns and cities; planned growth of food and every other sphere of life as planned. Planning and resource allotment to execute such plans speak of good management whether at micro or at macro level.

There are some designs which are more powerful than the others which have shaped the world over thousands of years of human existence. Some designs prevail others fail. Those designs prevail which enhance the quality of human life. Technology just does that. Let us consider some of the designs.

1. Design as Natural Representation

Man saw a wonderfully dancing peacock and painted an equally wonderful representation as painting. A sculptor infused his imagination into a hard rock and chiselled out glorious statue of an invisible god. An engineer was enamoured by a bird building a nest and he structured a huge stadium. A scientist in medical science devised a tissue to replace the cancerous one and restored health to those suffering from such disease. So too machines, vehicles, trains, aeroplanes, roads and bridges which helped man to build cities, travel and live in comfort. They saw something in nature; they were inspired by what they saw; they discovered a principle, a law of Nature, and designed an object, shaping it with the ingenuity of their imagination. Our story is a story of how we design.

Design is to shape a model, a mental model, a structured thought and then implement. Implement is a device, a mechanism, an application apparatus to execute the devised plan. This is activity, motion. It is an instrumental activity, in other words, a technical activity. It is intended first. Intention is stimulated by the abstracted proposals from Nature through the senses. Mind follows Nature through the medium of sensual perception and invents through various associations and combinations a design. This is *episteme,* knowledge, a mental determination of external Nature. Within the mind – intentionality - the act of knowledge evolves and develops to create intention, sets aim, determines meaning which relates to the external world in myriad ways creating civilization and a future for humanity. So, can we summarize what human mind has done with Nature intentionally, and with the help of technology physically. This is the summary of our both art and science, all of it crystallized in a single term, *design.*

Design is thus the story of approximately 5000 years of human endeavour at art, architecture, literature, the wheel, tools and machines, information processing, communication, governance, control, development of systems of political, social and economic development.

2. Design Thinking

It is an oversized classroom. It has big chairs, low tables, comfortable sofas, all sorts of electronic equipment and screens, colourful building blocks, outsized Lego wedges and latest gadgetry. The *students,* not more than half a dozen in these enormous classrooms, too are expected to perform some extraordinary tasks with standards set up by themselves and for themselves. Their thinking blocks are no different than of children; they begin to build their thinking from very naïve questions, none different than that of the tiny toddlers; they come up with solutions for computer systems of the next generation. They *design thinking.* Such is the learning eco-system within Hasso Plattner Institute in Potsdam, Berlin where SAP's university is situated.

Forty years ago, four youngsters in Weinheim in Germany, with broad bell-bottomed pants and wild long hair were fascinated by very large computing machines which they saw, and developed a wild idea of seeing the data

actually in real time on a screen rather than on reams of printed paper. Now, in 2012, two thirds of the world's business runs on **SAP** software which they have been developing.

Systemanalyse und Programmentwicklung is a mouthful of German but definitional significance has it as *System Analysis and Programme Development,* **SAP** for short, which was again redefined later as *Systems Applications and Products in Data Processing.* In 1972, Hasso Plattner, along with his other four friends, founded a computing systems development firm in Weinheim which was later headquartered at Walldorf, Baden Wuerttemberg in Germany. Today this multi-billion dollar corporation is present in all the major cities across the globe and is world's largest business software company.

Design Thinking is the institute of the university that is named after SAP's chairman, Hasso Plattner, which is driven by the very same idea with which Plattner and other co-founders had forty years ago – asking basic, vital and naive questions, engineering and constructing thoughts, and turning them into intelligent solutions, converting them into software.

The essence of contemporary economy is knowledge – *knowledge* driven industry, business, government and basics of everyday life. In the past knowledge was sought for itself; today all solutions to human problems lie in knowledge. Schools, universities, professional training institutions have to apparently direct themselves towards this new reality. Since, these are falling short, people in need find their own ways and means. SAP is one such example; no educational institute could provide it with knowledge support. Hence, they had to invent *Design Thinking.*

3. Design as Economic Game Theory

The game theory is not new; it is about the consequences one got to bear for either cooperating or competing with others to achieve an objective. What is new in Roth-Shapley is that they successfully developed a market design and matching theory. How people – individuals, associations, companies, groups – find, select and *decide* what they want? Why do you send your child to school X and not to any of the rest that you reject. Why manufacturers produce what they produce? Why companies sell what they sell? How two companies producing the same products or providing the same services price them differently, higher than or lower than the other, or even on the same level? The economic game theory is all about choices people make whether while shopping or companies at selling.

The *game* is simple. You can have it explained from your local policeman, if you like. He nabs two guys, detains them and interrogates them separately to elicit the truth. If they confess truly, they would be both discharged with equal penalty. This you may consider cooperation. However, you do not get such offenders of the law who are so friendly and cooperative anymore. To make matters worse, none thinks alike, not even robbers. Hence, they may try to outsmart one another by lying and thus competing with each other. Result: one is let off with light punishment and the other gets the full blast of it. The game gets its name as *prisoner's dilemma,* since they have to choose between cooperation and competition; and if the latter is chosen the complications multiply. In a similar fashion functions the contemporary economics: extreme competition, outsmarting strategies, devious pricing, deceptive derivatives in capital market, perils of risk, uncertain banking, insurances and so on.

Social scientists and psychologists too study such *games* people play, but they term them as social behaviour and psychological behaviour, respectively. While sociologists examine the social environment which determine habits, customs and traditions of the people and draw conclusions of group behaviours, the psychologists focus their attention on the development of the mind of an individual, the responses it produces to the given stimuli and thus determine the behaviour.

As Felix Baumgartner (14.102012), the Austrian daredevil extreme sportsman, jumped successfully from the periphery of the planet – some 40 kilometres above the Earth - the Nobel Prize Award Committee concerned itself with two economists whose challenge lay in meticulously analysing the economic choices people make. The sky jumper won accolades from across the globe; the two American economists Alvin E. Roth and Lloyd Shapley won the Nobel Prize for Economic Science 2012.

Felix Baumgartner skydives from 39 kms above the Earth at the speed of 1, 342 kms per hour (Image: courtesy Wekipedia)

What economists, like the above Nobel Prize winners, strive to do lifelong in developing a theory, and social scientists, psychologists, philosophers, religious prophets, political leaders, financial wizards, IT technologists and all kinds of experts try to accomplish and yet fail, children seem to achieve effortlessly. Children play such games, all the time: Thieves and Cops *(Chor-Police)* is just the beginning that they perfect from the adult world and then plunge into innumerable variety of games of sheer ingenuity, originality and such creative intelligence that is baffling to even the Nobel Prize winning immortals. However, that is another tale for another day.

In the Roth-Shapley analysis of the game theory the stroke of genius relates to, as is already mentioned above, markets, now with a caveat, which do not possess exhibit price. The classical economics, despite its global problems, which we have accepted as a matter of unassailable economic dogma, is based on *price.* In other words, they have done a Felix Baumgartner by pushing their theory to the limits of their science: gravity does not matter just as price does not matter. Standing on Earth's periphery, at least Baumgartner was awed by what he saw and humbly succumbed to the force of gravity and to the relief of millions landed on the good Earth with his two feet, but not so our two economists. To cut a long theory short, Roth-Shapley theory is a *game changer.*

While America and the entire Western developed world which is based on classical economics of supply-demand resource management and control it through pricing is wondering about their messy economy, they would love to take heart from those people who have found a new market design where price is not the determining factor. How would you value the donation of a human organ? How would you choose your career or put a price tag on it? What can you *not* buy for money?

Does it mean that the new economics advocates a new system? The answer is in the affirmative. To make the theory next to being simplistic, it is like match-making with scores of couples in a room. The song from the *Fiddler on the Roof: Match maker, match maker make me match, catch me catch…find me a perfect match* is the easiest way to remember the new theory. On serious note, how is it feasible to *design* markets to fit our needs? If we succeed in such a transition from theory to practice we would enjoy optimum *co-efficient.*

The foundations of new economics lie in the *cooperation* part of the above illustrated game, the prisoner's dilemma; so far under pricing regime we have been prisoners in the competition region. Can we cooperate economically, push the frontiers of our ethical behaviour to their limits, drop competition, embrace cooperation and enjoy benefits with equity and even-handedness? The answer lies in the highly rational economic theorems of Roth and Shapley.

4. Design as Geopolitics

Territorial turbulence, political turmoil, religious frenzy, cultural clash, ideological tumult, protests over religion, dissent over economy all this and more, the global cup of financial owes and there seems to be no respite in sight.

It all began with an amateurish film originating from USA that insulted the already injured Islamic community resulting in the death of the American ambassador to Libya in Bengasi. As if the opinionated tensions of this trouble were not enough, two world economic giants, China and Japan, let loose hysteria over two tiny islands that caused a political Tsunami which is yet to calm down. The right wing fundamentalists started to make arrangements for the public viewing of the anti Islamic film in Germany and the Islamic protests gained pan global character from Egypt to Indonesia and Sri Nagar to Chennai.

Add to this several hundred people becoming the innocent victims of bomb blasts from Aleppo in Syria to Karachi in Pakistan and the intermittent violence in Iraq and Afghanistan. Russian contribution to the current disorder is its ongoing protests following the infamous case of *Pussy Riot* rock musicians.

Amidst this chaos there erupted the Wall Street occupation anniversary in New York, Beijing grappled with slowdown in manufacturing, New Delhi scrambled for reforms, mine workers in South Africa went on strike, European economic uncertainty was further confounded by the policies of its Central Bank. While the most respected *Lufthansa,* the German airline, was grounded by the agitating employees, the *American* cancelled three hundred of its flights. Result: There receded the brief silver lining in the world economy that showed after a long period.

The core of the problem is the abject condition of the economy. The nation states are not able to understand and provide a stable economic relationship among themselves or with their citizens; the objective of public good has taken a beating. People are seeking desperate measures to cope with equally depressing living standards. Hence there are tensions – religious, territorial, nationalistic – which have their roots in bad economic policies and the basic anxiety of the people to deal with their day-to-day existence.

Take for instance India. It has the highest poverty levels and lowest living standards in the world. The bomb of dissatisfaction only becomes bigger - with religious tensions, dire economic conditions, and unbridled corruption and inefficient financial management – that is ready to explode. The newly introduced reforms of cuts in subsidies and rise in fuel prices are desperate and belated measures which have turned the common man against the government. None, not even the combined opposition, has a strategy to overcome the economic mess. Result: agitation. Agitations possess no solutions; they add to the public loss.

5. Design as Technology

Apple Company's designs by Steve Jobs of computers, laptops and mobile phones have taken the world by storm, despite very high prices. The amazing products are amazingly simple in shape and size and appeal aesthetically. However, the essence of the product lies not merely in its appearance but in the sophisticated technological fineness, exactitude and totally mesmerising efficiency. The product and its design is the most positive sign of our times.

Apple Mobile Phone (Courtesy: http://www.apple.com)

Humans travel by land, sea and air; the latter two have no constraints of space. Land presents innumerable and almost insurmountable difficulties through rough and inhospitable terrain, mountains, deserts and call for mega engineering projects that cost phenomenal amounts of labour and money. However, with all the trouble, the basic design of a road is very simple. Its purpose is the most practical one: to facilitate land mobility. However, it is very frustrating to keep the road in good condition and requires constant maintenance. The roads are laid and the vehicles keep rolling on them. The roads themselves yield nothing. They are not productive in themselves like, for instance, plants or fields which yield produce.

Scott Brusaw's Solar Road design
(Courtesy: http://www.designboom.com)

The total network of roads in the world is about 70 million kms; India and China have approximately 4 million each; the United States of America has almost 8 million kms. Road engineering is expanding rapidly across the globe. Roads, if designed with a greater purpose than mere transport, there is possibility that they yield a useful product. What could be more useful to our energy starved world? Scott Brusaw, an engineer scientist of the US has designed and developed solar roads which could also generate enormous quantities of energy. One got to imagine burning hot roads during the day and its potential to generate power in millions of watts.

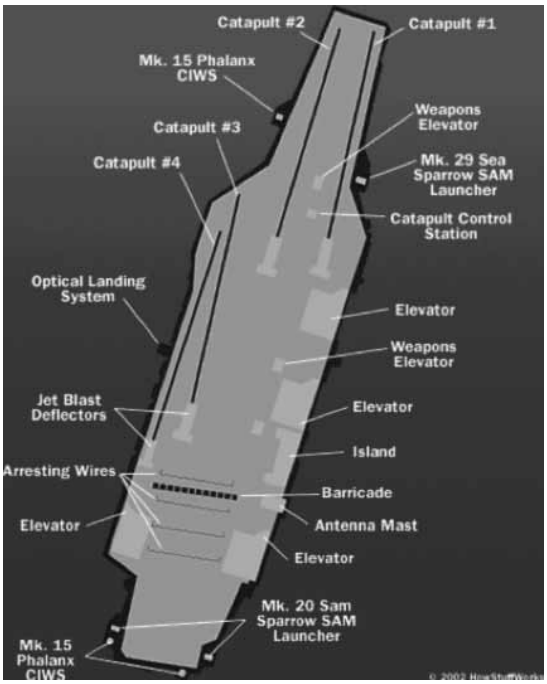
Man's ingenuity is limitless. In a world that is connected instantly in real time by Twitter and Facebook, the technology that makes it possible is immensely complex and is a result of utmost human genius.

High-tech Data Centre of Google
(Courtesy: http://www.designboom.com/technology)

What is mundane and as simple as a 'click of the button' has behind the scenes enormous hardware machinery, occupying large space, security and backup systems which could pass the test of nothing short of a world wonder. Only a couple of decades ago, people couldn't care less for a mobile phone or a tablet. Today a school should be considered living in Stone Age if the pupils are not using electronic tablets. Gone are the days of textbooks and homework on block pages. Similarly the blackboards are vanishing and you have LCD screens to gain knowledge in an interactive way from across the globe. Such power of technology seems like a miracle. Indeed miracles do happen with right design!

Man is not exactly a peace loving being. Strife, rivalry and jealousy make man insecure in himself and see others as his threat. These

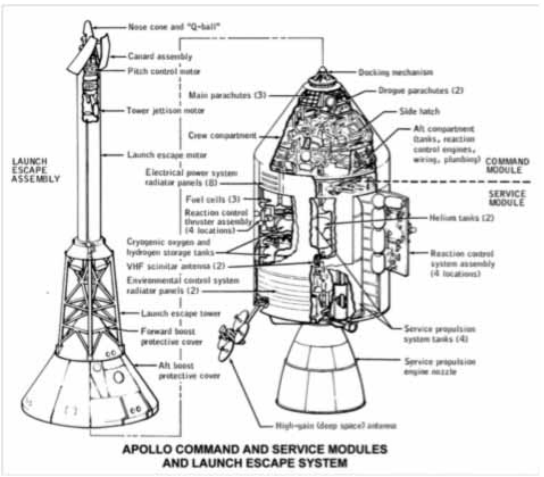
fears and insecurities lead him into suspicion about the designs (motives, intentions) of others and he uses his ingenuity to design weapons for self-defence. The individual attitude is found in a complex and enhanced fashion in nation states who have developed standing armies and weapon systems that can destroy not only the entire humanity but the planet Earth itself several times over. Military machine is a destructive technology, justified by the argument of self-defence.



Aircraft Carrier
(Graphic courtesy: http://static.ddmcdn.com)

Militaries around the world prepare with precision and are battle ready for any aggression or defence depending upon their commanders designs (decisions or strategies) to overcome enemy.

On the other hand, contrary to the destructive technology, it has been hailed as one of mankind's greatest achievement to step on the moon. It would not have been possible without most sophisticated technological design. Exploration of space with specific purpose of distant human future is most commendable.



Apollo Space Ship
(Graphic courtesy: http://img192.imageshack.us)

Although only a few countries are involved in the promotion and proliferation of the space technology now, it would become a mundane experience for people a century ahead of now. Over a century ago when the motor car was invented, not many people could visualize that it would become a common necessity of our times.

Situating Design in Nature-Mind-Technology Context

Situating design in the context of Nature Mind and Technology is relevant to the present world. Technology is nothing but an ingenious extension of mans limbs and physical faculties. Technology has provided help to all our senses: vision, hearing, touch, smell and taste. From the food we prepare and enjoy, the entertainment that we see and hear to travel, fly around the world, learn, study, work depends solely on technology.

In times of conflict, technology can be used for harmful purposes. Technology is a mere instrument in the hands of man. Its responsible use depends on the designs man has for himself and for the society. The Imperative of Responsibility takes us beyond the technological future. The challenge is to rethink about our existence and regain the ground that we have lost to technology.

We have to admit that the problem of how the immense responsibility should be met, which the irresistible scientific technological progress places on the shoulders of both its practitioners and the public which enjoys or suffers from its gifts, is still completely unsolved, and the ways of solving it are hidden in darkness. Only the beginnings of a new consciousness, recently awakened from the euphoria of the big victories to the harsh daylight of the dangers, learning again to know fear and trembling, give us hope that we shall voluntarily impose on us the barriers of responsibility and not allow.[1]

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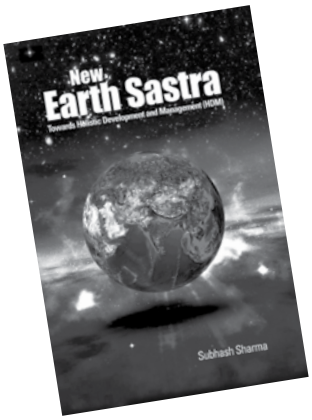
[1] *Hans Jonas, Das Prinzip Verantwortung: Versuch einer Ethik für die technologische Zivilisation (Frankfurt am Main, Insel-Verlag) in 1979, translated by the author and David Herr, titled as The Imperative of Responsibility: In Search of Ethics for the Technological Age (University of Chicago Press) in 1984.*



DISCOURSE
DISCUSSION
DIALOGUE
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BOOK REVIEW

New Earth Sastra: Towards Holistic Development & Management (HDM)

Subhash Sharma

IBA Publications, Bangalore, 2012

Review by I. Satya Sundaram
Economist and Writer

We understand from the Human Development Reports released by the UNDP that only a few countries are using their natural and human resources judiciously. Capricious use of scarce resources has not only retarded growth, but also created formidable problems. The situation worsened because of man's avaricious proclivities. It is in this context that one has to welcome the publication of the book under review.

The book contains 24 papers. It deals with themes like roles of the market and State, approaches to development, holistic vision of development, intellectual property rights, women in management and development, liberation and development, innovations in management education and Gita for holistic living.

According to the author, an important limitation of globalization is its excessive focus on the market values chain ignoring the social values chain. While market institutions promote market values, non-market institutions like the NGOs emerge in response to social values chain (p.17). The author also rightly stresses the importance of corporate social responsibility.

There is no doubt that India is facing crisis in leadership. If only resources available are properly utilized, problems of poverty and unemployment should have disappeared. Corruption on a large scale leads to mounting black money. The State is deprived of revenue due to it. In America, huge funds are available for the State as there is no tax evasion and black money. The Government there is able

to provide wonderful infrastructural facilities even for schools. In India, the situation is totally different. The limited resources mobilized by the State are poorly managed.

It is now agreed that the emphasis should be on a holistic vision of development. True, technology is the prime driver of society. But, technological revolution has also created not a few problems. Technology alone cannot deliver the goods. Japan has demonstrated that it is possible to create world class business organizations by combining western technology with Japanese cultural values.

The economy is becoming more and more complex. As such, we should go by priorities. Leadership constitutes the first force, technology is the second force, management input is the third force and information input or information technology is the fourth force (p.64). The author has thrown useful light on the managerial dimensions of economic growth.

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IBA Publications, Bangalore, 2012

Review by Brij Lata
Bangalore Management Academy, Bangalore

The author deserves congratulations for bringing out a truly world class book on Holistic Development and Management named as New Earth Sastra. The book written by Dr. Sharma is refreshingly different. The book is presented in the form of eight headings i.e. Harmonic Globalization, Roads to Development, Sacro –Civic Society, Liberation, Leadership, Living, New Age Strategic Thinking and Concluding words. These headings having sub- headings in the form of chapters and these chapters are according to the headings and fulfill the aim of these main headings. In each chapter the concepts and insights are dealt with in the beginning and those necessary models are described.

The sequence adopted by the author and the phrases he uses to describe the themes are very meaningful. For Example- According to Gandhiji, There is enough for everyone's need but not for greed, Darwin's, Survival of the fittest to eliminate the rest. The word Maru-Katte is a Kannada word but explanation by the author is very interesting and it educates the readers even those who do not understand this language in an excellent manner. Four Forces model for Holistic Globalization provides a holistic and harmonic view of development.

The distinctive feature of the book is the section titled "Soil to Soul". It gives the Holistic view of life and live experiences faced by the author and how successfully he managed them. The charm of the book is author's capability of explaining the real world experiences with both Spirituality and Science; this is the

uniqueness of the book for the readers. How easily author explains $e=mc^2$ with Spirituality, that is awesome!

Following Chapters are exceptionally well written where author's conceptual clarity and practical insights are clearly visible. These are Market, State and Society in New Age, Rise of the Bottom, Woman in Management and Development, Towards a Holistic Vision of Development, Orchha Vision, Gita for Holistic Living and Soil to Soul: Market's Maya, Mahatma Gandhi and Mt. Kailash etc.

Book provides a list of Supporting Articles by the author, Name of books by the author. Researchers interested in pursuing his ideas will find it very useful reference.

This book is a very valuable addition to the literature on holistic development and management. A must read for managers and leaders who are facing new challenges arising from Globalization.

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IBA Publications, Bangalore, 2012

Review by Daniel Albuquerque
Seat of Wisdom Educational Society, Goa

That I have read Subhash Sharma's new work is a mundane affair; but that I have studied it, digested its doctrine and discussed it with him at length on several occasions should increase your curiosity. The authenticity of his work – helpful acronyms, conceptual models, intuitive visions, crystal clear diagrams, innovative terms and lucid text – is *par excellence.*

Sutra stands for principle, *Sastra* for a doctrine or a system of thought which is built on the basis of a number of *sutras.* The author's mission is to expound a holistic doctrine of management science that characteristically bespeaks of Indian genius.

EARTH is an acronym for **E**nlightenment - **A**wakening – **R**ealization - **T**ruth – **H**armony, which is a way of 'rethinking economics through Integration of Indian thought (p. 3).' Similarly, **SASTRA** consists of **S**cience – **A**rt – **S**pirituality – **T**ranscendental - **A**pproach, which are principle based methodologies in the formation of the proposed *new* doctrine (p. 10).

Holistic Vision of Development, as the sub-title declares, is the core of the doctrine of *new Management* which evolves historical evolution combining both contemporary technology and the mature cultural traditions. Japan is singled out as a case of *harmony* between Western Technology and Japanese Work-Ethos.

The functions of management – Planning, Organizing, Staffing, Leading and Controlling – have a new matrix: **K**nowledge, **P**ower,

Capital and **L**abor, which in pre-industrial era was manual, in industrial era mechanical and in the new age it is based on knowledge. The **KPCL** matrix is a powerful wheel even for the future as sustainable development (see changing metaphors diagram on p. 65 presented below as Fig. 1).

and falling Capitalism. This compelled him to revisit Mahatma Gandhi's inclusive vision for India, which he termed in a most understandable language of the common people as *Ram Rajya,* a world community where all the three Ss are realized.

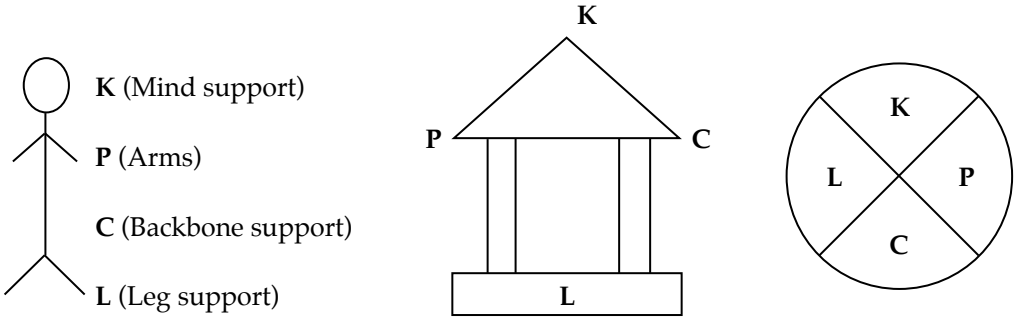


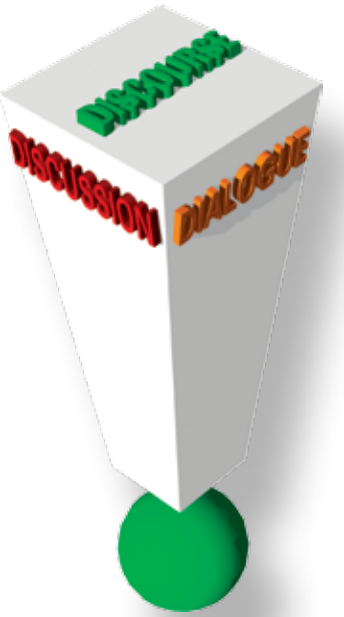
Fig. 1 : Changing metaphors of KPCL (p.65)

The fundamental question: What is the purpose of this all striving? Sharma has a three 'S' formula: **SSS** – ***S**ukh, **S**ampati* and ***S**hanti:* Pleasure, Profit and Peace, respectively (Page 130). The revelation of this vision came about in an otherwise little known place called Orchha, near Jhansi where people are found chanting 'Ram Raja Sarkar' (p. 129). It dawned on the author that there is a state of affairs possible beyond failed Communism

Finally, the doctrine is fine but how to realize it? Sharma's message is profound. The old saying *work is worship* takes the form of *Yoga-Udyoga,* namely, the term Udyoga which means *industry,* or quite simply work, includes Yoga: Ud-yoga; it is never distinct from each other (p. 159). This is the key to holistic living, a key that facilitates **R**eal **A**wakening of the **M**ind (RAM) (p. 132).

EXCERPT

The above vision leads us to a new definition of management. In this definition, management is defined as 'joy of living'. Managers create wealth for organization, for society and for themselves. They create employment. They create new knowledge. Any process of creation is a process of joy (p. 148).



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