Nature - Our Final Frontier

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We may have evolved with nature but as time passed and our human attitude turned into a more arrogant way towards conquering what we like, the desire for domination arose. To us Sri Lankans, respecting nature should not be an alien concept though today we may need to have major plans, special school programs and investments to get people to understand the importance. It appears we too have shifted away towards the dominance effect via pursuing economic growth at any cost.

It was Rachael Carson, the US marine biologist, whose book 'Silent Spring' awoke the United States to perils of unbridled action with the use of chemical pesticides on the part of humans. She was to point out that man is in a unique position in this world. Though it is important for man to have birds and butterflies for his survival, the necessity for us to be present is not important for the birds and butterflies. The way the world is turning around, they actually may prefer the most intelligent species, as we termed ourselves, to be absent!

We know that the world is far from perfect. Yet we see significant disparities between communities and countries sharing this earthly patch.

Sri Lanka has one of the worst Gini-coefficients in the region and whatever growth in GDP and Per-capita income over the years has not changed that. This is quite damning and worth closer scrutiny. This value is far more important perhaps than the per capita income. As relentless advances took place with man's final frontier becoming space, the need for a different way of development became apparent. As Neil Armstrong landed on the moon in 1969, his statement indicated the moment as one giant leap for mankind, but some were thinking differently.

As early as the 1970s, 'sustainability' was employed to describe an economy 'in equilibrium with basic ecological support systems'. In 1987, the most widely accepted definition on sustainable development was introduced by the Brundtlandt Commission. The idea of treading lightly on this planet became more applicable. Each passing moment has reinforced the virtue of the concept though the followers are not too many. We understand sustainability in a couple of ways. We can speak of social, environmental and economic sustainability – the triple bottom line concept. We also can think of intra generational equity in understanding sustainability. Sustainability is future focused and is against borrowing from the future to satisfy the unlimited demands of the present. Yet we see the economic sphere radically expanding, pushing the other two spheres of social and environmental aside and squashing them. The continuous emphasis on invisible shareholders over real stakeholders continues to rule.

It is interesting to note one of the recent findings published by the Institute of Development Studies, that two thirds of the world's poorest (1,275 billion people who earn less than US$ 1.25 a day) live in five populous middle-income countries – India, China, Nigeria, Indonesia and Pakistan. While some may be rising up the ladder, this indicates more may be sinking down.

It is clear that the world may have been told to head in a sustainable direction, but the path taken appears to be anything but that. We still continue to hear the same classical set of economic indicators, while green reporting may be a CSR activity enacted with awards in mind. We should not allow the spectra of Gini-coefficient to haunt us. Waves of successful innovations development as we see has come in as a result of series of industrial revolutions with some embedded innovations. Today perhaps more than any time in the world's history we can boast of our abilities – to go faster, to see further, to split atoms and to splice genes among so many.

Waves of successful innovations have brought us to this position, while some equally now appear to threaten the very existence. Hence today with the sustainable mindset, we may have to drive innovation differently. No longer can we afford to enjoy success via conquering the environment or reaching for resources in ever-increasing quantities. Today, nature may be our final frontier.

For most of the time nature has been a source of innovation rather than inspiring innovation. With the mandate to live lightly, the time has come to understand from nature how we should plan our future growth. The buzz word biomimicry is well-espoused by Janine Benyus. She speaks of making use nature as a model and as a mentor and finally nature as a measure. The latter is to make use of what is present in nature to measure one's own systems as what is present today in nature after all are results of 3.8 billion years of evolution. Thus, nature knows what lasts and what does not and trying to outsmart such a learning process can be quite challenging. Hence, why not compare notes of what we design with what exists in nature?

To give a simple example, we try to use expensive solar cells produced at enormous material and energy costs while nature harness energy neatly within leafy matter. Nature's catalyst of chlorophyll is far superior to our own platinum, which is limited and expensive. The question is, when can we develop a solar cell inspired by a leaf? There are many research groups searching for that answer today. Hence, innovation for a sustainable world may come from nature and signs are that this is already happening. Instead of dominating nature, respectful imitation is coming in and this may well turn out to be the smartest move that we can make today. Photosynthesis is what renewable energy researchers want to emulate. Self-assembly is the aim of nanotechnologists. Any nanotechnologist may openly state how important is to know the lotus effect of water repellence when water falls on to a lotus leaf. In the process the leaf is also kept clean. Today many are attempting and working on creating the lotus effect in a multitude of ways on engineered

surfaces and materials. Self-sustaining ecosystems are what cyclical economies are trying to emulate. The word industrial ecology has thus become quite fashionable.

Termite towers have today inspired building designers. Check the Eastgate Centre building in Harare, Zimbabwe for an actual implementation. Termites have developed their living system to have a constant temperature condition while the values around the tower change dramatically. To create uniformity in a normal building system, we spend enormous amounts of energy and effort and still the control systems are not perfect. Termites have humbled building engineers and that is one more example of biomimicry.

The message is that worshipping nature is taking place again – nature as a rich source of ideas. The interest of many has again come closer to the very environment that surrounds us. Are we as Sri Lankans to again take these ideas from outside or should we be part of the process of innovation? As a country with one of the highest biodiversities in the world and many unknown wonders, how many pointers for sustainable innovation process may be lurking around us? Up to now engineers may have ignored ecologists. No longer is this possible. What ecologists are unravelling is of utmost importance to the engineer in design. For this new innovation system to be beneficial to Sri Lanka, we must not separately study biology and mathematics.

Our system still pursues the concept of biology for medicine or bioscience fields and mathematics for engineering or physical science. Students are forced to think of some supreme occupations, forgetting the value of any other. The radicals may turn to humanities or fashion design, but these numbers are not great. Aspiring naturalists are very much rarer.

Nature abhors vacuum and is equally quite dismissive with monocultures. Yet we do have student populations growing up with few key occupations in mind. There is no interaction and no cross fertilisation of ideas. This is a recipe for a sterile mindset, not understanding what surrounds you or what moves this world. Even without biomimicry making an entry, this division has caused us many problems, though we have not really understood the damage. It is time for change in education and attitude if we are to benefit from this new frontier chase. The best of this scenario is the answers are around us. We just need to open our eyes with understanding to the natural world.