

Sustainable development, Climate Change and Innovation in the perspective of Socio - Economic - Environmental (SEE) Model with a Case Study of Costa Rica

P.J.Britto

Ph.D. Scholar, Department of Journalism and Mass Communication, Madurai Kamaraj University, Madurai, Tamil Nadu, India
Email: pjohnbritto@gmail.com

ABSTRACT

Sport hunting is a dangerous phenomenon for ecological damage. The first country to ban sport hunting in Central America was Costa Rica. Its only sports hunting, which was done for fun, that was not permitted, but was for local people whose livelihood depended on it were allowed to fish. This is their social justice. This country also spread its forest cover to an area that could amount to a larger extent, say doubling in over 25 years. This is how they could show their concern to the environment and ecology, striking a balance. They are likely to reach their goal of carbon-neutral by 2050. This is how they are future centric and could decrease the impact of green-house effect and thus climate change issue. The government and people could get their credit for investing in sustainable and renewable energy sources like wind and solar power to get their electricity. This makes the country largely carbon neutral. This is what is the impact of their innovative plans for sustainability, while they use socio-economic and environment model [SEE Model] to reach the goal of sustainable development goals, designed by the United Nations. The innovation of communities and countries need to be based not on exploitation of people, planet and prosperity but on the sustainability of them to win over the impacts of climate change and give a better world for the children to live in.

Keywords

Sustainable development, Climate Change, Socio - Economic – Environmental, SEE, Costa Rica

Introduction

When an economic system is based on carbon fueled growth, it can be clearly stated that it paves the way for climate change. This system is not at all environmentally sustainable. Fossil fuel economy is too dangerous as it is not sustainable, and the source is becoming scarce. What will be the future then? Nothing but human extinction as happened for the dinosaurs and other big mammals. Why does this happen? Because humanity forgot to think of the connection between and among society, ecology and economy. The interlinkages of people, planet and prosperity should be looked into. A new way of innovative thinking on the part of government and policymakers should happen. People, in general, should start to have values and behaviours of sustainability. The damages done in the environmental arena would, of course, affect the people and so social issues cannot be disengaged from the ecological context. Lots of damages have been already done.

But there is hope.

Take the example of Costa Rica. The country has reached a new record of sustainable and renewable energy. According to UNESCO, "In just the first half of 2017, Costa Rica has reached a new record in clean energy production and received their latest Biosphere Reserve declaration by UNESCO solidifying their unshakeable commitment to sustainability."

What is the role of innovation in sustainable development?

Sustainability needs innovation and innovation needs sustainability. But recently all business innovations tend to overexploit the environment to feed humanity. What is worse is that most of humanity goes to bed hungry. So, what is the innovation for? For profit? Not surely. Innovation should be for making the lives of everyone comfortable and also for a future generation while taking care of the environment around us.

What is innovation then?

Innovation is the ability to reimagine things that already are. From Dugout canoe, Catamaran and

sailing boat, through innovation ideas, ferry, ship, barge, and submarine are in use now. All navigation vessels were improved through innovation. It takes place when effective products are invented. New processes and services, when introduced in the market for the welfare of people, are surely innovations. A new technology which is user friendly and going to make ease of burdens of society, that is an innovation. A business model that takes care of the environment and the welfare of people is indeed an innovation.

In this paper, we study different aspects of sustainable development, climate change, innovation and learn about Costa Rica's achievement, a pioneer in the area of sustainability as it has designed its programs with SEE model.

Literature Review

Sustainable development and Climate change

Wang. T (2020) in his article on Global Climate Change – Statistics & Facts explains that, “The interconnectedness of environmental sustainability and human well-being has been increasingly recognised since the term sustainable development was popularly defined in the 1987 Brundtland Report and taken up at the 1992 Earth Summit. Indeed, sustainable development gained traction and international momentum in the 1980s and 1990s because it was often interpreted as compatible with market liberalism. Because market liberalism circumscribed the role of State and allowed market forces to develop with minimal external interference.”

When globalisation and privatisation started to flourish in the '80s and '90s, liberalisation was at its peak, so business houses never cared about the repercussions of overly exploiting the environment for making a profit. Profit became the centre of businesses than the service to people. Definitely two groups emerged. One to exploit and another to resist.

Wang. T (2020) further explains that, “Following the 2008 global financial crisis and in the run-up to the 2012 Rio+20 Conference, the United Nations Environment Program (UNEP) promoted 'Green Economy' as a concept that would result in 'improved human well-being and social equity, while significantly reducing environmental risks

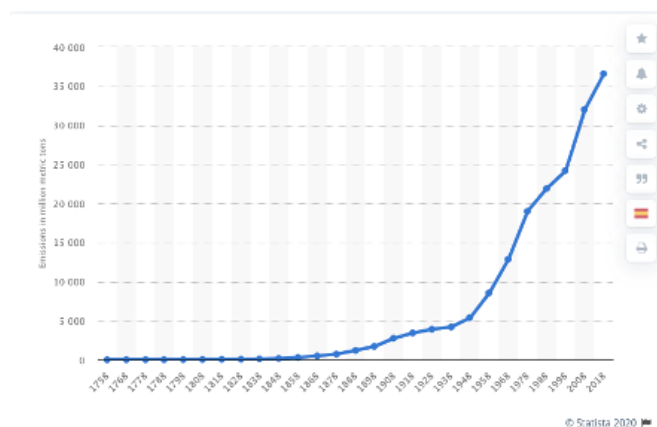
and ecological scarcities' by means of reducing an economy's carbon intensity and investing in environmental protection.”

Innovation

Innovation is bringing something 'new' to this world. It may be a device like a mobile phone or a method like new irrigation or material like a plastic bag. Innovation is a new idea, method, product, collaboration, direction or art form added to an existing one. It can be an addition or a subtraction. The new device or method or material should be useful for any organisation or society. The new element should have an added value useful for the organisation or society.

Sustainable Development and Climate Change

Sustainable development is where the people, planet and prosperity go along helping each other without damaging anyone. For example, if the businesses do not take care of excess carbon emissions, it would affect the present and future humanity. It would result in climate change and to its all effects.



Source: Statista2020

<https://www.statista.com/statistics/264699/worldwide-co2-emissions/>

Wang. T (2020) shocks with his report that, “United Nations assessment of the MDGs was the fact that carbon emissions, instead of stabilising or declining as proposed by the Kyoto Protocol, actually increased over 50 per cent between 1990 and 2012. Furthermore, biodiversity has declined at a rapid pace, and species extinction rates have accelerated. In fact, some research contends that we are facing a mass extinction episode

unparalleled since the disappearance of dinosaurs 65 million years ago.”

On the one hand, there were conferences and agreements like Kyoto Protocol, attended by Governments and businessmen and on the other hand, the reality was that biodiversity started declining to result in species extinction and possibly human extinction in near future. What happened? Indeed the governments did not keep up the promise and so rapid warming started happening which might bring the whole humanity to its end.

Wang. T (2020) further clarifies that, “The rapid warming, acidification and reduction of the oxygen content of oceans associated with carbon perturbation will have huge impacts on marine ecosystems and could further contribute to mass extinction. The majority of soils around the world are in fair, poor or very poor condition and are further degrading. This impacts not only food production but also the climate, as soils store more carbon than that resides in the atmosphere and all plant life combined.”

According to Statista2020, “In 2019, the earth's surface temperature was around 0.95 Celsius degrees warmer than the 20th-century average.” From the following graph, it can be easily understood how alarming it is to know the warming curve grow.

Climate change should be renamed as climate-people change as it not only affects the environment, it ultimately affects society, destroying its economy. It is political. Politics decide the policies on the economy. So, the focus of climate change is not only ecological but also economic, social and political. The necessary responses have to be taken primarily by people with power and to be followed by the beneficiaries.

Plan Melbourne report (2020) explains that, “More frequent and acute droughts and floods, for example, can severely affect the capacities of farmers to cope with the loss of crops and livestock. Traditional coping strategies centred on the sale of assets or community support to recover from losses may be insufficient to cope with more frequently recurring or larger hazards that affect entire regions.”

To understand who motivates innovation and for what purpose, it is significant to understand the nature and process of innovation that works in today's business world, making only profit-oriented and not having future in its mind. This leads us to study the science of innovation. After studying that we will come back to turn the ways of use of innovation for sustainability.

Innovation

“The act of introducing a new device, method or material for application to commercial or practical objectives”

-(Melissa A. Schilling, 2013)

What is innovation?

The inventor of iPhone, Steve Jobs says: “Innovation distinguishes between a leader and a follower.” The leader always thinks outside the box, constantly worrying about improving the situation by adding value.

Kinds of innovation

Product innovation is the innovation of a product, which is tangible. It can be touched, smelled, seen and heard. Service innovation is the innovation of service, which is non-tangible. Process innovation is the innovation of the conduct of an organization or community. Incremental innovation is that innovation that adds value in the existing business with existing technology. Incremental innovation is "doing a little bit at a time" whereas radical innovation is "doing it in a completely crazy way". Radical innovation is that innovation that harnesses new technology and a new business model simultaneously (Mariello, 2007; Lopez, 2015; Hopp, 2018).

Disruptive innovation is that innovation that adds value in the existing business with new technology. Landry. L (2017) explains that, “Architectural innovation refers to innovation in the architecture of a product that modifies or changes the way different components of the systems interact or link with each other.” Modular or component innovation is the innovation where a single part is changed in a product.

Management of innovation

Innovation management is an act of how an organization and its members manage the

innovation activities such as coming out with creative ideas, choosing the strategy of what, when and how to use the idea and executing the idea to make it tangible.

Process of Innovation

Idea generation and mobilization is the first stage of the innovation process. The urge and need for innovation and the freedom to think help come out with many ideas. *Advocacy and screening* as the second stage are to weigh the pros and cons of the ideas generated earlier. Here is where the ideas are evaluated and valued. It should be done with some standard and transparent. *Experimentation*, as the third stage, is where the ideas need to be prioritized according to the need of the users taking into account space, time and situation at the ground level. *Commercialization* is the fourth stage where the cost element and participation of users come into the picture. The last decision has to be made after seeing if the added value satisfies the users and also it would be beneficial to the organization, before implementing the innovation (Morris, 2013; Moore, 2019; Precor, 2019)

When finally, the new product or process or model is accepted by the company or institution it is called "Diffusion". What happens next? The process of starting with new structures and maintenances would at last shape the initial innovation come true. This step is called the implementation.

Characteristics of an innovator

The innovator has to have the following characteristics.

- **Divergent thinking:** Having many ideas on various new products and processes in mind and coming out with creativity to explore many possible answers for the problems.
- **Insatiable curiosity:** Having a strong desire to learn or know something.
- **Infectious passion:** Having a strong desire called determination or conviction.
- **Stamina:** It is the ability to sustain the prolonged physical or mental effort.
- **Compelling leadership:** Compelling leaders gain authority from their performance and how they relate to people resulting in getting their trust.
- **Respect for other innovators:** It is the feeling of deep admiration for someone or something

elicited by their abilities, qualities, or achievements.

- **Courage:** It is the bravery that keeps one going when things get tough (Bagley, 2014).

So, innovation is like a knife. This can be used to cut fruit or cut a throat. Below is the study why innovation has to be used for the success of the business while people and planet have to be cared for. All countries and communities need to understand what socio-economic-environment model is to use innovation for sustainability development coming out of climate change issues. What is the socio-economic-environmental model?

SEE Model [Socio-Economic-Environmental Model]

Take a list of innovations in human history that can be applauded for its greatness. What comes to mind? All the innovations like a light bulb, refrigeration, computer and motor car. All these innovations deplete the environmental resources and cause damage to this earth for sure. When some innovation is looked at the cause for a negative effect on the people who invented and on the planet in which they live, can it be called a real innovation? Not at all true.

Wijesooriya. N (2018) agrees that, "In fact, all high carbon emissions are due to innovations made during the last 300 years. Therefore, we need a more pro-environmental perception towards identifying what defines innovation. If innovations can become a challenge, why are human beings so determined to innovate? Can we survive without innovation? The simple answer is no. Sustainability itself is entirely dependent on our ability to innovate. If we did not innovate, we could never achieve anticipated targets across every sector. This also includes developing new strategies to address the crucial challenge of climate change."

Innovations do affect the community in both a positive and a negative way. It thus does good and does some damage. When the damage is more and the impact on the world is very negative, it disrupts the equilibrium fabric of society, its economy and the environment. In short that innovation cannot be called a sustainable

innovation. If the hope for the future to be built, there need to be a marriage between sustainability and innovation. Parker. L (2017) concludes that, "Thus, building a more integrated concept of 'sustainnovation', and bridging the gap between the two notions could provide hope for the future of sustainable development."

In this background, let us define Socio-Economic-Environmental model. It can be derived so that all economic activities that are meant to bring wellness for the society should not harm the environment for now and for the future in contrast with the idea of a privatised and liberalised market economy that proposes the natural resources to be exploited without rational thinking.

Society needs to take into consideration their children and future generation and give earth worth living. If the present economy overuses the resources and thus attracts impacts of climate change bringing worse effects on the people, the community and the livelihood, it has to immediately change their patters of working and living. The business enterprises and the people, in general, need to have ecological resilience, working to reduce greenhouse gas emissions. They should stop unsustainable practices of economical production and consumption that overstep the natural course of living.

Wang. T. (2020) notifies that, "UN's 2030 Agenda presents a renewed opportunity for a transformative eco-social turn. Based on the principles of universality and leaving no one behind, the 17 SDGs provide a normative framework for all nations that acknowledge the complexity of the challenges that lie ahead. Building on what has been learned from past applications of green economy and sustainable development approaches, the next generation of policies and strategies for sustainability and resilience needs to adopt an eco-social lens and promote equality, redistribution and empowerment as part of a changing development model."

Despite all these cries, one country moves forward used socio-economic-environmental model in sustainable development decreasing the effect on green-house and thus the impact of climate change.

Costa Rica!

Costa Rica SEE Model - A Case Study

According to National Energy Control Center (CENCE) of Costa Rica, its electricity came not from fossil fuel but sustainable sources for the first quarter and second quarter of the whole year 2017. It was around 99 per cent to be exact. For the past 30 years, the country worked on various sustainable and renewable sources like wind, geothermal, solar and hydroelectric to get 93% of its energy. Costa Rica has a goal of becoming the first carbon-neutral country before the year 2021. They have planned to observe this strategy in every region of the country and to be adopted by all citizens. The country emphasises the visitors also to follow across all industries. SO, it can be noted here that the concept of sustainability is rooted in the culture of Costa Rica.

The Tourism Board of Costa Rica proudly announces that, "Another win for sustainability was earned in June when UNESCO declared Savegre River, located in the Zona de Los Santos (Zone of the Saints), a Biosphere Reserve. Biosphere reserves are specially designated areas for sustainable development that reconcile the conservation of biodiversity with the proper use of natural resources. As stated on the UNESCO website: Biosphere reserves are 'Science for Sustainability support sites' – special places for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity. Costa Rica already has four reserves, but this is the first with coastal marine components, as it includes the marine part of the Manuel Antonio National Park, in Quepos."

What we see in Costa Rica is a model for other countries in the world. They can learn from Costa Rica how sustainable growth is achieved there. The notable strategy is that the Costa Rica government gave land to its citizens as a form of welfare. In this way, people of that country could work on these lands, earn for their livelihood, laying the base for economical growth that would benefit all people. There grew a group of people that could connect and have power in the process of growth. These group of people and the

government closely worked together to solve the issues that came on their way of progress.

When people got the land as welfare, they started cutting trees to make it ready for agriculture. Since it happened country wise, it was looked as a danger for deforestation. So, the government thought over this issue and came out with 'Payment for Environmental Services (PES) program'.

According to the PES program, it "helps protect land outside the country's natural reserves, by compensating landowners who conserve forests and the water supply. These practices, in turn, benefit Costa Ricans as a whole, creating a cycle of prosperity. As of 2013, the PES program provided benefits for 8,000 landowners. To supplement the PES program, the government implements fuel and water taxes that promote clean energy, hybrid vehicles and biofuels. The government also banned deforestation and designated approximately 20 per cent of the country's land into untouchable natural reserves"(Lux, 2016).

By that time eighty percent deforestation already happened. Now is the time to fill the land with trees. So, the Government paid the citizens through payment for improving the land with trees, so that the forest cover would improve at least to sixty per cent. This is the strategy to invest in long-term sustainable goals even though there are negative concerns in the short term.

This process may need some corrections, given the system, but in fact, it is very promising. For example, according to the Costa Rica Tourism Board, "The country lacks public transportation, causing significant vehicle pollution. Still, the country's background and progress thus far suggest more gains will be achieved. In 2013, Costa Rica was one of eight countries to receive a World Bank grant to help implement a cap-and-trade program. Tourists and businesses are charged voluntary taxes to offset their carbon emissions. The combination of emissions reduction and forest restoration efforts ensures Costa Rica will achieve its development and environmental goals."

This is the reason why other countries can use Costa Rica's model for improving their own economic and environmental development. It is surely a model as it looks after the development of people and also worries about the health of the planet. It is in the process of prosperity. The key lessons from this experiment are the political will to invest in agriculture supporting people to take up the lead to improve their lives without harming their environment. This is how the cooperation of the government and the people and the environment can be successful to reach economic prosperity.

Recommendation

1. A strong political will, in the part of policymakers, to use innovation in agriculture, industry, business and the use of environmental resources is needed to achieve the Costa Rica SEE model. Specifically, governments need to go for bio-diversified sustainable agriculture and environment-friendly businesses.
2. A cultural revolution in the minds of people, changing the values, thoughts and behaviours of people from all strata to use SEE model in their day to day life, has to happen to be successful. Specifically, people's organizations have to be built to get awareness on SEE model and make it their way of life. Media has to be heavily used in this purpose.
3. The businessmen and traders have to realise that fossil fuel is limited, all the world resources are limited, and the population is growing and are left with no choice to take Costa Rica SEE model to increase their business for the betterment of humanity and not only for profit. Specifically, business houses have to indulge in alternative sustainable energy models.
4. The technologists have to be innovative to invent new technologies for the betterment of people and planet so that future generation would not suffer because of today's greediness. Specifically, technologies should go beyond artificial intelligence and robotics and invest in nature-based machines.

Conclusion

Costa Rica stands high in showing to the world that proper planning, with socio-economic-

environmental growth in mind, can create wonders, diminishing the environmental degradation, increasing the profitability of the business and satisfying the needs of all people in the country. It has helped the world understand that innovation could be used for the betterment of people and the planet in a sustainable way, reducing the fear of climate change effects.

Costa Rica way, the SEE way, is the THE way.

References

- [1] Bagley, Rebecca O.(2014). “ The 10 traits of great innovators” as retrieved from <https://www.forbes.com/sites/rebeccabagley/2014/01/15/the-10-traits-of-great-innovators/#5648ee6d4bf4> as on 08.11.2019
- [2] Costa Rica Tourism Board (2017). “Costa Rica achieves tow new records in sustainability effort” as retrieved from <https://www.newswire.ca/news-releases/costa-rica-achieves-two-new-records-in-sustainability-effort-636713503.html> as on 06.05.2020.
- [3] Green Economy” as retrieved from <https://en.wikipedia.org/wiki/OECD> as on 09.11.2020.
- [4] Hopp, Christian et.al. (2018). Published on 9th April, ‘What 40 years of research reveal about the difference between distributive and radical innovation’ as retrieved from <https://hbr.org/2018/04/what-40-years-of-research-reveals-about-the-difference-between-disruptive-and-radical-innovation> as on 24.11.2019.
- [5] Landry, Lauren. (2017). Published on 21st December, An innovation process, a step by step guide, as retrieved from <https://www.northeastern.edu/graduate/blog/innovation-process/> as on 25.11.2015.
- [6] Lopez, George. (2015). “Types of Innovation” as retrieved from <https://techblog.constantcontact.com/software-development/types-of-innovation/> as on 08.11.2019.
- [7] Lux,MCKenna. (2016). “Coasta Rica: A model of sustainable development” as retrieved from <https://www.borgenmagazine.com/costa-rica-sustainable-development/#:~:text=Half%20as%20much%20carbon%20is,be%20carbon%2Dneutral%20by%202021.> as on 05.06.2020.
- [8] Mariello, Alissa. (2007). Published on 1st April, Magazine Opinion and Analysis, “The five stages of successful innovation” as retrieved from <https://sloanreview.mit.edu/article/the-five-stages-of-successful-innovation/> as on 25.11.2019.
- [9] Melissa A. Schilling. (2013). Strategic Management of Technological Innovation. Tata McGrawHill, 4, pp.1–314.
- [10] Moore, Ryan. (2019). Published on 4th June, “11 Disruptive innovation examples” as retrieved from <https://openviewpartners.com/blog/11-disruptive-innovation-examples-and-why-uber-and-tesla-dont-make-the-cut/#disruption> as on 22.11.2019.
- [11] Morris, Langdon. (2013). “How to innovate - The process of innovation” as retrieved from <https://innovationmanagement.se/2013/08/08/how-to-innovate-the-innovation-process/> as on 09.11.2019
- [12] Parker, Laura. (2017). “The five innovations that shaped sustainability in 2016 as retrieved from <https://www.theguardian.com/sustainable-business/2017/jan/01/sustainable-technology-2016-climate-change-environment> as on 05.06.2020.
- [13] Plan Melbourne Report (Chapter 5). “Sustainable development in times of climate change” - as retrieved from <http://www.unrisd.org/flagship2016-chapter5> as on 05.06.2020.
- [14] Precr, (2017). “ The Innovation Process” as retrieved from <https://www.precor.com/en-us/resources/the-innovation-process-3-steps-to-improving-your-facility> as on 09.11.2019
- [15] Wang,T. (2020). “Global Climate Change - Statistics & Facts” as retrieved from <https://www.statista.com/topics/1148/global-climate-change/> as on 05.06.2020.
- [16] Wijesooriya, Nirankika. (2018). “sustainability needs innovation, innovation needs sustainability” as retrieved from <http://sydney.edu.au/environment-institute/opinion/sustainability-needs-innovation-innovation-needs-sustainability/> as on 05.06.2020.