

# ANTICIPATING A DISRUPTED WORLD: LEVERS FOR SUSTAINABLE ECONOMIC DEVELOPMENT

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## Approaches to the Term

Today's context businesses are vulnerable to different risk situations. Challenges of disruptive change are one of the major risk components that have got adversely fastened into businesses. The present-day value of a business is judged through multiple dimensions paying attention to economic, social and environmental concerns. The core value of a business is not an undeviating measure of pure manufacturing performance but a much more in-depth commitment of a more focused strategic direction on sustainable economic development. Global mega trends (Demographic transitions, Urbanization, Climate and resources, Commodity cycles, Technological disruptions, Fragility and violence, Shifts in the global economy, debate about globalization and many other forces operating in the environment) and challengers are expected as a risk in macro circumstances lead extreme disruptive challenges and gradual modification of risk in businesses, which would affect the change in equilibrium of businesses and it would manifest in manufacturing processes. A better understanding of the linkages among these trends and the associated changes in economic, social and environmental conditions is needed for long-run survival in businesses.

Manufacturing plays a role in both disruptive changes in mitigation and adaptation. Mitigation focuses on limiting the speed and scale of disruptive changes. It has typically received utmost attention in policy circles, such as debates over business modal innovations, technological shift, multi-stakeholder collaboration, macro circumstances pressure (whether related issues and legal matters) and micro circumstances pressure (such as task-oriented pressure, stakeholder pressure, institutional pressure, etc.) across the economy. Adaptation involves adjusting to actual or expected disruptive change effects. The mitigation management of disruptive change risk is included as a part of the transition making it allowances for sustainable economic development and exploitation opportunities to alter the financial viability of the capital stock and the business models. This discussion focuses on the inclusion of disruptive change risks in financial, social and environmental viability in the rubber manufacturing process in Sri Lanka. The aim of this discussion is two-fold: firstly, examines the questions of long-term financial feasibility risk in disruptive transition to a sustainable future. It discusses different anticipatory options that interface with resolving and/or managing this risk, as well as the implication for Bankers. Secondly, this review is on the risk associated with mitigation, labelled as challenges of disruptive change and

the associate long-term impact on the performance of assets and business portfolios. Hence, it is ventured in the rubber manufacturing industry which has to ascertain the significance of the anticipatory approach, together towards tomorrow which is ever so important indeed for the entire world.

## Framing the Issues: From Ignorance to Awareness

Because of the way a challenge is perceived influences on a business model, framing the issues, dynamics and dilemmas is a critical responsibility of business leaders. Let's look, first, at the issue that arises when the challenge of disruptive change is perceived as a threat. Since its inception, socioeconomic development was always about innovation and change management. However, the focus has been on disruptive change, and not on incremental change or dramatic change. What exactly is disruptive change? Is it a single field or discipline? Is it a process? Is it an agreed approach? Is it an effort to identify and pursue goals? Perhaps a philosophy? Or, is it development phase or problem-solving?

### Figure 1: Incremental Vs. Disruptive changes



Source: Photo by Sabine Loetscher.

An example, (See Figure 1) the focus was on how to stable the bags onto the truck in a better way instead of thinking about an entirely alternative transportation method. Disruptive change is a universal challenge for the whole human race to face significant challenges to reduce the economic intensity of man-made activities to avoid irreversible catastrophic impacts in society. Therefore, disruptive change is a field of risk management or a dynamic construct. It has no priori measured indicators and the purpose is to arrive at a more parsimonious conceptual understanding of the disruptive change. Present organizations do not consider much on disruptive

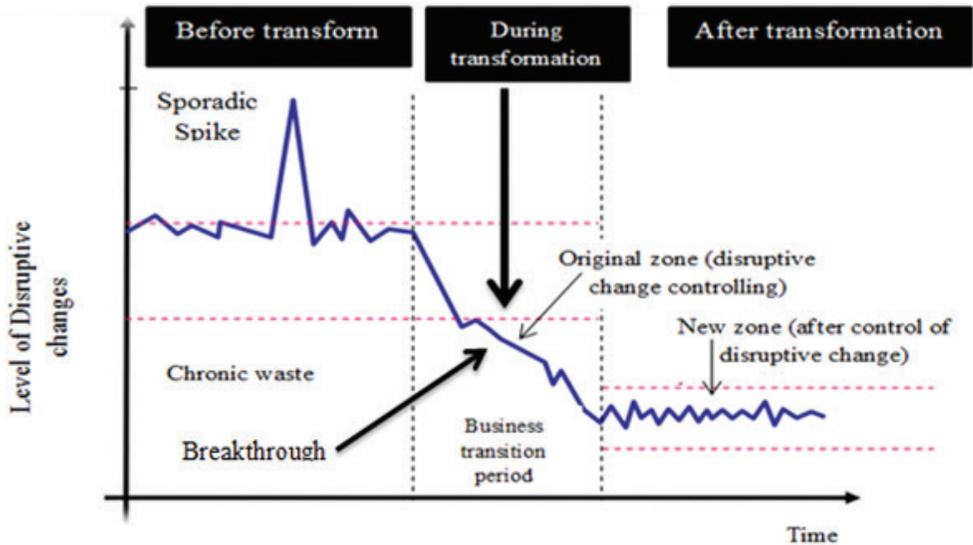
transition risk and mitigation activities under their organisational risk frameworks. However, the focus of this discussion has been on disruptive change, and not on a gradualist approach (incremental or dramatic change) or the great-leap approach (drastic change).

In business we need to consider the kinds of events that could pose a risk to a business and take adequate steps to mitigate them, it is an investment for the future of mankind and humanity that organizations could make. What working methods and tools can support disruptive challenges? For disruptive change, we will need to explore and invent which means that we operate with many unknowns and high risks neither the end goal nor the solution path is known in advance, developing ideas is not the most challenging part of disruptive innovation the real challenge is to implementation and action while putting ideas into practice and to make them work. With the industrial revolution this balance of business and environment started to crack (disrupted) showing disrespect to long-term damage caused by our man made selfish acts. The industrial sector is facing extraordinary disruptions. But leading industries are not afraid; they perceive massive opportunities are emerging and they are looking forward to turning disruptive change as a challenge from ignorance to awareness. Challengers for disruptive change that are initially framed as an opportunity, because the organization doesn't feel the threat as Mark Twain famously said, ***“Every once in a while one stumbles across a good idea, but with any luck, you'll right yourself and pass it by.”***

## **Beyond Framing - from Awareness to Conflicts**

There are three broad channels (physical risks, liability risk, and transition risks) through which disruptive change can affect the economic, social and environmental stability of a business. Physical risks associated with the macro-oriented circumstances arise from climate and weather-related events, such as floods, tsunamis, and storms, etc. that cause loss of life and damage to property or disruption on trade. Liability risk is the second associated risk that may arise tomorrow, and if the parties who had suffered loss or damage from the effects of disruptive risk seeks compensation from those whom they hold liable. The final risk is the risk that ensues from the -transition due to disruptions. Coercing issues, due to the adjustable the manufacturing sector makes towards, spend more time at the periphery, change the way you approach problems, recognize the early warning signs of disruptive change and stay grounded while avoiding stagnation to survive the business in the long run. The broad concept of cradle-to-grave disruptive change is logical breaks down into some recognized phases, business model innovations through corporates and start-ups, technological shifts in markets and industries as an opportunity for sustainable economic development and multi- stakeholder collaboration and pressure.

**Figure 2: Level of Disruptive Change and Business Risk Transformation**



Source: Author's own elaboration

On account of the phase of disruptive change, the process often contains certain chronic problems (see **Figure 2**) in businesses. These sporadic problems are solved through “fire fighting”. Eventually, it becomes evident that something has to be done to eliminate chronic problems. They will not disappear on their own, that’s the nature of disruptive change in business. The transition to the sustainable economy may lead to investing in standard physical assets that will generally impact investment decision; therefore the decision should be to prioritize for the most exposed assets shadow pricing.

## From Talk to Action

A comparison of traditional and modern products is not the way of facing disruptive change. This step on the spiral of improvement activities concerns the process of translating the needs of the user, learned from field intelligence, innovation, research and development, new technologies, new product development, knowledge worker concept, learning organization, etc. So how can you develop a targeted approach to business performance during disruptive change? When we are setting objectives in the period of transformation, it is necessary to develop a breakthrough in attitudes, use of Pareto principle, organizing for a breakthrough in knowledge, creation of steering arm, creation of diagnostic arm, diagnosis, a breakthrough in cultural pattern action and transition to a new level through implicit approach than explicit orientation. In the phase of transformation (see **Figure 2**-breakthrough approach), the bank has a role to play, both providing and expediting to guide the projects, organize for diagnosis to

find the causes and provide remedies. Prove that the remedies are effective under operating conditions, provide for control to hold the gains. In 2017, KPMG International surveyed 120 bank CEOs around the world to find out how they plan to grow, what opportunities they see in the market and what steps they have taken to turn the current disruption into a competitive advantage. As an example, Emission control is directly related to the product carbon footprint in industries. Burning fossil fuel is a governing factor in increasing emissions in manufacturing processes. Currently, organizations are extremely conscious of reducing life cycle emissions in the supply chain to enhance their organisational financial performance. Organizations now are very conscious of their carbon footprint and aggressively pursue action to re-engineer their process like investments in biomass energy sources to reduce carbon footprint. Converting to biomass boilers require capital investments that may delay implementation depending on the financial position of the organization. Pending such investments, organizations do indeed have cut down on emissions by reducing consumption of furnace oil through rationalizing thermic boilers, optimizing burner efficiencies, power factor correction using new capacitor banks and replacing high power-consuming motors with variable frequency drivers. Any attempts and the achievement of emission reductions directly lead to cash savings by reducing furnace oil consumption and electricity resulting in profit growth leading to the healthy financial performance of the organization. It is evidenced that converting to biomass boilers indeed gives significant savings with a quick return on investment. This example elaborates that bank should focus more on their sensing capabilities, and support green projects/investments, beyond their traditional business financing

‘Outside-in sensing’ –banks need to understand how the industry sectors around them are changing and how that will impact on their business. Next, they will need to run ‘inside-out scenarios’ – taking all of the information they gathered from their outside-in sensing (both on-line and off-line) and running what scenarios to identify exactly, how these trends apply to their business and operating models, what new opportunities they create and what risks they need to avoid, such as enhancing green projects through hybrid loans, low interest rates for export-oriented industries to go for a carbon-neutral products, enhance innovation by encouraging industries through ecological financing and increase credit facilities for carbon-free logistic activities, develop new loan schemes for water saving projects (by considering water footprint or ecological footprint in businesses, ex., Apparel and fashion industry), encourage organic agro management practices, new facilities for eco-friendly projects and etc. Finally, banks need to develop a simple, yet effective business strategy into operating model tactics -ecologically sustainable business models. A good example is an introduction of “run-flat tyres” in the automotive industry. This led to the elimination of the spare tyre, which helps minimize the damage caused to the environment by way of input, and above all, by dumping of old tyres in the ocean. For the car company, one tyre less does not mean fewer profits but more profits indeed through the marketability of the technology to the consumer, incorporating the concept of green into the brand. Karl Marx was the first to elaborate on the idea that changes in technology are significant, if not the primary, force acting on the shape and nature of society. The common view, that rapidly changing technologies are shaping our lives, stems from Marx’s observation.

## From bark to the root: Rubber Industry in Sri Lanka

In a disruptively changing business environment, financing vital industries such as the rubber industry is a challenge for banks. However, in order to achieve sustainable economic development, it is important for banks to understand the drastic changes that had occurred in the industry over the years. Hence, it is vital to briefly browse through the history of rubber industry of Sri Lanka.

Though indigenous rainforest dwellers of South America have been using rubber for generations, it was not until 1839 that rubber had its first practical application in the industrial world. In the 1860s, Henry Wickham, a British citizen, smuggled some of the seeds from these rubber plants out of Brazil and sent 70 000 seeds to Sri Lanka for planting first as commercial rubber in 1883. In 1998 the rubber industry was deemed to have produced equal amounts of raw rubber exports and same in amounts of domestic consumptions, and it can be considered as a remarkable year for the industry by being contingent on or dependent on to use more latex for domestic purposes than for foreign trade. While domestic consumptions have increased and fluctuation of rubber prices may have caused to shift the process into finished products to get more value additions to one kilogram of the processed rubber. Considering the advancement of agro-based industries such as rubber, it generates enormous solid and liquids waste (roots of the disruptive change in manufacturing process).

**Table 1: Rubber and Rubber based Products Contribution to Total Merchandise Exports 2006-2016 May**

Year	Percentage Share from total exports
2006	8.01
2007	7.74
2008	8.14
2009	6.78
2010	8.69
2011	10.89
2012	10.6
2013	9.6
2014	8.47
2015	7.7
2016 May	7.83

Source: Sri Lankan Export Development Board  
(<http://www.srilankabusiness.com/blog/product/rubber.html> - Retrieved on 29 April 2014)

Environmental destruction is an inevitable consequence of human beings and became more complex and multidimensional due to heavy utilization of resources and mounting up of by-products at a phenomenal rate and leading to a high global pollution of air, land and water in the atmosphere/environment. The Central Bank Report (2016) highlighted that the foreign exchange earnings from rubber was more than 6 billion rupees in 2016 and recorded 7.83 % from total exports in the first quarter of 2016 (see Table 1).

At present, the country ranks among the world's top ten largest producers and the seventh largest exporter in natural rubber. Sri Lankan rubber Industry consists of two closely-related independent sectors; the rubber plantation industry which produces raw rubber and the high value new product innovations in finished rubber goods. Starting from the stage of tapping latex to the manufacture of semi- finished or semi-processed rubber products, together with primary products, this sector is moving forward to the manufacturing of value added products combined with those involved in trading in the rubber industry. Sri Lankan export development board (SLEDB) elaborated in 2016 that regarding value addition of rubber and rubber based products (see Table 2). Central Bank of Sri Lanka report, 2015 indicated that last year's total contribution to gross domestic product (GDP) is 3 per cent and total production of rubber was 88.9 Kg million in 2015 which increase only to 98.6 Kg million in 2014 of 0.7 % small increment from 2014. The noticeable drop in the growth rate of rubber and rubber products is mainly due to the global recession, which prevailed in the year 2009. SLEDB (2016) reports acknowledged that Sri Lanka can boast of international acceptance in our products such as Solideal branded industrial tyres manufactured in our country by Loadstar Ltd.

**Table 2: Export Performance Rubber Products 2006 to 2016 May**

Year	Value in USD million
2006	541.65
2007	592.24
2008	665.27
2009	483.18
2010	730.55
2011	1091.15
2012	981.77
2013	959.03
2014	935
2015	787.3
2016 May	323.84

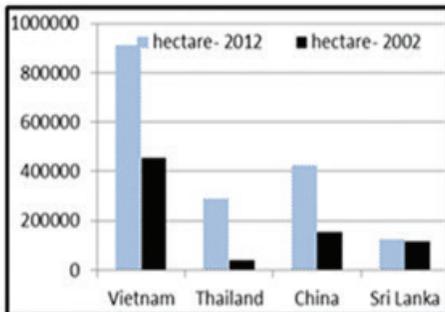
Source: Sri Lankan Export Development Board  
(<http://www.srilankabusiness.com/blog/product/rubber.html> - Retrieved on 29 April 2014)

There are other multinational companies too that are engaged in the manufacture of this natural rubber products while promoting more employment. Based on the population in the industry engaged in the production of rubber goods of the manufacturing sector, are organizations categorized under small, medium and large scale manufacturers. These manufacturing organizations collectively have a large portfolio of different products that are manufactured either for local sales or predominantly for the lucrative export market. The wide range of products comprises such items as solid tyres, latex gloves, rubber bands, extrusions, beadings, mats, miscellaneous sports goods, mattresses, pillows etc. The versatility and experience of the technologists and designers accredit the manufacture of rubber products to suit the stringent and competitive requirements of the marketplace and these commodities are internationally acclaimed and accepted for their quality and durability. Sri Lanka produces rubber and rubber products for International brands such as Continental, Solideal, Wonder grip, Mapa, Safety Work, etc. In consideration of the potential of its high value adding capacity in the product manufacturing sector, the industry together with relevant government institutions have developed a long term master plan for the development of the rubber industry in Sri Lanka, which will be vital information for banks.

## From Symptom to Cause - Developing Nations Darkened by Disruption? (Special attention to Rubber Industry in Sri Lanka)

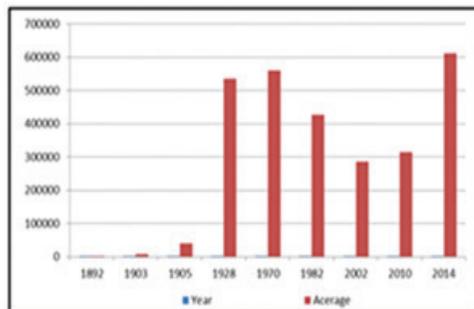
The country today not only boasts self-sufficiency in rice and even to have the capacity to imports. Organic cultivation has become a focal point within the farming communities and needs the utmost attention to encourage organic farming and low-interest rate longs for ecologically beneficial products for sustainable development. According to figure 3, it realized the growth rate of Sri Lankan rubber cultivation in comparison to countries involved in rubber cultivation. Sri Lanka is staying in the lowest position of cultivation and remains least regarding development in comparison with those of other rubber producing countries. The author emphasizes the poor progress of cultivation and their impact on futuristic demand for domestic consumption of the nation.

Figure 3: Rubber Cultivation extent by other countries



Source: Author's own elaboration

Figure 4: Comparison of rubber extent being from 1892 till to 2014

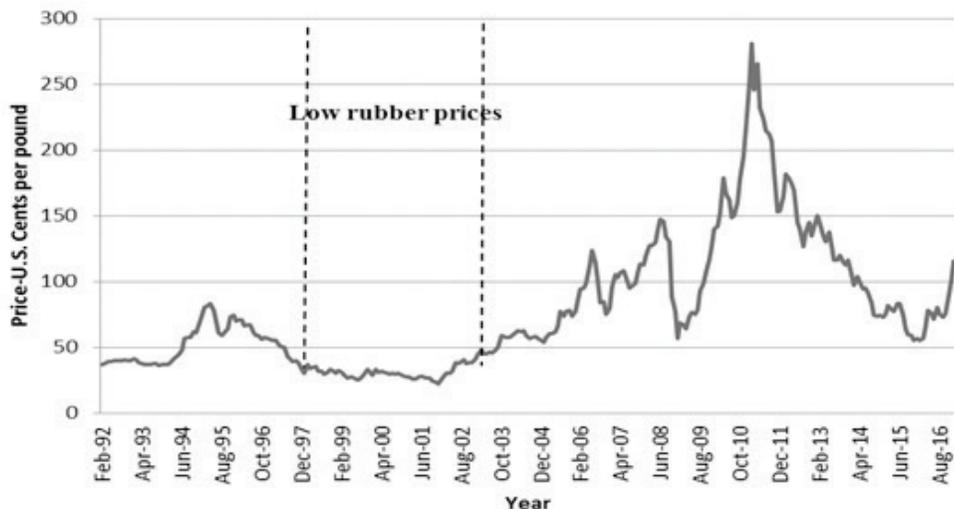


Source: Author's own elaboration

**Figure 4** shows that the highest cultivation is recorded in 1982 and the lowest was in 2002 with a slight improvement in 2010. The logical reason for this occurrence is due to the rubber price increase in the international market. According to historical facts and figures, in 1970 it recorded an extent of 224 000 hectares, in 1982 it declined to 171 726 hectares, in 2002 it was 114 681 hectares and in 2010 it was 125645 hectares, and to date rubber cultivation has not attained the previous extent of rubber in 1970 and far behind by 100 000 hectares in comparison to the rubber plantation of the same year. Increasing rubber cultivation in small farmer plots can result in significant increases in household income and it will result in the eradication of poverty of the communities. However, in the course of decision-making, it provides for growing rubber to farmers, it will create a situation in the decades ahead for farmers to commit themselves to earn money to get the return on their investments. Growing of more rubber trees is considered as a feasible solution for the neutralization of such adverse impact mitigation of climate risks whilst helping the reduction of atmospheric carbon (need Green to Blue investments through Banks). This can be viewed as assigning a good financial implication as more rubber means better prices as well as less interruption to manufacturing towards a carbon-neutral economy (see the great leap approach in Thailand and Vietnam in **Figure 3**).

Rubber can be categorized as an industrial cash crop and it creates a demand depending strongly on the dynamics of the world economy. The price for rubber depends on the world demand and it indicates the bust-and-boom cycle which will expose farmers in a risk situation due to unpredictable price fluctuation in the market place (see Figure 5). Concerning rubber plantation comparatively, farmers regarding their yield are not able to build a short-term strategy to increase production with a dynamic market situation.

**Figure 5: Rubber Monthly Price - US cents per Pound**



Source: Singapore Commodity Exchange (SICOM)

Other than that, there are ecologically identified hazards due to crop diseases, pests, unfavourable weather conditions or any changes in climatic scenarios or situations. Previous research has emphasized the pollution of water resources, loss of natural vegetation and species, soil erosion and climate change as consequences of rubber cultivation. Furthermore, it needs more knowledge and sense of economic risk associated with monoculture crop, and its ecological consequences for their environment and livelihood. Policy to keep the growers captive to rubber is another area where government intervention is required. Minimum price levels, maintaining buffer stocks, export grants for more rubber use in finished products are some steps that are needed urgently.

Figure 6: Raw rubber production and exports

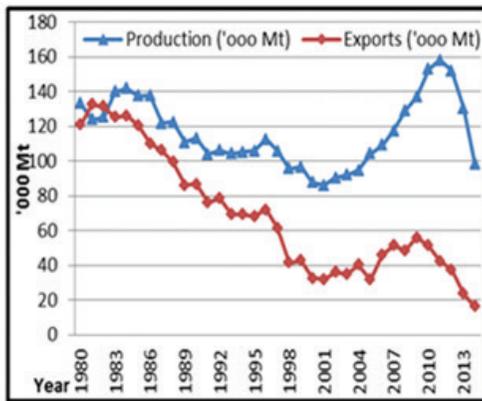
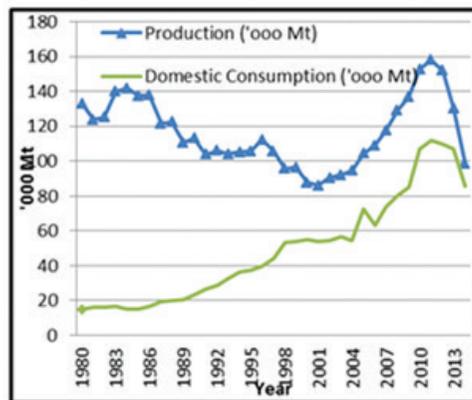


Figure 7: Raw rubber production and Domestic Consumption

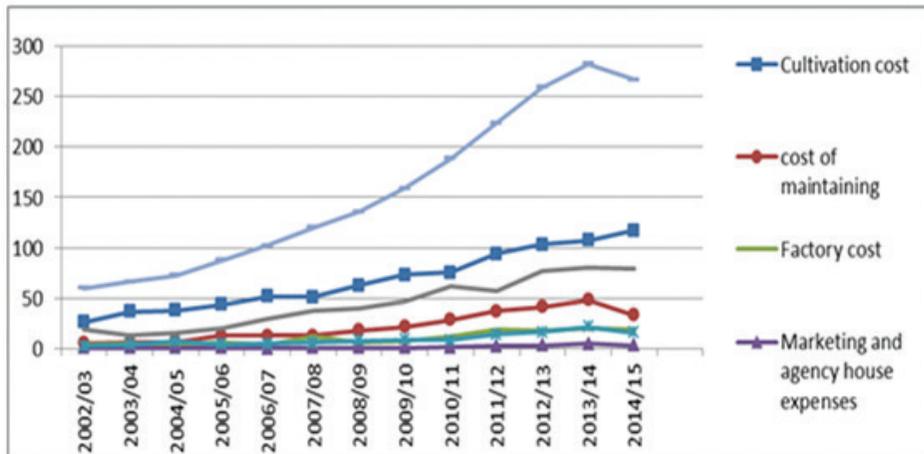


Source: Author's own elaboration based on Rubber Development

Growing of more rubber trees is considered a feasible solution for the neutralization of such adverse impact and mitigation of climate risks whilst helping the reduction of atmospheric carbon. This can be viewed as assigning a good financial implication as more rubber means better prices as well as less interruption to manufacturing. The Sri Lankan Rubber industry has experienced a phenomenal growth immediately in the late 1998s (see **Figure 6**) and ceaselessly it making headway as one of the stronger manufacturing sub-sectors in the country in terms of its contribution to the GDP and value addition created into Sri Lankan raw materials. If domestic consumption gets increased at the current rate the existing supply may not be enough to cater to that demand (see **Figure 7**). It will encourage importing raw rubber to cater to the increasing demand for domestic consumption. The author encourages replanting programs to be initiated to increase rubber cultivation and endeavour good ecosystem management for land utilization. A major reason regarding an increase in production is the failure to sustain a systematic and consistent long term replanting program. This indicates a shift in the processed raw rubber and export of standard end-products to higher value-addition during an increase in the cost of production (see **Figure 8**). This impressive growth record and the evolution of the competitive advantage in the manufacturing of rubber products over the past years were supported by several factors. The significant growth of the cost of production of raw rubber and processing

record of a continuous effect over the past twelve years was supported by several factors such as high labour cost, increase of cost of raw material and tapping and collecting cost. Moreover, these reforms placed greater emphasis on export-driven industries due to unavoidable price increases associated with processing-related activities.

**Figure 8: Relevant cost component associated with manufacturing of one kilogram of made**



Source: Agriculture and Environment Statistics Division: Department of Census and Statistics, Sri Lanka.

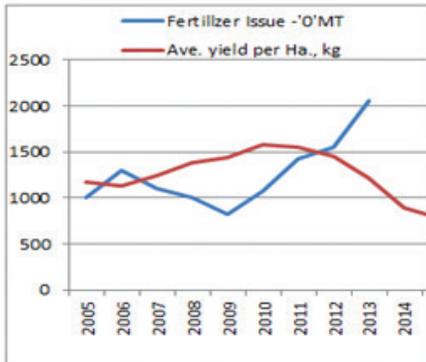
## Harness the Power of Sustainability

Society modernization and population growth have forced adoption of fertilizers to obtain a higher yield of latex as harvest. Fertilizer application directly affects climate transition by changing organic land into the conventional menu. Häuser (2015) argued that the application of chemical or artificial manure (to increase fertility) has a negative correlation with soil organic pools. Gunathilaka and Gunawardana (2015) found that a double effect in the emission of conventional rubber products when compared to the organic product while operating other process parameters in the same conditions. The other danger associated with rubber cultivation highlighted by Houghton et al. (2000) due to the effect of deforestation and burning of natural forest to convert land to rubber has reduced carbon stocks above- and below-ground by increasing the rate of carbon emissions. Malhi et al. (2008) estimated the change in biomass carbon stocks due to deforestation and Ziegler et al. (2012) highlighted the risk associated with the ecosystem. Change in weather patterns interrupt tapping and causes bark diseases and soil erosion reducing the latex yield and output of rubber products. Hence, Climate Change topic is already conceived as the need for aggressive follow up and pressure by all stakeholders.

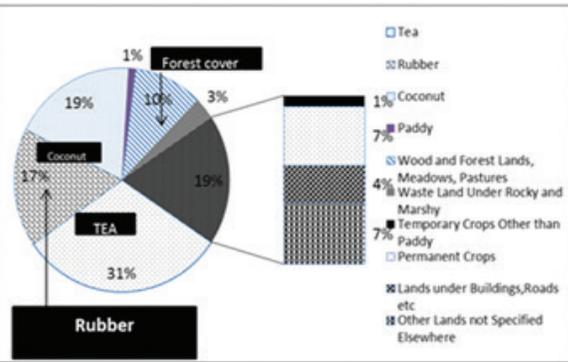
Land conservation projects such as forest cover, when transformed into rubber plantation may have mitigating effects of climate change as well as water availability during their life cycle.

There is good evidence to show that the average temperature of rubber-producing areas and also indicate a reduced stream flowing and drying up wells due to the adverse effect of regional water balance through rubber cultivation. The rapid loss in forest cover had been a major cause of concern in terms of climate transition. In the early season of natural rubber fertilizer input or application is very low and the surrounding soil appears to be enriched by the abundant leaf fall, biodiversity due to monoculture, excellent agronomic technique and growing a wide variety of crops during the immature period.

**Figure 9: Fertilizer Issue in a rubber plantation in '0'MT and Average yield**



**Figure 10: Total Extent under Tea, Rubber, Coconut and other cultivation in Sri Lanka**



Author's elaboration Census of Agriculture 2002; Estate Sector – Statistical table

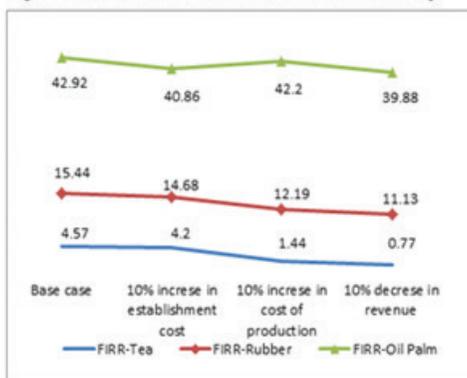
**Figure 9** indicates how the average yields of the crop had got reduced over the years, with the increase of using fertilizer chemicals in the rubber plantations. **Figure 10** highlights the extent of rubber cultivation (17%) in Sri Lanka, in comparison to other agriculture crops.

In the present-day society, people are moving from rubber land to different cash crops due to low price, applying fertilizers and pesticides due to the monoculture nature of rubber production, the danger of using agro - fertilizers effects wash-off which can enter into the aquatic system and threaten the quality of water for human use. In the sensibility of climate protection it is necessary to move rubber plantation into organic menus for global sustainability and environment resilience from the effects both the climate change and sociocultural issues such as protect ability of ranking water base from pollution but the threat associated is low yield due to absence of fertilizer application and high rubber prices will create instability in the market with no proper agro management.

Whenever the price is relatively low during certain periods, people look for introducing different cash crops. When considering different cash crops it is very essential to bear in mind this aspect of Financial Internal Rates of Return (FIRR) for crops. **Figure 11** describes FIRR in the three main cash crops. FIRR indicates the need for ascertaining a feasibility-study of growing cash crops. In planting activities, IFRR, weighted the average cost of capital (WACC) and the Net present value of the project (NPV) is very important. The WACC calculation is considered

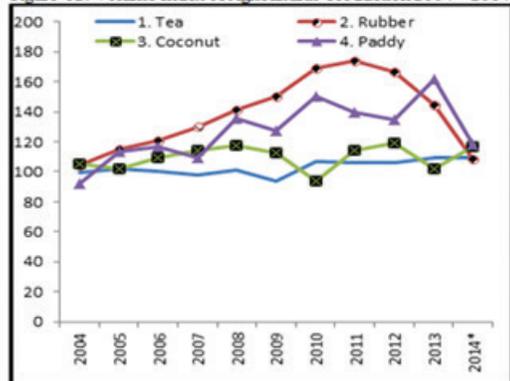
with funding from various sources and their terms and in such calculations of WACC, the annual average interest rate of 13 percent and the corporate tax rate of 28 percent are assumed to have been adjudged. The WACC after-tax, related to the three main crops is computed as 5.1-24 percent. **Figure 11** summarizes the FIRR of rubber per hectare as 15.44 percent and this is well above the WACC and it highlights that planting rubber is financially feasible than planting other cash crops such as tea except palm and palm oil is the best cash crops in comparison with planting the main three cash crops. Volume Index of Agricultural Production measures the aggregate production of a given set of goods and services over some time. Figure 12 shows that the volume index of rubber production in comparison with the other three main crops, which measure agricultural output changes. **Figure 12** emphasizes the fact that rubber is having the highest volume index of agricultural production in Sri Lanka.

Figure 11: Financial Internal Rate of return for three main cash crops



FIRR\* = Financial Internal Rate of Return  
Source: Asian Development Bank Independent Evaluation Department

Figure 12: Volume Index of Agricultural Production 2004 – 2014



Source: Agriculture and Environment Statistics Division: Department of Census and Statistics, Sri Lanka.

Heavy usages of energy have been depicted in the above sub-sections (see **Table 3**) is another contrasting factor in the industry to contribute more to energy consumption. Another concerning point is solid and liquid waste generated from manufacturing operations. Thus, it is worthwhile investigating the real reasons for the environmental transition from both environmental management and the environmental performance in the rubber industry. On the other hand one of the main targets of corrective action for climate change is to grow more rubber trees and in that context, the drive to grow more rubber trees which are now categorized under secondary “forest cover” would certainly have better financial implications on the whole for the industry. Globally rubber has been recognized as a main cash crop that contributes towards economic sustainability. Rubber cultivation has been identified to reduce environmental damage by reducing the carbon footprint in the atmosphere. Hence, financing rubber industry based projects has been identified as a viable investment area for banks.

**Table 3: Types of Energy use in Rubber Product Manufacturing**

Industry Division	Rubber Products (more than 25 persons engaged factory)	Rubber & Plastic (less than 25 persons engaged factory)
Fuel & Electricity Total (Rs.)	4,813,983,284	353,138,433
Electricity (Rs.)	2,614,359,207	260,424,778
Furnace (Rs.)	896,085,259	15,619,075
Diesel (Rs.)	314,977,700	24,944,532
Kerosene (Rs.)	52,972,080	737,867
Petrol (Rs.)	47,850,814	4,534,100
L.P.G. (Rs.)	20,530,227	37,888,271
Charcoal (Rs.)	208,096,259	14,600
Firewood (Rs.)	452,702,089	3,661,274
Water (Rs.)	190,168,153	3,536,752
Other fuel (Rs.)	16,241,497	1,777,183

Source: Annual industry survey 2011

-Malhi et al. (2008) discuss that change in biomass carbon stocks. According to Central bank (2014) reports that declined growth of rubber cultivation in the last few year periods as recorded in total extent in 134 000 hectares in 2014 and 2015 it was 135 000 hectares, shown slight inclination 2014 to 2015, 0.7% growth compared to 2013/2014. The adverse weather conditions caused by climate change also results in catastrophic landslides. Growing more rubber trees is considered a feasible solution that helps to reduce climate risks whilst helping to reduce atmospheric carbon. This can be viewed as leaving a good financial implication as more rubber means better prices and also less interruption to manufacturing. Effluent treatment is vital in operations apropos of management of used water, in modern treatment plant that incurs high capital investment by organizations. Consequently, long term feasibility in investment is the question raised for managers to find a realistic solution through water recycling or the use of treated water to avoid drinking water pollution. It has led to simultaneous benefits such as cost reduction of water bills and mitigation of GHGs emissions by way of effluent reduction. Edirisinghe (2013) stated that 40-50 liters of effluent are discharged on the average of one kilogram of rubber production. Further due to the total production of 114, 700 metric tonnes in 2006 it recorded that 4.5 to 5.7 billion liters of effluent have been produced and discharged to the environment (see **Figure 13**).

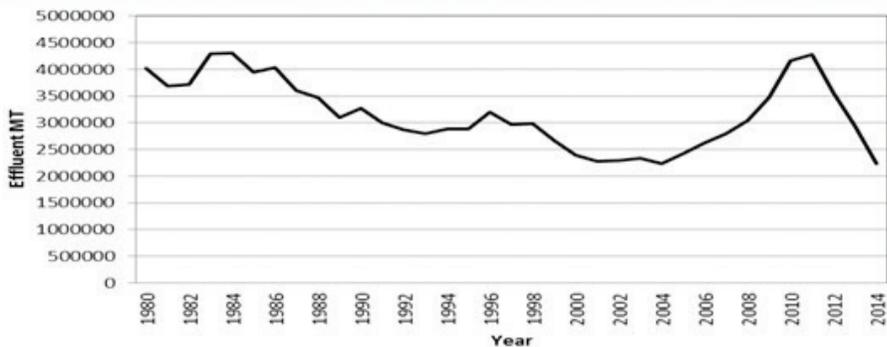


Figure 13: Effluents discharged due to raw rubber processing  
 Source: Author's elaboration

There are three main grades of natural rubber produced such as ribbed smoked sheets (RSS), crepe rubber and centrifuged latex, effluent generated by such production processes contains 30-40 percent of rubber and 60-70 percent serum substances (Edirisinghe, 2013). After 200 years from industrial revolution bad effects of climate change is already being experienced and one does not have to wait for another 200 years for the revolution as it is all happening so fast (see **Figure 14**). World consists not only of humans. There are millions of living species our responsibility is to protect them all now and the future generations, without waiting for the global climate revolution to happen. With the ever increasing population the quantities of their needs and requirements incrementally will be on the rise and rubber industry will play a big role in future not as a source of food but as facilitator for transport and supplier of health related and house hold items. In the future the whole world will depend on the speed of moving towards economic development.

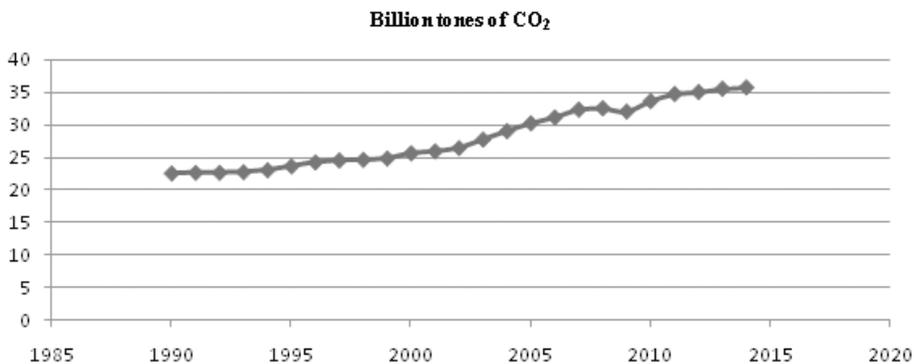


Figure 14: Global Trends in CO<sub>2</sub> 1990–2014 (unit: billion tonnes of CO<sub>2</sub>)  
 Source: 2015 Annual Publications by PBL Netherlands Environmental Assessment Agency and the European Commission's Joint Research Centre (JRC)

Understanding of global warming and corporate sector –attitude towards offsetting through Sustainable economic development is essential for a business to predict the future of the Organization. Today the pressure to -reduce energy consumption will come from the twin drivers of reducing fossil fuel burn that helps to reduce carbon emission and also to be cost competitiveness.

## Conclusion

Kaplan and Norton have presented the BSC concept in a series of articles published in the Harvard Business Review. They have argued that traditional financial accounting measures like the ROI, ROE, ROA, payback period, etc offer a narrow and incomplete picture of business performance, and that a reliance on such data hinders the creation of future business value. As a result, they suggest that financial measures be supplemented with additional ones that reflect customer satisfaction, internal business processes, and the ability to learn and grow. Their BSC is designed to complement ‘financial measures of past performance with measures of the drivers of future performance’ (Kaplan and Norton, 1996). The name of their concept reflects intent to keep score of a set of items that maintain a balance ‘between short- and long-term objectives including opportunity loss due to disruptive change, between financial and non-financial measures, between lagging and leading indicators, and between internal and external performance perspectives’ (Kaplan and Norton, 1996). Bankers’ attention to such a broad set of performance measures should not only help to ensure good short-term financial results, but also to guide a business as it seeks to achieve its strategic goals through challengers of disruptive change. By combining financial measures with non-financial measures in a single report (looking into 360° angle), BSC aims to provide managers with richer and more relevant information about activities they are managing than is provided by financial measures alone. The greater demand for companies with sustainable economic development justifies the need for more sustainable and green concern approaches to create a disruptive business model for a monetary reward. Thus, Banks that apply the recommended approach derived from the results of this discussion will be able to assist manufacturing organizations to have a better future through economic sustainability. Thus, challengers for disruptive change evidence that if the banker’s commitment, substantive effort, and action creating a sustainable future that follows good moral for industries, it may provide hope for the better sustainable future, together for tomorrow.

This article highlighted the challenges of disruptive change towards the business sectors, impacting on economic sustainability, social and environmental issues. The rubber industry, being a vital cash crop producing sector, has been discussed as an example in the paper. The discussion will be helpful for banks to get a better understanding of the industry and formulate strategies to contribute towards sustainable economic development in a disruptively changing business environment.

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