

**VALUE CREATION MECHANISM AND CLIMATE ISSUES:
AN EFFICIENT APPROACH FOR CONQUERING SYNCHRONIZED
CUSTOMER VALUE AND SUSTAINABLE DEVELOPMENT**

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ABSTRACT

“Strive for Excellence, not Perfection” is a new ideology of business in the era of competitiveness with deadlines. Cut throat competition is increasing with new business challenges and both customer and environment are putting swift torque to business drivers. Undoubtedly, businesses are running for wealth & profit creation but customer value enhancement and satisfaction have significant part in the outcomes of business intermediary processes and these processes are putting adverse impacts on ecosystem. Natural resources are depleted by rapid industrialization and reflecting negative climate change. Divergently, customers are becoming intelligent, eco conscious and technology savvy and thus they are “value takers”. It comprises organization, people and environment which are the principle dimensions and these are analysed to fabricate excellent value chain to enhance customer value premises for nurturing pragmatic business functions.

The present paper envisages empirical investigation covering environmental changes and sustainable development which affects value creation mechanism in the modern aggressive and knowledge equipped society. The aim of this paper is to suggest the companies to take the help of green value chain and build programs for eco-efficient treatment of products. This will provide a new base for competitive advantage and present a new core competence to win hearts of customers.

Keywords

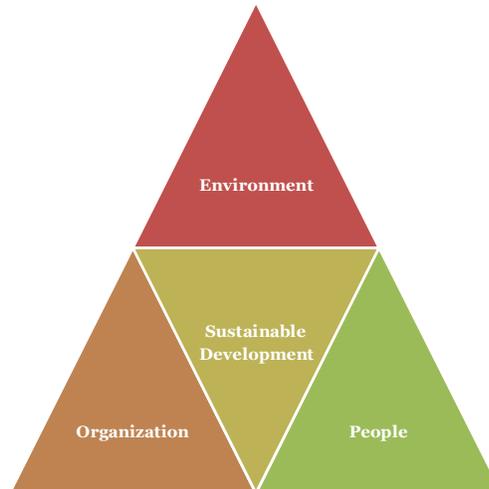
Green Value Chain, Sustainable Development, Eco-conscious Human Resources, Lean Development Mechanism

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Figure 1: Aspects of Sustainable Development

INTRODUCTION

Human Lives depend on a crucial relationship of people, environment and economic structures. The history of human development signifies the evidences of impact of environment on us. Environment is the universal and unique driver that affects



every wall of life. From day to night, winter to summers, breezes to storm, drought to flood and so forth. We are living in a developing and ever growing world with incomplete knowledge of development. Unfortunately, we have decided to cut same branch on which we are standing. It is the branch of materials and developing materialistic society. Although this is not a subject matter here but somewhere it is putting groove of grey matter. We live on this earth, we use all its natural resources and simultaneously spending these resources into vanishes just in the name and sake of development. We should remember if we lose earth and its elements that will be last day for all human beings. We are running to achieve higher growth rates but how and what will be the scenario after consuming all the natural resources, we can visualise. The scenario developed by LPG is sounding to put forward global economies particularly developing economies like India and China toward respectable positions on the world map.

Today's economic environment is significantly complex especially to undertake smooth business operations. Global trade is regularly increasing irrespective of global financial turmoil. Population is increasing and thrusting consumption and its patterns. Primarily this increase is taken as opportunity to enhance business operations by the business houses. Since all business operations are performed by the human and physical resources, and these are performing crucial role in two ways. Firstly, these are essential for production function and secondly, uninterrupted utilization imposing inherent natural pressure and risk on us. Uninterrupted utilization causing considerable issues regarding climate change. For instance, production and operation function involves different types of heat and chemical treatments and these processes require higher level of energy came from different sources. To produce energy and products we are just deploying natural resources without considering negative

impacts. Although, only high industrialization is not a single responsible factor for climate change but it is the most considerable aspect of development movement in this century. It originated several supportive processes and activities which are having the risk of natural calamities.

The climate change will create a need for rapid deployment of new, low-carbon, clean technologies at a scale of production which the world has rarely, if ever, seen before. But, according to a new report released by the World Business Council for Sustainable Development (WBCSD), global low-carbon technologies are not moving at the rate of demand. The report offers policy suggestions to governments on how to leverage R&D to drive private sector investments.¹ The ecological aspects are absolutely ignored in the race of development which has only one dimension i.e. economic development.

Despite the spectacular gains in productivity over the last thirty years, along with the continued pursuit for improved productivity using reengineering principles, the environment has suffered tremendous environmental damage. Toothless regulation, both domestically and internationally, has been unsuccessful at stopping the harm to our environment.²

This article considers three major dimensions viz. Environment, Organizations and People. These three dimensions are not isolated from each other and forming an interrelated relationship for achieving sustainable development. Organizations are representing a social arrangement to carry out specific developmental goals and, of course, people are inseparable from both dimensions.

For the business community, sustainability is more than mere window-dressing. By adopting sustainable practices, companies can gain competitive edge, increase their market share, and boost shareholder value.³

Governments are also taking initiatives for clean development system seriously because earlier efforts to retain favourable climatic conditions were not sufficient. In this respect different treaties and agreements are taking place to prevent environment and climate depletion.

This article gives emphasis on correlation of environment, organization and people through business and marketing thread. Primarily, it is focussed on the present climate consideration, as a consequential of industrial participation. As every business have specific value chain to create value, they can enrich total customer value by redefining value chain with a focus on sustainable green development.

OBJECTIVES OF THE STUDY

This article focuses on environment; people, business organization and sustainable development hence on green value chain for greener operations and its role for enhance customer value. The objectives of the study are as follows:

- To assess the impact of Business Operation on current climatic conditions.
- To correlate environment and industrialization to evaluate the role of industrialization in depleting climatic outlook.
- To analyse interrelationship between environment, business operation and customers' value
- To enhance collaborative role of business operation through value chain analysis in order to perform environment friendly processes
- To discuss customer value in the light of green value chain
- To analyse customer value in present marketing challenges

EFFECTS OF INDUSTRIALIZATION

According to United States National Research Council, Advancing the Science of Climate Change, "Science has made enormous inroads in understanding climate change and its causes, and is beginning to help develop a strong understanding of current and potential impacts that will affect people today and in coming decades. This understanding is crucial because it allows decision makers to place climate change in the context of other large challenges facing the nation and the world. There are still some uncertainties, and there always will be in understanding a complex system like Earth's climate. Nevertheless, there is a strong, credible body of evidence, based on multiple lines of research, documenting that climate is changing and that these changes are in large part caused by human activities. While much remains to be learned, the core phenomenon, scientific questions, and hypotheses have been examined thoroughly and have stood firm in the face of serious scientific debate and careful evaluation of alternative explanations." Heavy industrial practices are introducing contaminated things in the environment which is resulting in the stern climate transformation and contamination. Pollution became a popular issue after World War II, due to radioactive fallout from atomic warfare and testing. Then a non-nuclear event, The Great Smog of 1952 in London, killed at least 4000 people.⁴

The Industrial Revolution grades a major decisive moment in human history; almost every aspect of daily life was influenced in some way. Most notably, average income and population began to exhibit unprecedented sustained growth. In the two centuries following

1800, the world's average per capita income increased over 10-fold, while the world's population increased over 6-fold.⁵ In the words of Nobel Prize winner Robert E. Lucas, Jr., "For the first time in history, the living standards of the masses of ordinary people have begun to undergo sustained growth. ... Nothing remotely like this economic behavior has happened before."⁶

Industrial Revolution, World War I and II induced several changes like political instability, changes in geographic boundaries, social patterns etc. including heavy industrialization. Heavy industrialization was supported by scientific innovations and put a thrust upon structure of employment. Instead of social changes, industrial revolution provided a strong base to heavy industrialization. Population is ever increasing and to meet proportional demand.

Since the advent of industrial and technological revolutions, economic indicators have been considered as the principal criteria for measuring progress. The industrial and technological progress however, has been accompanied by a growing negative impact on the environment in terms of its pollution and degradation. Activities such as manufacturing, processing, transportation and consumption not only deplete the stock of natural resources but also add stress to the environmental system by accumulating the stock of wastes. The productivity of the industries, however, depends on the supply and quality of natural and environmental resources. While water, soil, air, forest and fishery resources are productive assets, the pollution of water, air, atmosphere and noise are the by-products of economic development, particularly industrialisation and urbanisation.⁷

In the past seventy years, we have exploited the Earth at the most crucial level. We are using physical resources of earth for mass production needs and in return, leaving all waste on earth. From the business philosophy, it is not a fair deal. It affects our earth and its climate negatively. In the context of climate variation, anthropogenic factors are human activities which affect the climate. The scientific consensus on climate change is, "that climate is changing and that these changes are in large part caused by human activities."⁸

Physical and natural resources like water, soil, air, forest etc. resources are productive assets, the pollution of water, air, atmosphere and noise are the by-products of growth and development, particularly industrialisation. "Global warming", "Green house effects", and "Acid Precipitation" are cases in point. Pollution is an "external cost". Untreated or improperly treated waste becomes pollutants and causing pollution and climate change. Climate change negatively affecting human health, flora and fauna. Climate change also

increasing social cost. The ecological and social costs of such unrestrained pollution and degradation have put a big question mark on the perceived notion of industrialisation as a way of economic development.⁹ Industrialisation is necessary for human civilization and newly defined development priorities but there should be balance between natural climate conditions and industrialised emissions which are causing pollution. As always, pollution induces inauspicious chemical reactions in the environment. These reactions are imposing adverse effects on natural cycles like Water Cycle, Carbon Cycle, and Nitrogen Cycle etc. Human health, on the other hand, is also a matter of vast consideration because pollution causes health losses and labour efficiency. Henceforth, matter of human capital degradation arises.

INDUSTRIAL PARTICIPATION AND SUSTAINABLE DEVELOPMENT:

Engaged in Bizarre Situation

We live in a “productivist” society, where growth and economic activity have long been the central focus of the activities we undertake as individuals and communities. World GDP has grown from around \$16 trillion in the mid 1970s to over \$40 trillion today. Companies are churning out more of everything and inventing new products all the time.¹⁰

It is known fact that better economic indicators are now the imperatives of development. If a country is giving high growth rate with high GDP, comparatively more per capita income, balanced trade with other countries, this means it is growing and putting a thumbnail on the globe.

If one country emitting huge carbon ash due to heavy industrialization, full of pollutants and due to natural air flow it is spread over another country what another country will do? Moreover, we have answers like Kyoto Protocol (11 December 1997 in Kyoto, Japan), developing and least developing countries are not supported by the developed countries. Major multinationals have played and to some extent continue to play a significant role in the politics of global warming, especially in the United States, through lobbying of government and funding of global warming sceptic. Business also plays a key role in the mitigation of global warming, through decisions to invest in researching and implementing new energy technologies and energy efficiency measures. Industrialization is the process of social and economic change that transforms a human group from an agrarian society into an industrial one. It is a part of a wider modernisation process, where social change and economic

development are closely related with technological innovation, particularly with the development of large-scale energy and metallurgy production. It is the extensive organisation of an economy for the purpose of manufacturing.¹¹

The international trade is increasing with the increasing purchasing power of the consumers. If we think about the decreasing the numbers of industries, it may lead to the serious problems like unemployment, poverty and inequality around the globe and of course, this is not a feasible solution. Heavy investment in large production houses fulfilling the need of population and the population is responsible for the specific patterns of consumption level; somewhere the heavy industrialization is responsible for environmental depletion. Climate change does not occur in fortnight, it is result of continuous aggregation of pollutants and their impact on local ecology (biotic and abiotic factors). Although, there are very few and low level operations of firms but at the level of industry the operations take place of huge processes and environmental consideration.

Societies have always depended on the climate but are only now coming to grips with the fact that the climate depends on their actions. The steep increase in greenhouse gases since the Industrial Revolution has transformed the relationship between people and the environment. In other words, not only does climate affect development but development affects the climate.

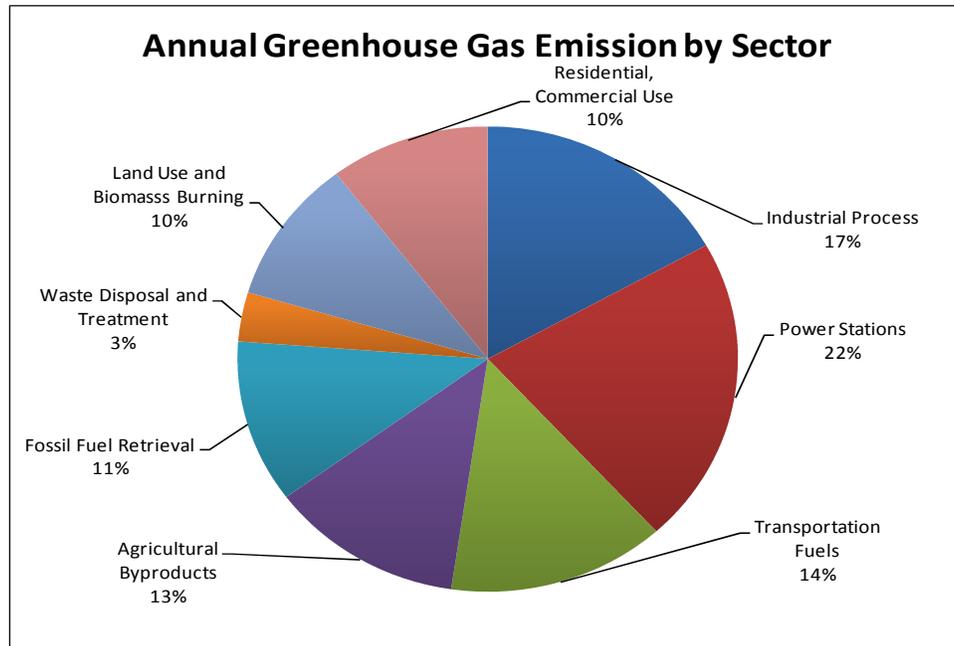
Climate change will reverse development progress and compromise the well-being of current and future generations. It is certain that the earth will get warmer on average, at unprecedented speed. Impacts will be felt everywhere, but much of the damage will be in developing countries. Millions of people from Bangladesh to Florida will suffer as the sea level rises, inundating settlements and contaminating freshwater. Greater rainfall variability and more severe droughts in semiarid Africa will hinder efforts to enhance food security and combat mal-nourishment. The hastening disappearance of the Himalayan and Andean glaciers—which regulate river flow, generate hydropower, and supply clean water for over a billion of people on farms and in cities—will threaten rural livelihoods and major food markets. That is why decisive, immediate action is needed. Even though the debate about the costs and benefits of climate change mitigation continues, the case is very strong for immediate action to avoid unmanageable increases in temperature.¹²

Industrialisation has spawned its own health problems. Modern stressors include noise, air, water pollution, poor nutrition, dangerous machinery, impersonal work, isolation, poverty, homelessness, and substance abuse. Health problems in industrial nations are as much caused

by economic, social, political, and cultural factors as by pathogens. Industrialisation has become a major medical issue worldwide. Countries, such as the United States and China are now looking at ways to manage emissions being let off. China, being one of the fastest growing industrialized countries, releases emissions at a much more rapid rate than any other country. They are burning more fossil fuels and discharge more Carbon emissions. With China's substantial industrialized growth, it is likely that we will see more cars on the road, letting of greater emissions. As more countries begin to develop, the pollution only gets larger, making it harder to improve the air. On one hand, as the economy rises, so does the amount of fossil fuels being burned daily. On the other hand, there is still the question of whether or not economic development could even happen while protecting the atmosphere. The main problem is that developed countries are competing instead of working together. Even if the countries do work together, there is still not enough participation among other countries to do any drastic change. Countries now need to agree on a low emission standard to cease the competition.¹³

Aside from purely human-produced synthetic halocarbons, most greenhouse gases have both natural and human-caused sources. During the pre-industrial Holocene, concentrations of existing gases were roughly constant. In the industrial era, human activities have added greenhouse gases to the atmosphere, mainly through the burning of fossil fuels and clearing of forests.¹⁴ Since about 1750 human activity has increased the concentration of carbon dioxide and other greenhouse gases. Measured atmospheric concentrations of carbon dioxide are currently 100 ppm higher than pre-industrial levels. Natural sources of carbon dioxide are more than 20 times greater than sources due to human activity,¹⁵ but over periods longer than a few years natural sources are closely balanced by natural sinks, mainly photosynthesis of carbon compounds by plants and marine plankton. As a result of this balance, the atmospheric mole fraction of carbon dioxide remained between 260 and 280 parts per million for the 10,000 years between the end of the last glacial maximum and the start of the industrial era.¹⁶

Figure 2: Annual GHG Emissions by Sector



Source: Climate Change 2007: Synthesis report, Summary for Policy Makers¹⁹

At the macroeconomic view point, the consumption and production are the two different sides of same coin. Growing rate of population growth resulting into increasing consumption and this increasing consumption is framing opportunity head of organization in their Economic Threat Opportunity Profile with higher production chance.

Despite the present downturn, the issue of environmental responsibility hasn't gone away. Again and again, we hear of a continued boardroom focus on the 'carbon agenda'. Yet at the exact same time as economic conditions are forcing organizations to justify the expenditure and effort on the most tangible and immediate of returns, half of our respondents say they are unable to quantify the savings achieved through carbon initiatives.¹⁷

The 2007 Fourth Assessment Report compiled by the IPCC (AR4) noted that "changes in atmospheric concentrations of greenhouse gases and aerosols, land cover and solar radiation alter the energy balance of the climate system", and concluded that "increases in anthropogenic greenhouse gas concentrations is very likely to have caused most of the increases in global average temperatures since the mid-20th century". In AR4, "most of" is defined as more than 50%.¹⁸

Gas	Preindustrial level	Current level	Increase since 1750
<i>Carbon dioxide</i>	280 ppm	388 ppm	108 ppm
<i>Methane</i>	700 ppb	1745 ppb	1045 ppb
<i>Nitrous oxide</i>	270 ppb	314 ppb	44 ppb
<i>CFC-12</i>	NIL	533 ppt	533 ppt
	ppm=parts per million	ppb=parts per billion	ppt=parts per trillion
Source: Climate Change 2007: Synthesis report, Summary for Policy Makers ¹⁹			

Expanding economies, growing populations and unsustainable patterns of energy supply and use could lead to an increase in global GHG emissions, incompatible with stabilization objectives. The Intergovernmental Panel on Climate Change has concluded that reductions of at least 50% in global CO₂ emissions compared to 2000 levels will be necessary by 2050 in order to prevent dangerous climate change. Concerns over energy security and the volatility of oil prices contribute to a demand for less fossil fuel in the energy mix. Achieving this goal will require a wider diffusion of existing low-carbon technologies as well as RD&D investment to improve existing low-carbon technologies and processes, and to produce new ones.¹⁹

In totality, industries are playing significant role in the issues related to the environment and climate change. Perfect evidences are available at the counterparts of industrialization. It is also clear from above discussion that environment is not a sole property of any country or organization; it is an asset of whole living and non living things available on the earth. Henceforth, for sustainable development, collective actions are required from different types of entities including business and non business organizations. The overall scenario is changing gradually. There are various organization which are taking climate change very seriously and striving for sustainable development. Environmentalism in the 21st century is likely to be characterized by various efforts to implement the sustainable development agenda. International organizations, such as the United Nations and World Bank, will be integral to the development of effective global environmental policy.²⁰ 2010 Biodiversity Indicators Partnership, 2010 International Year of Biodiversity, Afrique verte, Agronomy for Sustainable Development, Appropedia, Dashboard of Sustainability, Earth Charter, Greenhouse Development Rights, Institute for Environment and Sustainability (IES), Institute

for Trade, Standards and Sustainable Development (ITSSD), International Institute for Environment and Development, International Institute for Sustainable Development (IISD), International Organization for Sustainable Development, National Center for Appropriate Technology, National Strategy for a Sustainable America, Solar Net International, Stakeholder Forum for a Sustainable Future, Sustainable Tourism CRC, The Earth Institute, TERI – The Energy and Resources Institute, The Sustainable Urban Development Network (SUD-Net), The Venus Project, United Nations Decade of Education for Sustainable Development, World Cities Summit are the considerable institutions which are working for sustainable development.

There is an increased awareness of the importance of global warming (the current climate change) as a factor in a range of issues. Many environmental, economic and social issues find common ground in mitigation of global warming.²¹

Now the corporate sustainability, corporate sustainability is a business approach that creates long-term consumer and employee value by not only creating a "green" strategy aimed towards the natural environment, but taking into consideration every dimension of how a business operates in the social, cultural, and economic environment. Also formulating strategies to build a company that fosters longevity through transparency and proper employee development.

Corporate sustainability is an evolution on more traditional phrases describing ethical corporate practice. Phrases such as corporate social responsibility (CSR) or corporate citizenship continue to be used but are increasingly superseded by the broader term, corporate sustainability. Unlike the other phrases that focus on "added-on" policies, corporate sustainability describes business practices built around social and environmental considerations.²²

In the words of Mr. Connie Hedegaard, Danish Minister for the Environment, Measuring Sustainable Production, and Our overriding challenge is to dramatically decouple economic growth from the use of natural resources and degradation of the environment.

INTEGRATING MARKETING, SURROUNDINGS AND CUSTOMERS:

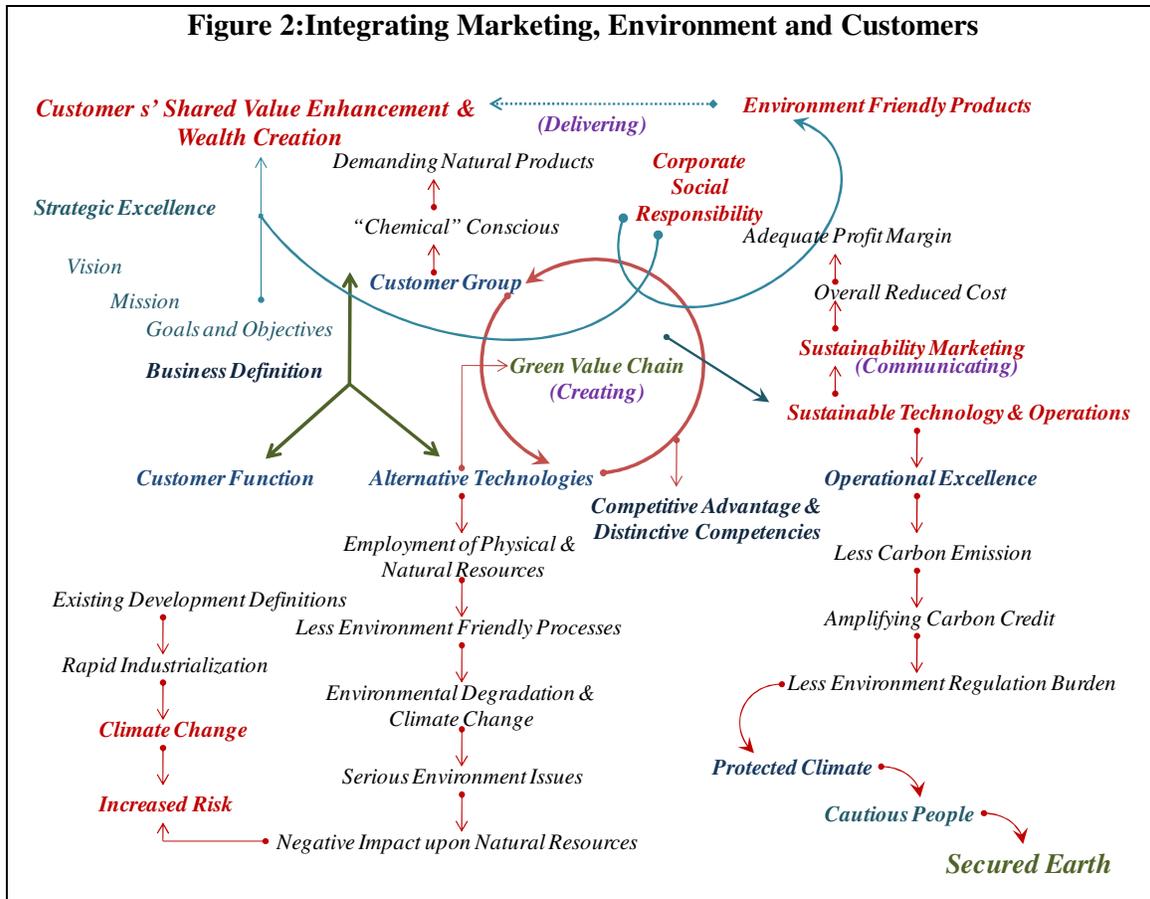
A Prolific Passage for Diametric Development

Incorporating marketing management with sustainable development, customer delighting & environmental brilliance is becoming a crucial element for achieving operational and strategic excellence. It results into creating shared value with the help of uninterrupted

enhancement cycle & process innovation to save money and optimum utilization of natural resources in the processes via diminished resources & utility cost. In this way, firm can support environment & enhance customer value. New environmental issues dictate the redefining of economic interest in the wake of the corporate social responsibility.

By leveraging superior visibility up and down the entire value chain, firms can achieve increased efficiency and reduce environmental impacts by aligning around common goals and making better-informed executive decisions. To sustain profitable growth over time, companies need to build a more robust and reliable growth platform with a disciplined focus on creating and exchanging value with their customers.

Increasingly, companies are striving to create value by using their assets and capabilities to drive innovation and profitable growth while striving for a positive economic, environmental and social impact. To become, in other words, sustainable enterprises that can use growing public support for more environmentally-friendly production to build good will and brand equity. The sheer breadth of the mission can appear daunting. Until, that is, you consider that Lean improvement tools and methodologies that have been used by many organizations for nearly 30 years to help cut waste and costs—and boost profits—also can provide a marked advantage in achieving sustainability objectives.²³



GREEN VALUE CHAIN:

A Little but Effective Approach to Uphold Environment

The term “Value Chain” was given by Michael E. Porter of Harvard in his book “Competitive Advantage: Creating and Sustaining Superior Performance” (1985) as a tool for identifying ways to create customer value. The value chain analysis describes the activities the organization performs and links them to the organizations competitive position.

Every firm is systems of different activities that are performed to acquire raw materials, design, product, market, deliver, and support its product. The value chain identifies nine strategically relevant activities that create value and cost in a business. The primary activities represent the sequence of bringing materials into the business (Inbound Logistics), converting them into final products (Operations), shipping out final products (Outbound Logistics), marketing them(Marketing and Sales), and servicing them(Service). The support activities- Procurement, Technology Development, Human Resource Management, and Firm

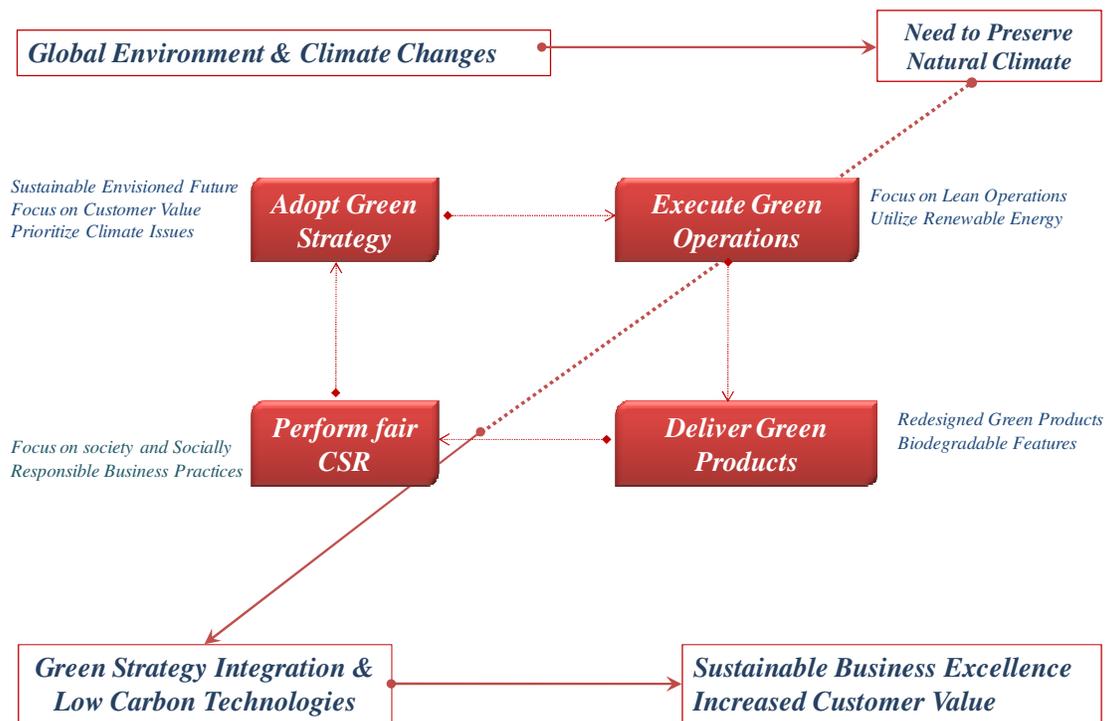
Infrastructure- are handled in certain specialized departments. The term “Margin” implies that organizations realize a profit margin that depends on their ability to manage the linkages between all activities in the value chain. In other words, the organization is able to deliver a product / service for which the customer is willing to pay more than the sum of the costs of all activities in the value chain.

It is clear from the above discussion that every organization has its own value chain to create value for customers. It can be observed that value chain includes all activities from procurement of raw materials to sales and after sales services. Therefore, the production operation function is included in between them. One of the three dimensions, the Alternative Technologies deals with it and envisages collaborative association with customer function and group. The role of alternative technologies is significant in value chain. It defines the mode of transformation of input into output and has greater influence on the environment. Microscopically, in primary activities the part framed by the Operation is significantly considerable for adopting green practices.

Differentiated green value chain operations envisages with the ways by which an organization can differentiate itself and gain market share over another by utilizing greener operations and achieve competencies for delivering high customer value. This concept is based on micro level analysis of each component or process of the product (or service) creation –Value Chain- to ascertain which activities are adding values in low carbon mode to the customer.

A differentiation strategy based on environmental protection can add value to the product. Since many companies will adopt a “wait and see” attitude toward environmental products, there is a window of opportunity for firms whose management is prepared to exploit it. Over time, corporate greening will become so widespread, that any “green advantage” will become a competitive necessity. However, in this interim, Green Reengineering leaders will have netted more profits, production efficiencies, and customer goodwill.²⁴

Figure 3: Strategic Framework for Green Operations



GREEN VALUE CHAIN, CUSTOMER VALUE AND ENVIRONMENT:

An Exceptional Association

As natural resources become scarcer and measures to reduce pollution and global warming increase, the continued trend to go “green” is accelerating. Growing concern and increasing awareness about environment aspects leads the companies to adopt leaner and greener practice in consistent to the economic and environmental benefits. Working closely across the value chain improves the effectiveness of their operations and reduce waste through alternative material usage, improved material utilization, transportation optimization to reduce carbon emissions etc. and it facilitates the journey to becoming greener.

In this aggressive arena, to match customer expectation is very difficult. Increasing customer expectations are imposing new concerns for the firm. As discussed earlier, an organization has abided by bidirectional forces, firstly, pressure from economic forces and secondly, pressure and responsibility to protect the environment. To survive in this competitive environment, firm must have a fresh look on their strategies with the touch of environmental protection.

Cornerstone of a well conceived marketing orientation is 'customer' & customer have the crucial voice and entire system revolves around their attitudes. Clear understanding of end consumer always pays to companies. Companies are striving to create value by using their resources and capabilities to drive innovation and profitable growth while striving for a positive economic, environmental and social impact. To become, sustainable enterprises can use growing public support for more environmentally-friendly production to build goodwill and brand equity. To achieve high performance, companies must understand the customer value enrichment drivers and the opportunities across the value chain and try to develop new competencies for sustainable development. By achieving sustainable growth, organization can set a new customer value equation.

With the help of eco-friendly products & Services, firm can develop and retain profitable customer relationship by creating differentiated customer centric experience. This attitude of firm will results into increased brand reputation, cost reduction by having less carbon footprint and it can create and influence customer loyalty. Since the awareness of environment is increasing in customers, on the other part it is a corporate responsibility to convey the core ideology of sustainable development to their customers. It thrust more green awareness and put a force of feel discerning by consuming green products. Customer experience design management will results into high customer value, hence high customer loyalty.

With the help of green value chain, companies can build programmes for eco efficient treatment of products. Businesses to win customer, must make the products to give customer surplus. Meanwhile, end consumers are also becoming more environmentally aware, creating an opportunity for marketing departments to appeal to this segment. A recent Accenture survey showed that 80 percent of respondents believed their lives would be impacted by climate change. Furthermore, these consumers are starting to demand sustainable solutions at the same price as products of comparable value.²⁵

Increasing step for happy environment results in to enormous positive impact on customer attitude while embodying comprehensive national strength. In a time of changing customer value and customer expectation, marketing function has a more strategic role to play in adding new dimension in their present concept. Adding a dimension of environmental can have a powerful impact on the customer attitude. It provides a new base for competitive advantage and presents a new core competence to win hearts of customer. It will present a

“win-win” situation in a way of happy & delighted customer, safe environment and growing business.

Figure 4: Assimilation of Green Value Chain and Customer Value

I. PrimaryActivities	“Green” Scope	Execution Mode	Customer Value Enrichment
1. InboundLogistics	Quantum of Fossil Fuel in Transit & Storage Function	Low inventory. Less frequency of shipment Optimumpurchase order size	Primary & Support activities have collaborative impact on Total Customer Value Customer ValuePropositionsare added through out the Value chain and finally communicated and delivered to the customer Customer are the Value maxi misers and GreenerOperations add Economic, Functional and Psychological values as perceived by customer
2. Operations	Lower Intensive Heating & Chemical Treatment	•Waste Elimination •Use of Solar & Nuclear Energy •Green & Lean Operations •Process Innovation •Low Carbon Transformation	ValueDrivers: Differentiatedcustomer experience
3. OutboundLogistics	Storage & Use of Fossil Fuel in Transit	OptimisePhysical Network SRM	UnparalleledCustomer Service Experience
4. Marketing& Sales	Use of Energy & Physical Evidences	Local Warehousing SimplifiedTertiary Packaging	Growth
5. Services	Service differentiation	Green Utility RenewableEnergy Extension	Costreduction
II. SupportActivities			EnhancedOrganizationalReputation
1. FirmInfrastructure	Ventilated, use of natural light & green surroundings	Energy saving Technology Follow Environmental Management System	Brand Image
2. HumanResource Management	Eco-consciousHuman Resource	Develop & buildeco responsible Human resources	CorporateSocial Responsibility
3. Technology Development	Clean DevelopmentMechanism	Process Innovation Transaction & management information system	ImprovedEnvironmental Image
4. Procurement	Sustainable Sourcing	Develop generic efficient natural practices	Quality of Life

Customers are value-maximizers, within the bounds of search costs and limited knowledge, mobility and income. They form an expectation of value and act on it. Whether or not the offer lives up to the value expectations affects both satisfaction and repurchase probability. Total Customer Value is the perceived monetary value of the bundle of economic, functional, and psychological benefits customers expect to incur in evaluating, obtaining, using and disposing of the given marketing offering.²⁶

Changing consumption pattern with a touch of eco-consciousness leads to consumer to spend money for environment friendly products. Green ordinal utility can be delivered through green products produced by sustainable value chain.

The recurrent theme of Green value chain is to reduce, reuse, and recycle. By undertaking effective initiatives to reduce, reuse, and recycle, companies can cut various costs while bolstering their brand's image of corporate responsibility. Businesses can integrate supply chain activities (from sourcing, through distribution and store operations, to end consumers) to make up most of their carbon footprint.

Corporate Participation in Sustainable Development:

A Case of Hindustan Unilever Limited, India²⁷

Hindustan Unilever Limited (HUL) is India's largest Fast Moving Consumer Goods Company with a heritage of over 75 years in India and touches the lives of two out of three Indians.

With over 35 brands spanning 20 distinct categories such as soaps, detergents, shampoos, skin care, toothpastes, deodorants, cosmetics, tea, coffee, packaged foods, ice cream, and water purifiers, the Company is a part of the everyday life of millions of consumers across India. The Company has over 15,000 employees and has an annual turnover of Rs.17, 523 crores (financial year 2009 - 2010). HUL is a subsidiary of Unilever, one of the world's leading suppliers of fast moving consumer goods with strong local roots in more than 100 countries across the globe with annual sales of about €44.3 billion in 2010. Unilever has about 52% shareholding in HUL.

Sustainability Strategy of HUL

Unilever's vision is to double the size of its business while reducing the overall impact on environment. This new vision recognises that the world is changing, populations are growing and the rise in incomes is fuelling a growth in the demand for consumer products. Products rely on an increasingly constrained set of natural resources, whether it is fuel, water, or other raw materials.

In Hindustan Unilever Limited (HUL), the principle of Corporate Responsibility (CR) is an integral part of their commitment to all stakeholders – consumers, customers, employees, the environment and the society that HUL operate in.

The key to this approach is developing a CR framework which integrates the social, economic, and environmental agenda with business priorities – growing markets, maintaining the competitive edge, enjoying goodwill in the communities HUL operate in, and building

trust and an exceptional reputation. Hence, in the future, the three cornerstones for CR integration with business at HUL will be:

1. Growing markets responsibly: They will address issues related to hygiene and nutrition through product innovations and awareness. Gathering information about the concerns expressed by consumers, communities, and stakeholders can help us identify opportunities for innovation at the category, brand, and marketing plan level. HUL have a very strong and trusted position in India and HUL can leverage to achieve competitive advantage.

2. Ensuring sustainable practices in operations: To secure a thriving future, organization need to establish sustainable sources for raw materials. Being a company that is heavily dependent on water, agriculture, fuels and petrochemicals, HUL must plan now for a future in which water could be scarce, agriculture could be under pressure, and fuels will be expensive.

3. Building a good reputation through responsible leadership: Corporate Responsibility is one of the key components of reputation and trust. A good reputation can be a major competitive advantage and can build employer brand and consumer loyalty.

Ecosystem: Sustainable living

Our planet faces enormous environmental problems. HULs' aim is to make own business activities more sustainable and encourage suppliers, consumers, and others. It is constant endeavour to manage and reduce wider footprint with sustainable agricultural practices, eco-efficient operations, as HUL as with product and packaging innovations.

Operations of HUL

A large amount of the raw materials HUL need is derived from agriculture, so Sustainable Agriculture Programme plays a key role in managing upstream impact. In operations HUL aim to improve the eco-efficiency of manufacturing operations, minimize resources used and waste created. To manage downstream impact, research and product development teams work towards reducing the environmental impact of products and packaging through reformulation and innovations.

Sustainable Sourcing

Since HUL depend on agriculture and forestry for a large part of raw materials, sustainable sourcing has become a strategic issue for business and brands.

Unilever developed the generic Good Agricultural Practice Guidelines (now known as the Unilever Sustainable Agriculture Code) for growers of key crops, which cover 11 indicators,

including water, energy, pesticide use, biodiversity, social capital and animal welfare. In 2002, HUL started using these guidelines for five crops.

HULs' long-term aim is to buy all key agricultural raw materials from sustainable sources, so that:

- Farmers and farm workers can obtain an income they can live on and improve their living conditions
- Soil fertility is maintained and improved
- Water availability and quality are protected and enhanced
- Nature and biodiversity are protected and enhanced

Eco-efficiency

HUL is striving to improve the eco-efficiency of manufacturing operations, minimising resources used, and residual waste created. HUL have continuous improvement targets for all environmental parameters and specific goals with respect to water and carbon.

All manufacturing sites have implemented Unilever's Environmental Care Framework Standards, which require all Unilever operations to establish a formal environmental management system. The framework is modeled on ISO-14001 and OHSAS 18001 international standards and is ultimately applicable to all manufacturing sites. Some units are also ISO-14001 and OHSAS-18001 certified.

The environmental data was collected from all 42 owned manufacturing units (including one in Nepal). HUL apply a set of mandatory standards of safety and environment to third party manufacturers and co-packers and encourage them to monitor their own performance. HULs' environmental performance is periodically reviewed by the Central Safety, Health and Environment Committee (CSHEC). It is supported by sub-committees which are responsible for making and recommending standards. Implementation and monitoring is done by safety, health and environment committees used, and residual waste created. HUL have at division and unit level (DSHEC and USHEC).

ECO-EFFICIENCY INITIATIVES

Low carbon technology: The ploughshare mixer technology eliminates the need for steam in soap making, cutting carbon emissions by 15,000 tonnes per year. HUL are the first Unilever business, in the world, to be awarded carbon credits under the Clean Development Mechanism (CDM)

1. Carbon neutral fuels and renewable energy: Manufacturing operations at Chiplun, Puducherry, and Hosur use briquette boilers that utilise bio-mass as fuel. The reduction per annum in CO₂ emissions in the Chiplun factory is 11,000 tonnes and in the Puducherry factory is 10,000 tonnes.

They also have project of switching over to biomass as fuel and replacing furnace oil has been registered as a CDM project. Mysore and Hosur manufacturing operations source green electricity from windmills.

2. Water sustainability in manufacturing operations: HUL is focussing on the strategy for water is based on the 4-R Principle – HUL reduce at source, reuse within process, recycle wherever possible, and renew groundwater with rainwater harvesting projects.

3. Compliance and Audit: All manufacturing units comply with local and national laws. Necessary environment clearances and all their conditions as applicable are being complied with. External audits for Unilever's Environmental Care Framework Standards are conducted once every three years for manufacturing operations

4. Climate-friendly Refrigeration: HUL ice-cream business uses deep freezers in retail and vending operations for storage of product at the point of sale. Since 2007, Kwality Wall's has moved into procuring technologically advanced Hydrocarbon (HC) refrigerant-based freezers for its retail operations, instead of the hydrofluorocarbons (HFC) refrigerant based freezers. HUL are also trying to develop freezers with HC technology for use in vending operations. The HFC avoidance methodology has been approved by the United Nations Framework Convention on Climate Change.

5. Safe drinking water without consuming energy: Without making use of electricity or heat energy, Pureit water purifier ensures that that water is as safe as boiled water. Pureit filtered water meets the stringent criteria of the Environmental Protection Agency (USA). Consumers, who use Pureit to get safe drinking water, do so without consuming electricity, thus conserving energy. The internal studies have indicated that in terms of CO₂ emission reduction.

6. Reducing water footprint: Unilever developed a formulation that produces less lather and hence requires less water when rinsing. Based on a study of current laundry habits and recommended detergent usage, it is estimated that Surf Excel quick wash has the potential to reduce water usage by consumers significantly. Considering large consumer base for this product, it makes a big difference, especially in the southern states of India, where laundry accounts for up to a quarter of the total water used.

7. Sustainable Packaging: Packaging protects products right from the transportation stage till its purchase by a consumer. HUL take a lifecycle approach to managing the environmental impact of packaging, therefore HUL try to ensure that the most suitable and sustainable packaging material is used. Sustainable packaging involves:

- Considering the whole product, not just the packaging
- Adopting leading-edge design techniques and choosing materials to minimise impact
- Working with others, through advocacy and partnerships, to strengthen the recycling and recovery infrastructure

This approach is dictated by five principles - remove, reduce, reuse, renew and recycle. The environmental impact of different materials varies significantly, so HUL consider the impact of the packaging at each stage of the product's lifecycle.

In a nutshell, we can conclude that HUL is continuously striving for customer value creation through adopting significant eco-efficient initiatives.

CONCLUSION

Heavy Industrialization, increasing population and cutting edge technology have adverse effect on the environment. Businesses are the development drivers and at the same time they are imposing serious environmental challenges. Value chain flexibility can be a valuable tool to both leverage reductions in carbon emissions and simultaneously exceed their customers' expectations. By integrating sustainable thinking within their selection of technology for their operations, organisations can therefore shift to lower carbon platforms and simultaneously reap business benefits.

Customer Value Propositions can be added across the Value chain and finally conveyed to the customer. Customers are the Value maximizers and Greener Operations add Economic, Functional and Psychological values to the customers with differentiated customer experience.

Organizations are missing out an opportunity to develop operations that are more sustainable as well as more cost effective. Organizations should have lean and flexible value chains, end to end visibility across those value chains, fair-but-flexible contracts with service providers, and an understanding of how best to harness carbon-based initiatives to the broader operational agenda.

Few lean and agile organizations are moving on the path of developing new competencies for sustainable development with an angle of customer value enrichment. It facilitates journey of “Greener Tomorrow” with threefold benefit for People, Environment and Organization.

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