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VALUE RECOGNITION FOR ADAPTABILITY OF CIRCULAR ECONOMY IN INDIA

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Abstract
Scientific discoveries and invention with economic feasibility had tremendously changed the life style of human beings, in parallel, created a huge pressure on nature. Continuous efforts had improved existing supply chain in terms of efficiency but increasing environment awareness attracts its concern for sustainability. From economic growth aspect, scope for survival of a supply chain is through demands which are now saturated in many cases. Consumerism is lifeline for economic activities but households is now full with most of the products and don't provide space for new one. To remove the old one, reverse supply chain is required to be develop which recognize the value of old one and compensate accordingly so that willingness of pushing the used product increases. The end of life product required to be taken as a resource in reverse supply chain and accordingly valued. Being valued it will not be categorized as waste and thus will serve both the objective of increasing demand and preventing environmental degradation. The paper attempts a methodology for understanding the valuation of the product from producer and consumer point of view which will make a link with reverse supply chain and continue the cycle.

Keywords: Value Recognition, Reverse supply chain, Sustainability, Circular Economy, Economic Growth.

1. Introduction

Indian culture and tradition have deep rooted association with all aspects of nature. Now unknowingly the society had became threat to them, causing loss in biodiversity and pollution on the sake of economic growth by generating waste which is not in accordance with nature. Before the beginning of industrial age, the waste generation was negligible compared to today's conditions. For energy we were dependent only on renewable biomass and materials used were biodegradable and other being valued till they get decomposed back to nature. The cause of today's waste generation is due to increasing demand of energy and materials. The consumption rate of these two is also assume to be the criteria for development, that ultimately create crisis in form of waste in all states of solid, liquid and gas. Liquid and gaseous waste is partial visible and can not be feel by touch but solid is visible and can be feel by touch. Solid waste generated by material consumption is identifiable and can be categorized in general by society.

India's GDP is estimated to have increased 6.6 per cent in 2017-18 and is expected to grow 7.3 per cent in 2018-19. India being an agriculture based economy is the largest producer of spices, pulses, milk, tea, cashew and jute; and the second largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton and oil seeds. India has the largest livestock population of around 512 million [1]. The output from the agriculture and livestock comes in the category of biodegradable but the other supply chain creates enormous amount of solid non-biodegradable waste. India has already become the world's third largest consumer of materials. With a fact of high population, increase income levels, lower technology cost and digitization, Indian consumers are looking to improve their homes and lifestyles. This is the key reason for increased quantum of end of life products being generated. Estimates of municipal Solid waste composition in India show a large organic fraction (40–60%), ash and fine earth/soil (30–40%), recyclables, such as paper, plastic, glass and metals (about 10%), by weight [2]. Confederation of Indian Industry report found that 1.46 million tons of electronics create a huge amount of e-waste in India per year which is hazardous due to the presence of toxic materials such as mercury, lead and brominated flame retardants.
The land pollution has a number of adverse effects on the physical, chemical and biological properties of the land that reduces its productivity. Further, the land becomes breeding ground for disease causing insects and vectors. Open burning and illegal dumping also allow the percolation of harmful substances in the food chain. Since independence in India, two revolutions had successful meet the objective of self sustaining agriculture and dairy output through Green and White revolution. The current challenges of waste management in country require another one, say Black revolution.

2. Environment Concern

The intent behind industrial growth is improving the quality of life. When and where the scope of improvement identified, economical activities begin. The productivity of human beings has increased manifold from being able to communicate using electronic devices to mechanization of daily chores like washing clothes. After enlightenment about environment degradation, quality of life is questionable, so as the existing economy culture. Based on scientific facts most conservative estimate of modern human existence on earth is since 50,000 years which is under survival threat in coming few centuries. Environment degradation & economy growth are directly proportional to each other and arguments stands for both side, but common concern are biodiversity loss, environmental depletion, high consumption & social tensions. Such concerns are also framed as economic opportunities.

Fuelled by the falling prices, households have multiple IT and consumer electronics equipment in order to make their lives more comfortable. Increase in the discarded televisions, computers, sound system, electric lamps, printing machines, refrigerator, cell phones and batteries included in the category of "hazardous household waste" are of serious danger to human health and the environment. Increment in quantity of e-waste is not only because of increased consumption but also obsolescence. Users discard old computers, mobiles and other equipment much faster than before. Electronic Waste Management in India identified computer equipment account for almost 70 % of e-waste, followed by telecommunication equipment (12 %), electrical equipment (8 %) and medical equipment (7%) with remaining from household e-waste [1]. The frequency of disposal for smart-phones is the highest. This is due to the fact that equipment hardware is rendered obsolete due to fast technological innovations including high speed networks, need for increased data-storage and software upgrades.

Many of these waste products can be refurbished, recycled or reused in an environmentally sound manner so that we make it less harmful to the ecosystem. Trying to solve this myriad of problems results only in a journey through every aspect of humanity from technology, our ecosystem, our society, all the way to our own perspectives and ultimately our mind. The core of our sustainability opportunity depends on the decisions we make, and each decision is guided by core values. It is critical that we as a society shift towards a more sustainable way of living if we value our survival, and in order to do so, tools have been developed to help facilitate this transition. Values can help address both rational and emotional fears, and a tool must also for it to be practical and useful [3].

Thinking in systems is growing, and scientific data on global warming, water shortages, loss of biodiversity create a new sense of urgency aided by more and faster information sharing through digitalization and the internet which enable connecting the local to the global environmental issues in unprecedented ways.

3. Circular Economy

Nature sustainability is because of its reversibility. In thermodynamics, reversibility means starting point is attain back in a process without making any permanent disturbance or change to the surroundings. Living and non living things complete cycle and do not mark a permanent change at their end of life. Nature does not produce any waste and every process is cyclic. Learning the sustainability from nature, human beings can follow the same reversibility for economic activities. Existing economic process have beginning and end as a line, how can this be make reversible or cyclic or circular? the answer is by joining its two ends. This is the base for Circular Economy (CE). Since 1970 dealing with waste had been concern, after 1990 strategies developed for connecting input and output for eco-efficiency and from 2010 onwards approaches shifted to maximizing value retention in the age of resource depletion under the umbrella of CE. The goal is not to minimize the cradle-to-grave flow of materials, but to generate cyclical, cradle-to-cradle ‘metabolisms’ that enable materials to maintain their status as resources [4].

In circular economy the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimized. The idea is that rather than discarding products before the value are fully utilized, we should use and re-use them. The transformation of products and their associated material

flows to be such that they form a supportive relationship with ecological systems and future economic growth. Circularity of a product is assessed on the basis of following parameters:

1. Utility during use phase: How long and intensely is the product used compared to an industry average product of similar type? This takes into account increased durability of products, but also repair/ maintenance and shared consumption business models.
2. Destination after use: How much material goes into landfill (or resource recovery), how much is collected for recycling, which components are collected for reuse?
3. Efficiency of recycling: How efficient are the recycling processes used to produce recycled input and to recycle material after use?
4. Input in the production process: How much input is coming from virgin and recycled materials and reused components?

The principle of a circular economy is to preserve and enhance natural capital, optimize resource yields by circulation at their highest utility in both technical and biological cycles & reduce environmental degradation. Accenture, in its report circular advantage has identified five circular business models.

1. Circular supplies particularly relevant for companies dealing with scarce commodities.
2. Resource recovery leverages technological innovations and capabilities to recover and reuse resource outputs that eliminates material leakage and maximizes economic value.
3. Product life extension helps companies extend the life cycle of their products and assets to ensure they remain economically useful. Extension of life results from product design, material selection, modularity, maintenance and repair.
4. Sharing of products and assets that have a low ownership or use rate due to high price and uniqueness. Companies that leverage this model can maximize the use of the products they sell, enhance productivity and value creation. .
5. In product as a service model, customers use products through a lease or pay-for-use arrangement at place of conventional buy-to-own approach. This model is attractive for companies that have high operational costs and ability to manage maintenance of that service and recapture residual value at the end of life.

Traditionally, India has been a frugal society and has practiced circularity as a part of day-to-day life. This includes high levels of repair and reuse of products, as well as valorization of post-use materials present in the products, through recycling. However, the rise in consumerism has led to more frequent replacement of assets on account of increased spending power and economies of scale [5]. This trend has stagnated the adoption of circularity and increased the dynamics of waste Produced. Japan and China were the first key Asian economic players to formally introduce CE policies on national level. In Europe, many states have implemented CE initiatives, policies and pilot programmers, most notably Denmark, Germany, the Netherlands, and the UK are taking the lead [6]. It is extremely complex for a nation to define which combinations of CE initiatives will help achieve its sustainability goals. Balance and parallel initiatives are required in agreement with society, ccustomer, ttechnologyy, finanee, mmanagerial potential, pperformance indicators, police makers and regulators. For successful adoption of circular economy a viable market for resource efficient products and consumer awareness is vital. While technological development and process innovation play an important role in adopting circularity during the production phase, mindset transformation and behavioral change promoting life cycle thinking at the consumption phase holds the key to unlock adoption of circular economy [7].

4. Value Recognition

Supply chain add value on the expense of Energy & materials, energy is in process and can not be recovered while material have value. Till a material have value, it can not be categorized as waste therefore to reduce waste recognize the value. Lets take the value of a product to be 1 (one) when it is transferred from producer to customer thereafter the value reduction takes part. The ideal sequence followed before the value reaches to zero are: extension of life through various means, re-use the product to the extent possible, recycle to save the resources, recover the energy incorporated in material and finally degrade to the extent possible in accordance with nature.

The other facet of extending product life from producer view is that till the sale out product does not come to its end of life, the demand will not generate for the new product and had been the reason for extinction of many producers. The one step forward in this concern is that if the consumer get a value for returning the product, its intention will increase for upgradation and thus generates demand for new product. The opportunity can be taped by incentives to the loyalty of customer and providing the expected value of the old product. The overall value of Return Intention of Indian consumer is 69.93 on 1-100 scale, which indicates that consumers are ready to return their used products. [8]

The value is divided in to five components: Raw material, Manufacturing, Distribution and Networks, Innovation (includes research & development, sales, marketing, promotions) and Taxes with other obligations. The sum of this component's weight age is one. The weight age depends upon the product sector and supply chain. The four sectors shown in table 1 had been discussed in this section.

S. No.	Sector	Represents	Functionality life till	Major Waste component
1	FMCG	Food, beverages, health-care, household and personal care.	Consumption	Packaging
2	Textile & Apparel	Garments, fibre, yarn, fabric, upholesty etc.	Obsolete / Depreciate	Material
3	Engineering products	Automobiles, industrial machinery, consumer appliances (air conditioner, refrigerators etc.)	Accident / Obsolete/Depreciate	Material
4	Electronic products.	Televisions, Computer systems, mobile phones & accessories	Accident/Obsolete/Depreciate	E-waste

Table1: Various sectors and life of functionality

The Ideal Product For Value Evaluation Is Take As Jewellery Made Of Gold Metal As Shown In Table 2.

Gold (Jewellery)				
S. No.	**Value component**	**Weightage**	**End of Use Value**	**Waste Generated**
1	Raw Material	0.8	0.8	Nil
2	Manufacturing	0.05	0	
3	Distribution & Network	0.05	0	
4	Innovation	0.05	0	
5	Taxes & obligation	0.05	0	
End of use expected value			0.8	

Table 2 : Value component & End of life value for Gold (Jewellery)

At the end of use, the owner is willing to pass it further with an expectation of return considering the existing product value. As a link to pass the product, three options are considered: producer, formal sector and informal sector as shown in Table 3.

Product: Gold Jewellery	Producer	Formal Sector	Informal Sector
Perceived Value	0.8	0.8	0.8
Characteristics	Customer loyalty, Brand Image	Flexibility, Dynamics	Accessibility
Priorities	I	I	I

Table 3: Perceived value and priorities for end of use link in Gold (Jewellery)

The end of use value for other metals as per current market rates are: Copper (0.74), Aluminium (0.54) & Iron (0.4).

4.1. Fast Moving Consumer Goods (FMCG)

This sector constitutes of food, beverages, health-care, household and personal care. The content resources used in the sector are consumable and biodegradable, as such the material functionality does not contribute to waste. But still this sector contributes maximum to municipal solid waste being generated by packaging material constitute of printed plastic, paper and board. Primary objective of the packaging is to safely and hygienically transfer the product to customer with necessary information. Secondary objective is the promotion of their product & brand. Table 4 shows typical end of use value for FMCG sector, the waste generated is non consumable packaging material.

FMCG				
S.No.	**Value component**	**Weightage**	**End of Use value**	**Waste Generated**
1	Resources	0.3	0.05	Non consumable-Packaging material
2	Manufacturing	0.2	0	
3	Distribution & Network	0.2	0	
4	Innovation	0.2	0	
5	Taxes & obligation	0.1	0	
End of use expected value			0.05	

Table 4: Value component & End of life value for FMCG

The major FMCG sector player in India are ITC, Hindustan Unilever, Colgate-Palmolive, Nestle, Parle Agro, Britannia Industries, Marico, Procter and Gamble etc. FMCG supply chains play an important role in providing agriculture and live-stock producer's access to markets. They affect the economic, social and environmental sustainability of rural communities.The supply chain is well organized, but no circularity had been developed for the packaging material which completely converted to municipal waste and processed by informal sector. Considering the nature of the waste, the priority for reverse supply chain should be of producer or formal sector as shown in table 5. By providing end of use value for the same, customer loyalty towards corporate and environment is accessible [9].

In existing business practices, the home delivery supply chain like Domino's Pizza can be assume to be an ideal conditions. The packaging of food stuff is only done by biodegradable paper board. With some efforts, the reverse supply chain for this waste can also be developed by the company that in turn can make the brand image as an environment conscious and attract the customer loyalty by providing them incentives of merely 0.05 %.

FMCG	Producer	Formal Sector	Informal Sector
Perceived Value	0.05	0.025	0.00
Characteristics	Customer loyalty, Brand Image Environmental Concern	Efficiency, Flexibility, Environmental Concern	Accessibility In efficient, Environmental Degradation
Priorities	I	I	II

Table 5: Perceived value and priorities for end of use link in FMCG

The end of use value for paper (0.09), plastic (0.08) and of glass is (.01) as per existing market rates.

4.2 Textiles & Apparel

The raw material for this sector are natural fibre like cotton, jute, silk, wool sourced from agriculture output and man made fibre nylon, polyester, acetate etc. sourced from petroleum derived chemicals. In the supply chain of apparel, innovation and distribution network have maximum value components. The end of life value is of degraded product. The product life is extendable by prevention and reusable. Increasing consumerism had enhanced the demand in this sector and vice versa the waste. The value components are shown in table 6.

Textiles & Apparel				
S.No.	Value component	Weightage	End of Use value	Waste Generated
1	Resources	0.3	0.15	Degraded apparel
2	Manufacturing	0.1	0	
3	Distribution & Network	0.2	0	
4	Innovation	0.3	0	
5	Taxes & obligation	0.1	0	
End of use expected value			0.15	

Table 6: Value component & End of life value for Textiles & Apparel

Wide variation, composition and flexibility of the sector make it convenient for the informal sector to process the generated waste and same is the practice in India as shown in table 7. Future group through its Big Bazaar retail outlet provide annual value offer to used apparel products for its customers, this simultaneously attracts loyalty of customer and promotes sales. Still no producer and formal sector had put efforts for reverse supply chain in this sector.

Textiles & Apparel	Producer	Formal Sector	Informal Sector
Perceived Value	0.15	0.10	0.05
Characteristics	Environmental Concern	Flexibility, Environmental Concern	Accessibility Efficiency, Flexibility Environmental concern
Priorities	III	II	I

Table 7: Perceived value and priorities for end of use link in Apparel

4.3 Engineering Products

The sector consists of automobiles, heavy engineering equipment, industrial machinery, consumer appliances like air conditioner, refrigerators, washing machines, sewing machine, electric fan, furniture etc. Table no. 8 shows the general value components.

With an annual production of more than 25 million vehicles, India is one of the largest automotive manufacturing countries in the world. It contributes 7.1% to India's GDP and almost 49% to the nation's manufacturing GDP

(FY 2015-16) . The supply chain of India's automotive industry is quite complex. An average vehicle may comprise up to 20,000 components with about 1,000 sub-assemblies or modules [10]. These components are manufactured from materials such as multiple variety of steels (conventional steel, high strength steel, stainless steel), iron, aluminum, rubber, plastics, composites, glass, copper, brass and zinc. Growth in mining and manufacturing sector had increases demand for heavy engineering equipment and industrial machinery.

Improved quality of life and falling prices increased engineering product demand. This need that the design of such product support easier repair and reuse with the objective of prolonging its useful life. The design needs to be receptive to use secondary resources and enable greater recovery when recycled at its end-of-life. The competition had increased the numbers of models, body styles, and variants over time despite a small amount of growth in the sector, this means that per-model, per-body style and per-variant volumes have fallen.

Engineering Products				
S.No.	**Value component**	**Weightage**	**End of Use**	**Waste Generated**
1	Resources (Raw Material)	0.4	0.2	Material
2	Manufacturing	0.2	0.05	
3	Distribution & Network	0.1	0	
4	Innovation	0.2	0.05	
5	Taxes & obligation	0.1	0	
End of use expected value			0.3	

Table 8: Value component & End of life value for Engineering Products

After-sales service has emerged as a critical part of engineering product value chain. Since this part of the value chain involves repair, replacement, maintenance, intensive overhauling and interventions for optimize material use and minimize wastes. In automobile sector, Maruti-Suzuki leads the market since long with the advantage of extending the life of product. The value component of engineered material made producer at first priority for getting expected end of life value in this sector Table 9.

Engineering Products	**Producer**	**Formal Sector**	**Informal Sector**
Perceived Value	0.3	0.2	0.1
Characteristics	Customer loyalty, Brand Image, Efficiency, Environmental Concern	Flexibility, Environmental Concern	Accessibility In efficient, Environmental Degradation
Priorities	I	II	III

Table 9: Perceived value and priorities for end of use link in Engineering Product

4.4 Electronics Product

The sector comprises of intensive semiconductor based electronics product like computers and its accessories, mobile phones, television, communication devices etc. With the trend to go 'smaller and sleeker', more exotic metals are used and smaller amount per product provides a smaller recovery value. Therefore the end of use value for these products is determined to be very less say 0.01 as shown in table 10. The long value period is maintained through extended life and reuse.

Reuses of product have ample opportunity in Indian scenario. Online resale websites provides fresh air to this sector, people had started attracting with this mode of getting value of their product as per market demand without intermediates. Such business models boost willingness of users to utilize the functionality of product until its actual end of life. The social and environmental benefits of reuse of electronics include diminished demand for new products. When the efforts to repair and/or extend useful life of a device seem to be a failure, one move on to material recovery - extent to which individual components can be separated and there by processed.

Electronics Product				
S.No	**Value component**	**Weightage**	**End of Use value**	**Waste Generated**
1	Resources	0.1	≈ 0.01	E-waste
2	Manufacturing	0.3	0	
3	Distribution & Network	0.1	0	
4	Innovation	0.4	0	
5	Taxes & obligation	0.1	0	
End of use expected value			0.01	

Table 10: Value component & End of life value for Electronics Products

Recycling the printed circuit boards from the electronic wastes is one of the major challenges. The circuit board contains some of the precious metals such as silver, gold, platinum, etc. and base metals such as iron, copper, aluminum, etc in very less amount. The best way to process e-waste is by melting circuit boards, burning the cable sheathing to recover copper wire and open-pit acid hang on for separating metals of value. To reclaim waste material other process are electrolysis, osmosis, electrolytic recovery, condensation, filtration, centrifugation, etc. A mere 1.5% of India's total e-waste gets recycled, with over 95% of it being managed by the unorganized sector and scrap dealers in this market, which down cycles the end-of-life products instead of recycling it [11]. It has severe environmental implications as materials which fetch marginal or no value are simply discarded in nearby water bodies or are often burnt. Due to this informal handling, recoverable materials, especially critical metals, are lost due to improper recovery and process inefficiencies. Considering the complication of E-waste, expert formal sector with producer must take a lead role in its processing and value recognition as mentioned in table 11.

Electronics Products	**Producer**	**Formal Sector**	**Informal Sector**
Perceived Value	0.11	0.10	0.00
Characteristics	Customer loyalty, Brand Image, Environmental Concern	Flexibility, Efficiency, Environmental Concern	Accessibility In efficient, Environmental Degradation
Priorities	II	I	III

Table 11: Value component & End of life value for Electronics Products

Awareness of green consumerism orients the demand of customers toward consuming healthier, eco-friendly, recyclable products thereby obliging businesses to develop products and services accordingly to achieve competitive advantage [12]. Green Living Survey (conducted by TNS Global September for DuPont in 2014, India) found that a majority of Indian consumers are familiar with green products, have confidence that green products are better for the environment, and feel that bio-based ingredients enhance the desirability of a product. While buying electronic products, preference should be made to those that: use recycled content, are energy efficient, are made with fewer toxic constituents, utilize minimal packaging, are designed for easy disassembly or upgrading and offer to lease or take back options.

5. Reverse Supply Chain

Valuing survival, consumers, societies and nations are willing to adopt environment friendly practices. Being able to assess the value at end of life product, they are ready to be an important link of extended supply chain, but for that robust reverse logistic network and recycling infrastructure is required for effective end of life management. Supply chain begins with extraction of raw material from natural resources and thereafter includes several production links, movement and storage before reaching to the consumer. Efficiency in supply chain benefits businesses and the environment in many ways. These include reduced cost of materials through process

improvements and reduced environmental impacts associated with extraction, processing, transferring, storage, and consumption. Supply chain ends at consumer, the extension to Reverse Supply Chain (RSC) connect the consumer back to the chain. After the product comes to end of life from owner's aspect, reverse supply chain plays a role for circular economy. RSC consist of collection and channelization of end of life product. It develops mechanism with dealer, collection centres, service centres, dismantler, recycler, ttreatment, sstorage and ddisposal ffacility for product flow. It address ggeneral scheme for collection of waste such as through buy-back arrangement, exchange scheme, ddeposit rrefund system, etc.

Computational technology can boost the transformation towards reverse supply chain. It can help closing the material loops by providing accurate information on the availability, location and condition of products and its value. Digitalize and easy to assess information on products regarding hazardous constituents, hazards of improper handling, disposal, accidental breakage, damage or improper recycling and iinstructions for handling and disposal of the equipment after its use will be critical in RSC. Provision of visible, legible and indelible symbol on the products or product user documentation will help to prevent waste from being dropped in garbage. Digitalization promotes longer life for products and minimizes the transaction costs [13].

Conservation of functionality is a thrust area for RSC, two matters are important in the context of functionality (1) the loss of functional substances present in the primary material and (2) counteracting the emergence of dysfunctional substances in the recovered product. For instance, in the case of recycling steel by re-melting, the percentage lost to slag's of functional alloying elements such as Mn, Nb and V may well exceed the percentage of functional Fe lost to slags. Loss of functionality may also occur when substances have functionality in the primary product but not in the secondary product. For instance, Ni and Cr are functional in stainless steel, but when stainless steel is used as an input in recycling to carbon steel, Ni and Cr lose their functionality [14]. Technological advancement play role in consistently narrowing the gap in quality between virgin and recycled products. Further technological development are helping is proper disposal of waste like Plasma Thermal Destruction Recovery technology is an environmentally friendly process, that converts wastes into non-toxic synthetic gas (which is a valuable source of alternative energy) and other useful end-products.

Ddecentralizeation is always in favour of ecosystem, same stands for recycling since work, environment impact and wealth generation is concentrated into particular locations if not decentralized across the society as a whole. In this reference, Micro Factory Retailing (MFR) is a hypothetical concept developed by the author Wells & Nieuwenhuis [15]. The factory becomes the centre for trade-ins, service, repair, used product sales, and end of life recycling and hence becomes the embodiment of product stewardship. It becomes the means by which material recovery and re-manufacturing are made viable at the local level. MFR is one means to take advantage of modular supply strategies combined with commodity or off-the-shelf purchasing.

6. Responsive Initiatives

India introduced one of the most notable policy that articulated the spirit of sustainable development was National Environment Policy of 2006. It mentions that only such development is sustainable, which respects ecological constraints and the imperatives of social justice. With regard to waste management regulations, Government of India (GoI) introduceced "Extended Producer Responsibility" an approach to reduces the environmental impacts of the products put on market and introduces the concept of the producer being responsible for the entire life cycle of the product [16].

In April 2016, the GoI published the revised E-waste Management Rules, 2015, considering the issues with regard to collection and recycling targets. Central Pollution Control Board introduced guidelines for Environmentally Sound Management of End of Life Vehicles with an objective to regulate the sector and promote disposing in an environmentally friendly manner based on shared responsibility involving all stakeholders. Government notified the Plastic Waste Management Rules in 2016 that will bring responsibilities in system of collecting back plastic wastes, use of plastic waste for road construction as per Indian Road Congress guidelines or energy recovery, or waste to oil etc. for gainful utilization of waste. Recently the GST Council significantly reduced the rates on

electronic waste from 28% to 5% while for plastic wastes as well as other waste or scrap of glass and rubber waste, the rates have been reduced from 18% to 5%. Some examples of Industries sustainability plans and actions are:

1. HCL Info system believes that the producers of electronic goods are responsible for facilitating an environmental friendly disposal. Once the product has reached the end of its life the company provides the recycling facility to its users regardless of the fact, when and where they purchased the product.
2. Nokia India launched a 'Take Back' campaign where customers can drop their old handset in the company's stores and win gifts. The take-back campaign is aimed at educating mobile phone users on the importance of recycling e-waste. As a part of this initiative, Nokia encourage mobile phone users to dispose their used handsets and accessories such as charges and handsets, regardless of the brand, at any of the recycling bins set up across Nokia Priority Dealers and Nokia Care Centers.
3. ITC Ltd has chosen energy management, environmental & waste management and social & farm forestry as major focus areas for Corporate Social Responsibility. Specific processes include recycling/reuse of paper mill back water for dilution of bleached pulp, recycling of paper machine primary clarifier outlet water for miscellaneous uses, etc.
4. Tata Motors has realized the value of remanufacturing components in their commercial vehicles as these vehicles have long use cycles, are very sensitive to cost increases, and are often managed as a fleet, making the use of remanufactured parts more attractive, especially with a warranty.Company buy backs, or exchanges the used vehicle parts like engine, gearbox or alternators and then remanufactures the returned part and offers the remanufactured product with a warranty. This approach allows longer use of parts, reduces demand for energy and materials, thereby creating new revenue streams for company.
5. Maruti India has been able to reuse the scrap generated from press shop operations by supplying them to component manufacturing for production of child parts, thus maximizing steel sheet utilization. The suppliers send back these child parts to the company for use in vehicle manufacturing.
6. Nissan uses recycled materials in Nissan Leaf that amounts to 25% of the total weight of the car. Most of the recycled material comes from recycled steel. Discarded cloth is used to make sound deadening panels, the upholstery is made from recycled soda bottles, and recycled plastics from discarded household appliances provide the raw materials for most of the plastic parts.
7. Ford uses recycled aluminium that helps in reducing energy consumption by 95%, use of recycled aluminium waste chips generated from stamping windows into body panels reduces consumption of virgin material by more than 40% .
8. Bosch as a part of its exchange program offers more than 11,000 remanufactured parts across 34 product groups ranging from the starters, alternators and electronics product sectors, as well as from brake, gasoline and diesel fuel-injection systems.
9. Swach a cooperative of self-employed waste pickers, waste collectors and other urban poor. Scope of actions includes urban household waste collection, resource recovery, trade and waste processing. Waste is sorted into categories (plastic, paper, metal, glass, leather etc). After further fine sorting by hand, any material with market value is sold. Based on the 3R philosophy, they developed V-collect services for newspapers, old clothes, and other household items like old electronic, electrical items, furniture, bicycles, kitchen utensils, etc. They repair and reuse what they can, and dismantle to recycle the rest. Clothes are segregated into categories as per age and size and sold to the poor at very low prices. Newspapers are used for the creation of disposable bags and eco-friendly carry bags.
10. The PET recycling industry is gaining momentum owing to the rise in consumerism and Government's impetus on effective waste management. Ganesh Ecosphere Limited, a plastic recycling company has institutional tie-ups with hotels, malls, restaurants and exhibition centers. The company has also joined hands with beverage giants like Bisleri and Coca-Cola India for sourcing waste PET bottles. The company also engages with informal sector mainly rag pickers to ensure uninterrupted supply of raw materials.

Switzerland remains one of the first countries in the world to be able to set up a completely formal system of e-waste management. SWICO Recycling, SENS and SLRS (Swiss Lighting Recycling Foundation), are three national, not-for-profit organizations responsible for taking back discarded electronic and electrical equipment and processing it. Advance recycling fees is charged from all consumers at the time of purchase of the electrical equipment. The fee collected is then used to fund collection, transport and recycling facilities. The consumers return the used products to retailers, manufacturers or importers free of charge and the latter are obligated to accept the Waste Electronics and Electrical Equipment. These regulations are contained in the Swiss Ordinance in Return, Taking Back and Disposal of Electrical and Electronic Equipment. After collection of Waste Electrical and Electronic Equipment, specialized disposal companies dismantle the equipment manually and mechanically. Fragments that are remaining are separated and recycled separately. Norway in 1998 initiated the process of setting take back companies collecting e-waste, and subsequently formulated the e-waste regulation in 1999, making producer responsible for managing e-waste and pay a membership fee to the take-back companies. This is how it provides the funding for collection and treatment of the e-waste. The price for membership differs according to product type. Sweden promotes the reuse and repair centers by tax breaks. The real-world situation across different sectors, countries and international supply chains are different and needs to be better understood [17]. This indicates that policy development for a circular economy will need to be differing across various countries.

7. Conclusion

Economic growth had put our environment in danger. The growth is vital for human development whereas environment sustainability put a question mark on our survival. Strategies and action plan are required so that both development and survival can be be taken care. Nature's sustainability secret is its reversibility in all its processes, which gives the rise to the base of circular economy approach. The adaptability of circular economy is a challenging task which requires consumer interface and change in mindset, as the change arise, producer will start responding. Consumer willingness to be a link of reverse supply chain is influenced by two factors, first their concern for degrading environment and second realization of the value of used product. The paper discusses methodology for value recognition, which can help the consumer to know the value component and depreciation after they own the product. The end of use value is the connecting link for circularity of material. The reverse supply chain flow plays the important role in resource conservation which is critical and necessarily required in current context. Responsive actions had been discussed from Government and corporate for understanding and implementing circularity.

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