# Life Cycle Assessment Of Green Products Vs Conventional Products: A Comparative Study

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Abstract:

In the present scenario, the global concentration is on environment sustainability. Everyone wants to become green and eco-friendly and reduce their affect on the environment and reconstruct the environment with clean and healthy practices. Everyone in the supply chain (manufacturer to a customer) is ready to apply green practices in their activities. If the industries produce the products in an environmentally sustainable manner thereby reduce environment impact level. This brings the demand for green production and green products. So the author attempted to assess the product environmental profile through life cycle assessment tool and distinguishes the green product over conventional product. This paper is based on secondary data collected from different sources which include journals, internet and different company websites. The paper primarily focuses on life cycle assessment of product and secondly discusses the comparison of green product over conventional product. The paper assists in a better understanding of the green product and discusses the influencing factors on stakeholders in the conversion process of conventional to green practices.

Key Words: Life cycle assessment, Green product, Conventional product and Environment Sustainability

**1. Introduction:**

The individual, alongside different animals directly or indirectly association with living and non-living nature in the earth. This association makes the base for the whole right of ecological security. Mechanical, modern, urban and financial improvement has offered tremendous advantages to man, however during the process of development environment has been contaminated. Deforestation, demolition the ozone layer, flora and fauna depletion, an Earth-wide temperature boost and environmental change are only some of the pessimistic consequences of human exercises, which truly aim risk to his endurance. The assurance of environment is present selected global, national and local responsibility. As of now the term sustainability is rising and required concept. As per the expansion of populace, there are no adequate resources to address their issues. The term sustainability accepted in the world commission on environment and advancement (1987). The earth affect diminished while the business and individuals pursue green practices in their exercises. The green product alludes to a product created by green practices association in each phase of production. The conceivable advantage of green products and green associations makes new clients and new markets in this manner arriving at a competitive advantage. Green products have less negative impacts on environment as opposed to conventional products. Conventional products are created by conventional techniques with a more negative impact on nature and less competitive advantage. The responsibility on environment sustainability required to the assessment is to present reasonable and reliable tools. Life cycle assessment ((LCA) is extraordinary tool as compared to other apparatus for making an ecological profile of product or service. LCA is holistic methodology and presents exact results of truthful environment trade-off product, services and human exercises.

**1.1. Life Cycle Assessment:**

Life cycle assessment is an estimation device to assess the product environment affective level and various resources utilized in a product life cycle stages. By and large, evaluation begins from raw material extraction, resources refining, creation, transportation, utilization and closures with waste administration. The appraisal could be a finished assessment of a product and brought all prospective of the planet, resources and human wellbeing (ISO, 2006a). It is an apparatus of correlation and not gives supreme outcomes. It is serving manufacturers to check all major natural effects within choices of various strategies (Curran 1996). The system was regularized by ISO in 1997 and modernized in 2006 (ISO 14040, 14044 2006). Ordinarily, LCA contains four particular stages: the objective and scope definition, stock examination, impact investigation, and interpretation. El-99 is a standout method amongst other methods utilized in the assessment of product environment profile with considers three viewpoints in particular biological system quality, human wellbeing and resources.

**1.2. Environment Sustainability:**

The insurance of the environment turns into a significant capability for increasing competitive advantage as well as obligation on partners to protect the natural resources for coming generations. By and by, stakeholders enhanced and actualized distinctive natural manageable practices to spare their lives from various conditions like dirtied air, water and nourishment just as the generation of resources sum consumed by stakeholders. The word environment sustainability alludes to keep up the common resources with the help of maintainable practices to competitive advantage, monetary improvement and favoured results for a long time. It is concerned technique to spare the earth from industrial and human exercises.

**1.3. Green Product:**

Generally, Green products are non-toxic, durable, less chemical and less packaging. Surely, there are no purely green products; negligible emanations are delivered during their creation procedure, transportation, warehousing, and consumption stages. So green is less impact on environment contrast with different substitutes.

**Green item definitions in different perceptions:**

1. Scholastic view, Green product is a procedure of resources recovery, generation, transportation, utilization and transfer of waste accessible for reusing, less contamination and with less energy – Liu and Wu 2009.
2. Mechanical view, the green product is less impact on the environment, got ready for auto reusing and has an official logo and furthermore contains 3 Rs namely reduce, reuse and recycle – www.humanvillage.com, Consumer and Enterprise Association.
3. Buyer View, the green product is the non-toxic, biodegradable, less ecological affect, less energy utilization and local made.

**1.4. Conventional Product:**

Conventional Product is a product just focus on the monetary favourable position of the organization and direct advantages of the products and services as well as more chemicals and toxins used in the generation contrast with green product generation.

**2. Objectives of the study:**

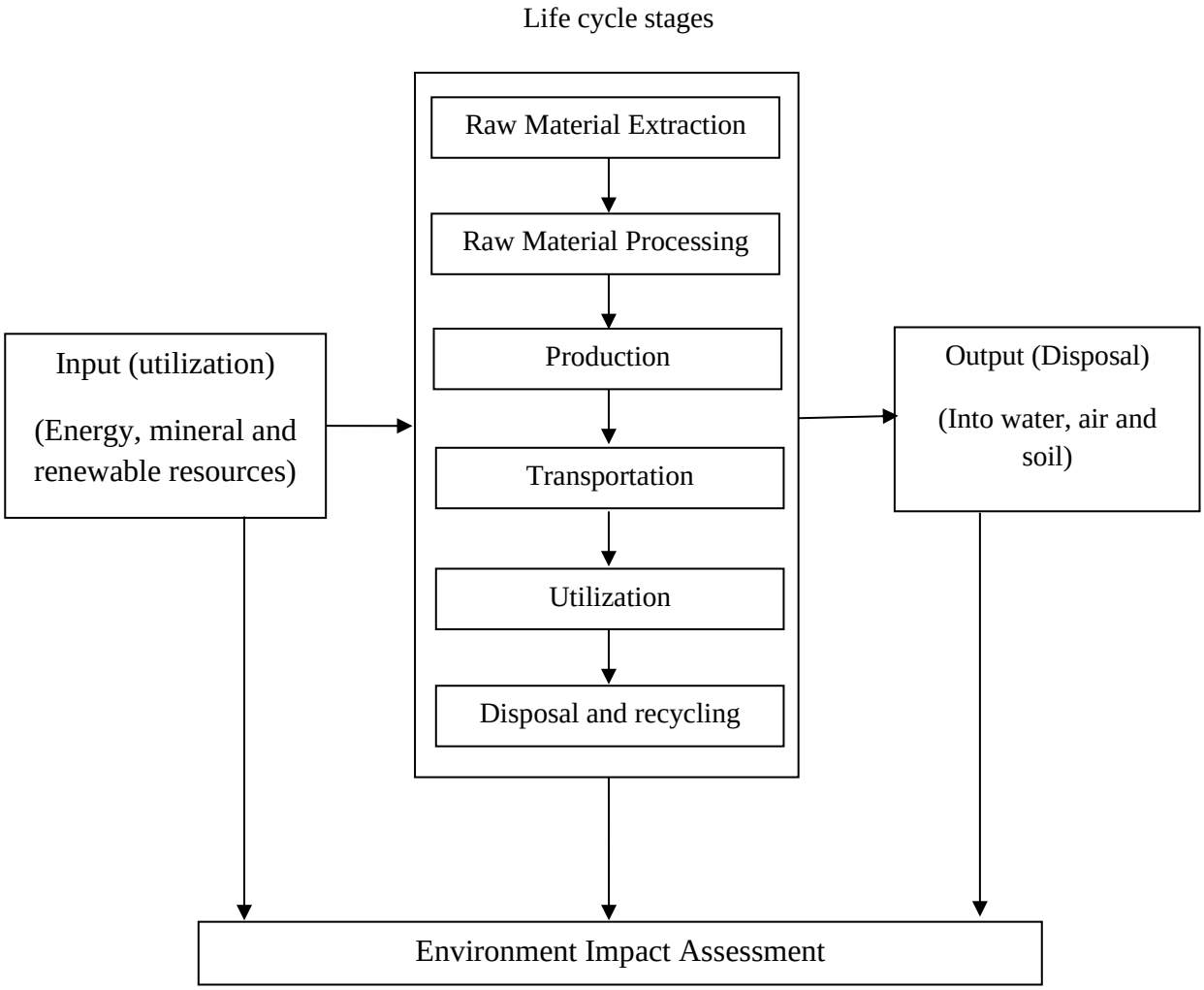
The principal objectives of study are:-

1. To comprehend the life cycle assessment of green product over conventional product
2. To recognize the advantages of green product over conventional product
3. To distinguish the conventional product and green product

**3. Research Methodology:**

The purpose for the study was to assemble data based on framework of life cycle assessment of a product and comprehend the data with consideration of environment impact of green product as well as conventional product and identified positive environmental impact of green product over conventional product. The information gathered from various secondary sources used to distinguish the benefits of green product over a conventional product and character separation done by interpreting the data.

**4. Life Cycle Assessment of product:**




The production of green product refers to not just the generation of a product that should be given positive natural outcomes while utilizing the product. Every single action in the production must be in the act of greenway, its beginnings from input resources, for example, energy and mineral retraction and closure with the arrival of production wastages in nature in a greenway. Green creation includes benefits, competitive advantage, environment friendly product and sustainability. Though traditional production is just focused on the creation of product not thinking about the consequences of environment. The principle point of traditional creation is to work with benefit to businesses and carelessness of natural maintainability.

**4.1. Input Supplies:**

Life cycle evaluation of product begins with input supplies. With regards to green production, the green practices begins from here itself

**4.1. 1Energy Resource:**

Energy is the principle segment for financial development. And furthermore direct relationship between financial development and per capita energy work. Per capita control utilization is high in developed nations as opposed to in the developing nations. Energy is the fundamental resource in the production. Use of energy in a green manner decreases the power utilization rate.

Generally energy generated from two sources is listed below:

| Energy Sources | | |
|---|---|---|
| Conventional | | Non-Conventional |
| Commercial | Non-Commercial | |
| | | |
| Coal | Fire Wood | Bio Energy |
| Petroleum | Straw | Solar Energy |
| Electricity | Dried Dung | Wind Energy |
| | | Tidal Energy |
| | | Energy From Energy Waste |

Without energy, there is no possibility of creation. Creation of conventional products finished with the help of traditional energy like utilizing coal, oil, and power, these three are going under commercial classification. Commercial classification speaks to pay cash for the utilization. Coming to non-commercial class firewood, straw and dried dung are utilizing, these are produced independently from anyone else as it were. At the point when the business chooses to create the products in a green manner industry like to pick non-conventional energy resources like bio, solar-based, wind and tidal energy and energy from urban waste. As indicated by the accessibility of energy resources industry selects kind of resource, for the most part, solar and wind energy utilized in India for the production of products.

**4.1.2. Mineral Resources:**

Mineral resources are non-renewable, arranged into two class metals (iron, copper, and aluminium) and non-metals (salt, clay, sand, phosphates, and gypsum). Minerals are important for being limited and non-renewable common resources. An industrial mineral constitutes most part in heterogeneous domain. These are utilized as crude materials for creation of products by softening like glasses. Minerals are enhancements and offer various creations to bring finished results. Generally, the use of minerals in the creation has ecological affects either in extraction and refining tasks or amount of waste delivered, there via land polluted. The contamination level of land lessens by sustainability procedures. The idea sustainability offers and presents innovative mineral processing technologies through these innovations enhance the utilization of initial resource and decrease waste. Recycling of mineral wastages makes significance and demand there by energy and raw materials saved. Recycling involves the principle job in sustainable development. Recycling in a broad sense called re-use**.**

**4.1.3. Renewable Resources:**

Renewable resources are resources will refill and supplant the sum diminished by utilization. These are regular resources, for example, oxygen, fresh water, solar energy and biomass. These resources are supplanted by either normal reproduction or repeating strategies in a constrained time in human time scale. The use of these resources in the industry in a recyclable manner, it will give a positive effect on the environment thereby lead to sustainability. Renewable resources are bio-renewable, chemicals, bio plastic, bio fuel, biomass and biogas.

**4.2. Life cycle stages:**

**4.2.1Raw Material extraction:**

The raw material is an essential commodity and unprocessed material additionally called feedstock. This is the fundamental contribution to making the products. Raw material extraction is the procedure of partition of required raw material from natural resources. Raw material extraction in conventional strategy requires high capital speculation, chances for polluting influences, logical errors,

need of high pressure, and decrease of power with time and at last environment additionally affected. Be that as it may, green extraction is the sustainable practice of extraction and burning concept in the multidisciplinary zone of science, science, and technology. For this concern presented the six-standard green extraction model. Green extraction refers to location and plan of procedures which diminishes the energy utilization and licenses to the use of renewable resources and substitute solvents subsequently produce the high-quality extract. Through the green extraction, the public and planet has been spared and between times periods increase the competition among companies with the vision of environmental, innovation and economical.

**4.2.2. Raw material processing:**

Processing of raw materials contains a succession of steps and utilized in assembling of raw materials in a usable manner. The means included chemical and engineering practices and for the most part, delivered huge amounts. Traditionally, the preparing techniques disregard the ecological sustainability, so by the activities the environment contaminated as air, water, and soil. Doing these exercises the world influenced and has been influencing. So the world assumes liability to sustain resources and protection of the natural resources for present and future generations. Material processing in an eco-friendly way lessens energy utilization and the wastage created in the material processing utilized as a raw material in the new product development and the product called by-product. Now and then By-product gives extra income for the industry.

**4.2.3. Production:**

Production is a progression of steps with a mix of various material and immaterial sources at long last changed over into the completed product. Conventional strategies utilized underway just focus on industrial benefits and disregard the earth security; it came about to natural resource depletion. This makes stress to start of sustainability and green production. Sustainability is the protection of natural resources for present and future generations. The word green utilized in everyday exercises

and green creation is a mix of the wide scope of ideas like recycling, green living, waste management, energy-saving, and pollution management, etc. Green production association of ethical, organic, environment awareness and fair-trades production. Green production is the arrangement of activities in an ethical way with concerns environment sustainability to deliver green products with fair trade (fair-trade means buyers acceptance of product prices and set the price of the product according to price-setting rules and regulations).

**4.2.4. Transportation:**

Transportation of products comprises of packaging, handling, and transport of products. Usually transportation of products done by road, water, and air. Conventional transportation discharges contaminated gases into the air. Product transportation to concerned area done by successful product packaging resulted to transpiration cost. Product packaging in traditional strategy subtracts three things including cheap, lightweight and quality. For the most part ordinary packaging made by plastic and non-biodegradable substances. Green transportation is an eco-friendly way and less impact on environment contrast with traditional transportation. Its incorporates eco-packaging, inventive packaging, eco-labelling, and eco-transportation. Eco-substances utilized for packaging, for example, Biogases, are delivered by sugarcane and a few cases created from fibrous compounds. PLA (represents polylactic Acid), called as a bio-plastic and made by plant starches in particular beets, wheat, corns, and potatoes. PLA looks like plastic however it is treated the soil and reused. The green transportation coming into the light with the impact of air contamination and greenhouse gas discharges, extraction of oil resource s and expanding of oil costs. The eco-friendly innovations presented the hybrid and electric vehicles in the market; these are a great substitute for traditional vehicles.

**4.2.5. Utilization:**

Utilization of conventional products its dangers to the environment and open by the method for environmental contamination, medical problems, and non-recyclable problems. When coming to idea sustainability the situation

changed. For the most part, ventures used to green practices to accomplish sustainable advancement and competitive advantage. The utilization of the green product, buyers decline their impact level to synthetic substances and lethal as well as breath quality air and taking cleanliness water. The natural nourishment utilization sparing the kids wellbeing without affected by pesticides. After utilizing of green product it very well may be recyclable thereby soil not dirtied and natural agribusiness lessens the soil pollution and develops the soil with Composting, crop rotation and cover cropping. Green utilization is precious to both people and the planet.

**4.2.6. Disposal and recycling:**

A consumed product called waste and that may be biodegradable or recycling. While conventional creation makers' overlook the product recycling and generally product disposed of after utilization. While coming to the green product it is recyclable and reusable. Recycling is a constructive outcome on a decrease of raw material utilization, this will become about to less quarrying and mining. A large portion of the world has been influenced by mining and quarrying and it's annihilating regular habitat and human wellbeing. And furthermore, raw material transportation may cause to natural contamination. Numerous cases product recycling need less energy this will make less contaminated environment. The matter of recycling made if the market of goods merchandises with recycled products.

**5. Output:**

Output also called disposal. After recycled remaining waste and non-recycled material ought to be released into the land, air, and water. The waste as gasses, liquid or solid. In traditionally without isolation of waste released, it directs ecological contamination and vegetation level diminished in the planet and individuals likewise influenced. Waste disposal in a green manner is less environment affect contrast with conventional strategy. In this technique isolate the waste as per waste nature before going to dump. Present many green procedures are utilized to waste management, for example, anaerobic assimilation, bio

corruption, fertilizing the soil, garden, recreation, landfill, sewage treatment, and waste to vitality these are the various procedures utilized for green waste administration.

**6. Results and Discussion:**

The exploration work offers a chance to comprehend green product and conventional product. It is obviously characterizes product environment profile through life cycle and backing to comprehend the advantages of the green product over conventional product. The word green is as yet rising and advantages given by it disregarded. Green production additionally considered supportable creation and produce the products with less negative impact of environment and individuals.

Discrimination table of green product and conventional product placed below:

| Character | Green Product | Conventional Product |
|---|---|---|
| Energy Usage | Renewable energy (Solar or Wind energy) | Non-Renewable energy (Petroleum and coal) |
| Minerals Usage | Innovative mineral processing technologies thereby reduce environmental impact | Traditional operational methods, natural resources contaminated |
| Raw material Extraction | Eco-friendly way | Investment high, Chances of impurities and analytical error |
| Raw material Processing | Less Energy Consumption and less waste | High energy consumption and high waste |
| Production | Product contains 3Rs Reduce, Reuse and Recycling | Product produced without of 3 Rs. |
| Transportation | Eco-Transportation including eco-packaging, eco-labelling, bio-degradable, hybrid and electric vehicles | Packaging by plastic and non-biodegradable |
| Utilization | Reuse, less environmental pollution, human well being | Environment pollution, human illness |
| Disposal and recycling | Waste isolation and disposal, production of by-products | Waste disposal without isolation, Non-biodegradable |
| Natural Resources | Sustainment | Non Sustainment |

**7. Suggestions:**

Green concept most emerging in present globalised world, but still it is in under processing, it has many reasons like

lack of awareness, government assistance and public involvement and so on.

1. Conduct the programmes like workshops and conferences related to green concept and sustainability.
2. The concept green and sustainability should be included in the curriculum of educational institutions.
3. The government have to planning and organise the effective policy system on sustainability towards the preservation of natural resources for present and future generations.
4. Financial institutions also assisted to entrepreneurs who want convert into green entrepreneurs.
5. Establishment of R& D centres for invention of new methods towards sustainability.
6. Public awareness also essential for green concept implementation, so do publicity of green concept by television, digital media and social media.

The green idea has been flashing and extremely pivotal to accomplish sustainability. Green practices are solid base to cross environment sustainability. A life cycle assessment is a device for the creation of environmental profile of a product and illustrates the earth's affect level of the concerned product. The green product has natural points of interest while the correlation with the conventional product. The present investigation finishes up, LCA helps to discover, which stages of the life cycle are significant to decrease the negative natural affects and avert the issues to cause negative environmental impact. LCA likewise gives environment profile on the timely premise. The green idea as yet creating, there is a call for increasing awareness in the partners. There is a need for a foundation of incubation and R & D centres towards green advancement. The innovated green product accessible in the market but the awareness is less. It is proposed that the solid policymaking, government assistance and awareness of projects to execute and accomplish in a sustainable environment.

**Conclusion**

Management defined getting things done through by others. The awareness and understanding the importance of green product and green practices, it will assist to management to formulation & implementation of green

concept by themselves and employees also. And study clearly stated the difference of green and conventional product, there by motivation of establishment of green practices in their industry. Generally industry divided into 4types such as primary its including mining, farming and fishing. Secondary industry contains making cars and steel, tertiary industry includes teaching and nursing and finally quaternary industries implied research and development industries like IT. By studying of this paper all industries aware about green production importance and will be motivated to applying of green practices in their activities. The study will also open up scope of future researchers to explore relevant dimensions like use green products instead of plastic products. Present, the world majorly focus on plastic eradication, so future research on policy system on plastic eradication, R & D establishment for innovation of non-plastic product and government role towards plastic eradication. And future research scope on the educational institutions, does the institutions included the green concept in their curriculum and how much the students know about the concept green. In view of, students are the future entrepreneurs and they are strong pillars to formulation & implementation of green concept towards sustainability.

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