

Contemporary Literature Review on Sustainable Development

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Introduction:

Sustainable development has become a worldwide goal of almost all the countries and nations in the modern era. In recent years, global population has increased by leaps and bounds which created alarming situation about the natural resources. The prolonging scarcity of natural resources has magnified the significance of sustainable development. Meanwhile, the quality of life is under immense threat and the monstrous of pollution has augmented the demands of energy, which in turn causes emissions of harmful gases (Skillington, 2021). In other words, human survival on the planet is under threat on both ends i.e., depletion of natural resources and resultant environmental degradation. In this context, the long term capability of earth to support life revolves around the sustainable development in the world. The experts have probed the situation and provided recommendations to control this menace of scarcity. Undoubtedly, it is a long, time taking process. The role of researchers is important while collaborating from all over the world to address the issues of sustainability (Snyder, 2019). In this context, this review of literature essay explores contemporary research relating to sustainable consumptions, carbon emission control, renewable energies, waste management along with cleaner production methods, re-usage and recycling, efficient supply chain, and Eco- design, etc.

Question of Research:

The primary question regarding which this literature review will revolve may proceed as: How can a project support sustainable consumption leading to sustainable development globally in alliance with the alternatives and recommendations?

For accomplishing this quest, broad range topics would be addressed in the light of latest and reliable research materials. In this context, the prescribed scope and adopted methodology are necessary to be mentioned in a precise way.

Scope of Literature Review:

The scope of this literature review is broad to cover the sustainability issues concerning multiple topics of grave significance. These include but not limited to carbon emission control, renewable energies, waste management along with cleaner production methods, re-usage and recycling,

efficient supply chain, sustainable consumptions and eco design. For throwing light on each of these topics, the latest research comprising utilized methods, field applications and overall outcomes is addressed in a brief manner. In addition, this literature review demonstrates implications of this diversified research along with the significant benefits and several challenges that may rise.

Methodology:

The conduction of this literature review adopted the broad range searching of diversified databases and multiple tools including search engines like Scopus, JSTOR, Yahoo, MSN and Google along with online catalogues like z-library, etc. For this purpose the individual and combination of various key words regarding the quoted topics were frequently used. In addition, the search of references lists and citation chains were executed to identify and grab relevant material. In this context, various course resources and provided materials proved very useful. For example, multiple chapters from “Designing for the Circular Economy” by Charter, “Plastics we cannot live without it” by Sharon George, Daily Mail article compiled by Gandy “Fury over cash-strapped council’s ‘sick’ plan to heat swimming pool by plugging it into crematorium”, and “Sustainability ranking does not always identify sustainable companies in the Conservation” by Rumina Dhalla and Flex Arndt. These are only few examples from the heap of provided material which was consulted. Moreover, the research for this review remains limited to past fifteen years and intentionally utilized English language for searching high profiled articles by renowned researchers.

Latest & Consolidated Review of Literature:

The comprehensive review of literature encompassing the stated topics is explored here which comprises latest research findings by multiple scholars, researchers, investigators, journalists, experts and writers in a brief manner:

Sustainable Consumptions:

The sustainable development has the critical elements of sustainable consumption. It deals with utilization of all the resources in a prescribed manner to minimize negative impacts and to augment human well-being around the globe. The main challenge in this regard is to make the public aware that it not an individual’s responsibility but the responsibility of society as a whole to take prescribed measures.

Dhalla & Arndt (2021) provided a comprehensive framework about the circular economy to ensure sustainable future compared to the present. The research compilation provides proper guidance in practical manner to design products, supply of services and formulate systems for achieving sustainability. The unique method is adopted in this edited material where all the stakeholders are entitled to get relevant and significant information. These may be policy makers, regulatory body

supervisors, administrators, producers and consumer slots. In addition, it emphasizes to ensure collaboration among all the main stakeholders for sustainable consumption.

Charter (2019) explored in chapter five of “Designing for the Circular Economy” the crucial role of Governments for implement policies and effectively using he resources. These polices may include regulation, rules, frameworks and standards to promote and ensure sustainable consumption. Resultantly, these play active role in shaping the attitudes of businesses authorizes and consumer communities to attain sustainable development. Overall these policies and introduced incentives may pave the way towards sustainable consumption. All the stakeholders have to play their active roles in this regard.

Daily Mail article (2011) by Carol Gandy, a council leader, which titled as “Fury over cash-strapped council’s ‘sick’ plan to heat swimming pool by plugging it into crematorium”. The article demonstrated a proposal which were considered highly nonsense and controversial at the start but later was appreciated. The proposal was to utilize the heat generated by the crematorium which was in the surrounding of a local swimming pool. The huge resistance was demonstrated by the public by declaring it nonsense and disrespectful. But the council presented the view about its beneficial aspects concerning saving money, minimizing carbon emissions and improvement in environmental cleanliness with patience. The detailed description of the project changed the minds of the local public and respective authorities to achieve sustainability goals. The article demonstrates the significance of engaging general public and local authorities to execute plans and accomplish projects for reducing carbon emission and also attain sustainability.

Similarly, Achillas et al. (2020) concluded that economic principles are backbone for promoting sustainable consumption and improving the production quarters. Through closed loop system, the circular economic principles can enhance sustainable production and also minimize the waste material and pollution hazards. In this contest, the need of the time is to design the ways to execute all the strategies for accomplishing the undergoing projects in a professional way. As a result, the resources can be secured and used for a long term without any loss or threats.

Carbon Emission Control:

According to the report of IEA, (2019), the electric cars are one of the most important ways of reducing carbon emissions. Decarbonization, i.e., the sum of all measures to reduce the turnover of carbon, plays a major role in the fight against climate change. This is particularly the case in the transport sector, which accounts for a large percentage of carbon gas emissions. So, moving away from the use of carbon-based fuel sources would have positive effects. In the US, the transport sector accounts for 29% of total greenhouse gas emissions, compared to 27% in the EU. An effective long-term strategy to reduce CO₂ emissions is to switch from petrol and diesel-powered vehicles to electric vehicles. Alternative means of transport such as bicycles, buses, and trains should be preferred. Major cities have taken important steps to facilitate the switch to electric vehicles. For example, at the UN

climate summit in Madrid, companies and governments committed to electrifying their fleets by 2030.

Wells et al., (2021) investigated that transport accounts for about a quarter of global CO₂ emissions. Carriers can reduce their CO₂ emissions by ensuring that they optimize routes to minimize fuel consumption. The additional advantage of this is the less fuel usage, which also saves costs for companies. When used in conjunction with on-vehicle telematics, the integrated computer program can also mean coaching drivers to drive more efficiently, save fuel, and reduce emissions. Many large companies now require this information by default, and is increasing by companies of all sizes. Good fleet management can also reduce carbon emissions. Vehicles should be used only when they are needed to optimize the journeys they take, and maintenance needs should be assessed carefully.

Austin Texas Government, (2017) reported that many carriers are increasingly looking at alternative fuels that have lower or zero CO₂ emissions. This includes EVs, hydrogen, used cooking oil, and even methane captured from landfills that can be used in a diesel dual-fuel engine. Apart from this, Austin Texas Government in the USA has recommended the use of measures including switching off the engines of vehicles and driving at the appropriate speed to reduce carbon emissions. In short, every organization should have a well-thought-out plan to reduce harmful emissions. Further, other than transport sector, several other dimensions exist where reduced carbon emissions can be achieved by proper planning and framing the policies. In this context, all the reasonable aspects and daily walks of life can be addressed for sustainable approach. These approaches may comprise reducing the waste material, composting, utility of public transportation at collective level and modern energy saving practices of cooking at large scales. For adoption such social behaviors at large scale both government and businesses community has to play vital role. The solely focus should be on awareness among masses at school level by promoting sustainable living for populace and future generations. In this way such menace of scarcity can be curbed in coming times leading to controlled carbon emission.

Renewable Energies:

Sgouridis et al., (2016) inferred that renewable energy comes from unlimited clean sources. It is better for the environment of the planet, making people less dependent on fossil fuels (which are the source of carbon emissions) and benefiting the economy. The Gulf region is expected to export green energy to neighboring nations due to the low cost of photovoltaic and hot weather. The UAE government has taken the lead in the past to expand renewable capacity. Renewable energies such as solar, wind, and biomass are expected to be used as clean energy that does not emit CO₂ during power generation. Scientists are working on various mechanisms and inventions to ensure a stable supply of electricity even if the weather, wind, and sunlight fluctuate due to natural phenomena. Photovoltaic power generation is a clean power generation method that directly converts the sunlight into electrical energy.

Martinelli et al., (2022) pointed out that many other solar power plants are in various stages of

production in Qatar and the MENA region as governments realize the importance of clean energy. Due to its importance, various nations including Qatar and the UAE are focusing on renewable energy. Scientists have suggested using ways to reduce carbon emissions in traditional carbon-emitting power plants as well. Biomass is an important source to achieve this objective. Japanese have been operating the Gushikawa Thermal Power Station since March 2010, where woody biomass, which is a carbon-neutral resource, is mixed with coal and burned.

Moreover, the output of solar power generation drops when clouds cover it, and the amount of electricity generated at night falls to zero. So, thermal power generation or other sources are used to adjust for that fluctuation to maintain a balance between supply and demand. Wind power generation is a method of generating power using the rotating motion of windmills (blades) that receive wind power. Like solar power generation, it is one of the clean power generation methods. With the aim of expanding the use of renewable energy and curbing CO₂ emissions, Qatar has prioritized solar energy. Al Kharsaah solar power plant can produce 800MW installed capacity and it has been supplying energy to the national grid since late last year (Admin, 2022).

Waste Management along with Cleaner Production Methods:

Martinelli et al., (2022) narrated that the modification in charcoal production is helpful for waste management. Already in Brazil, biomass occupies an important position in the energy mix. In current charcoal production processes, the gas stream from pyrolysis usually ends up directly in the environment, wasting energy and seriously polluting the environment. In Brazil, the “Sustainable Solid Biofuels Project”, one of the nation’s leading universities, collaborates with three firms to contribute to zero-waste and low-carbon production of charcoal by evaluating the feasibility and energy efficiency of different conversion technologies. The results show that carbon emissions can be dramatically reduced by liquid condensation, rather than burning the entire emissions from the furnace. In the proposed scenario, the non-condensable gas stream is burned and can be used to maintain the energy demand for pyrolysis. In addition, the condensation liquid can add value to the producer by exploiting this by-product into chemicals.

Keiller (2018) demonstrated the review of economy as a driving force in society for innovations. The need of sustainable economy is the key of sustainable development around the globe. The circular economy can relinquish the traditional charges and paves the way for innovative production and consumptions. In this context, the business opportunities and new models of economic prosperity may generate in society. Resultantly, the social practices may lead towards new norms and values that safe the environment. Impacts of circular economy ultimately put positive environmental impacts that lasts impeccable impressions for overall sustainability.

Moreover, cleaner manufacturing is one of the most critical ways of reducing carbon emissions. With time, producers realize the importance of reducing carbon footprints. It pays to coordinate the

machine, the technical infrastructure, and the subsystems of the facility. The design of the manufacturing facility might help reduce wastage and mitigate emissions. The biomass is efficiently transported to the burner resulting in the optimum utilization of resources (Gushikawa Thermal Power Station, 2022).

Re-usage and Recycling:

Recycling and re-usage are important elements to ensure sustainable development by decreasing environmental hazards, minimizing the waste material and save the resources for future usage.

Traverso and Feo (2020) concluded that recycling has direct impact on sustainable economy in any country of the world either developed or developing. The modern recycling technologies and implementation of programs may improve the quality, standard and speed of recycling. Effective recycling may be adopted at governmental level or private level that may ensure multi-dimensional benefits. The rates of goods and products may decrease, while improved job opportunities, enhanced social standards, and cleanliness may be other fruits in this regard.

Hwang and Kim (2020) deduced that the resource usage would be still a problem, especially if the waste material would continue to increase and their recycling would be missing. They argued that mines and steel mills would use their waste nearly carbon-free energy to make useful product like cars and batteries. The result would be electric cars that are produced and would drive without causing considerable CO₂ emissions. In this way, the recycling strategies must be formulated and implemented in industrial plants as well as in residential areas. Such promotion may leave lasting impression on the social behavior of the public along with sustainable economic aspects. The economic boom can also be achieved by proper policies of re-usage and recycling at massive levels. So, for future sustainability, the rate of recycling must be increased to maximum level.

Efficient Supply Chain:

The supply chain refers to the entire series of processes, including procurement of raw materials, manufacturing, distribution, sales, and disposal. The amount of emissions generated from this process is referred to as supply chain emissions. In order to attain sustainable development, the companies need to reduce activity, reduce emissions intensity and increase carbon removal.

According to report of IEA (2019), it is important to know that emissions intensity is the amount of CO₂ emitted per amount of activity. For example, producing 1 kWh of the same electricity will result in a different amount of CO₂ emissions depending on whether it is produced by coal-fired power generation or wind power generation. In other words, emissions intensity can be reduced through qualitative changes such as using renewable energy and changing the materials used in product manufacturing to those with lower CO₂ emissions. As a means of reducing CO₂ emitted by a company, there is a method called “negative emission” that removes CO₂ from the atmosphere that is not

emitted by the company. Although, it is true that many technologies have not yet been put into practical use, they are considered to be a necessary means of achieving carbon neutrality.

Eco Design:

Dalloul and Kusiak (2019) stated that the echo-design plays a vital role in sustainable architecture and also lessens the impacts regarding environment. It provides improved building construction and operations that result in high comfort and good performance. The surrounding environmental pollution is reduced up to maximum level by applying the said approach. The authors have recorded the evidences in the form of facts and figures to elaborate the beneficial aspects of eco designing. Along with the demonstration of artistic view, the eco designing is worthy approach for acquiring sustainable construction that provokes an efficient building environment.

Siriwardana and Kennedy (2019) examined that in developing countries around the globe, echo-design can play a peculiar role for promoting sustainability. In the context of economics, it improves durability of the product along with improved feasibility to use it for long times. The authors in the form of a case study reported the cost effective aspects of eco designing. The implementation of eco designing in Sri Lanka demonstrated that developing economies can acquire huge benefits by eco designing. It provides a very practical approach in the areas where general public along with the government agencies are suffering from insufficient budgetary allocations. Overall, the findings affirm that the said construction approach results in sustainable development.

Charter (2019) stated in “Designing for the Circular Economy” about the proceeding movement of repair cafes to promote eco design. The organizations attached with tactful work emphasize to reduce wastes and enhance the durability of goods. Meanwhile, the main focus would be on collection of data for first two years at “Farnham Repair Café” which influence the developers and designers to adopt such designing to acquire sustainability. In this way, the most repair demanding goods are entitled to be redesigned and more sustained goods would be created. Such an approach may decrease the waste quality and ultimately promote eco design in its vicinity. In addition, the environmental hazards can be eliminated and promotion of sustainable consumption can be achieved.

Hsieh and Wu (2020) argued about the massive role of eco designing in ensuring sustainability in a case study relating to mobile phones. Eco-design ultimately reduces the environmental hazards of producing and disposing of phones. In other words, the largest industry of the world i.e., the mobile phones may ensure environmental and economic sustainability. The findings of this case study may be applied to other IT based industrial units for achieving sustainability.

Conclusion:

In modern times, sustainable development is the critical issue around the globe and it must be properly addressed as soon as possible. Through the above stated review of literature, the broadest

paradigm is reported according the researches of reliable resources. The latest research depicts that ensuring sustainability needs urgent planning and implementation in multiple dimensions. These dimensions may comprise environmental pollution, sustainable consumption, recycling, waste management, controlled emissions of carbon and eco design, etc. The need of the time is to formulate a comprehensive plan of action by collaboration of all the stakeholders for a promising sustainable future.

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