

THE BUDDHIST ECO- FRIENDLY CONSTRUCTION TECHNOLOGY AND SOLUTION FOR THE PROBLEMS OF SUSTAINABLE DEVELOPMENT IN POST- MODERN CONSTRUCTION

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ABSTRACT

Buddhism is a religion which explained about the super mundane path “nibbana” to the living beings as well as it teaches ordinary people to utilize their life comfort through Buddhist teachings. Buddhism is a religion which highly appreciates eco-friendliness. The birth, enlightenment, passing away and all the special incidents in the life of the Buddha took place in association with nature. In “Wanaropama sutta”, “wattak khandaka, senasanak khandaka” in “Vinaya pitaka” and the Pali canonical text explains about the eco- friendly nature that should be maintain in the monastic tradition as well as in management and construction field. It also explained about the responsible consumption of the natural raw materials, how to utilize the raw materials for the maximum advantage. The Buddhist eco friendly construction is a concept which provides lot of solutions for the responsible consumption as well sustainable development in the post modern period. This concept is theoretically developed as a conceptual theory for the post modern responsible consumption and especially for the sustainable development process. Post modern construction is the latest construction technique of the modern century for the process of development in global context. But

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it is not a sustainable development as well as the responsible consumption is minimum. My research problem is, challenges for the responsible consumption and sustainable development in post-modern construction and why we should apply the Buddhist eco- friendly techniques even for the modern day constructions for achieving the goal of sustainable development. The main objective of the Buddhist sustainable development is, how we comfort our mundane life while attaining to super mundane objectives through the materialized world. The eco –friendly concept is the key element for the responsible consumption sustainability process. Sustainable consumption and development is about promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services. At the current time, material consumption of natural resources is increasing, particularly within Asia. Countries are also continuing to address challenges regarding air, water and soil pollution. Sustainable or responsible consumption and development aims at “doing more and better with less”. Net welfare gains from economic activities can increase by reducing resource use, degradation and pollution along the whole life cycle, while increasing quality of the production. The use of natural raw materials, the ventilation process, wastage management, make use of the natural light, use of enough insulation etc. are some of the major challenges in the Post modern constructions. But a Buddhist eco-friendly concept provides lot of solutions for it. It is a sustainable process based with environmental friendly nature. So in this research paper I tried to prove the productivity of the Buddhist eco- friend construction technology and how it provide solutions for the problems of responsible consumption and sustainable development in post- modern constructions. Main conclusion is Buddhist eco- friendly construction is the ideal solution for the present matter in sustainable development. This concept of the Buddhist eco-friendly construction technology is theoretically developed in university of Sri Jayewardenepura in Sri Lanka and looking forward to present in global Buddhist platform in UN conference.

Buddhism is a religion which explained about the super mundane path “nibbana” to the living beings as well as it teaches ordinary people to utilize their life comfort through Buddhist teachings. Buddhism is religion which highly appreciates eco-friendliness.

The birth, enlightenment, passing away and all the special incidents in the life of the Buddha took place in associated with nature. In the verses of senior monks the Buddha had appreciated the natural beauty of the nature.

*“The trees are now crimson, venerable sir,
They have shed their foliage and are ready to fruit.
They are splendid, as if on fire;
Great hero, this period is full of flavor”.*

(Sujatho, Walton, 2014, p.121)

In “Wanaropama sutta”, the Buddha had explained the importance of the being eco friendly and protecting mother nature.

*“Aramaropa wanaroopa yejana sethukaraka
Papancha udapanancha – ye dadanthi upassayan
Thesan diwacha raththocha sada punnan pawaddathi”.*

(Sanyutta nikaya1, 2006, p. 60)

“Wattak khandaka, senasanak khandaka” in “Vinaya pitaka” and the Pali canonical text explains about the eco- friendly nature that should be maintain in the monastic tradition as well as in management and construction field.

Post modern construction is the latest construction technique of the modern century for the process of development in global context. With the fourth industrial revolution development of the construction field and the concept of the sustainable development and the problems of the post modern sustainability came to existence in the present period of time. Eco-friendly, nature-friendly, and green are sustainability and marketing terms referring to goods and services, laws, guidelines and policies that claim reduced, minimum, or no harm upon ecosystems or to the environment. This term most commonly refers to products that contribute to green living or practices that help conserve resources like water and energy. Eco-friendly products also prevent contributions to air, water and land pollution. Eco-friendly, or ecological, construction is building a structure that is beneficial or non-harmful to the environment, and resource efficient. Eco-friendly construction has developed

in response to the knowledge that buildings have an often negative impact upon our environment and our natural resources.

“Buddhist monarchism of India had much in common with the monastic establishments of Europe, a condition due to the similarity of their aims. For instance the Buddhist monks, as did their Cistercian brethren, planted the houses of their order in wild and desolate places for apparently the same reasons that they might conduct their observances undisturbed by the distractions of any human environment. In a like manner their habitations had a similar beginning, for just as the cloister with its simple lean-to roof on stone pillars was the first step in the construction of the Benedictine monastery, so the early Buddhist vihara consisted of an open court, corresponding to the cloister-garth, enclosed also by a lean-to roof propped up by wooden posts”. (Brown 1956, p. 27)

At the very beginning the concept of the Buddhist monasteries in India maintained a very simple structure according to the vinaya precepts in the pali canonical texts. The Jainese influence on the rainy retreat season. The Buddha had put sanctions on the continuous travelling during the rainy season as it made harmful effects for the environment.

“Anujanā bhikkhūve arāmaṇa...” (Mahāvaggapāli, mahābhāṇḍakā) had given approval for the construction of the monasteries for the monks. But the Buddha had explained the rightful way for the construction as well as had clearly explained what the basic necessities of constructing the monasteries were.

*“Sithan unha patihanthi – thatho wala miganiṇṇa
 Sirinsapeṇṇa makase – sisire wapi wutathiyo
 Thatho wathathapo soro – sanjatho patinnathi
 Lenaththancha sukaththancha – yaithucha vipassithu”.*

(Chullawagga Pāli, senasanakkhandakā, 2006, p. 184)

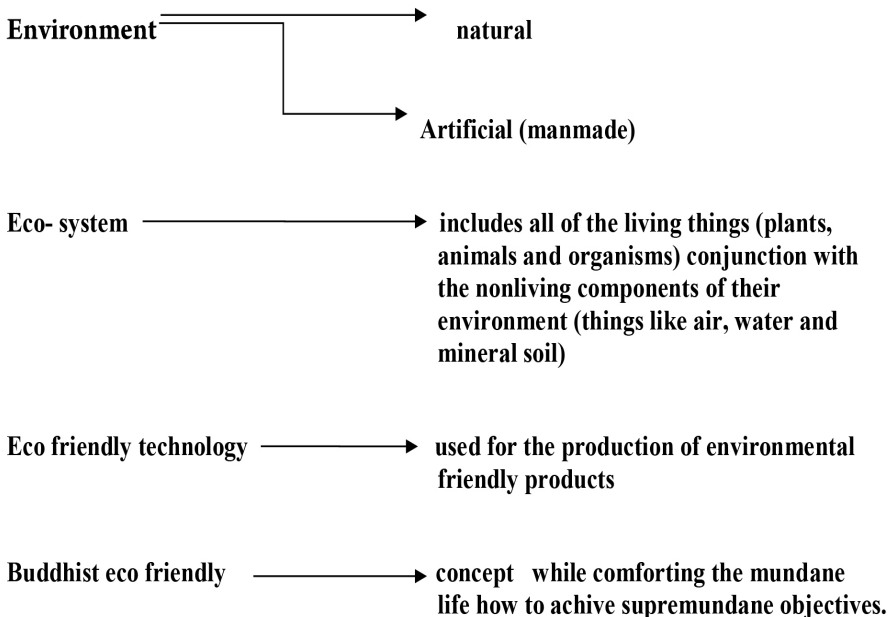
To protect from the cold and hot climate, to protect from the animals and insects and also to protect from the cold and hot wind the monasteries were made. Also mention it helps for the purpose of meditation as well as for the rightful protection of self

from the harmful environment effects. It explained the basic or the fundamental needs of the human beings.

So at the very beginning Buddhism explained a basic concept for the construction of the monasteries and hermitages. But with the period of time it becomes too complex level. Especially in the Sri Lankan context, it developed in unique way based with architectural landscaping designs of their own way.

1. THE BUDDHIST ECO FRIENDLY CONCEPT

The concept of eco friendliness is already established in the Buddhism. The fundamental teachings of Buddhism are always to protect the eco- system. It always appreciates the environmental beauty. Especially through this concept, it explained the sustainable development process without damaging the nature. The basic idea about the environment and eco-friendliness can be examined through following sketch.



The context and background of the Buddhist eco-friendly construction technology

The Buddhist eco- friendly construction technology is a concept that existed longer period of time and still a great solution for the problems in the modern sustainable development process. It explains

about the fundamental idea about the environmental friendly idea towards the construction and sustainable development. Also how the Buddhist principals can be applied to the construction process.

When consider about the background of the research, social background explained about the sociological importance of this research work. At the present context material development is one and only considerable factor in the post-modern period. So as a social group always focus on the sociological needs only. Development needed for the material perspective not for the achieving the sustainability. So the modern sustainable needs these types of concepts to uplift their productivity. Political background of the third world development country is always competitive with the environmental friendliness. As they focused less on that point , they work hard for the achieving only the development goals in their political arena. Sustainability is a minimum factor consider in their perspective while their main aim is only to achieve the material development. The political back ground of the developed country also to develop further more and more. So it also considers lesser attention for the sustainability. But in this Buddhist eco-friendly concept provides political solutions for the developing, under developing countries how to achieve the goal sustainable development through a minimum to the environment. And also it provide solutions to the developed counties in the post – modern period to the maximize their environmental friendly index in percentage for the minimize their sustainable development problems. Economic background always explains the productivity of the research. For the post –modern developed and developing countries the sustainability and its objects depends on the economy. But in this project it explained how to utilize their economy to achieve their sustainable goals. Always environment friendliness is challenged with economic stability. Economy is the key factor for the sustainability. Even though Buddhism provides lot of solutions for the Green Economy and sustainability. Green economy and its solutions for the sustainable development provide basic economical needed for the Buddhist eco friendly construction technology and the sustainable development problem in highly acceptable manner.

So the socio, cultural, political , economic background of this research provides lot of solutions for the sustainable development problems in the post-modern constructions. The Green technology concept is one of the fundamental concept in future world , this research explains about the Buddhist approaches in post –modern world with sustainable goals.

2. THE CONCEPT OF THE SUSTAINABLE DEVELOPMENT

The term “sustainable” according to the oxford dictionary, “Conserving an ecological balance by avoiding depletion of natural resources”.

“Sustainable development is the organizing principle for meeting human development goals while at the same time sustaining the ability of natural systems to provide the natural resources and ecosystem services upon which the economy and society depend...” (UN defines)

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987)

Sustainable development has emerged as the guiding principle for long term global development, without damaging the natural sources. So it has become the key element in post modern period of time.

The problems of the sustainable development in post modern constructions

Main issues of the sustainable development	Mino issues of the sustainable development
The scarcity of pure land, air and water	Reputation management
The limitation of the energy sources	Risk management
Global warming and climate change	Employee satisfaction
Material wastage management	Innovation and learning
Increase of population density	Access to capital

Increase of people density in urban areas	Financial performance
Scarcity of natural raw material	Labor problems

3. THE POST- MODERN CONSTRUCTIONS

Postmodern architecture emerged in the 1960s as a reaction against the perceived shortcomings of modern architecture, particularly its rigid doctrines, its uniformity, its lack of ornament, and its habit of ignoring the history and culture of the cities where it appeared. In 1966, Venturi formalized the movement in his book, *Complexity and Contradiction in Architecture*. He summarized the kind of architecture he wanted to see replace modernism. In place of the functional doctrines of modernism, he proposed giving primary emphasis to the façade, incorporating historical elements, a subtle use of unusual materials and historical allusions, and the use of fragmentation and modulations to make the building interesting. He urged architects take into consideration and to celebrate the existing architecture in a place, rather than to try to impose a visionary utopia from their own fantasies. This was in line with Scott Brown's belief that buildings should be built for people, and that architecture should listen to them. Starting from that point the post modern construction had rapid development in the construction field. At the present with the post structuralism, it hasn't any type of boundaries. It is existing as a free style of art in the modern period of time.

4. POST MODERN CONSTRUCTIONS AND THE FOURTH INDUSTRIAL REVOLUTION

The fourth industrial revolution had took place with vast development of the technological field and later spread it in to all the other fields of the post modern society in quick time. The possibilities of billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and access to knowledge, are unlimited. And these possibilities will be multiplied by emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy

storage, and quantum computing. Already, artificial intelligence is all around us, from self-driving cars and drones to virtual assistants and software that translate or invest. Impressive progress has been made in AI in recent years, driven by exponential increases in computing power and by the availability of vast amounts of data, from software used to discover new drugs to algorithms used to predict our cultural interests. Digital fabrication technologies, meanwhile, are interacting with the biological world on a daily basis. Engineers, designers, and architects are combining computational design, additive manufacturing, materials engineering, and synthetic biology to pioneer a symbiosis between microorganisms, our bodies, the products we consume, and even the buildings we inhabit.

With the digitalization of all the things in the new modern era, BIM building information modeling, building lifecycle management, construction supply chains, The use of prefabrication or offsite, modular construction, with components being produced in automated factories, shows signs of revolutionizing the housing market, enabling relatively rapid construction of low cost but high quality housing to meet social demand.

5. THE THEORY OF DEPENDENT ORIGINATION FOR THE ECO-FRIENDLINESS

- i. When this is, that is - (existed in the eco-system)
- ii. This arising, that arises - (origin within the environment)
- iii. When this is not, that is not - (if it is not in environment)
- iv. This ceasing, that ceases - (vanished through the environment)

Through the theory of dependent origination, the theory of Buddhist eco-friendly technology can be revealed. It can be use as a fundamental concept. As well as a universal application for the post modern period for the problems of sustainable development.

5.1. Characteristics of the Buddhist eco-friendly construction technology

- i. Aim – “Do more by less”, get maximum efficiency from the products.
- ii. Optimization of renewable resources without harming environment.

- iii. Environmental protection.
- iv. Environmental friendliness.
- v. Obtain energy from natural resources.(sun, wind, water,)), energy efficiency
- vi. Ecological sustainable development
- vii. Reducing harmful waste
- viii. Reducing environmental effect
- ix. To provide safe and pollution free environment.

5.2. Basic features of the Buddhist eco-friendly concept

Specific objective

The construction has a specific objective. For e.g.- stupa had constructed for the worshipping and to place the holly relics., “panchawasa” were established as a system of monasteries complex. The specific need of the construction always varies with the aim of the construction.

Weather and Climate

They always focused on the weather and climate in “senasankkhandaka” in chullawaggapali explained it very well. The construction technology always paid much more attention to the weather and climate factor. The all the development and the sustainability of the construction depends on the weather and climate resistance of the construction. But in Buddhism it explained as a basic need and to protect the climate and whether the construction had been used.

“Sithan unahan patigahani thatho walamiganicha

Siringape cha makase sisire chapi utathiyo.”

(Chullawaggapali, senasanakkhandaka, 2006, p. 186)

Necessity

The necessity of the construction is depended with the different varieties of needs. The “panchawasa” system includes, “pasada” type of construction with some stories for the usage of the monks, “hammiyan” also type of a building construction that was also

used in the monastic construction in the early period of time. “Panchawasa” includes with “saba,” ‘prathimalaya’ image house, “bodhi, pasada, and stupa”. It was divided into two parts according to the necessity major and minor.

Land space

The land was used in very useful manner for the all the constructions of the monasteries. Especially the park system that existed in the Anuradhapura region has higher eco – friendly value. Eg, Mahamewna park, ranmasu park, ritigala, rajagala also can be seen some of the greatest landscaping techniques of the Buddhist eco- friendly construction technology.

6. THE BUDDHIST ECO-FRIENDLY CONSTRUCTION TECHNOLOGY AND ITS SOLUTIONS FOR THE PROBLEMS

The Buddhist eco friendly construction technology used in, The ancient parks included with archeological and landscaping techniques, e.g. Mahamewna park, Ranmasu park, Nandana ,Ritigla parks for the usage of landscaping techniques only based with the natural raw materials.

Ancient irrigation system used the Buddhist eco friendly construction technology. Monasteries such as Mihintale, Madirigiriya and Alahana Parivena, which performed as the teaching centers were acquainted with hygienic precautions. Hospitals & Soakage pits were designed with residential treatment facilities & separate sewerage systems were constructed with Manholes. The urine passed through urinals was cleaned by using local mechanical & chemical system to avoid the contamination and preserving the environment. Drinking water was supplied through advance irrigation system & brick wells. The advanced medical baths or stone canoes were built onsite for residential treatment. To improve the mental health indoor and outdoor religious structures were constructed. protect the environment by reducing the toxic emission of gases and liquids from the wastage out –put. The slavery is not used for any these constructions.

The concept explained in the “vinaya pitaka” was practically used with the Buddhist eco – friendly technology , e.g.

(Vinaya pitakaya, wattak Kandaya, chantagarawata) Reduce fat; warm the body, Prevent from skin diseases .The importance of technology was still at the present use the steam bath system in post modern constructions. But it cost much money as well as the energy. But this is eco friendly construction in the Buddhist monasteries.

7. CONCLUSION

The Buddhist eco- friendly techniques can be applied for the sustainable development process in practical manner. The main objective of the Buddhist sustainable development is, *how we comfort our mundane life while attaining to super mundane objectives through the materialized world*. Buddhist eco- friendly construction technology is the ideal solution for the , post modern constructions to achive the goal of sustainability. Get the maximum advantage of the natural raw material and natural eco-system, without harming the natural source by saving it to future generation. *Man always tries to against nature, but its fail in process*. The eco –friendly construction technology is the key element for the sustainability process. Sustainable consumption and development is about promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services. At the current time, material consumption of natural resources is increasing, particularly within Asia. Countries are also continuing to address challenges regarding air, water and soil pollution. Sustainable or responsible consumption and development aims at “doing more and better with less”. Net welfare gains from economic activities can increase by reducing resource use, degradation and pollution along the whole life cycle, while increasing quality of the production. The use of natural raw materials, the ventilation process, wastage management, make use of the natural light, use of enough insulation etc. are some of the major challenges in the Post modern development. But Buddhist eco-friendly construction technology provides lot of solutions for the problems of the sustainable development in post modern period. So, It is a sustainable process based with environmental friendly nature. In this research paper I tried to prove the productivity of the Buddhist eco- friendly construction technology and how it provide solutions for the problems of responsible consumption

and sustainable development in post- modern period. So the Buddhist *eco- friendly concept is the ideal solution for the present matter in sustainable development.*

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