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Integrating Lean Green Technique Through Single Combined Strategy in Marble Industry

Saurabh Tege and Nilesh Diwakar

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Saurabh Tege[1], Nilesh Diwakar[2]

[1]Geetanjali Institute of Technical Studies, Udaipur, Rajasthan India
[2]SSSUTMS, Sehore
[1]saurabhtege4@gmail.com,[2]nileshdiwakarsssutms@gmail.com

Abstract: Today's scenario is technology-based and for huge growth, development with all resources all technology should be implemented at all stage s of manufacturing units. The quarrying of marble is not quite the same as the mining of different minerals. In marble quarrying, huge sizes of squares are exhumed. Prior extraction of marble was done physically by utilizing a drill and jib crane. In the marble mining industry, this issue arises as much that they willing not to implement latest trends because of a lack of knowledge and understanding. In this paper, the author should give a framework development through lean green technique, due to which wastages to be minimized in all aspects as well as environmental consideration also takes place.
Keywords: Environmental Design, lean green technique, RFID, IoT, Sensor Based Technology

1. Introduction

For quite a long while, fabricating rehearses have been for the most part centered around fulfilling or making requirements, while retaining seriousness with regard to item consistency, marketing potential and growth. Specifically, lean assembling, first presented for the auto business in Japan, has to a great extent been viewed as quite possibly the most compelling assembling ideal models. Lean assembling furnishes associations with the devices to improve their intensity dependent on expanding an incentive to clients, regarding profitability, efficiency, quality and costumers' fulfillment, by diminishing the assets utilization through waste end. This sort of assembly methods of logic focused on the interest of consumers, along with the increased demands of individuals for daily comforts, have spurred an increasing interest in the object, fulfilled by a considerable measure of goods produced, wound

up in an evolving era of pollution and squanders. In this particular case, organizations are urged to become more constructive with regard to their natural and social status, heading towards more feasible assembly rehearsals respect to the prominent conceptualization [1] of Triple-Bottom-Line (TBL) maintenance (appeared in Figure 1), which recommends that an organization would have the option to accomplish manageable outcomes gave it is fit for improving ecological, social and financial exhibitions all the while analysts accept lean assembly with a revived interest in producing greener arrangements capable of limiting squanders in this line, yet additionally of lessening, by expanding, altering adjusting and refreshing lean approaches, the natural and social negative effects of the generally utilized modern practices with sustainability through various technologies such as RFID, Sensor based technology, IoT etc.

Albeit some encouraging outcomes have been accounted for the composition by applying lean methods to achieve greener targets [2,3,4]. Many analysts agree that lean techniques have not yet advanced to the stage of improvement needed to ensure manageability [3,8]. In this way, they also suggested that, in order to produce fair performance, green production activities should also be considered [5]. Lean Green practices are centered around lessening unsafe discharges, disposing of the utilization of inefficient assets, reusing, and limiting wellbeing hazards all through the whole assembling measure, by limiting the natural impression during the entire item life cycle [9]. On one hand, there are scientists that concur that green techniques, for example, Environmental Design vs Green management of Supply Chain, improve the association of the monetary and the ecological frameworks, creating a practical turn of events and undertaking incorporation [10]. Then again, there are scientists that express that green practices are sufficiently not to guarantee manageability. Besides, professionals regularly contend that green practices can be a weight for arriving at enhancements with respect to plan and creation measures. In this clashing setting, specialists and experts accept that when executed solely, neither lean nor green practices have shown the option of preserving the usual balance between economical, ecological and social perspectives [8] At that point, the mix with lean green approach and also characteristics can be strengthened and their drawbacks can be draw, which has been suggested to meet the existing management requirements.

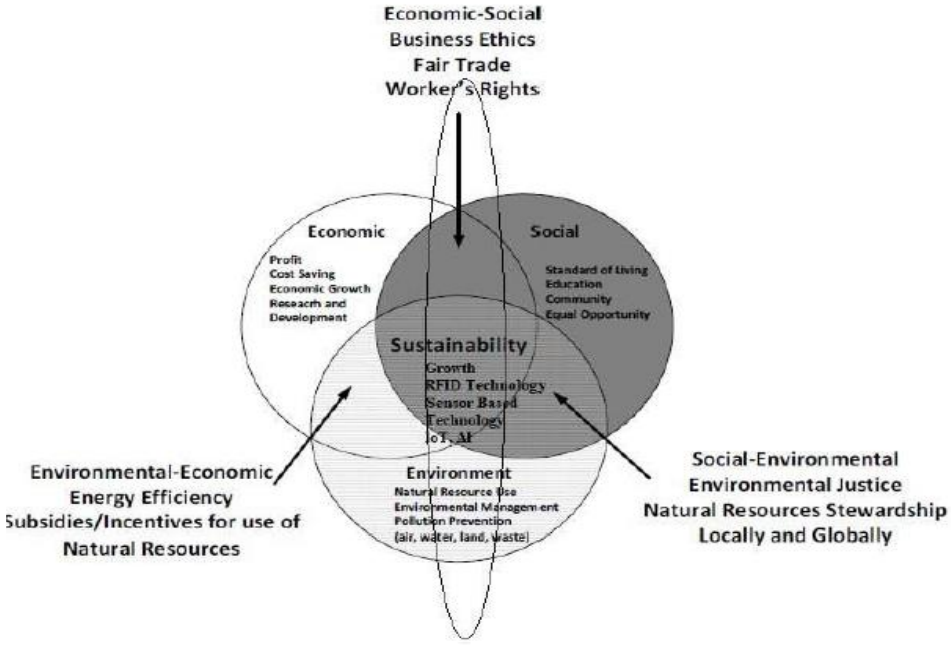

Figure 1: Triple-Bottom-Line (TBL) model for attaining sustainability

2. Previous Research Study:

Lean A short writing audit of the connected investigations recently led in various pieces of the world has been examined here to comprehend the meaning of directing the current exploration. These were partitioned into subsections; Harmful effects of marble squanders, Life Cycle Assessment, Cleaner Production and uses of marble squanders in helpful items.

Gursel et al., (2014) audits the qualities and shortcomings of cement LCIs to date, and offers an exploration activity guide for development in the nature of future LCA concentrates in that area. This examination guide offers Life Cycle Assessment based choice emotionally supportive network for makers. An exhaustive writing review was directed in such manner and their fundamental outcomes were made and looked at. It was uncovered that in endeavor any LCA study the gathering of sound information of life-cycle stock (LCI) is a significant and basic advance. Based on which ensuing LCA and LCIA (life cycle sway evaluation) can be based.

Hanieh et al. (2014) zeroed in on the natural, financial, and social effect of stone and marble preparing industry. The goal of the investigation was to presents the lifecycle of the interaction, ID of contamination area of interest and proposes alleviation measures for productive utilization of crude materials including common stone, water utilization and energy use during handling. Recuperation, Reuse and Recycle, 3Rs standards are utilized to boost the yield and limit the losses to improve measure

proficiency. This will give a casing work to future activity in this area.

Kushwah et al. (2014) contemplated that the utilization of marble slurry in easing. Properties of marble slurry are Bulking is 42%, which is generally outrageous at 5% sogginess. Fineness modulus was found to be 0.93. According to these limits Marbleslurry can be utilized in as Curing help.

Ioannidou et al. (2014) detailed Life Cycle Assessment (LCA) to distinguish best waste treatment framework office having less natural effects. For that reason information were gathered from two stone preparing offices in the investigation region and assessed. Furthermore, the utilization of other divider treatment frameworks like slender cladding and rock walling utilized were likewise assessed. The outcomes show that the stone item generally utilized in the design rather than slim cladding or rock divider framework. It was because of the accessibility of crude materials locally. Consequently it was inferred that the utilization of stone items in divider framework has less natural area of interest as contrast with other cycle.

Li et al. (2014) completed Life Cycle Inventory examination (LCI) to make possible enhancements in concrete industry. The itemized life cycle stock (LCI) of concrete assembling plant included total info and yields. The useful units are 1Tonne of Portland Ordinary concrete.

The information contain not just the conventional things, for example, crude materials incorporates limestone, dirt, gypsums, energy (coal and power), and admixtures (heater slag and fly debris), yet in addition new water which isn't focused in other writing. The yield information contain ozone depleting substances as well as the perilous air contamination just as commotion and hefty metal outflows which are normally disregarded by different analysts. The information were estimated nearby and assessed for to fuse it into the utilizations of diminishing toxins and waste warmth recuperation advancements in concrete industry.

Rajni et al. (2014) use of stone waste as a marble powder in mortar and concrete, both pozzolanic and non-pozzolanic, were studied. The stone waste can be utilized for developing insignificant exertion building materials, for instance, block, square, tiles, etc.

Uygunoglu et al. (2014) explored the utilization of marble squander and reused total in the creation of Self Compact Concrete. For that reason arrangement of control examples of cement containing marble squander and reused totals were arranged and tried for droop test, J-Ring test, air content, compressive and rigidity along modulus of flexibility were resolved. Results show that no huge contrast were seen in the mechanical properties of self compacting solid utilizing marble squander and reused totals. It was reasoned that the marble squander and reused totals can be utilized in self compacting concrete.

W. Rehman et al. (2014) found that the marble waste squares are lower in strength than common ended squares, yet their insignificant exertion, straightforwardness and speed of creation recommend them to be used in zone where higher strength isn't concern. They can be utilized in sanctuary for people in quake and flood impacted zones.

Singh et al. (2015) thought about that Finishing Material Marble Paste is better than divider mud. Which has more strength and more affordable. Marble stick is a mix of slurry powder with white concrete and relaxed or hydrated lime close by staying trained professional. Goodly influencing the environment. Put aside energy and money may be used somewhere else for the headway of the country.

Dharma et al. (2015) Studied that the marble waste and different kinds of waste can be used as filling material as 15% overriding with regular soil on thoroughfare advancement. Improve water conductivity, increases in the degree of coarser particles. It reduces quite far, raises beyond what many would consider possible and decreasing in the flexibility record of the earth in.

Nabil et al. (2015) investigated that the conceivable utilization of stone slurry powder in fake stone creation. The test results showed that the compressive strength extended by solid extent, the compressive strength of the fake stones is generally impacted by the solid to stone powder percent, compaction squeezing factor and reestablishing time.

Jehangir et al. (2015) researched the wellbeing hazard related with Marble effluents. They dealt with renal (kidney) stone development in the inhabitants of locale Rajsamand in Khyber Pakhtunkhwa region of Rajsamand. Kidney stone was seen in 1000 patients utilizing Marble wastewater polluted drinking water. In addition, the finding of this examination shows that marble preparing industry represents a potential human wellbeing hazard because of constant openness of marble effluents. This instigated persistent state of renal stone development requires appropriate consideration and alleviations to ensure the human wellbeing.

3. Lean & Green Technique

Finally, as shown by the investigation of selected manufacturing units, this review finds that typically generating units do not zero in on the principle of waste reduction, asset profitability, authoritative improvement, and source decrease, among the key similarities between the two practices; while differentiating their fundamental core, the concept of waste, the form of consumer, the assembly processes. In figure 2, relation between lean green has shown very well i.e. shown waste reduction in form of quality, cost, customer satisfaction, process waste etc.

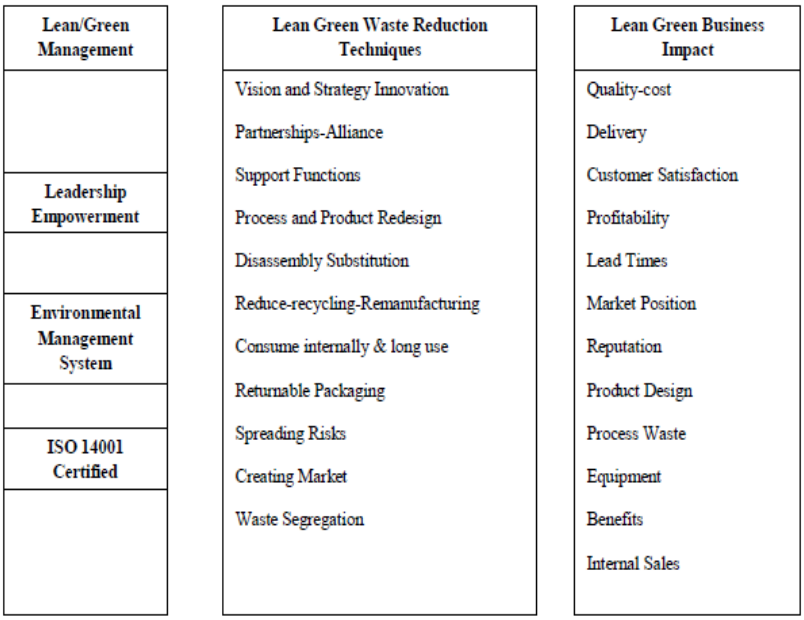

Figure 2: Relation between lean green techniques

4. Incorporating Green and Lean Activities through a single combined strategy

The standard and contrary concentrations of lean and green approaches are addressed at a high level. Consequently, it is then the problem of whether working together is genuinely equitable and appropriate. Furthermore, the composition is not inherently find exceedingly negligible observational proof of active instances in lean-green schemes, but the findings that can actually be found are often contradictory. On the one side, there are scholars who fight against the coordination between lean and green methods when they can synchronously make a collaborative effort to minimize waste. Energy, material and time usage, store network the load up and thing life cycle smoothing out. Of course, there are those that articulate that lean and green methods are not mostly possible; there are a few places where it can be especially difficult to go with them. For instance, in figure 3 stock levels are maybe the most essential points of view when merging lean and green approaches. For the present circumstance, while lean practices base on making, moving and squeezing little package expectation to fulfill customers' essentials.

At the point where everything is said in fact, experts who are reluctant to join the two programs are stressed whether lean practices based on waste decreasing from the

extra-value viewpoint of the consumers, expense, efficiency and lead times would be beneficial, irrespective of whether green practices focusing on biological objections that are not by and wide according to lean objections are combined. In this line, manufacturers propose that the core guideline test involves completing how can environmental issues be coupled with lean principles without reducing the economic sustainability of the last-mentioned, but still maintaining the economical, ecological, and social agreements? Furthermore, it is reported that green techniques would not, for the most part, restrict the negative effects that going green can have on organizational perspectives in a combined context.. have, being similarly clear the converse route around. Finally, in, makers moreover express those lean-green philosophies ought to stand up to the very troubles when openly executed, lean and green techniques ought to go up against that. For example, in, it is included that, as it is generally the situation of green practices, experts may have to focus on changed techniques to complete the lean-green technique.

For obtaining green outcomes, they cannot substitute green activities, but they can provide a clear enhancement, agile and transparency culture for staff to create an effective and amazingly beneficial atmosphere for the use of green exercises. Makers agree with these observations, sharing that green chips will be a catalyst away from the lean community, empowering the collection of traditional activities. Similarly, a detailed definition of such a reactant effect can be found where it has been demonstrated that the influence of lean activities on the implementation of operating stock companies can be increased by hindering tainting and reuse. In order to obtain green outcomes, they cannot substitute green activities, but they can provide a clear enhancement, agile and transparency culture for staff to create an effective and amazingly beneficial atmosphere for the use of green exercises. Makers agree with these observations, sharing that green chips will be a catalyst away from the lean community, empowering the collection of traditional activities. Similarly, a detailed definition of such a reactant effect can be found where it has been demonstrated that the influence of lean activities on the implementation of operating stock companies can be increased by hindering tainting and reuse. Interdisciplinary gatherings aware of consolidating lean and green practices in two amassing associations are coordinated. There are too many technologies used such as IoT, RFID in transportation for monitoring and controlling and ERP system which incorporated all inventory stocks. Makers agree with these observations, sharing that green chips will be a catalyst away from the lean community, empowering the collection of traditional activities. Similarly, a detailed definition of such a reactant effect can be found where it has been demonstrated that the influence of lean activities on the implementation of operating stock companies can be increased by hindering tainting and reuse.

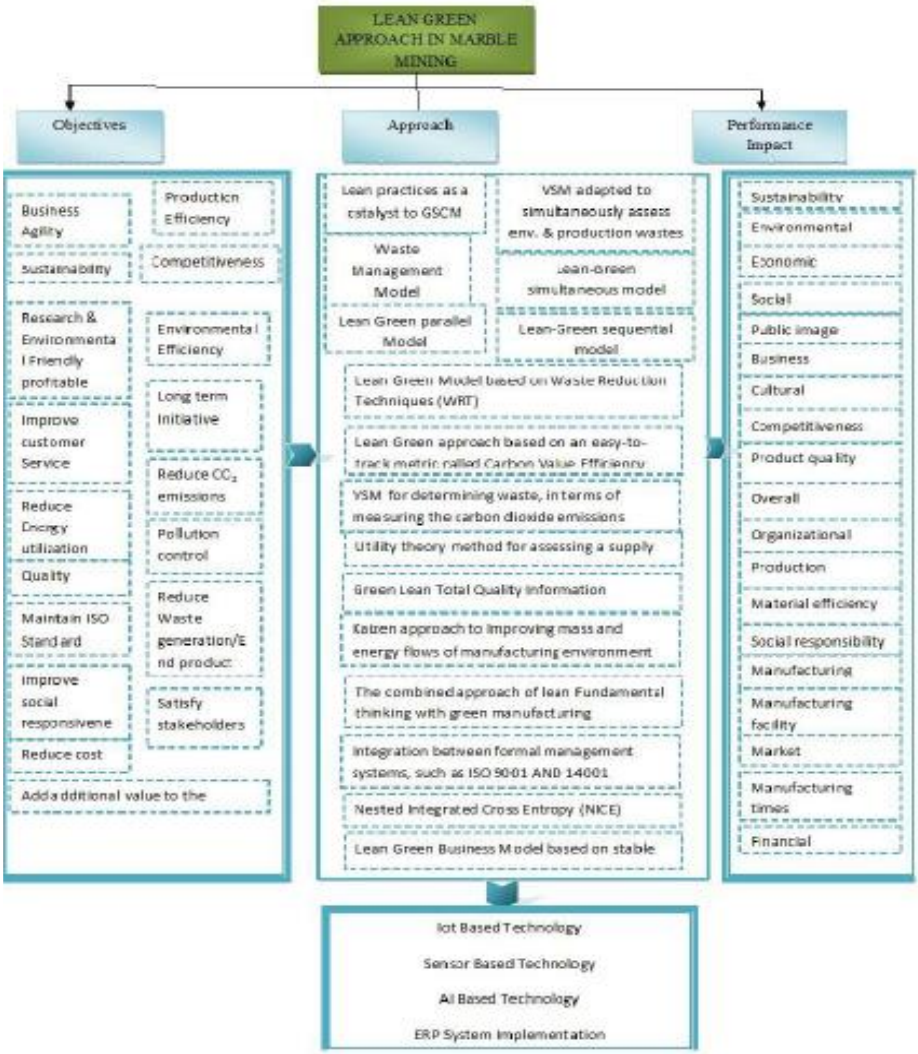

Figure 3: Summary of the recommended lean-green solution approach and their performance impact

5. Conclusion:

In marble mining industry this issue arises as much that they willing not to implement latest trends because lack of knowledge and understanding. In this paper author should give a conceptual framework development through lean green technique, due to which wastages to be minimized by using technologies such as sensor based technology, IoT, RFID technology in all aspects as well as environmental

consideration also takes place. By using all these long term benefited taking by mining industries which will give benefit to industry as well as whole supply chain

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