

The definition of sustainability engineering essay



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A Sustainable development is a development which meets the needs of the present without compromising the ability of future generations to meet their own needs. The natural environment is the source of all substances that sustain human life on this planet and is also an invaluable sink for our wastes. Because of this it is vital that it doesn't get worn out or become unusable. This is where sustainability comes into play. With the right techniques, measurement and implementation of policy or even law, we, as a race, can act in a sustainable manner and take what we need from the planet without causing it harm. This can be applied from the biggest city down to the smallest design project. (Sustainable development for engineers. Karel Mulder)

The History of Sustainability

The idea of sustainability as we know it emerged in a series of summits and reports during the 1970s and 1980s. The UN Stockholm Conference on the Human Environment, in the year 1972, marked the first great international meeting on how human activities and treatment of the earth were harming the environment and putting the human race at risk. The 1980 World Conservation Strategy promoted the idea of environmental protection in the self-interest of the human race and in the interest of the planet.

The Brundtland report said that the halting of economic development was not a feasible option, but it must change to work with the planet's ecological limits. It also popularized the term sustainable development (<http://www.sustreport.org/background/history.html>). It was the World Commission on Environment and Development that brought the idea of sustainable development into broader dissertation. Saying this, it was not until the UN <https://assignbuster.com/the-definition-of-sustainability-engineering-essay/>

Conference for Environment and Development and the Earth Summit, held in Rio de Janeiro in 1992, that the concept was spotlighted on the centre stage of the GPPD (global public policy debate). Our Common Future was the third in a long list of reports to focus attention and discussion in the world scientific community. The interest in sustainability that thrived during that time period was accelerated by a series of incidents and discoveries, such as the leak of poisonous gas from a chemical plant (Bhopal, India), the hole in the Antarctic ozone layer, the explosion and radioactive release (Chernobyl, Ukraine), leaking toxic chemical dumps, such as Love Canal and worry and conflict over decreasing natural resources (e. g forests and fisheries). This has led us to where we stand today on the topic of sustainability and its ever growing need to be properly measured, implemented and sustained in our developments and advances ([http://www. reliefweb. int/rw/rwt. nsf/db900SID/LHON-68ZJDP/\\$File/Introducing_Sustainable %20_Development_Introduction. pdf](http://www.reliefweb.int/rw/rwt.nsf/db900SID/LHON-68ZJDP/$File/Introducing_Sustainable%20_Development_Introduction.pdf)? OpenElement).

Why do we need Sustainability?

The easiest answer is that unsustainable societies collapse. Easter Island and the Maya in Central America are just some example of its importance. These were once powerful societies but they came apart and collapsed because they used there resources relentlessly until they eventually couldn't function as they used to and became victims of devolution. And how does this relate to modern day society? It's all around us, global warming due to our industrial activities, the impending oil/energy crisis due to our dependency and lack of effective, sustainable alternatives and the general breakdown of social conscience through globalisation. It is vital that human kind becomes

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largely (Sustainable development for engineers. Karel Mulder) sustainable to combat these challenges and continue progressing as a race. This kind of sustainability cannot be achieved at once and starts from the basic building blocks of society upwards. This means that each new project that's undertaken should be required by law, or at least strong policy, to comply with sustainability standards. This is the area that will be focused on in this project, evaluating the sustainability of a design project. This starts with examining the policies that are in place in certain countries/counties and considering the unification of these policies to provide a world wide standard (Rough guide to sustainability. Brian Edwards). Also the way in which sustainability is measured is an area of research which is of vital importance. Without proper measurement, sustainability will never be implemented properly and to full effect. The methods of measuring sustainability will also be studied to determine if it's possible to improve on the measuring systems already present. This will take the form of an evaluation matrix to measure the sustainability of a design project.

Basis of Sustainability

As we enter the 21st century, the concerns over the environment and its values that took root in the 1960s have brought into clear focus an awareness of the earth's fragility as a natural system. Sustainable development implies a redefinition and review of concepts such as wealth, production and interest. The basic need of sustainability is co-operation and international agreement. In an ideal system, economic theory should find a method of including assets of nature and human development into its equations. Although it is not possible to layout the definition of a fully sustainable

society as a situation to aim for, there are some basic principals that can be examined:

The consumption of resources should be minimized.

Consumption of non-renewable materials should be phased out.

Renewable materials and energy sources should be the preferred choice.

One should not just contribute to the private good, but to the common good also.

The question is asked in many of the articles provided on the web, Can we afford sustainability? After a minor amount of study the answer is clearly, we have no choice. If society continues on the road it has taken then the human race is facing chaos and decline. There is no alternative to sustainable development

(Sustainable development for engineers. Karel Mulder).

Sources of Non-Sustainability

As it stands the planet is rife with sources of unsustainability and this is, at last, coming under some strong scrutiny. Apart from population stabilization, five common but quantifiable criteria for sustainability are recommended, including:

- 1: The stabilization of greenhouse gas concentrations in the atmosphere.
- 2: The stabilization of acidity in rainfall.

3: The reduction of wasteful uses of heavy metals to natural enlistment rates.

4: The abolition of agriculture based on pumping fossil water from non-renewable sources/aquifers

5: The eradication of loss of arable land because of erosion or salination.

Other measures, such as the preservation of biodiversity, might be added to the list.

(http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VDY-3Y2MYGC-C&_user=906470&_coverDate=03%2F31%2F1996&_rdoc=1&_fmt=high&_orig=search&_origin=search&_sort=d&_docanchor=&view=c&_searchStrId=1489005091&_rerunOrigin=scholar.google&_acct=C000047746&_version=1&_urlVersion=0&_userid=906470&md5=55b4d1a71740ab0900429fdcc5168d36&searchtype=a)

Unsustainable actions/activities can be defined as those that: require a constant usage of non-renewable resources or use a greater amount of natural resources than the earth can generate, are the source of degradation to the environment, require such large quantities that they will not be available for future generations, push species towards the point of no return or extinction, actions that promote or stimulate selfishness and actions that create the risk of a disaster. This particular point of the study does seem to extend beyond the reach of the project title but it is important to have a broad understanding of sustainability and its challenges before the more intricate areas of its evaluation are tackled (Sustainable development for engineers. Karel Mulder).

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Measuring Sustainability

CEEQUAL

Introduction

CEEQUAL is an assessment and awards scheme for improving sustainability in civil engineering and public realm projects. Its original title was the “ Civil Engineering Environmental Quality Assessment and Award Scheme”. It is based in the united kingdom and is promoted by the ICE (institution of civil engineers) The method is most commonly used for the assessment of large scale projects. It was originally developed by a team led by the ICE and supported by the institutions R&D enabling fund and the UK government. It is based on a self-assessment carried out by a trained CEEQUAL Assessor that is then externally and autonomously verified by a CEEQUAL-appointed Verifier. Its objective is to promote the achievement of environmental excellence in civil engineering, and thereby deliver improved environmental and social performance in project specification, design and construction.

(<http://www.ceequal.com/how.htm>)

How does CEEQUAL work?

The scheme assesses performance across 12 areas of environmental and social importance. The assessment is made up of 200 questions which are contained in the CEEQUAL Manual relating to social and environmental aspects of a project such as the use of water, energy, land, impacts on ecology, landscape, neighbors, archaeology and waste minimization and management as well as community relations and amenity. It rewards project teams in which designers, clients and constructors go beyond the legal and environmental minimum standard to achieve distinguishing levels

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environmental and social standards. (CEEQUAL PDF) It basically determines how well a project team has dealt with environmental and social issues in work the work being carried out. When used during the design and construction phases, the CEEQUAL assessment is more than likely going to have a positive influence on the project's social and environmental performance. The organization that registers receives a copy of the latest version of the CEEQUAL manual and also a scoring spreadsheet for the category of award applied for. A CEEQUAL assessor then carries out an assessment on the project and scores the project accordingly. This assessor will have been trained at a " CEEQUAL Assessor training course" and also will have his assessment verified by an appointed CEEQUAL verifier. It is always best to carry out the assessment as the project progresses. This allows supporting evidence to be collected alongside the design and construction phases and leads to an overall result which is more accurate and reliable. Based on the assessment an award is allocated to the project, whether it be the client, the designer or the contractor, or all three. (<http://www.ceequal.com/about.htm#how>)

Awards

CEEQUAL provides the civil engineering industry with an incentive and set of rules for assessing, benchmarking and ' labeling' the sustainability performance of projects as part of the industry's contribution to sustainable development. This set of rules leads to the proper assessment of the design project and assigns an appropriate award based on the projects performance. The awards available in the assessment method are as follows:

The Whole Project Award (WPA), applied for jointly by or on behalf of the Client, Designer and Principal Contractor.

The WPA with an Interim Client & Design Award (the stage in the design process at which the Interim Assessment is undertaken can be chosen by the applicant to best suit their needs and procurement process).

The Client & Design Award, applied for jointly by the Client and Designer.

The Design-Only Award, applied for by only the principal Designer.

The Construction-Only Award, applied for only by the Principal Contractor.

Design & Construction Award for project teams that do not include the client, on design & construct and other partnership contracts.

The award achieved at the end of the day is reliant on the score awarded to the project after the assessment. (CEEQUAL PDF)

Objectives of CEEQUAL

The objectives of the CEEQUAL Scheme are:

To recognise the achievement of good, very good or excellent environmental and social standards in civil engineering and public realm projects.

To promote and advertise enhanced sustainability performance in project specification, design and construction

To create a climate of environmental awareness and continuous improvement in the industry.

In essence, CEEQUAL is: a tool for Project Teams to assess how well they have dealt with the environmental and many social issues on their projects, a mechanism for having those assessments externally and independently verified and recognition gained, an evidence-based assessment, not an assertion-based assessment, a question set that can be used by Project Teams as a checklist to significantly influence the development of design and/or construction management made as a project progresses from concept to completion.