

A Study on the Sustainability of the Environment, the Growth of Its Research, And the Trends

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Abstract: *As the importance of supportability grows, so does the study of sustainability improvement. The purpose of this paper is to lay out the research methodology, define writing classification, and research ecological supportability designing examination according to the viewpoint of authentic assessment in light of the top five highest figure journals the Journal Citation Report of the Institute of Logical Information. The method of grouping the examination articles is time skyline. By thoroughly evaluating 29,616 research articles over a 24-year period, this study will reflect the development of research in the area of environmental sustainability. Two examination centers—water exploration and pollution control and prevention—appear at the most notable count as the examination in supportability progresses swiftly. The Journal of Environmental Science and Technology has also established itself as the journal with the most advanced sustainability research disseminated throughout the long term. The implications of the findings in our review help to shape the direction of future research in the field of sustainability.*

Keywords: *Sustainability, Ecological Supportability, Environment etc.*

I. Introduction:

The concept of sustainability has been closely linked to human sustainability on the planet since the 1970s, giving rise to the definition of sustainability and sustainable development that is most frequently used today. Sustainable development is defined as "development that satisfies the needs of the present without compromising the ability of future generations to satisfy their own needs" by the United Nations World Commission on Environment and Development¹. Three interrelated objectives—environmental, economic, and social—are referred to as "sustainable development". The idea of sustainable development has become increasingly prevalent across a wide range of occupations since 1987. Both the number of engineering environmental journals and publications on sustainability are on the rise, which indicates this trend.

The analysis's results are also given in this publication. The results highlight historical trends in sustainability research, particularly over the past 24 years of sampling, as well as the research areas that different journals have focused on advancing and supporting in terms of sustainability research. A general discussion, recommendations for further study, and conclusions round up this work. A number of studies have used bibliographic research techniques to analyze how sustainability research has evolved. For instance, Melville and Ross⁴ concentrated on developing a research agenda on innovation in information systems for environmental sustainability. They began by going over the results of an eight-year search of the literature for articles on environmental sustainability that were published in five significant information system journals and five prestigious operations research journals.

Their study's conclusions were used to come up with potential research questions that information system specialists may look into. As a result, information scholarship is necessary to expand our understanding of environmental sustainability, which enhances the natural environment. Additionally, Securing and Muller⁵ focused their attention on studies of sustainable supply chain management through the use of content analysis. They carefully examined sustainable supply chain management and the challenges that have arisen in this sector. They examined 191 works that were released between 1994 and 2007 and offered a conceptual framework for sustainable supply chain management as well as a literature review.

Examining over twenty thousands publications in the sustainability sector published in the top five ISI journals from a historical perspective. The assessment's time frame has been widened to encompass the years 1987 through 2010. The growth of research into sustainability is analyzed, along with the emphasis, the category of sustainability research, and published papers. The numerous contributions to the development of sustainability research are also highlighted.

What is Sustainable Development?

The World Commission on Environment and Development advocated for this idea in 1987. Their research defines the idea as "development that fulfills the needs of the present without compromising the ability of future generations to satisfy their own needs. In other words, they wished to prevent the resources of the natural world from being depleted for future generations. As we all know, a single demand typically drives innovation. The long-term effects are therefore disregarded. As a result, this tactic harms a huge quantity of people. Therefore, the consequences will be increasingly severe the longer we pursue unsustainable growth. Climate change, a contentious issue around the world, is one of the most common.

Our environment is already suffering from climate change. As a result, sustainable development is now very necessary. If we want to leave a burnt-out globe with a degrading environment for future generations, we must ask ourselves this question. To undo the harm we have done, we must pursue sustainable growth. Greater social, environmental, and economic thinking will be aided by this. Most importantly, achieving it is not difficult. One must consider that world as a system connecting space and time. In essence, it demonstrates how South African water contamination might eventually have an impact on water quality in India. It also applies to other things in a similar way.

In conclusion, sustainable development aims to promote social and economic advancement without depleting the planet's finite natural resources. So that future generations can inherit a healthier, greener Earth, we must all collaborate to discover answers to these demands.

Implementation Strategies for Sustainable Development

There are several ways to put sustainable development into effect. First and foremost, it is crucial to offer people hygienic living and working conditions. The study of local environmental issues will thereafter be promoted. Additionally, taking precautions against known and acknowledged job risks. Finding cheap solutions to salvage hazardous industrial waste is also essential. We must prioritize encouraging afforestation. It would also be beneficial to include environmental education in college and high school curricula. All environmental issues must also be made social and human. Additionally, we need to encourage the use of alternative energy sources, particularly solar energy. Based on local resources and needs, it will be advantageous to explore for alternatives to products that are known to be dangerous. In a same vein, environmentally sustainable products must be produced. Promoting the use of organic fertilizers and other biotechnologies is also essential. Finally, to ensure accountability, environmental management must be watched.

The time horizon analysis was used as the research methodology in this study. Time estimation, journal scope definition, article selection, and analysis are the four stages that make up the procedure. Time period estimation: A 24-year period between 1987 and 2010 is considered for the assessment.

Data Analysis: The number of environmental sustainability papers published in the five selected publications since 1987 is shown in Table I of the study. It is feasible to infer that there is now more research being done on environmental engineering sustainability since 1987 based on the total number of articles published each year in this area. Comparing the overall number of papers published in each publication, Environmental Science and Technology appears to have published the most sustainability research articles, with 16,292. In the subsequent tier, 9,309 research papers were published in the Water Research Journal. These two periodicals, which have been around since 1967, are now the go-to places for publishing studies on sustainability.

Research on Sustainability in the Literature

In order to assess the primary study topic of published sustainability publications, the literature classification of sustainability research is established based on reviewed papers. The research on sustainable development is broken down into three main categories in this framework. Sustainability in the built environment, sustainability in industry, and sustainability in the energy sector. Figure 1 illustrates the 21 distinct study areas that make up these groups.

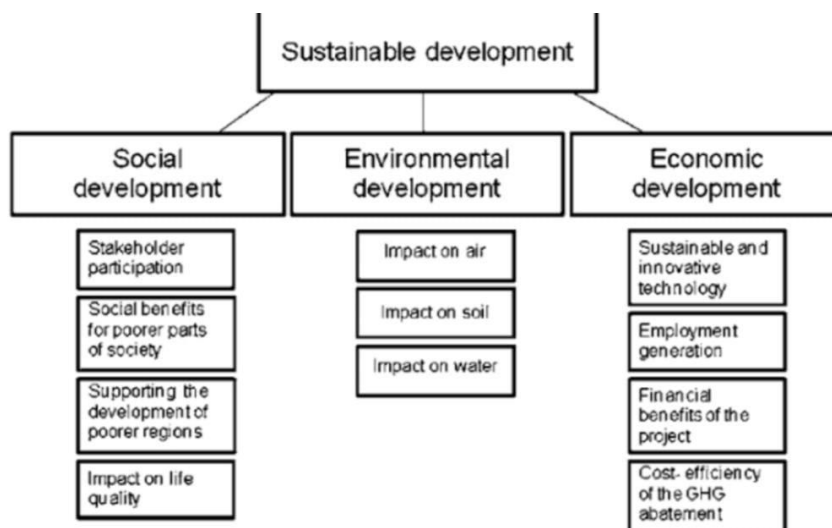


Fig. 1. Literature categorization of sustainability research

- **Research Focus on Sustainability**

Each published article was assigned to one or more of the 21 unique study focuses that the authors classified the 29,616 sustainability publications into. Some researchers aim to water, air, and soil in a sustainable environment and one to pollution control and prevention, whereas some assigned one to forestry sustainability and one to pollution control and prevention. The five main research foci with the most papers published are identified by calculating the number of publications each research focus has produced. Among the fields of study are water research, sustainable energy/energy management, pollution control and prevention, green engineering/manufacturing, materials and technology research, and pollution control and prevention.

Table I. Sustainability articles published.

| Year (List) | Journals | | | | | Total by year |
|------------------|----------|-------|------|------|-----|---------------|
| | 1 | 2 | 3 | 4 | 5 | |
| 1987 | NA | 169 | NA | 199 | NA | 368 |
| 1988 | NA | 218 | NA | 204 | NA | 422 |
| 1989 | NA | 220 | NA | 203 | NA | 423 |
| 1990 | NA | 260 | NA | 209 | NA | 469 |
| 1991 | NA | 273 | NA | 191 | NA | 464 |
| 1992 | NA | 341 | 18 | 198 | NA | 557 |
| 1993 | NA | 366 | 27 | 221 | NA | 614 |
| 1994 | NA | 338 | 31 | 300 | NA | 669 |
| 1995 | NA | 461 | 50 | 364 | NA | 875 |
| 1996 | NA | 489 | 91 | 387 | NA | 967 |
| 1997 | NA | 505 | 89 | 383 | NA | 977 |
| 1998 | 23 | 536 | 119 | 439 | NA | 1117 |
| 1999 | 25 | 628 | 92 | 397 | NA | 1142 |
| 2000 | 15 | 791 | 108 | 527 | NA | 1441 |
| 2001 | 20 | 691 | 185 | 534 | NA | 1430 |
| 2002 | 17 | 737 | 126 | 571 | NA | 1451 |
| 2003 | 24 | 782 | 243 | 537 | NA | 1586 |
| 2004 | 21 | 877 | 225 | 468 | NA | 1591 |
| 2005 | 15 | 1238 | 229 | 506 | NA | 1988 |
| 2006 | 11 | 1082 | 252 | 431 | NA | 1776 |
| 2007 | 16 | 1175 | 360 | 497 | 49 | 2097 |
| 2008 | 19 | 1365 | 358 | 515 | 56 | 2313 |
| 2009 | 25 | 1360 | 469 | 530 | 79 | 2463 |
| 2010 | 21 | 1390 | 394 | 498 | 113 | 2416 |
| Total by journal | 252 | 16292 | 3466 | 9309 | 297 | 29616 |

Notes: 1: Energy education science and technology; 2: Environmental science and technology; 3: Applied catalysis B-environmental; 4: Water research; 5: International journal of greenhouse gas control; NA: Not available.

II. Discussion:

Although earlier studies with a similar objective have already been published, this study employs a more thorough method for conducting a sustainability survey. During 20,000 survey articles with impact factors journals of more than four in sustainability were examined during a 24-year period from 1987 to 2011. In order to present a historical overview of sustainability research and to direct future sustainability research, the authors believed that this working paper was necessary.

According to the analytical results presented in Table I, the total number of articles from all journals has been steadily rising over time. This highlights the quick growth in the number of sustainability studies published over a 24-year span. Based on the focus of their research, academics can utilize the literature classification this study offered to organize their citations. Numerous study subjects that were chosen based on the papers reviewed make up the three main themes, which are sustainability in the built environment, sustainability in industry, and sustainability in energy. These data lead to the conclusion that the majority of sustainability papers have historically concentrated on water research and pollution management and prevention. Research on green engineering and manufacturing was the least thorough. Despite the fact that there aren't many publications in this field of study, the trend of sustainability research is growing.

III. Conclusion:

The study of sustainability has made great strides in the past two decades. Additionally, the focus of sustainability research has consistently been on water research; however, there has been a minor increase in the study concentration on manufacturing green engineering. Therefore, given that this field has a significant impact on sustainable development, academic researchers need to concentrate more of their research on green engineering manufacture. It is possible to have a better knowledge of the main issues and challenges that researchers face through survey research in sustainability. The results of this survey provide actual information on the development of sustainability research, which the authors believe can help researchers choose their research topic. However, the authors concur that there is still room for development in order to encourage this study to move forward into a wider field of acceptance in sustainability research.

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