

# A Theoretical appraisal on a greener approach towards sustainability in the construction industry

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## Abstract

The urgency for green construction has been associated with the nimbly deteriorating environment in the last decade due to the need for infrastructure development delivered by the construction industry. The present paper assesses the basic concept and methodology of ecological economics (EE) in comparison to that of the traditional or conventional economic model of promoting sustainability in the construction industry. The research was conducted through the use of credible secondary based (literatures) sources. The literature reviewed revealed that previous sustainable methods were centred primarily on buildings and environmental protection. Conversely, EE is a moderately new development in sustainability that has been created incompletely because of the restrictions of ecological matters relating to the economics of the construction industry. Moreover, the study revealed the various components of EE and how they differ from a traditional approach. The components were: sustainable scale, inter-generational equality and true economic efficiency amongst others. The study also addresses the diverse nature of the relationship between ecosystems and economic disciplines in a broader spectrum. Similarly, this relationship is the primary source of many ecological problems facing the construction industry today due to previous economic models that neglected the ecological aspect.

*Keywords:* Ecological economics, Sustainability, Traditional, Construction

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## 1. Introduction

Ecological Economics (EE) was enkindled during the late 20th century due to the need for environmental protection and economic sustainability. Perrings et al. (1995) defined EE as a modern methodology of the study that addresses the relationship between ecosystems and economic disciplines in a broader spectrum. Similarly Barker (2013) stated that EE is a moderately new development in economics that has been created incompletely because of the restrictions of ecological matters relating to economics in its treatment of the association of human culture and the indigenous environment.

Beinhocker (2006:p.24) observed that it is critical to recognize EE and specific methodology to the “traditional” or main stream economics. A definition by Bergh (2001) explained that traditional economics is centered on a model of utility expansion and the assignment of assets by means of the value component. Similarly, Ackerman and Heinzerling, (2004) found that it is urgently accepted that every natural administration can be changed over to cash and back again at any time, to an extent that they are little or no irreversible impacts. This is not the situation, so the generation of tomorrow confront the danger that they will be denied of key assets if economic development proceeds without limitations.

## 2. Traditional thinking

Tradition or main stream economists according to Simpson (1998) trust that there are not very many things that are really remarkable, as in they have no substitutes, including nature. Similarly, Colander et al., emphasized that natural assets and procedures have substitutes and are uninhibitedly tradable with another of like nature or kind. Kivati and Onyango (2015) stated that this major dogma generated thinking from a state-focused to a business sector driven viewpoint has a huge effect on the possibilities of ecological system and biodiversity conservation.

Similarly, traditional economists have the benefit of exhibiting an apparently rational and handy vision the environment and development problems a country may be facing. From this, we are able to deduce that they provide diagnostic apparatuses which in principle are helpful in managerial choices. Be that as it may, various inquiries stay unanswered. To support, Kivati and Onyango (2015) studied that these various inquiries are related to social power. Social power was opined by Atlee (2008) to be a basic component in legislative issues, economics, and every single social group that is due to their social connection to each other. In so saying, the model behind this branch of economics is centered on the full maximization and distribution of natural resources in order to maximize return revenue based on the price mechanism. Barker (2013) who cited Ackerman and Heinzerling (2004) mentioned that the model advocated that all natural resources have no irremediable effect in respect to resources being able to be transformed to money and back again during any period.

### 3. Ecological thinking

Ecological economics contrast from traditional economics regarding expansiveness of its cognizance on issues and how significant it merges the ecology-economy collaboration. In relation to its duration, it has variable scales and views human economy as a major aspect together with the collaborations between economies and the environmental sectors. Table 1 below shows that traditional economics is viewed by the world as a model were individual human consumers are the central figure. A defined time frame restricts this model of economics in terms of adopting a multi scale functionality, thus limiting its resources. In addition, Kivati and Onyango (2015) advocated that EE takes a more comprehensive perspective with humans as one segment in the general framework. Moreover, they opined that human activities, comprehension, technology and social associations all transform to portray more wide spread opportunities and barriers of the ecologic model.

**Table 1: Comparison of Traditional economics and Ecological Economics**

Characteristics	Traditional Economics	Ecological Economics
Basic World View	Mechanistic and Static Individual tastes and Preferences taken as given and the dominant force The resource base viewed as essentially limitless due to technical progress and infinite substitutability.	Dynamic , systems Human preference, understanding, technology and organisation co-evolve to reflect broad ecological opportunities and constrains. Humans are responsible for understanding their role in the system and managing it sustainably
Time frame	Short (50 years max)	Multi scale synthesis
Space frame	Local to international (From individuals to firms to countries)	Local to global (Hierarchical of scale)
Species frame	Human only. (Plants and animals only rarely included for contributory value)	Whole ecosystem including humans Acknowledgement interconnections between humans and rest of nature
Primary Macro goal	Growth of national economy	Ecological system sustainability
Primary Micro goal	Max Profits (firms) Maximum Utility (Individuals)	Must be adjusted to reflect system goals Social organization and cultural institutions at higher levels of space / time hierarchy Conflicts produced by myopic pursuit of micro goals
Assumptions about technical progress	Very optimistic	Prudently sceptical
Academic stance	Disciplinary (Focus on mathematical tools)	Trans disciplinary (Pluralistic, focus on problems)

*Source: (Constanza , 1989)*

To further comprehend the concept of EE, Kivati and Onyango (2015) studied the following various components of EE and how they differ from traditional economics:

### *3.1. Sustainable Scale*

Ecological economics expands the prime definition of capital. It encompasses the nature and both social and human capital. As stated by Constanza *et al.*, (1993) that the methodology fuses human qualities including integrity, consideration for future generation, and equity and in addition sees human as a major aspect of the world. Similarly, they argued that the methodology fuses human qualities including reasonableness, regard for future eras, and equity and in addition sees human as a major aspect of the world. Its accentuation changes from assets to system, contending that ecological limits exist, and when broken, system fall flat and breakdown. It declares that there is regularly no "substitute" for the administrations given by the system

### *3.2. Uncertainty in traditional economics*

Chee (2002) observed that ecological communities are perplexing, exceedingly interconnected, and includes varying co operations between variables at a scope of spatial and worldly scales. Similarly, Harwood and Stokes, (2003) added that these qualities and complexities make it difficult to foresee ecological behaviour in any point of interest. EE helps us to remember the intricacy of the numerous collaborating systems that make up the biosphere and the instability that is a crucial element for every single complex system. Moreover Kivati and Onyango (2015) supported in stating that it requires a basic methodology where technical portrayals of specific economies are utilized for situation examination.

### *3.3. Inter-generational equity*

According to Farley (2012), traditional economics is centered on a model of maximization of assets through the value systems. It vitally expect that every natural administration can be changed over to cash and back again in any given period, for instance that there are no irreversible impacts. Kivati and Onyango (2015) argued that This is not the situation, so future generation confront the danger that they will be denied of fundamental assets on the off chance that economic development proceeds without imperatives. Conversely, EE envelops a more general perspective of qualities, including natural privileges of ecological communities to exist.

### *3.4 Improved scientific understanding*

Shi (2003) studied that EE attempts to enhance scientific comprehension of the natural and social forms associated with human collaborations with the earth and in the meantime generating valuable information to managerial choices on sustainability of the environment. Similarly, Kivati and Onyango (2015) opined that while numerous environmental specialists would accept the importance of contemplation outside their examination, they claim to leave these to the 'decision-maker'. Smith (1997) stated that the capability of EE is to incorporate these as vital parts of investigation.

### *3.5 True economic efficiency*

EE also attempts to find true economics efficiency. Kivati and Onyango (2015) studied that economic efficiency and great financial choice making are impractical if the greater part of the expenses and advantages are not considered or incorporated into prices. In addition, regularly current market costs do not record the full expenses of a financial activities that drains assets or hinders the environmental systems or exacts expenses to human well-being

and prosperity (social and human capitals) brought about by pollution or other reactions due to the economic activities. These excluded expenses are called "externalities", characterized as expenses that are excluded in the cost of the item but rather are carried by a third party, outside the manufacturer and purchaser.

According to Kivati and Onyango (2015) who discovered further that recording of these expenses in the business sector would give an intense motivating force to move towards sustainability. A developing EE alternative which is a distinct option for multi-criteria decision aide (MCDA), which depends on various criteria, for example, efficiency, value or sustainability, taking into consideration a more practical evaluation of suitability and complimenting characteristics between the criteria. MCDA takes into account moral contemplation, inconsistency and sympathy toward the next generation in a democratic based managerial system. Similarly, O'Neill and Spash (2000) emphasized that proper implementation of true economic efficiency is overridden by a multitude of thinkers utilizing the traditional model of economics that focus efficiency without taking into account natural resources as a primary factor for all economic activity.

### *3.6 Policy roles; from theory to practice*

EE tends to manage strategy issues in theory as well as practice. A key approach part of EE is to give the scholarly foundation of ideas, introductions and scholarly speculations that educate systems. Specifically, it concentrates on elucidating appropriation issues and recognizing exchange offs in strategy development. According to O'Hara (2001) EE proposes to coordinate the natural and social attributes of the overwhelming economic coherence into the ideal models of political economy, and to embed the ecological measurement into the arranging practices of governments. Moreover, Kivati and Onyango (2015) stated that in setting environmental administration and strategy issues in an expansive connection that coordinates human conduct inside environmental and economic systems.

## **5. Research Methodology**

The study was conducted with reference to existing theoretical concepts and literatures on traditional economics and ecological economics from a comprehensive comparison of the two approaches. The study is purely based on a literature review and also looks at literatures on modern sustainable methods in use. Moreover, there are only a few studies conducted on the appraisal of ecological economic as a greener approach towards sustainability in the construction industry and thus adds to the body of knowledge. The current methodology adopted the quantitative research approach.

## **6. Findings and Discussions**

Kivati and Onyango (2015) studied that Economic development will in the end come up against the conveying limit of the environment regarding safe centralization of greenhouse gasses, the a global warming pandemic, or will involve irreversible harm to some crucial ecological system administration including land and water resources, so that the price system can no more work to give the administration. Nonetheless, Daly (1992) contends that scale is not controlled by costs, but rather by a social choice reflecting ecological confinement. Distribution is not controlled by prices, but by a social choice mirroring an only dispersion of the recently made resources.

Furthermore, the push to coordinate ecological and economical aspects to enhance natural and monetary administration, guarantee long-term sustainability has, and allows a more profound comprehension of the ecological functions and qualities. To add to this, Kivati and Onyango (2015) opined that the traditional economic concept barely considers the short, medium and long term effects of economic activities such as intergenerational factors, implementation of EE into any economic discussions, indirect and intangible factors are bound with challenges due to the model of mainstream economics being utilized in free markets and on an individual interest perspective.

## 7. Conclusion and Further Research

This paper has explored literatures relating to a greener approach towards sustainability in the construction industry. It has been evident that the major interrelation between generational issues connected with irreversible harm to the environment brought about the need for a greener approach towards sustainability. The study revealed that there are various components of EE and how they differ from the ones of the traditional perspective. These components included: sustainable scale, uncertainty in traditional economics, inter-generational equality, improved scientific understanding, true economic efficiency and policy role: from theory to practice. Furthermore to the findings above, EE advocates another method of approach of economic improvement that takes into consideration the natural resources and environmental confinements that mainstream economics neglects. It is therefore recommended that further research can focus on how to encourage the adaptability of ecological economics with the construction industry which could bring about economic improvement that takes into consideration the natural resources and environmental confinements that traditional economics neglects.

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## References

- Ackerman, F. & Heinzerling, L. (2004) *Priceless: On Knowing the Price of Everything and the Value of Nothing*. New York: The New Press.
- Atlee, J. (2008) *Democracy: A Social Power Analysis*. Institute for Economic. Analysis Think peace Issue 37/38.
- Barker, T. (2013). *What is Ecological Economics, as distinct from the neoclassical Environmental Economics?*, University of Cambridge, UK
- Beinhocker, E. (2006) *The Origin of Wealth: Evolution, Complexity and the Radical Remaking of Economics*, Random House Business Books.
- Bergh, C.J.M. van den (2000) *Ecological Economics: Themes, Approaches, and Differences with Environmental Economics*. *Regional Environmental Change*, vol. 2, 13–23.
- Bergh, C.J.M. van den (2000) *Ecological Economics: Themes, Approaches, and Differences with Environmental Economics*. *Regional Environmental Change*, vol. 2, 13–23.
- Costanza, R. (1989). *What is Ecological Economics?* *Ecological Economic* 1, 1-7.
- Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., et al. (1997). *The Value of the World's Ecosystem Services and Natural Capital*. *Nature* 387: 253–260.
- Daly, H. (1992) *Steady-State Economics*. London: EarthScan.
- Farley, J. (2012). *Ecosystem services: The economics debate*, *Ecosystem Services*, Volume 1, Issue 1, July 2012, Pages 40-49, ISSN 2212-0416, <http://dx.doi.org/10.1016/j.ecoser.2012.07.002>.
- Harwood, J. & Stokes, K. (2003). *Coping with uncertainty in ecological advice: Lessons from fisheries*. *Trends Ecol. Evol.*, 18, 617–622.
- Kivati and Onyango (2015). *Conventional vs. Ecological Economics Perspectives in Valuation of Ecosystem Services in East Africa*. African Centre for Technology Studies, Paper 010/2015
- O'Hara, S., (2001) *The Challenge of Valuation: Ecological Economics between matter and meaning*. In: Cleveland, C., Costaza, R., Stern, D. (eds.). *The Nature of Economics and the Economics of Nature*. Edward Elgar, Northampton, M.A, pp. 89 – 108.
- O'Neill, J. and Spash C.L. (2000) *Appendix: Policy research brief, conceptions of value in environmental decision making*. *Environmental Values* 9: 521–536.
- Perrings, C., Turner, K., Folke, C., 1995. *Ecological economics: The study of interdependent economic and ecological systems*. EEEM Discussion Paper No.9501, University of York.
- Shi, T., (2003). *Moving Towards Sustainable Development: Rhetoric, Policy and Reality of Ecological Agriculture in China*. *The International Journal of Sustainable Development and World Ecology* 10 (3), 185 – 210.
- Simpson, R.D. (1998) *Economic Analysis and Ecosystems: Some Concepts and Issues*. *Ecological Applications* 8, 342–349.
- Smith, F. (Ed.), (1997) *Environmental Sustainability: Practical Global Implications*. St. Lucie Press, Boca Raton, p. 287.