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Modelling sustainability

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Abstract

The article presents a general classification of the models being developed in the area of sustainability arguing that the existing models represent the historical conceptualisation of sustainability starting from environmental constraints and moving towards economic valuation and social behaviour and policies. Coupled with computer power, sophisticated models with a varying levels of complexity have also been developed (static/dynamic; local/global; specific/general). However as any model is a simplification of the complex reality, the main purpose of any sustainability modelling (and the newly emerging area of sustainability) should be to allow dynamic representation, including the co-evolution of the sustainability systems and the role of humans as sustainability guardians.

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1. Introduction

The concept of "sustainability" has been associated with a wide range of human activities related to the use of resources, including natural, human and financial, implying long-term continuity and ability to carry on with these activities indefinitely [27,28]. According to Hasna [18], sustainability refers to a development of all aspects of human life affecting sustenance. Since the mid 1970s the term has been laden with value judgements about justice in the distribution and use of resources. This was started by the World Council of Churches during its 1975 Assembly in Nairobi [8], followed by the publication of Our Common Future (or the Brundtand Report) by the World Commission on Environment and Development in 1987, the 1992 United Nations' Earth Summit in Rio de Janeiro (which adopted Agenda 21) and continued through the adoption of the Millennium Development Goals by the United Nations' General Assembly in 2000 and the 2002 World Summit in Johannesburg. The 1997 Kyoto Protocol linked to the United Nations Framework Convention on Climate Change entered into force in 2005 and the international community is expecting further changes following the 2009 Copenhagen Climate Change negotiations. A lot of this political debate has been fuelled by the evidence originating from the academic and scientific world as to what impacts climate change and environmental deterioration have on human and other communities.

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