

Ecologically sustainable development: origins, implementation and challenges

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Abstract

The concept of sustainability has received much attention since the publication of *Our Common Future* by the World Commission on Environment and Development in 1987. Despite the institutionalisation of sustainability principles through legislation and policy around the world, progress in implementing sustainable development actions has been slow. The very open-ended definition of sustainable development provided in these documents, and the “language” used has made interpretation of what is required for implementation controversial. “Principles” of sustainable development have been developed to provide further guidance for implementation, but sustainability remains a contested and value-laden concept. Yet there is increasing recognition that the present development paths around the world are clearly *not* sustainable into the future and that we need urgently to address this *unsustainability*. Water use has become a prominent issue through broad acceptance that its use in many situations, including southeast Australia and cities such as Sydney, is unsustainable. This paper provides a broad introduction to the development of the concept of sustainability, barriers to implementation of sustainable development, and the application of sustainable development principles to water provision for a city such as Sydney, with emphasis on the use of recycled water.

Keywords: Sustainability; Ecologically sustainable development; Urban water use; Water recycling

1. Introduction

The concept of “sustainability” has been much discussed over the past 17 years. Despite millions of articles, thousands of proposed definitions and the attention of a very large number of government and non-government bodies around the

world, sustainability remains a contested concept. We seem unable to agree on *exactly* what sustainability means and how the concept should be interpreted in particular situations.

What is clear, however, is that the way in which we use resources and deal with waste

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products requires urgent attention. This is evident due to the declining state of many natural resources and the potential for continuing, and most likely increasing, human pressure on these resources. This pressure comes from population growth, the need to provide for development in poorer nations, and continuing growth in consumption. Hence, at this time, it is best to urgently address the *unsustainable* nature of natural resource use, rather than putting this on hold while we argue endlessly about *exactly* what sustainability means!

A current example of the need for such urgent attention is the looming water supply “crisis” in Sydney. A page 1 item in the *Sydney Morning Herald* on 13-1-05 was a report on research by the Water Services Association of Australia which showed that Sydney needed to cut water consumption by 54% to prevent a “dire water shortage in 25 years”. The looming deficit was seen as particularly alarming because of the assumptions in the analysis — including a very high level of water conservation by households, 25% of all new developments using recycled water, and water-efficient washing machines and appliances as standard. Changing the way people think about water including implementation of large-scale schemes for use of storm-water and grey water was seen as critical.

2. Why is sustainability important?

A definition of sustainability is yet to be provided in this paper. First the question of why we should be concerned about sustainability will be discussed and for this a dictionary definition of sustainable will suffice. The Oxford Dictionary defines “sustainable” as supportable or maintainable [1]. As will be explored later, exactly what is to be supported or maintained and at what level, is controversial and one reason for the contested nature of the concept. First, however, it is necessary to consider why there has been so much

attention given to understanding sustainability and attempting to implement “sustainable practices”.

2.1. Ecological footprint analysis

A coarse index which gives a good idea of the basis for concern about the *unsustainability* of current practices is the Ecological Footprint. The Ecological Footprint estimates the “resource consumption and waste assimilation requirements of a defined human population or economy in terms of a corresponding productive land area” [2]. In other words how much productive land do we each require to support all of our activities and consumption?

The WWF Living Planet Report [3] shows that the earth has 11.4 billion ha of productive land and sea. Divided by 6 billion people this allows for 1.9 ha per person to provide for all our activities. In 1999 the world average Ecological Footprint per person was 2.3 ha or 20% above the earth’s biological capacity. In other words, we are maintaining our use of the planet by eating into capital stocks of non-renewable resources and exceeding the biological capacity of the earth’s stock of renewable resources. This is clearly not sustainable by the standard dictionary definition given above. The global Ecological Footprint has grown from 70% of the planet’s biological capacity in 1961 to 120% in 1999. We are clearly living beyond our means. Future projections suggest growth to 180–220% by 2050 [3].

It is also clear that there is enormous inequity in access to and use of the planet’s resources. For example, a comparative table of national Ecological Footprints for 1995, provided by Chambers et al. [4], shows that while the global average Ecological Footprint in 1995 was 2.2 ha per capita, Australia had a footprint of 9.4 ha per capita compared with the US at 9.6, the UK at 4.6, Spain at 3.8, Egypt at 1.4 and Bangladesh at 0.6. While different Footprint analysis may provide somewhat different figures, the relati-

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