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A background of the sustainable development concept

SUSTAINABLE DEVELOPMENT

Sustainable development is development that lasts. It is development that can be sustained forever. That is, development today cannot be achieved at the expence of future development.

Sustainability can be used at two levels. The first one is at the general level where we talk about sustainable development and the other is sectoral sustainability, such as in agriculture, forestry, mining, etc.

The concept of sustainable development is a vague term that was popularised by the Brundtland Commission Report in 1987 but earlier espoused in the World Conservation Strategy (IUCN, 1980). The Brundtland Commission in defining sustainable development, called for a balance to be struck in the pursuit of human welfare: " sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs " (World Commission on Environment and Development [WCED], 1987).

Barbier, et al. (1990) indicate that it is typically taken to mean that the well-being of the current generation should not be advanced at the expense of future generations. Within a generation, sustainability also implies particular concern for the most disadvantaged in society.

According to the World Wide Fund for Nature (WWF), this definition of sustainable development contains within it two key concepts. First, the concepts of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given. Second, the idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet the present and future needs (WWF, 1994).

The notion of balance finds its way between the lines of this Brundtland Commission's definition of sustainable development; the balance between human needs and the environment's ability to meet these needs, between the needs of the present and future generations, and between the needs of the poor and the rich.

The World Wide Fund for Nature (WWF), in collaboration with the World Conservation Union (IUCN) and the United Nations Environment Programme (UNEP), further developed the notion of balance in caring for the earth, defining sustainable development as " improving the quality of human life within the carrying capacity of supporting ecosystems " (IUCN, UNEP and WWF, 1991).

Since the Brundtland Report, substantial work has been undertaken in an effort to draw out the operational implications of the concept of sustainable development. This, for example, was the main theme of the World Bank's World Development Report 1992. The main message of the report is the need to integrate environmental considerations into development policymaking. The report pointed out that the value of the environment has been underestimated for far too long which could result in reduced productivity and undermine future development prospects. The report argues that continued, and accelerated, economic and human development is sustainable and can be consistent with improving environmental conditions, but this will require major policy, programme, and institutional shifts (WDR, 1992).

Sustainable development could typically be taken to embrace two issues; intragenerational equity and intergenerational equity. The concept of intragenerational equity is shared by Barbier et al. (1990) who argue that particular attention be shown to the most disadvantaged in society. Between generations, it is also argued that the welfare of the current generation should not be advanced

at the expense of future generations.

With respect to intergenerational equity, there is the recognition that there exist imperfections in the market including, externalities, imbalances in income distribution, access to opportunities and control over resources. These have resulted in inefficiencies and intergenerational inequities which need to be corrected.

Each generation would have the right to enjoy the services from natural assets, but the assets themselves must be passed on to the next generation. It is a matter of the distribution of productive assets or caring across generations.

Viewing sustainability as a matter of intergenerational equity requires the actual concern for the future that affects current behaviour. Future generations should not suffer because of excessive use and consumption today. Therefore natural resources providing life-support and other unique functions must be kept intact. Keeping natural resources intact would require some transfers to be made to future generations.

Definition

There is now a general consensus, especially among economists, on the principal definition of sustainable development used by Pearce et al (1989,1991): a non-declining average human welfare over time (Mäler, 1991; Pezzey, 1992; Toman et al., 1994).[1]

With the consensus on the definition of economic sustainability, attention has been focused on the necessary conditions for its achievement. This is the Capital Theory Approach (CTA) to sustainable development. The exponents of this

[1] Pearce et al. (1989) also used the definition: " natural capital assets ... should not decline through time ".

approach assume that welfare is a monotonically increasing function of income (eg. Mäler, 1991) and then argue that for a flow of income to be sustainable, the stock of capital needs to be constant or increasing over time (Solow, 1986).

The definition of capital that satisfies these conditions is broad and composed of a number of categories of capital, namely natural, manufactured, human and institutional (Stern, 1995). Natural capital is the aggregate of natural resource stocks. Manufactured capital refers to the standard neoclassical definition of "a factor of production produced by the economic system" (Pearce, 1992), such as machines, etc. Human capital also follows the standard definition. Institutional capital includes the institutions and knowledge necessary for the organization and reproduction of the economic system. It includes the ethical or moral capital referred to by Hirsch (1976) and the cultural capital referred to by Berkes and Folke (1992).

Sustainable income is, therefore, the maximum consumption in a period consistent with the maintenance of aggregate capital intact (Weitzman 1976; Mäler, 1991). This is an extension of Hick's 1946 definition of income as the maximum consumption in a period consistent with the maintenance of wealth.

Capital theorists are divided among proponents of either weak sustainability[2] and strong sustainability.[3] The criterion that differentiates between the categories is the degree of substitutability believed to be possible between natural capital and the other forms of capital.

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[2] Weak sustainability is sometimes referred too as Solow-sustainability (Common and Perrings, 1992)

[3] The demarcation between the categories varies among authors with Turner et al. (1992) differentiating among four different views on the necessary conditions for sustainability.

The weak sustainability viewpoint holds that the relevant capital stock is an aggregate stock of artificial and natural capital. Reductions in natural capital may be offset by increases in artificial capital. It is sometimes implied that this might not only be a necessary condition but also a sufficient condition for sustainability. Weak sustainability assumes that there are no natural resources that contribute to human welfare that cannot be fully replaced by other forms of capital. Solow (1974) presented a formal model of long term growth, where mineral extraction could be a sustainable source of economic growth if revenues from extracted resources are used to finance investment. Growth could continue indefinitely as long as the economy obeys the sustainability criterion that it invests the rents from the exploitation of exhaustible natural resources in artificial capital that can yield a stream of income of the same size in the future.

Proponents of the strong sustainability viewpoint argue that though the weak sustainability criterion is a necessary condition for sustainability it cannot possibly be a sufficient condition. Instead, a minimum necessary condition is that separate stocks of aggregate natural capital and aggregate artificial capital must be maintained. Costanza and Daly specifically states: "it is important for operational purposes to define sustainable development in terms of constant or nondeclining total natural capital" (Costanza and Dally, 1992 pp.32). This would imply increasing stocks of renewable resources to counter the depletion of non-renewable resources.

Other analysts hold views between these two extremes (see Victor, 1991). They argue that though it is possible to substitute between natural and artificial capital there are certain stocks of "critical natural capital" for which no substitutes exist. A

necessary condition for sustainability is that these stocks of critical capital must be maintained in addition to the general aggregate capital stock.

Inspite of the discords between the various sustainability criterion and the fact that artificial capital cannot be a perfect substitute for manufactured capital, the CTA has still become established as the dominant theoretical basics for economic sustainability policy.

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