

Sustainable Development: Can New Technology and Economic Growth Be the Answer?

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Abstract

Since the aftermath of the World Commission on Environment and Development, policymakers and researchers have become concerned about finding lasting solutions to the challenges of sustainable development. Rapid economic growth and new technology have been identified as vital solutions to the attainment of sustainable development. Using the review of secondary literature, this paper analyses the prospects of economic growth and technology in achieving sustainable development. The paper finds that, there is some possibility of poverty alleviation with rapid economic growth that may support the attainment of sustainable development. But as endless as it may seem, economic growth can also put more pressure on available limited resources and pose challenges to humans and the environment. By adopting the Ehrlich and Pringle, (2008) IPAT heuristic equation approach, the paper reveals that though the development of new technology can be effective, an increasing rate of population and affluent lifestyle can hinder the possibility of achieving sustainable development. Besides, technology has its own limits and a rebound effects is possible if technology is overstretched. Therefore, the paper proposes that for sustainable development to be achieved, economic growth and new technology should be coupled with a well-structured balance between population and consumption in a holistic interconnection between economy, environment and society.

Keywords: Sustainable Development, Economic Growth, New Technology.

1. INTRODUCTION

The concept of sustainable development (SD) has become a dominant issue in contemporary discourse, spurring up widespread publications and international discussions. Although it gained much prominence in the 1980s, specifically after the Brundtland Report (1987), many agree that the concept has its roots from previous discourses (Brundtland, 1987; Adams, 2006; Strange and Bayley, 2008). Previous milestones worth-acknowledging include the 1972 Declaration of the UN Conference on Human Environment and the 1980 World Conservation Strategy. In recent years, the UN Conference on Environment and Development (Rio, 1992), World Summit on Sustainable Development (Johannesburg, 2002) and the UN Conference on Sustainable Development (Rio+20, 2012) have been major landmarks. The reference to these landmark conferences point towards one direction; the fact that humans, through our actions and inactions, have been negatively impacting our natural environment, over living our boundaries and overstressing the natural capacity available to current and future generation, which is of concern to many.

Despite the success in raising global awareness and engendering international efforts at promoting sustainable development, more challenges persist with its sustenance. For instance, for the first time in the history of humanity, population has increased exponentially, the world is much warmer, more disasters occur and more people are poorer than previously (Brundtland, 1987; Global Footprint Network, 2010; Bjørke, 2013). Considering the continuous effects, in the next 20 years and beyond, humanity will need the capacity of two earths to keep pace with human destruction and consumption, which is practically impossible (Global Footprint Network, 2010). The most current updates on the environment- GEO5, reveals that not only has the human destruction increased, but agreed goals have not been realized (UNEP, 2012).

Many publications such as the Brundtland Report (1987), have stressed on a number of factors necessary to achieve sustainable development. Among other factors, the need for rapid economic growth and advancement of new technology has been identified as necessary precursors for sustainable development. The paper examines the feasibility of these two factors in promoting sustainable development. In that regard, the objective of the paper is three fold: (1) to examine the key argument on how economic growth and new technology may impact sustainable development, (2) to ascertain the feasibility of the two factors in promoting sustainable development, and (3) to examine the larger implications of the findings of this research on the politics and policy decisions on sustainable development.

1.2 BACKGROUND OVERVIEW: CONTEXTUALIZATION

1.2.1 Sustainable Development (SD)

Sustainable development has been defined differently but the most authoritative definition is given by the Brundtland Report 'Our Common Future' (1987, p. 14). The Report defines sustainable development as

“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It implies that decisions on sustainable development should take into account the potential impact of the actions of people on the society, environment and economy (Strange and Bayley, 2008, p. 24). It needs to be noted that in spite of the fact that the general idea on sustainable development emphasize three main domains; economic, social (equity, justice) and environmental (ecology) sustainability, the environmental domain of sustainable development receives much attention. Perhaps, the definition of the concept by experts was meant for environmentally inclined issues and organizations such as the World Commission on Environment and Development (now Brundtland Commission). However, one thing that is implicit in the definitions of sustainable development is a presupposition that sustainable development is considered as an ‘ethical necessity’. Ethical in the sense that; we think of what is *wrong* about the status quo and work towards how to make it right for future generation. It is necessary because human destruction and overstretching of the earth capacity (disasters, global warming, poverty, and resource conflicts) have made it necessary to act now in order to salvage the earth and humanity.

1.2.1 Economic Growth (EG)

The World Bank defines economic growth as a quantitative change in the economy which is measured as percentage increase in GDP and GNP. It notes that economic growth may either be ‘extensive’- using more resources or ‘intensive’- using the same amount of resources more productively (Tatyana, 2004, p. 133). Unfortunately, the definition is restricted to the domain of materialism, production and consumption in numerical terms and does not capture the holistic characteristics (such as health) that make up economic development.

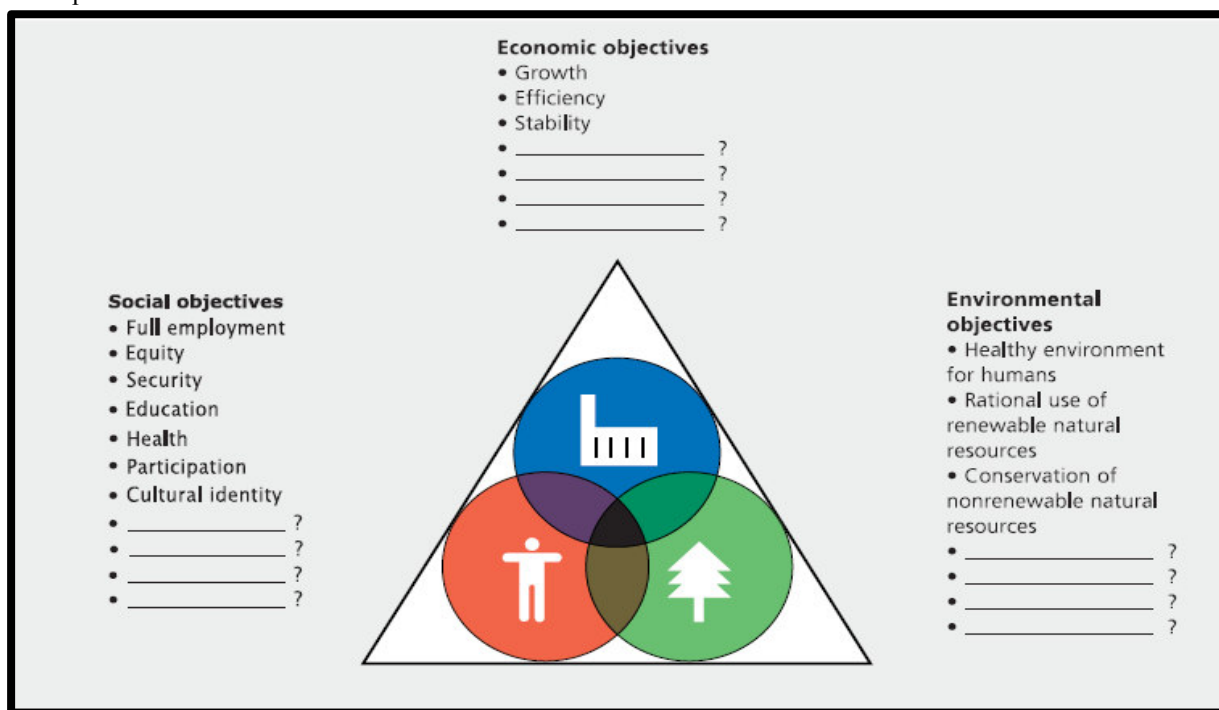


Figure 1: Three Main Components (Elements) Of Sustainable Development
 Source: Tatyana (World Bank), 2004, p. 10

1.2.1 Technology (T)

Technology can be defined as the use of knowledge to create and modify tools, machines and techniques to provide and improve solutions to human problems. The new technology- “environmentally sound technologies” - as called by Agenda 21(1992, Ch. 34) are those that protect the environment, are less polluting, use all resources in more sustainable manner, and recycle more of their wastes and products.

2.1 THE RELATIONSHIP BETWEEN ECONOMIC GROWTH (EG), TECHNOLOGY (T) AND SUSTAINABLE DEVELOPMENT (SD)

The Brundtland Report (1987) and the Rio Declaration (1992) support the need for rapid economic growth in the age of sustainable development. The idea that development is like a bicycle - when growth is stopped or slowed, balance is lost and fall is inevitable – implies that economic growth should be continuous and rapid. The new era of economic growth must be less material- and energy-intensive and more equitable in its impact on rich and poor nations (Brundtland, 1987, p. 21). It is expected that, with more economic growth, coupled with equitable distribution, poverty will be alleviated and people will not have to rely on their immediate environment for

subsistence (Brundtland, 1987, p. 21) and this should lead to sustainable development. Yet, rapid economic growth in a free market means growth will depend on raw material from the environment. However, Adams (2006, p.78), in assessing the impact of “green development” poses critical questions on the pressure of economic growth on sustainable development. He criticizes the 1987 Brundtland Report for not showing how more rapid economic growth will be achieved sustainably. In addition, he questions the impact of the demand for energy and other raw materials, and pollution on sustainable development.

It needs to be stressed that while it may be true that economic growth enhances potential for poverty reduction on one hand, economic growth also creates many problems than it solves on the other hand (Bjørke, 2012). Foremost, there is the realization that economic growth alone is not sufficient to achieve sustainable development since socio-economic and environmental aspects of actions are interwoven (Strange and Bayley, 2008, p. 25). In addition, the focus on profit and consumption often leads to social and environmental damages. Similarly, over-protecting the environment may affect social and economic life of humans. Moreover, research has shown that the limit of growth causes the many global challenges of today (Meadows et al, 1972).

Tatyana (2004, p.8) argues that economic growth may not necessarily be followed by subsequent progress in human development but rather greater inequality and overconsumption of natural resources. It is feared that, if economic growth is continued unabated and the throughput passes the optimum, growth may become uneconomic with more ills accumulated than wealth, which may make poverty harder to fight (Jackson, 2011 cited in Bjørke, 2012). Recent findings have also noted a direct relationship between economic growth, atmospheric destruction (CO₂ emission) and population increase (UNEP-GEO5, 2012, p. 14). As illustrated in the Figure 2 below, as GDP increased from 1990-2008 and CO₂ emissions increased, population growth also increased. This suggests that, all things being equal, rapid economic growth without decreasing rate of population might not necessarily lead to sustainable development.

A more summed disagreement of economic growth agenda is presented by the Degrowth Theory (Georgescu-Roegen, 1971; Latouche, 2004; Fournier, 2008). The theory, which is based on humanity and the move away from economic thinking purports that global economic growth has resulted in increased extraction of natural resources and increased waste and emissions. A more summed disagreement of economic growth agenda is presented by the Degrowth Theory (Georgescu-Roegen, 1971; Latouche, 2004; Fournier, 2008). The theory, which is based on humanity and the move away from economic thinking purports that global economic growth has resulted in increased extraction of natural resources and increased waste and emissions.

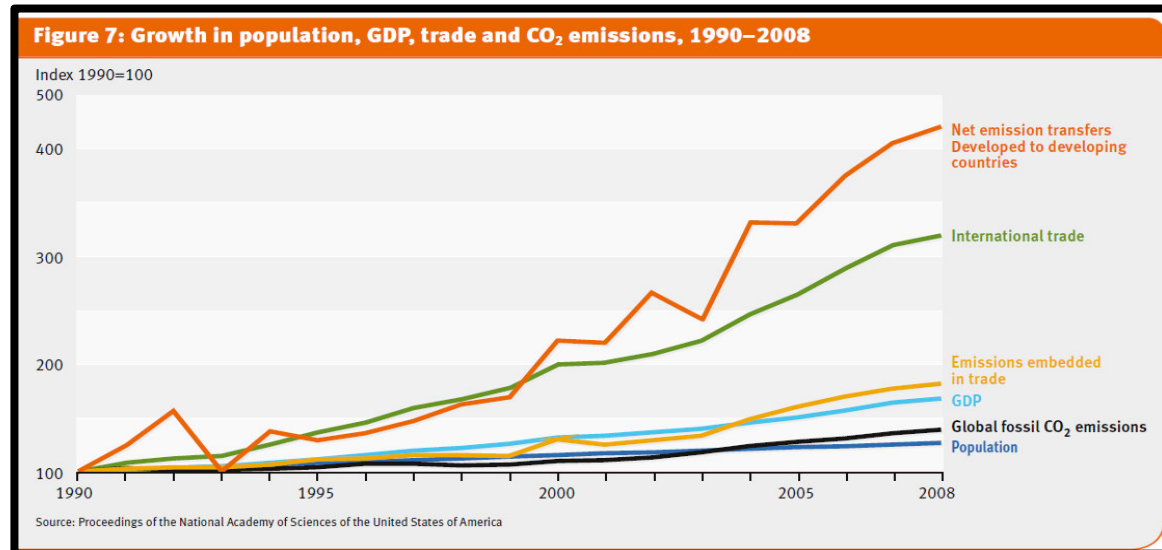


Figure 2: The Relationship between EG (GDP, trade), CO₂ Emission and Population

Source: UNEP-GEO5, 2012, p. 14

It further argues that global economic growth has not succeeded in reducing poverty, but rather i n c r e a s e d inequality. Yet, scientific evidence indicates that the global economy has grown beyond ecologically sustainable limits. It concludes that if there is no respond to this situation by bringing global economic activity in line with the capacity of our ecosystem, the result will be a process of involuntary and uncontrolled economic decline or collapse, with potentially serious social impacts, especially for the most disadvantaged (Declaration on Degrowth, 2008, p. 425). The aforementioned arguments conclude that; the view that rapid economic growth can lead to sustainable development is inadequate and not necessarily viable. Indeed, it cannot be denied that the current liberalized monetary economy underperforms and creates more

problems than it solves (Bjørke, 2012).

There is also a general belief that development of new technology will enhance the carrying capacity of the resource base and the potential for slowing the dangerously rapid consumption of finite resource (Brundtland, 1987, p. 14). The reorientation of technology should be based on technological innovation that takes cognizance of environmental impact and it must be redesigned to deliver the same amounts of services with less energy inputs and less cost (Brundtland, 1987, p.21). To some extent, new technology has shown remarkable improvement and success in that regard. For instance, new green buildings are emerging, electric cars are gradually replacing fuel cars and solar panels are becoming popular. Additionally, “experience in the industrialized nations has proved that anti-pollution technology is cost-effective in terms of health, property, and environmental damage avoided... and efficiencies created by the new technologies” (Brundtland, 1987, p. 31)

Others support the view of technology but from a different angle that focus on appropriate technology. They argue that by adopting the “small is beautiful” approach of ‘Appropriate Technology (AT), humanity can bridge the gap between environment and development (Pearce, 2012; Schumacher, 1973). Appropriate Technologies are those “technologies that are easily and economically utilized from readily available resources by local communities to meet their needs” (Pearce 2013, p. 427). Appropriate technology relies on the use of simple technology within the economic, social and environmental boundaries of a community. However, in spite of the fact that it is environmentally viable, its economic significance in a fast developing world is doubtful.

To further explain the prospects of technology on promoting sustainable development, this study adopts the approach of Ehrlich and Pringle (2008) that uses the impact, population size, affluence and technology (IPAT) heuristic equation in its analysis. By analyzing human impact on biodiversity, they concluded that the impact (I) of human activity is the product of three factors: population size (P), affluence (A) and technology (T). They noted that if (P) and (A) rises, then (I) could be reduced by an improvement in (T) because technology increases efficiency (Ehrlich and Pringle, 2008, p.335). All things being equal, there seem to be some success of new technology in promoting sustainable development in many countries as postulated by this model. However, it must be noted that the success of new technology and the call for further advancement is by no means a guarantee for 100% efficiency. If technology improves fast to outpace (P) and (A), the impact level remains the same. If we need to reduce impact, technology must become even more efficient, or must be combined with a population and / or consumption reduction (Bjørke, 2013). Yet population and consumption are fast increasing and the effects of other issues – such as health and social effects on humans - remain unsolved by technology. Simultaneously, recent reports show that current technologies has its limits; are not necessarily in the direction of sustainable development and are also beneficial to few industrialized countries (UNEP,2013).

In addition, the Degrowth theory cautions of a rebound effect of technological advancement, arguing that new technologies are associated with risks of new toxic and accidents beyond present coping mechanisms. For example, DCoronata (2009) complains about how “technological innovations in aquaculture have in the last half century led to a near total breakdown of all saltwater fisheries worldwide. He concludes that because technological innovation in aquaculture has not made life easier for the fish but for the fisherman, it is not sustainable because any technology that does not promote the environment first is not sustainable. Considering the fast growth rate/projections of world population and current consumption levels, technological advancement is necessary but not enough to achieve sustainable development.

CONCLUSION

Over the last three decades, sustainable development has become topical in global affairs calling for answers to contain the diminishing capacity of the natural environment. Economic growth and advancement in technology have been endorsed as answers to sustainable development (Brundtland, 1987; Agenda 21, 1992). Rapid economic growth and technological advancement has shown some contribution towards sustainable development. For instance, economic growth has potentially reduced poverty and promoted environmentally sound technology (such as solar panels), which has limited the human impact on environment. However, the analysis above has shown that limitless economic growth and unabated technological advancement may not necessarily solve the numerous challenges the world is faced with. Besides, certain attempts at growth and advancement can pose a threat to the natural environment and likely create greater challenges beyond current capacity (Tatyana, 2004; Meadows et al, 1972; Declaration on Degrowth, 2008).

Therefore, this paper concludes that, in spite of its significance to some extent, the call for rapid economic growth and advancement in new technologies is by no means an absolute answer to the complex challenge of sustainable development. Any attempt towards achieving sustainable development must be accompanied by a balanced effort to reduce population growth and the consumption (affluence) levels to achieve any positive result. Specifically, any effort at promoting sustainable development should be combined with measures to

promote a reduction of population growth rate and controlling extravagant (affluent) consumptions. In addition, fashion and 'trendiness' must be limited, technologies have to be naturally viable for both humans and environment, and growth must be redirected toward sustainability. In other words, strategies and policies for promoting sustainable development globally must aim at promoting a good balance between the economy, society and environment (Strange and Bayley, 2008, p.25). Until such a balance is well structured, the quest to save humanity and prevent further destruction of natural environment will remain daunting.

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