

# THE SUSTAINABLE DEVELOPMENT GOALS AND THE SYSTEMS APPROACH TO SUSTAINABILITY IN INDIA

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## ABSTRACT

*This paper explores the link between the systems advance to sustainability and the 17 Sustainable Development Goals (SDGs), which were formally adopted by the UN in 2015. The systems approach depicts sustainable development as the intersection of the goals attributed to three interlinked systems: environmental (or ecological), economic and social. The authors illustrate how each of the 17 SDGs can be characterized as a goal primarily attributed either to the environmental, economic or social system, and as suggested by the systems approach, there may be important tradeoffs in attempting to attain all these goals simultaneously. By adopting standard methods of the theory of choice and welfare under imposed quantities, the author's show that it is possible to measure the welfare effects of an increase in the indicator level for one SDG by identifying the tradeoffs that occur with achieving another goal. They present a quantitative assessment of current progress and tradeoffs among the 17 SDGs, using a representative indicator for each goal. They then conduct a preliminary welfare analysis of these tradeoffs through employing the approach developed in this paper. Although this analysis focuses on the potential tradeoffs among SDGs, the approach could also be applied to show complementarities, or "win-wins", in simultaneous progress among two or more SDGs. Such an analysis can help in the design of appropriate policy interventions to achieve specific SDGs, minimizing the potentially negative knock-on effects on some goals whilst capitalizing on the positive win-win impacts on other SDGs.*

**Keywords:** Sustainable development, Sustainable development goals and System approach.

## 1 INTRODUCTION

Economic interpretations of sustainability usually take as their starting point the consensus reached by the World Commission on Environment and Development (WCED 1987), which defined sustainable development as: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

But despite the universal approval of the WCED definition of sustainability, opinions still diverge on how this goal can be attained. One of the first attempts in economics was the *systems approach*, which characterizes sustainability as the maximization of goals across environmental, economic and social systems (Barbier 1987; Barbier and Markandya 2012; Costanza et al. 2016 Ekins 1994; Elliott 2006; Holmberg and Sandbrook 1992; Pezzey and Toman 2002). This approach is attributed to Barbier (1987), who first identifies three systems as basic to any process of development: the environmental or ecological system, the economic system and the social system. He then argues that "the general objective of sustainable economic development, then, is to maximize the goals all these systems through an adaptive process of trade-offs" (Barbier 1987, p. 104). This can be represented by a Venn diagram, which depicts sustainable development as the intersection of the goals attributed to the environmental, economic and social systems.

In this paper, we explore the link between this systems approach to sustainability and the Sustainable Development Goals (SDGs), which were formally adopted in 2015 by the General Assembly of the United Nations (UN) as its 2030 agenda for sustainable development (UN 2015). The 17 SDGs that comprise this objective are a

complex system comprising 169 targets and currently about 230 indicators. The UN agenda emphasizes that the interlink ages and integrated nature of the SDGs are of crucial importance in ensuring that sustainable development is realized. As we show here, each SDG can in fact be identified as primarily an economic, environmental, or social system goal. Thus, collectively the UN's SDG targets can be considered a representation of the systems approach to sustainable economic development. To show this, we first describe and discuss in more detail the systems approach and its relation to the UN SDGs. We illustrate how each of the 17 SDGs can be characterized as a goal primarily attributed either to the environmental, economic or social system, and as suggested by the systems approach, there may be important tradeoffs in attempting to attain all these goals simultaneously. However, to date, a key limitation to the systems approach to sustainability is that "there is no guidance as to how the tradeoffs among the goals of the various systems should be made" (Barbier and Markandya 2012, p. 38). By adopting standard theoretical methods of the theory of choice and welfare under imposed quantities (Freeman 2003; Lankford 1988), we show that is possible to measure the welfare effects of an increase in the indicator level for one SDG by identifying the tradeoffs that occur with achieving another goal. Such an approach could be applied to assessing recent progress in attaining the UN SDGs. Although there is currently insufficient data to employ such a comprehensive and explicit welfare measurement, we present a quantitative assessment of current progress for each of the 17 SDGs, using a representative indicator for each goal. The assessment not only provides a useful summary of the current state of the UN's 2030 sustainability agenda but also helps identify the likely tradeoffs among the SDGs that need further consideration. We then conduct a preliminary assessment of these tradeoffs through employing the welfare analysis approach developed in this paper. Although this analysis focuses on the potential tradeoffs among SDGs, our approach could also be applied to show complementarities, or "win-wins", in simultaneous progress among two or more SDGs. Thus, the approach illustrated here adds to the growing interest in assessing possible tradeoffs and synergies in achieving various SDGs simultaneously (Nilsson et al. 2016; von Stechow et al. 2016).

## **2 THE SYSTEMS APPROACH TO SUSTAINABLE DEVELOPMENT**

The concepts of sustainability and sustainable development are analyzed from a systems perspective. In the most general terms, sustainability of any system can be represented by a non-decreasing valuation function of the outputs of interest of the system considered. Different perspectives on the system of reference are discussed, from the extreme anthropocentric to the extreme bio- or eccentric positions, and related to the criteria (based on the assumed substitutability between natural and manufactured capital); of very strong, strong, weak, and very weak sustainability. A set of underlying determinants of sustainability is proposed and discussed, including availability of resources, adaptability/flexibility, and homeostasis, capacity of response, self-reliance, and empowerment. The concept of sustainable development is discussed and alternative theoretical perspectives that have been used in the literature are presented. The relationship between sustainability, development, no development, and maldevelopment; and material and non-material economic growth, and alternative trajectories towards sustainable development for rich and poor countries are identified. Five alternative paradigms/strategies for sustainable development are summarized, showing the complexity of the process of choosing the right actions to move towards sustainable development.

## **3. THE INDIAN SUSTAINABLE DEVELOPMENT GOALS (SDGS)**

Voices around the world are demanding leadership on poverty, inequality and climate change. To turn these demands into actions, world leaders gathered on 25 September, 2015, at the United Nations in New York to adopt the 2030 Agenda for Sustainable Development. The 2030 Agenda comprises 17 new Sustainable Development Goals (SDGs), which will guide policy and funding for the next 15 years, beginning with a historic pledge to end poverty everywhere permanently. The concept of the SDGs was born at the United Nations Conference on Sustainable Development, Rio+20, in 2012. The objective was to produce a set of universally applicable goals that balances the three dimensions of sustainable development: environmental, social, and economic. The SDGs replace the Millennium Development Goals (MDGs), which in September 2000 rallied the world around a common 15-year agenda to tackle the indignity of poverty.

The MDGs established measurable, universally-agreed objectives for eradicating extreme poverty and hunger, preventing deadly but treatable disease, and expanding educational opportunities to all children, among other development imperatives. We will achieve the sustainable development goals reduce some particular several areas that are:

- Income poverty
- Access to improved sources of water
- Primary school enrollment
- Child mortality
- With the job unfinished for millions of people—we need to go the last mile on ending hunger, achieving full gender equality, improving health services and getting every child into school. Now we must shift the world onto a sustainable path. The SDGs aim to do just that, with 2030 as the target date.
- This new development agenda applies to all countries, promotes peaceful and inclusive societies, creates better jobs and tackles the environmental challenges of our time—particularly climate change.
- The SDGs must finish the job that the MDGs started, and leave no one behind.

#### 4. THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT GOALS IN INDIA

At the Sustainable Development Summit on 25 September 2015, UN Member States adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030. The SDGs build on the Millennium Development Goals (MDGs), eight anti-poverty targets that the world committed to achieving by 2015. The MDGs, adopted in 2000, aimed at an array of issues that included slashing poverty, hunger, disease, gender inequality, and access to water and sanitation. Enormous progress has been made on the MDGs, showing the value of a unifying agenda underpinned by goals and targets. Despite this success, the indignity of poverty has not been ended for all. The new SDGs, and the broader sustainability agenda, go much further than the MDGs, addressing the root causes of poverty and the universal need for development that works for all people.

UNDP Administrator Helen Clark noted: "This agreement marks an important milestone in putting our world on an inclusive and sustainable course. If we all work together, we have a chance of meeting citizens' aspirations for peace, prosperity, and wellbeing, and to preserve our planet." The SDGs will now finish the job of the MDGs, and ensure that no one is left behind.

- 1. No Poverty:** End poverty in all its forms, everywhere (*Economic*)
- 2. Zero Hunger:** End hunger, achieve food security and improved nutrition and promote sustainable agriculture (*Economic*)
- 3. Good Health and Well Being:** Ensure healthy lives and promote well-being for all at all ages (*Economic*)
- 4. Quality Education:** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (*Social*)
- 5. Gender Equality:** Achieve gender equality and empower all women and girls (*Social*)
- 6. Clean Water and Sanitation:** Ensure available and sustainable management of water and sanitation for all (*Economic*)
- 7. Affordable and Clean Energy:** Ensure access to affordable, reliable, sustainable and modern energy for all (*Economic*)

**8. Good Jobs and Economic Growth:** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (*Economic*)

**9. Industry, Innovation and Infrastructure:** Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (*Economic*)

**10. Reduced Inequalities:** Reduce inequality within and among countries (*Social*)

**11. Sustainable Cities and Communities:** Make cities and human settlements inclusive, safe, resilient and sustainable (*Environment*)

**12. Responsible Consumption and Production:** Ensure sustainable consumption and production patterns (*Environment*)

**13. Climate Action:** Take urgent action to combat climate change and its impacts (*Environment*)

**14. Life below Water:** Conserve and sustainably use the oceans, seas and marine resources for sustainable development (*Environment*)

**15. Life on Land:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (*Environment*)

**16. Peace, Justice and Strong Institutions:** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels (*Social*)

**17. Partnerships for the Goals:** A successful sustainable development agenda requires partnerships between governments, the private sector and civil society. These inclusive partnerships built upon principles and values, a shared vision, and shared goals that place people and the planet at the center, are needed at the global, regional, national and local level (*Social*).

## 5. CONCLUSION

One of the first attempts in economics to explain sustainable development was the *systems approach*, which suggests that sustainability can only be achieved by balancing the tradeoffs among the various goals across environmental, economic and social systems although conceptually appealing and easy to depict visually this approach has provided little policy guidance on how to assess the tradeoffs among various system goals or how to determine the welfare implications of such choices. The sustainable development goals will be implemented a enormous problem but continuous effort and different schemes provide for below poverty line people when eradication of poverty and educate everyone at the moment we will achieve the sustainable development goals in the society, it is link with decreasing inequalities and increasing equality in our country. This is very important in revolution of achieving the every individual to participate and to help to society and economically based society at least some properties share with the poor people and having an integrated approach to supporting progress across the multiple goals is achieving the SDGs, and UNDP is uniquely placed to support and continuous process is required.

## 6. REFERENCES

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