

Sachin Chaturvedi
K. Seeta Prabhu
Sabyasachi Saha *Editors*

Wellbeing, Values and Lifestyles

Towards a New Development Paradigm



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Sachin Chaturvedi · K. Seeta Prabhu ·
Sabyasachi Saha
Editors

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Editors

Sachin Chaturvedi
Research and Information System for
Developing Countries (RIS)
New Delhi, India

K. Seeta Prabhu
Institute for Human Development
New Delhi, India

Sabyasachi Saha
Research and Information System for
Developing Countries (RIS)
New Delhi, India



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अमिताभ कांत
Amitabh Kant
जी20 शेरपा
G20 Sherpa



सत्यमेव जयते



Foreword

Under India's Presidency of the G20, Lifestyles for Environment (LiFE) garnered massive momentum as it received support from the international community and those aspiring for a healthy and green lifestyle. The motto of India's G20 Presidency – “One Earth One Family One Future” – truly encapsulated the essence of pro-planet-people. Today, LiFE is poised to become the global mantra for combating climate change.

Back in 2015, ahead of the landmark Paris Climate Conference, Prime Minister of India had argued through an article that the instinct of India's culture is to take a sustainable path to development. He had said, “When a child is born, we plant a tree. Since ancient times, we have seen humanity as part of nature, not superior to it. This idea, rooted in our ancient texts, endures in sacred groves and in community forests across the land.”

The idea behind his advocacy was to alert the world that the unsustainable lifestyles of a few should not deny the dreams of the rest. In India, lifestyles have been influenced by the traditional culture and ethos, where co-existence with nature and mindful consumption is deeply ingrained in day-to-day lifestyles. Inspired by this, India tried to mobilize global actors to focus on mindful consumption.

Mission LiFE is a call for action by all citizens and governments across the world to save the planet from environmental degradation which we see around us in various forms. Mission LiFE has attracted enthusiastic response from world leaders, who have lauded India's initiative for blending its ideal of “Vasudhaiva Kutumbakam” to drive green transformation globally. Mission LiFE was launched at the CoP 26 in Glasgow in 2021. Mission LiFE is a mass movement for “mindful and deliberate utilization, instead of mindless and destructive consumption.” Government of India has prioritized Mission LiFE as a programme to induce behaviour change among individuals. We have identified seven simple yet powerful actions to initiate behaviour shifts like save energy; save water; say no to single use plastic; adopt sustainable food systems; reduce waste; adopt healthy lifestyles; and reduce e-waste.

Sustainable consumption and production patterns are deeply embedded in the ethical approaches that are integral part of our lifestyles. We have also argued that the concept of 'Reduce, Reuse and Recycle' and circular economy has been a part of the lifestyle of Indians for thousands of years. From individuals to industry, we must ensure that we build a new economic model around sustainable consumption and production with deeper linkages with lifestyle shifts. Various studies have estimated that transitioning to sustainable lifestyles would reduce annual global carbon dioxide (CO₂) emissions. According to International Energy Association (IEA), more than 2 billion tonnes (Gt) of CO₂ emission can be reduced by 2030 by adopting LiFE measures. Such transitions would also be supported through creating resilient infrastructure.

This Volume has taken forward the idea of LiFE in the direction of harmonizing the issues on sustainable consumption and production and their wider implications across countries further. Deeper understanding and scholarly work in this area will immensely help in achieving the underlying objectives of LiFE through robust policy action and adoption across countries.

The book has indeed been able to bring to center-stage the philosophies that profess moderate restraint and a balanced approach to life and living, and emphasise on sufficiency over efficiency. It integrates the concepts, theories and evidence and connects values and lifestyles into an economic model that has the potential to address the 21st century challenges and minimize perceived trade-offs between development and sustainability. At the individual level, the new development paradigm goes

beyond the anthropocentric view to incorporate not just climate change mitigation strategies and intergenerational justice but also trans-species justice.

Lifestyles for environment would also entail not only balancing our sustainable consumption and production but also measurement approaches for wellbeing that are in harmony with nature, thereby emphasizing on going beyond GDP to measure human centric progress. This volume addresses the issues of methodologies to measure wellbeing going beyond the narrow concept of GDP. The methodologies in this regard need to be studied and explored further by UN and other agencies for realizing the objectives of LiFE and Sustainable Development Goals (SDGs).

Lifestyles for Environment would also require new approaches on production ecosystems wherein firms working towards social benefits can be supported. India introduced the novel idea of Social Stock Exchange in 2019 for helping such entities to raise financial resources to fund themselves and be self-sustaining. Financial institutions need to formulate policies and strategies to nurture this new sector of the economy that goes beyond conventional understanding of profit orientation.

The volume has very aptly attempted to underscore the emphasis on novel incentives, like Impact funds, for developing and deploying innovations that address the unmet needs in agriculture, health care, education, financial services, green technologies, among others. I strongly believe that entrepreneurship that prioritizes 'people' and 'planet' over 'profits' is surely going to make a big difference in our approach to sustainability and inclusion. We, therefore, need more social entrepreneurs and those that bring wider benefits to citizens and society. This necessitates encouraging, supporting and empowering social entrepreneurs. In India, we have numerous such change makers. I am happy that the book also throws light on this.

During India's G20 presidency steps were taken to launch a new Action Plan to Accelerate the SDGs and adopt the High-level Principles on Lifestyles for Sustainable Development. Prior to G20, there have been attempts to strengthen collaboration through the International Solar Alliance and Coalition for Disaster Resilient Infrastructure. India has also launched DAKSHIN, the Global South Centre for Excellence to widen our partnership with the Global South on development solutions. In furthering collaborations on LiFE and ensuring continuity at the forthcoming G20 presidencies initiatives like GALERI (Global Alliance for Life Economies Research and Innovation) would bring together academics, civil society and other actors to enable research and sharing of best practices.

I congratulate RIS on coming out with this important volume on the theme of LiFE. It presents a concrete foundation for building up on this new development paradigm. The Volume, having twenty-three scholarly contributions, is indeed very timely. It recognizes the evolution of LiFE as a concept, with its roots in India and its acceptance at the G20 as a key pathway for development transformation that is both sustainable and equitable. I am confident that the readers would find it an interesting and useful reference on the theme of LiFE.


(Amitabh Kant)
21st August, 2024



Tel : +91-11-24156460, 24156500 • E-mail : g20sherpaoffice@mea.gov.in / amitabh.kant@nic.in

भारत सरकार, जी20 सचिवालय, सुष्मा स्वराज भवन, नई दिल्ली - 110021
Government of India, G20 Secretariat, Sushma Swaraj Bhawan, New Delhi - 110021

Foreword by Gabriela Ramos

As we face the climate crisis, and the gaps in actions required to address it persist, frameworks like the “Wellbeing, Values and Lifestyles” can help us accelerate change towards a more sustainable world. This framework, based on India’s “Lifestyles for Environment” (LiFE) initiative, is both a product of the country’s recent international cooperation efforts and its ancient intellectual heritage. It aims to instil a new relationship with nature. India has made a strong call to address climate inequalities and we were proud to contribute to its G20 presidency, where the Indian government promoted the LiFE initiative globally with the motto “One Earth, One Planet, One Future”.

This book compiles actionable knowledge to establish a new paradigm across four key dimensions. First, traditional metrics like GDP fail to capture true societal wellbeing, ignoring environmental degradation, social inequalities, and quality of life. It is crucial that we expand the evidence based on which policymakers rely beyond macro-economic considerations. This volume advocates for new metrics, that include environmental health, social equity, and overall wellbeing to provide a broader understanding of progress, such as Dennis Snower and Colin Mayer’s SAGE Dashboard, or the *ex ante* equity-sustainability-call that UNESCO’s Management of Social Transformations (MOST) Programme issued in its “Inclusive and Resilient Societies” publication.

Second, it promotes the intrinsic value of all living beings and a compassionate relationship with nature, emphasizing the protection of biodiversity and minimizing harm through policies that preserve habitats, reduce pollution, and promote coexistence with wildlife. Third, it underscores the need for innovative governance in climate change mitigation and local adaptation, advocating for production systems with social and environmental benefits. This includes supporting a circular economy, sustainable practices, resilient infrastructures, impact funds, alongside technical assistance and educational programmes.

Finally, the book highlights the importance of collaboration at all levels for sustainable development, citing India’s G20 presidency and the launch of DAKSHIN to promote cooperation amongst developing countries. Future G20 presidencies

should continue initiatives like the Global Alliance for Life Economies Research and Innovation (GALERI).

UNESCO has been looking at ways in which action for climate can be accelerated. In this sense, we are proud to partner with the Research and Information System for Developing Countries (RIS), be it by advancing knowledge on the distributional impact of climate policies, on understanding human behaviour through our BRIDGES Coalition for sustainability science, or by adopting global standards such as the UNESCO Declaration of Ethical Principles in relation to Climate Change. As we advance integrated approaches, we also included an environmental chapter in our Recommendation on the Ethics of Artificial Intelligence, as the digital transformation, migrations, and other major trends are also impacting our environment and the climate agenda. These are few examples amongst other efforts, and all stakeholders in the international community should work towards devising governance frameworks that would allow to implement effective, inclusive, and sustainable change, as highlighted at the 2024 edition of the MOST Forum.

The volume you hold in your hands is a concrete step in this direction, providing methods and policies to promote a more sustainable and equitable world. By delivering a framework for integrating ethical, environmental, economic and social considerations into development planning, this book serves as a valuable resource for policy makers, academics and practitioners aiming to achieve this goal.

Gabriela Ramos
Assistant Director-General for Social and Human Sciences
UNESCO, Paris

Preface

The genesis of LiFE can be traced back to its unveiling at CoP 26 in Glasgow by the Indian Prime Minister, where it emerged as a beacon of hope—a movement advocating for mindful and deliberate utilization over mindless and destructive consumption and pledge towards pro-planet actions. In the wake of escalating global challenges, the imperative for a transformative shift in our development paradigm has never been more pronounced.

This book is born out of the collective efforts of insightful scholars and thought leaders, who embark on a journey to explore and articulate a groundbreaking concept, LiFE: Lifestyle for Environment.

LiFE is more than a concept; it is a clarion call for a profound reorientation in our individual and collective behaviours, weaving together sustainability, ethics, compassion and wellbeing into the fabric of our economic models. It serves as a comprehensive exploration of the multifaceted dimensions that LiFE encompasses, evolving from a grassroots behavioural movement to a visionary economic model.

The present volume unfolds the narrative of LiFE's journey, from its roots in India to its embrace by the G20 as a core area for reforming development pathways. As you traverse through these chapters, you will encounter the interconnected facets of LiFE: first, moving towards ethical foundations and value system for LiFE; second, sustainable consumption and production; third, modalities for systemic transformation; fourth, financing resilient infrastructure; and fifth, innovative approaches to measuring wellbeing beyond GDP. The contributors delve into the core principles of LiFE, emphasizing ethical values, social enterprises, technology, finance and international cooperation as pivotal elements in this transformative paradigm.

Moreover, the narrative expands to underscore the role of LiFE in accelerating the achievement of Sustainable Development Goals (SDGs). At a critical juncture where the world grapples with the alarming pace of climate change, rising inequality and the need for an ethical reformation of global relations, LiFE emerges as a practical pathway towards a sustainable, inclusive and equitable future.

Inspired by Prime Minister's call for LiFE, we feel satisfied that our efforts in working on his message led us to document key insights in the form of this volume. We acknowledge the encouragement, support and guidance received from Mr. Amitabh

Kant, India's G20 Sherpa and Ambassador Harsh Vardhan Shringla, Chief Coordinator, G20 India in this journey and enabling us to align our efforts with India's G20 Presidency. We are thankful to Ambassador Abhay Thakur, Sou-Sherpa, G20 India, Ambassador Muktesh Pardeshi, Special Secretary, G20 India, as well as Co-chairs of Development Working Group Ms. Enam Gambhir, Joint Secretary, G20, and Ambassador Nagraj Naidu, Joint Secretary, G20, for their insights on LiFE and the issues for consideration by the G20.

Under the overall guidance of G20 Sherpa Mr. Amitabh Kant and with the active participation of Think 20 India Chair Ambassador Sujan R. Chinoy, Think 20 India constituted a unique Task Force on "LiFE, Resilience and Values for Wellbeing" comprising of 23 globally renowned scholars. I remain thankful to Ambassador Chinoy, Dr. Samir Saran and the Think 20 India Secretariat for extending their full cooperation in facilitating the deliberations of the Task Force.

I am grateful to the eminent thinkers and scholars with whom we had the privilege to work as Co-chairs of Indian Think 20 Task Force 3: LiFE, Resilience and Values for Wellbeing. I thank Prof. Seeta Prabhu and Dr. Sabyasachi Saha, both my fellow Co-chairs in Task Force 3, for their leading role in consolidating ideas and perspectives on specific tracks under the Task Force and contributing substantially to the volume. They have played instrumental roles in conceptualization, editing and finalization of this volume.

We are glad that this volume is being launched as the first publication of the G20 Research Forum announced during Indonesian G20 Presidency, at the Think 20 Summit in Bali. I acknowledge the financial support received from the Economic Research Institute for ASEAN and East Asia (ERIA) and thank Professor Tetsuya Watanabe, President, ERIA, for his full support and cooperation. This initiative has also benefitted from the support received from Mr Hidetoshi Nishimura, immediate past-President of ERIA. I thank Ms. Anita Prakash, Senior Policy Advisor, ERIA, for facilitating this important partnership between RIS and ERIA.

Finally, I appreciate the contributions received from distinguished co-authors who have associated with our Task Force and have helped us in elaborating the LiFE paradigm. I recognize the contribution of Mr. Syed Arslan Ali for his constant involvement from conceptualization to the production of this volume and undertaking extensive background research work. I also note with appreciation the support received from the RIS publication team comprising Dr. Ivy Roy Sarkar, Mr. Tish Malhotra, Mr. Sachin Singhal, and Mr. Sanjeev Karna and Ms. Nupoor Singh from Springer for arranging the production of this report.

We hope that this volume would serve as a useful reference for academicians, researchers and public policy practitioners to better understand the contemporary challenges and chart out policies towards a more equitable and inclusive development order and to usher in a new era where the principles of LiFE guide our actions, policies and aspirations, fostering harmonious coexistence with nature and society.

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Editors and Contributors

About the Editors

Prof. Sachin Chaturvedi is Director General at the Research and Information System for Developing Countries (RIS), a New Delhi based Think-Tank. He works on issues related to development economics, involving development finance, SDGs and South-South Cooperation, apart from trade, investment and innovation linkages with special focus on WTO. Currently he is also Member, Board of Governors, Reserve Bank of India. He was Global Justice Fellow at the MacMillan Center for International Affairs at Yale University; Developing Country Fellow at the University of Amsterdam; Visiting Fellow at the Institute of Advanced Studies, Shimla; and Visiting Scholar at the German Development Institute (IDOS). He has served as a Visiting Professor at the Jawaharlal Nehru University (JNU) and has been closely associated with the UN Food and Agricultural Organization, World Bank, UN-ESCAP, UNESCO, OECD and many other agencies. He was the lead Co-chair of Think 20 India Task Force 3 on LiFE, Resilience and Values for Wellbeing and is Member of the International Advisory Council of Think 20 Brazil.

Prof. K. Seeta Prabhu is currently Visiting Professor at the Institute for Human Development, New Delhi. She is an expert of the human development approach and spearheaded the preparation of Human Development Reports across 26 Indian States as Head of Human Development Resource Centre, UNDP, India. The positions she occupied include Tata Chair Professor and Director, Prime Minister's Rural Development Fellows programme at the Tata Institute of Social Sciences, Mumbai and Professor of Development Economics, University of Mumbai. She was a Co-chair of Think 20 India Task Force 3 on LiFE, Resilience and Values for Wellbeing.

Dr. Sabyasachi Saha is Associate Professor at the Research and Information System for Developing Countries (RIS), a New Delhi based autonomous policy research organization and think tank. Dr. Saha is an economist specializing in technology, international trade and sustainable development and has over 15 years of professional

experience. He has Co-edited two volumes published by Springer and contributed extensively through research articles and policy briefs. Dr. Saha holds a Ph.D. in Economics from Jawaharlal Nehru University (JNU), New Delhi; where he also earned his M.Phil. and M.A. Dr. Saha regularly contributes on global governance and regional cooperation issues within his domain of expertise and engages more deeply on matters related to G20, BRICS and South Asia. He is the current editor of South Asia Economic Journal published by Sage. He was a Co-chair of Think 20 India Task Force 3 on LiFE, Resilience and Values for Wellbeing and is currently a Co-chair of Think 20 Brazil Task Force 6 on Strengthening Multilateralism and Global Governance.

Contributors

Cezmi A. Akdis Swiss Institute of Allergy and Asthma Research (SIAF), University-Zurich, Davos, Switzerland

Syed Arslan Ali Research and Information System for Developing Countries (RIS), New Delhi, India

Ashita Allamraju University of Toronto, Toronto, Canada

José Fernandez Alonso National Scientific and Technical Research Council (CONICET), Center of Studies in International Relations of Rosario (CERIR), National University of Rosario (UNR), Rosario, Argentina

R. Balasubramaniam (Balu) Capacity Building Commission, New Delhi, India

Dan Banik Oslo SDG Initiative, University of Oslo, Oslo, Norway

Arpit Barman Research and Information System for Developing Countries (RIS), New Delhi, India

D. Bhagwan Das Dayalbagh Educational Institute (Deemed to be University), Agra, India

Soumya Bhowmick Centre for New Economic Diplomacy (CNED), Observer Research Foundation (ORF), New Delhi, India

Consuelo Carreras Department of Maritime and Energy, Studi e Ricerche per il Mezzogiorno, Naples, Italy

Sachin Chaturvedi Research and Information System for Developing Countries (RIS), New Delhi, India

Pedro Conceicao Human Development Report Office, UNDP, New York, NY, USA

Massimo Deandreis Studi e Ricerche per il Mezzogiorno, Naples, Italy

Arsh Dhir Advisory Committee on Education, Dayalbagh Educational Institute (Deemed to be University), Agra, India

Pami Dua Delhi School of Economics, University of Delhi, New Delhi, India

V. B. Gupta Advisory Committee on Education, Online and Distance Education Programme, Dayalbagh Educational Institute (Deemed to be University), Agra, India

Sandhya S. Iyer Centre for Public Policy, Habitat and Human Development, School of Development Studies, Tata Institute of Social Sciences, Mumbai, India

T. C. James Research and Information System for Developing Countries (RIS), New Delhi, India

Shailly Kedia The Energy and Resources Institute (TERI), New Delhi, India

Palak Khanna The Energy and Resources Institute (TERI), New Delhi, India

Ashok Khosla Development Alternatives Group, New Delhi, India

Ashish Kumar Macroeconomics & Statistics Vertical, Pahle India Foundation, New Delhi, India

Shashiprabha Kumar Vivekananda International Foundation, New Delhi, India

Debolina Kundu National Institute of Urban Affairs (NIUA), New Delhi, India

Gladys Lechini South–South Relations and Cooperation Programme (PRECSUR), Center of Studies in International Relations of Rosario (CERIR), National University of Rosario (UNR), Rosario, Argentina

Xiaoyun Li College of International Development and Global Agriculture (CIDGA), China Agricultural University (CAU), Beijing, China

Madhuparna Maiti The Energy and Resources Institute (TERI), New Delhi, India

Colin Mayer Said Business School, University of Oxford, Oxford, UK

Kari Nadeau Department of Environmental Health, Department of Climate and Population Studies, Center for Climate, Health, and the Global Environment, Harvard T.H. Chan School of Public Health, Boston, MA, USA

Apurva Narayan University of Western Ontario, London, Canada;
University of Waterloo, Waterloo, Canada;
University of British Columbia, Vancouver, Canada

Amrita Narlikar Observer Research Foundation, Delhi, India;
Darwin College, University of Cambridge, Cambridge, England

Alessandro Panaro Department of Maritime and Energy, Studi e Ricerche per il Mezzogiorno, Naples, Italy

Anita Prakash Economic Research Institute for ASEAN and East Asia (ERIA), Jakarta, Indonesia

Ruby Pawankar Department of Pediatrics, Nippon Medical School, Tokyo, Japan

Thomas Pogge Yale University, New Haven, USA

Francesco Profumo Isybank, Milan, Italy

Heerad Sabeti Fourth Sector Group, Washington, DC, USA

Sabyasachi Saha Research and Information System for Developing Countries (RIS), New Delhi, India

K. Seeta Prabhu Institute for Human Development, New Delhi, India

Dennis J. Snower Institute for New Economic Thinking, Oxford University, Oxford, UK;
Global Solutions Initiative, Berlin, Germany;
Brookings Institution, Washington, DC, USA

Shoba Suri Centre for New Economic Diplomacy (CNED), Observer Research Foundation (ORF), New Delhi, India

G. A. Tadas Research and Information System for Developing Countries (RIS), New Delhi, India

Chuanhong Zhang Department of Development Studies, College of Humanities and Development Studies, Beijing, China

Chapter 1

Introduction



Sachin Chaturvedi, K. Seeta Prabhu, and Sabyasachi Saha

The simultaneous, interconnected, and interacting crises across the globe in the economic, environmental, and social spheres have created an unprecedented situation stalling or even reversing progress on crucial dimensions of human wellbeing. The situation has glaringly exposed the limitations of the current development paradigm leading to demand for moving away from “business as usual” policies and strategies and to accelerate the search for an alternative development paradigm that is more equitable and sustainable.

Lifestyle for Environment (LiFE), built upon the concept of sustainable lifestyle, was first unveiled in CoP 26 in Glasgow as a mass movement towards environment conscious lifestyle which eventually expanded into a new economic model. Lifestyle plays an important role in carbon emissions which has been analysed in detail in the United Nations Environment Programme (UNEP) Emissions Gap Reports 2020 and 2023. Disparities in consumption-based emissions extend across countries and income groups (Capstick et al. 2020). The affluent top 10% of the global population, primarily situated in developed countries, is responsible for almost half (48%) of emissions. In stark contrast, the bottom 50% of the world’s population contributes only 12% to the total emissions (UNEP 2023). Historically, USA which comprises 4% of the world’s population, accounts for 17% of emissions from 1850 to 2021, inclusive of methane and nitrous oxide impacts. India, on the other hand, represents 18% of the global population but has contributed a mere 5% during the same period (UNEP 2023).

While announcing the LiFE campaign, the Prime Minister of India stressed: “This can become a mass movement of environmentally conscious lifestyle. What is

S. Chaturvedi

Research and Information System for Developing Countries (RIS), New Delhi, India

K. Seeta Prabhu

Institute for Human Development, New Delhi, India

S. Saha (✉)

Research and Information System for Developing Countries (RIS), New Delhi, India

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needed today is mindful and deliberate utilisation, instead of mindless and destructive consumption”. Centrality of the concept of sustainability assumed key importance in the evolution of various facets of SDGs (RIS 2015; Chaturvedi et al. 2019a, b, c). Since 2015, India has been advocating for sustainable lifestyles at various multilateral forums and has focused on formulating practical policy approaches.

The Indian G20 presidency took up LiFE as one of the core areas for reforming the development pathways and accelerating the SDGs. The G20 New Delhi Leaders Declaration emphasised on mainstreaming Lifestyles for Sustainable Development (LiFE) and endorsed the G20 High-Level Principles (HLPs) on Lifestyles for Sustainable Development (G20 India 2023a), which was adopted in the Development Ministers meeting at Varanasi. The commitment to sustainable development, outlined in the HLPs on Lifestyles for Sustainable Development, calls for integrating our fragmented climate, development, and environment agenda (G20 India 2023b). Subsequently, the G20 Leaders committed to promote G20 HLPs, through international cooperation and financial aid, encourage international organizations to incorporate the HLPs into their programmes (G20 India 2023a).

The impact of lifestyles, particularly our consumption and production patterns, is connected with the realisation of SDGs at a time when the SDGs are in severe crisis. According to the United Nations Secretary General 2023 Progress Report on SDGs, only 12% of 140 targets that were tracked showed progress, while 30% of targets have regressed below the 2015 baseline. It is also implied that 575 million people shall still be trapped in extreme poverty in 2030. Similarly, carbon dioxide levels are at a staggering 149% higher than pre-industrial levels, reaching a point not seen in the last 2 million years. Consumption and production patterns play an important role in Co₂ and other GHGs emissions. SDG 12 is a standalone goal which aims to ensure sustainable consumption and production patterns, tracked through various targets and underlined indicators including material footprint and domestic material consumption. However, there exist significant disparities between Global North and Global South. Under SDG target 12.2, Northern America and Europe have 14% higher material footprint than domestic material consumption, while in sub-Saharan Africa, the material footprint was lower than domestic material consumption by 32% (UNSGR 2023).

The large-scale inequity in terms of access and distribution of resources, particularly finance and technology, both among and within countries has exacerbated to a point where growing inequality and underdevelopment are reinforcing each other. On the one hand, there is demand for reforming the global financial architecture to deliver on development priorities; on the other hand, access to technology continues to remain an aspirational, broken, and heavily punctuated agenda in the absence of common understanding, framework, or institution of engagement.

The Technology Facilitation Mechanism (TFM), negotiated as part of Agenda 2030, is a pilot and experimental attempt to overcome these barriers and navigate the technological advancement towards solving fundamental issues of development (Chaturvedi and Saha 2016). The most tangible outcome so far is the launch of the Global Pilot Programme on STI for SDGs Roadmaps by the UN in 2019 with five pilot countries—Ethiopia, Ghana, Kenya, Serbia, and India (Chaturvedi et al. 2019a,

b, c; Chaturvedi et al. 2020). However, technology generation and transfer still work on the current reward mechanisms on innovation based on monopoly markups. The LiFE paradigm fundamentally alters the rewarding mechanism by prioritising societal impact rather than profits towards fostering innovations, starting with life-saving domains. To overcome capacity gaps, there has to be generous support for knowledge sharing and building partnerships. The LiFE paradigm incorporates various facets that are interlinked and interoperable. The paradigm proposes an economic model where actions and behaviours of individuals, communities, businesses, and institutions are governed by fair norms, values of integrity and principles of justice and functioning of economic actors are based on the ethical framework of access, equity, and inclusion (AEI).

In order for global government and institutions to deliver on the aspirations of this new development paradigm as well as on values and wellbeing, there has to be a broader understanding of the tools, concepts, evidence, roadmaps, and collaborations. This would lead to enhanced and rational allocation of resources; localisation of development; bringing AEI through technology; and reformulating development partnerships, trade relations, and capacity creation. Therefore, a new configuration of institutions and multilateral structures is needed to build upon the idea of values, wellbeing, and lifestyles. Drawing upon these foundational principles, the five facets of LiFE and associated new development paradigms are elaborated below.

1.1 Facets of Development Paradigm Based on LiFE

1.1.1 Ethical Foundation and Value System

The foundational facet of LiFE is the ethical foundation and value system that must underpin individual and community behaviour. In India, lifestyles have been historically influenced by the value systems and civilisational ethos leading to practising of a harmonious coexistence with nature and other species.

The role of ethics and traditional Indian values in promoting a lifestyle which is in consonance with nature conservation and rejuvenation has been explored by Shashi Prabha Kumar in her chapter *Lifestyle and Values: Through the Prism of Ancient Indian Tradition*. On similar track; Amrita Narlikar discusses the philosophical underpinning of the theme of Indian G20 presidency “*One Earth, One Family, One Future*” in her chapter titled “*Unpacking the Theme of India’s G20 Presidency and Its Wide-Ranging Implications*”. The traditional Indian values and concepts promote an inclusive approach to life, considering human as responsible beings obliged to take care of other forms of life and the environment. Similarly, the theme, *Vasudhaiva Kutumbakam*, which translates to “the world is one family” has its origin in the ancient Indian text—the Maha Upanishad, emphasising the interconnectedness of all beings on Earth and extending beyond humans to include the entire ecosystem. The challenges posed by the Anthropocene era, characterised by

human actions impacting nature and livelihoods, are discussed in the chapter *Perspectives on Ethical Values for Lifestyle for Environment (LiFE)-Mediated Economy* by Seeta Prabhu, et al. The chapter argues for the adoption of pro-planet LiFE-mediated development with equity and sustainability as core values. It provides a number of practical policy initiatives drawn from the experiences of middle-income countries in the Global South that have successfully adopted such development.

At the global level, ethical interlinkages with structural issues in the multilateral world order perpetuating poverty and inequality are highlighted by Thomas Pogge. In the chapter on *Moralising International Relations*, Thomas Pogge expands the concept of LiFE, which revolves around the idea of gradually moralising international politics. It emphasises the need to shift international politics from a power-centric approach to one that prioritises moral principles and the common good. By addressing this issue and rectifying global economic and financial rules that perpetuate inequality, a significant move towards moral progress can be made.

1.1.2 Sustainable Consumption and Production

The second facet is the shift towards sustainable consumption and production patterns and holistic operationalisation of a circular economy framework. As defined by the UNEP, “SCP is a holistic approach to minimising the negative environmental impacts from consumption and production systems while promoting quality of life for all” (UNEP 2016). The three principles of SCP, namely improving quality of life without increasing environmental degradation; decoupling economic growth from environmental degradation; and applying life cycle thinking, balance the developmental needs on one hand whilst charting out a trajectory for sustainable consumption and production patterns on the other. The approaches of SCP are particularly discussed within the framework of circular economy (CE) where the economy is reconstructed on the 3 R’s reduce, recycle, and reuse which gives an alternative economic vision away from the mainstreamed linear model of production. In spirit, this is similar to Prime Minister’s call for zero defect and zero effect production and consumption process.

The chapter *Internationalising Lifestyle for the Environment* by Shailly Kedia et al. explores the innovative concept of LiFE. It calls for a holistic approach to sustainable consumption and production, addressing all segments of resource value chains, including resource extraction, manufacturing, consumption, and disposal. Ashok Khosla in his chapter *Equity and Social Consequences of Raising Resource Efficiency* deliberates on the complex interplay between economic development, resource consumption, environmental impact, and social equity. It raises critical questions about the sustainability of current global consumption patterns, especially if countries in the Global South were to emulate the resource-intensive lifestyles of the global north. The chapter underscores the importance of closing knowledge gaps in understanding the social and environmental implications of resource efficiency measures. Shoba Suri and Soumya Bhowmick *Plant-Based Diet for Mission LiFE:*

Food Security, Health, and Environment explore the intersection of plant-based diets, Mission LiFE's principles, and the quest for sustainable food systems. The role of alternative fuel and its impact on the maritime sector is discussed in the chapter by Francesco Profumo et al. on the theme of *Future Prospects for Alternative Fuels in the Maritime Sector* which is set in the context of the global push for sustainability in the maritime sector. It explores the complex landscape of maritime decarbonisation, highlighting key insights and recommendations for a sustainable future.

At the practical level, several good practices and ongoing efforts on holistic models of development can be cited. Here actions on LiFE and their role in fulfilling the SDGs are discussed in the chapter *Catalysing SDG Achievement Through Community Engagement: A Case Study of Dayalbagh, India* by Pami Dua et al. where authors depict the case study of the Dayalbagh community in India, embracing responsible production and consumption through a Sigma Six Quality-Values-Attributes (Q-V-A) Model that has six elements: agriculture and dairy; education and healthcare; air quality; water quality; innovation; and human values. The model facilitates the transition towards holistic sustainability that encompasses Lifestyle for Environment (LiFE).

1.1.3 New Modalities for Systemic Transformation

As stated earlier, the LiFE paradigm perhaps goes beyond the technical understanding of the sustainable consumption and production approaches, which has hitherto gained currency among sustainability advocates, through mobilisation for systemic transitions by incorporating new modalities including expansion of social entrepreneurship and trusteeship, leveraging technology for access, equity and inclusion, and international cooperation. International cooperation for LiFE economy is an inevitable aspect of systemic transitions. *Multilateralism and Lifestyle for Environment (LiFE): Contours and Challenges*, by Sandhya S. Iyer et al. explores a comprehensive framework for promoting sustainable lifestyles. The chapter recommends a four-pronged approach to operationalise LiFE viz. cooperation, coherence, convergence, and commitment. It emphasises the need for enhanced development cooperation, collective responsibilities, policy coherence at global and national levels, and the creation of mechanisms for policy coordination.

The current dominant economic system founded on the theory of profit maximisation, an extension of the industrial revolution framework, has become incompatible with the global challenges of the twenty-first century. The LiFE paradigm advocates for a “for-benefits” economic framework, emphasising the transition from profit-centric capitalism to a broader objective of benefiting all participants in the economy. In the chapter *Transitioning to LiFE Economy: Rethinking Growth, Sustainability, and Stakeholder Benefits*, by R. Balasubramaniam and *The LiFE Economy: Towards a New Development Paradigm* by G. A. Tadas et al. the authors delve into the need for a shift from a “for-profit” mindset to a “for-benefit” economic model and role of social enterprises. It advocates for democratically self-managed companies with

equitable ownership, decision-making, remuneration, and profit sharing based on the value each stakeholder brings. These social enterprises globally exhibit diverse goals, with common priorities, including community improvement, job creation, health enhancement, environmental protection, and education. The discussion extends to aligning development finance with the sustainable development goals (SDGs) and the importance of policy coherence for sustainable development.

Furthermore, access to technology is one of the critical modalities for systemic transformation. Leveraging innovation for equity is introduced as a unique approach to addressing global disparities in Science, Technology, and Innovation (STI) research and outputs. The intricacies of a new paradigm for science and technology and practical solutions towards fostering innovations have been discussed in chapters by Sabyasachi Saha and Syed Arslan Ali on *The Pursuit of Technology and Paradigm of Equity* and by Thomas Pogge on *Ecological Impact Fund: Greening the Global South*. LiFE approach emphasises the urgent need to bridge the gap between developed and developing countries in terms of access to scientific knowledge and technological advancements.

Lastly, the LiFE framework suggests recognising the interdependence with nature and all species for credible pathways towards harmonious coexistence. In this context, experts have dealt with the idea of “One Health” in detail. An in-depth exploration of the intricate relationship between climate change, human and environmental health, and the interconnectedness of all life forms on Earth. T. C. James and Ruby Pawankar, et al., elaborate on the concept of One Health (OH) in their chapters *One Health for a Sustainable Future* and *Climate Change, Environment, and One Health*, respectively. They discuss the significance of the One Health approach in the context of global health challenges, highlighting its unique concepts and their relevance for achieving sustainable development goals (SDGs).

1.1.4 Financing for Resilient Infrastructure

The fourth important facet that the new paradigm delves into is the financing of resilient infrastructure and cities to foster urbanisation with a low ecological footprint whilst maintaining urban–rural equilibrium. Financial globalisation has often been at cross-heads with financing needs for development. There has been longstanding debate as to whether financial globalisation promotes growth (and development) in developing countries. One of the key recommendations by T20 India Task Force 3 addresses the issues around financing for resilient infrastructure by suggesting that the global financial architecture and institutional approaches should be reformed based on accepted LiFE principles by the G20, which would address financial flows for physical, social, digital, and energy infrastructure from the perspective of sustainability, resilience, circularity, inclusivity, rural–urban balance, and trans-species balance (G20 India 2023c). Xiaoyun Li and Chuanhong ZHANG, and Debolina Kundu delve deeper into the issues of urbanisation and sustainability, and future

rurality in their respective chapters *Innovating a Comprehensive Approach to Sustainable Rurality in Global South: Key Junctures and Trajectories* and *Future Urbanisation and Habitat: Transitioning Towards Climate Responsive and Sustainable Development*. The chapters explore the challenges and characteristics of rural transformation in the Global South, emphasising the vital role that rural areas play in providing essential resources and livelihoods for a large part of the world's population. It highlights the importance of strengthening urban–rural linkages to build sustainable habitats and the need for effective urban planning and governance.

The issue of ethical considerations in finance represents another aspect of the LiFE paradigm, emphasising the role of excessive financialisation and its detachment from ethical behaviour. LiFE explores how value-based approaches and ethical norm settings to create integrity in financial systems can be adapted to support transitions and enhance resilience and wellbeing in the countries and sectors that have been long deprived of growth and development. *Green Bonds: Opportunities and Challenges for Reconciling Ethics and the International Financial System* by Gladys Lechini and José Fernandez Alonso delves into the domain of green bonds as a promising financial instrument to address climate change, emphasising their potential to bridge the gap between finance and ethics. The chapter highlights several key concepts and offers recommendations for strengthening the framework around green bonds. The chapter by Anita Prakash on *Infrastructure Investment for Connectivity: Converging Investors and Governments with LiFE and People's Wellbeing* underscores the critical role of infrastructure projects in fostering connectivity and wellbeing among nations and regions. To address the challenges in infrastructure financing, the chapter recommends the establishment of a multilateral cooperation framework endorsed by the G20. This framework would serve as a platform for governments, multilateral development banks (MDBs), and other stakeholders to collaborate on infrastructure projects.

1.1.5 New Wellbeing Measurement Approaches—Going Beyond GDP

The fifth facet of LiFE paradigm as captured in the book focuses on the measurement of wellbeing and its intrinsic interconnection with prevailing facets such as sustainable consumption and production (SCP), the circular economy, resilient infrastructure among others. Empirical observations derived from countries emphasising gross domestic product (GDP)-centric growth show that elevated income levels do not uniformly translate to enhanced wellbeing, especially amid challenges like climate change, biodiversity loss, limited access to essential services, and social inequities. Indicators should reflect priorities like climate change, SDGs, and emerging dimensions of digital infrastructure to transform and ease the lives of citizens. Interlinking the beyond GDP approaches with the models discussed above, the T20 India Task Force 3 Statement categorically mentions: “Developing wellbeing indicators will be

a prerequisite for setting priorities and allocating resources. Systemic transformation approaches that support comprehensive indicator profiles should be encouraged, with the aim of promoting, among others, business models and corporate practices for sustainability, social inclusion, care work, trusteeship, and good governance as part of the LiFE economy”.

Ashish Kumar, Arpit Barman, and G. A. Tadas have provided critical insights into the ongoing debate of wellbeing measurement in their respective chapters *Multidimensional Framework for Measuring Wellbeing* and *LiFE, SDGs and Wellbeing: Towards an Integrated Approach*. In the chapters, authors delve into the evolution of economic development metrics, with a primary focus on gross domestic product (GDP). They highlight the limitations of GDP in capturing the multifaceted nature of societal progress and wellbeing. Colin Mayer and Dennis Snower in their chapter on *Moral Measurement of Prosperity* recommend a new framework, termed the “SAGE Dashboard”. This framework measures prosperity through four components: solidarity (S), agency (A), gain (representing economic wellbeing), and environmental sustainability (E). Each component is linked to a specific normative foundation, reflecting values shared across cultures and nations.

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Part I

Ethics and Value System

Chapter 2

Lifestyle and Values: Through the Prism of Ancient Indian Tradition



Shashiprabha Kumar

Abstract The chapter proposes to put forth a traditional Indian view of lifestyle which is holistic and grounded in strong ethical values that can provide inherent foundations for a balanced and sustainable way of life. It does not claim to be a policy document but aims to highlight a few ideas from ancient Indian culture which are universal in nature and can be helpful in meeting the current challenge of environmental degradation and climate change.

The chapter proposes to put forth a traditional Indian view of lifestyle which is holistic and grounded in strong ethical values that can provide inherent foundations for a balanced and sustainable way of life. It does not claim to be a policy document but aims to highlight a few ideas from ancient Indian culture which are universal in nature and can be helpful in meeting the current challenge of environmental degradation and climate change.

In the backdrop of India's G20 Presidency and the launch of the 'Lifestyle for Environment' (LiFE) mission by Prime Minister Sri Narendra Modi in the year 2022, it is imperative for each one of us as responsible citizens of the world that we think of ways that are well within our means and can be immediately adopted so that the crisis is not precipitated any further. To propagate the mission LiFE, PM Modi has emphasised the need for mass movements and behaviour transformation. He has said that the issue of climate change cannot be addressed just by formal discussions:

When an idea moves from discussion tables to dinner tables, it becomes a mass movement. Making every family and individual aware that their choices can help the planet, can provide scale and speed. When people become conscious that simple acts in their daily life are powerful, there will be a very positive impact on the environment.

S. Kumar (✉)

Vivekananda International Foundation, New Delhi, India

The G20 logo ‘One Earth, One Family, One Future’ clearly reflects the age-old Indian ethos, which proclaims that all the inhabitants of the earth are the progeny of the divine immortal¹ and share an innate amity; equality is given to them by birth. It will therefore be in the fitness of things that we refurbish our traditional Indian view of synergising human life with nature and the world at large; not only because of India’s G20 Presidency but also because it is valuable for sustaining humanity. According to it, human beings are not only the most blessed beings but also the most responsible ones who are obliged to take care of other forms of life in the world.

From this point of view, the Indian concept of three obligations (*ṛṇatraya*)² is quite significant. Accordingly, every human being is born indebted with the following three debts:

- **To the seers (*ṛṣi-ṛṇa*):** One’s first obligation is to the seers or preceptors who have transmitted wisdom to posterity in the form of eternal truths for cosmic welfare. This can be repaid by constantly pursuing the path of integral knowledge for universal wellbeing.
- **To the parents and ancestors (*pitṛ-ṛṇa*):** Next comes the indebtedness to one’s parents and ancestors who have not only borne their children but also carried forward the perpetuation of the human race. This can be repaid by bearing one’s progeny as well as caring for the elders.
- **To the divine powers (*deva-ṛṇa*):** Last but not the least is one’s obligation to the divine forces, i.e. the sun, rain, earth, fire, sky, etc. This can be redeemed by offering one’s gratitude to these cosmic powers and working for the welfare of all.

Evidently, the traditional Indian idea of three debts (*ṛṇatraya*) bespeaks an inclusive approach to life wherein intra-generational as well as intergenerational gratitude is implied. This pattern of mutual give and take between human beings and other beings as well as with nature is an underlying idea that works for cosmic welfare. Bhagavadgītā has clearly asserted this fact.³

The reciprocal model of life in ancient Indian tradition is best expressed through another key concept of *yajña* which is actually a symbol of mutual sharing between cosmic powers and human beings as well as between humans and other species. *Yajña* is not only a daily family ritual but a clue for maintaining balance among the five elements of nature and fostering harmony between human beings and their environment. The earth is sanctified for the act of *yajna*, i.e. offering one’s best to the divine forces; water is sprinkled and sipped for this ritual act; air is purified with the herbal material *sāmagrī* offered; and a subtle form of air reaches the sky to combine with water and rain over the earth again; this completes the cycle of mutual dependence and reinforces the idea of interconnectedness.

¹ *Śṛṇvantu viśve amṛtasya putrāḥ*. Rgveda, 10/13/01.

² For details, see Shashiprabha Kumar, “Obligations Towards Others” in *Self, Society and Value* (Kumar S (2005) Obligations towards others. In: *Self, society and value*, pp 149–161).

³ *Devābhāvayatānena te devā bhāvayantu vaḥ*.

#*Parasparam bhāvayantaḥ śreyah paramayāpsyatha*. Bhagavadgītā, 3/11.

Accordingly, five types of *yajñas* are enunciated in ancient Indian sources, and every householder is enjoined to perform these daily:

- a. *Brahma-yajña*: For the propitiation of one's preceptors, each one is enjoined to partake daily in knowledge discourses leading to spiritual upliftment for one and all. This is the continuous process for the ennobling of humankind.
- b. *Pitṛ-yajña*: For repaying one's debt towards ancestors, each one must treat the mother, father, and other elders with utmost reverence every day and by all means. This is not only essential for maintaining continuity between generations but also for transmitting traditional values with lifestyle practices for the future. This is helpful for familial concord and social solidarity as well.
- c. *Deva-yajña*: This signifies that while enjoying physical pleasures, one should not forget gratifying natural forces such as the sun, the rain, the wind, the fire, and the earth; these natural forces are held to be *devas* or deities that ought to be cared for. It is in fact the most efficient way of cultivating a harmonious bond between human beings and the physical elements while also discharging one's duties towards the protection of the environment. It is through such practices that several forces of nature like earth, water, air, fire, and sky are held to be sacred in Indian tradition.
- d. *Bhūta-yajña*: Human beings are not supposed to and cannot afford to live in isolation but only in close cooperation with other living beings, so they are also enjoined to look after the welfare of other living beings such as the cow, the dog, the birds as well as insects on daily basis.
- e. It is worth mentioning here that until a few decades ago, almost every Indian household used to offer foodgrains for birds and cereal floors for insects; cooked food was first offered to cows and dogs before consuming oneself. These lifestyle habits were followed across the land in some way or the other. It makes clear without doubt that Indian tradition upholds principles of cosmic coexistence and universal friendship among all forms of life.⁴ Eating alone is stated to be a sin⁵ and sharing of food is held to be mandatory for one and all.
- f. *Atithi-yajña*: Indian hospitality is well-known all over the world. According to ancient Indian tradition, one should not only share with one's fellow human beings about whatever best is available at home but also welcome and greet unexpected guests to one's household. This is the reason that guests along with parents and preceptors are treated as divine beings in Indian culture.⁶ This fosters a feeling of goodwill and strengthens the participatory model of existence for a healthy society.

What follows from the above is that in Indian culture, human beings are held to be a part of the larger cosmic whole wherein various aspects of existence are offering their best for the welfare of others. In fact, this integrated view of life is based

⁴ *Mitrasyāhaṁ cakṣuṣā sarvāṇi bhūtāni samīkṣe. Mitrasya mā cakṣuṣā sarvāṇi bhūtāni samīkṣantāṁ.* Yajurveda, 36/18.

⁵ *Kevalāgho bhavati kevalaādi.* Ṛgveda, 10/117/06.

⁶ *Māṛḍeḍeḍe bhava, Pitṛeḍeḍe bhava. Ācāryadeḍe bhava.* Taittirīya Upaniṣad, Śikṣāvalī, 11/02.

upon a form of coordination and cooperation rather than the current model of competition and confrontation. In this inclusive scheme of life, the animate world as well as the inanimate nature are not segregated but are integrated in such a way that each one is fulfilling its role with gratitude to other forms of existence. In simpler terms, the ancient Indian view of life reflects a culture of reverence rather than the prevalent attitude of arrogance.

The significance and sanctity of Yoga in the Indian lifestyle have been well accepted by the whole world. International Yoga Day is celebrated across continents on 21 June every year. Now it is high time that underlying values associated with Yoga are adopted and projected by one and all. Out of the eight limbs of *āṣṭāṅga* Yoga, the following two are worth mentioning in this regard:

A. Five **Yama**-s are restraints for community partnership and social concord-

- *Ahimsā*: Non-violence means not hurting anyone by word or deed.
- *Satya*: Truthfulness means abstaining from the falsehood of all kinds.
- *Asteya*: Non-stealing signifies being content with one's own wealth.
- *Brahmacarya*: Continence is control of sensual desires.
- *Aparigraha*: Non-possession connotes not accumulating more than what is needed.

B. Five **Niyama**-s are the principles or observances for a balanced and holistic life of a person:

- *Sauca*—Hygiene: physical as well as mental.
- *Santoṣa*—Contentment.
- *Tapa*—Austerity.
- *Swādhyāya*—Self-study.
- *Īśvara-praṇidhāna*—Meditation and surrender to the supreme divine.

Obviously, the above values, if practised on a day-to-day basis, will lead to a sustainable lifestyle for an individual as well as society.

It is also noteworthy here that the ideas mentioned above are not just theoretical but are extremely practical. In fact, the Indian way of life is so deeply rooted in these values that every small act of daily routine is infused with such practices which are not only environment-friendly but also help in developing an emotional bonding with different aspects of the environment. It is not without reason then that the earth is invoked as a mother and the sky is addressed as father⁷; daily watering of the medicinal plants like basil (*tulasi*), bitter fruit tree (*neem*), and the holy fig tree (*peepal*) is linked with religious rites so that nobody shuns from

⁷ *Dyaurme pitā janitā nābhīratra bandhurme mātā pṛthivī mahīyān*. Ṛgveda, 1/164/33.

them. Offering water to the sun every morning and daily worshipping of fire (*agni-hotra*) is actually symbolic of accepting the significance of solar energy for the sustenance of life.

It is in this background that natural forces are not only personified but deified in Indian tradition in such a way that human beings treat them in the most reverential manner rather than looking upon them as mere commodities. In other words, '**communion with nature**' is the norm of life in Indian culture rather than the current craving for '**dominion over nature**'. Humankind has faced the fury of nature recently in the form of a pandemic which has proved that even a minute virus emanating from some unknown bird in a distant land can affect the whole of humanity across continents. It is because the whole cosmos is closely interlinked. It has also warned us all that the urge for controlling nature will boomerang and bring more serious challenges.

Therefore, in the current parlance, a change of mindset is the real need of the hour; it is not only a formal conservation that is to be practised but a sense of consecration is also to be inculcated for accomplishing the goal of peaceful coexistence. In fact, it is not a question of legally binding laws but of morally obliging attitudes that is more important to pursue in the Indian way of life as has been done for centuries. For example, a small but significant lifestyle practice of keeping a handkerchief and a bag made of cloth has been almost discarded in India and replaced with paper tissues and plastic bags; this has created havoc for our environment. It has been more disastrous because the magnitude of the Indian population is much more than many of the smaller nations. So if India starts adopting its age-old practices conducive to the environment, then there will be enormous positive impact on the planet.

Recycling of natural resources is intrinsically inherent in the traditional Indian lifestyle because the concept of time is held to be cyclical⁸ according to the Indian viewpoint and not linear as in Western tradition. Accordingly, nothing goes forever, rather everything comes back in a different name and form. Thus, recycling is a regular phenomenon of nature and not an externally imposed principle.

Moreover, each entity of the universe is seen as pulsating with divine consciousness⁹ and so eternally valuable in the traditional Indian view. Hence, the sheer thought of wastage of food or water is treated as a sin, for food is nothing but a benign blessing of the divine¹⁰ and water is held to be sacred due to its healing powers.¹¹ Evidently, the contemporary utilitarian, consumerist, and materialistic attitude cannot appreciate such noble thoughts unless it is endowed with a value-based biocentric approach.

There is another principle of Indian philosophy which signifies perfect parity between the individual and the universal in some way or the other:

⁸ Atharvaveda, 19/53/01-02.

⁹ Sa otaḥ *protaśca vibhūḥ prajāsu*. Yajurveda, 32/08.

¹⁰ *Annaṁ brahma*. Taittirīyopaniṣad, Bhṛguvallī, II.1.

¹¹ *Āpaśca viśvabheṣajīḥ*. Ṛgveda, 1/23/20.

*Yathā piṇḍe tathā brahmāṇḍe,
i.e. the microcosm is just a replica of the macrocosm.*

According to this principle, although an individual being is just a tiny tot in the cosmos, it represents the whole universe in its miniature form. To put it more precisely, the subtle thoughts and blatant actions of an individual do definitely affect the gross form of the universe. So, one should live and behave in an individual capacity as if in total tandem with the whole world.

Viewed from this perspective, everything in the world is interrelated, and so human beings cannot absolve themselves of their selfish activities, they have to work in accordance with the universal order expressed through the Vedic idea of *ṛtam*. The Vedic principle of *ṛtam* has wide-ranging connotations,¹² but there is an overriding sense of dynamic world order (rhythm) in it- both physical as well as moral. Therefore, in the Indian view of life, only moderate indulgence is prescribed¹³ and moral implications of unlimited sensual pleasures being enjoyed by human beings are not held to be good, rather these are termed disastrous for personal health as well as the world environment.

This brings us to Āyurveda or the holistic science of wellbeing, another aspect of ancient Indian tradition which ordains a restrained lifestyle embedded in ethical norms intertwined with Nature. Āyurveda is an integral method of healthy living and is intrinsically connected with moral values as well as universal wellbeing. Compassion for all beings (*sarvabhūtanukampā*) is its driving force while a protocol for sustainable living (*sadvṛtta*) is its lesson. It is not only concerned with the wellbeing of humans but also of the trees and animals,¹⁴ so it reflects a multipolar viewpoint rather than a unipolar one.

In this respect, it will be interesting to quote the basic definition of a healthy person according to a popular narrative of Āyurveda which is as follows:

Q. Who is a healthy person? (*ko'ruk? ko'ruk? ko'ruk?*)

Answer:

- One who eats what is beneficial (*hitabhuk*).
- One who eats in a limited amount (*mitabhuk*).
- One who eats at regular intervals (*rtabhuk*).¹⁵

Obviously, it prescribes a balanced and beneficial course of diet in a regulated manner for a healthy and disease-free long life. It is worth mentioning in this respect that a recent survey conducted by the scientists of Brazil, Jordan, UAE, Switzerland, and India (published in the April 2023 issue of the *Indian Journal of Medical Research* of the Indian Council of Medical Research ICMR) has

¹²P. V. Kane, *History of Dharmasāstra* (Kane PV (1973) History of Dharmasāstra, vol IV. Bhandarkar Oriental Research Institute, Poona, p 2).

¹³*Tena tyaktena bhuñjithāḥ*. *Īśāvāsyopaniṣad*, 1.

¹⁴Vide “*Vṛkṣāyurveda*” in *Bṛhatsaṃhitā* of Varāhmihira and “*Aśvāyurveda*” of Śārṅgadharma and Śālihotra.

¹⁵A popular legend of Āyurveda in Kerala region.

highlighted the fact that food plays an important role for a healthy life. According to this report, Indian food habits are really healthy, and the various types of Indian dishes have helped in saving the lives of lakhs of humans during COVID-19. The above research carried out under the area of Nutrigenomics proves that good food habits can be preventive as well as curative. Following such basic guidelines for a balanced diet and healthy living has been the norm in traditional Indian lifestyle practised for thousands of years. Such easy to adopt but life-saving practices need to be projected and propagated across the world not only for the sake of individual wellbeing but also for the sake of the cosmic environment.

Accordingly, Āyurveda is an integral health system which focuses on the entire system of a human being as one whole and promotes a holistic idea of treatment. It provides guidelines for daily lifestyle (*dinacaryā*) in diverse domains as well as changing seasons (*rtucaryā*).¹⁶ Therefore, Āyurveda is not just an alternative system of medicine but a descriptive as well as prescriptive branch of multidisciplinary wisdom. Moreover, Āyurveda medicines are not chemically prepared but mostly derived from plants and herbs—available in different locales. This is the reason that these medicines do not have damaging side effects like modern systems of medicine. It will be, therefore, quite appropriate that the LiFE project includes basic teachings and tenets of Āyurveda in its draft for the benefit of humanity.

In brief, it may be said that these are only some of the several intrinsic values embedded in the Indian way of life, which have been transmitted to us from generation to generation for a long. But nowadays, there is a visible decline in the practice of such traditional values even in India, not because they are worthless but because of the growing individualistic and materialistic tendencies in urban lifestyle; on the one hand, there is no direct link between the elders and youngsters due to decline in the joint family system, and on the other hand, there is the growing impact of western lifestyle which is being widely projected through aggressive advertising via electronic gadgets and social media. Therefore, traditional Indian ideals like ‘simple living and high thinking’ have lost their ground. But there is no doubt about the fact that the current challenge of environmental pollution and the crisis of climate change will force us to turn back to our traditional treasure of values and practices which promote sustainable lifestyle. For accomplishing this goal, we have to:

Revisit our roots,
refresh a few important lessons for ourselves, *restrain* ourselves from over-indulgence, and *remind* our younger generation to
reduce material consumption,
reuse the biodegradable objects for the protection of their own future,
recycle natural resources.

¹⁶A typical feature of the Indian subcontinent.

It is only when we keep in mind the underlying notions of cosmic concord and universal welfare that we shall be able to adopt an integral approach to lifestyle based on inclusive values as suggested above. It is by practising a holistic pattern of lifestyle based on the hygiene of the body, the positivity of mind, and the purity of food that our aspirations for universal health, hope, harmony, and happiness will be fulfilled.

Only then our prayers for world-peace such as the following one will be much more meaningful:

Om dyauḥ śāntirantarikṣaṁ śāntiḥ

prthivī śāntirāpaḥ śāntiṣadhyāḥ śāntiḥ vanaspatayaḥ śāntirīśvedevāḥ śāntir-
brahma śāntiḥ sarvaṁ śāntiḥ śāntireva śāntiḥ sā mā śāntiredhi.

Om śāntiḥ śāntiḥ śāntiḥ.

(Yajurveda, 36/17),

i.e. peace in the sky, peace in the mid-air, peace on the earth, peace in waters, peace in plants, peace in forest trees, peace in all devas, peace in Brahman, peace in all things, and peace in peace. May that peace come to me! Peace, Peace, Peace.

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Chapter 3

“One Earth, One Family, One Future”: Unpacking the Theme of India’s G20 Presidency and Its Wide-Ranging Implications



Amrita Narlikar

Abstract As part of its G20 Presidency, India has developed an important overarching theme, which it summarises as “One Earth, One Family, One Future”. This chapter unpacks the concept that serves as the inspiration for this theme. It highlights the depth of meaning contained in the concept, as well as its far-reaching philosophical and political implications. Drawn from India’s ancient texts, the concept is radical in the scale of its inclusion and the scope that it offers for individual agency. It allows us to include, but also move beyond notions of “human development” and “community development”. Self-styled “realists” who regard the motto as emblematic of the sweet nothings of idealism would be well-served to think again: delve into the concept, and it suggests important ways to uphold hard interests, while also reminding us of the importance of values. But the devil lies in the details of implementation, and the move from rhetoric to practice is seldom easy. This chapter develops ways in which India’s pioneering idea can be implemented—domestically and globally, in the course of future G20 meetings, and indeed in other forums of global governance too.

As part of its G20 Presidency, India has developed an interesting overarching theme, which it summarises as “One Earth, One Family, One Future”. This chapter unpacks the concept that serves as the inspiration for this theme, to highlight the depth of meaning that it contains, as well as its far-reaching philosophical and political implications. Drawn from India’s ancient texts, the concept is radical in the scale of its inclusion and the scope that it offers for individual agency.

A. Narlikar (✉)

Observer Research Foundation (ORF), Delhi, India

Darwin College, University of Cambridge, Cambridge, England

It allows us to include, but also move beyond notions of “human development” and “community development”. Self-styled “realists” who regard the motto as emblematic of the sweet nothings of idealism would be well-served to think again: delve into the concept, and it offers important ways to uphold hard *interests*, while also reminding us of the importance of *values*. But the devil lies in the details of implementation, and the move from rhetoric to practice is seldom easy. This chapter suggests ways in which India’s pioneering idea can be implemented—domestically and globally, in the course of future G20 meetings, and indeed in other forums of global governance too.

3.1 The Theme of India’s G20 Presidency

In contrast to the global summitry that accompanies formal organisations, the G20’s informal nature allows considerable scope for the host country to exercise agency. India has seized this opportunity enthusiastically and has developed a theme that draws on its ancient civilisational roots. Versions of its G20 logo reflect this explicitly by including the original Sanskrit phrase—*Vasudhaiva Kutumbakam*—as part of the design. India’s interpretation of the phrase for its G20 Presidency takes the formulation of “One Earth, One Family, One Future”.

The inspiration for this theme comes from an ancient Indian text, the *Mahopnishad*. The specific verse is provided below:

अयं नजिः परो वेतगिणना लघु चेतसाम् ।
उदारचरतानां तु वसुधैव कुटुम्बकम् ॥

This is mine, this is yours—only mean-minded people indulge in such bean-counting. For the generous-minded, the entire earth is one family. *Mahopnishad*, 6.71.

While most people, in India and abroad,¹ engage with this concept of the understanding that it refers to all the *peoples* of the *world* constituting one family, the notion of *Vasudhaiva Kutumbakam* (वसुधैव कुटुम्बकम्) goes considerably further than that. The word “Vasudha” refers not to the “world” but the “earth”; apply the concept correctly and one must recognise that it is referring not only to *humans* as belonging to one family, but to all the more-than-human inhabitants of the planet.²

¹For a systematic debunking of this “grand dichotomy”, see Amartya Sen, *Human Rights and Asian Values*, Sixteenth Annual Morgenthau Memorial Lecture on Ethics and Foreign Policy, Carnegie Council for Ethics in International Affairs, www.carnegiecouncil.org/publications/archive/morgenthau/254.html, 1997.

²For far too long, liberal values of individual rights, democracy, and pluralism have been treated as the sole preserve of the West, and in which the Global South can best be schooled. Academic accounts which try to engage with questions of liberalism in developing countries tend to go only as far back as the nineteenth century, and then explore questions of contestations and interactions. The possibility that there may be autonomous and ancient origins of similar ideas is

This non-anthropocentric conceptualisation of family—and indeed also welfare, rights, and justice—is not limited to the one verse cited above. It is prevalent in several other ancient texts and thrives to this day in the verses that many Indians are taught. For instance, both as part of learning at home and in formal Sanskrit lessons at school, this author imbibed the idea of आत्मवत् सर्वभूतेषु यः पश्यति सः पण्डितः he who looks upon all beings as he looks upon himself, he is the truly wise one. The *Bhagavad Gita* similarly states:

समं सर्वेषु भूतेषु तर्षिठन्तं परमेश्वरम्।

वनिश्यत्स्ववनिश्यन्तं यः पश्यति स पश्यति॥

He who sees the divine in all creatures,

And in all mortal bodies sees the immortal soul, he is the one who truly understands.

Bhagavad Gita, 13.28

The *Mahabharat*—one of India’s two renowned epics, whose stories live in the hearts and minds of Indians even today—similarly reinforces the message of not just environmentalism and biodiversity, but a non-anthropocentric conceptualisation of equal rights that all creatures are entitled to. Among the most well-known of its stories on this topic is that of Yudhishtir—the only one among several brave and noble heroes to be accorded entry and a special status in heaven due to his refusal to abandon a faithful dog. Towards the end of the 100,000 verses-long epic, Yudhishtir is put to his final test. He is told that while he has won himself a place in heaven, entry will not be permitted to the stray dog who has loyally accompanied him on the arduous journey. In the face of multiple arguments that are meant to appeal to his own interests and others that target his high sense of morality, delivered by the king of gods himself, Yudhishtir stands firm. He offers systematic counter-reasoning and argues that the act of abandoning one who has shown devotion is more heinous than several horrendous crimes put together. He makes it clear that he is willing to even forgo celestial bliss if his faithful companion is not welcomed alongside. Importantly, at no point does Yudhishtir make a distinction between animals and humans—for this hero of the *Mahabharat*, the dog is entitled to exactly the same protection, respect, and loyalty that humans usually claim solely for themselves. For his commitment to stand for trans-species justice, and refusal to accept the world in anthropocentric terms, Yudhishtir is rewarded with a unique boon and taken to heaven with the highest honours.³

The above references serve as illustrations of a broader pattern in Indian philosophy and political thought. Across different sources, we find similar teachings

seldom considered. The author had the opportunity to present some of her ideas to address this gap in a project of the DFG-funded Excellence Cluster, SCRIPTS, on which the author served as a PI. She is grateful to members and guests of the cluster for lively debates and helpful feedback, which have helped refine her own thinking on the topic.

³On the role of narratives in international relations, see Amrita Narlikar, *Poverty Narratives and Power Paradoxes in International Trade Negotiations and Beyond*, New York: Cambridge University Press, 2020.

that emphasise not only the importance of peaceful coexistence of peoples, but also across species (also associated with the concept of *Ahimsa* as popularised by Mahatma Gandhi), and even the attribution of personhood, equality and rights across the human and more-than-human worlds. It is to the credit of the current Indian government that it has chosen a notion of “family”—at its most universal and inclusive—as the core theme of its G20 Presidency. Were this approach translated into politics, its implications could be huge.

3.2 Philosophical and Political Implications

Let us begin with the philosophical implications of the approach that India offers. In academic and policy debates on human rights, a “grand dichotomy” is presented between “Asian” versus primarily Western, “universal” values. Asian values are supposedly family and community-oriented, and offered as a justification for authoritarianism; the individual-oriented “universal” values espoused by the West, in contrast, are taken to represent liberal ideals.⁴ Via its emphasis on *Vasudhaiva Kutumbakam*—and the personhood that the concept offers to individual animals within species, besides considerations of trans-species justice and biodiversity—India shakes up this crude dichotomy. Instead, it advances a version of “human rights” that is even more liberal than the Western variant; the verses and stories outlined in Section I of this chapter exemplify the claim that “human rights are not human only” (Panikkar and Panikkar 1982). This Indian perspective serves up a major challenge to prior legal-philosophical assumptions on more-than-human rights and personhood. It also suggests the urgent need for a recognition of variants of liberal thought that have ancient and non-Western origins.⁵

At an operational level too, the non-anthropocentric perspective that India’s *Vasudhaiva Kutumbakam* concept offers is very different from the dominant Western one. Take, for instance, the increasing multi-generation climate activism in Europe. Inspired by Greta Thunberg, children across Europe (and in other parts of the globe too) have gotten engaged in *Fridays for Future* demonstrations, to demand immediate action to stop (and reverse) climate change. It is captured most patently in Greta Thunberg’s oft-quoted line: “You have stolen *my* dreams and childhood” (emphasis added). Children are thus demanding that the planet be saved for their *own* future, while their parents appeal to inter-generational justice on behalf of their children and future grandchildren. In contrast to this largely anthropocentric narrative, India’s narrative seeks trans-species justice. Such differences in narratives matter, as they lead to potentially different policies and outcomes.⁶ The Western, anthropocentric narrative, for instance, suggests the importance of environmental conservation, whereas the Indian non-anthropocentric narrative argues for the importance of ecogism.

⁴ See Footnote 1.

⁵ See Footnote 2.

⁶ See Footnote 3.

What are the political and policy implications of the difference between Western anthropocentrism and the non-anthropocentric vision being offered by India? I flag up three here.

First, on issues pertaining to economic development or security, a paradigm shift becomes necessary. Policies would have to be enacted that are not restricted to (what were once regarded as the radical concepts of) human development and human security but would need to go beyond them. Social policies to address human development, for instance, would have to be balanced by environmental policies that assign due weight to the protection of animals, plants, insects, and the many beings that also have a right to life and respect on our shared planet. Policies to address human security would similarly need to be balanced by including more-than-human considerations. When taking into account questions of “health security”, it would become necessary to recognise—and guard against—the havoc that certain diseases are wreaking on not only humans but also animals.⁷

Second, related to the Asian versus universal values dichotomy is an assumed contradiction between community versus individual-based approaches. India’s contribution to this debate is also far-reaching. On the one hand, the notion of *Vasudhaiva Kutumbakam* broadens the notion of “community” to transcend the human. On the other hand, the attention that it gives to the rights of each and every being, allows it to place emphasis on the individual. And to each and every *human being*, it offers agency—our individual actions (e.g. via changes in our lifestyles) are crucial for protecting and sustaining all the human and non-human beings who belong to this expanded community. Together with its expansion of the concept of community and its focus on the role and rights of the individual, India suggests a pathway of peaceful and equal coexistence across species. In terms of policy implications, this requires a fundamental rethink on urban and rural planning and infrastructure development. For instance, as new highways and railroads are built, they will need to guard against not only the damage that they cause to village communities, but also the elephants, wildcats, and other species on whose territory they encroach.

⁷E.g.: “Nipah (NiV) is a zoonotic virus that made its first appearance in Malaysia in the late 1990s and soon spread to nearby countries. A bat-borne virus with a mortality rate between 40 and 70 per cent, it causes brain inflammation and can quickly lead to comatose states. Due to its contagiousness and potential for a global outbreak, NiV is considered one of the “epidemic threats needing urgent R&D [research and development] action” by the World Health Organization. While its deadly effects on humans have been well documented, NiV also presents a security threat to more-than-human animals. Pigs, for example, suffer immensely from the virus. The agroc capitalist condition of pigs in intensive meat factories in Malaysia, one of Southeast Asia’s largest pig meat producers, was a primary reason why NiV became a human and more-than-human security threat.... We often think of the human effects of pathogenic viruses to the exclusion of how more-than-human dimensions impact virus and health security decisions. In the case of factory farm conditions related to pathogenic virus transmissions across borders, we often consider more-than-human animals as sources or reservoirs of viruses. It is with less frequency that we articulate the specificity of more-than-human experiences of viruses, even though the effects of viruses and the security decisions made in response to them are experienced in complex, multi-species ways”. See Leep (2023).

And third, lest it be assumed that India's push for the idea of *Vasudhaiva Kutumbakam* is just idealistic rhetoric, we come to the third policy implication. The concept, in fact, has the potential to allow India and other like-minded countries to overcome yet another false dichotomy of values versus interests. In fact, as I have argued elsewhere, there are insights in the Indian canon that suggest that the two are reflexive, with values shaping interests and vice versa (Narlikar 2023). The argument for better treatment of animals is not only a “nice-to-have”. We know that the horrific conditions in which animals are kept—be this farmed animals in Europe and the US or wet markets in Asia—promote zoonotic jumping and the spread of a variety of highly contagious and lethal diseases. Ensuring dignity and safety for animals contributes to not only our moral wellbeing but also better public health.

It is also important to bear in mind that India's push for global, trans-species justice comes at an opportune time when a significant and increasing group of animal rights activists are speaking up on behalf of the voiceless. There are domestic political ramifications of this, including growing pressure, especially on governments committed to liberal values, to improve animal welfare and open up the space for animal rights. For instance, Germany has recently established its first Animal Welfare Commissioner.⁸

Defending animal rights, moreover, also creates new business opportunities. Veganism is contributing to a growing cruelty-free food industry—albeit the rate of increase varies considerably across different parts of the world. In the EU-India Free Trade Agreement, labour and environmental standards have proven to be a long-standing stumbling block. India could be well-served to apply the more holistic, less anthropocentric perspective, which it has pioneered in the G20, also to its trade negotiations with the EU. This agenda-setting narrative could help reshape the debate and find a way out of this deadlock. Together, these changing political and economic conditions enable the creation of new partnerships.

The move away from anthropocentrism (in keeping with the concept of *Vasudhaiva Kutumbakam*) would thus not only help alleviate the suffering of more-than-human inhabitants of the planet, but would also have a positive impact on multiple human concerns that include public health, climate change, and sustainable development.

3.3 From Rhetoric to Practice: Implementation

Planting innovative ideas in global governance institutions is an important first step. But the move from rhetoric to practice is seldom easy. The theme that this chapter has outlined is especially tough to implement. The difficulties arise partly from standard political economic considerations of entrenched interests, e.g. industrial farming lobbies in the West, or those who stand to gain (from both the developed and developing worlds) via trophy hunting and trade in endangered animals and products. This problem gets exacerbated by the fact that

⁸ <https://www.bmel.de/DE/ministerium/organisation/tierschutzbeauftragte/>.

more-than-human species—despite their sentence—do not have many to speak on their behalf and lobby for their rights. Additionally, on grounds of culture and tradition (ranging from whale-hunting in the Arctic regions and bull-fighting in Spain to the use of animal parts for “medicinal” purposes in Asia), there are often loud voices arguing against the changes in lifestyle and updating of rules that considerations of trans-species justice and balance require. In this concluding section, I suggest three ways in which this approach can nonetheless be meaningfully incorporated into politics.

First, the effectiveness of leading by example should never be underestimated. Having already introduced the idea via its G20 Presidency, India can and should update its own laws that credibly signal its own commitment to this issue. This would require an urgent amendment and updating of the Prevention of Cruelty to Animals Act (1960). For instance, Chapter III, Article 11, of the PCA, states the penalty and punishment for cruelty to animals as: “...in the case of a first offence, with fine which shall not be less than ten rupees but which may extend to fifty rupees and in the case of a second or subsequent offence committed within three years of the previous offence, with fine which shall not be less than twenty-five rupees but which may extend to one hundred rupees or with imprisonment for a term which may extend to three months, or with both”.⁹ Such low penalties no longer serve as a deterrent against abuse of animals; perhaps they even send a perverse signal on how undervalued the lives and suffering of animals are. These fines need to be dramatically raised, and violence and indignities inflicted on animals be treated as a much more severe offence than a three-month imprisonment term suggests. That said, even these measures—however whole-heartedly enacted—would not suffice on their own.

Accompanying the tightening of the law must also be a narrative change at local and national levels, which matches up with India’s international narrative. There are growing voices within India speaking up for animal rights, and which are successfully using social media platforms to harness transnational and domestic support.¹⁰ This would be a good support base for the central, state, and local governments to work with. And it would establish India as a credible, global leader, both on ecological concerns and the economic opportunities that would emerge from this.

Second, there are other traditional cultures across the world, which align well with the approach that India has put on the G20 agenda. In different traditions within Latin America, we see rights being accorded to a range of more-than-human beings (Fraundorfer 2018). It is opportune that Brazil will follow India in the G20 Presidency in 2024; the two countries together would be well-placed to

⁹PCA (1960).

¹⁰A recent example of this was the coalescing of diverse voices via Twitter with the hashtag of #SayNoToLivestockBill2023. The bill would have allowed the export and import of live animals—a regressive act in itself, given the growing recognition of the extreme cruelties this entails—and also included dogs, cats and other animals that could be thus traded. India’s animal rights’ activists rose up in anger against this bill, and mobilised digital support from non-resident Indians as well as non-Indians in this cause. Despite having only 10 days notice period to register their feedback, they were successful in obtaining a stay order on the bill (e.g. <https://twitter.com/DivyamKhera/status/1671253316612018177>).

mainstream non-anthropocentric considerations into international and domestic politics (especially if Brazil were to tap into its indigenous cultures on the rights of nature, rather than focus on its agro-industry). Given the relative novelty of this topic as a research subject in Political Science and International Relations—and thereby also the serious gaps in policy and politics on animal rights—Brazil and India could join forces in building a global coalition of engaged scholars. Such a coalition could study non-anthropocentric, indigenous traditions across different cultures, and investigate their modern-day relevance. Using a multi-stakeholder format, such a global coalition could go on to work with activists, policymakers, and perhaps also entrepreneurs interested in reshaping the world of business away from exploitative and abusive industries (including the animal farming industry).

Third, not all countries will agree to the non-anthropocentric agenda that the idea of *Vasudhaiva Kutumbakam* espouses. But there *are* states (often democracies)—in both the Global South and the Global North—with vibrant civil society groups and activists, which recognise the importance of trans-species justice. Faced with new geoeconomic and geopolitical challenges and threats, many—including Biden's USA—are paying greater attention to the importance of values in shaping alliances. How governments treat their more-than-human inhabitants can serve as a useful indicator of how like-minded they actually are.

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Chapter 4

Perspectives on Ethical Values for Lifestyle for Environment (LiFE)-Mediated Economy



K. Seeta Prabhu, Sandhya S. Iyer, and Pedro Conceicao

Abstract The current global crisis has led to a consensus that returning to pre-COVID development policies is no longer viable. This chapter outlines a human development approach aligned with Lifestyle for Environment's (LiFE) values. It provides evidence of how economic and environmental activities have been pursued through people-centric approaches across countries. History shows how communities have embraced significant change, facilitating transformative occurrences. The current focus on just transition needs to recognize this facet and link values to sustainable development. Several Global South countries have been proactive in advocating for the recognition and inclusion of cultural values, collective responses, and nature protection values in development. Integrating human development and sustainable living would lead to transformative change, ensuring equity and sustainability in achieving SDGs. This new approach offers hope for a more sustainable and equitable future.

4.1 Introduction

Following the unprecedented polycrisis that has engulfed the world and the erosion of development gains of the past several decades across countries, there is a broad consensus that going back to the pre-covid era policies of development in a 'business as usual approach' is 'no longer an option'. It is clear that there is an urgent need to move from the present scenario of inequitable and unsustainable development to a more just world that guarantees human flourishing and freedom for all (Catalano and Lorenzo Forni 2021; OECD 2020). While the potential links between

K. Seeta Prabhu (✉)

Institute for Human Development, New Delhi, India

S. S. Iyer

Centre for Public Policy, Habitat and Human Development, School of Development Studies, Tata Institute of Social Sciences, Mumbai, India

P. Conceicao

Human Development Report Office, UNDP, New York, NY, USA

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economic growth and poverty reduction are recognised, the excessive exploitation of nature and the need for resources to ‘.....reach all people in society, not just elites, while safeguarding the natural environment today and for future generations’¹ is not in the reckoning of most policy regimes. With the existential crisis posed by climate change looming large, it is imperative to move away from the current resource extractive production processes towards a more resource regenerating system and bring about ‘urgent system-wide transformation’ (United Nations Environment Programme 2022) in order to be able to adhere to the Paris Agreement target of limiting global warming to 1.5 °C by 2030. The United Nations Regional Economic Commissions have also identified the need to adopt measures that would facilitate resource generation to be managed sustainably, inclusively, and equitably.²

The advent of the age of the Anthropocene has brought about a significant change whereby human actions are increasingly impacting nature, endangering the lives of humans and other species, and thereby affecting the livelihoods of millions of people, besides increasing their vulnerability. Against this backdrop, the Lifestyle for Environment (LiFE) Mission proposed by the Indian G20 Presidency in 2023 assumes importance as it provides the necessary impetus for systemic transformations to create a self-sustaining economy based on environmentally friendly behaviours. At the core of such developmental transformation is the role of people, both as actors and as agents, as it is their agency that leads to expansion in human development and capabilities, which in turn influence and shape behavioural change essential to revive ‘nature’.

The human development approach, being anchored in the ethical values of human agency, freedom, and choices, including collective choices and responsibility, is ideally situated to operationalise the LiFE-influenced development paradigm. This chapter outlines the contours of the human development approach as applicable to the values of LiFE and provides localised empirical evidence from across countries that demonstrate the nature and extent of how economy and environment-related activities have been simultaneously pursued through people-centric approaches.

¹ UN-Secretary General, (2021), ‘Share gains from extracting precious raw materials more equitably, guard against pitfalls: UN chief’ UN-News, [UN-news.un.org/en/story/2021/05/1092692](https://un-news.un.org/en/story/2021/05/1092692).

² The needs and rights of women, indigenous peoples, local communities, and other stakeholders who are affected by the industry get excluded from the design and benefits of extractive operations (UN-Secretary General, 2021) Secretary-General’s remarks to the Global Roundtable on Transforming Extractive Industries for Sustainable Development [as delivered] <https://www.un.org/sg/en/content/sg/sttable-transforming-extractive-industries-for-sustainable-development-delivered?>.

4.2 Shaping Ideas and Ethical Values for LiFE

4.2.1 *Lessons from the Past*

Learnings from the seventeenth and eighteenth centuries relating to the pre-industrial to the industrial era as well as the rise of the new world order in the mid-twentieth century illustrate the importance of ideas in shaping global transformations. The phenomenal changes that occurred during the industrial revolution ushered in new norms, behaviours, institutions, and policies essential to pursue economic growth. Scholars have pointed out that change occurs in a dynamic series of steps that often span decades. The ideas relating to transformation are required to be accepted and embedded in society before technology, institutions, and policies change.

It is useful to refer to classical political economy theories and *The Theory of Moral Sentiments* in particular, wherein Adam Smith recognised that an individual act not merely on self-interest, but also on what is morally and ethically right (Smith 1759). The notion of the ‘good’ is embedded in the cultural milieu, and it influences and shapes an individual’s demand. History stands testimony to the processes whereby communities have adopted change on a large enough scale to enable transformations to happen.

The current focus on just transitions in the context of the Paris Agreement implementation (UNDP 2022a, b) is to be seen in this context. It recognises implicitly, if not explicitly, that transitions can be disruptive and that there could be winners and losers in the process. Deliberate efforts are needed to ensure that the process of transition is smooth and also just.

4.2.2 *Twinning Equity and Sustainability*

It is unreasonable to expect that in an unequal world, change could trigger similar responses from people. In reality, the responses vary a great deal depending on their life circumstances. This is all the more true in the post-covid era when the pandemic resulted in widening of inequality in incomes, wealth, and opportunities. The expectations that post-covid recovery policies would move countries towards a green and more sustainable pathway have been largely belied. There has been wide diversity in the sustainable recovery policies adopted across countries.³

³ In 2020–21, 41% of covid-19 recovery packages globally went to fossil fuel intensive sectors and 38% went to clean energy sectors though slowly there has been a move towards green recovery measures. In 2022, the situation improved, with advanced economies being on track for achieving their net zero commitments, whereas the developing and emerging economies have been struggling with limited fiscal manoeuvrability to maintain food and fuel prices and consequently managed to mobilise in 2023 only USD 52 billion for investments in clean energy, which is grossly inadequate to meet the net zero targets. International Renewable Energy Agency, 2023, *Sustainable Recovery*

Given this background, the steering of the current unequal, unjust, and unsustainable world towards an equitable and sustainable pathway would require a strong impetus that is universally relevant. The idea of equity that has embedded within the notion of justice provides a powerful alternative to achieve this transformation. When interpreted from a human development perspective, equity implies equality of opportunity in multiple dimensions, viz., economic, social, cultural, and political and hence has universal appeal. Equity encompasses both intra-generational and intergenerational dimensions. In fact, intergenerational equity is nothing but sustainability. From this point of view, *equity and sustainability are two sides of the same coin* and hence need to be pursued together. From a policy viewpoint, the pursuit of LiFE-influenced development is through the lens of equity that invariably encompasses sustainability. It is necessary to recognise that sustainability is multifaceted and includes, at the very least, environmental, economic, and social dimensions (WCED 1987).

Linking values to LiFE-mediated development entails acknowledging the role of ‘Pro-Planet People’ processes that would make individuals responsible for their collective future. In this endeavour, economy and environment are seen as intertwined. Success in this simultaneous pursuit of the values of equity and sustainability can lead to a more sustainable world anchored in a resource-regenerating mode of production.

4.3 Evidence of Transformational Shifts for LiFE-Mediated Development from the Global South

4.3.1 Lessons from Middle Human Development Countries

Move towards a just transition hinges on climate justice, energy justice, and environmental justice, while the philosophical underpinning of LiFE is a collective responsibility for a collective future. Interlinking the two can be best achieved through the human development and capabilities approach as both hinges on the agency of people even when levels of economic progress are moderate.⁴ Empirical evidence across countries shows that at relatively lower human development index (HDI) values and lower per capita income levels, the gap between the Planetary Adjusted Human Development Index (PHDI) and the HDI is almost non-existent (Conceição 2022). As income levels increased, the gap between the PHDI and HDI widened, demonstrating that the rise in incomes was through the adoption of unsustainable resource extraction-led processes, negatively affecting the wellbeing of the people living in these regions.

Tracker, April 2022 Update, page 4, <https://www.irena.org/Publications/2023/Mar/World-Energy-Transitions-Outlook-2023>, accessed 14 April 2023.

⁴ UNDP (2020).

Meanwhile, several middle-income countries have convincingly demonstrated that an increase in per capita income need not necessarily be driven by environmental degradation and depletion of natural resources. There is thus an opportunity for countries in the middle-income group to adopt sustainable production patterns that minimise the pressure on the planet. In fact, there is evidence to indicate that countries in recent years have been more aware of the environmental dimensions of economic growth and have managed to attain higher per capita incomes while not adding to GHG emissions (Hannah 2021).

Based on the experience of several middle human development countries (largely from the Global South) that have embedded their policies within the social realities they are confronted with, we identify culture, community, conservation, and choices as the *four Cs* that contribute to the formation of values and norms, which in turn leads to behaviours' compatible with the idea of LiFE-mediated development.

4.3.2 Cultural Values for LiFE

LiFE encourages pro-planet behaviour across individuals. Values, particularly of ancient civilisations, which have survived the onslaught of centuries, have ingrained in people's cultural traditions that have shaped people's behaviours and through them, led to the conservation of nature. For example, in India, the concept of *Vasudhaiva Kutumbakam* (The world is one family) is deeply rooted in people's minds, leading to practices that consider trees, birds, flora, and fauna as worthy of respect, which in turn triggers behaviours of compassion and coexistence rather than exploitation and depletion. Gandhian values emphasise individual responsibility in practising sustainable consumption and production and that of trusteeship wherein all resources and wealth are considered to belong to nature and the Almighty that people manage as trustees.⁵ The influential Confucian ethic that has shaped the norms and behaviours of people in China and East Asia considers heaven, earth, and the human order as the trinity whose configuration is necessary for ultimate harmony.⁶ There are several cultures in Africa, Latin America, and other regions that share similar values.

4.3.3 Communities, Conservation, and Public Policy

Preservation of ecologies and natural resources such as forests, biodiversity, and wildlife is embedded in value systems and norms followed by indigenous communities. For example, the protection of mangroves in the Sunderbans area of Bangladesh

⁵ Bhattacharya, D. (2019), <http://southernvoice.org/mahatma-gandhi-and-the-sustainable-developmentgoals>, accessed 26 April 2023, and Dharmadhikari, C. S., *Gandhian view on Trusteeship*, no date, <https://www.gandhiashramsevagaram.org/gandhi-articles/gandhi-concept-of-trusteeship.php>.

⁶ https://www.researchgate.net/publication/27828290_Confucian_ethics_and_the_environment.

and in Afghanistan, where sacred groves are being maintained by the rural people (Khan et al. 2008), are contributing to ensure ecological balance as a praxis of everyday life. Estimates indicate that 36% of forest landscapes globally are within indigenous people's lands.⁷ 'Eighty per cent of the biological diversity is found in the 22% of global land area that is still stewarded by indigenous peoples, with modes of subsistence, consumption, and care for nature based on their traditional bodies of knowledge' (Havemann 2016, p. 49). Behavioural transformations globally indicate that viewing human beings as part of the natural world and respecting nature for its *intrinsic rather than for its instrumental value* holds the key to success.

Ecological rights, entitlements, and implementation of environmental policies have enabled connecting nature with nurture. It is estimated that a large proportion of the world's wildlife and forests are defended by the local groups who live in and around them. The case of Chinanteco population living in Oaxaca region of Mexico, who have been able to protect natural resources in 126 community conservation sites covering 375,457 hectares,⁸ is a case in point. Since 2018, the Government of Mexico implemented a restoration programme called *Sembrando Vida (Planting Life)* as part of the country's efforts to revive and restore the environment. Such measures of policy and institutional support from the government contribute to the sustenance and nurturing of the environment contributing to environmental preservation. Similar examples are documented for the Arunachal Pradesh in India.⁹

4.3.4 Human Capabilities, Choices, and Peoples Participation

The polycrisis that the global economy is experiencing is accentuated by the weak state-market nexus. This has resulted in a situation wherein neither economic growth nor human wellbeing is ensured, thereby accentuating the vulnerabilities of people on multiple counts. Human capabilities have played a crucial role in enabling resilient recoveries in this period. Following Fleishman and Solorzaro (2018), we identify *three* factors essential for state-community partnerships to succeed. These are (1) institutions engage in fostering partnerships across governments and communities; (2) citizens participate actively, and (3) citizens have the capabilities for such participation.

The emergence of Costa Rica as a champion for sustainable development is an example of the important role played by political will, backed by public policy and

⁷ UNDP (2020).

⁸ The communities own and control the resources with constitutional and legal protection being provided by the Mexican government. Nearly, 39% of the area is covered high evergreen forests that also nurture high biodiversity. Ortega-Vil-laseñor Humberto, 2022, *Journal of Ethnic and Cultural Studies*, February 2022, Vol. 9, No. 1 (February 2022), pp. 39–55, <https://www.ejecs.org/index.php/JECS/article/view/963>.

⁹ Lakshmi, R. B., 3 Lessons from Indian Tribes on Ecosystem Conservation, Earth.org, <https://earth.org/indian-tribes-ecosystem-conservation>, accessed 25 April 2022.

finance, in reversing massive deforestation that occurred between 1940 and 1980 due to expanding agriculture.¹⁰ On the other hand, though China was the highest emitter of GHGs and third in terms of per capita emissions, in 2020, in an effort to move towards a more sustainable economy, the Chinese President announced in the 75th session of the UN General Assembly in 2020, that the country will achieve carbon neutrality before 2060.¹¹ So far, the Government of China has implemented several measures to reduce carbon emissions, involving communities to achieve behavioural change through over 100 community-level pilot projects since 2014. The low-carbon initiatives were implemented in new urban communities, existing urban communities, and existing rural communities. On the cultural side, there was guidance on low-carbon lifestyles, promotion of low-carbon products, encouragement for low-carbon travel, and low-carbon education. Several other measures encompassing infrastructure, renovation of buildings, and the like were also undertaken.

Behavioural changes at the individual, community, and societal levels must be fostered through paying attention to a set of enhanced human development indicators and advocacy and by systematically placing common interests above individual self-interest. India's unique 'Give it Up' campaign, wherein under the Ujwala Yojana launched in 2016, citizens voluntarily gave up the subsidy they were entitled to on LPG cooking gas cylinders in favour of people who are less well placed economically, is an example where self-interest was foregone to benefit the community. The success of this campaign leading to over 10 million people voluntarily surrendering their LPG subsidy by July 2019¹² is noteworthy and indicates the potential of the possibility of nudging people towards responsible behaviour.

4.4 Conclusion

The advent of the age of Anthropocene, where human action is increasingly driving dangerous planetary change, raises questions about the relevance of the resource extractive patterns of growth pursued thus far. This has led to calls, as in the 2030 Agenda for Sustainable Development, to transform our world towards equity

¹⁰ See Rodríguez, S. (2016), *How Costa Rica reversed deforestation and raised millions for conservation*, <https://dialogochino.net/en/climate-energy/how-costa-rica-deforestation-millions-for-conservation/>, accessed 24 April 2023; Flagg (2018), World Bank 2023, Costa Rica's Forest Conservation Pays Off, <https://www.worldbank.org/en/news/feature/2022/11/16/costa-rica-s-forest-conservation-pays-off>, accessed 24 April 2023.

¹¹ Additional commitments were also made soon thereafter that by 2030 China will lower its carbon dioxide emission per unit of GDP by over 65% from the 2005 level, increase the share of non-fossil fuels in primary energy consumption to around 25%, increase the forest stock volume by 6 billion cubic metres from the 2005 level, and bring its total installed capacity of wind and solar power to over 1.2 billion kilowatts. UNFCCC, *China's Mid-Century Long-Term Low Green-house Gas Emission Development Strategy*, <https://unfccc.int/sites/default/files/resource/China%E2%80%99s%20Mid-Century%20Long-Term%20Low%20Greenhouse%20Gas%20Emission%20Development%20Strategy.pdf>.

¹² <https://pib.gov.in/PressReleasePage.aspx?PRID=1577742>, accessed 25 April 2023.

and sustainability. The LiFE-mediated development approach proposed by the G20 Indian presidency provides the much-needed emphasis on collective partnerships to address the dual global challenge of mitigating climate change and accelerating SDG progress. The collective and sustained response of G20 countries in taking necessary actions within their own contexts will be crucial. The countries in the Global South have consistently and proactively advocated for the greater recognition and inclusion of cultural values, collective responses, and protection of nature at various development fora. Their efforts to secure access to financing and technological transfers for low and middle human development countries is going to be equally crucial. It is only such efforts that will enable the mainstreaming of the LiFE-mediated development approach that will usher in sustainable consumption and production through responsible behavioural change.

Contrary to general understanding, the Global South has been a successful norm-setter in recent times. A striking example is provided by the human development paradigm's conceptualisation and its eventual adoption by the global community, which is largely due to the intellectual prowess, integrity, and persistence of the Global South. The conviction of the Global South in bringing about a change in the development paradigm, along with its ability to build coalitions across the globe with intellectuals, institutions, and governments, augurs well for reestablishing the values of equity and sustainability as a developmental ethic globally. The participatory process leading up to the formulation of the SDGs demonstrated the enthusiasm and involvement of people from the Global South in setting agendas that matter to them. This spirit needs to be fostered and strengthened considerably, particularly when neoliberal policies have 'integrated economies but disintegrated societies, and thereby, enhanced vulnerabilities, precariousness, and discrimination' (Prabhu and Iyer 2019, p. 75).

Finally, LiFE can play a transformational role by integrating equity and sustainability as core values governing 'all' policies—monetary, fiscal, incomes—so that they are characterised by a 'redistributive ethos' including not only intra-generational but also intergenerational considerations. This can enable the achievement of the SDGs, which are currently spluttering and weakened due to the polycrisis. The future of the ambitious Agenda 2030 depends on a transformational change towards LiFE-mediated development emphasising equity and sustainability—settling for anything less would threaten our very existence and is self-defeating.

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Chapter 5

Moralising International Relations



Thomas Pogge

Abstract Our adversarial system of international relations poses substantial risks of violent catastrophe and impedes morally urgent initiatives and reform collaborations. The domestic politics of more evolved societies provide guidance toward a better world governed by just rules, which ensure that basic human needs are met, inequalities constrained, and weapons and wealth marginalized as tools for influencing political and judicial outcomes. Impartial administration, adjudication, and enforcement of just rules require a strong normative expectation on officials and citizens to fully subordinate their personal and national loyalties to their shared commitment to the just and fair functioning of the global order. As we have fought nepotism within states, we must fight nepotism on behalf of states to overcome humanity's great common challenges. To moralize international relations, states can plausibly begin with reforming the world economy toward ending severe poverty, thereby building the trust and respect needed for more difficult reforms.

5.1 Introduction

If enlightened eighteenth-century thinkers could observe the present, they would surely be impressed—though probably not surprised—by the scientific and economic progress humanity has made since their time, including the new technologies that can make life much safer, more comfortable, and more interesting. But they would also be disappointed by how little *moral* progress has come with these achievements. Severe poverty still blights the lives of half of humankind, with over three billion unable to afford a healthy diet. We have not achieved global governance institutions that fairly take account of everyone's basic needs but still settle international disagreements in a barbaric way: by violence and the threat thereof. What is worse, war now poses an existential threat to humanity and many other life forms—as do the rapidly intensifying ecological effects of human activities.

T. Pogge (✉)
Yale University, New Haven, CT, USA

Humans aspire to more: to a world in which conflicts and challenges are resolved through moral reasoning and democratic processes, in which weapons and violence no longer have political relevance, in which income and wealth distributions no longer dominate political outcomes. We know how to resolve conflicting claims on the basis of standing rules, democratically adopted and impartially adjudicated by an independent professional judiciary. The domestic lives of many national societies—and, to some extent, the European Union—demonstrate this know-how, showing that large numbers of people can form a vibrant and diverse political community in which (the capacity for) violence has lost all importance. So why is this kind of structure not realised at the global level?

Clearly, such a global order is possible with today's economic, technological, and administrative capabilities. The great difficulty lies in the transition. How can we mobilise sufficient political forces to move the world from the old to the desired new state? Let me offer two thoughts towards answering this question, one analysing the *status quo* and one towards gradually overcoming it.

5.2 The Adversarial Modus Vivendi

We live in a world of rival states, which differs from a Hobbesian state of nature in that this rivalry is deeply structured by rules. We have reams of international law, bilateral and multilateral treaties, and unwritten conventions that organise the interactions of state actors as well as those of their banks, corporations, and the like. One could say that international relations have become a highly complex game, which my doctoral supervisor Rawls (1993) has characterised as a “*modus vivendi*.”

Rule-governed rivalry has immense advantages over a state of nature: participants can form stabler expectations and usually resolve conflicts without violence. These advantages depend on it being in each party's interest to play by the rules. Such incentive compatibility requires that the rules treat the various parties differently, according to their respective bargaining power. This evidently leads to rules that unfairly favour the strong. But such bias is in the interest also of the weak, who fare better with unfair rules than with fair rules that, when push comes to shove, the strong would disregard.

The distribution of power shifts over time: some parties become weaker; others stronger. Such changes need not disrupt the *modus vivendi* but can be accommodated by adjusting its rules, which then reflect a *dynamic* prudential equilibrium.

In this dynamic contest, the rules are influenced by the distribution of power and, conversely, the power distribution is influenced by the rules. Understanding this, strengthening parties will seek to modify the rules to further increase their power. Declines in power therefore tend to be cumulative and self-reinforcing, giving rise to upward and downward spirals, where an initial power shift, through rule changes it facilitates, intensifies into a major power slide.

Participant awareness of the danger of such a descending spiral has a destabilising effect. An actor who foresees that it will prudently have to acquiesce to

increasingly unfavourable rules in the future may prefer to fight at once, even imprudently, rather than become increasingly marginalised over time. Russia's ongoing war against Ukraine may exemplify this possibility.

The palpable danger of a descending spiral leads *modus vivendi* participants to focus obsessively on the preservation and expansion of their power without letting moral principles or values get in the way. This imperative of national security infects even domestic politics: for optimal power projection, a country's government needs popular support and should therefore seek to create it by any means, even dishonest and undemocratic ones. Politicians then tell themselves that they must violate their country's values for the sake of those values themselves—namely to ensure the long-term preservation and, ideally, global triumph of those very values: “standing for a future world of freedom, transparency, democracy, and human rights, we sadly must often use nasty means towards achieving it: drones, torture, coups, assassinations, and disinformation. Such is *realpolitik*.”

In the world we aspire to, states would not pursue power at the expense of their moral values. But within the existing *modus vivendi*, any practical anticipation of such a world is risky. If others join in, perpetual peace may be achieved. But if others merely pretend to go along, then the sincere party risks a substantial loss of power—as happened with Gorbachev's ambitious initiative, which sent the USSR/Russia into a downward spiral. This cautionary example complicates the transition problem but does not make it unsolvable. The transition requires precisely coordinated steps that, at each stage, only minimally affect the power distribution among the most powerful states. There is, however, another even more serious obstacle.

The power of states feeds on three sources: military strength, economic strength, and a residual category—including cultural influence, charisma, moral reputation, and the capacity to convince others by sound argument—for which Nye (2004) has coined the term *soft power*. Within each of these components, what matters is *relative* position: for example, a state's economic strength compared to that of its rivals. A state's power depends on its position in these three hierarchies. States have an interest in protecting and improving their position in all three rankings but, in doing so, face difficult choices about the strategically optimal allocation of their limited resources. Efforts in one dimension typically have opportunity costs in the other two dimensions.

How much weight each of the three components has in determining the overall distribution of political power depends on the global political climate. When states are at war or on the brink of war, military strength is paramount. In more peaceful periods, economic strength and soft power have greater significance. Consequently, states have opposing interests regarding the geopolitical climate. States whose comparative advantage lies in military strength have an interest in not letting the world become too peaceful. Such states, whose relative military position is stronger than their relative position in the other two hierarchies, must always exist. Presently, the premier example is the USA—militarily about as strong as all other states combined but economically accounting for merely one-sixth of gross world product at purchasing power parities. Russia, too, seems to belong in this group, even after the recent reassessment of its military strength. On the opposite side are the states that score better in economic and cultural than in military strength—currently most obviously

Japan, Germany, South Korea, Indonesia, China, Mexico, and Switzerland. Such states would gain political power if military strength lost its relevance—though the richer ones among them might also lose some political power insofar as they could no longer justify economic selfishness by declaring the world to be a jungle in which they can ill afford the luxury of morality.

The geopolitical climate influences not merely the international but also the intra-national power distribution. In times of war and crisis, the executive branch gains power, as do the military, intelligence services, and the arms industry. These actors, therefore, often have an interest in deliberately worsening the international political climate. An unpopular government, for example, may gain power and influence domestically if it can, in contentious confrontation with other states, drape itself in the national flag and rouse the population's patriotism, national pride, chauvinism, or xenophobia. Genuine peace thus has natural—*ex officio*—enemies, most notably the supremely important President of the USA, who can increase both his political power within his country and the political power of his country by moving the world closer to war.

The presented analysis sees humanity trapped in an adversarial game in which political actors use their political power to maintain and, if possible, expand it. In this game, the use and threat of violence remain central because this serves the interests of those actors whose comparative advantage is military strength—and because these actors can easily prevail over the rest: disputes, crises, incidents, tensions, belligerence, and hostilities are much easier to produce than to prevent.

Though conducted in a civilised, rule-structured way, this adversarial *modus vivendi* game is, in the long run, a matter of naked survival because its rules are not fixed but rather adjusted to shifts in power so that strengthening participants are induced to remain in compliance. Each participant thus runs the risk of sliding into a descending spiral that can marginalise it and ultimately eliminate it from the game. And all participants are endangered by others who, fearing such a spiral, seek immediate combat.

The foregoing analysis has the character of a self-fulfilling prophecy: it is true because many political professionals take it to be true. Another, much better world is possible, but we must find a way to achieve it with the political actors that now exist.

5.3 Overcoming the Adversarial System

A first step is to make clear, especially to political leaders, that in their adversarial game, everyone will lose in the long run. A world in which more and more states invest more and more effort into inventing and accumulating ever more powerful weapons of mass destruction will sooner or later be consumed in a horrific war. This gives us a reason to seek profound reform—but not yet a reform programme.

A plausible reform programme must remove certain important rules from the *modus vivendi* game and entrench them in such a way that all actors can rely on their

continued observance. One attempt in this direction was the *Universal Declaration of Human Rights*, whose validity even states explicitly declared to be independent of state recognition. The same is true of *Ius Cogens*, which prohibits, among other things, genocide, wars of aggression, slavery, torture, and piracy. These attempts have succeeded insofar as there are no sustained disputes about those constraints, and no actor seriously seeks to modify them to its own advantage.

In a more important respect, however, these attempts have failed in that political actors still react to a violation in a political way: condemning it only when doing so is not detrimental to their power position. Hence, the real influence of these special rules remains limited. Violations by powerful actors are often downplayed because criticism of such actors entails costs. Such manifestly unequal treatment of similar violations undermines the moral standing of the special rules and the credibility of those who criticise on their basis. It also renders the special rules unreliable: those who violate them may face condemnation but can use their power to soften or undermine it through counteraccusations of hypocrisy. Thus, European criticism of human rights abuses in the Global South is often answered with the question: “Where were you when the US waged wars of aggression with murder and torture in Vietnam, Afghanistan, and Iraq?”.

Special rules are good, but they work only in combination with a special attitude towards these rules. Political actors must regard and treat these constraints as special and hold them sacred. This requires a bifurcation of will. Political actors must subordinate their central imperative of power maximisation to an even higher constraint of respecting and enforcing the special rules.

We find such a bifurcation in sports. Athletes are wholeheartedly invested in their sport and desperate to win. But not unconditionally. They want to win in a fair competition. They have two goals: they want to win, and they want the contest to take place under fair and impartially applied rules. Someone with two goals normally weighs them against each other and is ready to give up a little of one goal for the sake of achieving more of the other. But this is not how it is here. A true athlete will not compromise the fairness of the contest in the slightest, even if doing so could greatly improve her chance of winning. The fairness of the competition is sacred to her.

You may object that such genuine sportsmanship is rare. Yet, nonetheless, the *ideal* of genuine sportsmanship is real: everyone immediately recognises it—feels uplifted by it, drawn to it.

In politics, too, we know such a bifurcation of will. Whoever holds a public office must set aside all personal goals in its exercise. A school principal, for instance, must treat all pupils equally, even if one of them is her own son in whose success she, as his mother, takes a passionate interest. Even if her son is equally qualified as other pupils for the prestigious school prize, we expect her not simply to award the prize to him but in this case, to leave the decision to others or to make it by lot. Even the strongest reasons for action arising from our very closest relationships are to be considered null and set aside in such a context. Granted, this does not always happen. But when violations come to light, there is little sympathy and tolerance—and much loud criticism of corruption, nepotism, favouritism, and cronyism.

What holds for the headmistress holds, of course, even more for politicians in the most advanced states, who should never favour their relatives and friends or their hometown. Interestingly, it also holds for ordinary people in their role as citizens. Consider, for example, a woman who takes a public stand on the political question of whether, in the face of historical discrimination in education, girls or dark-skinned children should now be accorded certain advantages. And suppose it were to come out that she has tailored her public statements to the interests of her own children—thinking along the lines of: “I love my children, and if they were girls or dark-skinned, then, of course, I would speak out in favour of such advantages. But since my children are white boys, whose taxes could be raised and career prospects lowered by such advantages, I will raise my political voice against them.” Even opponents of special benefits for historically discriminated groups would find such reasoning morally offensive. This shows that we normatively expect even ordinary citizens, in their public expressions and voting behaviour, to set aside their private attachments and be guided solely by justice and the common good.

Familiar from domestic politics in advanced states, this thought pattern can help us at the international level. In today’s world, politicians pursue their respective partisan interests. There are indeed some special offices, such as that of the Secretary General of the United Nations, where impartiality is expected. But the important international decisions are made in bodies whose members pursue the power interests of their respective states, and these decisions, therefore, reflect the existing power distribution in keeping with the *modus vivendi* model.

To overcome this condition, we need another bifurcation of will. We must spread worldwide a normative expectation that anyone involved in such international decisions may represent her country’s partisan interests but must subordinate this effort to the observance and enforcement of special—sacred—rules that protect the weak and preserve the essentials of a level playing field.

Intellectually, this task seems achievable. National impartiality requirements are now deeply entrenched in the more advanced national societies. Anti-nepotism has a long and distinguished history in several great cultural traditions as well as more recent, inspiring passionate support in newer states such as South Korea, Malaysia, Brazil, and South Africa. So, the idea of a special kind of loyalty that cancels other loyalties within its domain is already familiar. It should thus be possible to gain a foothold for this idea on the supranational plane: for the idea that it is as shameful to subvert the justice of our global institutional order for the benefit of one’s own country as it is to subvert the justice of one’s country’s national institutional order for the sake of benefiting oneself or one’s family, friends, or neighbours.

While the task seems intellectually within reach, politically it is daunting. One reason for this is that the needed transition cannot count on an important factor that may well have played a crucial role in the emergence of the modern state. It is deeply surprising that, in many national societies, an impartiality requirement associated with certain roles and performances has come to be internalised and honoured to the extent that it is—that, in these societies, most citizens are genuinely appalled when they learn that a mother has used her political office to enrich her son, even when his gain is greater than the social loss. Centuries of social struggle on different continents

and diverse cultures have preceded this civilisational achievement. Crucially important to the historical outcome is the plain fact that, in any historical period, societies that were ahead in terms of internalising a strong impartiality requirement had a substantial competitive edge over societies that were behind. By interfering with an efficient, merit-based division of labour, nepotism, and other forms of corruption are a serious drag on any society's ability to solve its problems and compete against other societies.

It is evident that, analogously, nationalist nepotism—the tendency to prioritise one's own country's interests in the design and application of international rules—is a serious drag on humanity's ability to solve its problems, to make us safe from advanced weapons and other dangerous technologies, ecological catastrophe, resource depletion, pandemics, financial meltdowns, etc. Unfortunately, this drag causes no competitive pressures: we are not falling behind some other intelligent species, at least not as far as we know. Still, a vivid appreciation of the real prospect of future catastrophe should be able to help us achieve the transition to a cosmopolitan ethos.

This may sound unrealistic. It is hard to imagine that a national ambassador to the United Nations Security Council would acknowledge, let alone highlight, constraints that disadvantage her own country without being removed from office soon thereafter. But such progress is realistically conceivable if it is linked to new bodies whose members are explicitly sworn to impartiality. For example, we can create a body of jurists tasked with impartially determining whether the conditions for humanitarian intervention are met in particular cases. The relevant ambassador to the Security Council would then not have to judge for herself that her state's military intervention was illegitimate but would merely have to follow the independent panel's judgement on this matter.

5.4 Conclusion

Along these lines, a gradual moralisation of international politics may be achievable. It can take hold only if the sanctified rules do not significantly alter the power distribution among powerful states and do not expose these states to new and, above all, unequal risks. If it works with small beginnings, then trust can gradually build, especially when each country's political leaders know that its rival's population is deeply committed to the entrenched moral contents, which deters defection by its government.

Moralisation should start with the eradication of structural poverty. Here—at little cost and risk to the more powerful states—enormous moral progress can be made. While the global average income has reached 62 international dollars per person per day (OECD), 35.4% of human beings cannot afford a healthy diet, costing 3.96 international dollars daily (FAO 2024). Dating back to colonial times, this radical inequality is perpetuated and reinforced by the more powerful states dominating negotiations of the international economic and financial rules. If these rules were

brought into compliance with even minimal requirements of justice, then this alone would get us more than halfway towards the full realisation of human rights.

Progress against poverty would help us anchor the idea of moralisation in people's minds, to build trust, and then to extend the moral approach to more difficult challenges, such as environmental protection, resource depletion, global health, dangerous technologies, and the threat of war. Following this path, humanity may yet be able, through overlapping consensus, to achieve its deepest aspiration of an ethical commonwealth (Kant), Tianxia (all under Heaven), Ubuntu (we are through one another), and *Vasudhaiva Kutumbakam* (one Earth, one family, one future).

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Part II

Sustainable Consumption and Production

Chapter 6

Internationalising Lifestyle for the Environment



Shailly Kedia, Madhuparna Maiti, and Palak Khanna

Abstract ‘Lifestyle for the Environment’ (LiFE), introduced by India’s Prime Minister at COP26, emphasises behavioural shifts for sustainable consumption. This chapter explores the integration of LiFE into multilateral processes to strengthen global sustainability efforts. It analyses opportunities within the G20, the Sustainable Development Goals (SDGs), the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations General Assembly (UNGA) to embed lifestyle-centric approaches into global governance.

Positioning LiFE as a normative contribution from the Global South, the chapter identifies four enabling instruments—norm development, policy design, market mechanisms, and social tools—to institutionalise lifestyle approaches. It outlines how global frameworks can incorporate LiFE by using G20 leadership, refining SDG indicators through the IAEG-SDG, incorporating lifestyle dimensions into IPCC and SBSTA processes, and pursuing a UNGA resolution. In doing so, the chapter contributes to understanding how behaviour-based interventions can be embedded within multilateral systems to support climate and development goals.

6.1 Introduction

Agenda 21, the outcome document of the United Nations Conference on Environment and Development emphasised that unsustainable patterns of production and consumption require international attention along with actions by governments and major groups including industry. In 2015, out of the seventeen sustainable development goals (SDGs), Goal 12 was a dedicated goal on responsible consumption and production.

S. Kedia (✉)

The Energy and Resources Institute (TERI), New Delhi, India

M. Maiti

The Energy and Resources Institute (TERI), New Delhi, India

P. Khanna

The Energy and Resources Institute (TERI), New Delhi, India

From a Global South perspective, the COP26 Charter of Actions advocated that India should play the role of a normative leader when it came to sustainable lifestyles and climate justice (TERI 2021). The idea of ‘Lifestyle for the Environment—LiFE Movement’ was introduced by India’s Prime Minister during the 26th United Nations Climate Change Conference of the Parties (COP26) in Glasgow in 2021. The idea promotes an environment-conscious lifestyle that focuses on ‘mindful and deliberate utilisation’ instead of ‘mindless and destructive consumption’ through advocating sustainable choices by ‘Pro-Planet People’. According to Mission LiFE of Niti Aayog, along with policy and regulatory measures to address environmental issues, harnessing the power of collective action led by individuals is crucial to solve complex problems (NITI Aayog 2022). India’s updated National Determined Contribution aims to ‘put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for “LiFE”—“Lifestyle for Environment” as a key to combating climate change’ (GoI 2022). More recently, as a part of Mission LiFE, the Government of India has proposed a notification entitled ‘draft Green Credit Programme Implementation Rules 2023,’ whereas green credits will arise from a range of sectors and entities, ranging from small-scale ones—such as, individuals, farmer producer organisations, cooperatives, forestry enterprises, and sustainable agriculture enterprises; to those being developed at the level of urban and rural local bodies, private sectors, industries, and organisations (GoI 2023a).

Sustainable consumption and lifestyles need to be seen from the perspective of consumption and production systems that include resource extraction, manufacturing and processing, use by consumers, and disposal (Fig. 6.1). Broadly, resource value chains consist of three segments: upstream (resource extraction), mid-stream (manufacturing and processing), and downstream (consumption and disposal). Mainstream frameworks on sustainable consumption and production including SDG 12 fail to holistically capture downstream segments of resource consumption and production systems especially when it comes to lifestyle choices including its linking to upstream and mid-stream components.

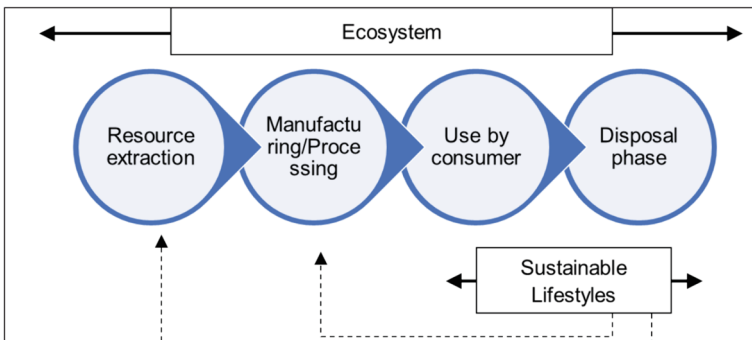


Fig. 6.1 Sustainable lifestyles in consumption production systems. *Source* Authors

Questions of equitable consumption as well as under consumption are crucial when considering sustainable lifestyles. In terms of cumulative and per capita emissions, there are disparities among countries. In cumulative terms, among G20 countries, the USA, EU-27, and China alone accounted for more than 55% of cumulative GHG emissions from 1850 to 2020 (Our World in Data 2023a). India (1.9 tonnes per person), Indonesia (2.3 tonnes per person), and Brazil (2.3 tonnes per person) have per capita CO₂ emissions lower than the world average (4.7 tonnes per person), where India has the lowest per capita emissions among G20 countries (Our World in Data 2023b).

Four categories of instruments become important when it comes to LiFE, sustainable consumption, and just green transitions (Kedia et al. 2023). These include norm evolution through internationalisation, policy instruments, market instruments, and social instruments; these four categories are not mutually exclusive. For example, consumers' movements and social movements fuelled by international norms and social instruments may be vital to bring about changes in policy and advertising norms. Similarly, policy instruments may be vital to introduce market instruments, such as pricing and procurement. Therefore, these categories of instruments can interact with each other.

Instrument 1: Norm evolution through internationalisation: Widely shared expectations about what constitutes appropriate behaviour among governments and non-state actors in international systems. These norms, even though based in non-binding frameworks, can lead to cascading effects and policy changes within and across countries and stakeholders.

Instrument 2: Policy instruments: Policy instruments are used by governments when they have a good understanding of the issue as well as the legitimacy to intervene. Policy instruments can include policy frameworks and goals, regulatory and legislative instruments, public finance instruments, making certain standards mandatory, programmatic interventions, procurement, fiscal instruments (taxes and subsidies), and rights-based approaches such as 'right to repair'.

Instrument 3: Market instruments: These instruments seek to harness the potential of markets and promote not just internalising of externalities, but also innovations and business models that drive new products and services promote responsible waste management and phase out environmentally harmful products and services. These include responsible advertising, carbon markets, labelling, extended producer responsibility, and new products and services.

Instrument 4: Social instruments: Social instruments aim at awareness generation and capacity building of consumers through providing information about a product or a service, such as product qualities and certifications, to influence consumer behaviour. Social instruments also include self-regulating and bottom-up instruments at the individual and community levels, like carpooling.

India's intent to internationalise Mission LiFE is quite explicit in its approach in the G20 process. Aglobal LiFE movement needs to consider individual behaviour change along with an evolution of norms and institutions at a global scale.

While sustainable lifestyles are internationalised, further internationalising of LiFE implies strengthening collective action through further norm evolution to engage all stakeholders including governments, intergovernmental organisations, markets, institutions, communities, and individuals.

Building on the work of TERI (2022), this chapter will review international processes and focus on the first category of instruments. The objective is to provide suggestions for possible hooks for further internationalisation of LiFE. The chapter will seek to delve into four specific multilateral processes, namely the G20 forum, SDGs processes, United Nations Framework Convention on Climate Change (UNFCCC) processes and United Nations General Assembly (UNGA) processes.

6.2 Internationalising LiFE Through the G20 Forum

G20 can play a crucial role with respect to international norms concerning international lifestyles. So far G20 discussions, much like global discussions, have focused on resource efficiency and circular economy aspects of sustainable consumption production systems and not individual behaviours. In 2022, the G20 Bali Leaders' Declaration for the first time considered lifestyles along with resource efficiency and circular economy (see Table 6.1 for key developments in the G20 forum concerning sustainable lifestyles). G20 High-Level Principles on Lifestyles for Sustainable Development, an outcome document, advocates for the Lifestyles for Sustainable Development Approach as an embodiment of the spirit of 'One Earth. One Family. One Future' (2023).

LiFE is driven by the underlying conviction that individuals' decisions and community behaviour are crucial to saving our planet. Considering the inherent relationship that actions, responses, and repercussions connected to climate change and environmental degradation have with sustainable development, it strives to achieve development, environment, and climate goals in an integrated manner (GoI 2023b).

Table 6.1 Key developments in the G20 forum concerning sustainable lifestyles

2017	G20 leaders' declaration from the hamburg summit	G20 resource efficiency dialogue
2019	The G20 Osaka leaders' declaration	Circular economy, sustainable materials management, the 3Rs
2020	The leaders' declaration of the G20 Riyadh summit	Circular carbon economy (CCE) platform and 4Rs framework
2021	The G20 Rome leaders' declaration	Circular economy approaches for climate mitigation and adaptation
2022	G20 Bali leaders' declaration	Lifestyles, resource efficiency, and circular economy

Source Authors' compilation based on G20 Outcome Documents

To realise the Paris temperature goals, it will require meaningful actions and commitment by all countries, taking different approaches into account, through the development of clear national pathways that align long-term ambition with short- and medium-term goals with international cooperation and support, including finance and technology, and sustainable and responsible consumption and production as critical enablers, in the context of sustainable development (GoI 2023c).

By integrating the LiFE effort into the G20's framework and starting the processes to deliberate on ideas and best practices from existing G20 member policies and programmes, India's G20 Presidency envisaged to strengthen the LiFE initiative (RIS 2022). Many G20 countries have policies and have already implemented strategies centred around behavioural changes and lifestyle actions, whether they are focused on aspects such as increasing building energy efficiency, waste management, electric vehicle adoption, public transportation use, and rooftop solar PV deployment. From a Global South perspective, these initiatives need to strengthen aspects of climate adaptation, biodiversity protection as well as pollution abatement.

Recently, the 2nd Environment and Climate Sustainability Working Group (ECSWG), jointly led by the Ministry of Environment, Forests, and Climate Change (MoEFCC) and the Ministry of Jal Shakti (MoJS), concentrated on the holistic management of water resources across the globe. With a compendium and appreciation of best practices for water management in India, the G20 states delegates echoed the urgent need for global action and scaling up of such initiatives to address the alarming rate of groundwater depletion around the world.

Taking a parallel example from one of the outcomes of India's G20 Presidency is the launch of the 'Millets And OtHer Ancient GRains International ReSeArch Initiative (MAHARISHI)' to enable research collaboration on nutrient-rich and climate-resilient grains, including millets and other underutilised grains, under the auspices of a G20 Meetings of Agricultural Chief Scientists of G20 states (MACS) Global Research Collaboration Priority (GRCP). This will support the initiatives made as part of the United Nations General Assembly's (UNGA) International Year of Millets 2023 programme. The MAHARISHI secretariat will be based in the Indian Institute of Millets Research (IIMR), Hyderabad, with technical support from the International Crops Research Institute for Semi-Arid Tropics (ICRISAT), One CGIAR, International Organisations (IOs), and research institutions. This was another significant accomplishment achieved in the 100th Meeting under India's G20 Presidency, where the G20 MACS delegates acknowledged the need to step up efforts towards sustainable agriculture and food systems by utilising science, technology, and innovations to address the concerns about global food security brought on by the COVID-19 pandemic and climate change with the topic 'Sustainable Agriculture and Food System for Healthy People and Planet'. The gathering adopted a Chair Summary cum Outcome Document that emphasised the key topics of cooperation in agricultural research and development for food security and nutrition, digital agriculture, resilient agri-food systems, and public-private partnerships in agricultural R&D.

Similarly, the concept of LiFE can be discussed to develop, produce, and adopt a draft framework that considers the policies of G20 states and how to integrate the LiFE mission to ensure sustainable production and consumption through individual

lifestyle choices. The relationship between individual action and policy frameworks can be strengthened through an iterative and bottom-up process of knowledge gathering and information sharing. It can be recommended to create a dedicated online platform that acts as an exchange for tools, resources, and information about sustainable living and lifestyle choices. This platform can highlight success stories, offer ideas, stories, and suggestions on implementing sustainable practices and encourage interaction and cooperation among people, communities, and organisations all around the world.

Some of the outcome documents put forth by India, such as the High-Level Principles (HLPs) for Data for Development, the High-Level Principles for LiFE, and the Action Plan on Accelerating Progress on the SDGs, are expected to directly inform the creation of the Green Development Pact, a document to be adopted at the Leaders' Summit in September. Investments in sustainable lifestyles, utilising green hydrogen for climate action, and accelerating progress on the sustainable development goals (SDGs) are just a few of the actions outlined in the Green Development Pact (Hindustan Times 2023). India, through the G20 forum, can amplify efforts in India such as the right to repair approaches and green credits apart from awareness-raising activities on sustainable actions that people can take.

6.3 Internationalising LiFE Through SDG Processes

In September 2023, the world will approach the halfway point of the 2030 Agenda and sustainable development goals (SDGs). This provides a golden opportunity to further internationalise LiFE. The seventeen SDGs with 169 targets were adopted by the member states of the United Nations in 2015. These goals encompass a comprehensive plan of action for addressing various aspects related to people, prosperity, the planet, peace, and partnership.

Additionally, indicators were developed to aid in monitoring and measuring the advancements made in achieving these targets (United Nations 2015). The outcome document 'Transforming our World: The 2030 Agenda for Sustainable Development' (United Nations 2015) mentioned sustainable lifestyles under Target 4.7 (Goal 4 on education) and Target 12.8 (Goal 12 on sustainable consumption and production) wherein these targets emphasised the role of education, knowledge, and awareness. Additionally, Target 13.3 (Goal 13 on climate action) also emphasised on improving education and awareness-raising for addressing climate change. It is imperative to impart knowledge and create awareness among the people on sustainable lifestyles to encourage them to follow environment-friendly behaviours through the formal education system. However, for ensuring sustainable lifestyles, more initiatives are needed. A wide range of policy, market, and social instruments are needed including eco-labels, fiscal instruments, and rights-based approaches.

In the global indicator framework of the United Nations, for targets 4.7, 12.8, and 13.3, the indicator to track progress is 'extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national

education policies; (b) curricula; (c) teacher education; and (d) student assessment' (United Nations 2023a, b, c). Thus, the indicators for these targets under Goal 4, Goal 12, and Goal 13 are linked to the formal education systems. While these are essential components, they do not encompass the entirety of measures needed to promote sustainable lifestyles and responsible consumption.

Since India has undertaken various initiatives under the broader LiFE initiative, India can propose indicators, policy-market, and social instruments. India is in the process of developing a market-based green credit trading mechanism for individuals and institutions. The idea is to reward a host of entities—individuals, industries, farmers producers' organisations, urban local bodies, gram panchayats, and private sectors—through 'green credits' for undertaking environment-friendly actions. India also has an eco-mark scheme.

India can take a leadership role and these recommendations can be proposed by India's focal points under Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs), which has been conducting a comprehensive review of the global indicator framework throughout 2024 (United Nations General Assembly 2017) with the aim to submit its proposed refinements, revisions, replacements, additions, and deletions to the 56th session of the United Nations Statistical Commission in March 2025 for its consideration (United Nations Statistical Commission 2023).

The High-Level Political Forum on Sustainable Development (HLPF) can play a significant role in internationalising LiFE (Lifestyles for Environment). The HLPF is a central platform established by the United Nations for the follow-up and review of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs). HLPF also offers various mediums to showcase innovations and foster discussions with fellow stakeholders and country representatives; these include the Voluntary National Review (VNR) that aims to accelerate the implementation of the 2030 Agenda by facilitating the sharing of experiences, including successes, challenges, and lessons learned. Insofar, India has submitted its VNR in 2017 and 2020. India can strongly advocate for LiFE initiatives through the next VNR and showcase efforts on the global platform of HLPF. Another medium to promote the specificity of sustainable lifestyle and responsible consumption includes the Global Sustainable Development Report (GSDR). GSDR aims to inform the quadrennial SDG review deliberations at the High-Level Political Forum under the auspices of the General Assembly (United Nations 2023a, b, c). The draft version of the 2023 GSDR highlights the need to focus on inclusive growth, climate policies, green innovation, conservation, and sustainable lifestyles (United Nations 2023a, b, c). Through the GSDR, India can advocate for a Global South perspective on sustainable lifestyles.

6.4 Internationalising LiFE Through UNFCCC

The United Nations Framework Convention on Climate Change (UNFCCC) is a key multilateral forum focused on climate change, making it a strategic entry point for promoting sustainable lifestyles and responsible consumption. Leveraging the UNFCCC's global mandate, mechanisms, and expertise can elevate the importance of lifestyles as an issue for climate action and can potentially foster international cooperation towards promoting sustainable lifestyles and responsible consumption on a significant scale.

During the past years, the Subsidiary Body for Scientific and Technological Advice (SBSTA) under the UNFCCC has addressed various important issue-based topics (UNFCCC 2022a, b). Apart from the usual suspects of adaptation, loss and damage, mitigation, technology transfer, global stocktake, and other mechanisms as mandated by the Paris Agreement, SBSTA has deliberated on issues such as 'just transitions' along with 'agriculture and food security'. Since other issues have been discussed under the ambit of UNFCCC, India can take a lead to garner support on sustainable lifestyles in the UNFCCC processes.

The assessments of the Intergovernmental Panel on Climate Change (IPCC) have recognised that changes in lifestyle, behaviour patterns, and management practices have the potential to contribute to climate action across all sectors. A growing body of literature shows the interconnectedness between climate change and sustainable consumption (Campbell et al. 2018; Thapa et al. 2023). The United Nations Environment Programme (2022) and International Energy Agency (2023) also recognise the importance of transitioning towards sustainable lifestyles and consumption patterns to achieve global climate goals.

The Fourth Assessment Report of the IPCC emphasises that changes in lifestyle, behaviour patterns, and management practices can contribute to climate change mitigation across all sectors. It highlights the potential for positive impacts on mitigation through changes in consumption patterns, education, building occupant behaviour, transport management, and industry practices.

The Fifth Assessment Report of the IPCC underscores the influence of livelihoods, lifestyles, behaviour, and culture on vulnerability to climate change and capacity for adaptation and mitigation. It acknowledges the mitigation potential of changes in consumption patterns, energy-saving measures, dietary shifts, and waste reduction. The report also emphasises that addressing climate change requires considering population dynamics, income levels, technology, prices, and lifestyle changes, highlighting their significant impacts on emissions and economic sectors.

The Sixth Assessment Report of the IPCC reaffirms that unsustainable energy use, land use change, lifestyles, and consumption patterns have contributed to global greenhouse gas emissions. It emphasises the importance of combining mitigation efforts with policies that promote lifestyle and behaviour changes, such as promoting walkable urban areas and clean energy options, which can yield health co-benefits and enhance societal wellbeing.

According to the Intergovernmental Panel on Climate Change (2022), two scenarios showed that changes in behaviour and culture, such as adjusting heating and cooling settings, taking shorter showers, reducing appliance use, using public transit, adopting less meat-intensive diets, and improving recycling, can result in additional CO₂ savings of 1.7 Gt and 3 Gt in 2050 for the 2 °C and 1.5 °C climate ambitions, respectively, beyond what can be achieved through technology-focused mitigation scenarios (Van Sluisveld et al. 2015; Van Vuuren et al. 2018).

According to the IEA's modelling, the adoption worldwide of the kinds of actions and measures targeted by LiFE—including behavioural changes and sustainable consumer choices—would reduce annual global carbon dioxide (CO₂) emissions by more than 2 billion tonnes (Gt) in 2030 which is 20% of the emissions reductions needed by 2030 to put the world on a pathway to net zero emissions (International Energy Agency 2023a, b, p. 3). The report also highlighted that majority of the emissions reduction by LiFE measures could be directly influenced by governments.

Dr Jim Skea, Co-chair of IPCC Working Group III, delivered a lecture on the IPCC Sixth Assessment Report (AR6) with a focus on lifestyle issues. The lecture highlighted the previously neglected significance of lifestyle in climate discussions. It emphasised that global emissions could be reduced by 40–70% by 2050 while meeting people's basic needs through demand-side management, supported by infrastructure and technology (Ministry of Environment, Forest and Climate Change 2023).

Aligning with the objectives as stated under Article 2 of the UNFCCC, sustainable lifestyles and responsible consumption are crucial in achieving the stabilisation of greenhouse gas concentrations and preventing dangerous anthropogenic interference with the climate system. These issues directly relate to the Convention's objective of allowing ecosystems to adapt naturally, safeguarding food production, and promoting sustainable economic development (United Nations 1992). Sustainable lifestyles can contribute to both mitigation and adaptation.

The Paris Agreement explicitly mentions the importance of sustainable lifestyles and patterns of consumption and production, with developed countries taking the lead (United Nations Framework Convention on Climate Change 2015). The issue of sustainable lifestyles is key to achieving the objective as stated under Article 2 of the Paris Agreement which aims to strengthen the global response to the threat of climate change, in the context of sustainable development (UNFCCC 2015).

Bringing forth deliberations on sustainable lifestyles and responsible consumption in UNFCCC processes including the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA), Subsidiary Body for Scientific and Technological Advice (SBSTA), and the Conference of the Parties (COP) can further internationalise sustainable lifestyles and responsible consumption and elevate the same as a global issue to promote both adaptation and mitigation behaviours, which can then percolate to countries and sub-national initiatives.

6.5 Internationalising LiFE Through UNGA

Considering the advances made in stages of LiFE-related measures including those around the green credit mechanism and the right to repair, India could internationalise LiFE by using the United Nations General Assembly (UNGA) as a platform and sponsor a resolution on LiFE.

An analysis of UNGA resolutions post the adoption of Agenda 2030 reveals that there are only three resolutions that relate to sustainable consumption (Table 6.2), and they do not articulate the need for measures for sustainable lifestyles involving individuals and institutions. Fewer reports on sustainable consumption have mentioned the advantages of environmentally friendly lifestyle practices, but they have failed to elaborate more on the subject as to how individuals, institutions, and countries across the world can come together for collective action for responsible consumption (Table 6.3). India, with its LiFE initiative, can deliberate on the urgent need for behavioural changes to encourage individuals and communities to lead lives in a way that is in harmony with nature, promoting a healthy and sustainable lifestyle as a crucial strategy for addressing climate change and achieving SDG 12.

On 12 December 2016, Tajikistan introduced a draft resolution entitled ‘International Decade for Action, Water for Sustainable Development 2018–2028’ presenting objectives including creating data that is pertinent to the water-related sustainable development goals, pursuing advocacy, networking, and encouraging partnership and action by various actors to implement the water-related sustainable development goals and targets in coordination with current initiatives. The draft requested that Member States, the relevant United Nations bodies, specialised agencies, regional commissions, and other UN institutions, as well as other relevant partners, including the corporate sector, take action to support the implementation of the 2030 Agenda for

Table 6.2 UNGA resolutions on sustainable development (2015–present)

#	Title	Articulation of sustainable lifestyles with respect to individuals (Y/N)	Resolution sponsored by which country
1	Promoting zero-waste initiatives to advance the 2030 agenda for sustainable development (A/RES/77/161)	No	Turkey
2	Promoting sustainable consumption and production patterns for the implementation of the 2030 agenda for sustainable development, building on agenda 21 (A/RES/77/162)	No	Turkey
3	Promoting sustainable consumption and production patterns for the implementation of the 2030 agenda for sustainable development, building on agenda 21 (A/RES/76/202)	No	NA

Source Authors’ Analysis based on United Nations Digital Library (2023)

Table 6.3 UNSG reports on sustainable development requested by UNGA (2015–present)

#	Title	Articulation of sustainable lifestyles with respect to individuals (Y/N)	UNGA resolution requesting the report
1	Entrepreneurship for sustainable development (A/77/254)	No	Entrepreneurship for sustainable development (A/ RES/77/160)
2	Midterm comprehensive review of the implementation of the international decade for action, ‘water for sustainable development’, 2018–2028 (A/77/249)	No	International decade for action, ‘water for sustainable development’, 2018– 2028 (A/ RES/71/222)
3	Towards the achievement of sustainable development: implementation of the 2030 agenda for sustainable development, including through sustainable consumption and production, building on agenda 21 (A/77/210)	Yes, but very vague	Promoting sustainable consumption and production patterns for the implementation of the 2030 agenda for sustainable development, building on agenda 21 (A/ RES/76/202)
4	Implementation of agenda 21, the programme for the further implementation of agenda 21 and the outcomes of the world summit on sustainable development and of the united nations conference on sustainable development (A/71/212)	Yes, but very vague	Implementation of agenda 21, the programme for the further implementation of agenda 21 and the outcomes of the world summit on sustainable development and of the United Nations conference on sustainable development (A/ RES/ 70/201)

Source Authors’ Analysis based on United Nations Digital Library ([2023](#))

Sustainable Development, contribute to the International Decade for Action, ‘Water and Sustainable Development’, 2018–2028, and provide a coordinated response, building on the momentum created by the International Decade for Action, Water for Life, 2005–2015. In order to assist in focusing more attention on water over the next ten years, the UNGA unanimously adopted the resolution ‘International Decade (2018–2028) for Action—Water for Sustainable Development’ in December 2016, which commenced on 22 March 2018, and will end on 22 March 2028. However, the resolution does not take into account the significance of individual consumption of water resources for its mindful usage and conservation.

Drawing an analogy, India can put forward a draft resolution on sustainable production and consumption that will emphasise the need to adopt individual practices and sustainable lifestyles that are in the best interest of the environment. India, as principal sponsor, can interact with the member states to understand the respective policies in those countries and then envisage an international platform to integrate the already existing policies into the global LiFE initiative. Before submitting the ‘best version possible’, India as the principal sponsor could interact with Member

States for informal negotiations on a text to enable action as soon as the L-document is presented in the UNGA Plenary. Following the presentation of the L-document, unofficial negotiations are conducted under the direction of the principal sponsor, or a facilitator chosen by the chair of the second committee. The negotiated text will take the place of the original draft if consensus is obtained. This resolution could further internationalise LiFE and could be integral to combating climate change and achieving the SDGs. Some features could also include mandating a UNSG report on sustainable lifestyles which could focus on incentivising individual and institutional behaviours.

6.6 Conclusion

The G20 High-Level Principles on Lifestyles for Sustainable Development, an outcome document, can serve as a basis for India to mobilise support for norm evolution and internationalising of Mission LiFE. India will surely have an outcome document which will be anchored on sustainable lifestyles. What remains to be seen is how India can sustain the momentum it would have gained from its G20 Presidency.

Insofar, as the consideration of sustainable lifestyles, especially that of incentivising individuals and institutions, in SDG processes is weak. In September 2023, the world will approach the halfway point of the 2030 Agenda and sustainable development goals (SDGs). This provides a golden opportunity to further internationalise LiFE. Through strengthening the global indicator framework and well as advocacy through platforms such as the HLPF and GSDR, India can continue to further internationalise LiFE.

The scientific consensus around sustainable lifestyles as a solution is growing as is evident from the findings emerging from bodies such as the IPCC, UNEP, and IEA. Since other issues have been discussed under the ambit of UNFCCC, India can take a lead to garner support for sustainable lifestyles in the UNFCCC processes. Article 2 under the UNFCCC as well as the Paris Agreement provide a clear rationale for sustainable lifestyles to be considered as a topic of discussion as a part of UNFCCC processes including CMA, SBSTA, and the COPs.

An analysis of UNGA resolutions post the adoption of Agenda 2030 reveals that there are only three resolutions that relate to sustainable consumption, and they do not articulate the need for measures for sustainable lifestyles involving individuals and institutions. India can put forward a draft resolution on sustainable production and consumption that will emphasise the need to adopt individual practices and sustainable lifestyles that are in the best interest of the environment. Some features could also include mandating a UNSG report on sustainable lifestyles which could focus on incentivising individual and institutional behaviours.

India's G20 presidency is at the cusp of this opportune moment and India is well poised to take a leadership role in internationalising lifestyle for the environment. A critical mass of support from various stakeholders is required for norms and institutions to change. Internationalisation can play a key role here. Along with stakeholder

support, evidence of best practices as well as data is needed for informed international norms as well as policies and practices within countries.

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Chapter 7

Equity and Social Consequences of Raising Resource Efficiency



Ashok Khosla

Abstract What hope is there for this planet if the countries of the Global South start to consume resources as the Global North does today? Or if the vast numbers of poor in our world demand the same things the rich few already have? They are not only entitled to do so under any concept of fairness and justice but are also being encouraged to do so by the forces of the global market. What will be the demographic, economic and environmental impact in the longer term if poverty and marginalisation in the economy of our world further delay the stabilisation of its population? The goal of creating a better world for all clearly cannot be reached with today's urban-industrial lifestyles or existing material-financial aspirations. Nor can they be reached with the disparities we have created within and between countries. Sustainable development implies not only efficient and ecologically sound management of resources but also the need to establish social equity and political empowerment. The affluent tend to over-consume "non-renewable" resources; the poor, out of the exigency of survival, tend to over-consume "renewable" resources such as soils, biomass and forests, often making them non-renewable in time frames relevant to human lives.

7.1 Introduction

What hope is there for this planet if the countries of the Global South start to consume resources as the Global North does today? Or if the vast numbers of poor in our world demand the same things the rich few already have? They are not only entitled to do so under any concept of fairness and justice but are also being encouraged to do so by the forces of the global market. What will be the demographic, economic and environmental impact in the longer term if poverty and marginalisation in the economy of our world further delay the stabilisation of its population?

The goal of creating a better world for all clearly cannot be reached with today's urban-industrial lifestyles or existing material-financial aspirations. Nor can they be

A. Khosla (✉)
Development Alternatives Group, New Delhi, India

reached with the disparities we have created within and between countries. Sustainable development implies not only efficient and ecologically sound management of resources but also the need to establish social equity and political empowerment. The affluent tend to over-consume “non-renewable” resources; the poor, out of the exigency of survival, tend to over-consume “renewable” resources such as soils, biomass and forests, often making them non-renewable in time frames relevant to human lives.

Among the perennial questions of northern consumption patterns and southern population growth, the central issues are, of course, sufficiency and efficiency. How much is enough, and how little in the way of materials and energy do we have to use to get it? This means that development goals also require us to reorient the way we produce the goods and services that we consume. The sustainability equation inexorably brings together the sufficiency of consumption and efficiency of production. And this means that those who are concerned with the future will necessarily have to work more closely with those who live for the here and now.

Our central aim must be physical and material wellbeing accompanied by intellectual and spiritual fulfilment. The central goals of our social and political systems must be to empower us to achieve these aims. The central objectives of our production systems must be not only the generation of goods and services but equally the creation of jobs and the efficient use of natural resources. For the poorer half of the world, this translates into the satisfaction of basic needs, income (and purchasing power), and maintaining the productivity of the resource base. We now need to relearn and show how all these factors can be operationally linked together to get a better strategy for sustainable development.

Today’s industrial methods are no good. They involve too much capital per job created. They waste too many resources. They cause too much pollution. And they disrupt too many life support systems—the material flows generated today by mankind are estimated to be already comparable to geological flows. Large-scale industry causes large-scale disruption, both ecologically and socially.

We need new technologies as well as a new science of economics. We need to create workplaces—jobs—at one hundredth the cost of the ones we create today in our globalised economy. And we need to increase the productivity of material resource use by at least 10 times what it is today. Sustainable industrialisation will unquestionably have to be more decentralised, efficient and responsive than today. And it must be based on a better understanding of resource pricing, environmental accounting, scales of production, financing systems and the many other factors that require fundamental change.

According to the great traditions of human civilisation, the purpose of life is to live in harmony with each other and with the rest of creation—humanity and nature supporting each other in ever-growing circles of health, wellbeing and mutual fulfilment. To reorient our economies and policies towards such a purpose will require quite basic changes in our societies. This will need new mindsets. And this, in turn, will require a fundamental transformation in each of us.

Today the environmental movement is at the forefront of the fight to redesign our consumption patterns and production systems. But that is not enough. Those who are sensitive to the impacts of our lifestyles on our humanity must ultimately take the lead. Our job is to bring such insights—from traditional, indigenous wisdom to modern, science-based humanism—into the equation.

7.2 Relevance to the G20

Throughout modern history, as countries have progressed through various stages of economic development, adverse impacts have afflicted the state of the environment. Conventional routes to maximise economic prosperity rarely coincides with routes to environmental quality or social stability, prompting individuals and societies to trade off between these factors. By 2050, as the world's population crosses 9 billion and per capita incomes triple, global material intensity is projected to double. Resource use, in the same time horizon, is expected to surpass 189 billion tonnes breaching safe operating spaces of planetary boundaries (IRP 2019). Development models focused on increasing output and expanding production systems register severe environmental costs, including increased consumption of non-renewable sources, higher levels of pollution and emissions, loss of biodiversity and habitats, and climate change.

Decades of expanding production and industrial systems without adequate environmental protection have created a state wherein these environmental costs deter future growth. The largest economic impact of climate change is postulated to be that it could wipe off up to 18% of the GDP of the worldwide economy by 2050 following a temperature rise of 3.2 °C (World Economic Forum 2021). In future projections, global growth will be hindered by rising operational costs as temperatures rise. Although there will be winners and losers at different levels of warming, the impacts will be widespread due to the financial, political and economic integration of the world's economies. Global warming affects economic growth through damage to property, and infrastructure, mass migration, loss of productivity and security threats. Inflation would rise as shortages emerge, and energy costs will likely shoot up in the transition to renewable sources. On the other hand, bringing together the growth and climate agendas could lift 2050 economic output by up to 2.8% (OECD 2017, 3). It is the countries of G20 that have the greatest incentives and capacity to bring this about.

At the start of the third millennium, there was a clear consensus among policy-makers and practitioners on the need to divorce economic activity from its ecological impact, an outcome termed “decoupling”. This idea became a central component of the United Nations Development Agenda, echoed in the Sustainable Development Goals (SDGs). The SDGs encouraged interventions and policy action across levels of governance and cooperation, to enhance resource productivity and improve resource management. By 2005, several leading international organisations were undertaking research on the role of natural resources in development; and the UN Environment was conducting detailed studies into how we use resources and their impacts. As

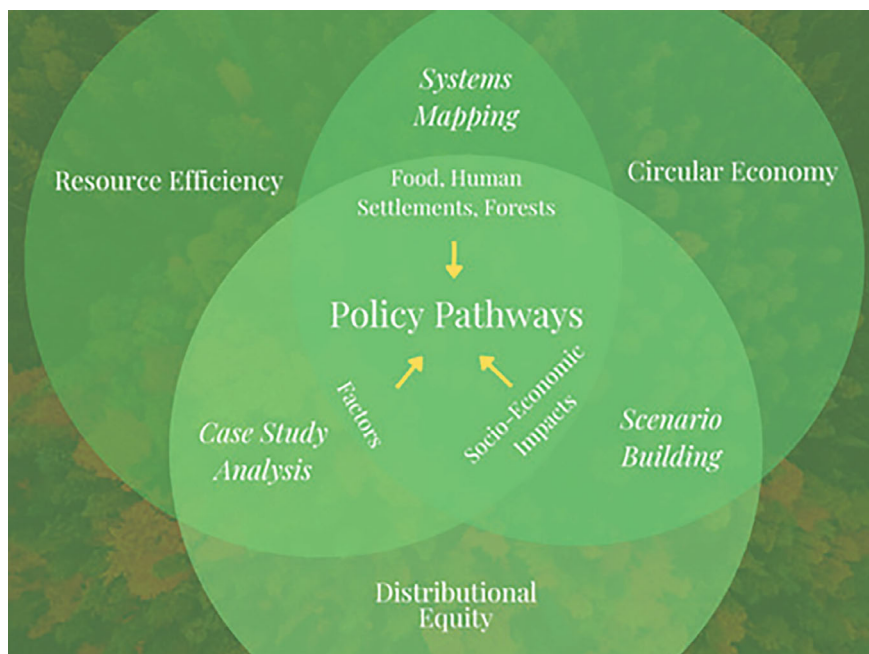
part of these efforts, it launched the International Resource Panel (IRP) in 2007. A global science-policy platform, the aim of the IRP is to build and share knowledge to improve resource use worldwide, steering us away from overconsumption, waste and ecological harm. IRP reports have provided valuable scientific and socio-economic assessments of global resource use and other themes such as material flows, decoupling, trade patterns, materials and minerals, SDGs, food, land and biodiversity.

Recognising the complex nature of the resource ecosystem, the IRP has been a staunch advocate of the need for a deeper understanding of the socio-economic implications of sustainability measures, particularly uneven access and distribution of resources across and within nations. It is significantly after nations have rallied around the sustainability agenda that their impacts are being understood comprehensively. Disparities between and within nations have caused concerns around equity and access and distribution of benefits to enter the mainstream. In terms of national disparities, high-income countries consume more than 10 times higher quantities of materials per person than low-income countries; and the billion richest individuals in the world consume 72% of its resources, the 1.2 billion poorest individuals account for 1% consumption. In its vision for resource use, the IRP advocates for a future that is socially equitable, economically efficient and environmentally healthy.

The development trajectory of the BRIC economies best exemplifies the impact of economic activity on environmental indicators. In the period of exponential GDP growth between 1992 and 2004, researchers noted a drastic increase in CO₂ emissions and energy consumption (Chousa et al. 2008). An increase in 1% GDP growth rate in the BRIC nations led to an increase in 0.28% energy consumption. Independent analysis revealed statistically significant relationships with India, China and Brazil, showing a high correlation. More recent evidence (Shahani and Khaneja 2021) confirms the continuation of this pattern. In 2018, China (5.8%) and India (7.8%) had extremely high rates of energy consumption while the world average stood at 2.9%.

The IRP has defined four high-impact priority areas for its work, one of which is sustainable resource management for effective action on human health, wellbeing, prosperity and equity. This study is a step forward in this direction. It is founded on acknowledging finite natural resources and inequities in resource access and use by different socio-economic groups. The outcome, a report titled “Socio-economic Implications for Enhancing Resource Efficiency and Circular Economy” is expected to contribute towards evidence-based policy pathways for equitable distribution of resource efficiency and circular economy benefits across development contexts. The scope of the report is global, and its primary purpose is to examine the following:

How can policies and strategies for enhancing resource efficiency and circular economy also lead to wellbeing for all?



Source Authors' Compilation

There is growing recognition that decoupling measures alone will have inherent limits and are unlikely to result in enabling the poorest to achieve acceptable standards of wellbeing as envisioned in Agenda 2030. Policies, methods, and practices for raising resource efficiency must be found that also include the principles of sufficiency, both as the minimum needed to meet basic needs and as the maximum desirable for ensuring a “good life”; otherwise, the efficiency gains will be cornered by the few and may lead not just to an even more inequitable society but also increased and unsustainable consumption patterns.

Development Alternatives and UNEP’s International Resource Panel have begun studying various environmental, security and resilience issues of current resource management policies and practices over the past five years—food, water, land and soils, forests, and jobs—and now wish to analyse the social impacts of increasing resource efficiency, including the unintended side effects of measures to raise the productivity of our land, water and mineral resources.

Members of G20 are particularly well placed to identify alternatives:

1. Frameworks for optimising equity-ecological sustainability-economic growth.
2. Relationships between equity and resource efficiency.
3. Ways to close the gaps in knowledge on these issues.

This study will analyse data from a wide range of economic, environmental and social literature to identify the possible impacts on equity and human wellbeing of efforts to raise resource efficiency and strengthen the circular economy. Systems

maps derived from case studies and empirical evidence are used to elucidate this relationship. These systems maps are then used to build scenarios and draw policy options for promoting resource efficiency, leading to greater equity and social justice while minimising the possibility of unintended negative consequences.

7.3 Conclusion

Economic development has been the reigning national and global priority since the conception of the modern nation-state vision. Economic growth, in simple monetary terms, refers to “an increase in the quantity and quality of the economic goods and services that a society produces and consumes (OECD)” The basic idea behind measuring economic development is to track the number of goods flowing in the economy and services the people can access. Economic growth is considered a fundamental requirement in a nation’s development, resting on the idea that increased economic activity improves wellbeing and quality of life. However, it is well-established that this economic growth and social development necessitates extracting and using tremendous amounts of natural resources and materials. In fact, in the last half-century, as the global population has doubled and the global GDP has grown by at least four times, the use of natural resources has more than tripled (IRP 2019).

Manufacturing and trade of goods have been part of human activity since the earliest civilisations. Medieval trade networks such as the Silk Route were dynamic and had far greater scope than the simple exchange of goods. These trade routes connecting Eurasia and North Africa served in the development of science, technology, literature and the arts. But with the dawn of the Industrial Revolution in the nineteenth century, the practice of producing and trading goods on a large scale was introduced. This has gradually become the dominant pattern of economic development for the world. Landmark global economic phenomena such as trade liberalisation and globalisation which followed industrialisation have integrated the economies of the world to an unprecedented level. Opening economies to the global system and reducing trade barriers is essential to ensuring shared prosperity (IMF 2001). And evidently, the global economy has collectively improved the quality of life for people worldwide. The average person is now four times richer, with an income increase from just \$3300 in 1950 to \$14,574 in 2016 (Roser 2019). The world is more interconnected, and the markets are more active than ever.

In modern times, economists and policymakers began to track stages of development for countries through various methods. The most well-known and frequently utilised of these is the GDP. The metric was developed in the 1930s in America amid the turmoil of the Great Depression and the World War (Costanza et al. 2009). Even before countries were required to collect this data, Simon Kuznets, the metric’s chief architect himself, cautioned against the misuse of a metric that equates growth in monetary transactions with societal wellbeing (Ibid.). The GDP paints an incomplete picture of the system viewing economic activities, as isolated from social and

environmental realities. For instance, despite the destruction wreaked by Hurricane Sandy in 2012, the event actually boosted US GDP because it stimulated rebuilding in the region. Or the fact that increased crime rates do not raise living standards or create welfare, but they can lift GDP by raising expenditures on security systems (Constanza et al. 2014, pp. 283–285). It is increasingly apparent that the misplaced primacy of the GDP in policymaking has led to increased inefficiencies, mismanagement of resources and unsustainable levels of material consumption.

The awareness of GDP as a half-measure inconsistent with environmental and social systems is gaining momentum within the community of researchers and practitioners of today (Constanza et al. 2009). They are concerned that measuring economic activity in a country or region provides no insights for better sustainable development outcomes. Recent development literature has even argued that given the finite nature of the planet and its resources, any form of economic growth is eventually unsustainable. The critique of economic growth, once a radical position, is now more visible. Since the economy grows when it produces more, policies that encourage the accumulation of capital in any way lead to economic growth. Even if those activities end up overusing and stressing the environment, through the lens of natural capital, traditional thought has disregarded consequences as externalities and views this as an overall good for the economy. Due to its foundational assumption of rational human beings as self-interested agents, neoclassical and neoliberal economics have posited nature as a limited resource. The purpose of it is, therefore, to cater to the material demands of the rational consumer.

The anthropocentric narrative of development today is dominated by the need to have high consumption, production and growth rates which are ecologically and socially unsustainable.

This mindset of “growthmania” (Daly 1973) can lead economists to think of nations as closed, independent entities perpetually competing for more and more resources in a situation of growing scarcity. Mainstream economics prioritises markets over governments, and rewards private entrepreneurship over collective action. But capitalist economic models and assumptions developed in the nineteenth century are no longer relevant to confront the demographic, social and environmental realities of the twenty-first century. The tensions that the environmental crisis is causing globally showcase the fact that the everyday assumptions taken by economists about natural systems and resources need to be transformed.

The paradigm of “sustainable development”, conceptualised in the 1980 “World Conservation Strategy” co-sponsored by IUCN, WWF and IUCN and subsequently publicised by the 1987 Brundtland Commission’s Report “Our Common Future”, has become an indelible part of the environmental discourse. The paradigm attempts to bring together two seemingly conflicting visions. The vision of achieving development rests upon both the alleviation of poverty and the improvement of material standards of living of the “present” generation. On the other hand, sustainability deals with maintaining and regenerating the environmental resource base for “future” generations. The idea of sustainable development is promising, but if it continues to operate from within the neoliberal lens, the outcomes can turn out to be superficial and self-defeating. Policies for sustainability need to be more systemic in their

approach to avoid these outcomes. For instance, policy mechanisms to empower producers to make more sustainable choices in advanced economies are highly relevant. But, designing such policies in growing economies like India or China, which are currently prioritising growth, can be more challenging. These nations in present times do not have the luxury of an available “safe operating space” (EEAC 2014) to focus on economic growth first and then work towards efficient and judicious use of resources. Therefore, technological and fiscal fixes in “production systems” to achieve the decoupling of resources and environmental impacts have to be further accompanied by “sustainable consumption” practices. These practices are desirable for the economy because the less consumption we can maintain in a given state, the better off we are environmentally (Boulding 1966).

A globalised economic system might have exacerbated the environmental crisis, but global policy frameworks and international cooperation are the keys to finding long-term solutions. International recognition of a multi-conceptual world is essential to address the systematic problem of natural capital overuse embedded in economics. There is a growing need for economics as a discipline to interrogate issues under the nation’s purview in the current political discourse as problems which are significant for the environmental governance of the world. A positive transformation can only be realised when economic growth moves away from its ecological impacts to build sustainability for future development. In order to do this, it is important to thoroughly understand the different kinds of environmental and social impacts brought on by unfettered economic growth.

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Chapter 8

Plant-Based Diet for Mission LiFE: Food Security, Health, and Environment



Soumya Bhowmick and Shoba Suri

Abstract This chapter explores the interplay between food insecurity, energy security, and climate change, emphasising the need for integrated solutions to address these challenges. The chapter advocates for adopting plant-based diets, which align with India's Mission Lifestyle for Environment (LiFE) to promote sustainable food production and reduce environmental impacts. Additionally, it discusses the emergence of the degrowth concept as a potential pathway to sustainability, highlighting the need for resilient food systems through local production, reducing food waste, and regenerative agriculture. While degrowth presents economic and political challenges, the chapter suggests that a balanced approach could enhance food security and sustainability. The complexities of adopting plant-based diets, including health, environmental, and socioeconomic considerations, are also analysed, emphasising the importance of informed choices for personal and ecological wellbeing.

8.1 Introduction

Global food insecurity has been amplified in nearly every country because of the COVID-19 pandemic, which has led to reduced incomes and disruptions in food supply chains. The situation was further exacerbated by the Ukraine–Russia conflict. The pandemic's impact on global hunger and poverty remains profound, particularly affecting the most impoverished and vulnerable populations. In 2022, the number of people facing severe food insecurity had reached 276 million individuals, compared to the pre-pandemic levels. In fact, the World Food Programme (WFP) estimated that by the end of 2022, this figure had further escalated to 323 million people due to the compounding effects of ongoing social, political, and economic crises worldwide (Smith et al. 2020).

S. Bhowmick (✉)

Centre for New Economic Diplomacy (CNED), Observer Research Foundation (ORF), New Delhi, India

S. Suri

Centre for New Economic Diplomacy (CNED), Observer Research Foundation (ORF), New Delhi, India

Food insecurity poses significant threats to the long-term sustainability of our planet and has profound socioeconomic and environmental implications. The increasing global population, particularly in the G20 countries, which covers almost 65% of the world population (Cooper 2010) is placing growing demands for environmentally friendly and safe food availability (see Fig. 8.1). However, numerous challenges, including climate change, environmental degradation, geopolitical conflicts, and macroeconomic shocks, have exacerbated the issue. Hence, exploring the multi-faceted impacts of food insecurity and its implications for socioeconomic stability and environmental sustainability is crucial.

Firstly, food security is closely intertwined with energy security, as both sectors rely on finite resources and face similar challenges. Ensuring adequate access to affordable and sustainable energy sources is essential for efficient and environmentally friendly food production, storage, and distribution. The interplay between food and energy security underscores the need for integrated solutions to address both issues (Mechlem et al. 2004; Schmidhuber et al. 2007). Secondly, climate change poses a significant threat to food security worldwide. Rising temperatures, changing precipitation patterns, and extreme weather events directly impact agricultural productivity, leading to crop failures and reduced food availability. Climate change-induced sea-level rise also threatens coastal regions, often vulnerable to food insecurity. Mitigating and adapting to the effects of climate change are crucial for ensuring a sustainable food supply (Brown et al. 2008; Mbow et al. 2019). Third, unsustainable agricultural practices, deforestation, and land degradation contribute to environmental decline and biodiversity loss. These factors compromise the resilience of ecosystems and agricultural systems, making them more susceptible to economic shocks and disruptions. Preserving natural resources, adopting sustainable farming techniques, and promoting biodiversity conservation are integral to addressing food insecurity and maintaining ecological balance (Kuku 2009). And fourth, geopolitical events, such as the Ukraine–Russia war, can trigger macroeconomic shocks that reverberate throughout the global food system. Supply chain disruptions, trade conflicts, and political instability can disrupt food production, distribution, and access, exacerbating food insecurity. Strengthening international cooperation, promoting conflict resolution, and building resilient food systems are crucial for mitigating these risks (Adem 2008; Ahmad et al. 2021).

In this context, adopting a plant-based diet can play a significant role in addressing these issues, while aligning with the principles of India's Mission Lifestyle for Environment (LiFE), which aims to foster sustainable lifestyles for the wellbeing of individuals and the environment. Plant-based diets contribute to food security by promoting sustainable food production and reducing environmental impacts (Woodside et al. 2022). By shifting towards plant-based diets, resources such as land, water, and energy could be utilised more efficiently. Animal agriculture, particularly intensive meat production, requires vast resources and contributes to deforestation, water scarcity, and greenhouse gas (GHG) emissions, bringing the idea of degrowth to the forefront of sustainability discussions (Noguerol et al. 2021; Blondin et al. 2022). Hence, embracing plant-based options can reduce the pressure to expand agricultural

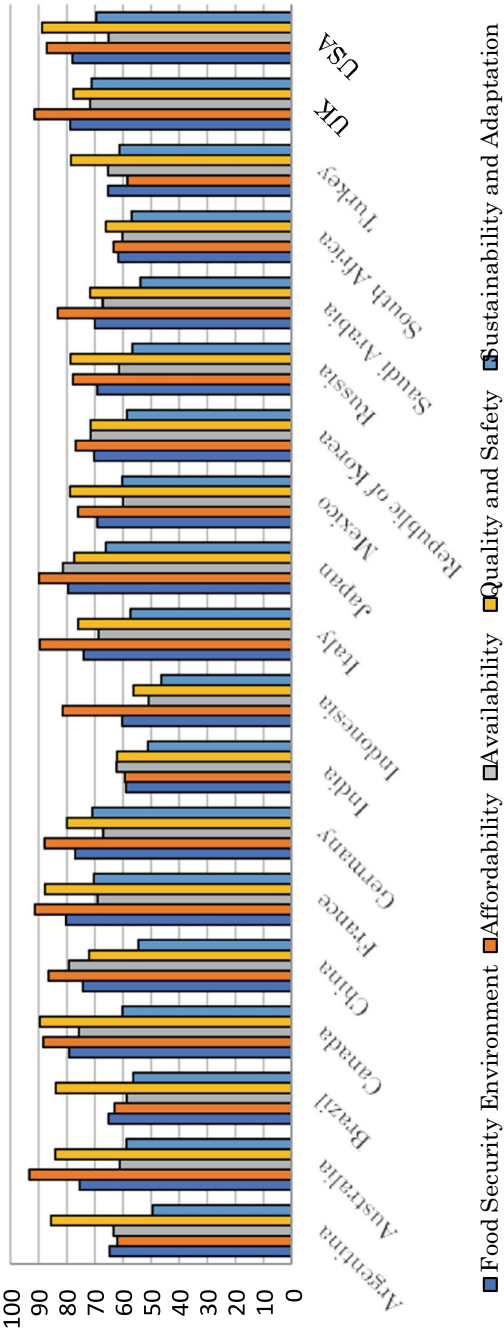


Fig. 8.1 Global food security parameters across G20 nations, 2022 (scores 0–100). *Source* Economist Impact (2022)

land and mitigate the environmental consequences associated with food production, thus enhancing food security for the growing global population.

8.2 Emergence of Degrowth

Degrowth is a concept that advocates for shrinking economies instead of pursuing continuous growth, prioritising wellbeing over profit and aiming for greater sustainability. Coined in 1972 by Austrian-French social philosopher André Gorz, the concept emerged as a movement in the early 2000s, challenging the prevailing model of economic growth that has been dominant since the seventeenth and eighteenth centuries (Masterson 2022). Degrowth proponents argue that pursuing infinite growth is unsustainable and contributes to climate change. Several strategies aligned with the degrowth paradigm include promoting local food systems, reducing food waste, and prioritising regenerative agriculture, which could substantially impact food security.

Building stronger local food systems helps reduce dependence on long-distance food supply chains and supports local economies. This approach encourages the production and consumption of locally sourced food, minimising the environmental impact associated with transportation and packaging (von Braun et al. 2023). However, food loss and waste contribute to resource depletion and environmental pollution. Addressing this issue is crucial for achieving sustainability goals. By reducing food waste at various supply chain stages, such as production, processing, distribution, and consumption, valuable resources can be conserved, and environmental impacts minimised (Chaboud et al. 2017; Santeramo 2021). Additionally, regenerative agriculture focuses on restoring soil health, biodiversity, and ecosystem functions while promoting sustainable food production. This approach employs techniques such as cover cropping, crop rotation, and reduced chemical inputs to improve soil fertility, conserve water, and sequester carbon. By prioritising regenerative practices, food systems can become more resilient, environmentally friendly, and socially beneficial (Mechlem 2004).

By implementing these strategies, societies can work towards more sustainable and resilient food systems. For example, promoting local food systems reduces the carbon footprint associated with long-distance transportation, while reducing food waste helps conserve resources and minimise environmental pollution. Additionally, prioritising regenerative agriculture practices helps restore and enhance the natural ecosystem services upon which food production depends. Together, these strategies contribute to addressing food insecurity and environmental concerns, aligning with the principles of degrowth in pursuit of a more sustainable future.

While degrowth as a sustainable roadmap towards sustainable food systems has gained attention in recent years, several demerits must be considered when considering its economic implications and political feasibility. From an economic

perspective, the concept of degrowth challenges the traditional notion of continuous economic expansion. Instead, it proposes an equitable downscaling of production and consumption (Bodirsky et al. 2022). This can pose challenges for nations, which are typically driven by high levels of economic growth and have economic systems heavily reliant on consumption and production. Implementing degrowth policies could lead to reduced economic output, which may result in unemployment, decreased investment, and lower living standards. These factors can pose significant hurdles to the adoption of degrowth strategies in G20 nations, where economic growth is often a key policy objective.

Moreover, the political feasibility of implementing degrowth policies is also a critical consideration. Policymaking in these nations often involves complex negotiations and balancing various stakeholders' interests. Introducing degrowth measures that aim to limit economic growth for food security and redistribute wealth may face resistance from powerful economic actors, including corporations and industries that thrive on continuous growth. These actors may argue against the potential negative impacts on employment and economic competitiveness, making it challenging to gain political support for degrowth policies (Gaupp et al. 2021).

Another aspect to consider is the global context in which the world economies operate. Economic growth is often seen as a driver of development and a means to address pressing social issues like poverty and inequality. Limiting economic growth through degrowth strategies could be viewed as contradictory to these objectives, making it challenging to garner broad-based support for such policies. Instead of advocating for an outright rejection of degrowth, it may be more realistic to explore alternative approaches that prioritise sustainable practices and consider the social and economic transitions required for a more balanced and resilient food system.

8.3 Plant-Based Diet for Mission LiFE

Mission LiFE is a global initiative led by India to promote an environmentally conscious lifestyle and combat climate change. Indian Prime Minister Narendra Modi introduced it during the 26th United Nations Climate Change Conference of the Parties (COP26) in Glasgow in 2021, which seeks to achieve the UN Sustainable Development Goals through a sustainable way of life. Mission LiFE recognises that Indian culture and living traditions are inherently sustainable and aims to leverage the power of collective action to nudge individuals worldwide to adopt climate-friendly measures and also seeks to enhance awareness and understanding of the importance of sustainable practices in everyday life (Narain 2023).

Mission LiFE indirectly aligns with the principles of reducing consumption and promoting sustainability in the context of degrowth. Degrowth advocates for a transition from an unsustainable growth-oriented economic model to one focusing on human wellbeing, ecological sustainability, and social equity. While Mission LiFE may not explicitly mention degrowth, its objective of promoting an environmentally

conscious lifestyle and shifting towards sustainable practices aligns with the principles of degrowth by encouraging individuals to prioritise mindful and deliberate utilisation over mindless and wasteful consumption. Adopting plant-based diets is one key practice that aligns with degrowth theory and could offer significant benefits for the environment, human health, and food security. Plant-based diets emphasise the consumption of plant-derived foods while reducing or eliminating the consumption of animal products. There are multiple reasons why adopting a plant-based diet can have positive impacts on both the environment and our health (see Fig. 8.3).

Plant-based diets generally have a lower environmental footprint than diets heavily reliant on animal products. They require less land, water, and energy for production, resulting in reduced GHG emissions and other pollutants (see Table 8.1). This contributes to efforts to mitigate climate change (Li 2020). Additionally, plant-based diets are rich sources of essential nutrients such as fibre, vitamins, and minerals, and at the same time, lower in saturated fat and cholesterol compared to diets high in animal products. By incorporating plant-based foods, the risk of chronic diseases like cardiovascular disease, type 2 diabetes, and certain types of cancer can be reduced (Bhatia et al. 2021). Ethical concerns regarding animal welfare and sustainability also drive many individuals to choose plant-based diets. These diets offer a wide variety of food, including fruits, vegetables, whole grains, legumes, nuts, and seeds, allowing for diversity and flexibility that caters to individual preferences and nutritional needs (Vågsholm 2020). A balanced plant-based diet provides all the essential nutrients needed for optimal health and wellbeing, promoting better food security by diversifying food sources.

Plant-based foods exhibit greater resource efficiency compared to animal-based foods. For instance, producing a pound of grains or vegetables requires significantly less water than a pound of meat. By opting for plant-based foods, individuals can contribute to conserving water and other natural resources. By 2027, the global meat market is projected to grow by US\$ 522.63 billion, with a compound annual growth rate of around 7% (see Fig. 8.2). Choosing a plant-based diet can be crucial in reducing and offsetting carbon emissions associated with the meat and dairy industries. Research suggests that if every person in the USA decided to go meat- and dairy-free for one day each week, it would have an environmental impact equivalent to taking 7.6 million cars off the road (Nieves 2022). Furthermore, plant-based diets can potentially increase the global food supply by up to 49% without expanding croplands. This dietary approach can significantly reduce methane emissions by decreasing the number of animals raised in the meat and dairy industries in accordance with the outcomes expected from Mission LiFE.

As the global population continues to grow, traditional animal-based food production systems face challenges in meeting the increasing demand. Plant-based diets can provide a more efficient use of resources, as plant crops typically require fewer resources and have higher yield potentials compared to animal agriculture. This efficiency can help alleviate pressure on agricultural land, reduce water usage, and enhance food availability (Hoehn et al. 2021). Additionally, the adoption of plant-based diets also contributes to the sustainability and resilience of food systems. Diversifying our food sources by incorporating plant-based alternatives reduces reliance

Table 8.1 GHG emissions per kilogram across food products

Entity	GHG emissions (in kg)
Citrus fruit	0.39
Apples	0.43
Nuts	0.43
Root vegetables	0.43
Potatoes	0.46
Onions and leeks	0.5
Brassicas	0.51
Other vegetables	0.53
Bananas	0.86
Peas	0.98
Soy milk	0.98
Other fruit	1.05
Barley	1.18
Cassava	1.32
Berries and grapes	1.53
Wheat and rye	1.57
Maize	1.7
Other pulses	1.79
Wine	1.79
Beet sugar	1.81
Tomatoes	2.09
Oatmeal	2.48
Milk	3.15
Tofu	3.16
Cane sugar	3.2
Groundnuts	3.23
Rice	4.45
Eggs	4.67
Poultry meat	9.87
Pig meat	12.31
Fish (farmed)	13.63
Cheese	23.88
Prawns (farmed)	26.87
Coffee	28.53
Beef (dairy herd)	33.3
Lamb and mutton	39.72
Dark chocolate	46.65
Beef (beef herd)	99.48

Source Poore and Nemecek (2018)

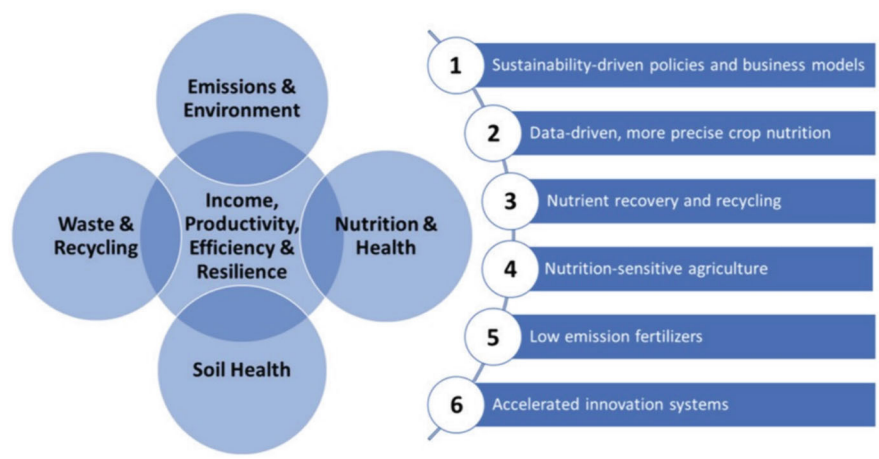


Fig. 8.2 Responsible plant nutrition—5 interconnected aims and 6 key actions. *Source* Bruulsema et al. (2020)



Fig. 8.3 Global meat market outlook in US\$ billion (2017–2027). *Source* Zlati et al. (2023)

on a few resource-intensive commodities, making the food supply chains more robust and adaptable to challenges such as climate change and disruptions in global trade (Li 2020). This resilience is essential for ensuring stable access to nutritious food, particularly in vulnerable communities where food security is a pressing concern.

8.4 Complexities in Adopting Plant-Based Diets

8.4.1 *Health and Environmental Considerations*

To align with the principles of Mission LiFE, it is crucial to understand that not all plant-based foods are inherently nutritious or environmentally friendly. Unplanned plant-based diets often lack adequate nutrition. A comprehensive analysis, which examined 48 studies on vegan diets in European populations, discovered that these diets did not meet the World Health Organization's recommended levels of essential macro and micronutrients (Bakaloudi et al. 2021). The study revealed that vegans had insufficient protein intake and low levels of vitamins B2, B3, B12, D, iodine, zinc, calcium, potassium, and selenium. Particularly concerning was the significant deficiency in vitamin B12, which was well below the recommended levels of 2.4 µg. Furthermore, most vegans consumed less calcium than the daily recommended intake of 750 mg. To address these nutritional inadequacies in an unplanned vegan diet, seeking guidance from a nutrition expert is necessary. However, there is currently a notable gap in people's attitudes towards seeking such guidance, leading to potential nutritional deficiencies and adverse health consequences during a sudden transition to veganism.

Another area of concern for both human health and the environment is the consumption of processed plant-based food options. These highly refined products often contain additives, preservatives, excessive sodium, sugar, and unhealthy fats. Consumption of such foods can contribute to health issues like obesity, diabetes, and cardiovascular diseases, undermining the health benefits of a plant-based diet (D'Alessandro et al. 2022). Plant-based meat alternatives, known as fake or mock meat, have recently gained popularity as a food trend. In fact, these products have experienced significant commercial success, with a revenue of approximately US\$ 900 million in 2019, marking a 38% increase over the previous two years (Mc Clements and Grossmann 2021). However, it is essential to recognise that these impressive commercial figures do not reflect the potential negative impact of fake meats on health. For example, using the UK's Nutrient Profiling Model, it is found that 14% of plant-based meat products were categorised as "less healthy", and following the UK's front-of-pack labelling criteria, a cross-sectional survey revealed that 20% of plant-based meat products contained high levels of saturated fat or salt (Alessandrini et al. 2021). Furthermore, another study emphasised that the production of plant-based meat alternatives could have detrimental effects on the environment, as it requires significant amounts of land, water, and energy resources, leading to increased GHG emissions, soil degradation, and water pollution (Van Vliet et al. 2020).

By considering the principles of Mission LiFE, which advocates for mindful and deliberate utilisation instead of mindless and destructive consumption, it becomes clear that a comprehensive understanding of plant-based diets' nutritional aspects and environmental impact is essential. This knowledge can guide individuals

towards making informed choices that promote both personal health and ecological conservation.

8.4.2 Acceptability, Accessibility, and Affordability

The universal acceptance of plant-based diets faces a significant challenge due to global cultural and culinary diversity. Diets in many cultures are deeply ingrained in customs and traditions, making it challenging for individuals and communities to abandon animal-based foods completely. Moreover, certain communities and developing regions still have greater access to and affordability of animal-based foods compared to plant-based alternatives. However, limited availability, lack of infrastructure, and higher costs of fresh produce and plant-based substitutes are factors that hinder marginalised populations from adopting plant-based diets. This socio-economic barrier creates difficulties in ensuring universal access and affordability of plant-based options. To address this issue, a study conducted in 2020 assessed the affordability of the EAT-Lancet reference diet, which promotes a healthy and sustainable eating pattern (Hirvonen et al. 2020). The findings revealed that the average cost of the EAT-Lancet reference diet, US\$ 2.84 per day, was not affordable for at least 1.58 billion people worldwide. Notably, the high cost of the diet was primarily attributed to plant-based foods such as fruits and vegetables (31%) and legumes and nuts (18%), followed by meat, eggs, and fish (15%), and dairy products (13%). This cost rendered the diet unaffordable for many individuals living in poverty. Hence, policy interventions and strategies to enhance the affordability of plant-based diets align with the principles of Mission LiFE.

Furthermore, an assessment of the food environment in Kenyan cities, focusing on the accessibility and affordability of vegetables and fruits, revealed numerous challenges (Zenk et al. 2009). Low-income communities, in particular, faced obstacles such as limited availability and higher prices for vegetables and fruits. This highlights the disparities in access to plant-based options, further emphasising the need to address affordability and accessibility issues to promote an environmentally conscious lifestyle.

A nationwide study conducted in Canada in 2019 demonstrated that vegetarian and vegan diets are generally affordable and accessible, with costs equivalent to or lower than non-vegetarian diets (Bryant 2019). However, regional variations were observed, indicating that certain remote areas and low-income communities experienced higher costs. This study underscored the importance of diversifying plant-based diets across different regions, taking into account affordability and accessibility considerations. By recognising and addressing these regional disparities, Mission LiFE can promote a mass movement towards an environmentally conscious lifestyle that is mindful of the challenges faced by different communities in adopting plant-based diets.

8.5 Sustainable Food Systems

A sustainable food system is a system that guarantees food security and nourishment for all without jeopardising the economic, socioeconomic, or environmental foundations for this to happen (Feenstra 2002). Agriculture is a major cause of climate change, accounting for between 19 and 29% of total greenhouse gas emissions (Vermeulen et al. 2012). The food system's sustainability can be achieved by adopting a sustainable agriculture system, shifting to sustainable eating practices, and identifying ways to reduce greenhouse gas emissions at various stages of the food production supply chain.

Sustainable agriculture, also known as climate-smart agriculture (CSA), is a comprehensive approach that integrates climate-conscious practices into livestock and crop cultivation (Lipper et al. 2014). CSA can help reduce greenhouse gas emissions or enhance carbon sequestration. It also takes into account the increasing global population and works to ensure food security for everyone. CSA offers a range of measures to combat the challenges of sustainable cropping. There are numerous other promising aspects of sustainable agriculture, such as organic farming, integrated pest management, agroforestry, and more (Yadav et al. 2013). However, having a comprehensive implementation strategy involving all stakeholders is essential.

8.5.1 *An Example of the Mediterranean Diet*

The Mediterranean diet, known as the MedDiet, has gained global recognition as the most effective dietary approach for overall health and wellbeing (Morris et al. 2016). Originating from the traditional eating patterns of the Mediterranean region, this diet emphasises the consumption of whole, minimally processed foods, abundant fruits and vegetables, whole grains, legumes, nuts, and healthy fats. The United Nations Educational, Scientific and Cultural Council (UNESCO) and the US Department of Health have recommended it as the healthiest dietary pattern in the world (Maggi et al. 2021). The MedDiet also includes a moderate number of poultry, eggs, fish, and seafood 2–3 times a week, which adds to its wholesome and adaptable nature. Numerous studies have demonstrated the positive impact of MedDiet on health (Tosti et al. 2018).

Evidence has also shown that a Mediterranean diet can reduce the risk of various diseases (Sofi et al. 2010). Furthermore, the Mediterranean diet has been found to be less detrimental to the environment, as it reduces the use of agricultural land, energy consumption, and water consumption, all of which are important for the health of humans and natural resources. In a 2013 study conducted in collaboration with the Spanish Ministry of Economics and Competitiveness (Sáez-Almendros et al. 2013), the environmental footprint of the Mediterranean diet, the Western diet, and the Spanish diet were compared. The results showed that the Mediterranean diet had the least environmental footprint, while the Western diet had the highest footprint. The

study concluded that if Spain adopted the Mediterranean diet, its GHG emissions would be reduced by 72%, agricultural land use by 58%, energy consumption by 52%, and water consumption by 33%.

The environmental benefits of MedDiet stem from its emphasis on plant-based foods and sustainable food choices (Dernini et al. 2015) in tandem with LiFE. Mediterranean diets have significantly lower carbon footprints and GHG emissions than those rich in animal products. Furthermore, by promoting the consumption of whole-plant foods, MedDiet reduces land and water usage and contributes to biodiversity preservation (Novoselov 2023). In contrast, future food systems based on processed plant-based foods cannot rival the Mediterranean diet in terms of the balance between environmental preservation, adequate nutrition, adaptability, and food security.

8.6 Conclusion

A sustainable food system must address food security and nutrition adequacy while minimising non-renewable resources, reducing GHG emissions, protecting biological diversity, and promoting social equity. Plant-based foods and diets have emerged as the most effective means to achieve these goals, as they significantly decrease carbon emissions, increase food production without expanding croplands, and lower methane emissions, which brings out some of the positive benefits of a degrowth approach to development. However, unplanned plant-based diets may lack essential nutrients, and certain plant-based processed foods have been classified as “less healthy” and environmentally detrimental. Additionally, challenges such as limited access, high costs, and cultural diversity can hinder marginalised populations from adopting plant-based options.

Education and policy interventions are vital in overcoming these challenges and promoting the widespread adoption of plant-based diets. Through nutrition education integrated into school curricula and public awareness campaigns, individuals can be equipped with the knowledge to make informed dietary choices that consider plant-based diets’ environmental, health, and ethical benefits. Furthermore, policy interventions, including subsidies, tax incentives, regulations, and labelling requirements, can make plant-based foods more affordable, accessible, and transparent in terms of nutritional content and environmental impact that can advance the objectives of Mission LiFE. The Mediterranean diet, recognised as the world’s healthiest diet, offers significant health benefits while being environmentally friendly. Adapting the Mediterranean diet to cultural requirements is also more feasible than a solely plant-based approach. Therefore, plant-based foods and diets are viable options for a sustainable food system, offering human health and environmental benefits. By raising awareness, promoting knowledge, and implementing supportive policies, we can create a more sustainable and inclusive food system, advancing the food security objective for the G20 nations and a broader context.

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Chapter 9

Future Prospects for Alternative Fuels in the Maritime Sector



Francesco Profumo, Massimo Deandreis, Alessandro Panaro, and Consuelo Carreras

Abstract The chapter will explore the impact of de-carbonization and the use of alternative fuels in the maritime sector, with the aim of highlighting how ports and shipping are changing their strategies towards a zero-carbon perspective, implementing various initiatives aimed at modernising their infrastructures based on the advent of so-called Green Ships and new Green Ports models (ports as zero-emission ecosystems, where competitiveness and sustainability processes can be improved). The maritime sector's environmental footprint is certainly rather small compared to the huge volumes of goods transported around the world (90% of international trade travels by sea), but nevertheless the decarbonization of shipping is on the priority list of both the United Nations, through the IMO (International Maritime Organization), and the European Union. The green transition in shipping undoubtedly presents many opportunities, but it is at the same time a complex path due to a number of geopolitical, technical and logistical implications, including the presence of the necessary storage and distribution infrastructure in ports and terminals. Making 'green-oriented' choices in a scenario characterized by several unknowns is a far-reaching challenge that needs to be tackled with synergy between the various players in the maritime and port cluster.

F. Profumo (✉)
Isybank, Milan, Italy

M. Deandreis
Studi e Ricerche per il Mezzogiorno, Naples, Italy

A. Panaro
Department of Maritime and Energy, Studi e Ricerche per il Mezzogiorno, Naples, Italy

C. Carreras
Department of Maritime and Energy, Studi e Ricerche per il Mezzogiorno, Naples, Italy

9.1 Introduction

The international arena in recent years has been strongly affected by several events; first the pandemic and then the conflict, which led to geopolitical crises and economic shocks, steering governments towards a radical transformation in the use of energy and transport services. As a consequence of disruptive phenomena, which have led to disruptions in global value chains, companies have been forced to face changes in energy and raw material supplies, looking with interest at the opportunities to be seized by investing in transition, especially in the light of the shift towards more sustainable growth and the challenges this brings and spanning all sectors, starting with energy and digital innovation. The first consequence has been a substantial increase in global demand for new and more sustainable infrastructures, with infrastructure investments increasingly becoming a geopolitical instrument of influence for major powers to increase their connectivity with countries deemed strategic.

As the recovery plans in countries around the world are proving, infrastructure can help provide the key framework for a revival of world economies hard hit by the crisis of recent years. Sustainability goals have become more urgent. Nevertheless, due to hostilities, soaring oil and gas prices and the difficulties associated with the transfer of gas to Europe, heavily dependent on Russia, countries have been led to find new suppliers or even to rethink coal, and the need and awareness to quickly find alternative energy sources have accelerated.

The emphasis for radical change has been placed on applying the principles of environmental and social sustainability to business activities and solutions compatible with a circular economy. Over the past decade, this focus on sustainability has also risen dramatically on the shipping agenda, with environmental, social and governance issues already influencing funding decisions, fleet renewal and regulatory changes across the industry. The shipping industry is, therefore, now heavily focused on the decarbonisation pathway.

9.2 Some Recent Challenges and Pathways Ahead

In 2018, the United Nations International Maritime Organisation (IMO) set an ambitious target for the industry: to reduce the CO₂ intensity of shipping by 40% by 2030 and 70% by 2050 and also to decrease its greenhouse gas emissions by 50% by 2050, compared to a 2008 baseline. Key emissions regulations include IMO 2030 short-term targets (with the introduction of EEXI and CII) and IMO 2050 targets.

Pressure to go beyond the current IMO targets is mounting, with the 2021 European Union regulation 'Fit for 55' outlining how it intends to reduce its greenhouse gases by at least 55% by 2030, compared to 1990 levels. In order to ensure that the shipping sector contributes to the EU's major climate ambition, the Commission will apply a 'carbon tax' through its Emissions Trading Scheme (ETS) to cover the CO₂ emissions of large ships (above 5000 gross tonnages), regardless of the flag they fly.

The extension will include all emissions from ships calling at an EU port for voyages within the EU (intra-EU), as well as 50% of emissions from voyages that begin or end outside the EU (extra-EU voyages) and all emissions that occur when ships are berthed in EU ports.

The reform envisages that emissions in the sectors covered by the ETS must be reduced by 62% by 2030 compared to 2005 levels. The result is an economic signal to incentivise improved energy efficiency and low-carbon solutions as well as reducing the price differential between alternative and conventional marine fuels.

The reasons behind this major industrial powers' interest in sustainability in transport are numerous but can be summarised as follows: ensuring greater resilience to climate change (increasing temperatures, droughts and floods); increasing urbanisation in the Mediterranean region, where some 500 million people live and circulate; increasing road mobility volumes and, in particular, freight traffic and last-mile logistics, which is affected by the disruptive flows of e-commerce, which have increased especially during the pandemic period.

To understand the scale of the problem, one has to consider that, according to the latest Clarksons estimates, maritime transport emissions will contribute 2.1% and 822 million tonnes to global CO₂ production in 2023. This figure is slightly down from 2022 (2.3%, 845 million tonnes) mainly due to the impact of slow steaming. Overall, the transport sector accounts for about 21% of global CO₂ emissions (the highest share of emissions comes from the electricity generation process: 39%), with road freight accounting for 6.5%, road passenger transport for 9.7%, aviation for 2% and rail for 0.2%. Maritime transport therefore remains the most carbon-efficient mode of transport.

Over the ten-year period 2009–2019, data from the International Energy Agency shows an increase of about 20% in CO₂ emissions from road transport, an even greater growth in emissions from aviation and a substantial stability in emissions from rail transport, which declined in terms of weight in the overall share. As for maritime transport, Clarksons data show that CO₂ emissions decreased by about 14% over the same period. This is mainly due—as mentioned—to 'slow steaming' and an increasing presence of more efficient ships equipped with ad hoc technologies. For instance, in 2009, the 'green' fleet was negligible, while in 2019, it accounted for 18% of capacity, and by 2024 Clarksons estimates it could reach 32% of capacity. At the same time, we should not forget about alternative fuels accounting for 3% of fleet capacity in 2019 and 5% today.

Shipping's emissions would not seem particularly pressing were it not for three essential elements, which have the ability to affect and transform the market: world-wide shipping carries 90% of goods, it is a capital-intensive sector whose long-term investments affect the future, and it is highly concentrated, so the actions of the big players have the potential to steer markets. The pathway to maritime decarbonisation therefore impacts ship design, technological improvements, but also the use of alternative fuels.

Although the maritime sector uses a wide range of fuels, the predominant ones remain the traditional liquid fuels, such as ultra-low sulphur intermediate fuel oil (VLS IFO) and intermediate fuel oil with a maximum viscosity of 380 centistokes

(IFO380), together with VLS marine gas oil. In the current technological landscape, three lines of development are emerging to replace current petroleum-derived fuels: the light gas line, the heavy gas and alcohol line and, finally, the liquid biological and synthetic fuels line; these lines of development envisage possible solutions in the short, medium and long term. In the short term, the LNG solution seems to be the only one that can be effectively applied. Biofuels are already available and used as a drop-in in today's fuels, but their high cost and the limited quantities available are currently an objective obstacle to their expansion. In the medium term, a gradual substitution of LNG by bio-methane can be expected, and in the long term, hydrogen will be the point of arrival for light gases, and we will see solutions such as bio- or electro-methanol come to the fore, with ammonia eventually becoming the point of arrival for heavy gases. In the medium and long term, biofuels will be supplemented and replaced by liquid synthetic fuels and second and third-generation fuels.

In recent years, however, the drive to go green and growing concerns for the environment have been leading shipowners to invest more and more in new-generation hybrid or LNG-powered ships aimed at making vessels more efficient and reducing their environmental impact.

The year 2022 saw a sustained growth in orders for alternative fuel ships, accounting for 60% of the total capacity ordered. LNG has been the most popular choice, but there has also been growing interest in methanol. Emerging alternative fuels also include LPG, ammonia, hydrogen, biofuels and batteries.

According to the International Energy Agency, 'green' ammonia is one of the most promising low-emission fuels and will reach 130 million tonnes by 2070 via shipping. However, the energy produced by this fuel is less dense than that of oil, which means that ships will consume up to five times more fuel by volume. The use of ammonia, while having the criticality of toxicity, has the advantage that it can be handled more easily.

Ammonia production is expected to increase by 440 million tonnes—more than three times current production—requiring 750 GW of renewable energy.

As for hydrogen, it must be said that it does not emit carbon but the current production method generates a large amount of greenhouse gases, thus nullifying its green credentials. As with ammonia, the density of this fuel is low and also requires a new refuelling system. This makes it complex to store, transport and use, posing safety issues related to the possibility of accidental combustion.

As for batteries, given that the electricity for recharging batteries must necessarily come from renewable or at least carbon-free sources, the problem with the application of batteries in the naval sphere is their weight, size and recharging time in relation to the required capacity. This technology has made great progress in recent years, but full-electric applications in the naval field, especially with reference to medium- and large-sized vessels, still require significant up-scaling. A typical container ship would require the power of 10,000 T S85 batteries per day, which means that 70,000 batteries would be needed to sail for a week. This is different for hybrid solutions, where the batteries, charged in port or underway, are used in manoeuvring and during port stops, with clearly lower power requirements. Despite these issues yet to be

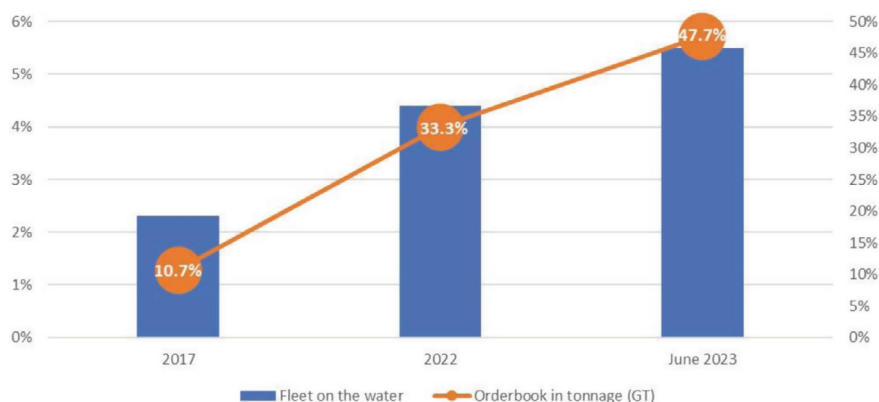


Fig. 9.1 Fleet capable of using alternative fuels or propulsion. *Source* SRM on Clarksons

resolved, it is not difficult to imagine a future where short-haul connections can find an effective and satisfying solution in full-electric propulsion.

Also worth mentioning is the announcement of an experiment completed in a California laboratory on nuclear fusion, which, when exploitable on a large scale, could open up completely new scenarios both economically and geopolitically.

As of June 2023, ships capable of alternative fuel accounted for 5.5% of the in-water fleet (GT) and 47.7% of the order book (Fig. 9.1).

Of the total order book, most of the tonnage is destined for LNG use (39%), 5.4% for methanol use, and 2.1% for LPG.

Financing needs for the fuel transition are expected to increase, with annual investment in new construction rising from about \$92 billion per year (2012–2022) to about \$150 billion per year (2023–2033); with a projected scenario of more than \$1.7 trillion in new construction orders over the next ten years and \$4.4 trillion until 2050.¹ Major shipowners, especially in the container segment but not only, are investing in alternative fuels. MSC and CMA CGM are moving towards LNG, as is Hapag Lloyd; CMA CGM is also investing in methanol, as is Maersk. Overall, an estimated \$3 trillion is needed to decarbonise the industry.²

In the container segment, according to Alphaliner, the share of ‘alternative’ propulsion vessels in the orderbook exceeded 40% for the first time in the first half of 2022, while orders for conventionally propelled vessels dropped. For the first half of 2023, the forecast is as high as 92% of the order book in the container segment operated with alternative fuels.

Dual-power LNG vessels in the order book had already reached 198 units with 2.31 MTEU in February last year, accounting for just under 30% of the order book. However, it is the rapid growth of methanol-fuelled units that has led to the largest increase in green orders: dual-fuelled methanol vessels have increased at a faster rate in proportion to the order book as a whole, reaching 68 vessels of 0.93 MTEU. At the beginning of the year, CMA CGM signed a contract for twelve 13,000-TEU

¹ Clarksons (2023)

² Drewry (2023).

methanol-powered dual-fuel units at Hyundai Heavy Industries shipyards to be delivered between 2025 and 2026. Only 14% of the capacity ordered in the second half of 2022 was oil-fuelled. While dual-fuelled methanol orders exceeded LNG for the first time in terms of ordered capacity.

The percentage of orders for fuel oil ships continued to decline. For the first half of 2023, only 8% of the capacity has been allocated to conventionally propelled ships. With new LNG orders surpassing LNG orders, Maersk tops the list. The Danish company has almost 300,000 TEU of dual-fuel methanol capacity on order, accounting for 80% of new building tonnage. It recently ordered six 17,000-TEU units from Hyundai Heavy Industries, to be delivered within seven months until December 2025.

CMA CGM could soon overtake Maersk with an order of six 16,000-TEU dual-fuel methanol units. CMA CGM's methanol ship contracts would rise to a value of 342,000 TEUs, surpassing those held by the Danish carrier. In third place is OOCL, which only entered the dual-fuelled methanol market last October, ordering seven 24,000-TEU from NACKS for deliveries between 2026 and 2027 (Fig. 9.2).

The green transition in the shipping sector is also reflected in the modernisation of port infrastructure, which must adapt to the advent of so-called 'green ships'; decarbonisation goals can be achieved not only through the efforts of the shipping industry but also through the implementation of new port models. Adapting power systems to the use of alternative fuels requires the presence of adequate supporting logistics, i.e. the necessary infrastructure in ports and terminals. Therefore, a ready and organised supply chain is also needed on the land side.

Ports are becoming strategic hubs to facilitate the energy transition. Thus, we speak of 'Green Ports', or ports as zero-emission ecosystems, where competitiveness can be improved, which include sustainability of processes in their strategies and are therefore also able to offer services related to energy production and storage (such as cold ironing) as well as bunkering.

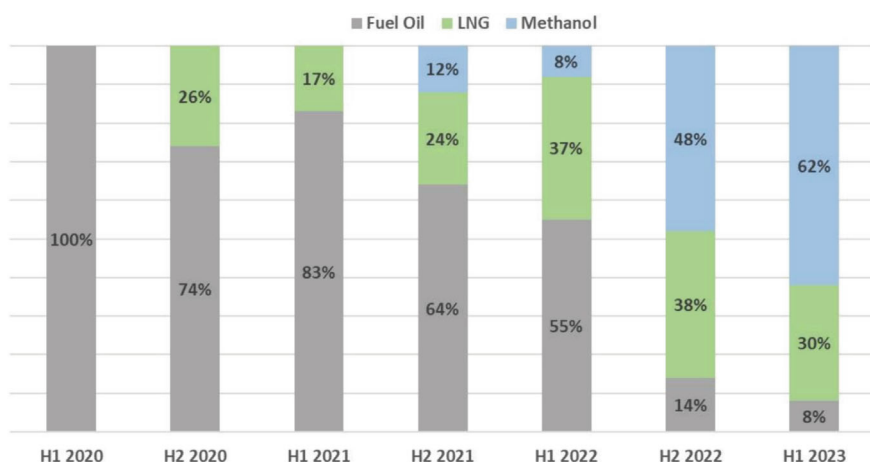


Fig. 9.2 Containerships current orderbook: propulsion method by capacity/order date. *Source* SRM on Alphaliner

There are currently 169 active LNG bunkering ports worldwide (and 95 planned facilities), while over 2000 ships are equipped or will be equipped with shore-side electricity connections. The strategy of providing alternative fuels is a competitive asset for a port's future, as it increases its appeal to ships that are moving towards sustainability.

As seaports are often located in or near urban areas, there is pressure on them to pay attention to energy efficiency, environmental protection and sustainable development to protect the health of people living or working in these areas. Besides the environmental and economic aspects, the social aspect also plays a role in green ports. Finally, making ports more sustainable is crucial to ensure their long-term competitiveness. Sustainability has a positive impact on economic, commercial and operational activities, as 'green ports' ensure cost savings, environmental protection, customer satisfaction and thus also customer loyalty and a good corporate image. Ultimately, this will also have a positive effect on the overall economy of the country where the port is located.

New port models involve the coexistence of a number of features, with a special focus on the modal shift. Decarbonisation goals can be achieved not only through the efforts of the shipping industry but also through efficient rail connectivity. Using rail before or after loading/unloading goods from a ship instead of road transport allows us to reduce emissions as rail is often electrified while road transport is not.

Another feature is the flexibility of the service, which goes hand in hand with greater integration between road and rail transport; the best way to ensure flexibility in the transfer of goods is the development of short sea shipping and roll-on roll-off. Ro-Ro is, in fact, a special type of ship used for the transport of motor vehicles, including trailers, in which they enter and leave without the use of loading cranes. Short Sea Shipping (SSS Short Sea Shipping) is the interchange of goods in closed seas/areas (such as the Mediterranean) and includes all maritime traffic without transoceanic origin or destination. This type of transport enjoys greater flexibility than the other segments, as it can adapt more easily to the needs of demand, according to door-to-door logic.

As a consequence of the transformations related to the energy transition, bilateral agreements between carriers and fuel producers are multiplying with the aim of securing appropriate supplies for the needs of ships: for example, the large German carrier Hapag Lloyd signed an agreement with Shell while MSC signed one with Gasum for cruise ships. Another phenomenon concerns agreements between carriers and port infrastructures: at the end of March 2023, an agreement was signed between Shanghai Port, the world's largest container port, and Maersk, the world's second-largest operator, to develop cooperation on green methanol bunkering. The agreement to match supply and demand envisages the use of the fuel from 2024. The Port of Shanghai will provide the port's bunkering infrastructure for green methanol, while the Danish group has ordered 19 bi-fuel methanol ships (the first of which will be delivered at the end of 2023 and the others between 2024 and 2025). In the first phase, the Chinese port—as a potential supplier of bunkering services to Maersk—will carry out ship-to-ship refuelling and in-port storage of fuel tanks. In the second phase, the parties will explore how to form a strategic partnership to

promote the extension of such services upstream in the green methanol industrial chain. Meanwhile, Maersk has signed pre-agreements with nine green methanol producers to receive fuel supplies starting next year. The appointed producers are Carbon Sink, CIMC ENRIC, Debo, European Energy, Green Technology Bank, Orsted, Proman, Wastefuel and SunGas.

Looking at Europe, Northern Range ports, in particular, are investing in sustainability by building ammonia and methanol plants near the ports. To meet the challenge of decarbonization, it is not enough to just build new ships powered by alternative fuels, but it is also necessary to build new facilities, including by adapting old facilities to the new needs, where ships can refuel. A critical issue in the energy transition process is precisely the difficulty of finding the chosen type of fuel outside of defined routes.

Refueling and storage infrastructures can serve as a starting point for a network to use ammonia and methanol as fuels for shipping, reducing the costs of 'last-mile' distribution. There are several projects underway for refueling ships with alternative fuels. One example is Yara, the largest ammonia plant construction company in the world, which trades about one-third of the global ammonia with plants all around the globe. It recently announced plans to build 15 bunkering plants throughout Scandinavia by 2024. Approximately 120 ports around the world are now involved in the transport of ammonia by sea. In port, the cargo is usually stored in surface tanks. The fuel can be transported from central hubs to ships via trucks, pipelines or bunkering vessels.

Among Northern European ports, the Port of Rotterdam is a prime example of responsiveness to the challenges of the energy transition and sustainability with the aim of greening its operations. The port's activities in this area mainly focus on innovative projects in the fields of energy, digitisation of the logistics chain and sustainable infrastructure with the goal of achieving climate neutrality by 2050. There are currently 70 sustainability-related initiatives at the Port, including 19 operational projects, 15 initiatives in progress, and 36 projects in preparation. The port's energy transition strategy towards a 'circular' and carbon-neutral port has three phases: providing adequate infrastructure, e.g. for the heating network and CO₂ emission capture; changing the energy system by generating green electricity in the wind and solar parks and producing and importing hydrogen; replacing fossil fuels with green hydrogen, biomass and recycled materials.

The Port of Rotterdam aims to supply hydrogen and LNG on a large scale. As for hydrogen, the port aims to become an international hub for the production, import, application and transfer of hydrogen to neighbouring countries. To replace oil and gas, the port is gradually switching to electricity and (green) hydrogen. The use of green hydrogen requires electricity from sources such as solar and wind power. The port therefore encourages companies to install solar panels on buildings and uses wind turbines to generate green energy. The future goal is to further expand the use of solar and wind energy, for example, by building offshore wind farms and a floating solar park. In addition, the port is working towards a large-scale hydrogen network with a green hydrogen plant. Indeed, if produced in locations where solar and wind energy resources are abundantly available, green hydrogen can also support the

electricity sector by providing long-term, large-scale storage. The port also aims to be a hub for LNG. The plans envisage the provision of shore power or ‘cold ironing’, i.e. the availability of shore-side electricity supply to ships at the quayside. The same authority testifies that every year, seagoing ships moored at the quayside consume the same amount of electricity as 250,000–300,000 households. In the process, they release harmful emissions into the atmosphere, including 600,000 tonnes of CO₂ and 8000 tonnes of nitrogen. By 2030, Rotterdam’s cold ironing strategy could result in carbon emission savings of around 200,000 tonnes per year. In addition, the port is developing a carbon capture, utilisation and storage project, in which CO₂ is stored in (empty) gas fields under the North Sea. Finally, the Dutch port is also evaluating alternatives, such as the use of geothermal energy and is focusing on the use of biomass. Even among the countries on the southern shore of the Mediterranean, we find examples of strong activity aimed at strengthening sustainability strategies. This is the case of Egyptian initiatives in the maritime and port sectors. Egypt is progressively strengthening its role in the transition to a green economy by increasing investments in renewable sources. The country’s government has invested resources in green ports in order to reduce the environmental impact of port activities and curb related emissions. In particular, for example, the port of Alexandria has implemented several green measures, including the use of electric vehicles and a photovoltaic lighting system, while the port of Sokhna has implemented a solar-powered electricity system capable of covering one-fifth of the port’s energy needs.

The recent MoU between Egypt and the EU (signed at COP-27 in Sharm el-Sheikh) for the creation of a strategic partnership on climate, energy and energy transition, with the prospect of establishing a Mediterranean Hydrogen Partnership, should be considered in this regard. To see a Mediterranean hydrogen market grow and flourish, a coordinated effort between the public and private sectors of the northern and southern shores of the Mediterranean will be required. This kind of investment is a prerequisite for the development of fully sustainable regional value chains. To do so, companies need coordinated and environmentally sustainable production and transport on both sides of the Mediterranean.

Egypt has made green hydrogen projects one of its priorities. As early as 2021, the Suez Canal Zone signed a contract to develop the port of Sokhna with an estimated investment of around \$1.27 billion.

The energy crisis generated by the war in Ukraine has therefore changed the scale of priorities of governments, especially in Europe, forcing them to focus on meeting short-term supply needs. Having to do without Russian gas and oil has actually put a boost on the pathway of the green transition, so much so that by 2027 renewables are expected to be the first source of electricity production at the expense of fossil fuels. However, this is not a pathway without obstacles: the energy transition will require increasingly intensive use of new technologies, around which a possible economic war between the major powers is looming. On the one hand, it is China that currently occupies a leading role in the sector, both for control of a large part of the necessary raw materials (suffice it to say that Beijing holds more than 90% of global rare earths) but also for the production of solar panels (80% of the world total). On the other hand, the United States and the European Union are trying to reduce the disadvantage, but at the moment they are using the leverage of subsidies.

9.3 Conclusion

Despite current progress and ongoing initiatives, the long-term pathway for the decarbonisation of maritime transport seems quite uncertain and bumpy (not only in terms of technology but also in terms of regulation). If the adoption of electrification (and governmental targets) for road and rail is clear and points to a marked pathway, for maritime transport the case scenarios are less predictable. Timing still remains the biggest challenge. With geopolitics, the world economy, inflation and energy security at the top of countries' political agendas, there will be many things to consider when assessing the prospects for maritime freight transport. However, what is certain is that—alongside slow steaming, retrofitting with energy-saving technologies (ESTs), fleet renewal, and the search for more efficient routes—the role of alternative fuels will constantly increase.

It is not possible to say today what the fuel of the future will be; it must be emphasised that there may be no single, optimal solution suitable for all situations. All solutions are being studied or refined, but none of them offers any certainty today as to their possible use in the very long term. Different paths will therefore emerge, depending on traffic and contingent circumstances, starting with the strong dependence, at least in an initial phase, on the bunkering facilities actually available in the ports of call.

It is, therefore, challenging to make 'green-oriented' choices in a scenario characterised by several uncertainties and a far-reaching challenge that needs to be tackled with the synergy of the various players in the maritime and port cluster. The transition to zero-impact fuels has just begun.

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Chapter 10

Catalysing SDGs Achievement Through Community Engagement: A Case Study of the Dayalbagh Model



Pami Dua, Arsh Dhir, D. Bhagwan Das, Ashita Allamraju, Apurva Narayan, and V. B. Gupta

Abstract The G20 countries face multifaceted challenges in their pursuit of the sustainable development goals (SDGs). Progress has plateaued due to global health crises such as the COVID-19 pandemic, geopolitical tensions, and uneven economic growth. It is imperative then to reevaluate the existing strategies aimed at achieving the SDGs. To achieve the SDGs in a timebound manner, this study recommends a shift towards holistic sustainability, integrating the inner dimension of sustainability comprising values, beliefs, attitudes, spiritual and intuitive consciousness, and conscientiousness along with the external dimension that includes environmental, social, and economic factors. The Dayalbagh community in India exemplifies this through the Sigma Six Qualities-Values-Attributes (Q-V-A) model, which embraces responsible production and consumption through six elements: agriculture and dairy, education and healthcare, air quality, water quality, innovation, and human values. The model facilitates the transition towards holistic sustainability

This chapter draws from two earlier works of the authors for which authors have the necessary clearance to re-use. Excerpts from both works are spread across this chapter. A version of the study is published as a pre-print by the authors on University of Waterloo's institutional repository UWSpace as Dua et al. (2023a), UWSpace: University of Waterloo; original can be accessed at <https://uwspace.uwaterloo.ca/bitstream/handle/10012/19181/Dua%20et.al%20%282023%29.pdf>.

A major part of this chapter is drawn from the open source T20 policy brief titled 'Catalysing SDGs Achievement through Community Engagement: A Case Study of the Dayalbagh Model', authored by Pami Dua, Arsh Dhir, D. Bhagwan Das, Ashita Allamraju, Apurva Narayan, and V. B. Gupta, in October 2023; original can be accessed at https://t20ind.org/wp-content/uploads/2023/10/T20_PB_TF1_Dayalbagh-Model.pdf.

P. Dua (✉)

Delhi School of Economics, University of Delhi, New Delhi, India

A. Dhir

Advisory Committee on Education, Dayalbagh Educational Institute (Deemed to be University), Agra, India

D. Bhagwan Das

Dayalbagh Educational Institute (Deemed to be University), Agra, India

that encompasses the principles of Lifestyle for Environment (LiFE). The G20's role is vital in fostering holistic sustainability through a community-centric approach that promotes responsible production and consumption, fosters innovation, advocates sustainable agriculture, prioritises education and healthcare, and enhances community engagement.

10.1 The Challenge

The pursuit of the sustainable development goals (SDGs) encounters multifaceted challenges stemming from intricate interdependencies among social, economic, and environmental dimensions. Using the SDG Index by Sachs et al. (2018), the study assesses the G20 countries' advancement in Fig. 10.1, categorised into the G7, BRICS (Brazil, Russia, India, China, and South Africa), Asia Pacific and Latin America, and West Asia.¹ The study finds that despite initial impetus, progress towards realising the SDGs has plateaued across G20 nations. Obstacles like global health crises, political discord, and uneven economic growth have disrupted envisioned trajectories. Addressing these challenges demands concerted international cooperation, innovative policy frameworks, and sustained commitment from governments, organisations, and individuals alike.

Realising the SDGs within defined timeframes demands a fundamental change that transcends the conventional focus on the three external dimensions—economic, social, and environmental (Plag and Jules-Plag 2019). Following Dua et al. (2023a), one way to characterise holistic sustainability is to include aspects from the external (environmental, social, and economic) as well as the internal (people's values, beliefs, attitudes, intuitive and spiritual consciousness, and conscientiousness) dimensions. Figure 10.2 shows that achieving holistic sustainability requires the integration of the inner and external dimensions. By emphasising the inner dimension, the influence of external dimensions can be enhanced, resulting in more enduring strategies and solutions. The former acts as the basis of sustainable development, playing a pivotal role in protecting both humanity and the planet while fostering prosperity.

¹ The European Union as a region has been excluded from the analysis due to data constraints.

A. Allamraju
University of Toronto, Toronto, Canada

A. Narayan
University of Western Ontario, London, Canada

University of Waterloo, Waterloo, Canada

University of British Columbia, Vancouver, Canada

V. B. Gupta
Advisory Committee on Education, Online and Distance Education Programme, Dayalbagh Educational Institute (Deemed to be University), Agra, India

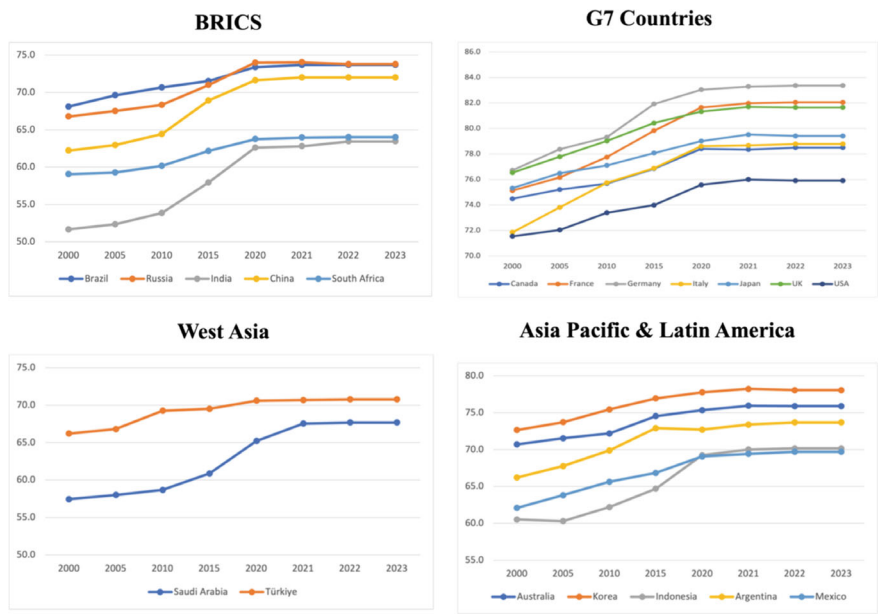


Fig. 10.1 Trends in SDG Index for G20 countries (2000–2023). *Source* Authors’ compilation based on data from sdgindex.org

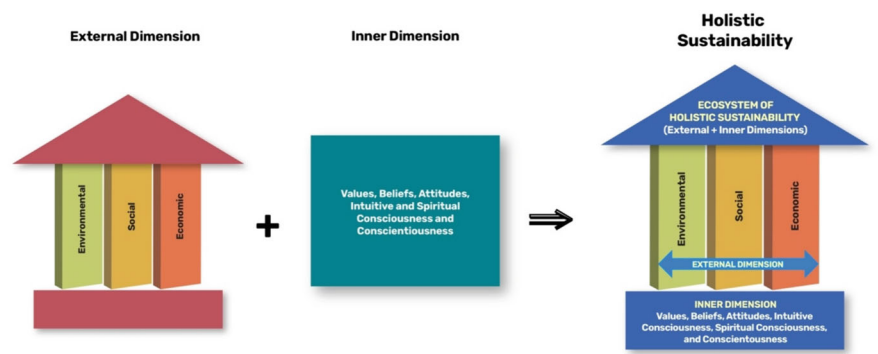


Fig. 10.2 Holistic sustainability. *Source* Dua et al. (2023b)

In this framework, communities play a central role by embodying and nurturing the values that drive collective action and promote wellbeing, equitable progress, and environmental consciousness. The significance of local communities in advancing sustainability has also been acknowledged in Agenda 21 from the 1992 Rio Summit, through initiatives like Local Agenda 21 (Bayulken and Huisinhg 2015; Khan et al. 2018; Moallemi et al. 2020). Ultimately, the bottom-up approach recognises that sustainable progress is most robust when communities are at the forefront of change.

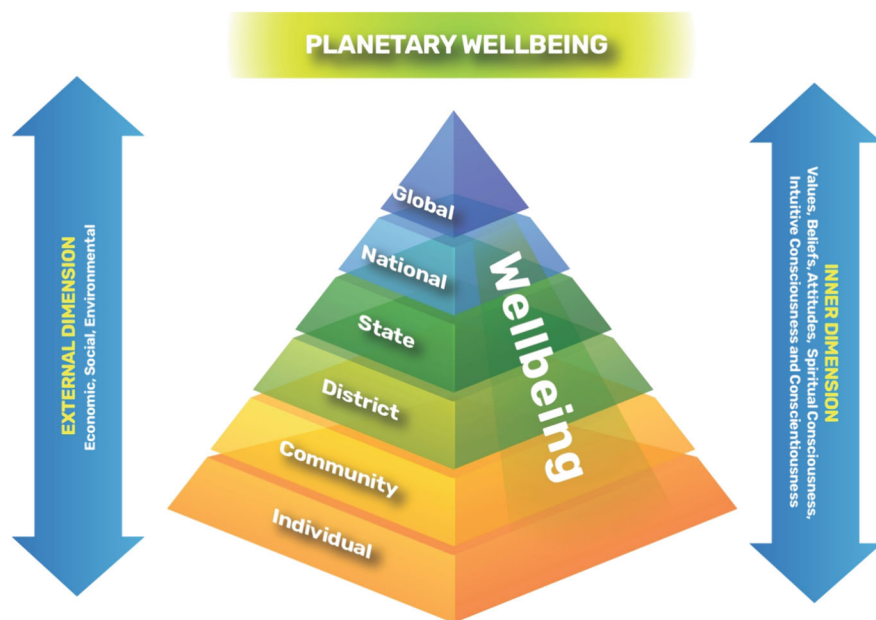


Fig. 10.3 Individual to planetary wellbeing. *Source* Dua et al. (2023b)

Figure 10.3 shows how individual change can trigger a ripple effect that advances planetary wellbeing as it spreads through communities, districts, states, and nations and the globe. Thus, a bottom-up approach with individuals as catalysts for change supported by communities is indispensable for SDG achievement.

An illustration of a community-based holistic sustainability can be seen at Dayalbagh,² Agra, in Uttar Pradesh, India. Dayalbagh, which translates as the “Garden of the Merciful” in English is an eco-village and healthcare habitat. It serves as the Radhasoami Satsang Community’s headquarters and is a self-contained colony of the adherents of the *Ra Dha Sva Aa Mi* faith. The residents’ way of life is informed by the Sigma Six Qualities-Values-Attributes (Q-V-A) model³ (see Fig. 10.4), which

² While there are several communities globally that incorporate sustainable lifestyles and values to achieve the SDGs, this study focuses on Dayalbagh as an illustrative example. While each community offers unique insights into sustainable practices, Dayalbagh’s case study allows for an in-depth exploration of specific strategies, providing valuable lessons that can inspire and inform broader global efforts towards SDGs.

³ The model Sigma Six Q-V-A represents a summation of six qualities that define the Dayalbagh community. The synergy between these six qualities creates an outcome that is greater than the sum of its parts.



Fig. 10.4 Sigma Six Q-V-A model of Dayalbagh community. *Source* Radhasoami Satsang Sabha (2019)

embraces responsible consumption and production through the six elements of agriculture and dairy, education and healthcare, water quality, air quality, innovation, and human values.

Agriculture and Dairy: Agriculture, including dairy farming, plays a pivotal role in supporting various SDGs (see Table 10.1). Agroecological-cum-precision farming practices are given prime importance in Dayalbagh where members of the community irrespective of income level, status, or occupation, perform voluntary selfless service in the agricultural fields. These practices at Dayalbagh prioritise resilient farming systems, conservation of resources, and enhancement of biodiversity (Yeats-Brown 1936; DEI 2022a, b).

Education and Healthcare: Education intersects with all SDGs. It has been given prime importance in Dayalbagh. The Radhasoami Satsang Sabha is the sponsor for the Dayalbagh Educational Institute (DEI). DEI's educational policy emphasises holistic development of a student through unique curricula, community engagement, and entrepreneurial programmes (DEI 2018). The focus is on serving society through outreach programmes such as medical camps. The education system nurtures intuitive consciousness for a fulfilling life path. Application of the systemic approach of Sigma Six Q-V-A model to education at the DEI has led to remarkable accolades including

Table 10.1 Agricultural practices at Dayalbagh and external and inner dimensions of sustainability

Features: agriculture and dairy	SDGs impacted	SDGs reinforced through
External dimension (environmental, economic, social)		Inner dimension (values, beliefs, attitudes, spiritual and intuitive consciousness and conscientiousness)
<i>Agroecology-cum-precision farming practices</i> • Coexistence of multiple bio-ecosystems such as crop fields, vegetable gardens, fruit orchards, fodder fields, medicinal herb gardens, and biodiversity parks • Crop diversification • Intercropping • Crop rotations, often including legumes • Integration of animals into farming • Organic farming • Sensors for soil temperature, humidity, wind speed and direction, climatic conditions, and rain • Multiland use model with solar agricultural farms (farming is done on land below solar modules) • Proper crop classification, timely planting and irrigation of crops and appropriate irrigation methods • Use of technologies such as smart truck tracking to increase efficiency <i>Dairy and cattle shed</i> • Crop-livestock integration • Technological interventions to improve breeding, nutrition, and health management • State-of-the-art dairy facility (food safety and standards authority of India and hazard analysis critical control point certified) <i>Ecological consciousness</i> • Organic farming • Use of recycled water for irrigation • Zero waste • Tree plantations	• SDG 1 (no poverty) • SDG 2 (zero hunger) • SDG 3 (good health and wellbeing) • SDG 4 (quality education) • SDG 5 (gender equality) • SDG 10 (reducing inequality) • SDG 13 (climate action) • SDG 16 (peace, justice, and strong institutions)	• Zero waste and optimal utilisation of resources • Hard work • Shared responsibility • Respect for one another • Respect for environment • Fostering equality • Humane treatment of cattle <i>Community engagement</i> • Community cooperation and cohesion • Voluntary service for at least four hours a day

Source Dua et al. (2023b)

grant of numerous publications in refereed journals and patents. Table 10.2 gives details of these features of education at Dayalbagh and how they relate to SDGs.

In a similar vein, there is no denying the significance of healthcare for sustainable development. Dayalbagh focuses on providing the last, the least, the lowest, and the lost with access to high-quality healthcare and education from “maternity to eternity”. The relationship between the SDGs and the distinctive characteristics of these aspects at Dayalbagh is shown in Table 10.3.

Water Quality: Water is intricately tied to several SDGs. Dayalbagh has focussed on ensuring access to clean and safe drinking water through proper treatment and monitoring. The state of groundwater is also reflected in the earth leakage resistance, which is maintained by Dayalbagh at very low levels (DEI 2023). It is also at the forefront of addressing water scarcity, pollution, and sanitation facilities (DEI 2022b). Moreover, Dayalbagh’s initiatives in cleaning up the banks and surroundings of river Yamuna help to create awareness among the members of the neighbouring communities towards sustainable conservation and development of the adjoining areas. Table 10.4 gives details of the efforts at Dayalbagh for maintaining and improving the water quality and its relationship to SDGs.

Air Quality: Addressing air pollution aligns with SDGs 3, 8, and 11, fostering economic growth and resilient communities while safeguarding ecosystems (SDG 15) for long-term sustainable development. With various initiatives to reduce pollution levels including planting trees, developing biodiversity parks, and encouraging organic agroecology-cum-precision farming practices, Dayalbagh contributes to better air quality (Lakhani 2021; Satsangi 2021) through multifaceted approaches which lead to reducing the carbon footprint of the community (DEI 2022b). Table 10.5 enumerates the features and the external and inner dimensions of sustainability.

Human Values: Human values are integral to fostering all SDGs. Embedding values can help societies harmonise economic, social, and environmental aspects, contributing to broader SDG achievements and long-term wellbeing (Satsangi et al. 2024). Table 10.6 gives details of the values fostered at Dayalbagh. The community promotes a simple and modest lifestyle, valuing contentment and moderation over material possessions (Brunton 1934; Yeats-Brown 1936). A strong sense of community with gatherings and communal activities focused on selfless service, equality, moral, and ethical values is fostered.

Innovation: Innovation is intricately tied to multiple SDGs. Within the framework of Dayalbagh, innovation encompasses not only inventive techniques but also system processes and creative strategies used to accomplish goals effectively and efficiently. It defines Dayalbagh’s distinctive way of life of fostering holistic development in alignment with its sustainable vision. In particular, a few unique initiatives of Dayalbagh are listed in Table 10.7.

Table 10.2 Features of education at Dayalbagh and its relation to SDGs

Features: education at Dayalbagh	SDGs impacted	SDGs reinforced through
External dimension		Inner dimension
i. <i>Education system</i> - Affordable and accessible education for all - Broad-based core courses including agriculture, environmental studies, and social services - Education from “maternity to eternity” (Education in Dayalbagh is a lifelong journey commencing with infancy at 3 weeks old, with children introduced to community service, culture, and heritage through participation in healthcare and self-defense exercises and selfless service in agroecology-cum-precision farming operations in two shifts daily of 4 h each. This fosters their relationship with nature for bio-socio-cognitive development from a very young age and makes them Global Conscious Citizens. This journey then transcends to conventional education, including school, university, and advanced degrees like Ph.D. and D.Sc. This provides a long-lasting foundation for continuous, lifelong learning and overall physical, mental, and spiritual development with a commitment to community, nation, and world at large.) (3 weeks to Ph.D. to D.Sc. to spiritual education) - Reaching the last, the least, the lowest, and the lost (Reaching the last, the least, the lowest and the lost refers to upliftment and empowerment of marginalised and vulnerable sections of the society, including (but not limited to) women and children through need based, low cost or even free of cost quality education/vocational education at their doorstep, especially in remote and tribal (aboriginal) areas through the outreach programme.) - Social service-based village adoption programmes - Skilling rural women and youth - Skill development and vocational and technical training - Entrepreneurial education including earn while you learn as well as learn while you earn and life-long learning ii. <i>Innovation and outreach</i> - Research and frugal innovation - Distance education programmes and application of information, communication, and technology in teaching, research, and outreach - Collaboration with national and international institutes - Focus on rural, tribal, and underprivileged communities iii. <i>Conservation of biodiversity</i> iv. <i>Environmental consciousness</i> - Mandatory core courses on environmental studies - Focus on zero waste - Emphasis on community service for maintaining cleanliness in and around the educational campus	- SDG 1 (no poverty) - SDG 4 (quality education) - SDG 5 (gender equality) - SDG 6 (ensure access to water and sanitation) - SDG 7 (affordable and clean energy) - SDG 8 (decent work and economic growth) - SDG 10 (reduce inequality) - SDG 11 (sustainable cities and communities) - SDG 12 (responsible consumption and production) - SDG 13 (Climate Action) - SDG 16 (peace, justice, and strong institutions) - SDG 17 (partnerships for the goals)	i. <i>Values inculcated</i> - Hard work - Integrity - Self-reliance - Selfless service - Cooperation - Honesty - Sincerity - Dignity of labour - Humility ii. <i>Evolution of a “complete person” with the following qualities</i> - Intellectual strength - Scientific temper - Emotional maturity - Truthfulness - High moral character - Simple living - Dedication to duty and discharge of obligations - Awareness of one’s duties and obligations to society - Interdisciplinary outlook, good general knowledge, sound aptitude, and understanding of society iii. <i>Service to mankind</i> - Honorary service by faculty and staff including those in senior administrative positions such as the director (vice-chancellor), registrar, and treasurer <i>Community engagement</i> - Support from sponsoring body - Strong alumni association - Advisory committee on education: a non-statutory body comprising of eminent and experienced academicians and educationists that serve as a think tank

Source Dua et al. (2023b)

Table 10.3 Features of healthcare at Dayalbagh and its relation to SDGs

Features: healthcare at Dayalbagh	SDGs impacted	SDGs reinforced through
External dimension		Inner dimension
i. <i>Treatment of disease</i> - Charitable health and medical facilities (allopathic, homoeopathic, and AYUSH, i.e. Ayurveda, yoga, naturopathy, Unani, siddha, and homeopathy) - Free medical camps ii. <i>Prevention of disease</i> - Availability of affordable nutritious food for all through community kitchen - Traditional nutritional supplements like <i>chyawanprash</i> (Chyawanprash is a traditional ayurvedic health supplement, enriched with herbs and minerals, consumption of which helps to restore strength and vitality and improve general health.) and millets - Subsidised organic milk - Nutritional supplements for children - Organic fruits and vegetables at nominal prices iii. <i>Physical fitness</i> - Regular exercise through physical training - Fieldwork <i>Conservation of environment</i> - Regular monitoring of air and water quality - Use of new and renewable energy sources (solar power) for community as well as residential buildings	- SDG 1 (no poverty) - SDG 2 (zero hunger) - SDG 3 (good health and wellbeing) - SDG 10 (reduce inequality) - SDG 13 (climate action)	- Humility - Duty - Compassion - Universal brotherhood and sense of shared social responsibility - Connection with nature <i>Community engagement</i> - Community cooperation and cohesion - Selfless service

Source Dua et al. (2023b)

The Sigma Six Q-V-A model of Dayalbagh plays a crucial role in supporting neighbouring communities through its outreach efforts such as medical camps, with particular focus on improving the trinity of air quality, water quality, and land quality. This approach promotes a holistic and sustainable enhancement of the environment, benefiting the wellbeing of residents and the ecosystem.

10.2 The G20’s Role

The G20 holds a key role in shaping global policies that drive sustainable development. Recognising that comprehensive development goes beyond economic metrics, the G20 can encourage policies that prioritise responsible consumption, living in harmony with nature, sustainable resource management, and coexistence and cooperation. It can contribute significantly to empowering local communities and advancing

Table 10.4 Features of water quality and its relation to SDGs

Features: water quality at Dayalbagh	SDGs impacted	SDGs reinforced through
External dimension		Inner dimension
i. <i>Access</i> • Clean and safe drinking water for all • Monitoring of water quality ii. <i>Treatment</i> • Sewage treatment plant (STP) • Treatment of water with potassium permanganate or alum iii. <i>Conservation</i> • Reviving old dry wells • Treated water from STP used for agriculture • Conservation at household and community levels • Clean-up of river Yamuna	• SDG 3 (good health and wellbeing) • SDG 5 (gender equality) • SDG 6 (clean water and sanitation) • SDG 10 (Reduce inequality) • SDG 11 (sustainable cities and communities) • SDG 12 (responsible consumption and production) • SDG 13 (climate action) • SDG 14 (life below water) • SDG 15 (Life on land) • SDG 17 (Partnership for the goals)	• Connection with nature <i>Community engagement</i> • Preserving the water quality • Conservation of all resources including water • Community cooperation and cohesion • Duty • Responsibility

Source Dua et al. (2023b)

an integrated, bottom-up approach to SDGs that aligns with the spirit of One Earth, One Family, One Future.

Communities are pivotal in nurturing individual transformation towards responsible production and consumption through inner dimension. Dayalbagh’s scientific model of Sigma Six Q-V-A exemplifies this approach, providing an ecosystem that embraces eco-friendly practices, equity, and holistic wellbeing across agriculture, education, healthcare, air and water quality, human values, and innovation. This resonates with the Lifestyle for Environment (LiFE) initiative, highlighting the transformative potential of individual choices in promoting sustainability. The relationship between the Dayalbagh model, LiFE, and holistic sustainability is depicted in Fig. 10.5. Embracing the Sigma Six model entails a lifestyle that harmonises with the environment, is anchored in values and ethics, and contributes to holistic sustainability, ultimately advancing the SDGs.

The Sigma Six Q-V-A model of the Dayalbagh community is a scientifically entrusted model of a socio-economic-technological-spiritual-climatic complex. Furthermore, it has proven to work for more than 100 years and is fundamentally seated in the scientific foundations of Abstract Mathematics-based topological graph

Table 10.5 Features of air quality and its relation to SDGs

Features of air quality at Dayalbagh	SDGs impacted	SDGs reinforced through
External dimension		Inner dimension
i. <i>Reducing carbon footprint</i> • Electric vehicles for intra-colony travel • Solar thermal cooking in community kitchen • Piped gas for cooking • Cordoning off dust-generating activities • Solar power (new and renewable energy) for community facilities, university, and residential dwellings • Economical use of energy and resources ii. <i>Monitoring air quality</i> • Regular measurement and reporting of air quality index <i>Reducing pollution</i> • Misting and spraying with fine water droplets • Planting trees and pollution-absorbing plants • Wind augmentation air purifying unit at various sites to reduce pollution by trapping pm 2.5 and pm 10 • Use of renewable energy for battery banks	• SDG 7 (affordable and clean energy) • SDG 11 (sustainable cities) • SDG 12 (responsible consumption and production) • SDG 13 (climate action)	• Environmental consciousness • Connection with nature <i>Community engagement</i> • Community cooperation and cohesion • Shared core values and beliefs • Duty • Responsibility

Source Dua et al. (2023b)

theory and systems theory⁴ (Roe 1966; Satsangi and Ellis 1971; Satsangi 2006; Srivastava et al. 2017; Satsangi et al. 2024). The scientific foundation and real-world implementation make it a good case for G20 policy makers to review and take up

⁴ The field of study known as Abstract Mathematics of Topological Graph Theory has its roots in the eighteenth century. This scientific discipline, led globally by its pioneers, Rev. Prof. Prem Saran Satsangi, along with Prof. Jack Ellis and Prof. Peter Roe, has been put into practical application at Dayalbagh. For more information on the implementation of the Systems Framework, refer to “Autobiographical Retrospectives” (Satsangi 2006).

Table 10.6 Features of human values and its relation to SDGs

Human values at Dayalbagh	SDGs impacted	SDGs reinforced through
External dimension		Inner dimension
i. <i>Simple living</i> • Moderation, no ostentatious expenditure • Adherence to “<i>golden mean path</i>” ii. <i>Zero waste</i> iii. <i>Selfless service</i> • Fieldwork, community kitchen, and medical care • Reaching the last, the least, the lowest, and the lost • Upliftment of tribals, scheduled caste iv. <i>Reducing inequalities</i> • No ownership of property • Similar houses • Availability of essential goods and services to all • Women empowerment	All SDGs	• Encouraging the value of “work is worship” • Fatherhood of god and brotherhood of man • Better worldliness • Optimal utilisation of resources • Humility <i>Community engagement</i> • Duty • Equality • Responsibility • Community cooperation and cohesion • Service to mankind

Source Dua et al. (2023b)

Table 10.7 Features of innovation at Dayalbagh and its relation to SDGs

Features: innovation at Dayalbagh	SDGs impacted	SDGs reinforced through
External dimension		Inner dimension
• Consciousness studies • Renewable energy • Superman evolutionary scheme • Cottage industries	All SDGs	• Dignity of labour <i>Community engagement</i> • Service to humankind • Community cooperation and cohesion • <i>Environmental consciousness</i> • <i>Intuitive consciousness</i>

Source Dua et al. (2023b)

its recommendations. The case study can serve as a valuable model for the G20 to enhance global collaboration in sustainable lifestyles. Dayalbagh’s successful sustainable community practices can be used by the G20 to inspire multistakeholder partnerships to catalyse the mainstreaming of sustainable lifestyles and consumer choices on a global scale. This will effectively drive sustainable development in line with the G20’s principles. The G20 has a unique and transformative role to play in advancing the SDGs by integrating principles from the LiFE initiative, which is encompassed in Dayalbagh’s Sigma Six model of holistic sustainability. It can

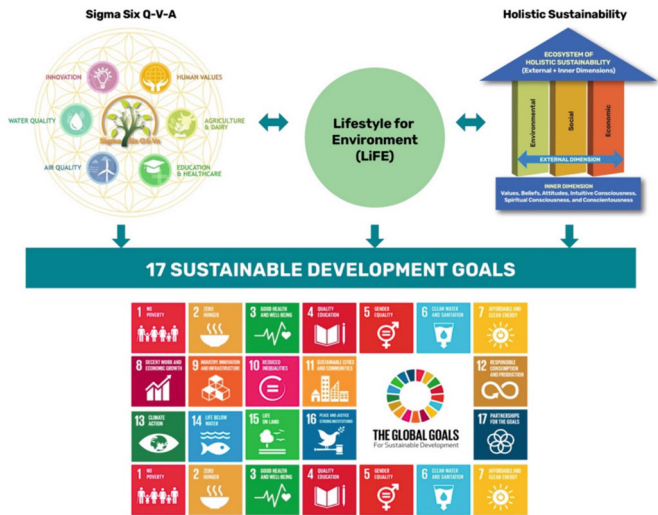


Fig. 10.5 Relationship between Sigma Six Q-V-A, LiFe, and holistic sustainability. *Source* Dua et al. (2023b)

pave the way for a future where economic prosperity, social wellbeing, and environmental preservation are harmoniously interwoven. The adoption of the Sigma Six Q-V-A approach which promotes the adoption of LiFe as a developmental paradigm, underpinned by ethical values, holds the potential to foster a systemic shift from the wellbeing of the individual to that of the entire planet.

10.3 Recommendations to the G20

In the light of the case study presented above, the following recommendations to the G20 are derived from the Sigma Six Q-V-A systems model, which has a scientific foundation grounded in the Abstract Mathematics-based topological graph theory, in addition to the guiding principles of LiFe.

Integrate Holistic Values in Policy and Practice

- Encourage member nations to prioritise and integrate human values into policies and practices, promoting ethical leadership, community engagement, and sustainable livelihoods.
- Raise awareness of the significance of the inner dimensions of sustainability, such as people’s consciousness, conscience-based conscientiousness, values, beliefs, and attitudes. Integrate these inner dimensions with the external dimensions of sustainability to create a holistic approach to sustainable development.

Promote Adoption of LiFE

- Evolve, understand, and absorb LiFE and ethics for the functioning of the economy.
- Encourage countries to champion policies fostering conscientious production and consumption, guiding individuals to make informed decisions that reduce environmental harm. Responsible choices spanning individuals, households, and communities wield substantial influence at broader scales.

Community Engagement and Empowerment

- Prioritise community involvement in policy formulation and implementation, fostering ownership and alignment with local needs for sustainable development.

Promote Community-Centric Livelihood Strategies

- Encourage the adoption of community-centric livelihood strategies that empower local communities, especially in the context of agriculture. These strategies should prioritise sustainable farming practices, resource conservation, and equitable distribution of resources within the community.
- Create and support small-scale businesses that can employ women equally among the rural and tribal populations to produce high-quality everyday necessities at cheap cost and minimum profit, all the while encouraging teamwork and a culture of selfless service.

Women Empowerment

- G20 should prioritise women's empowerment by ensuring their safety through a robust framework involving health, education, physical fitness, and community involvement. By providing quality education and vocational training, women can access skillsets aligned with emerging sectors.
- Moreover, equal opportunities in leadership and entrepreneurship must be promoted.

Promote Innovation Ecosystems

- Encourage member states to establish innovation hubs that support research, technology, and novel approaches, driving sustainable solutions for challenges aligned with the SDGs.
- Allocate resources to research and innovation in sustainable agriculture practices, technologies, and processes. Encourage the development of eco-friendly and efficient farming methods that reduce environmental impact while increasing productivity.

Sustainable Agriculture

- Encourage and support community-based agricultural initiatives (Satsangi 2023) that emphasise sustainable practices, biodiversity conservation, ecological balance, and increased use of technology with the help of local governments. Such

approaches can empower local communities to take charge of their agricultural systems, fostering resilience and long-term viability.

- Champion agroecology-cum-precision farming methods to ensure food security, enhance crop yields, and reduce environmental impact, creating resilient agricultural systems.

Quality Education and Skill Development

- Urge member states to focus on accessible and quality education, along with vocational training, to equip individuals with skills useful for emerging industries, thereby fostering sustainable livelihoods.
- Promote holistic education and awareness programmes at low cost with intensive use of technology.

Healthcare Accessibility

- Prioritise access to universal healthcare for the improvement of public well-being, productivity, and social resilience, thereby contributing to sustainable development.

Environmental Monitoring at Community Level

- Implement comprehensive air and water quality monitoring systems at the community level, aiding communitarian participation for informed decision-making and sustainable resource management.

Collaborative Partnerships

- Facilitate international cooperation, knowledge exchange, best practices sharing, and joint projects that align with the SDGs and foster sustainable development globally.

Circular Economy Practices

- Advocate circular economy principles to minimise waste, promote resource efficiency, and create sustainable business models that consider long-term societal and environmental wellbeing.

By incorporating these recommendations, the G20 could leverage the Dayalbagh model's principles to catalyse sustainable development on a larger scale, contributing perennially towards a more equitable, prosperous, and resilient global future.

Disclaimer The views expressed in the study are attributed to the authors and do not necessarily represent those of the institutions they represent or of Dayalbagh. Any errors and omissions are the responsibility of the authors.

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Part III

Modalities for Systemic Transition

Chapter 11

Multilateralism and Lifestyle for Environment (LiFE): Contours and Challenges



Sandhya S. Iyer, Dan Banik, and K. Seeta Prabhu

Abstract As nations prepare to address multiple crises and mitigate the negative impacts of climate change, it has become increasingly clear that the current multilateral system and established global governance mechanisms are inadequate. This chapter thoroughly examines an innovative approach called Lifestyle for Environment (LiFE) introduced by India and explores its practical implementation to effectively address global challenges. Drawing on the concept of *Prakriti Rakshati Rakshita*—those who protect nature, nature protects them, the chapter advocates for promoting sustainable consumption and production by encouraging affluent individuals and groups to adopt lifestyles that minimise environmental harm. This approach, centred around a people-focused LiFE framework, emphasises the significance of regenerative resource processes in human development, with humans acting as stewards responsible for creating a just and sustainable future. To achieve this, the operationalisation of the LiFE approach requires a focus on the 4Cs—cooperation, coherence, convergence, and commitments.

11.1 Introduction

Economic growth in the past seven decades has made poverty reduction possible in large parts of the world. However, the onset of the pandemic in 2020 marked a turning point in the 30-year pursuit of successful global poverty reduction. According to recent World Bank (2023) estimates, the incomes of the poorest 40 of the world's population likely fall by 4% in 2020. As a result, the number of people living in extreme poverty likely increased by 11% in 2020—i.e. it increased from 648 million

S. S. Iyer

Centre for Public Policy, Habitat and Human Development, School of Development Studies, Tata Institute of Social Sciences (TISS), Mumbai, India

D. Banik

Oslo SDG Initiative, University of Oslo, Oslo, Norway

K. Seeta Prabhu (✉)

Institute for Human Development, New Delhi, India

to 719 million. The pandemic also increased global inequality. The rise in extreme poverty and decline of shared prosperity caused by inflation, currency depreciations, and broader overlapping crises facing development pose numerous challenges to global development, including the future of the 2030 Agenda and its accompanying 17 Sustainable Development Goals (SDGs). Just when the world had begun to recover from the effects of the COVID-19 pandemic, the war in Ukraine further exacerbated the global crisis. Added to this is increased climate disruption, global warming, and the increased frequency of natural disasters and extreme weather events.

While countries prepare themselves to address these multiple crises and cope with the adverse impacts of climate disruption, the multilateral system and long-established mechanisms of global governance have proven to be inadequate. In a multipolar world, rising powers such as India and China and other emerging economies in the Global South are seeking greater global influence and demanding much-needed reform of the multilateral system. In this age of doom and gloom characterised by a fragmented world order, how best can the global community join forces to promote sustainable development and address the dangers posed by climate disruption? We begin with a brief overview of a relatively new approach proposed by India—Lifestyle for Environment (LiFE)—and thereafter discuss how this approach can potentially be operationalised in practice to help address global challenges.

11.2 The Lifestyle for Environment (LiFE) Approach to Global Policymaking

LiFE has been launched by India as a broad approach to reshape human activity in harmony with nature. Drawing on the idea *Prakriti Rakshati Rakshita*—those who protect nature, nature protects them—it advocates a move away from the dominant paradigm of resource extraction to one of resource rejuvenation, including a pragmatic framework for strengthening the global sustainable development agenda. The approach highlights the importance of sustainable consumption and production where affluent individuals and groups must adopt lifestyles that do not cause further harm to the planet's environment. Accordingly, sustainable development can only be achieved when population size and growth patterns are in harmony with the changing productive potential of the ecosystem (Brundtland Commission 1987, Para 29).

Nature is valued in large parts of the world and protecting the environment, in most countries, is considered crucial for the promotion of human development and wellbeing. Awareness of the adverse impacts of climate change is not only growing in the Global North but also in many parts of the so-called Global South. Similarly, in many African countries, Ubuntu signifies belief in a bond that connects all humans and the importance of displaying “humanity” towards others, including protecting the environment (Danford T. Chibvongodze (2016); Museka et al. 2012). Similarly, the biocultural diversity in Brazil centralises the relationships of indigenous and

local knowledge, language, and practices with plants, animals, habitats, and ecological functions through dimensions such as materialised biocultural diversity, lived biocultural diversity, and stewardship biocultural diversity (Stålhammar and Brink 2021).

It is envisioned that within India and abroad, LiFE will encourage mass social movements promoting more environmentally conscious lifestyles. As Indian Prime Minister Narendra Modi put it at the COP 26 meeting in Glasgow in 2021, the goal is to foster “Mindful and Deliberate Utilization” rather than “Mindless and Destructive Consumption” (PIB 2021). Movements inspired by LiFE, according to Mr. Modi, ought to “set goals that can revolutionise” a range of development spheres including food production and consumption, agriculture, housing, tourism, water management, and access to modern energy. At COP26, the Indian government set forth an ambitious plan of action based on the LiFE approach to address the problem of climate change. These included five core elements (“Panchamrit”) that will be achieved by 2030: India will increase its non-fossil energy capacity to 500 GW (1) and meet half of its energy requirements from renewable energy (2). The country also plans to reduce carbon emissions by one billion tonnes (3) and take serious steps to reduce the carbon intensity of its economy (4): Finally, India aims to achieve the target of Net Zero by 2070 (5).

The LiFE Mission of the G20 India Presidency builds on the above commitments and offers a practical pathway to address multiple global challenges. Towards this goal, the Varanasi Development Working Group G20 countries unanimously endorsed an Action Plan to “commit to put sustainable development at the centre of the international cooperation agenda” and to fast-track progress on the SDGs (Government of India 2023). However, operationalising the approach requires further thought, which is what we attempt in the ensuing sections.

11.3 Operationalisation of LiFE in the G20

LiFE could potentially shape the formation and mandate of future G20 working groups, the dialogue process, and the Sherpa Track that future G20 presidencies (e.g. Brazil and South Africa) may wish to adopt. However, to ensure that the approach receives greater global attention, the approach must receive international support and be mainstreamed in the multilateral system. To address numerous global development challenges, LiFE must be closely linked with strategies for inclusive growth on the one hand and just transition policies on the other (see Fig. 11.1). The business-as-usual approach to global policymaking has traditionally perpetuated consumption-centric solutions, which in turn has resulted in the excessive exploitation of fossil resources thereby exacerbating climate disruption. We believe that progress towards a just transition in an unequal world can be achieved only when there is recognition of equity and sustainability as universal values for the shaping of a collective future. In

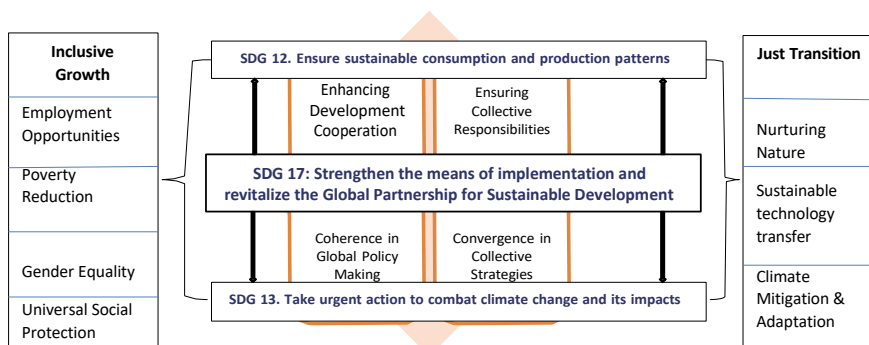


Fig. 11.1 Operationalising LiFE. *Source* Authors' compilation

this context, the broad sub-constituents of inclusive growth would include employment generation, poverty reduction, gender equality, and universal social protection. Accordingly, just transition policies must focus on nurturing nature, facilitating sustainable technology transfers across countries (especially in LDCs) and securing financial commitments for climate mitigation and adaptation policies.

Operationalising the LiFE approach through a human-nature-related framework places resource regenerative processes at the centre of human development with human beings as stewards responsible for a just future (Fig. 11.1). The thrust of the linkage between inclusive growth and just transition cannot be ensured unless it is driven by synergies across two SDGs—SDG12 (which advocates sustainable consumption and production patterns) and SDG13 (combating climate change and its impacts). While most countries have pursued these policies at the national levels, scaling these up to the global level is challenging due to the lack of adequate resources, human capabilities, and access to technologies. Bridging this huge gap will only be possible once SDG17 (effective global cooperation through established multilateral arrangements) is closely integrated and aligned with effective global governance frameworks. Towards this end, we suggest that operationalising LiFE requires greater focus on the 4Cs—cooperation, coherence, convergence, and commitments (see Fig. 11.1).

11.4 Key Dimensions for LiFE for Transformational Change

Step 1: Enhancing Development Cooperation

The current system of global cooperation is characterised by multiple development agendas—on climate, development finance, the SDGs, the UN Secretary General's "Common Agenda" and post-pandemic recovery—and growing concerns over the extent to which the ambitious SDGs can be achieved by 2030. While the SDGs were

already off track before COVID-19 struck, the pandemic halted or reversed numerous years of progress and exposed and further intensified inequalities within and among countries. The war in Ukraine and the recent rise in global fuel, food, and fertiliser prices have further worsened the outlook for the global economy. Addressing these challenges will require stronger political and financial commitments from countries in the Global North and the Global South. Most Western aid agencies recognise that achieving the SDGs will require more than aid. Although the role of businesses in financing the SDGs has received considerable attention, the reality has not matched the rhetoric and ambition thus far.

In recent years, there has been growing concern about the quality of development cooperation and the type of aid transfers required for effective poverty reduction. Despite ambitious commitments and numerous high-level meetings and dialogues, we notice a widening gap between the needs and aspirations of the Global North and the Global South. The Addis Ababa Declaration provided a framework for integrating public and private investments. Yet, the OECD-DAC international development statistics estimate that a mere USD 4.5 billion of the USD 185.9 billion in total ODA flows from DAC members in 2021 was dedicated to development-oriented private sector instruments (OECD 2023). The recently concluded *Summit for the New Global Financing Pact* brought to the fore the distinct North–South divide in acknowledging the importance of global compacts such as the Paris Climate Declaration. Added to this is the absence of high-quality data on current international commitments towards LiFE-oriented SDGs (Chakrabarti and Chaturvedi 2021). The process of ensuring effective partnerships to operationalise LiFE calls for strengthening the global governance process. The role of development cooperation across official development assistance (ODA), South-South cooperation (SSC), and triangular/trilateral cooperation (TrC) could provide new mechanisms to pursue policies for capacity building, trade and investment, development finance, technology transfer, and grants.

Step 2: Ensuring Collective Responsibilities

A major source of disagreement among states is on who should burden how much of the responsibility for the drastic changes required to address global warming and climate disruption. Since G20 countries contribute nearly 60% of the global emissions, they must lead the just transition and sustainable recovery processes. However, while developed countries of the Global North must shoulder the main responsibility for reducing their already high emission levels, emerging economies must also do their bit to ensure that policymaking prioritises a move away from fossil fuels and increases investments in renewable energy. The same applies to sustainable consumption—be it in relation to reducing the consumption of meat or adopting more sustainable and healthy lifestyles that reduce harm to the environment.

Given the diversity of G20 countries, emerging countries like India, Brazil, and South Africa could potentially champion LiFE in global discourses through systematic efforts and sustained political leadership and commitment. In this regard, the approach could offer a convergence platform for inclusive growth and just transitions

not only across formal multilateral systems but also in non-formal country groupings. Since climate action is a global public good, evolving multilateral frameworks for integrating policy strategies must be determined through global development institutions.

Effective policies aimed at promoting sustainable consumption and production that are already being implemented in the Global South should receive far greater global attention than they currently do. The same applies to a range of successful social protection programmes, including conditional cash transfer programmes that were first championed in Latin America but have now become a standard package of development policies in many countries around the world. In addition, various human-nature nexus policies implemented in Costa Rica, India, Brazil, and some African countries may help usher in structural transformation in other national contexts (Flagg 2018). While emerging countries will play a crucial role in inclusive economic recovery, their ability to ensure just transition may be limited as the distribution of technology and finances is unequal. This is relevant as emerging countries are facing rising food insecurity, poverty, and unemployment rates in the post-pandemic years.

Lessons from the advancements made during the COVID-19 pandemic period are also critical to arrive at crucial pathways for LiFE. These lessons include (i) the role of the R&D community and the collaborative and high-quality work of thousands of researchers and research institutions, which ensured the speedy mobilisation of resources and production of vaccines; (ii) strong commitment by governments to invest in a global public good; (iii) the role of nationalism and focus on self-interest that played a major role in the failure of the global community to make vaccines available to the world's most needy groups (Stiglitz 2022). In this context, global governance systems, through conscious efforts to mainstream LiFE, could play an important role in fostering stronger linkages between growth, equity, and sustainability.

Step 3. Evolving Global Mechanisms for Policy Coherence

The subjective interpretation of the Paris Declaration and the voluntary cooperation in the implementation of their nationally determined contributions initially provided countries the flexibility to shape national-level action plans. However, in the post-pandemic period, the gap between policy and action is widening (United Nations 2023a). There has been considerable focus over the years in the global development discourse on why policy coherence is crucial for achieving sustainable development. Ensuring policy coherence in both high-income and low-income countries requires a commitment to creating enabling environments, minimising overlaps between administrative agencies, ensuring coherence of actions at all levels of government, and assessing the impact of policies (OECD 2016). Thus, one must prioritise the creation of “institutional mechanisms and processes to harmonise and manage often competing policy objectives and interests” (OECD 2016, p. 15). Policy coordination is particularly important for resolving “conflicts or inconsistencies between policies” and for the creation and strengthening of “systems for monitoring, analysis and

reporting on the impacts of policies to provide evidence to inform decision-making” (Tosun and Lang 2017).

For decades, global development has been influenced by ambitious international goalsetting projects (e.g. MDGs and SDGs) that entail internationally agreed informal norms aimed at guiding the behaviour of member states. Goalsetting is thus a process of translating agreed aims into often quantifiable and time-bound targets. However, global goals are typically legally non-binding and are primarily not a part of the international legal system. National governments therefore do not have any formal obligations to adopt and implement such global goals and targets within their domestic legal regimes. The goals are also invariably non-confrontational and country-driven (Biermann et al. 2017), which means that governance through such goals almost always functions through weak institutional arrangements. The implementation process therefore faces numerous challenges that can be directly attributed to weak governance mechanisms and policy incoherence in large parts of the world, including in high-income countries.

A range of multilateral institutions are currently working independently on sustainable development and climate change-related strategies. The prevailing weak governance mechanisms necessitate a broader umbrella governance architecture that would not only integrate multiple approaches being launched by the G20 and other groupings but also help monitor and assess progress made therein. Hence, the promotion of policy coherence in international policymaking will be as crucial as doing so in national contexts. To ensure that the LiFE approach maintains its momentum beyond 2030, it is important that it attracts the interest and support of UN agencies, multilateral development agencies, and civil society actors. These missions could nudge both government and non-government institutions to ensure the coherence of multilateral processes and provide an equal voice to national policies. For LiFE to achieve global acceptance, it must be anchored in the G20 member countries, which in turn will help maintain political pressure for other countries to adopt the approach. By nudging other countries to enhance national expenditures and development aid processes to meet the challenge of climate change, the G20 could help mainstream LiFE in global governance discourses.

Step 4 Building Convergence in Collective Strategies

There is growing awareness in the international community to work towards cleaner and greener solutions in production and consumption systems. For example, between 2019 and 2022, 62 countries implemented over 485 policies on sustainable consumption and production (UN 2023b). In this context, South-South Cooperation (SSC) and Triangular Cooperation are playing a prominent role, particularly in relation to global development cooperation. For example, in addition to traditional aid provided by the Global North, SSC has resulted in increased availability of finance aimed at shaping economic and social transformation across developing countries (Banik and Mawdsley 2023). SSC can play an even stronger role in identifying a set of collective strategies aimed at promoting finance for trade of environmentally sustainable products (e.g. through the Trade and Environment Fund (as proposed by China and India, 2011); building technical capacities, especially of least developed countries (LDCs)

and small islands developing states (SIDS), building climate-smart infrastructure; and providing incentives such as a zero-tariff regime for plastic substitutes. Similarly, productive partnerships between individual countries and UN agencies aimed at a third country or region (triangular or trilateral cooperation, TrC) can offer additional finance and opportunities to address neglected areas and concerns. A case in point is the India-UN Development Partnership process, through which the Government of India has committed \$150 million over ten years to the India-UN Fund, including \$50 million under a separate Commonwealth Window, \$14 million dedicated to countries of the Caribbean Community, and \$12 million for Pacific Island Developing States. Thus, both SSC and TrC are important mechanisms to demonstrate international solidarity, and both mechanisms have provided developing countries with the possibility of coping with a range of crises and uncertainties.

The donor-driven processes under the auspices of the OECD, SSC, and TrC are markedly different and follow distinct monitoring and evaluation processes. The extent to which SDG12 and SDG13 are integrated within these frameworks will depend on cooperation not only across multilateral institutions but also across bilateral donor agencies and mechanisms. Due to cultural and ecological differences, the top-down approach of many global compacts has often failed to resonate at the local level in many countries. Given the diversity in efforts across countries, UNEP (2022) suggested that SDG12 hub be created as a centralised platform of information on SDG indicators and progress. Such a hub could potentially be integrated with the LiFE approach to encourage and promote inclusive growth and a just transition process.

11.5 Conclusion

The post-pandemic world is characterised by reduced faith in the traditional multilateral system, and there are numerous calls for major reforms to make multilateralism fit for purpose to address global challenges. In addition to a drastic overhaul of the financial architecture, there is also a growing frustration with the lack of adequate representation of some parts of the world in influential global forums (e.g. the African Union in the G20) and at the United Nations (e.g. India has long argued that it deserves a permanent seat at the UN Security Council).

The reimagining of global development to address the challenges posed by climate disruption necessitates a renewed focus on ethical values, policies, and processes. The cascading effects of multiple challenges not only put pressure on policy responsiveness but also on development partnership processes to address economic slow-down, climate change-related vagaries, and the SDGs. Given the broad contestations that characterise the current global debates, operationalising LiFE, we have argued, requires a four-pronged approach consisting of cooperation, coherence, convergence, and commitments.

In addition to individual action aimed at promoting both development and the environment, the role of community action and responses is crucial. In societies with

rising inequalities and characterised by uncertainty, defining an ideal commodity set that also includes an environmental component can be challenging. The prevalence of hunger and undernutrition implies that the provision of adequate food to people living in poverty ought to be treated as a public good. Similarly, the prevalence of infectious diseases and poor maternal health that results in high maternal mortality requires preventive and promotional healthcare, which again ought to be classified as a public good. Services that tend to ensure higher social rates of return can maximise wellbeing through public provisioning. If LiFE were to be considered a global public good, it could potentially help align development finance with improved transparency of decision-making and accountability across all systems.

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Chapter 12

The LiFE Economy: Towards a New Development Paradigm



Sachin Chaturvedi, Heerad Sabeti, and G.A. Tadas

Abstract Achieving a holistic approach to development requires a transition towards a LiFE Economy—an economic system in which production, consumption, finance, employment, and other economic activities not only minimise harm but advance social and environmental objectives, delivering inclusive growth, inter-generational equity, and a thriving environment that nurtures biodiversity. Implemented effectively, the LiFE Economy should encourage and enable a shift in values, mindsets, and behaviours on the part of individuals, businesses, investors, and institutions that lead to progress on the SDGs, without contributing to backsliding. In this sense, ‘LiFE Economy’ can be called as ‘Life Economy’ in a holistic way as the constituents of LiFE economy go beyond ‘lifestyle changes’. However, for the LiFE Economy to thrive, the global community must develop new, robust enabling ecosystems to promote and accelerate its growth. At the national and sub-national levels, this encompasses laws, institutions, regulatory regimes, property rights, incentive structures, and norms that govern the generation and distribution of resources within and between regions. At the organisational level, it encompasses the legal and institutional frameworks that influence strategies, behaviours, and the ability to generate revenues. At the individual level, it shapes choices and opportunities. The challenge and opportunity before the G20 is how to turn the Varanasi Principles into action by accomplishing this paradigm shift.

S. Chaturvedi

Research and Information System for Developing Countries (RIS), New Delhi, India

H. Sabeti

Fourth Sector Group, Washington, DC, USA

G.A. Tadas (✉)

Research and Information System for Developing Countries (RIS), New Delhi, India

12.1 New Pathways for Sustainable Growth and Development

It is well known that the design of current economic systems, although vary considerably across different models of political economy, have tended to prioritise GDP growth over other goals despite the growing awareness that GDP is a highly inadequate measure of development. While these systems, born out of the industrial age, have spawned trade, technologies and infrastructure that have created unprecedented prosperity and improved the quality of life for much of humanity, they have also given rise to the social and ecological challenges that have begun to disrupt the twenty-first century. The key assumptions underpinning our legacy economic systems are no longer tenable: that natural resources are inexhaustible; that human activity has no degrading effect on the environment; and that all members of society benefit from economic growth. The policy instruments, the legal and regulatory regimes, the economic and business models, and even the technological innovations that form the bedrock of modern life embody these out-dated assumptions, exacerbating today's global challenges. In confronting the multitude of interlocking and escalating challenges we are facing, leaders are increasingly recognising the need to approach development and growth in a truly holistic way. The adoption of the UN Sustainable Development Goals (SDGs), the Addis Ababa Action Agenda on Financing for Development, and the Paris Agreement on Climate Change by the global community reflect this, by emphasising the need for a more sustainable approach to growth and development. However, despite all efforts, progress on the SDGs has slowed and even reversed across many countries and areas. Further, holding global warming below 1.5 °C as committed under the Paris Agreement looks increasingly out of reach. COP15 goals of conserving at least 30% of the world's lands, inland waters, coastal areas, and oceans and halting biodiversity loss by 2030 seem untenable. To reverse these trends, we must advance solutions that address the root cause of many of the critical challenges we are facing: legacy economic systems that were not designed to prioritise sustainability and the wellbeing of people and planet.

The India G20 Presidency has set the stage for the transition to a new economic paradigm through its theme—‘One Earth, One Family, One Future’—based on the principle of *Vasudhaiva Kutumbakam*, meaning ‘the world is one family’. In June 2023, the Development Ministers of the G20 unanimously endorsed the ‘G20 High-Level Principles on Lifestyles for Sustainable Development’ (LiFE), which is a substantive elaboration of nine principles covering the integration of development and climate agendas (G20 India 2023a). These principles, also known as the Varanasi Principles, call for promoting, among others: (i) environmentally friendly individual and community lifestyles and choices; (ii) sustainable production and consumption, through sustainable value chains, technological innovations and investments; (iii) sustainable businesses and social enterprises; (iv) localization and community driven approaches and traditional knowledge; and (v) the role of finance and international cooperation. The adoption of the Varanasi Principles has

been a milestone in global consensus building in pursuit of new approaches to sustainable development.

To support the objectives of India's G20 presidency, Think 20 India constituted an international Task Force (No.3) on *LiFE, Resilience and Values for Wellbeing* (T20 India 2023). The Task Force proposed a new model of development based on LiFE principles, norms, and measurement frameworks, and provided guidance for policies and actions based on widely accepted goals: (i) balancing sufficiency and efficiency imperatives through circular economy and lifestyle shifts, sustainable consumption and production, sustainable growth, and energy transitions; (ii) expanding the LiFE Economy, encouraging for-benefit enterprises and responsible business practices and promoting local efforts and traditional knowledge; (iii) integrating values and ethics for just, equitable and sustainable economies for inter and intra-generational equity, trans-species balance, and just transitions; (iv) reorienting economic systems for resilience, including sustainable urban spaces, mindful of rural–urban balance; (v) empowering women and youth as drivers of change and sustainable development; (vi) reforming development finance and the global financial architecture to support the transition towards a LiFE Economy, and infusing ethics in the functioning of financial institutions; (vii) adopting new measurement frameworks on wellbeing that account for social, human, and natural capital, care economy and quality of economic growth aligned with the LiFE Economy; and (viii) recognising the centrality of values and ethical norms in future actions on lifestyles for sustainable development.

India G20 Presidency Summit held in September 2023 adopted the High-Level Principles on LiFE and called for collective actions that will enable the world to embrace sustainable production and consumption patterns and mainstream Lifestyles for Sustainable Development (G20 India 2023b). The G20 Leaders have also committed to support the creation of an enabling policy environment to promote sustainable lifestyles for climate action and the implementation of the High-Level Principles (HLPs) through international cooperation, financial support, and development, deployment and dissemination of technology. The G20 Summit declaration has acknowledged the critical role played by circular economy, extended producer responsibility, and resource efficiency in achieving sustainable development.

12.2 Transition to LiFE Economy

LiFE is a comprehensive approach focused on individual and community actions to achieve sustainable development and climate goals. It promotes the evolution of a sustainable, pro-growth and equitable development paradigm and reaffirms the importance of sustainable patterns of consumption and production to effectively tackle environmental and socio-economic challenges. The adoption by the G20 of this ambitious and integrated framework is a reflection of a growing awareness across many countries of the causal link between choices individuals, businesses

and governments make and the wellbeing of society and the sustainability of the planet. This awareness has created demand for, and fuelled innovation in the direction of, a new development paradigm that is not just about economic growth, but growth that enhances wellbeing and is environment friendly, socially inclusive, and people centric.

Achieving this holistic approach to development requires a transition towards a LiFE Economy—an economic system in which production, consumption, finance, employment, and other economic activities not only minimise harm but advance social and environmental objectives, delivering inclusive growth, inter-generational equity, and a thriving environment that nurtures biodiversity. Implemented effectively, the LiFE Economy should encourage and enable a shift in values, mindsets, and behaviours on the part of individuals, businesses, investors, and institutions that lead to progress on the SDGs, without contributing to backsliding. In this sense, ‘LiFE Economy’ can be called as ‘Life Economy’ in a holistic way as the constituents of LiFE economy go beyond ‘lifestyle changes’.

However, for the LiFE Economy to thrive, the global community must develop new, robust enabling ecosystems to promote and accelerate its growth. At the national and sub-national levels, this encompasses laws, institutions, regulatory regimes, property rights, incentive structures, and norms that govern the generation and distribution of resources within and between regions. At the organisational level, it encompasses the legal and institutional frameworks that influence strategies, behaviours, and the ability to generate revenues. At the individual level, it shapes choices and opportunities. The challenge and opportunity before the G20 is how to turn the Varanasi Principles into action by accomplishing this paradigm shift.

12.3 Emerging Building Blocks of the LiFE Economy

Firms are the building blocks of the economy. They create jobs, provide goods and services that enhance quality of life, fuel innovation, and generate the taxes and philanthropic capital that finance governments and philanthropy. Thus, a LiFE Economy that fosters truly sustainable and inclusive development must be comprised of firms that deliver such outcomes. There is a widespread conviction that the social and ecological goals enshrined in the SDGs cannot be achieved without significant engagement of the private sector, which creates nine out of ten jobs even in poor countries. Yet, today most businesses are designed first and foremost to maximise financial returns, often generating harmful social and environmental externalities that hamper, or even reverse, progress on the SDGs.

Over the past few decades, however, new models of enterprise have emerged, dedicated primarily to social and environmental objectives. Broadly referred to as ‘purpose-driven’ or ‘for-benefit’ enterprises, these include social enterprises, sustainable businesses, cooperatives, public benefit corporations, community development banks, community interest companies, and numerous other models. In their

pursuit of serving the common good, they have been supported by innovations in public policy, sustainable finance, sustainable production and consumption, impact measurement, and responsible management. Impact investing, wellbeing measurement, new corporate forms, circular economy, ESG, venture philanthropy, and blended finance are examples of innovations supporting the shift to for-benefit business.

For-benefit enterprises and the ecosystem innovations that support them are at the core of the LiFE Economy. Every year, millions of for-benefit enterprises are launched around the world aiming to deliver healthy food, affordable health care and housing, quality education, environmentally friendly transportation and energy, digital access, social services, water and sanitation, financial services, and more to billions of consumers eager to make choices aligned with their values. They offer quality jobs, pay taxes, make investments, and create innovative new products and services in areas often ignored or under-prioritised by traditional markets (Fourth Sector Group 2020). For these for-benefit enterprises, delivering explicit societal and environmental impacts and balancing the interests of all stakeholders are cornerstones of their business strategy. They pursue a wide range of public benefit objectives through delivering goods or services, generating revenues that allow them to scale their impacts while creating jobs and contributing to the sustainable growth of the wider economy. For-benefits have been rising in response to a growing movement of values-driven consumers, investors, workers, and managers expressing their preferences through their economic choices. These values express themselves in a number of secondary attributes found in most for-benefit enterprises (Table 12.1).

Different terms and definitions are used to describe for-benefit enterprises across the world. Depending on the country context, for-benefit enterprises could be registered as non-profit organisations or for-profit entities such as cooperatives,

Table 12.1 Primary and secondary characteristics of for-benefit organisations

DEFINING CHARACTERISTICS	SECONDARY CHARACTERISTICS	
SOCIAL PURPOSE. A commitment to mission is embedded in the organization's DNA. Fiduciary duty is tied to mission. EARNED INCOME. Sales of goods and services generate most of the income.	INCLUSIVE OWNERSHIP. Ownership rights are allocated among stakeholders in accordance with their contributions. STAKEHOLDER GOVERNANCE. Decision rights regarding information and control are distributed among stakeholder constituencies. FAIR COMPENSATION. Employees and other stakeholders are compensated in proportion to their contributions. REASONABLE RETURNS. Limitations on investment returns protect the organization's ability to achieve its mission.	SOCIAL AND ENVIRONMENTAL RESPONSIBILITY. Social and environmental performance is constantly improved throughout the stakeholder network. TRANSPARENCY. Social, environmental, and financial performance and impact are fully and accurately assessed and reported. PROTECTED ASSETS. Social-purpose assets are preserved upon dissolution, conversion, or ownership transfer.

Source Fourth Sector Group

private limited companies, non-banking financial institutions, producer companies, among others. However, what they all have in common is a primary commitment to social and/or environmental purposes.

For-benefit enterprises already constitute a significant share of the economy in many countries. While reliable data on size, scope and growth trends in the for-benefit sector are as yet not readily available because these firms are typically not disaggregated from mainstream businesses or NGOs, by some estimates they make up about 10% of GDP in the USA and Europe, and around 6% in Ibero-American countries (CGC 2019). The sector is growing rapidly in a diverse world-wide landscape, encompassing a broad range of organisations that vary in size, structure, and purpose.

For-benefit enterprises operating in geographic areas that might not be attractive to for-profit companies can help revive local economies and create new job opportunities. In regions characterised by high levels of poverty and chronic underemployment, especially among young people, the impact of social entrepreneurship can be considerable (Schott et al. 2015). The Global Entrepreneurship Monitor in its special issue on social entrepreneurship studied 58 countries and reports that the average rate of nascent social entrepreneurial activity is 3.2% (individuals who are currently trying to start a social enterprise activity) and is as high as 10% in countries like Peru. By comparison the global average rate of commercial start-ups is 7.6% (Bosma et al. 2016). Other noteworthy findings that point to the scale and scope of for-benefit enterprise activity include

- The Business and Sustainable Development Commission in its report ‘Better Business Better World 2017’, suggests that sustainable business models could open economic opportunities worth up to USD 12 trillion and increase employment by up to 380 million jobs by 2030 (Business & Development Commission Report 2017).
- Purpose-driven companies are now making a significant contribution in the labour market. For example, social enterprises are estimated to employ 7% of the working population in Europe (Global Entrepreneurship Monitor 2015).
- A 2020 British Council report on social enterprise and job creation in Sub-Saharan Africa estimates that the number of jobs directly created by social enterprises in Sub-Saharan Africa ranges from 28 to 41 million (British Council 2020).
- According to a UN World Youth Report, in 2016, 871 million people in nine countries in Europe and Central Asia benefitted from social enterprises providing services and products worth € 6 billion and creating employment, particularly among the most marginalised social groups (UN 2020).
- An Ibero-American study of seven countries suggest that there are over 170,000 for-benefit organisations accounting for over 6% of the total economy (Centre for Governance of Change 2019).

Despite the potential demonstrated by these studies, in order for the for-benefit sector to realise its full potential, it must transition from an organic self-organising phenomenon of individual enterprises to a systemic and holistic approach that mainstreams for-benefit business in the economy. Major challenges to the growth of these enterprises remain however, as they are often restricted by the current dichotomy of for-profit businesses and non-profit organisations and the ‘either-or’ mindsets of governments, investors, and other stakeholders. This affects their legal registration, ability to raise capital, access to government programmes, ability to uphold their mission and values, and much more. The LiFE Economy’s potential can be unleashed through building an enabling environment for for-benefit enterprises, with conducive government policies, supportive financial mechanisms, uniform reporting standards, and other measures that level the playing field for these organisations.

There are encouraging global developments already taking shape, with every member of the G20 having instituted some form of domestic legal framework that facilitates for-benefit enterprises, along with many other countries, including Colombia, Ethiopia, Ghana, Malaysia, the Philippines, Singapore, and Sri Lanka (Table 12.2).

Table 12.2 New legal frameworks enabling for-benefit enterprise

G7 G20		
G7	Canada	2018 Benefit Corporations; Low-Profit Limited Liability Company
	France	2019 PACTE Law Act
	Germany	2013 Gesetz zur Förderung von Social Entrepreneurship; Gemeinwohl-Ökonomie
	Italy	2015 Società Benefit
	Japan	2018 Godo Kaisha
	United Kingdom	2005 Community Interest Companies
	United States	2008 Benefit Corporations
	European Union	2021 European Commission Social Economy Action Plan
	Argentina	2018 Benefit and Collective Interest Companies
	Australia	2018 National Social Enterprise Strategy
G20	Brazil	2014 Social Organizations
	China	2016 Public Welfare Foundations
	India	2019 Social Stock Exchange
	Indonesia	
	Mexico	2018 Ley de Empresas de Impacto Social
	Russia	2019 Amendment to federal law on SMEs
	Saudi Arabia	
	South Africa	2019 Social Economy Policy for South Africa
	South Korea	2017 Social Enterprise Promotion Act
	Turkey	
	Austria	2016 Common Good Cooperative /Gemeinwohl-Genossenschaft
	Colombia	2018 Empresa de Beneficio e Interés Colectivo
	Netherlands	2012 Besloten Vennootschap met maatschappelijk doel
	Vietnam	2014 New Enterprise Law
	Malaysia	2019 Social Enterprise Accreditation Guideline
	Thailand	2019 Social Enterprise Promotion Act
	Ghana	2019 Ghana Social Enterprise Policy
	Singapore	2013 Company Limited by Guarantee with a Social Purpose

Source Author’s compilation

12.4 Poised for Significant Growth

A global expansion of the LiFE Economy would accelerate the transition to a sustainable, equitable, and inclusive development paradigm. There are encouraging indicators that this is already underway:

- The Global Commons Survey 2021 (Global Commons Alliance 2021) found that among G20 countries, 74% of people support the idea that their country's economic priorities move beyond profit and increasing wealth to focus more on human wellbeing and ecological protection.
- According to the 2022 Global State of Social Enterprise report by the British Council and Social Enterprise UK (British Council 2022), an estimated 11 million businesses across the world could be recognised as social enterprises.
- According to the Global Sustainability Study 2021 (Kucher 2021), 85% of people worldwide indicate that they have made minor to significant shifts towards being more sustainable in their consumption in the past five years.
- Already in 2017, the Business and Sustainable Development Commission suggested that sustainable business models could open economic opportunities worth up to US\$12 trillion and increase employment by up to 380 million jobs by 2030.
- A 2020 British Council report on social enterprise and job creation estimated that the number of jobs directly created by social enterprises in Sub-Saharan Africa ranged from 28 to 41 million.
- In 2022, the Global Impact Investing Network (GIIN) estimated the size of the worldwide impact investing market to be \$1.16 trillion.
- According to Barry (Forrester blog, 2022), global green finance saw record growth in 2021, exceeding \$720 billion.

12.5 The LiFE Economy in India

The concept of 'Lifestyle for the Environment (LiFE)' introduced by India in November 2021 at COP26 in Glasgow marks the beginning of a new way of looking at sustainable development. The LiFE approach encourages a fundamental shift in our relationship with nature, consistent with what humanity recognised long ago, but seems to have largely forgotten over time. Many ancient civilisations, including Chinese, Egyptian, Greek, and Hindu, described nature in four or five basic elements, viz. earth, water, fire, air, and space or ether, that are vital for sustenance of life.

India's leadership on advancing the G20 Varanasi Principles can be considered a natural extension of the cultural ethos that has influenced life in India for ages. India has traditionally benefited from simple lifestyles, activities, and community living arrangements that are well aligned with these Principles. The Indian traditions of Yoga, meditation, and Ayurveda draw upon the importance

of inter-relationships between human beings and nature to promote equilibrium and greater wellbeing (Burgin 2021). The Atharva veda (Prithvi Sukta, slok no. 12) recognises the enduring filial relationship of humankind to the planet Earth as reflected in ‘Mata Bhumi Putroham Prithivya’, which means ‘Earth is my mother, I am her son’ (Ministry of Culture, GOI website). It could be argued that Indian Vedic society was the first Environmental Protection Society in human history (Sarma 2015).

For-benefit enterprises in India are growing in scale and scope and several studies have begun to shed light on different approaches within this sector. Social enterprises, cooperatives, Farmer Producer Organisations (FPOs), Self-Help Groups (SHGs), rural livelihood promotion through farm and non-farm activities, as well as the promotion and preservation of traditional cottage-based industries are some of the more prominent clusters of for-benefit enterprise in India. Social enterprises are emerging as a promising approach to development at the base of the pyramid and for underserved populations. While there is no formal definition of social enterprise in India, the Social Stock Exchange of India specifies that to be identified as a social enterprise, an organisation must demonstrate that 67% of its activities qualify as eligible activities based on guiding social and environmental criteria set forth by the National Stock Exchange of India (NSE 2023). A British Council study (2015) estimated that there were around two million social enterprises in the country. Of the 258 social enterprises they surveyed, 57% had existed for less than five years. They were characterised by young leadership—under 44 years on average—and more than half employed people from disadvantaged groups. Most of these social enterprises were concentrated in bigger cities, and predominantly in the west and south, with regional branch operations across the country.

A 2018 study of 600 social enterprises by Intellectap and Bertelsmann Stiftung identified key sectors of operation (Ganesh et al. 2018). A majority were focused on addressing a specific development challenge, with agriculture (38%), clean energy (18%), and health care (10%) being the prominent sectors. Other sectors included water and sanitation (12%), financial inclusion (12%), and education (9%). Each of these domains is critical to low-income communities in India, given that more than 50% of the Indian population is dependent on low productivity smallholder agriculture.

The British Council study found that 70% of the social enterprises work with individuals from socially and economically disadvantaged communities, 82% work with women, 31% work with differently-abled individuals, and 46% work with children, indicating a significant focus on social impact. Similarly, the Bertelsmann Stiftung study defines social enterprises as predominantly small businesses that engage with low-income populations to address challenges of access and affordability in critical needs sectors.

Although the existing ecosystem provides opportunities for social enterprises to grow in India, they face limitations in competing with or even complementing traditional public and private entities due to regulatory and resource constraints. The complex regulatory environment, with numerous regulations governing businesses

and non-profits—such as registration, taxation, investment, and reporting—creates entry barriers and slows growth. Further, lack of awareness both among entrepreneurs and investors makes it difficult to attract funding and talent. All these point to the need to adopt a comprehensive approach in creating conducive environment for attracting entrepreneurs and investment in the for-benefit sector in India.

12.6 Aligning Development Finance with the SDGs Requires the LiFE Economy

The SDGs provide an outline of a new global vision for more sustainable development (Sachs et al. 2023). However, pursuing one SDG within the existing economic paradigm often leads to irreconcilable conflicts with one or more other SDGs, making the pursuit of the SDGs a zero-sum game. The Covid-19 pandemic illustrates this well. On one hand, the drop in human economic activity led to lower fossil fuel consumption, reducing greenhouse gas emissions and related types of air pollution (Venter et al. 2020). On the other hand, the pandemic led to the first rise in global poverty in two decades, resulting in setbacks across multiple other SDGs, including prevention and care for diseases, particularly for those already marginalised (Sachs et al. 2021). And, while overall plastic use declined in line with the slowing economy, the medical and epidemiological efforts that saved lives also generated an additional eight million tons of pandemic-related plastic waste (Peng et al. 2021). These figures mirror a general pattern of trade-offs between better access to health care (SDG 3) and modern medicine's high demand of energy and waste-prone materials. The growing demand for the rare minerals required for a clean energy transition (SDG 7: affordable and clean energy; SDG 13: climate action) is driving an expansion of both terrestrial and sea-bed mining, potentially exacerbating fragility and conflict in some developing countries (SDG 16: peace, justice and strong institutions), and threatening delicate ecosystems (SDG 14: life below water, SDG 15: life on land) (Nair 2021).

While development finance provided by governments, international institutions and philanthropic organisations has played a catalytic role in promoting sustainable growth and made significant strides in aligning more closely with the SDGs, major challenges remain in directing financial flows in adequate recognition of the interconnectedness of sustainability objectives. Too often, development finance providers have pursued the SDGs as independent goals, rather than as interdependent parts of an inseparable whole. To overcome this misalignment, there is an opportunity to leverage the nearly USD 380 billion in annual development finance spending to develop an enabling ecosystem for the LiFE Economy and to catalyse scalable LiFE Economy solutions across the full range of SDGs. Such an enabling ecosystem would help align corporate behaviour, labour and environmental standards, technology and materials, energy sources, production chains, consumption, and other relevant areas of economic activity in the delivery of development projects with the

SDGs. Development finance would thus make a significant contribution to advancing the SDGs not just through the intended outputs of the projects it finances, but also through reducing negative externalities in the way those projects are implemented. This can address the ‘one step forward, two steps back’ dilemma often encountered in advancing the SDGs and help to accelerate the transition to a socially and ecologically sustainable economy. In this light, advancing the LiFE Economy is not a distraction or addition to the 2030 Agenda; it is intrinsic to achieving it.

12.7 Advancing Policy Coherence Through the LiFE Economy

SDG Target 17.14 calls on all countries to enhance policy coherence for sustainable development as an essential means of implementation of the SDGs. This means ensuring that different government policies are aligned with and supportive of each other to achieve sustainable development outcomes across economic, social, and environmental dimensions. The need for coherence with sustainable development objectives is not limited to domestic policies but necessitates coordination and cooperation at a global scale.

Governments, philanthropy, civil society, and the private sector have been collaborating in myriad national and international processes and institutions ranging from the fight against climate change to development cooperation and financing for development. Some of these efforts have resulted in considerable progress towards more sustainability in the current global economic system (Table 12.3). However, these efforts are often disparate with insufficient cross-cutting coordination and collaboration among them, contributing to a lack of policy coherence for sustainable development.

To succeed at their intended outcomes, each of these efforts ultimately needs to overcome the shortcomings of our legacy economic systems, which are inherently not designed for, or capable of delivering, sustainable development. This core challenge can be addressed by incorporating the LiFE Economy—which is inherently designed to integrate development and sustainability into these processes and institutions as a complementary strategy. A holistic and cross-cutting focus on enabling and harnessing the LiFE Economy would improve policy coherence and foster synergies across these efforts, both at the domestic and international levels.

12.8 From Principles to Action: Role of the G20 in Growing the LiFE Economy

The LiFE Economy is poised for significant growth. The G20 could leverage the past decades of innovation and the shifts in the demands of citizens, consumers, managers, employees, investors, social entrepreneurs, and youth to accelerate the

Table 12.3 LiFE Economy can foster coherence and coordination in existing processes and institutions contributing to sustainable development

POLICY COHERENCE FOR SUSTAINABLE DEVELOPMENT	• UN Our Common Agenda • OECD Recommendation on PCSD
MOBILIZATION AND ALIGNMENT OF FINANCE WITH SDGS	• Bridgetown Initiative • Inter-Agency Task Force on Financing for Development (IATF) • Global Blended Finance Alliance • UNDP/OECD Framework for SDG Aligned Finance • G20 Framework for Debt Treatments • Global Impact Investing Network • Finance in Common (FIC) • G20 Financial Inclusion Action Plan • ODA and TOSSD
DEVELOPMENT EFFECTIVENESS	• Busan Principles on Aid Effectiveness • Kampala Principles on Effective Private Sector Engagement • Global Partnership of Effective Development Cooperation
CLIMATE ACTION AND BIODIVERSITY	• UNFCCC Paris Agreement • UN CBD Global Biodiversity Framework • IEA Energy Netzero Roadmap • Glasgow Financial Alliance for Net Zero (GFANZ) • Task Force on Nature-related Financial Disclosures (TNFD) • Good Food Finance Network • G20 Lifestyle for Environment (LiFE)
HEALTH RESILIENCE AND PREPAREDNESS	• G20 Health-Finance Task-force • COVAX Facility
JUST DIGITAL TRANSFORMATION	• UN Roadmap for Digital Co-operation • UN Task-Force on the Digital Finance of SDG • OECD Artificial Intelligence Principles

Source Fourth Sector Group

growth of the LiFE Economy and scale its contributions. Based on experience and expertise gained across its member countries, the G20 may encourage and support governments worldwide in creating regulatory and policy environments, financial mechanisms, incentive structures, impact measurement and reporting standards, and other factors conducive to levelling the playing field for values-driven enterprise. Doing so would have significant implications for addressing a range of critical, inter-related issues where the LiFE Economy can unlock new solution pathways, including

- Reforming the global financial architecture
- Transforming trade and value chains
- Sustainable and resilient infrastructure
- Scaling entrepreneurship and employment
- Coupling technology and innovation with sustainable development
- Sustainable consumption and production
- Promoting women-led development
- People-centric and inclusive governance

- Aligning development finance with the SDGs
- Climate change and biodiversity loss
- Sustainable food systems
- Integrated and holistic health systems
- Policy coherence for sustainable development.

Encouragingly, many countries and regions, including all members of the G20, have enacted legal reforms in recent years to enable the activities of for-benefit enterprises. These reforms constitute a promising start, and the G20 can build on them through a range of measures, including:

1. Promotion of a better understanding of the LiFE Economy and its potential for addressing global challenges.
2. Mapping and understanding the LiFE Economy and existing efforts and best practices across sectors and countries towards the expansion of the for-benefit enterprise sector.
3. Identification of specific barriers faced by the LiFE Economy, such as unfavourable policy frameworks or limitations on access to capital.
4. Creation of frameworks and standards for defining for-benefit enterprises and assessing and reporting on their economic, social, and environmental impacts and contributions to achieving the SDGs.
5. Advancement of national and international regulatory and policy environments conducive to the expansion of the for-benefit enterprise sector and the LiFE Economy.
6. Improvement of mechanisms providing access to finance to for-benefit enterprises, including collaboration between governments, international finance institutions, and philanthropy to advance SDG-aligned financing mechanisms.
7. Creation of a Community of Practice for coordination and collaboration between governments, academia, for-benefit enterprises, investors, private sector, philanthropy, civil society, and other stakeholders in promoting ecosystems favourable to the LiFE Economy.
8. Development of wellbeing indicators aligned with the LiFE Economy that can guide priority setting and public policy making.
9. Creation of capacities within governments to lead and monitor efforts to promote favourable ecosystems supporting for-benefit enterprises.
10. Establishment of a monitoring and review system to track progress on global efforts to facilitate and accelerate the expansion of the LiFE Economy.

The India G20 Presidency has significantly contributed towards advancing a ‘LiFE Economy principles’ and it is time the G20 and the global community collectively work on a LiFE Economy Action Plan’ encompassing these and other measures to facilitate a more robust joint effort for ensuring sustainable and inclusive development.

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Chapter 13

Transitioning to LiFE Economy: Rethinking Growth, Sustainability, and Stakeholder Benefits



R. Balasubramaniam (Balu)

Abstract The Coronavirus pandemic has tested the health systems and economies of most countries around the world with two major issues: containing the crisis and initiating economic recovery. There were talks globally about the falling GDP and the impending collapse of the economies of several nations. Nations are increasingly recognising that existing economic models could be more a problem than a solution. A new economic order that is equitable, fair and compassionate is needed to meet the Delhi declaration of G20 to ensure that issues related to People, Profits, Peace and Planet are addressed. This article attempts to provide this LiFE Economy model as a viable and workable alternative.

13.1 Introduction

The Coronavirus pandemic has tested the health systems and economies of most countries around the world with two major issues: containing the crisis and initiating economic recovery. There were talks globally about the falling GDP and the impending collapse of the economies of several nations. Typical discourses were around providing bailouts, fiscal stimulus, enhancing social protection, and relooking at taxation policies.

While these measures were needed, the need to assess the current economic model of growth became evident. In its essence, the ongoing model thrives on consumption, where the paradigm of markets holds dominance. The narratives around the world show how this current *consumption-driven market economy* has taken away everything that can be sustainable. There is little space for concepts like community, equity, fairness, and justice.

All participants in the economy operate on the principle of “profit maximisation”. Moreover, there hasn’t been enough traction to make a significant impact on the way in which the planet and other living creatures on it are addressed. One knows that human life is important, but its importance is intricately and inseparably linked to

R. Balasubramaniam (Balu) (✉)
Capacity Building Commission, New Delhi, India

other lifeforms in particular and the life of the planet in general. Words like *Planet, People, Profits, and Peace* (the 4Ps) can no longer be fashion statements but have to become an integral part of our lives and lifestyles. Thus, there is a dire need now to explore an alternative economic model of growth, a new order of operation that borrows the DNA of creating surplus value and, more importantly, sharing the benefits that accrue amongst all stakeholders.

13.2 The ‘For-Benefits’ Framework

Drawing lessons from the current scenario, the new narrative needs a paradigm shift from a ‘*for-profit*’ mindset to that of a ‘*for-benefit*’ one. One must build a new economic framework that actively combines the inherent public service ethos of the government sector, the operational effectiveness of the corporate sector, and the unwavering dedication and passion of the civil society sector. One must redirect the focus from revenue generation towards revenue generation as a means to ensure the benefits of all stakeholders. Thus, it becomes important to realise that a movement away from “profit maximisation” to “benefit optimisation” is a must for building a *sustainable* world economic order.

As nations around the world are being challenged on how to ensure the benefits of governance and development reach the last mile, the theme of India’s G20 presidency, which is “*Vasudhaiva Kutumbakam*¹”, is an imperative need for the world to function as one family. The challenges confronting us—whether it is climate change or economic inequities or geo-political tensions, need a collaborative response to help mitigate them.

The timing is appropriate to explore the emergence of this new economic order that is driven by the LiFE thinking that the PM of India Mr Narendra Modi, has been advocating for, to become a reality sooner than later. Initially, this started as a one-word movement at COP26 Summit (2021) in Glasgow, stated as LiFE—L, i, F, E, i.e. Lifestyle For Environment. This solitary, in the context of climate change, became the basic foundation of One World. Since then, this has become a movement for an Environmentally Conscious Lifestyle.

¹ *Vasudhaiva Kutumbakam* is a Sanskrit phrase found in Hindu texts such as the Maha Upanishad, which means “*The World Is One Family*”. Vedic tradition mentions “*Vasudhaiva Kutumbakam*” meaning all living beings on the earth are one large family. (Source: https://en.wikipedia.org/wiki/Vasudhaiva_Kutumbakam).

13.3 LiFE Economy

For the uninitiated, the concept of a “*life economy*” refers to an economic system that values and prioritises the wellbeing and flourishing of all life on Earth, rather than just economic growth and material prosperity. In its essence, it implies Mindful and Deliberate Utilisation, instead of Mindless and Destructive Consumption.

Life Economy is a relatively new and emerging concept, and there is not yet a standardised way to measure or evaluate a country’s performance in this area. However, there are some examples of countries that are taking steps towards a more life-centred economy:

For instance, Bhutan is often cited as an example of a country that prioritises the happiness and wellbeing of its citizens over GDP as per the Bhutan Annual Report. The country’s Gross National Happiness (GNH) index (which witnessed a growth of 3.3% over the past seven years) measures the wellbeing of citizens based on factors such as health, education, and social support, in addition to economic indicators. Bhutan also has a strong commitment to environmental conservation and sustainability.

Iceland, on a similar note, has made gender equality a core part of its domestic and foreign policies, with significant support for universal childcare and shared parental leave. The country also has a strong commitment to renewable energy and environmental conservation.

Another example can be of New Zealand, which has been changing the conversation on wellbeing, with the “*Wellbeing Budget*” 2019 that was set out to prioritise key areas such as mental health, child wellbeing, building a productive nation, and transformation of the economy.

With regard to environmental sustainability, Germany has made commitments to transition to a low-carbon economy, with a goal of reducing greenhouse gas emissions by 80–95% by 2050. The country also has a strong social safety net and invests in programmes to support education and training for its citizens.

These are just a few examples of countries that are taking steps towards a more life-centred economy. However, there is still much work to be done to create a global economic system that prioritises the wellbeing of all life on Earth. The mandate of G20, ‘One Earth, One Family, One Future’ is the only practical way forward. Therefore, it is imperative for all nations to unite and collectively participate in taking forward, Lifestyle For Environment (LiFE) as a campaign. These movements together can set goals that can revolutionise many sectors and diverse areas such as Fishing, Agriculture, Wellness, Dietary Choices, Packaging, Housing, Hospitality, Tourism, Clothing, Fashion, Water Management, and Energy.

Building on the narrative of LiFE economy forward, we now need to shape the chronicle that recognises and embraces the interdependence of various factors, going beyond the sole emphasis on the financial bottom line, to encompass issues such as creating and sharing benefits, stakeholder roles, sectoral strengths, interconnectedness, and life’s priorities. We have to now move towards forming democratically self-managed companies while keeping the interests of the stakeholders involved.

Legal ownership, decision-making, remuneration, and profit sharing have to be made on an equitable basis driven by the 'value' that each stakeholder brings and the benefits that accrue by this value. The emerging disparate examples from around the world indicate that 'for-benefits' are a rapidly growing class of organisations that are giving rise to a new, fourth sector of the economy. Like non-profits and governmental agencies, 'for-benefits' pursue a wide range of social and environmental objectives as their primary purpose. Like for-profits, 'for-benefits' primarily earn their revenues by selling a broad range of products and services that improve the quality of life for consumers, create jobs, and contribute to the economy. The two defining characteristics that distinguish 'for-benefits' from other organisational models are their primary commitment to social purpose, together with a predominantly earned-income business model. Other characteristics encompass inclusive ownership, stakeholder governance, fair compensation and reasonable returns on their products and services. Farmer Producer Organisations (FPO) in India would come closest to qualify as 'for-benefits'.

13.4 Farmer Producer Organisations: An Illustrative 'For-Benefits' Organisation

The aim of the Farmer Producer Organisations is to empower and improve the bargaining power and quality of life of small and marginal farmers/producers. FPOs help empower farmers by organising them into cohesive groups. By working collectively, farmers can pool their resources, access information, and negotiate better prices for their produce. This empowerment leads to improved livelihoods and greater economic independence for the farmers' community. These FPOs also provide a platform for farmers to share knowledge, exchange best practices, and learn from each other.

Overall, by promoting collective action, enhancing market access, improving productivity, and fostering rural development, FPOs contribute significantly to the economic growth and sustainability of the agricultural sector, benefiting both farmers and the wider economy. Incidentally, these FPOs can be the driving force for LiFE economy for a country like India, wherein the agricultural sector employs the major workforce.

Reiterating the '*for-benefits*' economic model, it is inevitable to state that the '*for-benefits*' strive to ensure that the social and environmental performances are constantly improved throughout the stakeholder network. High standards of transparency ensure that social, environmental, and financial performance and impact are fully and accurately assessed and reported. Social-purpose assets are preserved upon dissolution, conversion, or ownership transfer.

Unlike traditional for-profits and non-profits, which are legally distinct and recognised entities, '*for-benefits*' lack formal recognition and common definition because

the sector has been emerging in a highly distributed and fragmented way world-wide. Creating and building on this new model is not an easy task; one needs to create a new narrative, a new definition, a new language, and a new understanding. We need to build awareness of what are benefits and for whom and why. We need policies and Government buy-in, as without them, the needle cannot be moved. We require a toolkit to effectively operationalize the '*for-benefits*' economy, as well as Institutions that can offer training and necessary support to these emerging entities. There is a need to establish agencies that actively monitor and evaluate the benefits. Undoubtedly, this endeavour requires substantial effort, but it is the ideal moment for all stakeholders in the economy, including NGOs, Industry heads, and companies to come together.

We know that NGOs have a declared purpose of responding to societal demands and mobilising communities to participate in the development that affects their lives. Hence, the exigency of the moment is that NGOs acquire the capability of going beyond seeking donations to generating resources on their own to ensure that they continue to engage in social development without being too dependent on public or private funds.

On the other hand, *Industry captains* need to ask themselves difficult questions and have the courage to move beyond shareholder pressures and their own personal interest of generating profits at any cost. They need to consciously take on the mandate of focusing on the quadruple bottom line of *Planet, People, Profits, and Peace*, and move their organisations towards being socially and environmentally responsible in the true sense of the term.

As a matter of fact, *Companies* have already started coming under pressure to mitigate the harm they were causing to the planet. Investors have begun looking not only at profits but also at how good the company's environmental/social obligations are. And so, it has become all the more necessary for companies to make a transition to what is traditionally known as *ESG (economic, social, and governance) thinking*. This difference in thinking has in fact led to the evolution of stock exchanges over time, nevertheless the birth of a concept termed as *Social Stock exchange* for the companies that don't just exist to generate earnings!

13.5 Social Stock Exchange in India

In India, the Union Finance Minister first announced of *Social Stock Exchange* in July 2019 and SEBI was mandated with the responsibility of setting it up. While a fully functional SSE can prove to be a game-changer for funding and mobilising resources for projects in the social sector and '*for-benefits*' domain, especially considering the post-covid scenario, what is to be seen as a concern are the operational details of making a Social exchange work.

Social Enterprises, Development Sector Organisations, Not-for-profits, NGOs, and Civil Society Organisations (CSOs) work with a "social purpose" and an intent to bring about a '*positive change*' in society. These organisations are often constrained

by the lack of capital to convert their “intent” into “impact” and are also limited by sustained access to capital. It is in this context that the Social Stock Exchange (SSE) can potentially enhance the ability of social enterprises and voluntary organisations to raise capital through debt, equity and/or mutual funds.

At present, the social development sector in India receives funding through multiple sources spanning corporate social responsibility (CSR), philanthropy, government funding, and retail charity. The SSE will attempt to bring convergence across these diverse platforms with uniform frameworks of funding, utilisation, impact-creation, measurement, disclosures, and reporting.

For the uninitiated, a Social Stock exchange is a trading platform that allows social businesses and non-profits to raise capital by attracting ethical investors willing to invest in organisations that have a dual corporate and social mission. Such exchanges help social enterprises find investors and raise funds for their causes, with the primary objective of *social gains*.

There are close to 14 Social Stock Exchanges globally at different stages of evolution. Only the Canadian *Social Stock Exchange* is up and operational with a reasonable level/quantum of trading. Since there is no successful Social Stock exchange in the world, ergo, an opportunity for India to become the ‘*jagadguru*’ by setting up an indigenous stock exchange, that’s both culturally acceptable and contextually viable.

A viable SSE structure is designed with three key components:

- **supply side incentive component:** this component encourages investments in the SSE set-up.
- **the central component:** this component focuses on establishing an actual stock exchange ecosystem that prioritises *transparency and accountability*. It consists of an oversight regulator and other intermediaries.
- **the demand side component:** this component enables social sector and ‘*for-benefits*’ organisations to engage with and benefit from the SSE, driving social progress.

13.6 Conclusion

All in all, the present time is opportune for exploring the emergence of this new economic order that seeks to create public good while ensuring reasonable private gains for the entrepreneur. Unless capitalism gets grounded in compassion, equity, fairness, and justice for all stakeholders; sustainability will remain just a fashion statement. For a world that seems to be rapidly absorbing, accelerating, and celebrating the spirit of market economics and individual attainment in tandem; a ‘*for-benefits*’ model will seem unnecessary and difficult to undertake. But embedded in the paradigm of a harmonious economy is a consideration for the planet, and its people, and fair gains for everyone. The foundation for a sustainable global framework rests upon transitioning from the narrow focus of *targeting profits* to the broader objective of targeting benefits for all participants in the economy.

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Chapter 14

The Pursuit of Technology and Paradigm of Equity



Sabyasachi Saha and Syed Arslan Ali

Abstract In the absence of any universally recognized framework for technology cooperation, inequalities between the developed and the developing world in Science, Technology and Innovation (STI) capacity and outputs have been insurmountable. In the contemporary context, the situation gets more complex due to the misaligned priorities of scientific research with SDGs which is also a prime concern of countries in the Global South. The existing difference in innovation capacities and performance across countries is taken as fait accompli and with minimum attention to the fact that in effect such disparities hamper the collective progress of humanity resulting in stubborn inequalities. This calls for technology cooperation and access to resources based on public good principles of knowledge creation. To enhance access, there has to be a greater appreciation for ‘solutions’ and their ‘impact’. This requires new frameworks to prepare humanity for a true knowledge society founded on equity and, at the same time, help knowledge enterprise to contribute to the deepening of the paradigm of equity itself.

14.1 Introduction

There have been stark inequalities in the Science, Technology and Innovation (STI) research and outputs between the developed and developing world and, at the same time, a wider disconnect of scientific research with SDGs. For example, 85% of the authors are affiliated with OECD countries when it comes to scientific publications on climate change (UNCTAD 2023). Developed countries are ahead of the developing world in terms of the availability of patented knowledge, technical know-how, trade secrets and various infrastructures ranging from physical, institutional, regulatory and

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S. Saha (✉)

Research and Information System for Developing Countries (RIS), New Delhi, India

S. A. Ali

Research and Information System for Developing Countries (RIS), New Delhi, India

digital (Bostrom and Nayyar 2023). Of the total patent applications in 2022, China, the USA, Japan, Korea and Europe accounted for 84.9% (WIPO 2023). Developed countries have exported green technologies worth more than US \$156 billion in 2021 and developing countries merely US \$75 bn, registering a growth of 160% and 32%, respectively (UNCTAD 2023). The existing difference in innovation capacities and performance across countries is taken as *fait accompli* and with minimum attention to the fact that in effect such disparities hamper the collective progress of humanity resulting in stubborn inequalities. For example, the Global South, carrying 90% of the world disease burden, receives only 10% of the health research funding (GFHR 2001). Such disparities has remained unchanged (Yegros-Yegros et al. 2020). Recently the UNCTAD reinforce the argument on why all countries would be required to leverage technology and prepare for technological disruptions keeping in view demography, society, culture and ecology despite varying levels of capacities (UNCTAD 2021).

Stiglitz (1999) points out that innovations (research and development expenditures) are even more concentrated in advanced industrial countries than incomes. The dual deprivation of low research output and patentable invention coupled with misaligned STI priorities with respect to SDGs by the Global North, which dominates the scientific research agenda globally, was highlighted in the recently released STRINGS report titled *Changing Directions Steering Science, Technology and Innovation towards the Sustainable Development Goals*. The report states that among the High-Income Countries (HIC), Upper Middle-Income Countries (UMIC), and Low Middle-Income Countries (LMIC), only 20–30% of the published research in science journals and 2–5% of patent filing was related to SDGs. Whereas, in Low-Income Countries (LICs), 60–80% of research publication and 9% of the invention was related to SDGs, emphasising the enormous SDG challenges LICs face and the push to bridge SDG gaps. However, LICs produce just 0.2% of science research and 0.02% of all patented inventions globally (Ciarli 2022).

It is to be noted that access to technology remains a highly dynamic concept, as access is linked to every new cohort of technology that is introduced. However, within a reasonable framework, there have to be considerations for faster delivery of technologies for covering the last mile. The distribution of COVID-19 vaccines remains a prominent example. It is the rich countries that have mostly been able to access vaccines and distribute these amongst the population (Bostrom and Nayyar 2023). However, to provide holistic health, adequate nutrition, enable cognitive development as well as protect the environment through advanced monitoring, the role of technology is paramount. As is well understood, one should not only be concerned about the pace of technological change but also the direction of it (Arrow 1962; Mazzucato 2018; Lema et al. 2015; Mallet 2015). As famously argued, learning is a by-product of R&D and the character of learning will influence the direction of R&D spending and influence the utilisation of technological opportunities (Cohen 1989). For developing countries, technological learning is an essential process of catch-up.

Knowledge, by definition, is a public good. Knowledge is often a product of human effort and creativity. In economic terms, public goods are characterised by a non-rivalrous and non-excludable nature. Knowledge is also labelled an ‘impure public good’ in the sense that although the consumption of knowledge does not

exclude others from its benefits or diminish its availability, the character of the good can change by the use of legal norms to erect exclusionary barriers to the good. There is excludability in that it is possible to exclude people from knowledge or from the use of it. This is what much of the present essay addresses. Once demonstrated and disseminated, its use is non-excludable and non-rivalrous. Scientific applications, often termed technology, are considered a resource-intensive process. Given higher chances of unbridled appropriation, basic scientific pursuits have faced market failure possibilities which justifies public funding of such research (Nelson 1959; Lundvall 2016). Government funding has remained an important source of industrial innovation given the wide divergence between private and social returns to R&D. Hall (1996) discusses the various dimensions of this literature. Technology in certain domains helps alleviate common human challenges or provides security of various kinds. The pursuit of technology in such cases also receives public patronage, for example, national defence.

A large part of the early success of technology-led industrialisation, first in the UK and then in the USA, has been attributed to the emergence of patent systems (North 1981; Mokyr 2002). Certainly, the utility of the patent system has been contested on the grounds of its overreach and welfare-reducing impacts (Boldrin and Levine 2008; Shapiro 2007; Jaffe and Lerner 2004; Lerner 2009; Ockwell et al. 2010). However, with the steady progress of S&T over recent centuries, every new cohort of technology has practically emerged from the global scientific commons with a new touch of human creativity. Nevertheless, technologies are reproduced in units embedded in goods and services, and supply shortages and resource constraints make those excludable in certain contexts. Even in cases of such goods and services, excessive rewards through patents and cost to avoid patent infringement liability act as major challenges for technology users. In the long term, this will reduce economic efficiency by curtailing innovation through high costs and restrictions (Shapiro 2007). Also as argued in Arrow (1962), technologies that are needed for solving human problems are restricted in access due to resource constraints and would cause sub-optimal welfare. For most technologies, the core scientific principle retains its public good character even as the nature of the solution is subjected to novelty tests. However, the creativity behind an invention is often not of one single individual. Rather insights and problems are drawn from the society at large and from prior processes and products (Nelson 1989). While scientific collaborations lead to technologies is a common fact, new innovations in emerging technologies have demonstrated that such technologies can be co-created, produced and used at scale by a network of individuals who are not collaborators in the conventional sense. Such developments call for a new reward structure beyond patent systems (Banerjee et al. 2010).

14.2 SDGs and Progress on the Technology Facilitation Framework—an Illustration

The 17 Sustainable Development Goals (SDGs) cover all aspects of socioeconomic development and environmental sustainability, including governance, institutional capacities and partnership. The implementation of the SDGs is about localization on the one hand and effective global cooperation on the other. The key means of implementation, i.e. Finance and Technology are inadequate and, at the same time, skewed in terms of distribution both among and within countries. While most countries took steps towards implementing the SDGs within the domestic policy space, progress on global public goods and financing thereof has been modest by all accounts. Cooperation in delivering technology assets and scientific knowledge has been even weaker. Unforeseen shocks in the form of the global pandemic have exacerbated existing inequalities in access to technology which has disproportionately impacted SDGs progress in developing countries, making recoveries highly unequal.

The launch of the Agenda 2030 witnessed some elaborate attention on the issue of technology mainstreaming from the perspective of developing countries. While SDGs became a universal agenda, these countries were at a huge disadvantage with respect to making technologies available for achieving the SDGs. The gaps in technology capability and availability were formidable and attracted inadequate attention towards initiating institutional reforms to correct historical inequalities. As stated in 2012, the UN Conference on Sustainable Development (“Rio + 20”) called for identifying a Technology Facilitation Mechanism. The Addis Ababa Action Agenda, in paragraph 123, decided to establish the same. Paragraph 70 of the 2030 Agenda for Sustainable Development announced the launch of a Technology Facilitation Mechanism (TFM) to support the implementation of the SDGs. It aimed “to facilitate multi-stakeholder collaboration and partnerships through the sharing of information, experiences, best practices and policy advice among Member States, civil society, the private sector, the scientific community, United Nations entities and other stakeholders”. In a certain sense, with the TFM yet to take off, it is obvious that the global community has to make further efforts to implement and scale up the TFM to meet the requirement of making technologies accessible in Low-Income Countries (LICs) and Low Middle-Income Countries (LMICs).

The G20 has in the past also recognised the scale of the problem and, in their efforts, endorsed the new frameworks on STI for SDGs Roadmaps as proposed by the UN and some of the international partner organisations. The new framework introduced in 2019 is supposed to support the original TFM launched in 2015. G20 Leaders endorsed the draft UN “Guiding Principles for the Development of STI for SDGs Roadmaps” as part of the G20 Summit declaration in 2019.¹ Based on this, a Global Pilot Programme on Science, Technology and Innovation for Sustainable Development Goals (STI for SDGs) Roadmaps was launched in 2019. Six pilot countries Ethiopia, Ghana, Kenya, Serbia, India and Ukraine joined this initiative.

¹ G20 Osaka Leaders’ Declaration (https://www.mofa.go.jp/policy/economy/g20_summit/osa-ka19/en/documents/final_g20_osaka_leaders_declaration.html).

International organisations like UN agencies, the World Bank, the EU, as well as the Government of Japan, joined as facilitators to bring key stakeholders on board and mobilise seed money to support the country-level pilots.

This global project is perhaps the most prominent outcome of the TFM. This project enabled policymakers in these countries to revisit their STI initiatives from the perspective of country-level SDG priorities and seek international collaborations in some areas for both knowledge and resources.² This is a significant experiment as part of increasingly popular methods of piloting new ideas even at the level of international cooperation. It remains to be seen how the momentum is carried forward to multiply STI initiatives and partnerships so that within a stipulated time frame, some countries can have greater access to technologies, information and capacities that they would otherwise not have had access to at the desired scale.

The TFM remains an aspirational agenda. Countries mostly engage in bilateral technology cooperation dialogues. Cross-country flows of knowledge and information are deeply concentrated in high-income countries, as was evident during the COVID-19 pandemic response (Druehl et al. 2021). Emerging markets have been responding to sustainability and development challenges through local efforts. However, the ability to widely leverage STI knowledge and assets widely varies. LMICs, LDCs and countries in special situations like Small Island Developing States (SIDS) still grossly depend on ‘imported’ knowledge. Much of it comes in the form of development cooperation and not Foreign Direct Investment or scientific collaborations. They often also lack the ability to conduct needs assessments. With particular challenges of One-Health and Climate Change, the problems of this world are no longer localised. Hence, STI policymaking in countries, particularly in high-income ones and emerging markets, should be more holistic in terms of extended collaborations with countries not at similar levels of STI inputs or outputs. A global TFM should track and document cross-country collaborations emerging at various levels and may be crucial in bringing up absorptive capacities in LMICs and LICs. It is important to recognise that policy ecosystems are equally as important as technology transfers.

14.3 Technology and Welfare: What We Know So Far?

Historically, barring occasions when crude means to restrict knowledge flows or damage knowledge repositories have been ruthlessly employed by some misguided and tyrannical rulers, the practice of knowledge has been a collective effort with concerted attempts to maintain continuity across generations. However, in recent centuries beyond the first industrial revolution, there has been an explicit urge to ‘own’ knowledge and seek rent from it. Prior to the industrial revolution, technology and its underlying knowledge were primarily organised around the principle of openness, similar to open-source technology in the modern era (Mokyr 2007; Boldrin and

² STI for SDGs Roadmaps: status and opportunities (https://sdgs.un.org/sites/de-fault/files/2022-10/Updates_per%20on%20STI4SDGs_per%20Road-maps_Aug_2022_rev.pdf).

Table 14.1 Types of technology and relevance to SDGs

A	Emerging technology ³	Enabling technology ⁴	General-purpose technology ⁵
Novelty	Radical technology	Drive radical change in use	Affect broad socio-economic areas
Impacts	Uncertain and ambiguous	Enhance user capability	Change extant economic and social structure
Impact of technology	Coherence/Convergence	Applicability to diverse field	Creates many spillover effects
Observed change	Relatively fast growth in use	Rapid development of subsequent technology	Societal transformation
Complementarity	Explore methods of use	Complement for broader impacts	Complementary for transformative change and acceleration

Source Iizuka and Hane 2020

Levine 2008). Keeping in view the transcendence of a new architecture that adheres more to older values than recent ones, one can argue that the pursuit of knowledge must be free and its fruits more accessible.

There are some attempts to identify technologies in terms of their nature and use. Iizuka and Hane (2020, 2021a, b) present a useful illustration in this regard. They classify technologies as general-purpose technologies (GPT), enabling technologies and emerging technologies and the advantages that each of these groups brings to aid policy decisions (Table 14.1). It is clear that standard general-purpose technologies are a combination of several standard technologies that have emerged in the earlier period and have attained widespread scale in terms of use to the extent of being considered public goods. Policy frameworks supportive of GPTs and their further deepening emerge as critical preconditions for capabilities at the national level. The availability of GPTs enormously brightens the prospects of the SDGs. However, enabling and emerging technologies need a very different set of policy interventions as the local availability of ‘skills’ greatly determines the technology

³ Enabling Technology is the use of various forms of devices and tech to support a person with disabilities to live as independently as possible. These types of technologies include sensors, mobile applications, remote support systems and other smart devices.

⁴ General-purpose technologies are technologies that can affect an entire economy. GPTs have the potential to drastically alter societies through their impact on pre-existing economic and social structures. These include the steam engine, railroad, interchangeable parts, electricity, electronics, material handling, mechanisation, control theory (automation), the automobile, the computer, the Internet, medicine and artificial intelligence

⁵ Grand challenges are defined by multifaceted interdependencies, needing solutions that fundamentally replace unsustainable methods and go beyond technology improvements to encompass behavioural and cultural change in addition to societal change. The Transformative Innovation Policy can be applied in all policy problems, particularly the grand societal goals or challenges (Amanatidou et al. 2014; Haddad et al. 2022).

trajectory. Here, cooperation between countries on STI for SDGs could be leveraged for an STI for SDGs framework with a focus on measuring institutional development and technology absorption.

The innovation system framework has by and large focused on overcoming governance failures and information asymmetries in a handful of countries where transitioning to a more advanced ecosystem is in principle easier due to favourable preconditions. In this regard, it is notable that beyond national innovation systems, later on, opportunities in regions, industries and other scientific systems got attention (OECD 1997). In recent decades, the private sector in developed countries has widened its search for innovations that could propel humanity into a reality of converging technological experience. Nevertheless, the challenges of sustainability have pushed the horizon even further, where much more widespread innovation activity is now visible. The emerging grand challenges⁶ now define the scope of policy interventions (Amanatidou et al. 2014; Schot and Steinmueller 2018; Steward 2012). Recognition of grand challenges and the necessity of triggering collective action on finding solutions is also shaping the pursuit of knowledge. There is a greater focus on leveraging complementary capabilities existing in diverse geographies within national boundaries and beyond.

The EU introduced the Smart Specialisation model. Foray (2014) outlines that the Smart Specialisation explicitly aims to foster a process of self-discovery in entrepreneurial activity connected to local resources and capabilities. Such efforts would support the optimal utilisation of locally available resources and capacities and build partnerships with stakeholders. The development context in the region should guide the process and hence should support the SDGs. Within this, a new framework of Smart Specialisation Strategies for Sustainability (S4) has been adopted by the European Commission with a focus on nations, regions and cities. High hopes have been placed on this strategy to integrate sustainability and resilience building as part of the EU's STI strategy (Foray 2014; 2017; Nakicenovic et al. 2021).

Japan's Society 5.0, launched as part of the 5th Science and Technology Basic Plan (2016–2020), has been acknowledged at various levels for its imaginative and futuristic approach from the perspective of future societies in advanced economies. It is similar to notions of the fourth industrial revolution but emphasises on reaping the benefits of the emerging technology paradigm for society and its evolving needs. Deguchi (2020) suggests that Society 5.0 defines the relationship between people and society as one which is being mediated by technology. This paradigm captures the need for sustainable technologies that can balance imperatives of economic growth as well as set in motion new innovations that are pro-planet. Society 5.0 is expected to have profound implications for several sectors, including education (Rojas et al. 2021).

Developing countries, in addition to the technology distance, also face challenges of regional disparities, which are compounded by technology deficits. While market failures result in net welfare loss when technologies are undersupplied, there are greater challenges of missing markets, especially in developing countries as well as

⁶ Emerging technologies include a variety of technologies such as educational technology, information technology, nanotechnology, biotechnology, robotics, and artificial intelligence.

governance failures. In recent decades, with increased vulnerabilities in societies, a new organisation of S&T policies has emerged around grand challenges (Azhgaliyeva et al. 2022). However, such efforts are not very successful beyond a few countries. Emerging economies have also enhanced their stakes in such efforts, however, with weaker knowledge bases. While earlier mission-oriented projects hardly paid attention to economic feasibility and societal appropriateness, there is a rising awareness of such matters (Alonso et al. 2023). The other ever-prominent missing link is the inability of existing institutions to cover the gap in scientific pursuits across regions which is eventually contributing to the slower spread of scientific temper among the masses (Acemoglu et al. 2004).

While the emergence of new business models and inclusive approaches is evident, enhanced capacities need to be created (Schot and Steinmeuller 2018; Geels et al. 2008). Developing countries shall remain more vulnerable to grand challenges exacerbated by pre-existing inequalities restricting their ability to develop or access new technologies, necessitating coordinated policy action. Partnerships across institutions from the perspective of innovation systems have so far not been widespread in developing countries. With the right policy environment, developing countries can significantly improve the outcome and impact of their S&T systems for addressing local needs and emerge as solutions hubs. The capacity gaps that sometimes act as handicaps in developing countries need a specific long-term policy approach. However, opportunities for technological leapfrogging can be leveraged through a mix of short and long-term policies. Both human resources and material assets would be a necessary condition to leapfrog. Such capacity gaps need to be filled both in the public and private sectors alike.

14.4 Approaching a New Paradigm of Equity

This article argues why reforms are urgent based on public good principles of knowledge. When access barriers are severe and as technology flows from North to South, given the shared future, there is an urgency that the global North eases those barriers. Negotiations on access to technology cannot be resolved by involving limited parties who believe in the absoluteness of market efficiency and transactions based on individual property rights. For instance, in the pharmaceutical sector, the comparatively less purchase of medicines by Africa and other developing regions directly influences their stake in R&D decisions. These decisions are largely made by giant pharma companies in the North, which prioritise the production of those medicines catering to the needs of the developed countries over those for common diseases which largely affect the South. Therefore, multi-stakeholder engagement in technology access is critical. Transitioning to a new paradigm would be feasible if there is greater faith in more participatory processes of innovation and the urge to address the needs with urgency adhering to principles of access, equity, and inclusion. While we define innovation, we need to consider the broader definition of innovation that enables developing countries to catch-up. Innovation, as a paradigm, is mostly not comprehensible to local actors and policymakers in these countries. Hence, there are always

chances of lost opportunity when it comes to strengthening the innovation ecosystem or facilitating absorption.

While economic enterprises stare at several fragilities that are compounded by the continuation of environmentally unsustainable processes, technological opportunities need to be re-directed so as not to contribute to the same trap. The solutions in this direction may not emerge in the same fashion the way scientific enterprises have been carried on so far, with very few leaders among countries. The imperative is to take on board a wide array of not only scientific expertise but also insights from other disciplines when complex problems are to be resolved. At the same time, such efforts need to be much more distributed across countries as part of self-driven efforts as well as scientific collaborations.

To take existing initiatives further, by way of a practical example, new approaches to STI for SDGs definitely need to achieve a larger scale and purpose with a strong focus on regional needs in developing countries. The TFM should evolve as an umbrella mechanism, while several other global initiatives need to have sector-specific TFMs of their own. There has to be a greater assessment of funding channels, stakeholder participation, and regular reporting at the level of UN and regional forums. Effectively, both G7 and G20 need to patronise the agenda and support greater resource mobilisation to operationalise TFMs. New ways of engaging leading actors on STI, both in public and private sectors, with the sole aim of promoting global public goods are needed. Such efforts may cover climate mitigation, pandemic preparedness, disaster resilience and a host of conservation activities. In this regard, the template of multilateral financial flows and development cooperation needs to go through certain reforms to have partners to deliver on STI for SDGs. Digital public infrastructure may be a starting point, but obvious global public good properties intrinsic to other areas, from geospatial technologies, biotechnology, renewable energy, and the like, need to be fully appreciated.

There has to be greater recognition of the needs and potential of societies that live outside high-income countries. This is simply because of the fact that populations outside of high-income countries are way larger than those residing in them. India stands out for having the largest population in the world and has a significant share of the economy that runs on drivers of advanced skills and technology despite low per capita income. The prospect of a knowledge economy is set to emerge stronger with the expansion of the economy as India is poised to become the third-largest economy. In this process, India has achieved a significant technological leap in the digital sphere both by serendipity as well as by design. India is uniquely positioned to leverage the digital public infrastructure that has attained the largest scale in the world in recent times. The emergence of digital public infrastructure in India has been a study of the potential of innovation and diffusion and the large-scale welfare impact that digital infrastructure can have once strongly promoted by the public sector and the State. Innovations in ICT and Industry 4.0 and the co-evolution of India's digital public infrastructure (DPI) has opened new possibilities of open innovations, public-private partnership, affordable innovations, competition and fair use of technology, reinforcing the rationale for treating technology as a public good for wider applications than presently appreciated. DPI, comprising a set of applications, systems and platforms operated by open standards and specifications, is made available in

the public domain as much of it is developed through open-source software, with anyone free to utilise it, thereby meeting the characteristic of non-rivalry (Nilekani 2023).

In seeking a new paradigm, there has to be a greater appreciation that scientific research and technological applications are part of the same continuum. Additionally, the motivation to undertake scientific and technological enterprise, to a large extent, is connected to solving common human problems that affect all individuals directly or indirectly. The glitz of technology in modern times often obscures the fact that a large chunk of technology products is exclusively consumed by those who can afford them. However, each improvement in technology, even from the perspective of user experience, perhaps has a cumulative potential and contributes to shifts in frontiers, enriching scientific commons in some form. This is to make the point that even technical improvements appearing as ‘minor’ innovations may constantly add to the common pool of knowledge. This is akin to the entire volume of innovation literature that treats learning at par with R&D itself.

Finally, upholding the global scientific commons and a sophisticated framework of technology pools with multiple streams of knowledge and resources flowing into it would be desirable. The resistance to change is rooted in philosophies that are more recent and those that preserve the status quo while ignoring the urgency of human needs. To agree on a new paradigm, there has to be a greater appreciation for ‘solutions’ and their ‘impact’, transcending notions of efficiency in some situations and encouraging approaching knowledge with separate valuation criteria determined by all primary stakeholders collectively. This could lead to new legislations and institutional amendments to prepare humanity for a true knowledge society founded on equity and, at the same time, help the knowledge enterprise to contribute to the deepening of the paradigm of equity itself.

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Chapter 15

Ecological Impact Fund: Greening the Global South



Thomas Pogge

Abstract The Ecological Impact Fund (EIF) is a proposed new international financing facility that would enable originators of green innovations to exchange—in the lower-income countries—their monopoly markups for impact rewards. Each year, the EIF would split a preannounced disbursement among participating innovations according to the ecological impact achieved with them in the EIF-Zone. Replacing the headwind of monopoly markups with a tailwind of performance payments, the EIF would give originators a financial interest in the wide and effective use of their registered innovations and stimulate development of additional green innovations that—tailored to needs, cultures, circumstances, and preferences in the EIF-Zone—would be especially impactful there. These two effects would produce a third: the EIF would help build capacities to develop, manufacture, distribute, install, operate, and maintain green technologies in the EIF-Zone.

15.1 Introduction

Human activities are driving our world towards a climate catastrophe with worsening harms from extreme weather events, expanded reach of tropical diseases, increasing scarcity of food and water, and extinction of biological species. Our emissions also cause other harms, such as millions of annual deaths from air pollution (Vohra et al. 2021; WHO 2022). These problems will not be solved by drastically curtailing the conveniences of modern life or by reducing the human population. If we will solve them at all, then through swift development and deployment of green innovations (“greenovations”) coupled with deep changes in individual and societal behaviour to make consumption and production sustainable. But such a profound, rapid transition faces serious collective action problems.

Before new technologies can be sold and used, they must first be invented and developed. This requires risky research and development (R&D) investments whose cost must be borne by someone. Currently, this problem is addressed through state

T. Pogge (✉)
Yale University, New Haven, USA

funding, used to support research at public and private universities, institutes, and companies, as well as through the additional incentive of state-enforced patent awards, which have been globalised to a uniform standard in 1995. Annex 1C of the founding treaty of the World Trade Organisation requires WTO members to issue patents of at least 20-year duration on eligible innovations (TRIPS 2005, esp. Articles 27, 28, and 33). This regime enables successful innovators to reap substantial markups, royalties, or licensing fees from early users in nearly all countries.

15.2 Problems with Existing Innovation Rewards

While this TRIPS regime incentivises the development of new technologies, it also raises their sales price to a supra-competitive level, thereby disadvantaging them relative to older technologies that, offered by multiple suppliers, are available at competitive prices.¹ The reduction in sales caused by this disadvantage is doubly regrettable: it reduces the new technology's impact, and it diminishes originator rewards along with the incentive to invest in innovative R&D.

This headwind against uptake is aggravated by the present innovation regime's insensitivity to third-party benefits. This is especially significant for greenovations because nearly all their benefits go beyond buyers and users to present and future living beings all around the planet. These large potential benefits often remain unrealized because neither potential buyers (through a price surcharge) nor potential suppliers (through a price discount) are willing and able to finance them privately. The resulting lower sales volume is predictable, and many highly beneficial greenovations are therefore not even developed.

To illustrate, consider a factory that could be operated with or without a certain filter reducing harmful emissions. Deploying this device is expensive, partly because it requires paying a licensing fee to the patentee. In deciding whether to bear this cost, plant owners may weigh the health benefits to themselves and their employees. But they are rarely willing and able to take full account of the vastly larger difference their decision makes to the whole planet, future generations included.

Let's assume that, over time, each filter deployment has a small effect on the composition of the atmosphere, increasing the life expectancy of 20 billion present and future human beings by 63 s on average. That's 40,000 human life years per device installed. Nonetheless, many factory owners will not pay even US\$1,000 extra for these third-party benefits. Nor will typical patent holders make such a financial sacrifice. As rational market actors, they set the profit-maximising price. They prefer selling 100 licenses at US\$20,000 each over selling 150 licenses at US\$13,000 each—even if the latter decision would avert the loss of over 2 million

¹ The magnitude of supra-competitive markups in the green-tech space varies across products and is difficult to quantify. Typical estimates cluster around 10% (de Rassenfosse and Zhou 2020)—certainly large enough to frequently tip the scales in favour of a more-polluting technology.

human life years at a total cost of only US\$50,000.² In this realistic example, forty years of precious human life are lost for each additional dollar earned by the patentee.

This second collective action problem causes technologies with high positive externalities to be greatly underutilised. This in turn discourages innovators—expecting lower uptake—from attempting to develop such technologies in the first place, reducing R&D investment in the greenovation sector below the socially optimal level.

15.3 Counteracting the Headwind Against Greenovations

This classic market failure can be mitigated through political action, specifically through governments instituting environmental regulations, levies on emissions, or green subsidies, all of which incentivise the choice of green technologies by prohibiting, limiting, or discouraging the use of their dirtier alternatives. Among these three options, emission levies—denominated as a certain monetary charge per metric ton of CO₂e emitted (\$/tCO₂e)³—seem especially suitable because they favour the development and deployment of the most cost-effective greenovations while avoiding unfair burdens on non-polluting taxpayers (who would contribute to the cost of green subsidies). By penalising actors for present and future harm caused by their emissions, such levies shift their incentives towards deploying greenovations, which in turn stimulates green R&D investment.

Environmental regulations might be said to share the advantage of favouring the development and deployment of those greenovations that can achieve the most cost-effective compliance. But they ensure only “local” cost-effectiveness, in each area of regulation. They do not ensure that all the many regulations (of air traffic, cement production, oil well maintenance, animal feed, etc.) are holistically designed to instantiate the same marginal cost–benefit threshold. Even the best of experts, continuously monitoring and adjusting all the diverse regulations in view of changing technologies and circumstances, would fall well short of maintaining an optimally

² The relative loss amounts to 2 million years of human life because each of the 50 (=150–100) devices not licensed would have averted the loss of 40,000 life years. The patentee’s \$50,000 in extra earnings are the difference between licensing fees of $100 \times \$20,000$ *versus* $150 \times \$13,000$.

³ ‘CO₂e’ stands for CO₂equivalent, a measure that converts other greenhouse gases according to their global warming impact over a specific time horizon (such as 20 or 100 years). Specifying the time horizon is important, because different greenhouse gases fade from the atmosphere at different rates. Methane (CH₄), for example, has over 80 times the warming potential of CO over a 20-year horizon, but only about 30 times its warming potential over 100 years. While a 100-year time horizon is commonly used, I favour a 20-year horizon, which assigns higher importance to short-lived gases like methane. This can be justified by the crucial importance of the level at which we can get global warming to peak. The higher this peak, the more deeply the Earth’s patterns will be disturbed, with increasing risks of potentially massive positive feedback effects on its future climate. It is worth mentioning that, while CO₂ and CH₄ contain carbon, other important greenhouse gases—such as N₂O, SF₆, and NF₃—do not. I therefore avoid expressions like “carbon emissions” and “carbon neutrality”.

cost-effective design. Being subject to various political pressures, real-world politicians fall short to an even greater extent. It is better, then, to impose a simple levy on emissions, or an overall emissions ceiling with market trading, to incentivise emission reductions according to their cost-effectiveness.

Leaving the imposition of such emission levies to national decisions replicates the second collective action problem: each country imposing such a levy bears its full economic cost while gaining only a small fraction of its ecological benefit. States being disadvantaged when they charge a higher emission levy than other states, there is a competitive pull towards lower levy rates, which makes it difficult for any state to lead by example and makes achieved agreements vulnerable to unravelling into a race to the bottom. This collective action problem helps explain why the total amount charged as emission levies—US\$84 billion in 2021 (Twidale 2022)—is still much too low relative to the great present and future harms caused by current emissions. Less than a quarter of all emissions worldwide are subject to any kind of levy, and levy rates are often much too low to have a meaningful impact on investment decisions (Jessop and Twidale 2022). More widespread levies on our actual 40-plus billion tCO₂e of anthropogenic emissions, at more appropriate rates of US\$50–100/tCO₂e, would have raised somewhere around US\$3 trillion in 2021, some 36 times more than the actual amount.

This international collective action problem has a straightforward solution: an agreement among states to impose national emission levies at the same rate, ensuring that no state gains a competitive advantage and that every state shares in the cost of reducing emissions. International uniformity also ensures global cost-effectiveness: the cheaper any specific emissions are to avert, the stronger the incentive to avert them. Ideally, such a globally uniform levy should be high enough so that the negative externalities of any remaining emissions are fully internalised: those who benefit from activities associated with harmful emissions pay, embedded in the cost of their activity, a proportional penalty at a globally uniform rate (\$/tCO₂e).

Such globally uniform national emission levies are politically difficult to institute in a world of over 200 sovereign states against heavy political resistance from fossil fuel owners, producers, and consumers, who work hard in many countries to prevent or reduce national emission levies.

15.4 How TRIPS with a Global Price on Emissions is Unfair to Poor Populations

There are two further kinds of resistance specifically from the Global South. One is the moral argument that the developing world should not have to impede its own economic development by putting a price on emissions, given that the presently high-income countries became wealthy by emitting with abandon when they passed through similar phases in their development. Here the South is, as it were, saying to the North: “you say that you did nothing wrong when your economic development

imposed heavy losses and damages on the rest of the world” (cf. Milman 2022) and that you owe us no part of your accumulated riches as compensation. How then can you demand that we refrain from pursuing a similar development path, unhampered by ecological restraints? This argument has rhetorical appeal. But then the people most vulnerable to air pollution and climate change are in the Global South. Constituting an ever-increasing share of the global total, emissions originating in the Global South are harming and killing mostly people in the Global South.⁴

The other source of Southern political resistance to globally uniform national emission levies is the distribution of ownership of green patents, which mostly belong to originators in affluent states. Putting a price on emissions creates incentives to deploy green innovations, of which some 15,000 are newly patented each year in the USA alone, and over 13,000 in India.⁵ This makes emission levies profitable for patentees who can increase sales, even at higher prices, because the deployment of their green technology now produces large savings in emission levy costs. Such increased monopoly rents have the welcome effect of attracting additional R&D investments to the green technology sector, thereby accelerating the pace of green innovation.

But there is a snag. Patent holders are heavily concentrated in wealthier countries, including China, whose innovative corporations, often with government support, have the capital and human resources to advance the innovation frontier. Firms in lower-income countries are less able to compete effectively. This asymmetry in innovation capacities creates an asymmetry in the flow of patent income: far more of it flows South-to-North than North-to-South. Uniform emission levies would exacerbate this imbalance, and lower-income countries are understandably reluctant to support such redistributive capital outflows. This reluctance is reinforced by the preceding realisation that the North became wealthy on a “dirty” path of economic development. Why should lower-income countries impose on themselves an emission levy that would cause them to bleed wealth to the vastly richer Global North for permission to help avert a global disaster that the North has unleashed through its disproportional production and consumption? This compelling question indicates not merely a political but also a moral obstacle to globally uniform national emission levies. It would be unjust to arm-twist poorer countries into accepting such an agreement and unjust also for their governments to impose it on their populations.

Such arm-twisting is central to the Climate Club idea that—pioneered by William Nordhaus—is being promoted by some affluent states. It envisions creating a club of states that meet two requirements:

⁴ For details, see Vohra et al. (2021) and also the series of essays in the *New England Journal of Medicine* on the topic: Fossil-Fuel Pollution and Climate Change, <https://www.nejm.org/doi/full/10.1056/NEJMe2206300>. Also disproportionately affecting people in the Global South are the other negative effects of human emissions such as extreme weather events, the expanded reach of tropical diseases, and the increasing scarcity of food and water.

⁵ See <https://stats.oecd.org/index.aspx?queryid=29068> for the United States, and for India see <https://changelisted.com/green-innovation-and-green-patents-in-india/>

- Each member imposes an emission levy within its jurisdiction, starting at a certain level and then gradually increasing on a pre-agreed schedule (Nordhaus uses a base level of US\$50/tCO₂ in 2025, set to increase 3% annually in real terms).
- Each member state imposes a flat tariff (Nordhaus envisions 5–10%) on all imports from exactly those states that refuse to be members (Nordhaus 2021).

This Climate Club proposal appears fair because it treats all countries equally. But in fact, it is profoundly unfair by ignoring great differences among them. Three are especially important.

- Some countries are more than 100 times more affluent than others and therefore can much more easily afford to slow their economic development.⁶
- Those richer countries became rich in emission-intensive ways, causing great harm, especially to poorer populations; emissions of just the USA during the 1990–2014 period have caused damages abroad estimated at nearly US\$2 trillion (Milman 2022).
- By greatly multiplying the use of green innovations, worldwide emission levies would greatly increase income from green patents, mostly owned by Northern corporations. Poorer countries would suffer substantial new capital outflows.

Forcing lower-income countries to join such a club on pain of cancelling their free-trade privileges would aggravate the injustice of the global economic order.

One obvious way of avoiding such injustice is to exempt lower-income countries from the punitive tariffs, allowing them to stay outside the Climate Club without penalty.⁷ But this solution damages the urgent struggle to reduce emissions. Although US emissions are eight times higher *per capita*,⁸ we must not ignore India's emissions, which are quite large already and may grow massively as India's economy expands further.

Currently, incentives to deploy green technologies are far too weak in the Global South, leading to their massive underutilisation. An example of coal-fired power plants may illustrate this. Mitsui Babcock charged manufacturers of steam boilers about US\$1.5 million per 600 MW boiler for using its patented "ultra-supercritical" technology (Tan and Seligsohn 2010, p. 7). Consequently, many plants in India and other lower-income countries deployed less efficient subcritical or supercritical technologies (Barnes 2016, p. 4) that will generate up to 30% higher emissions for decades.⁹

Scant deployment of green technologies in the Global South is a big problem. In the remainder of this twenty-first century, many of these countries may experience

⁶ The World Bank reports that, in 2021, gross national income averaged US\$722 in the 28 low-income economies and US\$47,904 in the 81 high-income economies, with the full spectrum reaching from Burundi's US\$240 to US\$116,540 in the Bahamas. <http://wdi.worldbank.org/table/WV.17>

⁷ Club members could nonetheless institute a carbon border adjustment in order to neutralise the incentive to move polluting activities from Club countries to countries in the Global South.

⁸ <https://data.worldbank.org/indicator/EN.ATM.CO2E.PC>

⁹ If only 35 rather than 45% of the coal's energy content is converted into energy, then one must burn 30% more coal to generate the same amount of electricity (Pearce and Prater 2020).

massive economic growth, intensified by large population increases. The technologies they will use, the practices and habits they will form, and the roles they will be prepared to play in the fight for a liveable planet will matter far more than any choices affluent nations will make within their borders.¹⁰ Rapid emission reduction requires that highly effective and locally appropriate green technologies be widely and quickly deployed throughout the Global South.

These reflections define our task. We need a structure that

- provides cost-effective incentives towards developing and deploying green innovations worldwide,
- treats countries of the Global South fairly, and,
- mainly for viability, preserves the patent regime in its present globalised form.

One obvious way to conceive such a structure would supplement the global Climate Club with side payments compensating low-income countries for the outflow of royalties and licensing fees. For each such fee that users of a greenovation in a country of the Global South pay to Northern patentees, Northern states would make a compensating payment to the Southern country concerned. This idea should be studied further. But let us here explore another solution that, distributively similar, is more efficient and politically more realistic.¹¹

15.5 An Ecological Impact Fund (EIF)

Emission levies have the great merit of substantially increasing deployments of green technologies, thereby also accelerating the pace of green technology progress by stimulating green R&D. But they do not alter the fact that green technology patents impede the diffusion of patented products by adding a supra-competitive markup to their price. Despite the substantial deadweight losses they entail, such inflated prices seem appropriate in many cases where willing buyers pay a monopoly markup on a novel product they prefer—on a novel watch or toy or cosmetic, perhaps—and thereby ensure that judicious investments in desirable innovations are incentivised. In such cases, buyers and originators benefit without directly imposing costs upon third parties.¹² But inflated prices are highly undesirable in the green technology sector, where we urgently need wide and fast deployment.

¹⁰ For example, Sub-Saharan Africa's electricity production will increase dramatically as its *per capita* consumption—currently well below 2% of the US level—will catch up and its population will increase from the current 1.2 billion to about 4 billion by 2100.

¹¹ This proposal was initially suggested in Pogge (2010) and Walsh (2011).

¹² The patent imposes the indirect cost of preventing third parties from making the patented product and from selling it to, or buying it from, one another. This is not important with products one can easily do without. But it is hugely important in regard to essential medicines, for example, as millions have died because they could not afford life-saving products priced hundreds of times above cost of production. In the pharmaceutical sector, patents also spawn research neglect of diseases concentrated among the poor and discourage holistic strategies of containment and eradication of

The Ecological Impact Fund promotes this goal by inviting originators to EIF-register any new green technology, with two legal effects in all countries below a specified *per capita* income:

- The originator permanently forgoes, throughout the EIF-Zone, any monopoly rents it could earn from its registered technology; and
- The EIF rewards this technology for the emissions averted with it in the EIF-Zone through deployments completed within a six-year period.

The EIF would doubly support the diffusion of green technologies in the EIF-Zone: by avoiding the headwind of monopoly markups and by adding the tailwind of impact rewards. This substitution of impact rewards for monopoly rents transforms originator motivations. While the latter incite considerable efforts to find, stop, prevent, and deter patent infringements, impact rewards encourage originators actively to promote the rapid, frequent, and effective deployment of their greenovation for increased impact earnings. Even without profiting from its sales price, such originators would promote its effective use by providing technical support, maintenance, and sometimes even subsidies—insofar as they expect the increase in impact rewards earned through such promotional investments to exceed their cost.

EIF rewards might be paid through preannounced annual disbursements that could be scaled up over time. Any patentable new green technologies could be registered for participation in six consecutive disbursements, each divided among registered innovations according to emissions averted with them in the EIF-Zone in the preceding year. This principle of division ensures fairness among participating originators, who are rewarded in proportion to emissions averted, all at the same reward-to-benefit rate (\$/tCO_e).

Because participation is optional, this EIF's reward rate emerges endogenously and equilibrates to a level that makes participating originators content with their EIF-Zone-limited swap: permanent waiver of monopoly rents in exchange for six years of impact rewards.¹³ When originators find the going rate unattractive, registrations dry up and the reward rate rises as older innovations exit at the end of their reward period. When the reward rate is seen as generous, registrations multiply, and the reward rate declines. Such equilibration reassures participating originators and contributors that the reward rate will be fair between them, and stable over time.

communicable diseases (Pogge 2022). As the COVID pandemic has shown once again, pharmaceutical firms benefit when poor populations, shut out by high prices, proliferate a disease and become breeding grounds for the evolution of new variants.

¹³ The precise length of the reward period is not important because the reward rate adjusts to it: with a longer/shorter reward period, the number of registrations will remain roughly the same, but each registered greenovation will receive smaller/larger annual payments for a larger/smaller number of years. The reward period should not be so short that some registered innovations do not have a decent chance to establish themselves in the EIF-Zone—a problem that can also be mitigated by allowing registrants to defer their reward period. Nor should it be so long that the EIF rewards some old and obsolete greenovations that are no longer cutting edge. A shorter reward period has the further advantage of reduced assessment expenses.

The easiest way for registrants to relinquish their potential monopoly rents in the EIF-Zone is not to apply for patents there. This would save the registrant money while allowing multiple manufacturers to sell the technology in the EIF-Zone at competitive prices. Alternatively, a registrant might patent the registered greenovation in some or all EIF-Zone countries and then, during the patent period, offer cost-free licenses to those who want to produce or sell it there.¹⁴ Either way, the registrant would be free to manufacture and sell the registered technology too, but would have to do so, in the EIF-Zone, at a competitive price. Deriving its earnings from impact rewards, the registrant would be motivated to ensure that its registered technology is widely and cheaply available throughout the EIF-Zone and used for optimal impact. To this end, the registrant would collaborate with manufacturers and sellers of its technology and keep its own sales price low, often even below cost.

The EIF should be designed so that its reward rate equilibrates to a low level, making it as efficient (tCOe/\$) as possible at averting emissions. For this reason, the EIF should not demand too much from registrants. This thought motivates limiting the EIF to lower-income countries. Because demand for greenovations at monopoly prices is much weaker there, limiting the EIF to those countries greatly reduces the opportunity costs of EIF registration, and therefore the EIF's endogenous reward rate (\$/tCOe), while correspondingly increasing its ecological impact relative to the amounts it disburses (tCOe/\$). The exact qualification for membership in the EIF-Zone could then be based on the same desideratum: the EIF-Zone should include the countries in which uptake of patented green technologies has been poor. This would likely include at least the ca. 120 countries whose annual *per capita* gross national incomes fall below \$10,000.

Other design questions can be approached with the same guideline. Thus, consider whether, during the reward period, the registrant should have the option to offer its registered technology at a non-profit price throughout the EIF-Zone without having to permit others to manufacture and sell it as well. If it turned out that many potential registrants strongly value this option, then this would be a reason to give it to them in order to lower their reservation price and thereby achieve a lower EIF reward rate.

15.5.1 Features and Virtues of the EIF

The EIF would organise a wide competition across the whole greenovation sector, including electricity generation, traffic, residential and office heating and cooling, construction, meat production, agriculture, forestry, and industrial manufacture of steel, cement, and other commodities. Across all these areas, the EIF would attract the greenovations that achieve the greatest emission reductions relative to cost as they would be the most profitable ones to register. By increasing the profitability of highly

¹⁴ An originator might prefer the latter option because it affords some control over follow-on innovations and facilitates monitoring of manufacturers and sellers in the interest of tracking all rewardable emission reductions.

cost-effective innovations, the EIF would also stimulate additional R&D investment into developing such innovations, thereby accelerating technological advances. Here the EIF would not “bet on” specific technologies or subsectors but would rely on the greater expertise of innovators, who estimate which R&D investments and which additional deployments will yield the greatest ecological benefits.

High-impact greenovations from all areas would be competing on one EIF-created market towards the single goal of averting emissions. In this competition, all participants can be winners, that is, earn more in rewards than they have invested. And a registrant with low EIF earnings can still be highly successful if its income is especially high relative to its investment.

Participation in this market would train originators to holistically organise their research, development, marketing, and delivery operations towards realising the most cost-effective impact. Covering R&D costs and originator profits as public goods, the EIF would make access to registered greenovations widely affordable at competitive prices—with registrants highly motivated to promote impactful deployments.

The EIF would boost the diffusion of high-impact green technologies in the EIF-Zone, with massive emission reductions in the lower-income countries. The constrained sales price, supplemented with impact rewards, would further benefit their populations by enabling originators to make good profits from selling to people who cannot pay high markups. This would encourage R&D that targets their specific needs in their specific circumstances: locally appropriate greenovations sensitive to socio-cultural context and congruent with equitable access so that they mitigate existing socio-economic inequalities. The EIF would open whole new areas of green R&D and accelerate the overall pace of green innovation.

Moreover, in the competition to develop greenovations geared to the Global South, innovators in the EIF-Zone would not face the usual crushing head start by Northern originator firms. The EIF would therefore also help build, in lower-income countries, capacities in R&D, manufacturing, distribution, installation, operation and maintenance of green technologies.

The evolving EIF reward rate would be indicative of the EIF’s efficiency—but would also understate it substantially because the EIF’s full ecological impact greatly exceeds the sum of the assessed and rewarded impacts of all EIF-registered innovations. This is so not only because the EIF confines the rewardable impact of a registered greenovation to deployments during the first six years. A more important reason is that, by accelerating the pace of innovation, the EIF raises the standard against which newly registered innovations will be assessed. Over time, this effect will become quite large. A greenovation registered in 2040 will be rewarded for the emission reductions it achieves relative to the alternatives being deployed in that year. But this 2040 state of the art will be far superior to what it would have been if the EIF had not existed for the preceding decade or more. This acceleration of green innovation is an achievement the EIF need not pay for. It is likely to be especially significant in classes of green technologies that, under the current regime, suffer neglect because they are suitable for use only in the Global South, are more expensive to manufacture and deploy than their dirtier alternatives or bring widely diffused benefits that buyers care little about.

15.5.2 *Towards Implementing the EIF*

An experimental pilot could test and refine the EIF idea and thereby make the adoption of the EIF more likely. This pilot might involve a single reward pool of, say, US\$100 million, to be split among preselected green originators in proportion to the emission reductions they achieve with their respective innovations, competitively priced, in a self-selected region of the EIF-Zone over a 2-year period. The pilot would show concretely how green originators respond to competitive impact rewards and how ecological impact can be assessed in a reliable and timely manner. It would help refine impact assessment and provide an indication of the cost-effectiveness of the new impact rewards. The EIF pilot would also yield its own ecological benefits and policy insights through the pilot projects it monitors and rewards.

The UNFCCC's Green Climate Fund—mandated to “promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions” (Green Climate Fund 2011, p. 2)—is well suited to administering the EIF and its pilot. Both should be supported by high-income countries, which can most easily afford the cost, have contributed most to the global climate emergency, and continue to benefit from the great wealth they have accumulated through their decades of high pollution. Supporting the EIF would help the high-income countries discharge their responsibilities under Sustainable Development Goals 13 and 17¹⁵ and to fulfil their 2009 promise to devote \$100 billion annually to climate change mitigation and adaptation in the developing world (Timperley 2021). The EIF would benefit high-income countries by reducing emissions and by augmenting the income innovative firms in the Global North derive from their green innovations.

The EIF has no optimal size. As its annual reward pools increase, it will attract more registrations, avert more emissions, and do more to accelerate technological progress. States and other contributors could monitor these effects and gradually grow the EIF in the light of the data so collected. They might start with modest annual disbursements of, say, US\$1 billion,¹⁶ raising this level gradually, perhaps with new contributors joining the partnership.¹⁷ With real data about its effects, the EIF will also be able to raise additional funds in the international offset markets. As the EIF grows, its reward rate will tend to rise as less efficient technologies get registered. But a larger EIF will also enjoy enhanced operational efficiencies (impact

¹⁵ “Take urgent action to combat climate change and its impacts” and “strengthen the means of implementation and revitalise the global partnership for sustainable development” (UNGA 2015, p. 14).

¹⁶ With a substantially smaller EIF, the costs of administration and impact assessment might consume too large a percentage of the EIF's budget.

¹⁷ Contributing states might agree on a contribution formula that would tie their annual contribution to their *per capita* gross national income (g) and population's size (p). For example: $p^* (g - \text{US\$}10000)/10000$. Pursuant to this formula, high-income countries would on average contribute about \$4 per year for each of their residents. With $p = 335,000,000$ and $g = 73,000$, the US share would initially amount to US\$2.1 billion annually, still far below the damage U.S. emissions inflict on foreigners (Milman 2022).

assessment and administration) and a greater impact on the pace of green innovation which increases that part of its ecological impact that the EIF need not pay for. In any case, the various financing commitments sustaining the EIF must be designed so that it can meet the legitimate expectations of registrants who have developed and registered a greenovation in anticipation of participating in six annual disbursements.

15.6 Conclusion

The EIF is politically realistic because it requires no painful concessions. It can be implemented unilaterally by a coalition of willing states, perhaps supported by other funders looking for new cost-effective ways of reducing emissions, perhaps to offset their own. Conferring clear benefits, the EIF would be welcomed by the countries of the EIF-Zone whose governments and populations would benefit from better and cheaper options for greening their activities, from domestic capacity building, from substantial declines in air pollution, and from a slowing of climate change. The EIF proposal will find support also among firms with significant green technology patent portfolios, as it would substantially increase their opportunities to earn money from developing and selling greenovations into the EIF-Zone while leaving them the choice of whether to pursue these opportunities. Green movements around the world would applaud the EIF, as would organisations concerned with living conditions in the Global South. Defenders of intellectual property rights would find the EIF palatable because it applies only to EIF-Zone countries and, with each greenovation, lets its originator choose between the two rewards. Some wealthy states might be initially reluctant to contribute to the EIF's cost—but others could and should readily proceed without them. The EIF would, as intended, reduce the use of dirty technologies throughout the EIF-Zone but would also give the firms selling them ample new opportunities to supply state-of-the-art green substitutes. With some G20 support, the EIF could be instituted without significant political resistance.

When assuming the G20 Presidency, Prime Minister Modi pledged to give effect to the voices and needs of the Global South and to pursue an agenda that is “inclusive, ambitious, action-oriented, and decisive”.¹⁸ The Ecological Impact Fund proposal is an attempt to live up to his lofty ambition. EIF for LiFE!¹⁹

¹⁸ <https://www.moneycontrol.com/news/opinion/g20-presidency-climate-change-and-fractured-world-order-emerges-as-main-challenges-10698991.html>

¹⁹ This chapter is adapted from Thomas Pogge (2023). An Ecological Impact Fund. *Green and Low-Carbon Economy*, 1(1), 15–21. For valuable discussions of the impact fund approach and its promising alternatives, the author thanks Aidan Hollis, Sebastian Kistler, Max Matthey, Zeke Ngcobo, Tobias Orthen, Benjamin Roth, and Halit Ünver.

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Chapter 16

One Health for a Sustainable Future



T. C. James

Abstract The COVID-19 pandemic (2019–2022) has drawn considerable attention to many aspects of health care which have been often ignored in the past. One of them is the link between human health and the health of other beings. The One Health concept recognizes the interconnectedness of human, animal, and environmental health, offering a holistic approach to address complex global health challenges. This chapter argues for the adoption of One Health, highlighting its significance in addressing zoonotic diseases, antimicrobial resistance, and climate change impacts on health. International initiatives and collaborations have endorsed One Health, aligning it with the United Nations' Sustainable Development Goals (SDGs). Despite its importance, One Health implementation faces challenges, including inter-sectoral coordination, regulatory policies, funding, and political commitment. The G20 has a critical role in promoting One Health, and this chapter outlines a way forward for G20 leadership to advance this agenda. By embracing One Health, we can foster a more sustainable future, protecting the health of all.

16.1 Introduction

The COVID-19 pandemic (2019–2022) has drawn considerable attention to many aspects of health care which have been often ignored in the past. One of them is the link between human health and the health of other beings. The increasing number of zoonotic diseases as well as higher incidences of antimicrobial resistance (AMR) has become a matter of concern for national and international policymakers in health care. This has led to a renewed interest in the One Health approach.

The uniqueness of the One Health (OH) concept is that it acknowledges the interconnectedness of human, animal, plant, and environmental health. It recognises that the health of these domains is interdependent and that problems in one domain can have consequences in others. It involves a holistic and integrated approach to the

T. C. James (✉)

Research and Information System for Developing Countries (RIS), New Delhi, India

health and wellbeing of all living organisms and the ecosystem that sustains them. It promotes a collaborative, multi-sectoral, and transdisciplinary approach.¹

The discovery of *Trichinella spiralis* in pork by the German physician and pathologist Rudolf Virchow in the nineteenth century leading to the introduction of public health measures was an instance of an early application of the OH concept in a limited way.² Subsequently, many discoveries have been made of migration of pathogens from animals to humans, and these have brought home the salience of the concept of One Health in public health care. Initially, the stress was on collaboration between the professionals of human health and animal health and the importance of general hygiene. Public health specialists are now emphasising environmental factors like access to clean air and potable water for good health and also the need for the conservation of biodiversity. A One Health initiative was founded in 2006³

16.2 An Argument for One Health

There are two sets of global challenges which have relevance for health: one set has direct impact and the other has indirect influence. Those with direct impact are zoonotic diseases, AMR, and so on are the issues connected with climate change, biodiversity loss, and food security. OH can play a major role in tackling both these sets of challenges since the approach now consists of preventing outbreaks of zoonotic diseases in animals and humans, improving food safety and security, reducing AMR infections, improving human and animal health, protecting global health security, and preserving biodiversity and conservation⁴.

Zoonotic diseases have been on the rise in the recent past. There have been several instances in this century itself. Severe Acute Respiratory Syndrome (SARS) emerged in 2002. It is believed to have originated in bats and spread to humans through intermediate hosts such as civet cats. Avian influenza (H5N1) or bird flu in 2003 was transmitted from birds to humans. Middle East Respiratory Syndrome (MERS) in 2012 is believed to have originated in camels. Ebola virus disease in 2014 got transmitted to humans from bats. COVID-19 was the latest in the series which also might have originated in bats. As per a WHO agenda paper, citing an article in *Nature*,⁵ globally, about one billion cases of illness and millions of deaths occur every year from zoonoses. More importantly, around 60% of global infectious diseases are zoonoses. The paper also mentions that over 30 new human pathogens have been detected in the last three decades, 75% of which have originated in animals⁶. CDC also echoes this when it states that “more than 6 out of every 10 known infectious diseases in

¹ One Health Basics available at <https://www.cdc.gov/onehealth>.

² (Gyles 2016).

³ One Health Initiative. Available from: <http://www.onehealthinitiative.com>.

⁴ Supra 1.

⁵ Jones et al. (2008)

⁶ <https://www.emro.who.int/fr/pdf/about-who/rc61/zoonotic-diseases.pdf>.

people can be spread from animals, and 3 out of every 4 new or emerging infectious diseases in people come from animals”.⁷ The WHO agenda note goes on to state that zoonotic diseases can have devastating impacts with severe economic consequences for the countries through loss of trade, tourism, and consumer confidence. All these point to the need for a health programme that takes care of both humans and animals.

The increasing AMR is another public phenomenon that buttresses the need for an OH approach since it involves the interaction of human, animal, and environmental factors. The widespread use of antibiotics in agriculture, particularly in livestock, has led to the development of antibiotic-resistant bacteria in animals which can be transmitted to humans through food, water, or even contact. They can persist in soil, water, and air and spread to humans later. Coupled with this is the overuse and misuse of antibiotics in humans themselves. As per WHO’s *Global Antimicrobial Resistance and Use Surveillance System (GLASS) Report, 2022*, high levels (above 50%) of resistance were reported in bacteria frequently causing bloodstream infections in hospitals. There is increasing resistance to treatment in several bacteria-caused common infections. As per a report in *The Lancet* in January 2022, an estimated 1.27 million deaths were a direct result of antibiotic-resistant bacterial infections in 2019⁸.

Climate change poses many threats to the health and wellbeing of all living beings. It affects the social and environmental determinants of health such as clean air, safe drinking water, and nutrition. It can lead to many diseases such as malaria, diarrhoea, and heat stress. The WHO estimates that between 2030 and 2050, climate change is expected to cause 250,000 additional deaths⁹. Food security is an important determinant of nutrition, and climate change affects agriculture adversely and also biological diversity. According to a report by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), up to one million plant and animal species are threatened with extinction, many within decades. The number of species classified as threatened or endangered has increased since 1992, with over 30,000 species currently listed as threatened with extinction on the International Union for Conservation of Nature (IUCN) Red List. Biodiversity loss has significant impacts on human wellbeing, including impacts on food security, clean air, and safe drinking water.

⁷ Efgh.

⁸ Fernandez (2022)

⁹ <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>.

Environmental factors also affect health. The WHO estimates that 23% of global deaths in 2012 are attributable to the environment¹⁰. Air pollution causes 29% of all global deaths from lung disease, 24% of all global deaths from stroke, and 17% of all global deaths and diseases from acute lower respiratory infection. As per the WHO Fact sheet, the combined effects of ambient air pollution and household air pollution are associated with 6.7 million premature deaths annually¹¹. Climate change and environmental factors affect not only human beings but all living organisms. Diseases can and do transmit from one species to the other. Therefore, health policies and strategies have to take a composite view, that is, the OH approach which considers the health of humans, animals, plants, and the environment together.

International organisations like the World Health Organisation (WHO), Food and Agricultural Organisation (FAO), United Nations Organisation (UNO), and so on have been strong advocates of the OH approach. The WHO developed a strategic framework for implementing the OH approach in 2018. It contains the major elements of the strategy and guidance on how to implement the same at the national, regional, and global levels. It has also been conducting research and providing technical guidance to member countries on various OH issues like zoonotic diseases, AMR, and food safety. It has also included OH as a key component of its Global Health Security Agenda, which is meant to strengthen the prevention of the spread of infectious diseases. Further, the WHO has been collaborating with other organisations like FAO and the World Organisation for Animal Health in OH programmes¹². The FAO also developed an OH strategy in 2016. It shows its commitment to the approach and provides a clear roadmap for its implementation. The strategy involves addressing zoonotic diseases, AMR, and food security, three vital elements of the OH approach. Like WHO, it also provides technical assistance to governments and other stakeholders in the implementation of OH programmes and also conducts research and collects data on various OH issues¹³. The United Nations Environmental Programme (UNEP) has long been advocating for the integration of environmental considerations in public health policies and encouraging policy dialogue to promote OH. UNEP also provides technical assistance and contributes to capacity building to countries on OH programmes and in Southeast Asia has established a One Health Partnership for Zoonoses to strengthen the collaboration among different sectors and promote an OH approach to disease prevention and control¹⁴. The World Organisation for Animal Health (WOAH or OIE) develops and promotes international standards on animal health and welfare, which are used by its member countries to prevent and control the spread of animal diseases. It has already developed standards on the use of antimicrobials in animals, to help address the issue of antimicrobial resistance.

¹⁰ <https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/per-cent-of-total-mortality-and-burden-of-disease-attributable-to-the-environment-by-region>.

¹¹ <https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health>.

¹² <https://www.who.int/news-room/fact-sheets/detail/one-health>.

¹³ <https://www.fao.org/one-health/en>.

¹⁴ <https://www.unep.org/news-and-stories/opinion/one-health-one-planet>.

The WOAH supports the surveillance and monitoring of animal diseases, including zoonotic diseases, through its World Animal Health Information System (WAHIS). This helps to identify and respond to disease outbreaks quickly before they spread to humans.¹⁵

The collaboration among these organisations has led to the establishment of the One Health High-Level Expert Panel (OHHLEP) in 2021 as a joint initiative to provide guidance and recommendations on the OH approach. The panel includes experts from various sectors and regions, including human and animal health, environment, and social sciences. It has developed an OH action plan to guide the implementation of the OH approach at national and global levels, which has identified six priority areas including cross-sectoral collaboration, improving surveillance and early warning systems, and promoting evidence-based decision-making. It has also provided recommendations on COVID-19 and other zoonotic diseases, based on the One Health approach, which focuses on prevention, detection, and response to zoonotic disease outbreaks, as well as addressing the underlying drivers of disease emergence. OHHLEP has emphasised the importance of research and innovation in advancing the OH approach and has called for increased investment in research on zoonotic diseases, AMR, and other OH issues, as well as promoting the development of innovative tools and technologies for disease surveillance and control. The OHHLEP has several plans for the future to further promote and implement the OH approach. They include developing guidance and tools to support the implementation of the OH approach at national and global levels, such as developing guidance on OH surveillance, risk assessment, and communication, as well as developing tools for cross-sectoral collaboration and joint decision-making and plans to build capacity on OH issues through training programmes, workshops, and other capacity-building initiatives, promoting multi-sectoral partnerships and collaboration involving stakeholders from different sectors, such as agriculture, environment, and social sciences, to identify shared goals and develop joint strategies for addressing the OH challenges.¹⁶

These initiatives have pushed the OH approach to the main table of the global health agenda though many a time when health projects are drawn up at national and global levels, programmes that address specific health indicators get more attention. However, the compulsions to take OH forward and the challenges to the same are many, as brought out above. Besides those arguments, an equally important reason for OH is that the concept and approach gel with the current global agenda of Sustainable Development Goals (SDGs).

¹⁵ <https://www.woah.org/en/what-we-do/global-initiatives/one-health/>.

¹⁶ https://cdn.who.int/media/docs/default-source/one-health/ohhlep/ohhlep-annu-al-report-2021.pdf?sfvrsn=f2d61e40_10&download=true and <https://www.who.int/groups/one-health-high-level-expert-panel/meetings-and-working-groups>.

16.3 One Health and SDGs

Sustainability is fundamental to the OH approach. It proposes the achievement of sustainable development by recognising the interconnectedness of human, animal, and environmental health and promoting collaboration across sectors and disciplines. It, therefore, fits in with the current focus on SDGs and can contribute to achieving several SDGs, particularly SDGs 2, 3, 6, 13, and 15.

By its stress on promoting sustainable agriculture, improving food security and safety through the prevention and control of zoonotic diseases, and enhancing animal health and productivity, OH can play a crucial role in ending hunger and improving nutrition. Some of the specific ways it can contribute are by (a) promoting sustainable and diverse food systems including milk and other dairy products, fish, fruits, and vegetables, (b) improving food safety by reducing the incidence of foodborne diseases, and (c) addressing the impacts of climate change on food systems and their ability to provide adequate nutritious food for all.

A major element of the OH approach is the prevention and control of zoonotic diseases by addressing the root causes such as the destruction of natural habitats, unsustainable farming practices, and illegal wildlife trade. This approach can certainly reduce the risk of disease transmission and improve human health outcomes. By taking an integrated approach to health care, OH can improve the delivery and accessibility of healthcare services to communities in need. By reducing the use of antibiotics in livestock farming, improving food safety standards, and increasing access to safe and nutritious food, OH can help prevent the spread of diseases through the food chains and ensure better health outcomes. This will address the risk factors that contribute to the development of Non-Communicable Diseases (NCDs), such as poor diet. The OH approach promotes sustainable land use practices, reducing pollution and waste, and protecting biodiversity, thereby contributing to environmental sustainability. Reduction of exposure to environmental toxins can also reduce the incidence of NCDs. All these contribute to the achievement of health and wellbeing for all.

By identifying and controlling the sources of pollution in wastewater and developing new technologies for treating wastewater, OH can help in the prevention of waterborne diseases in humans and improve the health of aquatic animals. Adoption of the OH approach ensures that water used for agriculture is managed sustainably and that it does not contribute to water scarcity or pollution. The adoption of the OH programme and approach in Kenya in 2004 has led to rapid detection and control of zoonotic disease outbreaks at their source. The approach involved promoting water treatment, hygiene, and sanitation, as well as animal vaccination and deworming to reduce animal faecal contamination of water sources.¹⁷

OH approaches are critical for addressing challenges associated with climate change as well as protecting, restoring, and promoting sustainable use of terrestrial ecosystems, as they recognise the complex interactions between human, animal, and environmental health. They can contribute to developing and implementing

¹⁷ Munyua et al. (2019).

strategies to mitigate and adapt to the health impacts of climate change, promoting sustainable land use and agricultural practices that reduce greenhouse emissions, and encouraging sustainable practices that reduce deforestation, conserve biodiversity, and promote ecosystem health. By promoting healthy ecosystems and biodiversity conservation, it can provide healthy habitats for wildlife. Conserving habitats for wild pollinations, such as bees, can help to support biodiversity. Protecting natural resources such as water and soil is part of OH programmes.

To sum up, the OH approach goes well with the SDGs. There are many OH initiatives which directly impact health such as the Amazonian Tropical Bites Research Initiative (ATBRI) which is administered across nine countries in the Amazon basin, namely, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Surinam, and Venezuela, and covers rabies, snakebite envenomation, and many vector-borne NTDs such as Chagas disease and Leishmaniasis. It provides for the coordination of different sectors and inclusion of all stakeholders to generate evidence for policy-making, promoting governance and linkage across a One Health arena.¹⁸ All member-states of the European Union have implemented One Health AMR National Action Plans.¹⁹ Thailand has been successful in implementing OH approaches to address emerging infectious diseases.²⁰ Tamil Nadu in India launched many years ago a rabies control initiative using the OH approach.²¹

16.4 Challenges in Implementing One Health

Implementing a One Health approach can be challenging due to a variety of factors. These may vary from country to country. One of the biggest challenges is the siloed approach to health and environmental management, existing in most countries, where each sector operates independently without considering the impact of their actions on other sectors. It is essentially an issue of governance but it can lead to a lack of coordination and communication, making it difficult to implement a One Health approach, intersectoral cooperation and an integrated approach is crucial for the success of One Health programmes.

Another challenge is securing adequate funding for One Health initiatives. The World Bank estimates that between \$10.3 and 11.5 billion, a year is needed to implement One Health globally.²² Many organisations and governments may not recognise the value of OH approaches or may prioritise funding for other areas, such as disease-specific research or treatment. Statistical outcomes of One Health programmes take a

¹⁸ Taylor et al. (2023)

¹⁹ European Commission's Overview Report on the Review of Member States' One Health National Action Plans Against Antimicrobial Resistance (2022).

²⁰ Sommanustweechai (2017)

²¹ Abbas et al. (2011)

²² As quoted by WHO in 'One Health in G20 Countries', December 2022. <https://www.who.int/news/item/23-12-2022-one-health-in-g20-countries>.

long time to come, and funding sources are generally more interested in measurable and perceptible immediate results.

In many cases, policies and regulations may not support or incentivise One Health approaches. For example, regulations for land use, food safety, and animal welfare may be developed without considering their impact on human and environmental health. Here the fragmented and one-track approach and many a time the political necessity to respond to the demands of different groups make it a serious challenge to implement the OH approach. Implementing an OH approach requires collaboration and coordination across different sectors, which can be challenging if there is a lack of expertise or capacity in certain areas. This can be particularly challenging in low- and middle-income countries, where resources and expertise may be limited. There may be cultural or social barriers to implementing One Health approaches, particularly when it comes to working across different sectors or engaging with traditional healers or community members. At the same time, traditional medicine is capable of contributing to sustainable health because of the close linkage of therapies with nature as well as its stress on prevention rather than cure.

Overcoming these challenges requires strong leadership and coordination, as well as a commitment to addressing the root causes of global health and environmental challenges. It also requires investment in building capacity and expertise in areas such as surveillance, data analysis, and risk communication, as well as a commitment to promoting a culture of collaboration and interdisciplinary thinking.

16.5 G20 and One Health

One Health approach is not entirely new to G20. During the German presidency of the G20 in 2017, the health sector priorities included infectious diseases and AMR and the *Berlin Declaration of the G20 Health Ministers* recognised the importance of OH in addressing health challenges and committed themselves “to strengthen the One Health approach within the G20, while fully respecting the specific mandates of the WHO, OIE and FAO”²³. The declaration made a strong commitment to lead by example and to have in place multi-sectoral National Action Plans on AMR based on the One Health approach. The declaration emphasised the need for surveillance and early warning systems for emerging infectious diseases, as well as the importance of responsible use of antibiotics. During the Saudi Arabian presidency in 2020, the *G20 Leaders’ Declaration* reiterated this commitment and said that they would “continue tackling antimicrobial resistance (AMR) and zoonotic diseases based on the One-Health approach”²⁴. A *Call to Action on Building One Health Resilience* was drafted by the Italian G20 Presidency in 2021²⁵. It restated the commitment to operationalise One Health approaches at all levels in G20.

²³ Berlin Declaration of the G20 Health Ministers (2017)

²⁴ G20 Riyadh Summit (2020)

²⁵ https://www.salute.gov.it/imgs/C_17_paginaAree_5459_10_file.pdf.

In the G20 Health Ministers' Meeting in 2022 during the Indonesian presidency, the Lombok G20 One Health Policy Brief was approved. It stated unambiguously that global health challenges necessitated an OH approach and adopted seven recommendations for countries to scale up this integrated approach: These are (1) raise awareness and advocacy for OH priorities, (2) identify gaps and opportunities, (3) improve OH governance, (4) support OH funding or investment, (5) use the OH Joint Plan of Action as a blueprint for action, (6) implement the OH approach in all relevant policies, and (7) facilitate OH research, knowledge, and capacity. The Policy Brief also referred to promoting health and Sustainable Development Goals (SDGs), through the adoption of the One Health approach.

The One Health theme has thus been running through the G20 forum approvingly for the last many years. The G7 has also been supportive of the idea of OH. In 2015, the G7 Health Ministers' Meeting adopted a declaration that recognised the importance of OH in addressing global health challenges. The declaration emphasised the need for collaboration between the human, animal, and environmental health sectors to prevent and control infectious diseases, including zoonoses. The G7 countries also pledged to support capacity building for One Health research and implementation in low- and middle-income countries. In addition, the G7 Charlevoix Health Commitment in 2018 reaffirmed the importance of OH approaches in addressing global health challenges, including antimicrobial resistance and emerging infectious diseases. The commitment emphasised the need for increased research and development of new tools and interventions to address these challenges, as well as the importance of international cooperation to prevent and respond to health threats.

16.6 Way Forward for G20

Although the G20 has been making declarations and reaffirming its commitment to the OH approach in the past, it has to chalk out specific steps to make OH the predominant approach towards the achievement of sustainable health. The seven recommendations in the *Lombok G20 One Health Policy Brief* form a good roadmap for this. How to translate these recommendations into action is the challenge. The G20 can consider establishing a task force with experts from the human, animal, and environmental health sectors to promote collaboration and integration. The task force can identify priority areas for action and develop strategies to address these areas. This will be different from the OHHLEP and will be one of G20 only to take stock of the situation and push the programmes further.

Funding is a major challenge in all international programmes and OH is no exception, as mentioned above. What the G20 can do is prioritise funding for One Health research and innovation, including research on zoonotic diseases, AMR, sustainable agriculture, and environmental health. This would include funding for interdisciplinary research collaborations and innovation in healthcare technologies that promote One Health. It can think of establishing a fund for the same.

In addition to the above, as a group, it should support the development of policies and guidelines that promote OH such as sustainable agriculture, responsible use of antibiotics, and encourage collaboration among different sectors of health. It can also promote sharing best practices and developing joint initiatives in OH. Finally, by prioritising One Health and taking collective action, the G20 can help promote a sustainable future for all. These potential ways forward could provide a framework for the G20 to work towards this goal and for member countries to take action towards promoting One Health in their contexts.

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Chapter 17

Climate Change, Environment, and One Health



Ruby Pawankar, Cezmi A. Akdis, and Kari Nadeau

Abstract Global epidemiological studies have revealed that climate change has led to a decrease in biodiversity and has been responsible for the pollution of air, water, and food, including the presence of microplastics. These factors have contributed to the rise of various non-communicable diseases (NCDs). As a result, the overall expenses related to healthcare, work productivity, mental health, and the economic situation of nations, particularly those with limited resources, have been adversely affected. The human exposome, epithelial barriers, microbiome and immune system are all affected leading to an impact on immune health. These have led to a higher prevalence of NCDs such as diabetes, arthritis, cardiovascular diseases, obesity, cancer, asthma and allergies. Vulnerable and underserved populations such as children, pregnant women, migrants those with underlying disease, the elderly and indigenous people are particularly burdened by the health effects of climate change. Wild and domestic animals and food chains are also severely affected by the same factors. One Health is an interdisciplinary approach calling for collaborative efforts of working locally, nationally, and globally, to attain optimal health for people, animals and our environment because of their interconnectedness. To reverse planetary degradation, achieve sustainability and reduce the risk of potential disease outbreaks a multidisciplinary, cross-sector, and transborder approach under G20's leadership to change practices and policies at every level, from global to local is needed.

R. Pawankar (✉)

Department of Pediatrics, Nippon Medical School, Tokyo, Japan

C. A. Akdis

Swiss Institute of Allergy and Asthma Research (SIAF), University-Zurich, Davos, Switzerland

K. Nadeau

Department of Environmental Health, Department of Climate and Population Studies, Center for Climate, Health, and the Global Environment, Harvard T.H. Chan School of Public Health, Boston, MA, USA

17.1 Introduction

Climate change is a global phenomenon that has significant impacts on various aspects of human and environmental health. Increased levels of air pollution and increasing atmospheric carbon dioxide concentrations and other greenhouse gas emissions have large impacts on the global environment. Most importantly, climate change affects ecosystems, weather patterns, natural resources, and biodiversity, leading to widespread challenges for communities worldwide. Generally, climate change causes an increase in temperatures globally and other weather changes, including variability in precipitation levels, seasonal temperature, and larger weather events.

The 2023 International Panel on Climate Change (IPCC) report explains that global surface temperatures are expected to rise between 1.5 and 4 degrees Celsius by 2100 (Climate Change 2023 Synthesis Report, p. 34). Rise in temperatures has widespread implications on ecosystems such as rising sea levels, melting ice sheets and glaciers, and shifts in plant and animal behaviour. For larger weather patterns, climate change strengthens and increases the number of storms and natural disasters such as floods, heatwaves, and droughts (He and Siliman 2019). These large and small weather changes lead to decreased biodiversity, forcing organisms and ecosystems to adapt or fully decline. For example, adaptations cause mismatches in symbiotic relationships, such as in plant and pollinator species (Rafferty and Ives 2011). Other ecological relationships between competitors and prey/predators are largely damaged as species and populations must migrate or decline (Yang and Rudolf 2010; Bellard et al. 2012) (Fig. 17.1).

Climate change also alters individual and population health through the exposome. The exposome is defined as all environmental exposures an individual experiences throughout their entire lifetime. Such environmental exposures include ambient air pollution, indoor air pollution, radiation, microbiota and microorganisms, and the overall external climate (Karlsson et al. 2021). An individual's exposome is largely subject to the social determinants of health, such as their occupation, lifestyle, living conditions, location, public policy on the environment, and cultural norms. With global climate change, an individual's exposome is greatly changing. As air pollution continues, air quality decreases, and the amount of indoor and outdoor chemical pollutants in the exposome increases. As well, changing weather and ecosystems alter the microorganisms living in different regions. Finally, variability in precipitation impacts the exposome. Areas that have decreased precipitation or drought have more air pollution remain in the ambient air (Andrianou and Makris 2018). As the climate changes, so does an individual's exposome and the health effects of each exposure.

One Health, an interdisciplinary approach that recognises the interconnectedness of human, animal, and environmental health, offers a valuable framework for understanding and addressing the complex implications of climate change. One Health is also an integrated solution approach that works to address the widespread weather and ecological impacts of climate change and the human health issues they create.

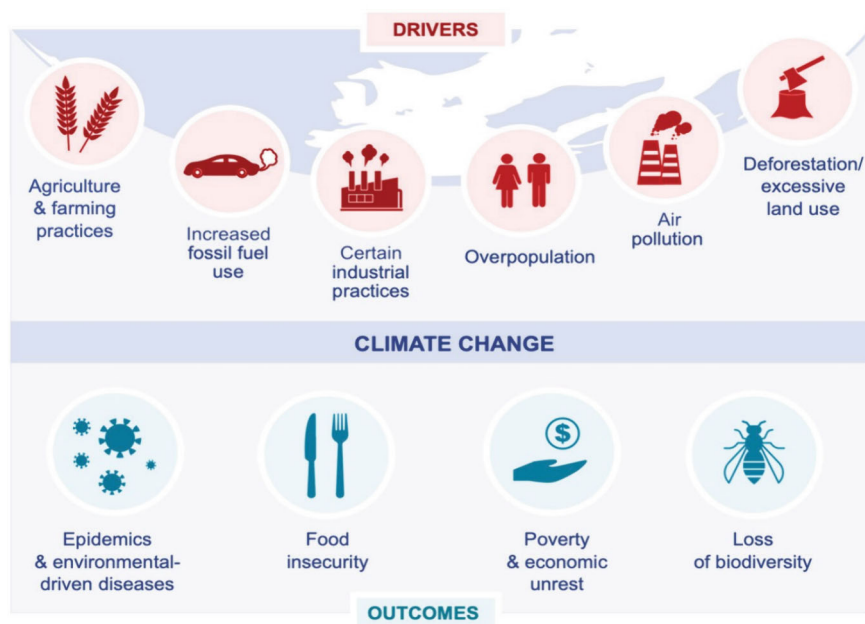


Fig. 17.1 Climate change, drivers, and outcomes. *Source* Authors' compilation

This chapter explores the relationship between climate change and One Health and explores potential solutions for climate change mitigation and adaptation (Fig. 17.2).

17.2 Climate Change and Health

Climate change poses substantial risks to human health, exacerbating existing health challenges and creating new ones.

Rising global temperatures contribute to heat-related illnesses and compromised air quality. As temperatures rise and heatwaves become more frequent, prevalence of heat-related illnesses like heat stroke, heat exhaustion, and heat stress will increase. Certain populations are more vulnerable to these illnesses, such as farmworkers that primarily work outdoors in the heat (El Khayat et al. 2022). Additionally, several respiratory health issues occur as a result of increasing emissions, outdoor air pollution, and wildfires. As air quality decreases, existing asthma cases worsen. Moreover, the effects of greenhouse gases on pollen affect the frequency, onset, and severity of asthma and allergic rhinitis (Mitamura et al. 2021). Another respiratory illness that develops in poor ambient air quality is chronic obstructive pulmonary disease (COPD). COPD is characterised by extreme, chronic inflammation and a restriction of airflow in the lungs. Such inflammation is often caused by inhaled pollutants in

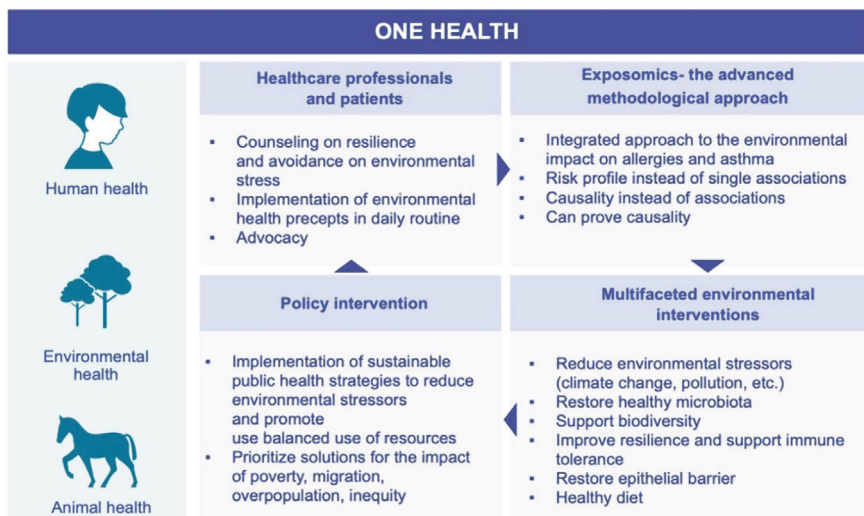


Fig. 17.2 One Health approach comprising the interconnectedness of human, animal, and environmental health. Health potential solutions for climate change mitigation and adaptation. *Source* Authors' compilation

the ambient air. The strongest association between air pollution and COPD is from particulate matter, which may come from wildfire smoke or combustion. Studies have found that exposure to particulate matter leads to epithelial barrier dysfunction and subsequent COPD (Mitamura et al. 2021; Roscioli et al. 2018; DeVries Kriebel and Sama 2017). In this dysfunction, the epithelial cells of the lungs are an abnormality in immune function, leading to more inflammation.

The number of patients affected with chronic non-communicable diseases in the 1960s was estimated to be around 20 million. Currently, we are talking about 2 billion patients, meaning that one fourth of the world's population has one kind of chronic non-infectious disease. The Epithelial Barrier Theory is a comprehensive explanation for the global, epidemic-level rise in chronic health conditions over the past 65 years and proposes that exposure to toxic substances introduced by industrialisation and modern lifestyle changes disrupts the epithelial barrier and microbiota of the skin, upper and lower airways, and gut mucosa, triggering an inflammatory immune response that can initiate or aggravate many chronic inflammatory diseases (Akdis 2006, 2021; Soyka et al. 2012). Epithelial barriers, which line our skin, respiratory tract, and gut, is the primary means the body interacts with the environment and is the first line of defence essential for safeguarding against infections, environmental toxins, pollutants, and allergens (Mitamura et al. 2021; Sugita et al. 2020). Epithelial barriers interact with the microbiome and the immune system to appropriately respond to the environment (Abdallah Mijouin and Pichon 2017). When epithelial barriers are disrupted (or "leaky"), substances and microbes can pass into deeper tissues, where they do not belong and trigger an immune/inflammatory response that

can initiate or aggravate many chronic inflammatory diseases (Akdis 2021; Celebi 2022).

In the past six decades, industrialisation, urbanisation, and technological progress have brought about substantial transformations in the exposome, raising concerns about their potential impact on human and animal health. A recent meta-analysis encompassing 22 chemical inventories from 19 countries uncovered the introduction of over 350000 new substances into our lives since the 1960s (Wang et al. 2020). Unfortunately, the health effects of these substances have received limited scrutiny and regulation. Many of these substances have the potential to become pollutants or become part of our daily exposome. Regrettably, approximately 50000 substances remain undisclosed due to confidential submissions, while nearly 70000 have been inadequately described, further compounding the challenge.

When considering the One Health approach, we must consider how climate change influences the epithelial barrier as a central mechanism connecting and explaining the impact of pollutants on the body (Sözener et al. 2020). In fact, the majority of environmental pollutants, which are increasing in abundance due to climate change, play a direct role in disrupting the epithelial barrier and initiating inflammatory immune responses. This impact then has an extreme downstream effect on the health of the individual as a whole. For example, exposure to ozone induces cell stress and cell death, and chronic exposure can increase collagen deposition, which together remodel the airways and increase susceptibility to diseases such as COPD (Roscioli et al. 2018) or asthma (Michaudel et al. 2018; Sokolowska 2019; Kim et al. 2018). Since the 1950s, plastic production has increased nearly 200-fold, with an estimated 8.3 billion metric tonnes produced worldwide by 2017. Micro—and nanoplastics (MNPs) can be found virtually everywhere around us in the biosphere and food chain; therefore, humans are continuously exposed to MNP, mainly via air, food, and water. Pro-inflammatory cell activation and disrupted barrier integrity were observed after exposure to MNP. MNP interacts with the lipids in epithelial membranes and change protein structure, both of which can have a detrimental and inflammatory impact (Hollóczki 2019). Within all of these substances, one of the most overwhelmingly exposed toxic ones to epithelium is laundry and dishwasher detergents and household cleaning substances (Wang et al. 2019; Ogulur et al. 2023). Increased usage of detergents in general and the addition of cell and epithelial barrier toxic surfactants to commercial detergents have significantly increased the daily exposure of the public to tissue barrier damaging substances. They can break epithelial barriers and show cell stress and toxicity in very low concentrations (Wang et al. 2019; Ogulur et al. 2023).

Particulate matter (PM) is also increasing in prevalence due to many factors, such as diesel exhaust and coal combustion. In 2015, PM was associated with nearly 9 million annual deaths worldwide (Burnett et al. 2018), and it primarily acts to damage the epithelial barrier. Specifically, PM damages the junctions between cells (Caraballo et al. 2011), allowing increased toxins, allergens, and pathogens to enter the body unchecked. One study found that airway epithelial cells that were exposed to PM had increased permeability following exposure to PM and also had elevated pro-inflammatory responses (Roscioli et al. 2018). When the epithelium is permeated

in this way, PM can enter circulation and further damage the body systemically (Cho et al. 2018).)

Aside from air quality and heat illness, climate change and increasing global temperatures also alter the transmission of infectious diseases. Changes in temperature, humidity, and rainfall increase the range of ecosystems to which vector-borne illnesses may spread to. Vector-borne illnesses (Myers et al. 2017) are carried by insects such as mosquitos and ticks. By increasing the range of areas these insects can inhabit, the prevalence of diseases like malaria, dengue fever, yellow fever, West Nile fever, Lyme disease, and more increases. In areas where the prevalence of vector-borne illnesses increases, health outcomes are likely to be worse, since populations have never experienced these illnesses and lack immunity (Small 2003; Haines 2006). Intensified and more frequent extreme weather events such as hurricanes, floods, heatwaves, and droughts as well have direct health impacts. These negative health outcomes include injuries, increased mortality, displacement, and mental health issues (Ahern et al. 2005; Yan et al. 2022). Additionally, changing weather patterns and ecosystem health lead to changes in agriculture and food availability. Specifically, atmospheric carbon dioxide increases, ambient temperature rises, and rainfall levels vary atypically. These all cause decreased pollinating insects, altered crop yields, and lower crop nutrient levels (Myers et al. 2017; Myers 2014; Abrol 2012). Together, these agricultural changes may lead to global undernutrition, water scarcity, and food insecurity (Myers et al. 2017). Floods, specifically, increase the transmission and prevalence of waterborne diseases like cholera, diarrhoea, typhoid, and paratyphoid, especially in areas where clean water is not available. Each of these various health outcomes and their risk are related to environmental health and climate change. One Health emphasises the interconnections between these health risks, recognising that human health is intimately linked to the health of animals and the environment.

17.3 The Role of One Health in Climate Change Adaptation

One Health provides a comprehensive approach to climate change adaptation by recognising that human, animal, and environmental health are interconnected. It emphasises the need for collaboration between various sectors, including health professionals, veterinarians, ecologists, and policymakers (Fig. 17.3). By adopting a One Health perspective, communities can enhance their resilience to climate change impacts through integrated strategies.

Surveillance and Early Warning Systems

One Health surveillance systems can monitor and detect changes in infectious diseases, zoonotic diseases, and vector populations (Haines 2006; Ahern et al. 2005). By integrating data from human, animal, and environmental health sources, early warning systems can provide timely alerts and enable swift responses to disease outbreaks or environmental threats associated with climate change. For example,



Fig. 17.3 Integrated approach to health. One Health, eco health, and planetary health. *Source* Authors’ compilation

surveillance of animals and the environment for early detection of threats to animal health and human health can provide prevention strategies that can mitigate disease outbreaks.

Climate change has increased the risk of infectious diseases in humans. Increased temperatures due to climate change result in less colder days and warmer days. More warmer days allow for easier transmission of infectious diseases into new geographical areas. Warmer temperatures and milder winters allow vectors, such as mosquitos and ticks, more time to reproduce, which can result in an outbreak of zoonotic diseases such as West Nile virus and Lyme disease, respectively (CDCP 2022).

Additionally, climate change has also increased the frequency of extreme weather events (USEP 2022). Droughts, which are influenced by both precipitation and temperature, have increased in onset and severity due to climate change (Mukherjee 2018; Paull et al. 2017). Drought has been shown to be the primary climatic driver of West Nile virus epidemics due to increased infection prevalence in certain mosquito populations (Paull et al. 2017). Monitoring a combination of both human health factors and environmental changes, such as droughts, can help allocate resources to mitigate infectious disease epidemics. For example, monitoring areas that are more susceptible to infectious diseases, such as areas with rapid population growth, after the occurrence of a drought can provide early warning signs to signal swift responses to potential disease outbreaks (Paull et al. 2017). Integrating data from human, animal, and environmental health sources can provide a multi-factored approach to understanding threats to human health.

Climate-Resilient Infrastructure

Investing in climate-resilient infrastructure is crucial for adapting to the changing climate. Since 1900, global atmospheric air temperature has risen 1.53 °C. Climate change has resulted in increasing the intensity and frequency of extreme weather events. The rate of change is projected to increase (Ebi et al. 2021). The increase

in weather-induced disasters such as floods, wildfires, and tropical cyclones will require resilient infrastructure to withstand extreme climatic events. This will include designing and retrofitting buildings, transportation systems, and public health facilities to withstand peak weather events and minimise health risks. High-tide flooding has become three to nine times more frequent in the last 50 years. Sea levels have begun to rise at a rate 2.5 times the average rate per year during the twentieth century (Lindsey 2022). The extent of wildfires in recent years has peaked alongside the increase in global temperatures (NIF 2022; Short 2015).

Historically, basic human infrastructure—housing, hospitals, schools, transportation networks, power plants, and industrial facilities—has been located near coastlines or in river valleys for agricultural proximity or transportation efficiencies. Longer term, we can now locate our infrastructure in far safer locations as these historical connections to water are less essential.

In the intermediate term, designing and retrofitting buildings and facilities to withstand extreme weather conditions are crucial for adapting to climate change. For example, implementing retention basins, green roofs, and water control systems is effective ways to reduce the effects of floods (Matos Silva 2016). Investing in stronger buildings by increasing shear wall strengths and raising ground floor levels offers some protection against strong winds. Raising bridge heights and enlarging reservoirs are measures that can be taken to address the variable increase in precipitation and sea level (OECD 2018). These changes would reduce climate-related infrastructure damage. In a case study in Ecuador, community members proposed purchasing fill to elevate infrastructure and regular trash management to keep drainage canals and ways clear as adaptive measures to prepare for flood events (Tauzer et al. 2019).

The rapidly increasing variability in climate threatens the resilience of transportation systems. These systems are vulnerable to heavy rainfall flooding, erosion, collapse, closure, and additional effects of climate change (Moretti and Loprencipe 2018). Transportation systems must be designed to function even during infrequent but critical evacuation events. Moretti and Loprencipe reviewed strategies to make transportation more resilient to climate change. For example, implementing bioretention systems, rain gardens, and bioswales can reduce the impact of heavy precipitation and flooding on transportation infrastructures, such as highways (Moretti and Loprencipe 2018).

Less centralised power systems, like local solar facilities, may reduce the impact of power outages during extreme weather conditions. Critical infrastructure like hospitals and evacuation facilities must maintain power with microgeneration or solar capture. Maintenance of the electrical system is important beyond the immediate effects on transit or critical infrastructure, like generator facilities for hospitals (Panteli and Mancarella 2015). Loss of power systems can have cascading on critical equipment, resulting in increased disease and mortality (Casey 2020).

In order to protect the environment, infrastructure, and global health, investing in climate-resilient infrastructure is essential to minimise dangers posed by climate change.

Strengthening Ecosystem Resilience

Ecosystems play a vital role in climate change adaptation by providing essential services such as water purification, carbon sequestration, and natural disaster mitigation (Munang 2013). Protecting and restoring ecosystems, including forests, wetlands, and coastal areas, can enhance their resilience and promote biodiversity. Wetlands provide water purification through a reduction in flow velocity, allowing pollutants to settle on wetland surfaces, where they are bound and removed by surrounding vegetation (Sileshi et al. 2020). Forest preservation allows for forest carbon sequestration, where trees and soil act as terrestrial carbon sinks, mitigating CO₂ emissions (Buotte et al. 2020). Additionally, preserving ecosystems provides a protective barrier against natural hazards, such as severe thunderstorms, wildfires, and droughts (Munang 2013). Protecting ecosystems benefits human health by providing important resources and protection against environmental threats. Consequently, strengthening ecosystem resilience also promotes biodiversity, which also impacts human health.

One of the interconnections between environment-related diseases and climate change is decreased biodiversity in the nature as well as human skin and mucosas. Biodiversity has been shown to be beneficial for different aspects of human health. Children raised in homes surrounded by green environments (forests and agricultural land) were found to be less likely to develop asthma and allergies. Early life exposure to green areas, or environmental biodiversity, may allow for a more diverse skin microbiota that can potentially protect against the development of allergies and other chronic inflammatory disorders (Ruokolainen et al. 2015). Positive mental health effects have also been associated with exposure to diverse ecosystems (Aerts, Honnay and Nieuwenhuysen 2018). Individuals who spent more time visiting green spaces reported better vitality and mental health compared to individuals who spent less time in green spaces in a self-reporting questionnaire (Van den Berg et al. 2016). Ecosystems, animals, and human health are intricately linked and interdependent. Therefore, strengthening ecosystem resilience contributes to the health and wellbeing of human and animal populations.

Promoting Sustainable Agriculture and Food Systems

Climate change impacts food production, availability, and nutritional quality. Adopting sustainable agricultural practices, such as organic farming, agroforestry, and aquaponics, can help reduce greenhouse gas emissions, conserve water, and enhance food security. Climate change has negative impacts on agriculture. Key impacts include changes in agricultural productivity, soil and water resources, and the health of agricultural workers and livestock (USEP 2022). Diversifying food sources and promoting local and traditional food systems can also contribute to resilient communities.

Enhancing Community Engagement and Education

One Health recognises the importance of community engagement and education in addressing climate change and its health impacts. Effective communication, outreach

programmes, and education campaigns can increase awareness and understanding of climate change-related risks, promote behaviour change, and foster community-led adaptation efforts.

Climate Change Mitigation and One Health

While adaptation strategies are necessary, mitigating climate change is equally important to prevent further damage to human and environmental health. One Health offers valuable insights and solutions for climate change mitigation by addressing the drivers of climate change.

Policy and Advocacy

One Health emphasises the importance of policy interventions and advocacy efforts to drive systemic change. Governments, international organisations, and civil society must collaborate to develop and implement policies that promote climate change mitigation strategies, allocate resources, and create incentives for sustainable practices. Science-based solutions and evidence, as well as indigenous knowledge are essential in policy-making.

17.4 Conclusion

Climate change, at the same time with environmental changes, presents complex challenges to human, animal, and environmental health, necessitating a holistic and integrated approach. One Health offers a valuable framework for understanding and addressing the interconnections between climate change, health, and the nature of the earth. By adopting One Health principles, communities can develop comprehensive strategies for climate change adaptation and mitigation, safeguarding human, animal, and environmental wellbeing for future generations.

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Part IV
Financing for Resilient Infrastructure,
Cities and Societies

Chapter 18

Green Bonds: Opportunities and Challenges for Reconciling Ethics and the International Financial System



Gladys Lechini and José Fernandez Alonso

Abstract Climate change is one of the most pressing challenges of the world and mankind, in general, at the present time. The most frequent occurrence and intensity of extreme weather events along with the increase of carbon dioxide particles and other greenhouse gases (GHGs) in the atmosphere have resulted in an escalation of economic and political tensions between and within states, opening up new sources of instability in the contemporary international order. Faced with the need to obtain foreign exchange to honor their international financial liabilities and the failure of developed countries to meet climate finance commitments, a significant number of developing states have been urged to deepen unsustainable production structures, limiting the possibility of an effective transition on a global scale. All this results in a reinforcement of the climate and sovereign debt crises. In recent years, innovative instruments have been developed in search of scaling up the resources allocated to the fight against climate change. Within this incipient trend, green bonds stand out as specific instruments oriented to finance certified climate-sustainable projects. This chapter aims to analyse the opportunities and challenges presented by green bonds in bridging the financial and ethical worlds. Based on this main objective, this chapter attempts to contribute to the design and implementation of international and national regulatory frameworks for green bonds and “labelled bonds”, in general.

G. Lechini (✉)

South–South Relations and Cooperation Programme (PRECSUR), Center of Studies in International Relations of Rosario (CERIR), National University of Rosario (UNR), Rosario, Argentina

J. F. Alonso

National Scientific and Technical Research Council (CONICET), Center of Studies in International Relations of Rosario (CERIR), National University of Rosario (UNR), Rosario, Argentina

18.1 Introduction

Climate change is one of the most pressing challenges of the world and mankind, in general, at the present time. The most frequent occurrence and intensity of extreme weather events along with the increase of carbon dioxide particles and other greenhouse gases (GHGs) in the atmosphere have resulted in an escalation of economic and political tensions between and within states, opening up new sources of instability in the contemporary international order. Although the externalities of the climate crisis are global, this phenomenon has particularly affected developing states, as they have fewer resources to address mitigation and, above all, adaptation policies. Paradoxically, these states have been the ones that reported lower emissions in historical terms.

This asymmetry between responsibilities and vulnerabilities has been recognised from the beginning of the multilateral negotiations that resulted in the United Nations Framework Convention on Climate Change (UNFCCC) during the so-called Summit of the Earth in 1992. This assumption, enshrined in the principle of common but differentiated responsibilities (CBDR), has been reflected in each of the agreements and protocols adopted and implemented under this institutional arena. Naturally, this premise became a cornerstone of the international climate finance architecture configured at the Conference of the Parties (COP) 15 of the UNFCCC held in Copenhagen in 2009. Under this mechanism, developed countries—those listed in Annex I of the UNFCCC—pledged a global collective goal of mobilising USD 100 billion a year by 2020. These commitments were subsequently formalised years later at the COP 16 in Cancun and ratified at the COP 21 in Paris, extending the aforementioned commitments to 2025.

Despite the rhetoric of leaders in several multilateral fora, industrialised countries have been far from meeting these goals, all of which have contributed significantly to a chronic deficit of climate actions aimed at meeting the aims of the Paris Agreement (PA).

Similarly, climate finance provided by developed countries has been heavily biased towards credit rather than grants. It was also skewed towards funding climate change mitigation measures. This credit-anchored pattern of climate finance does not correspond to the mandate of climate justice aimed at redressing the externalities caused by the emissions caused by the industrialisation process deployed by developed countries as a whole. Similarly, the pre-eminence of mitigation finance is not only a marked departure from what was agreed in the Paris Agreement but also a setback for the developing countries, which urgently need to take action to adapt to the new realities brought about by changing climate patterns on a global scale.

On the other hand, the gap in the fulfilment of climate finance pledges has exacerbated the effects of other crises that affect the contemporary international order and developing countries in particular: sovereign debt crisis. In this regard, it is noteworthy that during the last decades, and particularly since the global financial crisis in 2007/2008, sovereign debt has grown significantly. This process, drastically intensified after the outbreak of the COVID-19 pandemic, has particularly affected

developing countries, which have recorded growing debt/GDP ratios with meagre precedents. Faced with the need to obtain foreign exchange to honour their international financial liabilities, a significant number of developing states have been urged to deepen unsustainable production structures, limiting the possibility of an effective transition on a global scale. The failure of developed countries to meet their climate finance commitments further exacerbates the problem. In effect, given the limited access to resources promised by developed states and the chronic lack of endogenous resources to finance mitigation and adaptation policies, many developing countries have found incentives for not adopting and fulfilling climate commitments.

In light of the above, it is worth pointing out that the climate and sovereign debt crises tend to feedback and reinforce each other. In sum, the systemic increase in sovereign indebtedness operates against the capability of developing states to finance climate actions. Similarly, the occurrence of more frequent and intense extreme events will require more resources from countries that are already highly indebted and fiscally constrained (Mejía 2023). The existing climate challenges should be perceived as urgent by the stakeholders in the governance of the international financial architecture. In effect, extreme climate events affect the real economy by destroying physical assets, production, value chains and tax revenues. Besides, climate change significantly affects the financial system by affecting the payment (and collection) capacities of economic agents, and along with this, an increase in insurance and default events.

The responses to this climate crisis should not be based exclusively on a rational calculation, but rather on ethical considerations. By deepening inequalities and/or asymmetries between states, but above all, between people, the fighting of climate change—the financing of the fighting against climate change—becomes a problem that requires solutions based on ethics. Likewise, the response to the climate crisis—and the challenges of financing the transition process—should not be left to the states. As noted by Ehlers et al. (2022), the public sector response to the COVID-19 pandemic and the externalities of the Russia-Ukraine war have placed a burden on public finances in a number of economies, all of which have raised borrowing costs in parallel to the implementation of conservative monetary policies worldwide.

Notwithstanding the relevance of the climate finance commitments assumed by developed countries in a number of climate agreements (which understand climate finance as public, new and additional), private climate finance can help states—emerging ones, in particular—meet PA goals. It was precisely on this premise that, in recent years, innovative instruments have been developed in search of scaling up the resources allocated to the fight against climate change. Within this incipient trend, green bonds stood out as specific instruments oriented to finance certified climate-sustainable projects. Far from perceiving these instruments as a trivial response or a channel for exonerating public responsibilities, political-economic decision-makers must realise the relevance of green bonds and build a solid regulatory framework around these specific types of labelled bonds.

This chapter aims to analyse the opportunities and challenges presented by green bonds in bridging the financial and ethical worlds. Based on this main objective,

this chapter attempts to contribute to the design and implementation of international and national regulatory frameworks for green bonds and “labelled bonds”, in general. This work is inspired by the premise that “small changes in financial regulation should be expected to have a large impact on financial flows and hence on the real economy, (...) since financial regulations are designed to have a large leverage effect” (Schydrowsky 2020, p. 1). After this introduction, the chapter discusses the challenges and opportunities of green bonds. It then outlines possible courses of action to strengthen the regulatory frameworks and markets for these instruments. Finally, the chapter presents some concluding reflections.

18.2 Green Bonds: Between Opportunities and Challenges

The transition to a resilient and carbon-neutral society is one of the most defiant and ambitious undertakings of the human history given the challenge at stake: the sustainability of life in the planet itself. Since its externalities are not confined to a specific geographic region or socio-economic sector, climate change raises a complex debate which needs to be addressed through an open and democratic logic where no position is precluded. At the risk of being perceived as altruism, it is important to stress that these discussions must be approached ethically, as they deal with issues of sustainability of life and inequality between people and nations. Since discussions on climate change involve at their core deliberations on the allocation of intergenerational costs (Sanson and Burke 2020), contributions from an ethical perspective are vital, too. In this connection, an ethical perspective can shed light on a number of key questions concerning climate justice, such as the following: “Should the current generation choose to slow current growth based on cheap fossil fuel energy, for example, by imposing heavy carbon taxes, so as to move to a low carbon economy, aiming at minimising climate change damages to future generations? And if the answer is positive, can the current shortsighted political system (governments are elected every four years) provide the necessary policies? Can we find a way to distribute costs and benefits from mitigating climate change justly across generations?” (Sartzetakis 2021, p. 761).

It is a well-known fact that the transition to a post-carbonic socio-economic and political order involves the mobilisation of a huge mass of assets as well as united wills. The amounts and eventual allocations of these resources have forged arduous discussions among the scientific community, socio-political referents and movements, economic agents of various dimensions, among others. Beyond the differences in terms of sums and guidelines on strategies, all projections assume that they are sums involving several points of global Gross World Product (GWP). To illustrate, McKinsey (2022) calculated that to achieve a zero emissions scenario in 2050, it would require an investment of around 7.5% of the GWP over the period, which would be equivalent to 275 trillion dollars. Similarly, most projections claim that the amounts will continue to increase as long as mitigation efforts remain inadequate or, even worse, testimonial. In effect, the implementation of climate commitments on

a global scale is far from achieving the objectives set out in the PA. In this regard, and in accordance with the UNFCCC synthesis report published in late 2022, it is warned that if the climate commitments of 193 countries were 100% fulfilled, emissions would have increased by almost 11% in 2030 instead of being reduced by 45%, as established in the PA. Thus, the global average temperature would substantially exceed the commitments to keep this indicator below 1.5 °C (UNFCCC 2022).

Given the magnitude of the concerns and sums involved, it must be acknowledged that the transition to a carbon-neutral society cannot be covered by a limited number of actors—states and/or institutions—but by all actors participating in the global arena, in the international financial system, particularly. While it is true that the emissions of the financial sector are relatively limited in comparison to other sectors, it plays a capital role throughout the economy, mobilising capital from agents with the capacity to save to those with immediate consumption needs. In this sense, finance operates as a catalyst for emissions. In accordance with the former UNFCCC Executive Secretary Christiana Figueres (2020), “where finance goes, so go emissions or emission reductions”.

As previously marked, a multiplicity of instruments has been developed in recent years in order to achieve global climate goals. Green bonds are a clear derivative of this “greening” process within the international financial system and, therefore, a vehicle for expanding climate finance. Certainly, green bonds are not the only products of this trend. Alongside these innovative instruments, others have been developed during the last years in order to make “finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development” (PA, article 2.1. c). In this context, a variety of green instruments has gradually emerged such as “green loans”, “green sukuk”¹, “mezzanine/first-loss finance for infrastructure projects”, sustainability-linked instruments—bonds, loans, commercial paper, etc.—and “environmental impact bonds” (UNEP 2014; Bhattacharya et al. 2022; Fouad 2021; Berrada et al. 2022). Similarly, the development of these instruments has been accompanied by the institutionalisation of forums or platforms to foster the intersection of finance and the fight against climate change. In this vein, it is to be considered the creation of the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), launched at the Paris One Planet Summit in December 2017 and the Glasgow Financial Alliance for Net Zero (GFANZ) established in April 2021 with the involvement of 450 financial institutions (Michie 2022).

This awareness of the vulnerability of the economy, and of the financial system in particular, to climate change, was not spontaneous, but has been linked to the increasingly visible warning of the risks arising from climate change (Carney 2015). According to the specialised literature, the risks that the financial system may face as a consequence of climate change are threefold: physical, transitional and litigation risks. The physical risks of climate change refer to the damage caused to assets within

¹ As explained by Prasad et al. (2022:10): “Green Sukuk, Islamic bonds, that were first launched by Malaysia in 2017 and were used to exclusively finance green projects, have seen issuances in a few countries over the past few years, including Indonesia and the UAE”.

an economy following the manifestation of changing global weather patterns. In this sense, physical risks can be classified into “gradual” risks (caused by sea level rise, for example) and “abrupt” risks (generated by extreme weather events, such as storms or floods, for example). Transition risks, on the other hand, refer to those arising from the possibilities of certain agents being affected by the regulatory changes of the states in the fight against climate change in each country. Finally, liability litigation risks derive from the possibility of the different actors in the economic and financial systems being sued for not having correctly managed the challenges brought about by climate change (Campiglio 2016; Campiglio et al. 2018; Fernandez Alonso 2018).

In simplified terms, green bonds can be defined as a specific type of debt instrument issued by public or private institutions to finance environmental or climate change-related projects (Mercer 2015), such as renewables, water and energy efficiency, bioenergy and low carbon transports (Campiglio 2016). It is precisely the commitment to allocate the borrowed funds to a project with a positive impact on the environment and climate that constitutes the main characteristic of green bonds. In view of the need to assure creditors of the destination of the resources collected, green bonds are also distinguished by the fact that they are subject to a process of verification and public reporting.

Beyond the objective of funding an environmentally positive project and the associated certification and monitoring procedures, there is no difference between green bonds and traditional bonds, since the financial features of both—in terms of structure, risk and profitability—are similar. In the words of Bos (2023, p. 1), “the credit profile of a green bond is the same as that of a traditional bond from the same issuer, and in terms of pricing there is no significant difference between a green and non-green bond. (...) Green bond holders have the same recourse to the issuer. Essentially, they are standard bonds with an additional green element. Green bonds come in short—or long-dated maturities and have various types of coupons and yields”.

The history of green bonds began in 2007 when the European Investment Bank (EIB) issued its first Climate Awareness Bonds (CAB) to fund the establishment of renewable and energy efficiency programmes across Europe (Al Mheiri and Nobanee 2020). According to Saraiva y Casalinho (2022, p. 256), the EIB issuance “offered a pedagogical perspective or an example to be followed by other issuers. The year immediately following, in 2008, it is the World Bank’s turn to launch its first green bond, following EIB footsteps”. The years following the first green bond experiences were characterised by issuances designed and implemented by multi-lateral banks such as the European Investment Bank (EIB) and the World Bank (WB) (Kaminker et al. 2016). Government agencies, municipal entities and national development banks also participated in this nascent trend. The markets’ appetite for these instruments surprised more than a few financial market commentators in the years immediately following the outbreak of the crisis in 2007.

During the first years of the history of green bonds, the qualification of these instruments was conducted by the issuers themselves. However, over the course of time, a variety of standardisation efforts have been made in the search for a certain standardisation. In this context, it is important to underline the introduction of the Green Bond Principles (GBPs) by the International Capital Markets Association (ICMA)

in January 2014. In the same year, the Climate Bond Initiative (CBI) launched its climate bonds standards. A large number of jurisdictions began to use these two schemes; however, an equally large number of jurisdictions have developed their own taxonomies (Ehlers and Packer 2016). To summarise, all these initiatives coexist without providing a consistent and binding framework for all actors participating in green bond markets. In view of the foregoing, it is important to note that “there is no public regulation of green bonds, and hence the ‘greenness’ of the bonds is not enforceable. Instead, the governance of green bonds is decentralised and shaped by private governance. Specifically, to circumvent the lack of enforceability, issuers rely on certification by independent third parties” (Flammer 2020, p. 96).

A few brief comments on the process of issuing green bonds are worth making at this point. Just as Banga (2019, pp. 23–24) explains, “The process of issuing a certified green bond involves at least three major market players, including the issuer, an independent reviewer, and the underwriters (...) The process then begins when an issuer or a project developer sets up a green project. In the project document, the issuer should itemize, as much as possible, the expected positive impacts of its project on the environment. In order to avoid overestimations or underestimations of such impacts, an independent reviewer who is a specialist of environmental impact assessment, is required to confirm whether the project is actually environmentally friendly. (...) Once the second opinion attests the green nature of the project to be financed, the issuer is allowed to issue a certified labeled green bond in order to raise funds in the debt capital market”.

As might be expected, the certification of instruments by a third party entails an increase in administrative and compliance costs for issuers. This is all the more so as the market for the verification of such instruments is concentrated in a very limited number of firms.

In addition, there are a number of incentives that encourage green bond transactions and explain the relentless growth of this market. According to Maltais and Nykvist (2020), the motivations to operate in green bond markets—either as an issuer or as a creditor—can be divided into three categories: financial case, business case and legitimacy/institutionally oriented drivers. In terms of financial incentives, the aforementioned authors include better financial returns, reduced financial risk, lower cost of capital and better accessibility to capital. Under the category of business incentives, they recognise the following criteria: branding, operational efficiency, the creation of new markets and the reducing of business risks. Regarding reputational motivations for engaging in green bond transactions, these authors identify the legitimacy seeking and the social licence, the accountability to identifiable stakeholders and institutional pressures.

From the specific perspective of developing country actors, ownership of the climate actions to be financed is crucial. The issuance of green bonds is a suitable mechanism to overcome the traditional conditionalities of official credit providers, both bilateral and multilateral. In this connection, green bonds could be seen as a solution to the pro-mitigation bias that has been reported in the climate finance stack

so far. Similarly, the possibility of issuing these assets allows sub-national actors—and thus less likely to issue on a large scale—to access finance to capitalise on climate-friendly projects. This is the case for provinces, municipalities and/or townships in all countries, though the ability to issue these instruments is crucial for sub-national actors in developing countries, given their inherent budgetary constraints and the resulting difficulties in accessing voluntary debt markets.

Without limiting the foregoing, it is important to underline that green bonds are far from providing a definitive or unquestionable remedy. First of all, it should be said that the process of issuing these instruments is often much more complex—and necessarily lengthy—than that regularly reported. In this context, it is worth noting that green bonds require the fulfilment of numerous steps prior to issuance, which involve monitoring and verification processes by third-party agents.

Regardless of how individual operators are motivated, it is clear that green bonds have become one of the most dynamic financial markets. In effect, since the issuance of the first green bond in 2007, the market for such instruments has been increasing steadily. According to data collected by CBI, green bond issuance reached USD 487.1 billions in 2022, all of which implied just over half of labelled issuance. Besides, a growing share of these green bond markets has been taken up by issuance by states. According to CBI (2023), by the end of 2022, 43 sovereigns had issued labelled bonds. Most of these issues were made under the green bonds category.

Furthermore, and closely related to the above, it is argued that the certification of these instruments is costly since they are concentrated in the hands of a few international firms. The relatively small number of firms engaged to certify green bonds entails a market failure, which in fact makes these instruments more expensive.

It should also be observed that there are no unified criteria for labelling. As Purdie (2019) explains, “despite efforts to standardise the market by the Climate Bonds Initiative, the International Capital Market Association—which authored the ‘Green Bond Principles’—and the European Commission, there is still no definitional framework everyone can agree on (...) Existing standards, such as the Green Bond Principles, tend to focus on the use of proceeds, not the issuer’s wider operations. This means oil and gas companies can legitimately issue green bonds even if they are net contributors to carbon emissions, leading to charges of ‘greenwashing’. Similarly, Poland has led the way in issuing green sovereign bonds despite its continued reliance on coal to run its economy”.

Finally, but not least, it should be stressed that green bonds are not an option for all, at least under the current conditions of the structure and dynamics of the international financial system. In this regard, issuers with difficulties in accessing markets—a significant number of developing states—cannot make use of these instruments. This is particularly true for sovereigns with debt crises, as well as for those with difficulties issuing in their own currency.

18.3 Possible Courses of Action to Enable and Strengthen Green Bonds from a Multilateral and Comprehensive Perspective

Adversity, states Schydlowsky (2020, p. 6), “always has a flip side: it offers opportunity. Financial regulators also have a role in boosting society’s ability to turn adversity into an advantage”. In this respect, there are some responses that could be studied and implemented by policy-makers in order to build a solid framework regarding green bonds. Some of these observations are suggested below.

- To promote **unified criteria** in a multilateral space—G20, for example—for the labelling of green bonds. Although discussions on climate finance are conducted in other specific areas—primarily in the various UNFCCC bodies—this certainly does not prevent other multilateral spaces to make efforts towards the elaboration of cooperative approaches, in the definition of unified criteria for the labelling of green bonds and labelled bonds, in general. In the words of the OECD (2017:14), “Convergence towards commonly accepted definitions will be essential to maximise the effectiveness, efficiency and integrity of the market”.
- To foster **national capacity building** for the development and improvement of green bond regulations. The formation and strengthening of green bond markets require the design and implementation of ambitious capacity building processes for market prudential regulators, particularly in developing states. According to Banga (2019, p. 24), “Green bonds foremost require technical skills for monitoring and assessing of their use of proceeds throughout the project’s lifecycle. Many developing countries, however, lack such technical skills which are essential to ensure that projects are implemented in accordance with the Green Bond Principles”. As a venue that encompasses decision-makers from a number of financial and monetary institutions, the G20 can operate as an enabling framework to generate cooperative proposals for such capacity building. The deepening of technical knowledge on green bonds by officials dedicated to the design and implementation of national regulations can constitute an additional chapter in the effort to reconcile ethics with the international financial system.
- To promote **fiscal and/or economic benefits** to boost the incentive framework for issuers. This is intended to address one of the most significant de facto barriers in green bond markets, as the cost of the process can be significant, if not prohibitive, for issuers. Kaminker et al. (2016) illustrate that the process of obtaining a second opinion or third-party assurance could cost from 10 to 100 thousand dollars, all of which may limit the possibilities for minor players to pursue green bond issuance, and thus the possibility to finance climate or environmentally ambitious policies and/or projects. In this context, the experience of the Republic of Argentina, for example, could be considered. In this country, the Buenos Aires Stock Exchange decided to grant a bonus on the fee for primary placement as well as on listing and publication costs. Although this is a comparatively small market (USD 1.1 Billion), New firms have been added in recent years as well as Sub-National States.

- To promote a **fair and balanced notion** of green bonds in a variety of forums—political, economic and/or academic—as instruments that allow narrowing the gaps in climate finance. These efforts must highlight the crucial intertwining of ethical values and the financial system while recognising the limitations and the resistance of some of the actors in these initiatives. All of this, of course, without relinquishing the primary obligations of industrialised states in this area.
- To promote strong **regulations against green washing**. One of the most serious concerns in green bond markets is greenwashing, the risk that the issuer overstates or neglects to honour its environmental commitments. These developments may well be based on the European Commission’s initiatives in this field.²

18.4 Conclusion

Changes in climate patterns on a planetary scale represent one of the world’s greatest challenges for present and future generations. The progressively visible impacts of climate change are being felt everywhere and in increasingly radical manners. Although the consequences of climate change are global in nature, the most vulnerable states and groups report the most dramatic negative externalities. The international climate negotiations began with the recognition of this disparity between the responsibility for producing climate change and the vulnerability to its consequences. As a result, industrialised countries made a number of climate finance commitments. However, developed country pledges to mobilise international climate finance have not been met over the years and are widely recognised as insufficient to address the current climate crisis. The provided resources have not been adequate to subvert the required levels of finance to meet the commitments under the Paris Agreement to contain the increase in global average temperature to 1.5 °C. The multiple derivations of the war in Ukraine and the financial crisis opened in recent months have increased uncertainty in the international scenario and in the economic-financial dimension, particularly. Climate finance, already limited, has not been immune to the logic of withdrawal/conservative approach adopted by the major agents of the international financial system. This current uncertainty casts a further shadow on how the international climate finance architecture will be (re) configured after 2025. In this context, developed countries that are compelled to provide climate finance encounter greater reluctance to leverage funding. Notwithstanding the above, it is worth highlighting that in order to close the climate finance gap, the PA encourages the private sector the mobilisation of financial flows “with a pathway towards low greenhouse gas emissions and climate-resilient development” (Article 2.1.c).

Climate change as a global problem forces a comprehensive and democratic debate to evaluate and bring about effective solutions. In the context of these discussions, the reconciliation of finance and ethics becomes a categorical mandate.

² European Commission proposal of 30 March 2022 amending Directives 2005/29/ EC on unfair commercial practices and 2011/83/EU on consumer rights.

Green bonds could be seen as a manifestation of efforts to develop new frameworks and instruments to finance adaptation and mitigation strategies towards carbon neutrality and climate resilience. Because they can be issued by a wide variety of entities—public or private, large or small—they are optimal instruments for scaling up climate finance, thereby multiplying and accelerating mitigation and adaptation actions.

Like all labelled bonds, green bonds are far from becoming a panacea. In this context, it should be mentioned that although they can increase resources for climate finance and favour a sense of “ownership” of climate actions to be financed, escaping the conditionalities and biased targeting of resources provided by developed countries, green bonds have some drawbacks.

Firstly, green bonds are more costly—both in economic and temporal terms—compared to conventional issuances. Secondly, there are no uniform criteria for cataloguing these types of instruments. Finally, and closely connected to the above, green bonds can be a source of “greenwashing” operations, since the criteria in effect focus on the policy/project to be financed instead of looking at the issuer’s entire production structure.

As a consequence, it is clear that these instruments should be considered as an additional instrument for scaling up climate finance and subverting the historical deficit for financing mitigation and adaptation actions on a global level.

The resources leveraged through green bonds cannot replace the financing committed by industrialised countries as the main historical emitters of greenhouse gases.

In line with Park’s expressions (2018, pp. 267–268), it should be noted that “The future of the green bond market hinges on the capacity of issuers to sell more green bonds and the confidence of investors and civil society in their economic value and environmental impact. (...). Issuers, investors, and civil society must have confidence in the legitimacy of the marketplace and its rules. At the heart of legitimacy debates in the green bond market is a governance question: what is the optimal process for assessing the environmental impact of a green bond? Unless consensus is found on the answer to this question, green bonds may be relegated to permanent niche status”.

Political-monetary authorities around the world—especially Central Banks and national regulatory agencies—have a fundamental role to play in promoting these initiatives aimed at reducing the climate finance gap by promoting this type of instrument. These considerations are based not only on ethical grounds—the sustainability of life itself and issues of climate and intergenerational justice are at stake—but also on the stability of the financial system. In the words of Schydłowsky (2020, p. 5), “the new climate-related concern can be thought of as part of the financial regulator’s responsibility in maintaining a healthy financial system in the long run, capable of an improved handling of climate disasters and climate change in general. (...), it is important to note that coordination of financial regulators’ actions with those of others concerned with climate disasters will leverage all of the applied policies to greater advantage”. The experience of the coordinated work in the G20 can serve as a good support to advance in this direction.

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Chapter 19

Infrastructure Investment for Connectivity: Convergence for People's Wellbeing



Anita Prakash

Abstract Infrastructure projects are an international strategy for growth. They are indispensable for the achievement of Agenda 2030 and its 17 Sustainable Development Goals (SDGs). Financing gaps in infrastructure development continue to exist, mostly affecting the people in Global South. Issues with infrastructure project pipelines, governance, national budget, and sustainability costs are important factors that inhibit domestic and global capital flows into infrastructure projects. Cost of climate mitigation and disaster resilience further aggravate the capital provisions. Multilateral cooperation amongst governments and development banks can support an environment which fosters integrity and commitment to the development agenda. The G 20 LiFE agenda can be the framework of multilateral cooperation that converges global finance, governance, and people's wellbeing.

19.1 Introduction

'Connectivity' has always existed as an idea and infrastructure projects are the conduit of connectivity amongst people and places. Popularisation of the term 'connectivity' in the context of community building, social cohesion and prosperity, and trade and economic cooperation was especially linked to the Association of Southeast Asian Nations (ASEAN), leading to its Master Plan on ASEAN Connectivity (MPAC) adopted in Hanoi in 2011. Significantly, it has the subtitle 'One Vision, One Identity, One Community', which was taken further in the MPAC 2025 (Hawke and Prakash 2016). It is similar to India's theme for its G20 Presidency, '*Vasudhaiva Kutumbakam*' (One Earth–One Family–One Future), emphasising the connectedness amongst nations and regions and aiming to build unanimity to address global challenges collectively and effectively. The link between connectivity and community is

A. Prakash (✉)

Economic Research Institute for ASEAN and East Asia (ERIA), Jakarta, Indonesia

unmistakably of Asian origin¹ but requires global efforts for ensuring wellbeing and development amongst all people.

Infrastructure projects are central to connectivity amongst people and regions. They are an international strategy for growth and wellbeing and bring high rewards and innovation into different sectors of a country and its economy. These are recognised pathways for narrowing development gaps amongst regions and uplifting the development indices of vast numbers of people. Quality infrastructure—whether for transport, water, energy, digital, or social ties—is indispensable for the achievement of Agenda 2030 and its 17 Sustainable Development Goals (SDGs). Investing in infrastructure helps integrate national markets and provides connections to global value chains. Infrastructure growth, when done in a cost-efficient and sustainable manner with a climate approach, enhances wellbeing amongst people and amongst nations. From an economic growth perspective, it is trade—enhancing and enables direct investments into countries (Prakash 2020).

Planned infrastructure development improves the productive potential of the economy but requires careful calibration of cost and benefit, quality infrastructure, land acquisition, sustainable financing, and transparency of the projects. Regulatory policies and capacity issues add to the list. Promoters of infrastructure projects and prospective investors are usually left on their own to achieve this objective and resolve the difficult triad of attracting investments that promise returns, project governance, and sustainability (Prakash 2020, *ibid*).

The global demand for infrastructure far outstrips the pace of infrastructure development. From 2015 to 2030, global demand for new infrastructure could amount to more than \$90 trillion. Current infrastructure spending of \$2.5 trillion to \$3 trillion a year is only half the amount needed to meet the estimated \$6 trillion of average annual demand over the next 15 years.

The development paradox here is that institutional investors such as insurance companies, pension funds, and sovereign wealth funds have more than \$100 trillion in assets under management globally.

Crucial infrastructure could allow vast areas of Asia and Africa to realise their demographic dividend and economic potential. Mobilising the necessary resources is difficult due to inadequate addressing of project preparation, implementation, maintenance, sustainability, and capacity details. Despite the availability of policy guidance from the G20, OECD, multilateral development banks, and other stake holding bodies, several infrastructure plans across Asia and Africa are unable to take off, are delayed, or are not found to be sustainable. Geo—political rivalry over infrastructure projects and finances is also not helping and, in fact, making institutional investors more cautious (Prakash 2020, *ibid*).

¹ In the regional integration context, connectivity as a concept with a substantial Asian origin was first enunciated by Gary Hawke (2007), ‘Jusuf Wanandi, Always Thinking, Cajoling, Persuading’, in H. Soesastro and C. Joewono (eds.) *The Inclusive Regionalist: A Festschrift Dedicated to Jusuf Wanandi*. Jakarta: Centre for Strategic and International Studies, pp. 20–28. The merits of such linkages continue with ‘open regionalism’, ‘comprehensive and cooperative security’, ‘Asia-Pacific’, and even the ‘Indo-Pacific’.

Despite available policy guidance, mobilising funds for infrastructure requires a predictable, informed, and facilitative environment, especially when ensuring sustainable funding with people's benefit and wellbeing at the core. This article discusses a multilateral cooperation model endorsed by the G20 to overcome the underlying causes of financing gaps for infrastructure investments in Asia and Africa, facilitate global investment in infrastructure, and bring the people and their wellbeing to the core of governance of infrastructure projects (Prakash 2020, *ibid*).

19.2 Infrastructure Investment and G20²

Planned infrastructure development can positively exploit the diversity amongst countries and sub-regions and narrow the development gaps. Several guidelines are designed to support governments and financial institutions towards meeting the global standards of governance, sustainability, and investment pathways. These include the G20 Principles for Quality Infrastructure Investment, Principles for Project Preparation, and the OECD Principles for Private-Sector Participation in Infrastructure. A multilateral cooperation model endorsed by G20 can provide a predictable, informed, and facilitative environment for mobilising funds and converging the governance, sustainability, and investment pathways (Prakash 2020, *ibid*).

19.3 Investment Facilitation for Infrastructure Projects Can Reduce Asymmetry of Information, Simplify Governance, Harmonise Regulatory Processes, and Minimise Risks on Returns

Despite the fact that private investors, including institutional ones, have about \$120 trillion in global assets under management, investments in infrastructure are not forthcoming. Several studies have brought out the reasons for financial gaps between the demand and supply of capital for infrastructure development. Given this availability of capital on one side and lack of investments on the other, an analogy from trade facilitation can be drawn and applied to infrastructure investment. Trade facilitation measures expedite the movement, release, and clearance of goods, including goods in transit. It also includes measures for effective cooperation between regulatory authorities on facilitation and compliance issues. Technical assistance and capacity

² The challenges and recommendations in this essay are expanded and updated from author's T20 Policy Briefs of 2020 and 2022, namely, 'Multilateral Cooperation for Investment can mobilize infrastructure funds and link needs of investors, governments, and people' (T20 Task Force 5, 2020) and 'Planning and Investments in Efficient and Inclusive Infrastructure and Supply Chains in post-Covid-19 Recovery' (T20 Task Force 8, 2022).

building are essential for successful facilitation amongst developing and least developed countries. Importantly, trade facilitation is always more successful as a multi-lateral platform which benefits all stakeholders—investors, recipients, goods and service providers, and people—to maximise their objectives (Prakash 2020).

19.4 Multilateral Cooperation for Facilitating Investment in Infrastructure is an Urgent Need

Mobilising Finance for Infrastructure is the Foremost Concern

Infrastructure development has not kept pace with demand. The McKinsey report of 2016 estimated the value of the world's existing infrastructure at \$50 trillion, and global demand for new infrastructure up to 2030 could amount to more than \$90 trillion. Current infrastructure spending of \$2.5 trillion–\$3 trillion a year is only half the amount needed to meet the estimated \$6 trillion of average annual demand over the next 10 years. More than 60% of this financing gap is likely to be concentrated in middle-income countries and more than 50% in the power sector (Prakash et al. 2022a,b, *ibid*). Given this huge demand, capital markets will be pivotal to financing investment, particularly the banks, pensions, and insurance companies that hold more than 80% of institutional assets under management (AUM) in middle-income countries (Fig. 19.1).

Asia is one of the most dynamic and productive regions, but it is held back from realising its full potential by huge constraints in crucial infrastructure caused by a lack of investment. The Asian Development Bank (ADB) has estimated that Asia will need to invest \$26 trillion in infrastructure from 2016 to 2030, or \$1.7 trillion per year if the region is to maintain its growth momentum, eradicate poverty, and

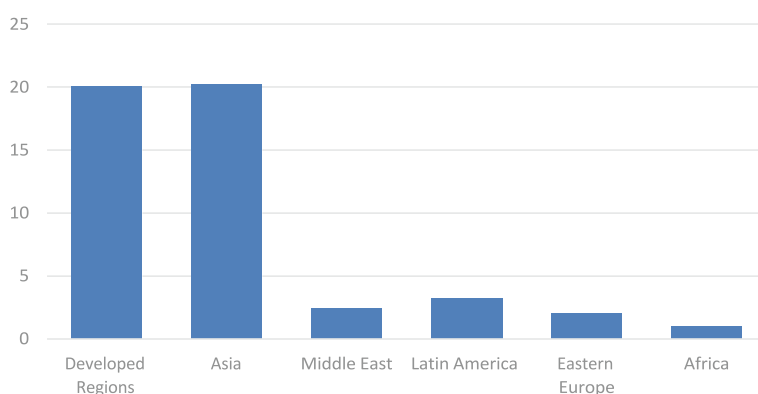


Fig. 19.1 Investment needs, 2016–2030 (US\$ trillion). *Note* Asia does not include Japan and South Korea. *Source* AfDB, 2018. Calculations based on Global Infrastructure Hub (2017) and UN (online)

respond to climate change. Without climate change mitigation and adaptation costs, \$22.6 trillion, or \$1.5 trillion per year, will be needed (ADB 2017).

Infrastructure investment needs vary considerably by sector (Table 19.1). The power and transport sectors require the largest investments. Telecommunications, water, and sanitation are no less important for an economy or for individual welfare and require investment. Each of these sectors has varying levels of regulatory, governance, and sustainability challenges in different countries. The ADB estimates in Table 19.1 bring a related issue to the fore. An updated estimate of infrastructure investment needs, especially with climate mitigation costs, has not been attempted since 2017. The G20 Infrastructure Working Group has given the mandate to the MDBs and the GIF to monitor the investment aspects. These reports must be made available to all policy research and development economists (Prakash et al. 2022, *ibid*).

Africa's infrastructure requirements are immense, too. One of the key factors retarding industrialisation has been the insufficient stock of productive infrastructure in power, water, and transport services that would allow firms to thrive in industries with strong comparative advantages. New estimates by the African Development Bank suggest that the continent's infrastructure needs amount to \$130–170 billion a year, with a financing gap in the range of \$68–\$108 billion (AfDB 2018).

Global funds are available for investment. A small fraction of the more than \$100 trillion in assets managed globally, and low-yield resources would be enough to plug the financing gap and finance productive and profitable infrastructure. Issues of infrastructure project pipelines, feasibility assessment, and national budget commitments are important factors that inhibit domestic and global savings to plough funds into infrastructure projects (Prakash et al. 2022, *ibid*).

Financing of Infrastructure Plans Creates Competing Interests Amongst Countries

Infrastructure initiatives are the new geo-political tools, creating new rivalries or prompting the re-emergence of old ones (Islam et al. 2019). China's ambitious Belt and Road Initiative (BRI) has helped bridge the infrastructure investment gap, but it has also increased geo-political tensions and competitive plans.

Infrastructure development within and outside domestic borders is noticeable in other important economies. Japan, India, and Europe, as well as Russia, the USA, and the Association of Southeast Asian Nations (ASEAN) are working hard to further their own connectivity agendas in Asia and Africa. The contours of the Master Plan on ASEAN Connectivity (MPAC), BRI, Asia Africa Growth Corridor (AAGC), and European Union (EU)-Asia connectivity, to name a few, are different in terms of their origins, partnerships, resources, and the political and economic priorities of the promoters (see Appendix). A comparative study of these important connectivity plans in Asia has been made by this author in 'Rethinking Global Governance' (Prakash 2019) and 'Connecting the Connectivity Plans in Asia and Beyond: International Cooperation for Expanded Supply Chains and Resilient Growth' (Prakash 2022a). The ASEAN approach to connectivity aims for a resilient and integrated ASEAN community. The BRI has strong financial resource commitments from China. It aims to set up multi-tiered connectivity networks amongst the Asian, European, and

Table 19.1 Infrastructure investment needs by sector, in 45 ADB developing member countries, 2016–2030 (\$ billion in 2015 prices)

Sector	Baseline estimates			Climate-adjusted estimates			Climate-related investments (annual)	
	Investment needs	Annual average	Share of total	Investment needs	Annual average	Share of total	Adaptation	Mitigation
Power	11,689	779	51.8	14,731	982	6.76	3	200
Transport	7,796	520	34.6	8,353	557	6.56	37	–
Telecommunications	2,279	152	10.1	2,279	152	5.12	–	–
Water and sanitation	787	52	3.5	802	53	3.31	1	200
Total	22,551	1,503	100.0	26,166	1,744	1.02	41	–

Source ADB Estimates, 2017

African continents and their adjacent seas and strengthen partnerships amongst the countries along the 'Belt and Road'. Supported by India, Japan, and many African and Asian countries, the AAGC aims for Africa's integration with Asia through physical, institutional, and social connectivity in which quality infrastructure, trade, institutional connectivity, and enhanced capacities and skills are important pillars (Prakash 2022a *ibid*). The EU-Asia connectivity plans are building blocks towards an 'EU Strategy on Connecting Europe and Asia' with concrete policy proposals and initiatives, including through interoperable transport, energy, and digital networks. The strategy seeks to ensure sustainable, comprehensive, and rules-based connectivity between Europe and Asia. In a global milieu, all of these plans are competing for space, resources, influence, and results. A multilateral cooperation process for investment facilitation could reduce multiplicity and create synergy and a common purpose amongst different infrastructure plans. The multilateral cooperation framework would promote and build transparency amongst competing initiatives, and investors will be able to make informed decisions (Prakash 2020, *ibid*).

Governance and Sustainability Increase the Cost but are Important for Attracting Financing from Financial Institutions

The financing gap for infrastructure is in large part the result of inadequate policies and processes and lack of familiarity with projects. Governments play a central role in most infrastructure projects because infrastructure has strong public-good characteristics, requires large-scale capital mobilisation, and is highly sensitive to local politics. However, the scale of infrastructure spending required over the next 10 to 15 years, coupled with widespread public-sector fiscal constraints, means that private finance will be increasingly important. A positive 'enabling environment'—that is, one characterised by sound policies, effective institutions, transparency, reliable contract enforcement, and other sector-specific factors—makes it easier to mobilise private finance (Prakash 2020, *ibid*). Conversely, a poor enabling environment—one characterised by distorting subsidies, unreliable counterparties, and flawed procurement processes—can raise the cost of private finance to the point where infrastructure projects are no longer economically viable. In all this, it is the government who must underwrite the costs of people's wellbeing and Life for Environment (Life) to infuse confidence amongst private investors.

Trans-regional plans such as BRI, AAGC, MPAC, and EU-Asia connectivity are seeking greater emphasis on governance, standards, transparency, and sustainability in varying degrees (Prakash 2022a, *ibid*). Institutions such as the Asian Development Bank (ADB) and the African Development Bank (AfDB) have helped to further this objective by providing climate adaptation and mitigation adjusted costs for infrastructure. The COVID-19 pandemic and the global liquidity crunch in the recovery phase have reduced the urgency in negotiating infrastructure finance (Prakash 2022a,b, *ibid*). However, sustainable finance, transparency in project preparation, and accountability in project execution are important global concerns emerging from the financing and implementation of infrastructure plans. Global attention has been

drawn towards issues of planning and project design, financing and debt sustainability, territorial integrity, and people's choices, and it is expected that G20 working groups and Sherpa Track will be giving priority to these in 2023 and beyond.

19.5 Financing Can Be Mobilised Through Multilateral Cooperation

Investment Facilitation

Financing infrastructure projects, which ensure returns, have sound project governance and comply with sustainability checks, require fund mobilisation from new sources. A greater crossholding of interest amongst all stakeholders is important to achieve this. A multilateral cooperation framework amongst governments, supported by the multilateral development banks (MDB), would help to streamline policies related to cost subsidy, regulations for procurement, information on contract enforcement and dispute redressal, and other similar market and capacity elements which are crucial for facilitating investments (Prakash 2022b).

The multilateral cooperation for investment facilitation has a specific role in removing the barriers to funding projects. These barriers to fund mobilisation are well known by agencies but surprisingly are not being addressed enough in policy and practice:

- Long-term plans for infrastructure (pipeline projects) are either unknown or may not be well communicated by governments, making it difficult for institutions to consider investing in evaluations and committing resources for those countries or sectors.
- Fragmented standards, diverse processes, and costs unique to a project deter prospective investors, especially those with limited resources, time, and expertise, such as pensions and insurance companies.
- Governance and sustainability incur higher upfront costs to the investor, while the savings accrue to the owner or consumer of infrastructure projects.
- Acquisition of land for infrastructure development remains one of the main challenges.
- Private investment can help enhance the financial sustainability of infrastructure projects but have different incentives from governments in relation to the development of projects. The private sector will typically tend to cluster its investments around fast-developing growth centres, creating disparities in spatial development.
- Global financial regulations on investment limits, capital adequacy and reserve requirements from banks, and limits on foreign investment can discourage investors from making longer-term and cross-border investments. Basel III regulation and Solvency II Directives are two such examples.

- Middle—and low-income countries face additional challenges through a lack of project development resources and to afford the funding commitments for guarantees to mitigate the risks of the project. (Prakash 2022b, *ibid*)

Multilateral Cooperation for Investments in Infrastructure Projects can Resolve the Difficult Triad of Investors, Governments, and People's Wellbeing

The general principles of multilateral cooperation for investment in infrastructure are already available in the G20 (see Appendix). These principles reflect the global consensus on quality infrastructure planning and investment but are voluntary in nature. Connecting the diverse requirements—or managing the difficult triad—of finances (investments and returns), governance (planning, implementation, and maintenance), and sustainability (environment, resilience and inclusiveness) of infrastructure projects requires multilateral cooperation mechanisms to ensure prompt compliance (Prakash 2020, *Ibid*). Collective decision-making is especially needed when an infrastructure scheme spans national boundaries and the alignment of cost and benefits may be contested (Hawke and Prakash 2016).

When adding the wellbeing of people and life for the environment, governments must help in calculating the costs under governance and sustainability. Ownership of such costs as public goods can be distributed amongst all the stakeholders, with the underwriting lying with the governments. LiFE and people's wellbeing in infrastructure planning and financing must not be subject to the principle of equity.

Funding infrastructure around the world should not be an issue when financial resources are available. Apart from the public-sector and central banks in advanced economies, institutional investors such as insurance companies, pension funds, and sovereign wealth funds have around \$100 trillion in assets under management globally (Arezki et al. 2017 in Prakash 2020, *ibid*). Mobilising these finances for investment in infrastructure is the key issue. There are institutional issues too, arising from managing the interaction of international pressures on national autonomy. There are practical aspects of the unified or common regime for the movement of goods, services, and people. The governance mechanisms and standards would also include technical specifications, safety management frameworks, the social and economic wellbeing of workers in the sector, competition policy, customs cooperation, etc. (Prakash 2019, *ibid*).

With governments as the main drivers of multilateral cooperation, the critical role of multilateral development banks (MDBs) and other Development Finance Institutions (DFIs) in blending public and private finance to scale up financing for infrastructure will be important (Prakash 2020, *ibid*). The Hamburg Principles have welcomed the role of the MDBs in mobilising and catalysing private capital and endorsed a target of increasing mobilisation by 25% to 35% by 2020 (GFI 2018). In 2023, India's presidency of G20 should deepen this responsibility of MDBs and DFIs by mandating them to calculate the costs of governance, transparency, and wellbeing of people into the infrastructure financing frameworks and agreements.

19.5.1 Multilateral Cooperation Will Mobilise Global Funds for Investment Facilitation

A multilateral cooperation programme amongst countries and MDBs could facilitate global investment in infrastructure by creating more efficient, informed, transparent, and predictable investment conditions around infrastructure plans and projects. Development banks feature prominently in this multilateral cooperation because they have the mandate, motivation, and means to influence financing flows and shape markets and have experience in infrastructure funding that could help other actors, such as private-sector and institutional investors in taking on the projects. Such cooperation works best when undertaken at a regional level, as is seen in the case of connectivity infrastructure projects in Asia and Africa. This is also important because it is easier for policymakers to find synergies between national and regional development strategies. Projects such as BRI, AAGC, Trilateral Highway, and Greater Tumen Initiative exemplify this. The cooperation however can extend to other regions too, as funds are expected to flow from far and near. The experience of members from other regions also matters (Prakash 2022b, *ibid*).

Some Noteworthy Initiatives on Multilateral Cooperation for Investment Facilitation in Infrastructure Are in Place

Some important initiatives of multilateral cooperation are already in place, and each is unique to the strengths and requirements of the members and partners (Prakash 2020, *ibid*). The Multilateral Cooperation Centre for Development Finance (MCDF) initiated by the Asian Infrastructure Investment Bank (AIIB), the AAGC, and MPAC 2025 are following the multilateral or trilateral cooperation framework for all or some aspects of infrastructure financing, project preparation, information sharing, and capacity building (see Appendix).

Multilateral cooperation for investment facilitation will improve the speed, scale, and pricing with which private capital could flow into infrastructure investment. It will lead and complement the capital markets' response towards infrastructure investments through streamlining of policy and regulatory rules, institutional conduct, and agency factors. A multilateral cooperation, supported by the G20 and other similar groups of economies, will encourage governments and MDBs to provide an informed, predictable, and transparent investment environment for institutional investors and get capital to flow into projects (Prakash 2020, *ibid*).

19.6 Conclusion

The G20 is mandated to promote innovative mechanisms for cooperation and development. Different tracks of G20 can be brought together to form a coherent multilateral framework for facilitating investment in infrastructure which can support LiFE and people's wellbeing:

The G20 already encompasses member countries that are promoting several infrastructure and connectivity plans in Asia, Africa, and Europe. Important financial institutions in Asia, Europe, and Africa are also part of the G20 process. G20 is committed to providing the ecology and platforms for multilateralism, innovative governance and cooperation mechanisms. A multilateral cooperation programme endorsed by G20 amongst countries and MDBs could facilitate global investment in infrastructure by creating more efficient, informed, transparent, and predictable investment conditions around infrastructure plans and projects.

G20 has created several principles for promoting important dimensions of infrastructure development. It supports the enhanced role of MDBs and private funds. The Global Infrastructure Connectivity Alliance (GICA) hosted by the World Bank is an important initiative for monitoring global infrastructure. Its mandate can be further supplemented with elements of LiFE and people's wellbeing. G20's several initiatives in finance, multilateralism, trade, and infrastructure tracks can be placed under a multilateral cooperation framework for investment facilitation for infrastructure (Prakash 2020, *ibid*). The mandates must be supplemented with elements from LiFE, in particular, the ethics and integrity in financing, and people's wellbeing is placed at the core of the cooperation framework. The finance ministers' meeting could steer the multilateral framework for facilitating investment in infrastructure. The regional approach to investment facilitation will be more practical.

The multilateral cooperation framework will be G20's coordinated effort to realise the G20 theme of connectivity—'One Earth—One Family—One Future'—through the facilitation of investments in infrastructure in which integrity, ethics, LiFE, and people's wellbeing are conspicuous by their presence.

Appendix

G20 Principles for Infrastructure Development

The G20 Principles of Infrastructure Project Preparation have introduced robust and transparent infrastructure planning and pipelines, improved business cases and project stage gate controls, and the development of business case methodologies.

The G20 Principles for Promoting Quality Infrastructure stresses the need to scale up infrastructure investment and provides an impetus for sound governance of and transparencies in infrastructure projects.

The Roadmap to Infrastructure as an Asset Class endorsed by G20 Leaders in 2018 provides concrete ways to mobilise more private capital.

The Hamburg Principles welcomed the role of the MDBs in mobilising and catalysing private capital and endorsed a target of increasing mobilisation by 25% to 35% by 2020 (GFI 2018).

The G20 has also highlighted the importance of the quality of investment itself, including in the Leaders' Communiqué at the 2016 Hangzhou Summit.

Noteworthy Examples of Multilateral Cooperation

The Multilateral Cooperation Center for Development Finance (MCDF) initiated by the Asian Infrastructure Investment Bank (AIIB) is a good beginning and includes the elements of information sharing, capacity building, and project preparation. The multilateral cooperation is primarily amongst the Ministry of Finance of China, AIIB, the World Bank Group, the European Bank of Reconstruction and Development, the European Investment Bank, Inter-American Development Bank, and the International Fund for Agricultural Development (AIIB 2020).

The Asia Africa Growth Corridor (AAGC) is an infrastructure—led industrialisation plan and was conceptualised as a triangular cooperation programme between India, Japan, and African states. ASEAN Member States have an important role in it, and the private sector is also participating in the investment plans. With more stakeholders on board, the AAGC is moving from a triangular cooperation plan to a multilateral one.

The Master Plan on ASEAN Connectivity (MPAC) 2025 is another example in which infrastructure financing has been given a fresh impetus through multilateral cooperation. To help accelerate investment in infrastructure in the region, the ASEAN Secretariat joined the World Bank, with the support of the ASEAN–Australia Development Cooperation Program Phase II (AADCP II) in developing a rolling priority pipeline of potential ASEAN infrastructure projects. It will help private investors and the Dialogue Partners of ASEAN to assess and prioritise infrastructure projects, especially those which will have regional impacts.

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Chapter 20

Innovating a Comprehensive Approach to Sustainable Rurality in Global South: Key Junctures and Trajectories



Chuanhong Zhang and Xiaoyun Li

Abstract In this chapter, the experiences of three types of countries were studied to define the key junctures and trajectories for sustainable rural transformation: countries that achieved spontaneous transformation; catch-up countries; and countries with an ongoing rural transformation process. Investigating the different experiences and paths of these countries, particularly about the key junctures of the transformation process can enable both policymakers and scholars understand the common laws of rural development from a global perspective. Some policy recommendations for achieving sustainable and just transformation in the Global South are provided at the end of the chapter based on the analysis.

20.1 Introduction

The rural area constitutes more than 90% of the world's land mass and provides crucial sources for the survival and quality life of human beings such as food, water, fresh air, biodiversity, recreation and homes, and livelihood opportunities for a large part of the world's population. In many countries, rural area is still places with deep poverty, poor infrastructure and insufficient public services. The divide between rural and urban areas has left many people behind, to a large extent affecting the food security, nutrition and health of the whole world population. Without sustainable and inclusive development of rural communities, it is not possible to achieve SDGs in many aspects. Driven by both domestic industrialisation process and global force, rural areas and rural societies are undergoing change that is unprecedented in speed, depth and with the involvement of the large number of countries and

C. Zhang

Department of Public Administration and Development Studies, College of Humanities and Development Studies, Beijing, China

X. Li (✉)

College of International Development and Global Agriculture (CIDGA), China Agricultural University (CAU), Beijing, China

people. In common practice, rural transformation means the decline in the relative weight of agriculture in the national economy, migration of rural people to cities and a transitory period of demographic growth. This trajectory greatly promoted the overall modernisation process and finally narrowed the rural–urban gap in many developed countries. However, for many countries in the Global South, rural transformation following a similar path does not lead to the societal change of rural communities. Economic recession and emptiness of rural communities are common in many rural areas in the Global South. The divide between rural and urban area has remained wide. Poverty, brain drain, capital outflow, underdeveloped infrastructure and unequal social services provision are common in many countries in the Global South.

Currently, urbanisation, globalisation, rapid population migration and the popularity of information technology have brought unprecedented impacts on rural societies around the world. Under the influence of climate change and science and technology, land-based traditional rural industries are constantly transforming, reshaping the traditional characteristics of rural areas. As the barriers to the flow of urban and rural populations are constantly removed, the modernisation process can lead to two outcomes: on the one hand, the large-scale emigration of the rural population will greatly reduce the income gap between urban and rural labour; on the other hand, how to maintain the multiple functions of agriculture and rural areas is the challenge faced by most rural areas in the developing countries as the unstable/unjust transformation process produced many circular labours between rural and urban areas. Many people need to go back to rural areas when job opportunities for them disappear due to industrial upgrading or ageing problem. This is a common dilemma faced in many rural areas around the world. Comparative studies on agricultural and rural development experiences of different countries with spontaneous modernisation processes or catch-up characteristics can enable us to understand the agricultural and rural development strategies adopted by countries at different stages of development and the effects achieved. The findings can provide a reference for the developing countries facing transformation issues.

In this chapter, the experiences of three types of countries were studied to define the key junctures and trajectories for sustainable rural transformation: the first category refers to the developed countries that achieved spontaneous rural and agricultural modernisation; the second category is the catch-up countries, such as Japan and South Korea. The third type is emerging economies with an ongoing rural transformation process. All these countries went through different process and faced challenges at different stages of development. Investigating the different experiences and paths that these countries have demonstrated during the process of agricultural and rural transformation can enable us to understand the key components for sustainable rural development and provide meaningful policy implications for the countries that are still struggling in the transformation process.

20.2 Key Junctures and Trajectories of Rural Transformation

20.2.1 *Experiences of the Early-bird Developed Countries*

In Western European countries, the rural transformation was driven by the spontaneous modernisation process starting from the Agricultural Revolution led by new farming technologies and increased productivity and food surplus and the institutional reform played a significant role in promoting the technology diffusion and capital allocation.

The redundant labours from the rural areas fueled the Industrial Revolution. Rural society transitioned from subsistence farming into commercial farming. Integrating into the globalisation process accelerated the mechanisation process and rural transformation of these developed countries as they had already enjoyed comparative advantages in agricultural productivities. With the large number of rural people migrating to urban areas and the capital investment in agricultural technology and infrastructure in rural areas. The rural–urban divide was gradually narrowed. The transformation process in these countries has lasted for long period of time compared with the latecomer countries. Industrialisation and institutional reform such as land reform policy and infrastructural investment contributed to this great transformation. Here we studied the UK's agricultural and rural transformation experiences to draw some useful lessons and experiences of the developed countries with spontaneous modernisation processes.

The UK

The UK went through a long period of rural transformation process. Some of the most crucial junctures include:

1. The Agricultural Revolution in the eighteenth century. Since early 18th century, new farming techniques and crop rotations were introduced, resulting in increased productivity and food surplus. This allowed labour to shift into industrial sector, fueling the Industrial Revolution. Rural society transitioned from subsistence farming into commercial agriculture (Overton 1996). During this period, agriculture accounted for over 1/3 of UK's GDP and 2/3 of employment similar to the current situation of many developing countries in Sub-Saharan Africa. Most people lived in rural areas but the urbanisation process started due to the enclosure movement. The per cent of the rural population started to decline as increased farm productivity released labour into the industry. Farming GDP contribution dropped to 15% by 1850 (Tsakok 2011).
2. The Corn Laws and their repeal in the nineteenth century. After the Napoleonic Wars, agricultural prices declined as supply went up. British landowners lobbied for protectionist laws to stabilise farm incomes. A series of laws were enacted between 1815 and 1846 in the UK to prohibit grain imports until domestic prices

rose above a certain level. The laws kept grain prices artificially high, benefiting large landowners but raising costs for urban consumers, especially the poor. People with manufacturing and trade interests argued that the laws limited economic growth. There were calls for repeal of the Corn Laws. In 1846, facing famine in Ireland and political pressure, the British Parliament repealed the Corn Laws. Cheaper imported grain lowered food prices, especially benefiting the urban poor. The repeal of Corn Laws exposed British farmers to foreign competition and pushed them to modernise and increase efficiency through mechanisation, new technology adoption and farm consolidation. There was a gradual shift to more market-oriented agriculture. In 1846, when the Corn Laws were repealed, 65% of the UK population was rural people. Agriculture employed 20–25% of all workers. Foreign grain imports increased while wheat prices fell. Farm income declined. Migration into cities was accelerated. The urban population rose from 20% to 50% of the total.

3. Rapid urbanisation period (1850s–1950s). The war led to food shortages, demand for increased productivity and self-sufficiency in food production in the UK. This accelerated mechanisation, the use of synthetic fertilisers and pesticides in British farming. Post-war policies also protected and subsidised the agricultural sector. Farming became more intensive and chemistry-based. Agricultural contribution to GDP fell to 7% and rural employment down to 3%. Industry dominated at 40–50% of GDP. Mechanisation and farm consolidation boosted yields and farm size but reduced labour needs. Productivity gains were rapid. Government protectionism shielded farmers but also slowed restructuring. Further innovation, industrial expansion and trade drove more migration into cities. Massive slums and pollution resulted from overcrowding and lack of regulation. By 1950, over 80% of British were urban dwellers. This urban transition supported Britain's dominance as a global economic power.
4. UK's accession to the European Community (EC) in 1973. Joining the EC provided new market opportunities but also increased competition for British farmers under the Common Agricultural Policy. However, the process prompted restructuring, specialisation and optimisation of farm production. UK Membership in the EC drove expansion into continental trade and competition with EU farmers. Subsidies for diversifying into other farm activities and goods such as poultry, wine, etc. The average farm size continued increasing to over 100 hectares. Small family farms declined and commercial farms took over. Organic farming started to develop during this period. The rural population accounted for less than 10% of the total population. Agriculture only made up 5% GDP and employed about 2% of total labour. The service sector became dominant, contributing more than 60% GDP (Brennan 2012).
5. Reforms since the 1980s. Government support for farming was reduced, and subsidies were linked more to environmental goals. Farmers gained more flexibility and independence to respond to market signals. Upscaling continued and farming became large-scale and professionalised. Demand for high-quality, sustainable and traceable produce grew. Reduction in government support pushed for more independent and efficient farming. Responding to market demands and

competitiveness became key to survival. About 50% of farms diversified into non-farm activities. Others pursued scale, high-quality or niche food production. Slums and poor living conditions for young urban dwellers became prevalent in the cities. The organic sector grew rapidly. Disparities emerged between large commercial and lifestyle farms. However, British farming remained small-scale relative to other European countries.

Counter-urbanisation has become a trend in the UK since the 1950s. Improved transportation and housing options enabled many city dwellers to commute from or move to smaller surrounding towns. Strict greenbelts contained urban sprawl. The government aimed for more balanced regional development. Revitalised cities attracted the attention of the government. Public investments in urban infrastructure, amenities and regeneration attracted more young, skilled workers to cities. Restrictive planning rules made housing less affordable, however. The policy now promotes affordable housing and transport. The urban population declined to 75% and gradually returned to the current 83%.

To summarise, as the UK transitioned to an industrial and service economy, agriculture's role declined substantially while productivity increased dramatically. Government policies and EU integration were major drivers of change. There is a clear long-term shift from small-scale family subsistence farming to large commercial and diversified agriculture. Overall, British agriculture transitioned over time under economic and policy influences from highly self-sufficient and regulated to more globally integrated and market-driven. Advancement in science and technology, as well as land consolidation, resulted in a decline in agricultural employment but increased labour productivity.

Britain's long experience with urbanisation also provides useful lessons. Unregulated early urban growth led to slums, health issues and environmental damage. Later government support for suburbanisation, greenbelts and urban regeneration aimed to address these problems and promote more sustainable cities. Policy should facilitate affordable housing, transportation and high quality of life to attract skilled workers to cities of all sizes.

20.2.2 Experience of the Catch-Up Developed Countries

The second type is the catch-up countries such as Japan and South Korea whose transformation process was in a relatively short period of time, and rural decline remained as a prevalent problem. Strong government intervention had been in place to converge or reducing the rural–urban gap, but rural decline and external reliance on food security have remained an issue until nowadays in these countries.

Japan

Japan's urbanisation started in the mid-1800s when the Meiji Restoration opened Japan to global trade. Rural migrants moved to cities seeking work in new factories.

The urban population rose from 5% to 35% of the total. Rapid industrialisation and Westernisation were underway. During the Interwar period (1920–1945), the urbanisation process was accelerated. Japan experienced the economic boom in the 1920s, then suffered in the 1930s. Rural poverty and unemployment pushed more people into cities. 65% of Japanese lived in cities, straining infrastructure. Nationalism and militarism were on the rise.

Japan went through rapid rural transformation during its post-war development. Land reform and redistribution in 1945–1950 abolished its feudal land tenancy system, and agricultural land was redistributed to cultivators. This boosted farm productivity and income, fueling initial economic growth. From 1950 to 1973, Japan achieved high economic growth and rapid industrialisation, which also led to massive rural–urban migration. Agriculture shrank to 11% of GDP and 33% of labour force. Small-scale rice farming dominated. After the oil crisis in the 1970s, food self-sufficiency and agricultural competitiveness became policy priorities. The government promoted farm mechanisation, electrification and scale expansion. Agricultural R&D also intensified. Trade liberalisation in the 1980s–1990s forced Japan to reduce trade barriers and implement a minimum rice price system for farmers exposed to global competition. Many farmers switched to high-value crops/product production and started to diversify and commercialise their farming activities. Since the 1990s, Japanese government shifted support to general services and direct income payments. This spurred another wave of farm mechanisation/scale expansion and diversification into value-added processing. Further trade integration and changing diets (more meat/dairy) impacted agriculture in the new millennium. Many marginal farms were abandoned and large commercial farms emerged, often in rural–urban fringes and sometimes with non-farming income sources.

By 1970, 77% of Japanese were urban dwellers. Large cities were heavily populated while rural areas declined. This shift supported Japan's rise as an economic superpower. However, since the 1990s, with the slow economic growth counter-urbanisation trends emerged in Japan. Smaller cities and towns gained population from both natural increase and in-migration. Strict planning controls contained urban sprawl. The urban population is now 92%, with many living in suburbs of mid-sized cities. Part-time farming increased. Government efforts have been given to promote balanced regional development (Tsakok 2011).

Japan's rural transformation was policy-driven with governments promoting farm mechanisation, income support and market orientation. Although initially disruptive, these changes boosted agricultural productivity, farm income and economic growth over the long run.

South Korea

South Korea underwent rapid rural transformation as its economy developed. The land reforms after WWII redistributed agricultural land and transferred ownership to tenants, which greatly increased farm productivity and income. Agriculture contributed more than 40% of GDP and 65% of the total labour force (Ban et al. 1980). Export-led industrialisation in the 1960s and 1970s pushed many rural labourers into manufacturing. Agriculture declined to 30% GDP and 50% labour force. Small

farms and poverty were key characteristics of rural areas in South Korea. At the same time, the South Korean government started to promote farm mechanisation through providing subsidies and loans for farm machines, irrigation and technology adoption to boost food self-sufficiency and farm income during industrialisation. Agricultural trade liberalisation in the 1990s forced South Korea to remove protections and subsidies. Cheaper food imports threatened many smallholder farmers. Many switched to high-value crops/products; others abandoned farming. Productivity growth slowed (Kang & Ramachandran 1999). Since the 2000s, the South Korean government introduced direct subsidies for farm income and management. Larger farm scale, mechanisation and value-added agriculture (e.g. ginseng) were introduced to curb rural depopulation. Bilateral trade deals (e.g. with US, EU) brought more import competition but also export opportunities. Farming diversified and premium markets targeted. Agro-food business investments increased.

South Korea's rural transformation has been a gradual process. Government policies initially aimed to increase food self-sufficiency, then promote farm scale/mechanisation and income. Reduced trade barriers and subsidies more recently have driven agricultural diversification and commercialisation. Income support policies curbed over-rapid depopulation in some rural areas. The Saemaul Movement starting in 1980s made significant impact on rural revitalization and the income gap between rural and urban citizens has been shrinking since then (HeeHang 1997). Valuable experiences can be drawn to inform rural modernisation strategies for developing countries.

South Korea's urbanisation was rapid during its period of industrialisation and economic growth. After WWII, post-war refugees and rural migrants crowded into cities seeking work in new factories. The urban population rose from 28% to 65% of the total. This shift fueled South Korea's rise as an export-driven manufacturing hub. However, the living conditions of migrant workers were often poor (Ramachandran 1995). After the 1970s, government policies favoured urban industries and infrastructure. Another wave of rural migrants moved to cities. By 1990, 83% of South Koreans lived in cities. Massive slums developed around Seoul, and poverty was widespread despite economic success. Starting from the 1990s, facing overcrowding and slums, the government invested in small- and mid-sized cities to attract more migrants and encourage business growth. Strict greenbelts contained sprawl. The urban population rose to 91% of the total by 2010. Living standards slowly improved. Sustainable cities were promoted in the last decade, and investments in public transit, renewal of old city districts and affordable housing aim to make cities more livable while limiting sprawl. Green spaces are conserved in nearby cities. The urban population has stabilised around 92% of the total. Policy promotes wellbeing for all urban residents (Tsakok 2011).

South Korea's rapid urbanisation brought both economic gains and costs to human welfare initially. Government policies and investments have since aimed to distribute the benefits of urban life more evenly by developing a range of sustainable cities and improving living conditions for all residents. Key lessons from South Korea's experiences include the need to provide affordable housing, public transit and a clean environment for people in cities of all sizes. Strict planning controls and targeted

investments in secondary cities can help curb issues like overcrowding, lack of services and slums. With balanced urban development, rapid economic growth and high quality of life can co-exist.

20.2.3 Experiences of the Emerging Economies

The emerging economies and many other developing countries fall into the third category of the transformation process. These countries cannot completely repeat the trajectory of the developed countries as a large proportion of the population still lives in rural areas and small-scale agricultural production is still the dominant mode of production. Modernising the rural area in these countries is key to the decent life of the rural people, to food security of the whole nation and even sustainable development of the whole world.

China

China's rural transformation has followed a gradual but path-dependent process since market reforms began in 1978. Some key junctures and trajectories include:

1. The collective system (1949–1978). After the new China was established in 1949, China's rural area went through a collective system. People's commune system contributed to the fast development of rural infrastructure through the free labour contribution of rural farmers. Rapid industrialisation was promoted by the government but it did not contribute to rapid urbanisation. Less than 20% of China's population were urban dwellers.
2. Household responsibility system (1978). In 1978, the villages contracted collective-owned land to individual households, increasing agricultural productivity and farmers' income. Agriculture contributed to 97% of GDP and smallholders farming was a key characteristic of the Chinese farming system with the average land area occupation was 0.2 ha.
3. The market reforms and integration into the global market since the 1980s reduced trade barriers and ended agricultural price controls. Some farmers shifted to more commercial crops/products but small farms and inefficiency persisted. Rural migrants moved to cities for better job opportunities as economies opened up. Agriculture declined to 50% GDP and the average farm size was 0.5 hectares. The urban population rose from 18% to 26% of the total. This fueled initial industrialisation and economic growth. WTO entry in 2001 triggered another wave of trade liberalisation, impacting many farmers. Some diversified or migrated for work; others operated at subsistence levels due to a lack of alternative opportunities. Agriculture fell to 15% of GDP.
4. Efforts to narrow the rural–urban divide since 2004. To curb rural–urban inequality, the Chinese government launched the movement of constructing a new socialist countryside to increase government investment in rural infrastructure and public services. To further improve farm productivity, the Chinese

government eliminated agricultural tax. In the last decade, agricultural scale, mechanisation, value-added production and agribusiness integration have been promoted by the government. A new class of commercial farms and rural enterprises is emerging. Agriculture remains at about 8% GDP but with fewer farmers work as full-time. The household registration system was reformed to provide more migrants access to healthcare, education and welfare benefits in small and medium cities. Sustainable urban development aims to encourage more rural residents to settle in small- and medium-sized cities, limit overcrowding in megacities and revitalise rural economies. But rural population are still as high as about 40% by 2018.

Government support for infrastructure, education, off-farm employment and agribusiness development will continue to drive agricultural commercialization and rural prosperity. However, small-scale farmers and high inequality persist in some areas, and further policy interventions are still needed. Urbanisation has been rapid in China since market reforms began in 1978. Rapid but unbalanced urbanisation can drive economic growth over the short-term but lead to high inequality and strains on resources. Government support for new urbanisation aims to distribute the benefits of urbanisation more evenly by developing a wider range of cities and providing more rural residents access to urban opportunities.

China's transformation over the last four decades has been phenomenal. The share of agricultural GDP to total GDP declined to less than 7%, the share of agricultural labour force declined to 20%, urbanisation rate increased to over 60%, but the rural–urban gap is still wide in all measures. By the end of 2020, China had successfully eliminated absolute poverty in rural areas. The new rural revitalisation strategy aims to illuminate a more sustainable and inclusive urban transition, which means strong government intervention is needed for the emerging economies to achieve agricultural modernisation and balanced rural–urban development.

India

India follows a similar trajectory of rural transformation with China with government support focused on improving small farm productivity and incomes at the beginning. Green Revolution in the 1970s introduced high-yielding crop varieties, irrigation and fertilizers and also increased food production and farm income, reducing poverty. Agriculture contributed 40% of GDP and the average farm size was 2.3 hectares. Economic liberalisation in the 1990s removed restrictions on private sector activity and trade. This opened new market opportunities but also exposed farmers to global competition. Many remained small scale with low productivity and agriculture fell to 25% of GDP (Binswanger-Mkhize 2013).

Since the new millennium, the Indian government started to pay attention to rural infrastructure investment. Government spending on roads, electricity, irrigation, education and healthcare in rural areas was increased to raise farm productivity and non-farm opportunities. Farm size and income rose slowly; agriculture was 18% of GDP. To incentivise production and protect farmer incomes, the Indian government sets minimum support prices for key crops. In the last decade, agricultural

modernisation has also been promoted through providing farmers' access to credit, technology adoption, value chain development and private investment in agriculture. However, the impacts have been limited so far. By 2017, agriculture still constitutes more than 15% of India's total GDP (Majumdar 2020).

Lack of economic diversification and irrigation limitations have constrained India's progress in sustainable transformation. Government support has aimed to boost small farm productivity and food security instead of significant restructuring. Poverty remains high in some rural areas. India's experiences highlight the challenges of achieving rapid rural transformation with many small subsistence farmers.

20.3 Challenges of Rural Transformation in the Global South

Characteristics of the Rural Transformation in Global South Different from the developed countries with spontaneous and catch-up modernisation process, rural transformation in most countries of the Global South has the following characteristics: dominance of smallholder agriculture with low productivity and income. Rural populations still make up a large per cent of the total population and the majority of them are still in poverty. These people are also facing the challenges caused by drought, flood, diseases and pests. Climate challenges also impact them the most. The majority of people have limited access to natural resources such as land, water and forests. Underdeveloped infrastructure for rural production, the development of the whole agricultural value chain and mobility of natural and human resources became the key bottleneck of agricultural and rural modernisation. For these countries, integration into globalisation could only boost income for large commercial farms and agricultural businesses. The smallholder subsistence farmers are often suffering from the negative impacts of globalisation.

Besides, due to the global food shortage and different initiatives to tackle climate change, these countries are facing the pressure of deindustrialisation, which means the majority of the rural population might not be able to find jobs in the cities. These tensions lead the governments in many developing countries facing a dilemma in balancing agricultural modernisation and increasing farmers' income.

At present, most policies in these developing countries target smallholder farmers rather than promoting large-scale agricultural modernisation processes. This indicated that rural transformation in developing countries follows a different path than in early industrialised nations. Challenges like poverty, lack of economic diversity and resource scarcity must be addressed through government policy and investments to improve agricultural productivity, living standards and opportunities in rural areas across the Global South. Globalisation must also be harnessed and managed to benefit all farmers and rural workers. With policy reforms and support for diversification, sustainable growth in agricultural incomes and productivity can be achieved to reduce poverty, curb migration pressures and ensure future food security. Comprehensive

approach to sustainable rurality in Global South Based on the experiences of the three types of countries mentioned above, some commonalities can be found in their transformation process: the increase of farming productivity and integration of the global market leads to the massive rural–urban migrant workers, which in turn leads to the decline of agricultural contribution to total GDP, the rapid urbanisation process and the widening rural–urban divide. Strong government intervention is needed to reduce the negative impact of market liberalisation on smallholder farmers, which also provides opportunities for agricultural mechanisation and modernisation and building sustainable rural areas. Obviously, to integrate rural and urban development in a more harmonious way to cope with the structural challenge of transformation is the core element of the new development model for most developing countries.

20.4 Comprehensive Approaches to Sustainable Rural Transformation

A comprehensive approach to rurality for most developing countries in the Global South should be based on the following conditions: (1) Agricultural and labour productivity has been boosted with technology adoption and massive rural labourers were liberated from farming activities. Most rural–urban migrant workers can live a decent life in cities, no matter it is megacities or small and medium cities. The left behind in rural areas can participate in both farming and off-farming activities. In the cases of Japan and South Korea, both countries started to promote balanced rural–urban development after the population urbanisation rate reached over 90%. China's rural revitalisation strategies just started 5 years ago when the absolute poverty was eliminated in rural areas. (2) Rural infrastructure construction is necessary for diversifying rural livelihoods and equalising public service provision between rural and urban areas. (3) People's attitudes, behaviour towards the environment, economic and social development, cultural diversity as well as consumption are related to the recognition of the values of rurality. A new value system towards the future rurality with sustainable, inclusive and just transformation is needed.

A comprehensive approach to sustainable rurality should include the following elements:

- (1) Diverting development finance into rural infrastructure in developing countries, including infrastructure for agricultural value chain development, eco-tourism and ethno-development to bring urban dynamism to rural areas.
- (2) Revitalising new values of rural development with holistic and sustainable development ideology through promoting new technologies such as bio-chemicals and conservation agriculture.
- (3) Encouraging government-led investment into pro-poor development projects to provide better public service as well as to create more job opportunities for rural poor and marginalised groups.

- (4) Mobilising more resources from the private sector and non-government organisations to invest in rural industry development so that young people can be attracted to the rural areas.
- (5) Establishing a platform for knowledge and experience sharing and learning between the think-tanks, academics and even government officials with the countries and beyond.
- (6) A fairer and inclusive globalisation process should be established through regulation and different forms of support programmes to developing countries in the Global South.

All in all, a comprehensive approach to sustainable rural development is key to the sustainable development of the whole planet. Without sustainable rural development, it is impossible to achieve sustainable development goals. Industry development can create job opportunities for rural people. The lifestyle change towards new rurality will make rural areas healthy and attractive. Attracting young talents into rural areas and organising the rural communities are also indispensable to revitalise rural areas and ensure that farmers are the owners and main beneficiaries of the rural industry, rural property and rural environment. All these efforts should be mobilised by the government of the countries in the Global South.

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Chapter 21

Future Urbanisation and Habitat: Transitioning Towards Climate Responsive and Sustainable Development



Debolina Kundu

Abstract Besides contributing to around 85% of the global GDP, G20 countries will play a critical role in setting the future path of urbanisation as they contributed to around 67% of the global urban population in 2023. Moreover, India and China are the two most populous G20 member countries housing the most populated megacities like New Delhi, Shanghai, Beijing, and Mumbai among others. Most of these megacities face challenges like congestion, housing shortage, unequal access to urban services, and unplanned growth. On the contrary, many European cities are experiencing population shrinkage without much reduction in their carbon footprint.

Notably, G20 countries contribute to 80% of the global carbon emissions, owing to economic production, weak planning and policy structure, and ineffective environmental regulations. Also, sprawl development is common across them, and is a major contributor to carbon emissions. Previous G20 summits have already acknowledged the role of cities in the ‘race to zero’ and highlighted the critical role of the ‘circular economy’ in reducing carbon footprint. The UN Habitat has also identified strengthening of urban rural linkages to build sustainable habitats. In light of the above, this chapter aims to identify the global demographic trajectory and development challenges with particular reference to the G20 countries. It highlights deficiencies in planning ‘zero carbon cities’ and discusses the merits of Mission LiFE proposed by India as a tool to plan for carbon neutral cities and habitats. The chapter suggests that by adopting mindful consumption behaviour, the future urbanisation can be more sustainable and help the countries to be on track with the global goals.

21.1 Introduction

The twenty-first century can be described as an urban century, where planetary urbanisation is assuming the lead role in determining the future of the earth. The year 2007 witnessed more than 50% of the global population living in urban areas and the figure is estimated to reach 70% by 2050 (UN DESA). Most importantly, the pace of

D. Kundu (✉)

National Institute of Urban Affairs (NIUA), New Delhi, India

urbanisation is projected to be rapid in the Global South, particularly in developing countries of Asia and Africa (UN-Habitat 2020; Kundu et al. 2023). The urban turn at the global level is also associated with grave challenges thrown up by urbanisation as cities have become hotspots of extreme climatic events and high carbon footprints. Importantly, 75% of the emission of greenhouse gases (GHGs) comes from cities. In fact, the Intergovernmental.

Panel on Climate Change's (IPCC's) Fifth Assessment Report (AR5) highlighted the role of rapid urbanisation in increasing carbon emissions and climate crises (Revi et al. 2014). The Sixth Assessment Report (AR6) of IPCC (Dodman et al. 2022) strongly stressed the fact that rapid urbanisation in developing countries without adequate infrastructure and adaptive capacity intensifies the risks of climate crisis in urban areas. Both reports highlighted the high degree of vulnerability of informal settlements. The IPCC AR5 also mentioned that high population concentration and agglomerations of activities can be extremely beneficial to reduce carbon footprint by proper planning and mentioned the role of small and medium cities in the reduction of carbon emissions (Revi et al. 2014).

So far, international agreements such as the Sendai Framework for Disaster Risk Reduction (2015), the Addis Ababa Action Agenda (2015), the Paris Agreement (2015), the 2030 Agenda for Sustainable Development (2015) and the New Urban Agenda (2016) have recognised the role of urbanisation as a key driver to economic growth as well as promoting sustainability and resilience. SDG 11, in particular, has a specific focus on making cities 'inclusive, safe, resilient and sustainable'. The recent COP26 climate discourse also puts a major thrust on the role of cities in climate change mitigation, especially the 'race to the zero'.¹

The Group of 20 (G20), comprising 19 countries and the European Union, is the most important global economic forum, which has a high potential to play an important role in promoting sustainable urbanisation and in tackling the global climate crisis through mainstreaming climate dialogues and climate financing. Besides contributing to around 85% of the global GDP, G20 countries are likely to play a critical role in setting the future path of urbanisation as they house around 67% of the global urban population in 2023. Moreover, India and China are the two most populous G20 member countries housing the most populated megacities like New Delhi, Shanghai, Beijing, Tianjin, Chongqing, Mumbai, Kolkata and among others. Many of these cities are coastal cities and are expected to bear the consequences of rising sea levels. Besides, G20 countries also contribute to 80% of global CO emissions and 70% of global plastic production (OECD-UNDP 2019). Therefore, G20 countries need to plan the growth of cities in order to meet the global target of limiting temperature rise below 1.5 °C, reducing carbon dioxide (CO₂) emissions by 45% by 2030 and attaining net zero by 2050.

In light of the above, following the introductory section, the second section analyses the urbanisation trajectory of G20 countries and the associated increase in built-up areas and documents the challenges the cities face. The third section highlights

¹ https://www.c40knowledgehub.org/s/article/COP26-What-the-Glasgow-Climate-Pact-means-for-cities?language=en_US

existing climate action plans and the progress towards creating ‘zero carbon cities’. The next section discusses the merits of Mission LiFE proposed by India as a tool to plan for achieving carbon-neutral cities and habitats. The last section concludes.

21.2 Urbanisation Trajectory in G20 Countries

Most of the G20 countries are highly urbanised. In 2023, G20 countries housed a 3.1 billion urban population, comprising 67% of the global urban population. By 2050, the absolute figure of urban population is projected to reach 3.9 billion. However, the level of urbanisation varies widely among the member countries. In 2023, it ranged from 92% in both Argentina and Japan to 36% in India (Table 21.1). Except for India (36%), Indonesia (59%), China (65%) and South Africa (69%), all remaining member countries have levels of urbanisation of more than 70%. Moreover, it is projected that most of the countries except India and Indonesia will be more than 80% urban by 2050 (UN DESA 2018).

Table 21.1 Level of Urbanisation in G20 Countries

Country	2000	2023	2030	2050
Argentina	89.1	92	93.2	95.2
Japan	78.6	92	92.7	94.7
Brazil	81.2	88	89.3	92.4
Australia	84.2	87	87.6	91.0
Saudi Arabia	79.8	85	86.5	90.4
UK	78.7	85	86.3	90.2
USA	79.1	83	84.9	89.2
France	75.9	82	83.6	88.3
Mexico	74.7	82	83.5	88.2
Canada	79.5	82	82.9	87.3
Republic of Korea	79.6	81	82.0	86.4
Turkey	64.7	77	80.2	86.0
Germany	75.0	78	78.9	84.3
European Union	70.8	76	77.5	83.6
Russian Federation	73.4	75	77.1	83.3
Italy	67.2	72	74.3	81.1
China	35.9	65	70.6	80.0
South Africa	56.9	69	72.1	79.8
Indonesia	42.0	59	62.8	72.8
India	27.7	36	40.1	52.8

Source UN DESA, 2018

While the levels of urbanisation are higher in developed countries (Fig. 21.1), growth rates of urban population are observed to be higher in developing countries. Between 2023 and 2050, the growth rate of urban population is projected to be highest in India (1.94%), followed by Indonesia (1.32%) and South Africa (1.22%). On the other hand, Japan will be experiencing negative annual growth of -0.41% . Moreover, very low urban growth will be experienced by countries like the Russian Federation (0.09%), South Korea (0.11%) and Germany (0.14%) (UN DESA 2018). The low growth of the urban population in these countries is mostly due to very low fertility rates coupled with an ageing demographic structure. In fact, a growing number of G20 countries like Japan, Italy, the Republic of Korea, the Russian Federation, Germany and China are expected to experience population decline before 2050 (UN DESA 2022).

In absolute terms, much of the additional urban population in the future decades will be concentrated in two countries, viz. India and China. Between 2023 and 2050, 358.3 million people will be added to Indian cities and towns compared to 165.5

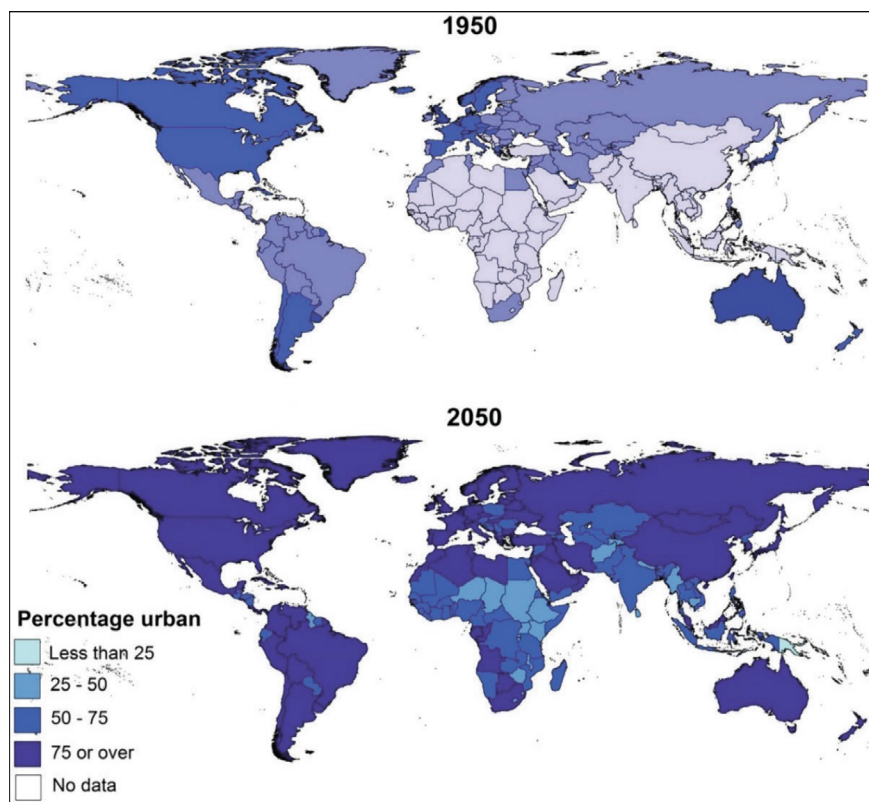


Fig. 21.1 Global pattern of changes in level of urbanisation, 1950–2050 *Source* United Nations, Department of Economic and Social Affairs, Population Division (2018)

million in the case of China. The demographic trajectory highlights that India will be at the centrestage of future urbanisation in G20 countries, followed by China. In addition to the demographic weight of these two countries, they account for a large number of million-plus cities. In 2020, there were 134 million-plus cities in China and 63 in India, accounting for 48% and 45.9% of the urban population, respectively (Fig. 21.2). By 2035, the number of million-plus cities is projected to be 183 in China and 78 in India, comprising 55.5% and 48.8% of the urban population in the respective countries. Moreover, China will be home to ten megacities with more than ten million people, while there will be eight such cities in India by 2035 (UN DESA 2018). It is also projected that most of the future urbanisation in China will be concentrated in a few superclusters, which may have a population of 120 million (Morgan Stanley 2019).² Likewise, Delhi Urban Agglomeration is projected to be the largest agglomeration in the world by 2035 (UN DESA 2018).

21.3 Urban Footprints Growing Faster Than Urban Population: A Global Trend

Urban sprawl, in the form of dispersed urbanisation or peri-urbanisation, is a spatial phenomenon initially used to describe the suburbanisation of developed countries of North America and Australia. However, this phenomenon of horizontal spreading of built-up areas is currently occurring in cities all over the world and growing much faster than their population, thereby consuming more land for urban development. This unchecked expansion of urban areas has adverse implications for energy consumption, greenhouse gas emissions, climate change and environmental degradation. A UN-Habitat report (2020) based on a study of 200 cities with over 100,000 population showed that between 1990 and 2015, cities in developed countries increased their urban land area by 1.8-fold while the urban population increased by 1.2-fold. This implied that the expansion of urban areas in relation to urban population growth increased by a ratio of 1.5. Also, urban areas in both developed and developing countries are expected to experience significant expansion between 2015 and 2050, with growth factors of approximately 1.9 and 3.7, respectively. This indicates a substantial conversion of agricultural land into built-up areas as cities expand. In the case of developing countries, over the same period, urban land use increased 3.5-fold, while the urban population increased onefold or doubled, suggesting that urban expansion increased 3.5 times in relation to the growth of the urban population. During this period, these cities will gradually encroach upon surrounding rural areas resulting in the formation of conurbations.

Peri-urbanisation, mainly driven by informal activities, is characterised by the efforts of low-income households seeking affordable land in convenient locations. As a result, new settlement patterns emerge, posing challenges for existing planning and regulatory systems to effectively address them. These expanding urban peripheries

² <https://www.morganstanley.com.au/ideas/2019-supercities>

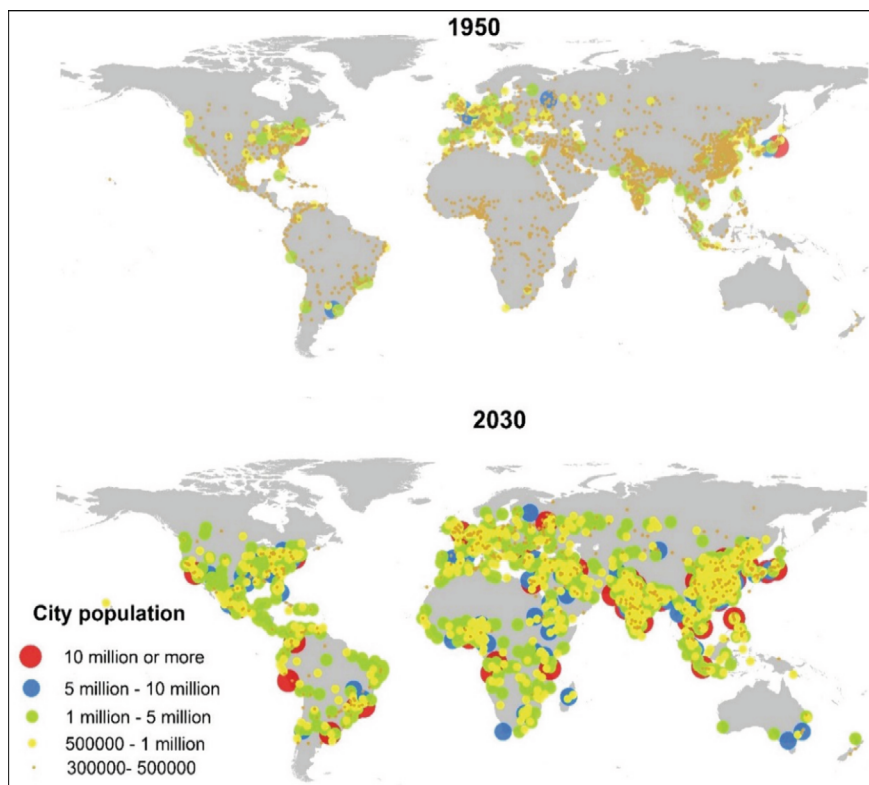


Fig. 21.2 Spatial pattern of cities by size class of settlements, 1950 and 2030 *Source* United Nations, Department of Economic and Social Affairs, Population Division (2018). *World Urbanization Prospects: The 2018 Revision*. Note-Cities with 300,000 or more inhabitants in 2018 are included in this analysis, and their respective population is plotted for 1950 and 2030

often lack connectivity with the main urban centres, leading to the development of disconnected sprawl. These expanding urban peripheries often suffer from inadequate connectivity, hindering efficient urban travel and burdening the cost of providing municipal services. The lack of effective planning and management in their expansion gives rise to significant resilience challenges like housing affordability, traffic congestion, limited access to labour markets and public spaces, heightened risks from natural hazards, loss of natural environment and ecosystems and insufficient access to basic services.

Urban areas, if effectively planned, managed and governed, can reduce the pace of urban expansion in both developing and developed countries at a projected factor of 1.1 and 2.5, respectively (UN-Habitat 2020). By 2030, the built-up areas in cities are expected to increase three times as compared to 2000, with much of the expansion occurring in relatively undisturbed key biodiversity hotspots of the Global South. Table 21.2 provides an indication of the expansion of urban areas in different regions.

The ratio of the rate of urban expansion to urban population growth is the highest in Europe (2.88). The cities in these regions have been able to offset the reduction of densities through innovative planning that contains sprawl and enhances connectivity, such as urban growth boundaries and urban infill policies. The countries of East (1.77) and South Asia (1.50) face difficulties in managing the urban expansion as the sprawls are often disconnected from the main city. The inadequate planning and governance structures in the sprawling areas hinder the development of agglomeration economies and the efficient provision of public goods and services. The challenge for planning and governance is devising mechanisms for directing or controlling the timing, rate and location of urban growth. Urban sprawl necessitates the adoption of more sustainable urban growth management policies to accommodate in situ urbanisation and organic growth of cities in a planned manner.

The urbanisation trajectory observed in the world's two most populous countries, along with the ongoing high carbon-intensive urbanisation in developed nations, is linked to challenges concerning heightened vulnerabilities to climate change. The rapid increase in the number of million-plus cities, particularly in countries like China and India will be associated with enormous increase in built-up areas leading to the emergence of heat islands and temperature rise. China's rapid urbanisation between 1961 and 2013 has already contributed to rise in average temperature by 1.44 °C (Su et al. 2016). The current pattern of urbanisation has thrown up several challenges, which are discussed in the following section.

Table 21.2 Growth in urban boundaries and urban population

Geographic regions	Average of urban extent annual change 2000–2015 (in per cent)	Average of urban extent population annual change 2000–2015 (in per cent)	Ratio of urban extent to urban population
Southern Asia	4.3	2.8	1.50
East Asia	7.2	4.1	1.77
South-East Asia	5.7	4.4	1.31
Central America	2.6	2.3	1.14
South America	2.0	1.8	1.13
Australia and New Zealand*	1.1	1.7	0.67
North America	2.0	1.5	1.32
Europe	2.1	0.7	2.88

*Two cities (Sydney and Auckland)

Source Based on UN-Habitat 2016b

21.4 Increased Climate Risks

The Sixth Assessment Report (AR6) of IPCC has highlighted that majority of the urban centres are already experiencing impacts of climate change such as heat stress, urban floods due to sea level rise, drought and water shortage. Also, the adaptive capacities of the cities of developing countries are insufficient without proper planning.

21.5 Infrastructure Gap and Vulnerabilities

Despite being the economic superpowers, there is a wide disparity in infrastructure development among G20 countries. While the cities of the developed countries of the G20 forum enjoy universal access to networked water supply, sewerage and waste management, the developing countries are experiencing urbanisation without corresponding infrastructure growth, which increases their vulnerabilities to climate change risks. Moreover, the rapid and unplanned urbanisation in these countries and the increase in the number of large conurbations put extra pressure on infrastructure, energy and housing requirements.

21.6 Economic Inequality and Poverty

Disparities in income and wealth distribution provide unequal opportunities for the citizens of many of the G20 countries. Income inequality is on the rise significantly in most of these nations. Moreover, the COVID-19 pandemic was responsible for significant wage loss incurred by workers and their families. On average, wage employees lost about six weeks of wages during 2020–21 (ILO 2022). Economic inequality and poverty intensify the climate risks as a large number of citizens lack adaptive measures and live in informality (Dodman et al. 2022). IPCC reports have acknowledged the heightened vulnerabilities of residents of the informal settlements (Revi et al. 2014; Dodman et al. 2022). Countries like India, Indonesia, South Africa and Brazil have a large share of the urban population living in informal settlements located in hazard-prone zones, which interalia increases their vulnerability from the perspective of climate change-induced natural disasters.

21.7 Demographic Shifts and Ageing Population

Many of the G20 nations are grappling with the challenges of an increase in the elderly population and declining birth rates. Presently there are about half a billion people aged 65 years or more living in the G20 countries (UN DESA 2019). Along with the increase in the median age, a predominance of females in the older age groups is also observed. The elderly population are extremely vulnerable to rising extreme climatic events and needs additional social security to combat climate-induced challenges.

21.8 Health and Healthcare Systems

Ensuring access to affordable and quality healthcare remains a challenge for several G20 countries. According to the World Health Organisation (WHO), non-communicable diseases (NCDs) are the leading cause of death in high-income countries whereas communicable diseases are still the main cause in lower-income countries. The recent pandemic highlighted the need to strengthen the global value and supply chains for medicines and vaccine production (Chapman et al. 2022). Moreover, there is a need to strengthen primary healthcare as most of the cities are going to experience the rise of several viral and vector-borne diseases due to rising temperatures.

21.9 Agendas Related to Climate Change in G20 Summits

The G20 addressed different issues of global climate change over the years. It supports and provides a platform for international climate negotiations and emphasises the importance of collective action to tackle environmental challenges and climate adversities and promotes flexible, transparent and cleaner energy systems. The issue of climate change was first explicitly mentioned in the Pittsburgh Summit in 2009 under the US presidency of G20. The leaders recognised the scientific evidence of global warming and committed to take strong and prompt action against it.

In the G20 Toronto Summit in 2010 under the G20 presidency of Canada, climate change was addressed in the context of sustainable development. The need for low-carbon growth, sustainable energy systems and international cooperation on climate change mitigation and adaptation were discussed. In the Cannes Summit (2011) under the G20 presidency of France, the ‘Cannes Action Plan for Growth and Jobs’ was launched, which emphasised green growth, energy efficiency and renewable energy. The members of G20 during Mexico summit (2012) also emphasised green growth and sustainable development.

The summit in St. Petersburg, Russian Federation (2013) reaffirmed the commitment towards investment in clean energy infrastructure, thus expanding access to

clean energy for growth and development. The following year, at the Australia summit, the G20 members prioritised energy efficiency and agreed to increase collaboration on energy efficiency that could drive both economic activity and productivity, strengthen energy security and improve environmental outcomes.

The following G20 summits focused on more sustainable and balanced growth. In the Hangzhou Summit, 2016, the G20 presidency announced a statement on Climate Change. In 2017, at Hamburg, Germany, a major climate initiative was developed by adopting a new pro-climate and pro-growth narrative.

The Buenos Aires, Argentina summit in 2018 focused on a number of issues related to adaptation to climate change and extreme weather events. At the G20 Osaka Summit of 2019, climate change was discussed as a part of the G20's agenda on environment and energy. The Riyadh Summit of 2020 identified climate change as one of the most pressing global challenges worldwide. In the document of 'Safeguarding the Planet' at the launch of the 2020 presidency, the adoption of an economic model to reduce greenhouse gas emission levels was stressed upon while supporting economic and sustainable development. In addition to discussions on combating land degradation and habitat loss, preserving the oceans, fostering sustainable and resilient water systems globally and promoting food security, access to cleaner, more sustainable and affordable energy was recognised as the fundamental agency to reduce poverty and promote economic growth. The 2021 Rome G20 summit provided a strong impetus for green recovery and climate sustainability. During the 2021 Indonesian presidency, the leaders discussed policy and regulatory approaches to climate finance mobilisation.

Paris Agreement and G20 countries

The Conference of Parties 21 (COP21), 2015, known as the Paris Agreement made a strong commitment to keep global warming to almost 2 degrees Celsius above pre-industrial levels and try to limit the temperature increase to 1.5 degrees Celsius. Importantly, 196 countries signed this agreement and pledged to stand by the ambitious goal by adopting the Nationally Determined Contributions (NDCs). NDCs provide a tool to parties for their future actions for climate change adaptation, mitigation and financing (UN-Habitat 2017).

The Glasgow Pact and G20

The UN Climate Conference in Glasgow (COP26) brought together leaders and individuals around the world. It was a crucial global summit aimed at accelerating action towards the goals of the Paris Agreement. It resulted in the adoption of the Glasgow Climate Pact which includes agreements on finance, adaptation, mitigation, transparency and loss and damage.

At the Rome Summit in 2021 prior to COP26, the G20 countries pledged to reduce methane emissions by 30% by 2030 and stop financing overseas coal-based power generation. The G20 Rome presidency announced Euro 1 billion to the Global Forest Pledge and promised to work on the circular economy. Prior to the negotiations at COP27 in Egypt in 2022, the participating countries were expected to submit revised or updated targets with renewed pledges. While 19 out of the 20 countries have

updated their pledges, only 11 submitted targets that are stronger than their previous ones (D’Souza and Sarkar 2023).

Net Zero Plan

At the heart of a country’s climate action plan lies the attempt to reach carbon neutrality. Net zero refers to the balance between the amount of greenhouse gas emissions that are produced and the amount that are removed from the atmosphere. It can be achieved through a combination of emission reduction and emission removal predominantly by reducing the emission of GHG, but also by increasing carbon removal, mostly by increasing the forest cover. Table 21.3 outlines the years by which countries plan to achieve net zero emissions.

Most developed countries have committed to achieving net zero carbon emission by 2050; while several countries, especially from Asia, plan to achieve the same at a later year. This is unsurprising given that developed economies, especially from Europe and North America, have traditionally been the major GHG emitters and are already on a trajectory to reduce emissions. In contrast, developing countries are yet to reach their peak as they grapple with economic growth and achieving carbon neutrality. Even the biggest emitters like China, Russia and Saudi Arabia are likely to cross the deadline of 2050 but committed to achieve carbon neutrality by 2060.

Sectoral Pledges

To augment the Paris Agreement and net zero commitment, a number of sectoral initiatives were launched during COP 26 (Glasgow) to accelerate climate action. Table 21.3 highlights the sectoral pledges made by the G20 countries.

Forestry pledge is the most signed pledge among the five sectors, with 11 countries adopting it, while methane pledge was adopted by nine G20 countries (Table 21.4). It is important to note that none of the 20 countries has unconditionally signed the ‘beyond oil and gas’ pledge.

Table 21.3 Net zero target year of G20 Countries

Net zero target year	G20 Countries
2050	Argentina, Australia, Brazil, Canada, France, Germany, Italy, Japan, South Africa, South Korea, UK, USA, EU
2053	Turkiye
2060	China, Russia, Saudi Arabia
2070	India
No Explicit Target	Indonesia, Mexico

Source Climate Action Tracker (<https://climateactiontracker.org/>) and other sources

Table 21.4 Sectoral pledges signed by G20 Countries

Country	Methane	Coal exit	Electric vehicle	Forestry	Beyond oil & Gas	Climate action tracker rank
Argentina	Yes	No	No	Yes	No	Highly Insufficient
Australia	No	No	No	No	<i>Data Not Available</i>	Insufficient
Brazil	Yes	No	No	Yes	No	Insufficient
Canada	Yes	Yes	Yes	Yes	No (but one province is a member)	Highly Insufficient
China	No	No	No	Yes	No	Highly Insufficient
France	<i>Data not available</i>					
Germany	<i>Data not available</i>					Insufficient
India	No	No	Yes	No	No	Highly Insufficient
Indonesia	Yes	Yes	No	No	No	Highly Insufficient
Italy	<i>Data not available</i>					
Japan	Yes	No	No	Yes	No	Insufficient
Mexico	Yes	No	No	Yes	No	Critically Insufficient
Russia	No	No	No	Yes	No	Critically Insufficient
Saudi Arabia	<i>Data not available</i>					Highly Insufficient
South Africa	No	No	No	No	No	Insufficient
South Korea	<i>Data not available</i>					
Turkiye	No	No	Yes	Yes	No	Critically Insufficient
UK	Yes	Yes	Yes	Yes	Wales only	Almost Sufficient
USA	Yes	No	No	Yes	No	Insufficient
European Union	Yes	Yes	14 EU member states	Yes	8 EU member states	Insufficient

Source Climate action tracker (<https://climateactiontracker.org/>)

Circular Economy

Given the significant influence on global resource consumption and waste generation, it is essential for the G20 countries to adopt a transition to a circular economy that encourages sustainable production and consumption practices and fosters innovation in recycling and waste management technologies. It not only leads to resource efficiency but also leads to a cleaner and cheaper production system for companies by reducing the cost of water, energy and raw materials while protecting the environment (UNIDO 2023).

21.10 India's Role as a Leader to Climate Dialogue: Mission LiFE

India's G20 presidency is crucial for bridging the climate cooperation between the Global North and Global South. India has the opportunity to incorporate the concerns of climate justice and equality which in its current form is not adequate.

The Prime Minister of India announced Mission LiFE at COP 26 in Glasgow in 2021 as a measure of climate mitigation. In 2022, India and the United Nations jointly launched the plan of action associated with the India-led global mass movement called Mission LiFE (Lifestyle for Environment). The mission aims to bring about a shared global future for all through the *Amrit Kaal* initiative by encouraging environmentally conscious practices and a sustainable way of living focused on green development and climate finance. The theme for this year's presidency is *Vasundhaiva Kutumbakam* (One Earth, One Family, One Future) inspired from the Maha Upanishad, which highlights the importance of all life forms like human, animal, plant and microorganisms as well as their interdependence on earth and across the universe.

LiFE as a mission emphasises on the need to bring about behavioural changes through social networks and the importance of the global networks of Pro-planet people to promote a pro-environment lifestyle. The plan involves nudging consumer-driven demand towards climate-friendly behavioural changes, enabling industries and markets to adjust supply to this changing demand and envisioning the necessary change in government-driven policy towards the achievement of SDG 12 of responsible consumption and production.

With a main moto of 'Prayas se Prabhaav Tak', i.e. 'From Mindless Consumption to Mindful Utilisation', Mission LiFE has main thrust areas around responsible consumption, circular economy, living with harmony and nature, sustainable resource management, and coexistence and cooperation.

With gradually phasing out the use of fossil fuels, India has pledged to reach net zero emissions by 2070. Indian cities have huge potential to reduce carbon emissions by using smart technologies, mass use of public transport, etc. Promotion of public transport and low-carbon transport like electric vehicles (EVs), a ban on single-use

plastic and the use of alternative and ecologically sustainable products may help the cities to lower their carbon footprints.

21.11 Conclusion

G20 countries are poised to play a critical role in setting the future path of urbanisation as these countries already house around 67% of the global urban population in 2023. Moreover, India and China are the two most populous G20 member countries housing the most populated megacities like New Delhi, Shanghai, Beijing and Mumbai in the world among others. Although these nations contribute to around 85% of the global GDP, most of these megacities face challenges like congestion, housing shortage, unequal access to urban services and unplanned growth. On the contrary, many European cities are experiencing population shrinkage without much reduction in their carbon footprint.

Notably, G20 countries contribute to 80% of the global carbon emissions, owing to economic production, weak planning and policy structure, and ineffective environmental regulations. Also, sprawl development is common across them and is a major contributor to carbon emissions. Previous G20 summits have already acknowledged the role of cities in the ‘race to zero’ and highlighted the critical role of the ‘circular economy’ in reducing carbon footprint. The UN-Habitat has also identified the strengthening of urban–rural linkages to build sustainable habitats.

G20 countries have a major focus on economic growth which explains the lack of strong commitment to complete phasing out of fossil fuel. Mission LiFE proposed by India encourages the adoption of circular economy and reducing carbon footprint by promoting sustainable and mindful consumption. Adoption of the tenets of this mission showcased by the Indian Presidency can help countries with higher levels of emission strategies and measures to counter climate change. By mindful consumption, future urbanisation can be more sustainable and help countries to be on track with global sustainable goals.

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Part V

Wellbeing Measurement Approaches

Chapter 22

GDP+: Need Universally Accepted Framework for Measuring Wellbeing



Ashish Kumar and Arpit Barman

Abstract National governments and other relevant stakeholders have realised that GDP, a single indicator, does not measure the overall wellbeing of the people and that the wellbeing must be measured through a defined set of multiple indicators. SDG target 17.19 also advocates for developing measures of progress on sustainable development that compliments GDP. Several formulations and procedures have been advocated by various agencies at global level and at the regional levels though being deficient on many aspects of wellbeing and sustainability. The chapter analyses and compares various multidimensional measures of wellbeing and has recommended for development of a universally accepted framework. G20 being an influential group in shaping global policies should steer the process of development of a framework by setting up a high-level group to represent realities of developing and developed countries to ensure its broad acceptability and adoptability. By moving beyond GDP, this chapter suggests that a more accurate and holistic understanding of wellbeing can be achieved by better capturing the socio-economic resilience of societies.

22.1 Introduction

Over the years, numerous interpretations of economic developments have emerged each in different context. One such metric, Gross Domestic Product (GDP), has been extensively and commonly used for measuring economic activity. In the Aftermath of the Great Depression of 1929, Simon Kuznets, in 1934, presented the formulation of Gross Domestic Product (GDP) to capture economic production by individuals, private organisation and government into a single measure that moves upwards and downwards during boom and bearish periods, respectively (United States Office of Business Economics 1935). GDP is generally calculated as the total value of final goods and services produced and traded monetarily for a fixed period annually.

A. Kumar (✉)

Macroeconomics & Statistics Vertical, Pahle India Foundation, New Delhi, India

A. Barman

Research and Information System for Developing Countries (RIS), New Delhi, India

It could be either calculated by adding the value of all the finished goods and services minus the value of intermediate consumption or by adding all wages, profits, investments and rental income. The most common method to calculate it is the expenditure approach, which is typically measured as an addition of the nation's consumption expenditure (household transactions on goods and services), investment (net capital formation defined as an increase in the value of the country's total stock of monetised capital goods), government expenditure (expenditure on public goods and services, debt payments, defence, etc.) and the value of the country's net export of goods and services.

According to conventional economic theory, utility is associated with the satisfaction obtained from consumption of material goods, services and leisure activities. In a lifetime utility model, one divides current income between present consumption and savings and as income rises, the utility also increases (Tadas 2023).

At the stage of World War II (WWII), following the Bretton Woods conference in 1944, GDP became the standardised tool for measuring the size and growth of the economy. However, in 1934, even before the Bretton Woods Agreement and WWII, Kuznets had warned the United States (US) Congress not to focus narrowly on GDP, stating '*The welfare of a country can scarcely be reported from a measure of national income*' (United States, Office of Business Economics 1935). The US Bureau of Economic Analysis states that GDP aims to answer questions such as how rapidly the economy is growing, the patterns of spending on goods and services, the percentage of increased production attributed to inflation and the amount of income used for consumption (McCulla 2007). It also gives how much investment is made to produce goods and services in future. GDP or its increase does not answer questions pertaining to the level of life satisfaction of individuals. Also, research over time has established that there is no relationship between the increase in GDP and the progress towards mean happiness (Easterlin 1974; Fischer 2019).

Therefore, there has been an increasing need to complement the traditional approaches to measure GDP with alternative measurement of societal development (World Forum on Statistics, Knowledge & Policy 2007). Various frameworks have been developed, such as the Human Development Index (HDI), which accounts for some socio-economic parameters, though limited to long and healthy life, being knowledgeable and having a decent standard of living; the World Happiness Report (WHR) developed by the Sustainable Development Solution Network (SDSN), report how people evaluate their own lives in more than 150 countries worldwide; but does not consider environmental aspects. Later, we will mention various other multidimensional wellbeing frameworks that comprise various indicators of health (mental and physical), equity, basic needs, environment, work and job quality, civic engagement, etc. These indicators relate to a specific dimension of human wellbeing.

With the COVID-19 pandemic and post-2020 geo-political conflicts, globally countries have been grappling with new profound challenges of sustaining livelihoods, supply chain disruptions, increasing demands for health care, food insecurity with higher burden on least developing countries (LDCs) and growing inequalities

across nations. These developments have renewed the demand for a comprehensive discussion on various facets of economic development. GDP, solely, cannot account for these exogenous shocks, and there is a need to develop a multidimensional metric that considers these shocks and vulnerabilities. For this, a paradigm shifts of policies where development is benchmarked to per capita GDP or income to aspects of multidimensionality of various shocks and vulnerabilities should be prioritised.

As we will further discuss, there are glaring imbalances in per capita income or GDP and measuring a nation's wellbeing. Thus, a departure towards measuring aspects of wellbeing such as quality of life, material living conditions and sustainability becomes essential. However, we need to complement and not discard GDP as mentioned in SDG target 17.19.¹ Therefore, this calls for creating a multidimensional framework for wellbeing which should go beyond an 'academic exercise' into policy-making decisions for the nation's overall development.

22.2 History of GDP Evolution as Development Metric

Before we further move towards the debate of the necessity of using a multidimensional wellbeing index for measuring the development of a nation, it first becomes imperative to understand a brief history of GDP evolution as it continues to be misused as an 'indicator for nation wellness'.

The GDP methodologies, as discussed earlier, started in the backdrop of the Great Depression and WWII during the 1930s and 1940s in the UK and the USA.² President Roosevelt's government used statistics to explain and justify policies and budgets issued with the aim of bringing the USA out of the economic depression. As the USA became more involved in WWII, there was a growing concern among the citizens whether the war would jeopardise the standard of living which was recovering after the economic depression. Further, according to (Costanza 2009), '*GDP estimates were used to show that the economy could provide sufficient supplies for the war while maintaining adequate production of consumer goods and services*'. Thus, to stabilise the economic scenario, in 1944, forty-four allied nations met in Bretton Woods, New Hampshire, to develop a process of international trade cooperation and exchange rate stability. The meeting also intended to pace up economic progress among the nations, aid political stability and bring peace and prosperity (Costanza 2009). The adoption of the Bretton Woods system led to the establishment of the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IRBD) (now part of the World Bank). In addition, the meeting extensively discussed the development of GDP methodology for the analysis of economic activities. Thus, over

¹ According to UN SDG, SDG 17.19 states 'By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries'. (<https://sdgs.un.org/goals/goal17>)

² Work by the US and UK Treasuries in the 1930s and 1940s was the foundation of NIPA and GDP methodologies. Since then, the work has been expanded on by many nations and has been formalized in the SNA1993 documentation.

the ensuing 60 years, GDP became the single most important measure of economic progress adopted by IMF and the World Bank (Costanza 2009). Post-1970, with the collapsing of the Bretton Woods system, the USA had a less dominating role in the IMF and the World Bank, although GDP remained the most widely used economic measure for a country's progress.

22.3 Need to Go Beyond Simple Measures of GDP Per Capita

The topic of going beyond GDP measurement and inculcating a wellbeing approach of measurement has been under discussion and consideration for a long time. Robert F. Kennedy, in his speech at the University of Kansas in 1968, questioned the measurement of GDP, '*GDP measure everything but except that which makes life worthwhile*'. It was justified to use GDP in the early 2000s for developing countries of East and Latin America to fulfil their basic needs. But as economies started developing, the differences in 'wellbeing' mattered less due to levels of income but more on the social and environmental factors. It is important to understand that GDP is not a wrong or irrelevant indicator, but it measures only a part of wellbeing, which we may call economic wellbeing. Thus, using it as an indicator for wellbeing is ambiguous and treacherous (Giannetti 2015). For instance, in the Aftermath of the Financial Crisis of 2008, the GDP loss that followed the crisis was not temporarily predicted by many conventional macro-economic models. There were other effects besides the permanent loss of physical capital, unemployment and reduced production and consumption. As an aftermath of the recession, there was the loss of invisible capital in the form of permanent scars and psychological stress of youths entering the labour market, low job training, losing satisfaction in life and lower trust in the economic system, which are not accounted in GDP measurement.

In the recent COVID-19 pandemic, we are presented with a unique opportunity to redefine the development paradigm. While GDP declined due to lockdowns, it showed an incomplete picture of the wellbeing of the people. Although stringent lockdown decreased the economic activities, which is well accounted for in the System of National Accounts (SNA), it could capture only the loss incurred in the formal sector of the economy. The economic losses in the informal sector with the increase in informalities of various sectors (emergence of gig economy) has affected the income, quality of work life, health status and personal wellbeing of individuals, which GDP fails to account for especially due to these development shocks; e.g. GDP could not account for the digital divide between the urban and rural sectors, which led to learning losses during COVID-19. According to a report by the World Bank, UNESCO and UNICEF in 2021 '*It is estimated that the present generation of students lost close to US\$17 Trillion in their lifetime earnings*'. However, it can be argued that an increase in GDP improves the quality of life as better earnings provide better housing infrastructure and materialistic joy. However, according to (Talberth 2007) '*beyond a certain threshold, increase in GDP are offset by the costs associated*

with increasing income inequality, loss of leisure time, unsatisfactory relationships, and effects on other dimensions of human happiness'. Extensive studies have shown a complex relationship between income and wellbeing; that is, after income reaches a certain level, it no longer promotes happiness, the Easterlin paradox—more wealth does not imply a greater level of happiness (Easterlin 1974, 1995).

GDP misuse also accelerates the damaging use of natural resources and decreases the services provided by the ecosystems. For example (Costanza 1997) estimated that the world's ecosystems, on an average, provided benefits of US\$33 trillion per year and were significantly greater than the total global GDP at that time. Therefore, GDP measurement ignores environmental costs and natural resource depletion rates, and, contradictorily, it includes the costs of environmental remediation as valuable production. Moreover, according to (Giannetti 2015), *'GDP disregards longer-term negative consequences of short-term exploitation of the ecosystem and its services, which reduces the system's capacity to function in many ways'*.

Because GDP does not address and often conceals social and economic inequities, it fails to provide proper societal insights into economic welfare, especially in the context of escalating crime, reduced worker productivity and diminished investment. When the growth is concentrated to only a few fractions of the society, it does not contribute to improving global economic prosperity as the social benefits of increasing consumption by the upper echelon have a less positive impact than compared to an increase in spending by the whole community (Talberth 2007). Therefore, GDP fails to account for costs associated with the unequal distribution of income and wealth.

22.4 Initiative of Various Multidimensional Wellbeing Framework

Having accepted the criticism towards GDP, it should be endeavour that the GDP must be accompanied by other indicators to measure wellbeing and its role should be clearly understood. The idea that wellbeing is essentially a multidimensional concept has presently become well-established in various academic and policy-related literature (Decancq 2013). European Commission (2013), presented by Nobel Prize laureates Stiglitz and Sen, came to a consensus that there is no unique definition of wellbeing. However, the report agreed *'wellbeing is a multidimensional concept, which comprises of the following eight dimensions: (i) material living standards (income, consumption and wealth); (ii) health; (iii) education; (iv) personal activities including work (v) political voice and governance; (vi) social connections and relationships; (vii) environment (present and future conditions); (viii) insecurity, of an economic as well as a physical nature'*. Also, there is a general agreement that the wellbeing framework should atleast include the positive indicators such as presence of positive emotions and moods (e.g. pleasure, happiness), negative indicators

such as negative emotions (e.g. depression, anxiety), life satisfaction and positive functioning (CDC 2018).

The idea of having a multidimensional wellbeing approach can be traced back to the declaration made by the Fourth King of Bhutan, King Jigme Singye Wangchuck, in 1972 using the concept of Gross National Happiness (GNH) and discarding the use of GDP as development metric. However, the concept of GNH was later quantified into an index in 2008, incorporating both traditional socio-economic dimensions such as education, living standards and health and less traditional aspects like culture and psychological wellbeing. This index provides a holistic reflection of the general wellbeing of a country's population, rather than relying solely on subjective psychological rankings of 'happiness'.³ In 1990, the UNDP launched its first Human Development Report, presenting a new measure of development, the Human Development Index (HDI).⁴ The HDI draws from Sen's 'capabilities' approach of understanding human wellbeing, which emphasised the importance of ends (such as decent standard of living) over means like per capita income and in some way, broad-ranging representation of basic needs approach (Barman 2023). The Human Development Report of 1990 states that human development is a process of enlarging people's choices, out of which the most crucial choice consists of living a long and healthy life, to be educated and to have access to resources for a decent standard of living. Human Development Report of 2020 proposed the planetary pressure-adjusted-HDI (P-HDI), which took into account environmental factors such as the country's carbon dioxide level and per capita material footprint emission to adjust the standard HDI of a country. However, HDI is not a multidimensional wellbeing measure and it accounts for limited aspects of environment and social factors. Another approach of going beyond GDP has been the subjective wellbeing (SWB) measure, which includes self-reported happiness and satisfaction perceived from life. The report (Easterlin 2014) cited that wellbeing experiences in countries such as China, Costa Rica and the USA highlighted a stark contrast between subjective wellbeing and GDP per capita. He found over the period, the SWB declined with an increase in GDP per capita over the period for China and the USA. Lastly, he concluded that although Costa Rica's per capita GDP is one-fourth of the USA, the citizens of Costa Rica were much happier compared to the Americans.

Globally, apart from the SDSN World Happiness Report, the Social Progress Index (SPI) ranks 169 countries on social progress defined as the '*capacity of a society to meet the basic human needs of its citizens, establish the foundational elements that enable citizens and communities to enhance and sustain a good quality of life, and foster opportunities and conditions for all individuals to achieve their maximum potential*' (Stern 2022). To calculate the index score, 60 environmental and social economic indicators are accounted. The score is based on a tiered system which includes various dimensions such as health, education, safety, access to technology,

³ For more information refer, Oxford Poverty and Human Development Initiative, Bhutan's Gross National Happiness Index <https://ophi.org.uk/policy/gross-national-happiness-index/>

⁴ HDI was created by Pakistani Economist Mahbub Ul Haq and propounded by Amartya Sen.

access to rights and more. However, the SPI does not consider economic indicators when calculating the index, although it draws a comparison of countries with similar GDP per capita and the social progress score. In the report of (ADB 2021), a Wellness Index was calculated for 153 countries in four pillars of wellness, i.e. physical wellness, intellectual wellness, environmental wellness and social wellness. The index, however, lacks a pillar of sustainability to take into consideration for future wellbeing.

United Nations is presently working on the establishment of a Multidimensional Vulnerability Index (MVI)⁵ with an aim of providing data-driven solutions for Small Islands Developing States (SIDS) to provide fair concessional financing required for surviving climate catastrophe and other vulnerabilities they face to improve their long-term national planning. The MVI consists of *Structural Vulnerability*, capturing the risk of hindering a country's sustainable development due to recurring adverse shocks and stressors and *Structural Resilience*, which captures the inherent capacity of countries to absorb, recover and withstand from, or minimise the adverse effects of shocks. This goes beyond the traditional measures of development accounting for various vulnerabilities of economics, environment and society. For instance, GNI per capita doesn't capture the cost associated with handling major threats such as catastrophic weather events or servicing old debts.

22.5 Measuring Wellbeing at the Regional Level

Wellbeing research and the Better Life Index (BLI) are based on the recommendations made in 2009 by the Commission on the Measurement of Economic Performance and Social Progress. According to (OECD 2020), *'The framework is built upon three distinct components: current wellbeing, inequalities in wellbeing outcomes and resources for future wellbeing with the objective of not only looking at the functioning of the economic system but also at the diverse experiences and living conditions of people'*.

OECD has developed a framework for measurement of wellbeing in the context of prevailing circumstances in its member states (Kumar, 2022). The framework has three pillars with appropriate domains, dimensions and indicators under each of the pillars. Pillars in the framework are *material living conditions*, *quality of life and sustainability*. Domains under the pillar material living conditions are *income and wealth, jobs and earnings and housing*. Domains under the pillar quality of life are *health status, work and life balance, education and skills, social connections, civic engagement and governance, personal security and environmental quality*. Each of the domains is measured through a set of indicators. The third pillar of sustainability is measured through indicators on the conservation of *natural capital, human capital, economic capital and social capital*. Some of the indicators selected are objectively and statistically measurable but a few of them are subjective and,

⁵ See <https://www.un.org/ohrlls/mvi> for more information regarding MVI progress.

therefore, have difficulty in consistent measurement (Kumar 2022). In this regard, the OECD has collaborated with eleven Latin American and Caribbean countries to appropriately adapt the framework to the context of developing countries. This adaptation includes incorporating features such as informality into the measurement of wellbeing. Various other frameworks pertaining to multidimensional aspects of wellbeing have been developed at the country level as well. For example, the UK community wellbeing index and subjective wellbeing Measurement Initiative by the Office of National Statistics (UK), Italy 'Il Sole 24 Ore' Quality of life Index, the Australian Unity Wellbeing Index and the Canadian Index of Wellbeing are some multidimensional frameworks adopted by these countries for measuring economic, social and environmental progress.

Lastly, the latest policy brief by UNDESA¹ stated that over-reliance on GDP in making policy decisions has serious consequences on our environment. In fact, as per the policy brief '*GDP can treat depletion and degradation of the environment as positive "economic output"*'. Utilising natural capital accounting through the System of Environmental-Economic Accounting (SEEA) can ensure that decision-makers possess the appropriate tools to assess the value of nature in their policies (UNDESA 2022). Lastly, according to (UNDESA 2022), '*analysis by the UN Committee of Experts on Environmental-Economic Accounting the SEEA can inform 40 Sustainable Development Goal (SDG) indicators spread over 9 different goals*'. However, currently only 90 countries have compiled Environmental Economic Accounting according to the standards set in SEEA.

Figure 22.1 provides a heatmap matrix which represents the distribution of indicators under each dimension of various national governments (Australia, Bhutan, Canada, UK), multilateral organisations (OECD, Asian Development Banks (ADB), UNDP, World Happiness Report by SDSN (WHR), Social Progress Imperative) and think tanks (such as RIS) have taken for developing a wellbeing framework. The dimensions are provided by Stiglitz-Sen-Fitoussi report, which captures multidimensional aspects of wellbeing. Furthermore, Table 22.1 provides analysis and remarks of various multidimensional wellbeing indices with gaps in certain domains in which it lacks requisite indicators. For example, looking at the heatmap Matrix ADB in their Wellness for Healthy Asia has moderate amount of indicators representing health, environment and sustainability, education and critical voice and governance. However, it lacks indicators to assess subjective wellbeing, personal security and safety and leisure and personal activities.

One can see that there are many multilateral organisation and country-level initiatives have been taken place to measure wellbeing. These initiatives are heterogeneous in nature and require a platform comprising of various multilateral and international organisations to assess, review and compare existing work in the domain of wellbeing metrics and develop a common global minimum agenda for developing global multidimensional wellbeing framework. There is a need for wellbeing framework that can leverage policy synergies across the board, bringing greater coherence and effectiveness of policies for development. This requires making various comprehensible lists

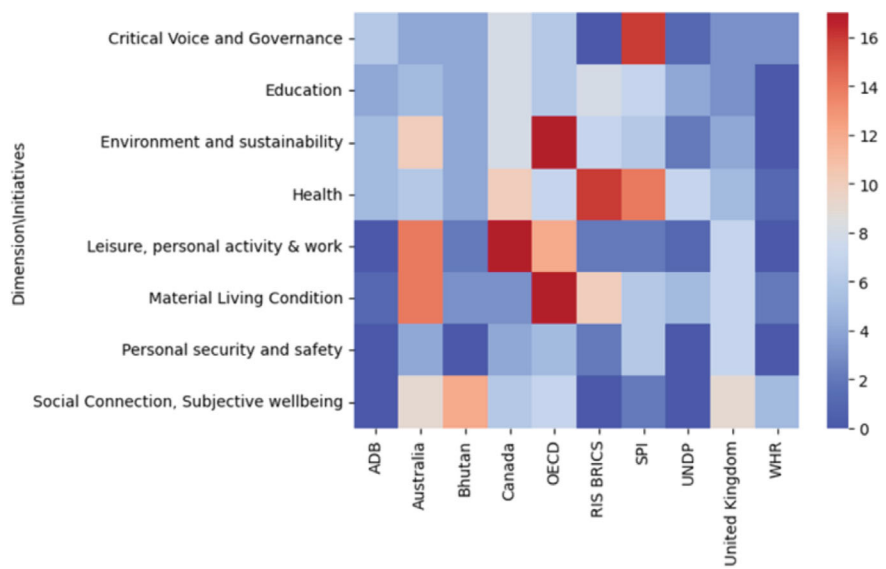


Fig. 22.1 Number of indicators distributed according to various dimensions of wellbeing as mentioned in the Stiglitz-Sen-Fitoussi report. *Source* Author’s own from various reports

of indicators distributed among different pillars and dimensions to capture multidimensional aspects of individual wellbeing. This will allow monitoring of wellbeing across citizens and aim for better sounded policy-making decision.

22.6 Challenges in Developing Multidimensional Wellbeing Framework

Developing a common framework for global multidimensional wellbeing: Challenges arise when developing a common definition of wellbeing which is acceptable internationally. Perception of wellbeing differ in both developing and developed countries, and also within developing countries, e.g. according to (OECD, 2021), ‘the health dimension of wellbeing is consistently ranked as one of the most valued aspects in people’s lives when developing national wellbeing frameworks in OECD countries (e.g., in Italy, Germany, Israel and Scotland) and by the users of the OECD Better Life Index’. Health is a multidimensional concept referring to ‘a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity’ (OECD 2021). However, data limitations in developing countries towards health perceptions survey means that it is most frequently measured in terms of burden of diseases and mortality rather than having approach of more positive health status. Thus, while (OECD 2020) has perceived health, death from suicide (mental health), and drug and alcohol abuse as indicators of health status, (OECD 2021) has

Table 22.1 Wellbeing measurement initiative for various countries and international organisation

Organisation/Country	Initiative	Remarks
Bhutan	Gross National Happiness Index	Source- https://www.grossnationalhappiness.com/ Missing indicators of Personal Security and safety
UK	Quality of life Index by Office of National Statistics (ONS)	• Source- Measures of National Wellbeing Dashboard: Quality of Life in the UK ⁶
Canada	Canadian Index of Wellbeing	Source- How are Canadian Really doing? 2016 CIW National Report
OECD	How's life report and Better Life Index	Source- How's life 2020? Measuring wellbeing
RIS	RIS BRICS Wellness Index	Source- Health, Nature and Quality of life: Towards BRICS Wellness Index (RIS) Only framework has been developed, and thus, there is a need to develop appropriate indicators for wellbeing. Missing indicators of social connection, subjective wellbeing, Critical voice and governance dimensions
UNDP	HDI, Inequality Adjusted Human Development Index (IHDI), Gender Development Index (GDI), Gender Inequality Index (GII), Multidimensional Poverty Index (MPI) and planetary pressure-adjusted Human Development Index (P-HDI)	Source- Human Development Report 2021–22 • Missing indicators of social connection, subjective wellbeing, personal security, safety and dimensions Limited aspects of personal activity, work quality, leisure, work-life balance; critical voice and governance; environment and sustainability dimensions
Social Progress Imperative	Social Progress Index	Source-Social Progress Report 2022 Limited aspects of quality of work, work-life balance, leisure and personal activity. No indicator has been taken for economic condition dimension

(continued)

⁶ To access the dashboard: <https://www.ons.gov.uk/people-population-and-community/wellbeing/articles/measures-of-national-wellbeing-dashboard-qualityoflifeintheuk/2022-08-12>.

Table 22.1 (continued)

Organisation/Country	Initiative	Remarks
Asian Development Bank	Wellness Index	Source-Wellness for Healthy Asia 2021 Missing indicators for work and job quality dimension, personal security and safety No indicators have taken for sustainability or future wellbeing dimension
World Happiness Report (John Helliwell 2022), Global Happiness Index	World Happiness Index	Source-World Happiness Report 2022 Missing indicators of education of work and job quality including work-life balance and personal activity, environment and sustainability, personal security and safety and education dimension
Australia	Measures of Australia Progress (MAP)	Source- https://www.abs.gov.au/ausstats/abs@.nsf/mf/1370.0 Important to note that 2013 was the latest dashboard for measuring Australia Progress

Source Author own Compilation

maternal, infant and child mortality; access to quality and affordable health care as indicators of health status. However, how's life report of both OECD countries and Latin American countries has life expectancy under health status dimension. Therefore, a multidimensional framework for wellbeing will require not only setting up a common minimum indicator lists for comparison of wellbeing among different developed, developing, LDCs and SIDS, but also indicator sets that pertains to each of the mentioned categories and allow for inter-comparison of countries among the mentioned classification.

Need for the development of robust data generation system: Acceptability of GDP as a common and most popular metric across countries has come about over a period of time due to the robustness in its compilation and ability of the countries to adopt it as a part of generation of their regular statistics production process. The indicators to be adopted for compilation of the wellbeing metrics have to be based on similar robust statistical systems. Many of the indicators have to emerge from non-financial material flow of accounts, especially for natural resources, human capital accounts, etc. Alongside the flows of goods and services associated with financial and material capital, there are flows of knowledge and information associated with human capital (education and skills), ecosystem services with natural capital, and public and social services with social capital. It is therefore possible to replicate systems of

stocks and flows associated with traditional national and corporate measurement in human, natural and social accounting. To align these accounting measures with an underlying sense of value and purpose, it is desirable that the measured stocks and flows be closely related to fundamental human needs, in particular, those associated with social solidarity and cohesion, agency and empowerment, material prosperity and environmental sustainability. In this regard, it is possible to measure the flows stemming from the benefits (1) consumption, (2) solidarity, (3) agency and (4) environmental services. These correspond to the stocks of (1) physical and human capital, (2) social capital, (3) capabilities and (4) natural capital.

Lack of data availability and accessibility with limited funding of the National Statistical System (NSS) limits the statistical capacity to provide timely statistics of various indicators of wellbeing. The developing and least-developed country's NSS needs to:

Collect wellbeing data in a standardised manner that allows for comparability and timely availability of information. Timely data is crucial for effectively incorporating wellbeing indicators into policy decision-making, as emphasised by the COVID-19 pandemic (OECD 2021).

Develop measurements of subjective wellbeing (SWB) as part of quality of life framework for Developing and LDCs.

Develop mechanism for channelising funds and resources to the National Statistical System (NSS):

Presently, the resources are made available by the governments to NSS in their country through normal budgeting processes. When there are competing demands of various sectors in a country, which is normally the case, especially in developing countries, the allocation for statistics is arbitrarily reduced. This results in complete dysfunctionality of the data collection systems and its processing resulting in huge deficit in terms of availability of information for important indicators to support policy-making. In such a situation policy-makers use information which is not evidence-based further creating problems for implementation and in getting desired outcomes. There is a need to develop a mechanism so that the amount allocated for the statistics becomes compulsory and may not require unnecessary cuts at the discretion of government. There are a few institutions like courts, parliaments, legislative assemblies whose expenditures are charged expenditure and are not subject to negotiation at the level of Ministry of Finance. Such a status has to be accorded to the statistics which is like an infrastructure for the policy-making in a country.

Methodological challenges due to differences in the development of methodologies across globe and within the developing countries.

There are challenges that arise from identifying internationally acceptable robust methodologies for surveying headline indicators and aggregation of various dimensions into an index. Also, one needs to be careful about weighting and time period selection when developing index. Whether to use normative weighting method or using statistical method for computing index such as principal component analysis (PCA) is a question which should be examined effectively based on the information available. As PCA is a dimension reduction tool for computing index, this statistical method allows for computing large indicators into single score and thus

reducing complexity of wellbeing index. However, applying PCA can lead to loss of information as it reduces the number of indicators used for analysis. In case of large sets of indicators, a dashboard might be preferable tool where it shows all necessary analysis of various indicators for each dimension, thus allowing for target specific policy-making decisions. However, as mentioned earlier, the simplicity of GDP being a single metric allows policy-makers in assessing the situation and taking further policy-making decision. In case of wellbeing measurement, there must be a set of indicators indicating performance at sector level. Further, subindices of each sectoral indicator would be necessary for sector specific policy interventions. The latest policy brief by United Nation advocates establishing of high-level expert group with a mandate to produce wellbeing dashboard with set of 10–20 indicators ideally by March 2024 (United Nation 2023).

22.7 Conclusion

Primary dependence on GDP as metric of development progress neither accurately reflects the world progress nor sustainable development for future generation. It is essential to undergo a paradigm shift in measuring progress. By capturing data on activities and outcomes that society genuinely values, we can enhance our understanding and make more informed policy and financial decisions based on that data. As extensively analysed, there are many Beyond GDP and wellbeing frameworks and indices that have been established by various international organisations. These existing frameworks need to be analysed and assessed deeply to arrive at a common global framework which accounts for multidimensionality aspects of wellbeing. The global framework should be designed in manner that creates opportunities for future to promote equality and resilience in the face of crises, ensuring that the advantages of social and economic progress are enjoyed by all. By going beyond GDP, we have the ability to assess what holds genuine value when defining development, redefine our understanding of progress and subsequently re-evaluate resource allocation and commit to tangible transformations. Indian presidency of G20 should use this opportunity to help in developing an index or a group of indices that complement GDP and better estimates countries' wellbeing.

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Chapter 23

Moral Measurement of Prosperity



Colin Mayer and Dennis J. Snower

Abstract The chapter's point of departure is that failures to address collective action problems, such as those of the G20, are invariably moral failures. To tackle these moral failures, it is necessary to measure prosperity in ways that reflect our moral values. The chapter proposes that the G20 adopts the SAGE dashboard for this purpose, where S measures solidarity, A stands for agency, G is material gain and E represents environmental sustainability. On this basis, it is possible to design a normative accounting framework for international, national and corporate accounts (INCAs) for public and private sectors. This is a first step towards “moral capitalism.”

23.1 The Challenge

Many of the problems that people around the world face nowadays—such as climate change, biodiversity loss, financial instability and inequities—are derived from a deficiency in the moral foundations of the market economy. They are collective action problems that are not addressed through the incentives prevalent in economic activities. People should be acting in ways that take into account the consequences of their actions for others, but they fail to do so because the market economy often gives them incentives to pursue their selfish interests to the detriment of others.

A central reason for this deficiency is that the prosperity of nations and businesses is not measured appropriately. National and business prosperity is measured primarily in terms of GDP and shareholder value, respectively. This deficiency is not inherent in the capitalist system. Rather, it is a failure to measure success within the capitalist system in ways that promote the pursuit of human flourishing.

C. Mayer
Saïd Business School, University of Oxford, Oxford, UK

D. J. Snower (✉)
Institute for New Economic Thinking, Oxford University, Oxford, UK

Global Solutions Initiative, Berlin, Germany

Brookings Institution, Washington, DC, USA

GDP and shareholder value do not take proper account of environmental degradation and social fragmentation. For example, climate change and biodiversity loss clearly endanger the present and future of humanity, but these phenomena are often not counted as detrimental to progress when the latter is evaluated in terms of GDP and shareholder value. Social fragmentation prevents people from engaging in the collective action that is required to overcome such problems, but when globalisation and robotisation undermine the social fabric of communities, these social consequences are given little attention in our measurement of national and business prosperity.

Capitalism is a system that enables people to mobilise resources, goods and services in the pursuit of given goals. If the goals are defined and measured inappropriately, then the market system will function inappropriately as well. On this account, a major challenge of our times is to rethink the measurement of prosperity, at both the national and business levels.

By measuring prosperity in ways that are consistent with the achievement of meaningful human wellbeing—individually and collectively, now and in the future—by accounting and reporting on such measures, we come into a position of conceiving how the capitalist system can be redirected to serve the genuine interest of humanity and the rest of the natural world.

23.2 G20's Role

The G20 can play an important role in the redirection of market economies by instituting a measurement of prosperity focused on human wellbeing derived from meaningful, fulfilling lives lived in thriving societies. This measurement can become the basis for evaluating the success of G20 policies in a variety of areas.

Through the measurement of prosperity in economic, social and environmental terms, the G20 can gain a broader, more nature-centric and human-centric perspective on what real progress means for societies.

23.3 Ethical Measurement of Prosperity

Failures to address collective action problems are invariably moral failures. The reason is simple: An essential purpose of moral values is to promote intrinsic cooperation within groups and suppress destructive selfishness. Moral values can thereby help people address collective challenges, such as public good and common pool resource problems.

On this basis, it is wrong to engage in economic activities that lead to the destruction of our natural world or the disintegration of our communities, preventing us from addressing these and other collective challenges.

Prosperity should be measured in ways that enable us to address our collective action problems at all the relevant levels—local, regional, national, multinational

and global. This requires human wellbeing to be measured more profoundly and extensively than GDP and shareholder value.

There are four major concepts of wellbeing. The first is concerned with “hedonic happiness,” pertaining to pleasures, such as those from consuming food, entertainment and walks in the country.

The second is life satisfaction. This focuses on how people evaluate their wellbeing over their life as a whole, rather than their feelings at a point in time.

The third concept is eudemonic happiness, which is often measured in terms of the subjective achievement of meaning and purpose, mastery and personal growth, social engagement and self-esteem. These measures are closely related to one’s mental state related to one’s ability to perform one’s characteristic functions well.

A fourth concept rests on the pursuit and achievement of one’s moral values, which we define in terms of their primary functions, namely, values that induce us to collaborate beyond enlightened self-interest in response to collective challenges and to suppress destructive competition. This concept, which may influence life satisfaction and eudemonic happiness, is intrinsically important across nations and cultures.

The ethical measurement of prosperity becomes central to the redirection of capitalism towards human fulfilment. The G20 can become central to an international measurement effort along these lines by recommending that its members pursue an ethical measurement of prosperity.

23.4 Recommendation: The SAGE Dashboard

Though there are many existing measures of wellbeing, none thus far has been focused exclusively on the pursuit and achievement of moral values. The SAGE Dashboard illustrates how such a dashboard of wellbeing can be constructed.

It is composed of four components:

1. **Solidarity** (S, measuring social cohesion and embeddedness): This covers the needs of humans as social creatures, living in communities with a sense of belonging.
2. **Agency** (A, measuring empowerment): It covers the need to shape one’s life through one’s own efforts, both personally and collectively. It includes mastery of the environment, personal growth and the attainment of personal and collective goals.
3. **Gain**, in the economic sense of GDP and profit. This variable is central in the economists’ toolkit.
4. **Environmental sustainability** (E, measuring the ability of the natural world to sustain and regenerate itself). It includes not only the consumption of what economists call “environmental services,” but also the need to participate in the flourishing of the natural world.

Each of these components has a corresponding normative foundation of wellbeing:

- Solidarity: communitarianism
- Agency: classical liberalism
- Gain: utilitarianism
- Environmental sustainability: eco-ethics.

These normative foundations are clearly related to core values that have been identified by other contributors to the literature on moral values. For example, with regard to Jonathan Haidt's moral foundation theory (e.g., Haidt 2013), the categories of Care/Harm, Loyalty/Betrayal, Authority/Subversion and Sanctity/Degradation can all be considered aspects of Solidarity, whereas Liberty/Oppression and Fairness/Cheating can be viewed as aspects of Agency.

The underlying claim of the SAGE dashboard is that it represents values, as well as the corresponding sources of wellbeing, that all people appear to have in common, transcending national and cultural boundaries. This claim is built on the following insights:

- Since the success of homosapiens is built largely on cooperation and niche construction, humans have evolved motives to socialise (particularly in groups of limited size) and to use their capacities to shape their environment.
- Consequently, personal empowerment (the exercise of agency) and social solidarity have become fundamental sources of human wellbeing—along with the consumption of goods and services and environmental sustainability.

When people's important material needs have been met, when they feel securely and meaningfully embedded in society, when they have the power to influence their circumstances in accordance with self-determined goals, and when they live respectfully of planetary boundaries, then they and their social groups, businesses and governments achieve a wider sense of human wellbeing than when they simply maximise GDP growth. Failure to achieve any of these ends is associated with suffering. The inability to meet basic material needs signifies extreme poverty; lack of empowerment signifies a lack of freedom, self-expression and self-determination; failure to achieve social solidarity is associated with loneliness and alienation; and living unsustainably means robbing future generations (as well as others in the current generation) of the opportunity to lead flourishing lives.

The goals of economic prosperity, empowerment, solidarity and environmental sustainability are "at par" (Chang 2017) in the following sense: (a) each component of wellbeing is better than others in some respects, (b) none seems to be at least as good as the others overall, in all relevant respects and (c) there is no common unit by which they can be measured with regard to overall wellbeing, though they may be comparable ordinally for decision purposes. When sources of wellbeing are "on a par," they are qualitatively different in terms of overall wellbeing, but nevertheless in the same neighbourhood of such overall wellbeing. This means that if, in a particular social context, when choices between two jobs in different disciplines (e.g., becoming a lawyer or a doctor) are at par, then offering a slightly higher wage in one job will not make that job preferable. Such choices are "hard choices," because "they are

comparable, but one is not better than the other, and yet nor are they equally good.” (Chang 2017, p.1).

The gains from empowerment and solidarity generally cannot be translated into temporally invariant money terms to measure economic prosperity. In order to thrive, people need to satisfy all four purposes—their basic material needs and wants, their desire to influence their destiny through their own efforts, their aim for social embeddedness and their need to remain within planetary boundaries. Empowerment is valueless when one is starving; consumption has limited value when one is in solitary confinement; and so on. Furthermore, the gains from empowerment, solidarity, economic prosperity and environmental sustainability are different in kind and thus not readily commensurable.

That is the reason why empowerment, solidarity, economic prosperity and environmental sustainability are to be understood as a dashboard. Just as the dashboard of an aeroplane measures magnitudes (altitude, speed, direction, fuel supply, etc.) that are not substitutable for one another (e.g., correct altitude is not substitutable for deficient fuel), so our four indexes are meant to represent separate goals. Only when a country makes progress with respect to all four goals can there be some grounds for confidence that a broad array of basic human needs and purposes is being progressively met?

The link between them comes from the moral underpinning of gain, which is the economic driver of a capitalist system. So long as there is an inconsistency in the way in which we measure gain while fulfilling the other components of the dashboard then there will be a tension between financial motivation and the intrinsic interests of us as individuals, societies and the natural world. It is essential that incentives are not at variance with human and planetary flourishing.

For this to be the case, the measurement of GDP and profit should be complemented by the measurement of the costs and benefits of maintaining, preserving and protecting solidarity, agency and environmental sustainability. Gains that occur at the expense of any of them are not true gains in the sense of benefits that accrue without detriment to others. To the extent that this is the case then we are overstating both GDP and profit by failing to account for the true costs of avoiding detriment. The way in which GDP and profit need to be complemented both at the macro, national and the micro, corporate level therefore follows very naturally from consideration of the three other components of the SAGE dashboard.

23.5 Recommendation: Empirical Development of the SAGE Dashboard for the G20

The empirical development of a normative dashboard of wellbeing should have the following aims:

1. **Universalisability:** to identify major normative components of wellbeing, which extend beyond cultural, national and religious boundaries.

2. **Simplicity:** to focus on four components of wellbeing, since that is the number of independent pieces of information that can be kept in working memory at the same time, on average. (Each of the components may of course be assessed in terms of multiple subsidiary elements.)
3. **Regularity:** to measure these normative components of wellbeing with the same regularity as GDP, which implies annual or quarterly measures.
4. **National scope and duration:** to measure the dashboard for most of the countries of the world over sizable time spans, so that national performance (beyond GDP) can be compared across nations and through time.
5. **Business scope and duration:** to measure the dashboard for companies on the same basis over sizable time spans, so that business performance (beyond shareholder value) can be compared across businesses and through time.
6. **Comparability across the policy-business divide:** to measure national performance and business performance consistently, so that indicators of policy effectiveness and business impacts are coherent, permitting an appropriate interaction between policy-making and business strategy.

The dashboard should be composed of a flow statement (measuring the flows of value-driven wellbeing from solidarity, agency, material gain and environmental sustainability) and a stock statement (measuring the stocks that enable the generation of the flows).

Social capital is the stock that enables the flow of solidarity. The stock of capabilities enables the flow of agency. The stocks of physical and human capital enable the flow of goods and services. And the stock of natural capital enables the flow of environmental services. (Needless to say, in addition to these direct effects, each of these stocks of these stocks of capital also has indirect effects on each of the flows.)

The flow and stock statements of the dashboard are analogous to the income statement and balance sheet of a company. Both statements are necessary for the assessment of prosperity.

It is important to emphasise that these stocks are enablers of the flows, not necessarily the generators of these flows. For example, the stock of social capital provides a social environment built on trust and cooperation, but only when people's interactions draw on these social resources does solidarity flow. Similarly, if capabilities are unused, then agency does not flow from them—much as goods and services do not flow from unutilised physical and human capital. Whereas social, physical and human capital, along with capabilities, generally depreciate when unutilised, natural capital often regenerates when environmental services are not consumed.

It is also important to recognise that flows do not necessarily diminish stocks, as we conventionally associate with physical assets. Indeed, that is a distinguishing characteristic of all three assets being discussed here—natural, human and social.

We can consume the benefits of many forms of nature without depreciating their stock provided we do not overconsume them to the point that they cannot regenerate themselves sufficiently rapidly. We can consume the benefits of human knowledge and information without diminishing the stocks of either, provided we do not abuse them through deceit or misrepresentation. We can consume social capital through

broad participation without diminishing (and in some cases rather increasing) its stock, if we do not misuse it through breaches of trust and expectation, but instead use it to generate increasing returns of social interactions. A rudimentary version of the SAGE dashboard's flow statement has already been developed for the measurement of national performance for over 160 countries over the last two decades, covering aims (1–4) above. The methodology and data sources underlying this empirical exercise is described in Lima de Miranda and Snower (2020, 2022). Whereas material gain (G) is captured by GDP per capita and environmental sustainability is also measured conventionally (such as through the Environmental Performance Index), solidarity (S) and agency (A) are assessed through subjective measures.

This is part of an ongoing empirical effort to develop these measures further and to relate them to other dashboards of wellbeing, such as the OECD Better Life Index (2019), the Social Progress Index (Stern et al. 2022), Genuine Progress Indicators (Kubiszewski et al. 2013), Green Accounting, the Dasgupta Review (Dasgupta et al. 2021), System of Environmental Economic Accounting for India (UN 2021), the Sustainable Development Goals (Schmidt-Traub et al. 2017) and others. Relevant measures from these other dashboards will be incorporated into the SAGE framework, in accordance with well-defined criteria. Other empirical efforts can thereby enrich our normative measures of wellbeing and, conversely, our normative measures can enrich the other dashboards by identifying those sources of wellbeing that arise from living in accordance with one's values. On this account, the SAGE dashboard is not to be understood as an alternative to existing wellbeing dashboards, but as an ongoing empirical effort to distil and categorise existing data within a framework focused on the moral foundations of wellbeing.

Once the flow and stock statements of a normative dashboard of wellbeing have been produced, it will be possible to develop measures of policy effectiveness not only with respect to commodities (such as multipliers, indicating the effect of government expenditures on GDP) and the environment (such as environmental impact multipliers of government expenditures), but also with respect to solidarity and agency. On this basis it will, for example, become possible to measure not only the effect of government expenditures on GDP and on environmental services, but also on social cohesion (via solidarity, S) and empowerment (via agency, A)—all on a consistent basis across countries and through time.

Furthermore, it will be possible to measure government policy effectiveness and business impact that are compatible with one another across all components of the normative dashboard. This will enable significant progress to be made in designing government macroeconomic and structural policies that are complementary with policies directed at business (such as the specification of business responsibility targets, taxation, regulation and government procurement rules).

23.6 Recommendation: Development of International, National and Corporate Accounts (INCA)

Based on the measurement initiative above, it will become possible to design a normative accounting framework for national and business accounts, so that national and business decision-making can be guided effectively by components of profound well-being. In particular, we propose the development of international, national and corporate accounts for public and private sectors, to which we have given the acronym, INCA.

What we believe is required is a consistent set of accounts across the macro–micro divide, including international, national and corporate accounts. This will incorporate traditional stocks and flows of human, social and natural, alongside the existing measures of financial and material products and services, including assets and liabilities, income, and profit and loss statements.

The approach would draw on existing systems of total wealth, impact measurement and natural capital accounting. Once these measures of stocks and flows make their way into reporting, as well as the measurement of policy and business effectiveness, they could have a significant impact on the governance of sectors such as the digital sector and places, such as left-behind towns and regions. It would promote, where appropriate, the delegation of authority to individuals, institutions and government at local, regional and sectoral levels. It could have as profound an effect on the management of human, social and natural assets in different localities and sectors as did the development of national accounts in the 1950s on macroeconomic management.

A normatively based dashboard of wellbeing (SAGE), spanning the policy–business divide, accompanied by a normative accounting system (INCA) is a first step towards the achievement of “moral capitalism,” in which businesses can compete for profits and consumers can fulfil their needs equitably and inclusively.

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Chapter 24

LiFE, SDGs and Wellbeing: Towards an Integrated Approach



G. A. Tadas

Abstract ‘Lifestyle for the Environment (LiFE)’, the concept introduced by India in November 2021 at COP26 in Glasgow, envisages replacement of ‘use-and-dispose’ approach with a circular economy. It is aimed at driving ‘mindful and deliberate utilisation of natural resources and adopt sustainable consumption lifestyles’, to protect and preserve the environment. LiFE requires increasing awareness among people to change their habits. This requires fundamental shift in our approach to life vis-à-vis nature. It is now evident that degradation in air, water, forests, wildlife would adversely affect environment and wellbeing. These environmental and ecological products may not be part of the market hitherto, but degradation in these has led global community to rethink on evolving an appropriate mechanism that can guide judicious and eco-friendly use of natural resources. Time has come to account for these aspects in the GDP and facilitate more informed decision-making at the national level for the benefit of society.

24.1 Introduction

Over the last two decades, several initiatives have been taken by global community to address environmental degradation, climate change, increasing gaps in SDGs, policy reforms and regulations. However, the progress is far from satisfactory. We are still far away from holding global warming to below 1.5 °C (above pre-industrial levels) as committed under Paris Agreement. There is hardly any progress in achieving COP15 goal of ‘restoring conservation of at least 30% of the world’s lands, inland waters, coastal areas and oceans and halting and reversing biodiversity loss by 2030’. According to the United Nations Environment Programme (UNEP), ‘if one billion people out of the global population of eight billion adopt environment-friendly behaviours in their daily lives, global carbon emissions could drop by approximately 20% (UNEP 2021). It is increasingly recognised that lifestyle changes can significantly mitigate ecological crisis.

G. A. Tadas (✉)

Research and Information System for Developing Countries (RIS), New Delhi, India

'Lifestyle for the Environment (LiFE)', the concept introduced by India in November 2021 at COP26 in Glasgow, envisages replacement of 'use-and-dispose' approach with a circular economy. It is aimed at driving 'mindful and deliberate utilisation of natural resources and adopt sustainable consumption lifestyles', to protect and preserve the environment. LiFE requires increasing awareness among people to change their habits. This requires fundamental shift in our approach to life vis-à-vis nature. The reverence to nature was well-recognised by humanity long ago. I am tempted to quote from Vedas 'Mitrasyaaham Chakshushaa Sarvaani Bhootani Sameekshe' (Yajur Veda: 36/18), which means 'look at every entity of Nature with the eye of a friend and sympathiser'. On the earth's replenishment capacity, it is said 'you give me and I give you', which may be interpreted as, if we treat and use resources of the earth with care and grace, the consequences may be benevolent and sustainable (Sarma 2015). It is now evident that degradation in air, water, forests, wildlife would adversely affect environment and wellbeing. These environmental and ecological products may not be part of the market hitherto, but degradation in these has led global community to rethink on evolving an appropriate mechanism that can guide judicious and eco-friendly use of natural resources. Time has come to account for these aspects in the GDP and facilitate more informed decision-making at the national level for the benefit of society.

24.2 Sustainable Lifestyles and Sustainable Production

Historically, the focus on GDP growth in government policy and economic pursuits has led to unmindful exploitation of natural resources and pursuit of lifestyles causing irreparable damage to environment, bio-diversity and social aspects of development. Research over the years has revealed that higher income levels do not necessarily mean higher wellbeing, especially in the context of adverse climate change, biodiversity loss, lack of access to basic amenities, social inequality, increased stress level (Easterlin 1995; Fischer 2009; Giannetti et al. 2015). There are limits to benchmarking GDP as a standard of the wellbeing of societies as it ignores economic inequality and does not integrate 'environmental services into economic decision' (Stiglitz et al. 2010). It is well recognised that climate it is not just an environmental issue, but has ramifications for economic growth patterns and social wellbeing. UNEP and UNFCCC have persistently taken up the cause of environment by highlighting the grave consequences of climate change and measures to mitigate environmental degradation (UNEP 2021; UNFCCC 2023). Therefore, sustainable growth in the long term requires insulating it from adverse environmental impacts. Studies point out that there are critical thresholds which must be respected in the use of natural assets and that the world is moving towards breaking point where the damage could be irreversible. It is all the more critical to ensure that production and consumption choices reflect the true cost of environmental impacts and government policy intervention has crucial role in striking an optimum balance (Everett et al. 2010; Hepburn and Bowen 2012). The studies on climate change and GHG emissions have revealed

that environmental-friendly production systems are not only sustainable but pro-growth as well (IMF 2022a). Scotland's First Minister Nicola Sturgeon has said that multiple global crises such as climate emergency, biodiversity loss and rising cost of living 'raise fundamental questions about what we value and what our economies are actually for' (Meredith 2023). There is a growing movement to transform economies around the world that is socially inclusive and people-centric which also takes care of environment and biodiversity.

The India G20 Presidency theme 'One Earth, One Family, One Future' and the emphasis on 'Lifestyle for Environment (Life)' have set the mandate towards a coherent agenda of sustainable development, climate action and climate justice (T20 India, Bhopal Declaration, January 2023). The transition to Life requires exploring new models of development promoting sustainable production that complements sustainable consumption and societal progress. The adoption of Agenda 2030 by the global community in a way reflects shift towards this kind of socially inclusive and sustainable development paradigm. The SDGs touch upon poverty, income inequalities, gender disparities, education, health, environment, bio-diversity, sustainable consumption and production. So, the world has now moved beyond GDP. Development transformation is not about structural transformation we are used to in economic theory, i.e. as the economy progresses, there will be shift of employment and GDP from agriculture to industry to services sector. It is not just about economic growth, but about growth that is environment-friendly, socially inclusive and people-centric. This is what I consider as basic foundation of 'LiFE economy' or to generalise it, 'Life economy' covering various elements of sustainability of life, inclusive economy and society, environment, ecology and bio-diversity.

24.3 SDGs—Why We are Lagging Behind and What Needs to Be Done?

The adoption of three major international agreements, viz. the 2030 Agenda and the Sustainable Development Goals (SDGs), the Paris Climate Agreement, and the Addis Ababa Action Agenda (AAAA) on financing for development in 2015 marked a major breakthrough in approach to development. The G20 has since then been deliberating and reviewing progress in SDGs regularly. In the years prior to the COVID pandemic, developing countries made some lagging progress in areas such as poverty reduction, maternal and child health, access to electricity and gender equality. In other areas such as reducing inequality, lowering carbon emissions, protecting nature and tackling hunger, progress was either stalling or even back-sliding (OECD 2023b). For example, the world remained off track to stay at or below the 1.5 °C target set by the 2015 Paris Agreement, and the number of undernourished people at global level increased by 7%, representing an additional 43 million people, between 2014 and 2019 (UN 2019). The COVID-19 pandemic has widened SDG gaps, especially in the areas of poverty, health care and food security

causing increase in multidimensional vulnerabilities. While the developed countries were able to respond to COVID challenges with aggressive macro-economic policies, fiscal constraints in developing countries have widened ‘pandemic recovery gap’. Many developing countries—faced with significantly higher borrowing costs and reduced access to international financial markets—have been rendered inflexible in their response. For the debt-ridden countries, although DSSI was made available to tide over the crisis, any further financing was available only at higher costs, shorter maturities and greater volatility (OECD 2023b; T20 India: TF6 Statement 2023). This so-called great finance divide contributed to ‘developing countries’ diminished ability to finance an appropriate response to a historic shock’ (UN 2022a). There has been a decrease in SDG financing, especially since the COVID pandemic. The SDG index since 2019 has virtually been flat and worsened in many developing countries, especially LDCs (Fig. 24.1).

It is observed that for some of the social indicators for which long time series data could be collected, there is perceptible progress in reduction in infant mortality rate and improvement in gross primary school enrolment over period of three decades, from 1990 to 2020 in both LICs and MICs. In fact, MICs had reached gross primary enrolment of more than 100% in the 1990s period. However, progress in secondary education is slow and as also improvement in life expectancy at birth. The implication is that any further increase in secondary and tertiary education and improvement in life expectancy would require different strategies and policies (Fig. 24.2).

India has assumed its G20 presidency when the global economy is reeling with multiple shocks including lingering post-pandemic effects. While the fiscal-monetary expansionary policy response to COVID-19 helped in mitigating the negative impacts of the pandemic on both growth and social sector needs, it has on the other hand caused negative spillover effects in terms of higher inflationary pressures adversely

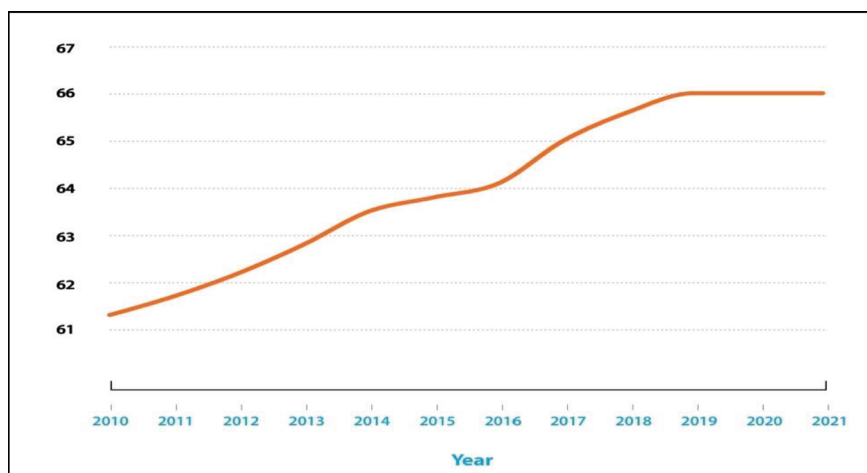


Fig. 24.1 SDG Index Score over time, world average (2010–2021). *Source* Jeffrey Sachs et al. (2022)

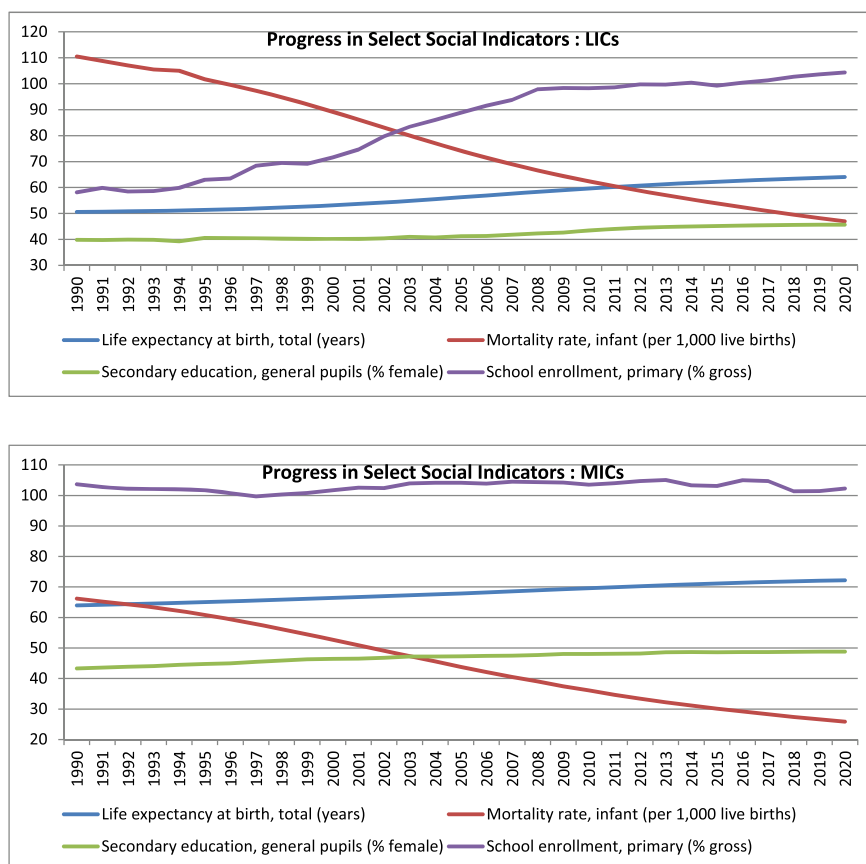


Fig. 24.2 Progress in select social indicators—LICs. *Source* Author

affecting low income and poor people. This is expected to make the economic recovery more fragile. With the advanced and emerging market economies hiking the interest rates to mitigate the inflation pressures, the cascading effect is felt in almost all the LDCs that are reeling under already high debt burden and are virtually left with negligible fiscal space to make any adjustments for such shocks. The sharp rise in public debt levels and subsequent rising debt-servicing costs appear to exert severe constraints on the countries' ability to finance the recovery process and also the long-term goals of achieving SDGs. Further, the on-going geo-political conflict has affected prices of food, fertiliser and fuel due to disruptions in supply chains, which has exacerbated the problems of the developing countries, especially the LICs. As observed by Secretary-General of the UN, 'at the mid-way point on our way to 2030, the SDGs are in deep trouble. A preliminary assessment of the roughly 140 targets with data shows only about 12% are on track; close to half, though showing progress, are moderately or severely off track and some 30% have

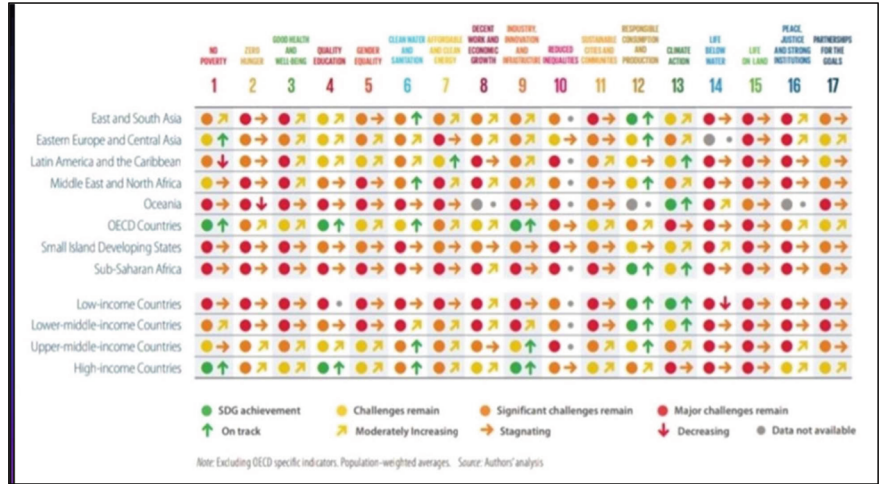


Fig. 24.3 Progress in select social indicators—MICs. Source Author

either seen no movement or regressed below the 2015 baseline’ (UN 2023). The dismal performance is observed especially in LICs and lower-middle income countries (LMICs) as per Sustainable Development Report 2022. The only SDGs where LICs and LMICs seem to have made some progress are in sustainable production and consumption and to a lesser degree in climate action. Among regions, the sub-Saharan Africa, SIDS and Middle-east and North Africa are much behind compared to other regions (Fig. 24.3).

24.3.1 Investments Needed in SDGs

While large investments are needed to achieve the SDGs and climate targets, public investment has declined significantly in developing countries over the years. Successive crises like COVID-19, on-going geo-political conflict and the environmental crisis, have accentuated inequalities between countries and caused a significant drop in various sources of financing for sustainable development (OECD 2023a, b). It is reported that the total volume of financing for sustainable development (FSD) flows to developing countries, excluding China, declined by USD 774 billion, or 17%, from USD 4.6 trillion in 2019 to USD 3.9 trillion in 2020. The largest drop was in available government revenue (i.e. government revenue after debt service repayments), which shrank by USD 689 billion (by 22%), from USD 3.1 trillion in 2019 to USD 2.4 trillion in 2020. The decline over 2019–20 also was more significant than during the 2008–09 global financial crisis: three times greater in LICs, two times greater in LMICs and four times greater in UMICs (IMF 2022a; UNCTAD 2022; OECD 2023b). Annual SDG financing gap in developing countries increased

by 56%, to USD 3.9 trillion in 2020. It is projected that SDG financing gap could reach USD 4.3 trillion per year from 2020 to 2025, an increase of USD 400 billion over 2019–20. Incremental SDG financing needs are large, 10–20% of GDP for many LICs and LMICs. Net-zero requires USD 1 trillion annual investment on clean energy in developing countries, but ODA provides only USD 3 billion.

SDG investments in physical capital and infrastructure have positive financial returns, but long gestation periods which require financing from investors with sufficiently long time horizons. These may include: (i) combination of public sector investment, private sectors and public–private participation; (ii) pension funds and/or public development banks; (iii) MDBs, RDBs, ODA and blended finance. Investments in green infrastructure also have large output and employment multipliers and thus significant co-benefits for sustainable development. Social sector investments may not have direct financial returns associated with them but can stimulate economic growth through enhancing human capabilities over the long term.

24.3.2 Sources of Increased SDG Financing

It is estimated that global SDG financing gap is in the range of 1–2% of gross world produce. Financing would need to come from a combination of global & domestic sources as also public & private sources. At the global level MDBs, ODA and bilateral arrangements, Global Philanthropies need to augment their capacities to be able to assist SDG financing at the scale required. At the domestic level, the governments, National Development Banks, PPPs and financial inclusion options would have to scale up funding through innovative ways. There is significant potential to push blended finance by attracting private finance through this mode (OECD 2023b). Attracting private finance and increasing blended finance require creating conducive business and regulatory environment. This would also go a long way in the development of local currency markets to support the introduction of innovative instruments for raising resources.

The scaling up of the resources of MDBs to meet the increasing SDG financing gaps in the developing countries is being deliberated at length in the recent years. The growing demand for reforming the global financial architecture and operating model of the MDBs is aimed at addressing these financing gaps in developing countries. The Bridgetown initiative called for ‘providing emergency liquidity, expanding multilateral lending to governments by US\$1 trillion and activating private sector savings for climate mitigation and fund reconstruction after a climate disaster through new multilateral mechanisms’ (Government of Barbados 2022).

24.3.3 South-South and Triangular Cooperation

The South-South and triangular cooperation derives its strength from mutual interdependence through exchange of knowledge, skills, experiences and lessons learned between and among countries of the Global South that ‘serves as a powerful catalyst for development’ (UN 2022c). These exchanges may even complement traditional North–South cooperation and promote and strengthen inclusive global partnerships towards sustainable development. Triangular cooperation is when international organisations, civil society, private sector, private philanthropy and others work together to co-create flexible, cost-effective and innovative solutions for reaching the SDGs. There is a huge potential of triangular cooperation to provide a ‘broader range of resources, expertise and capacities’, which is being driven by the demand of developing countries for national development and to meet their international commitments (Chaturvedi 2012; Quadir 2013). India and other BRICS countries have played an important role in redefining the structure of development cooperation which was earlier characterised by conditionalities and inequities. The South and triangular cooperation is driven by the needs of partner countries in line with their national development priorities.

24.3.4 Macro-Economic Policy and SDGs

Macro-economic policy-making assumes critical significance under situations of crisis so that SDGs are to a great extent insulated from such vulnerabilities. While the expansionary monetary and fiscal policy during COVID period did provide safety net to vulnerable groups, these policies resulted in inflationary pressures affecting again these vulnerable groups. The macro-economic policies need to factor long-term climate targets and SDGs to support additional funding required as also to create enabling environment for achieving SDGs. These raise questions related to what is the balance required in fiscal and monetary policies to achieve the twin objectives of macro-economic stability and augmenting SDG financing. However, the Government can play an active role through fiscal support and policy tools to provide social protection for the vulnerable population, create social infrastructure facilities to meet health, education, water and sanitation needs of the people through higher allocation of sources and improving efficiency in resource deployment. For instance, it is observed that there is no well-defined framework incorporating macro-economic policies specific to achieving SDGs in many Asia Pacific countries although some countries are seen to have integrated SDGs in their national development plans (Chakravarty 2020). It is viewed that the policies need to ensure economic and environmental sustainability over time to safeguard the wellbeing of current and future generations (Cerra 2022). There seems to be no consensus on macro-economic policies that can be deployed to facilitate these goals, especially in the context of increasing number of global shocks (Giovanni 2020).

24.3.5 *Creating Conducive Environment*

The market-driven innovative sustainable financing instruments have virtually bypassed many developing countries. Over 97% of the estimated USD 1.7 trillion in total sustainable investment funds are held in HICs (UNCTAD 2022). Innovative financing instruments, such as green, social, sustainable and sustainability-linked (GSSS) bonds, offer opportunities for governments, financial institutions or corporates. (Dembale et al. 2021). The G20 under Italian presidency in 2021 highlighted this potential and identified High-Level principles on sustainability-related financial instruments (G20 Italy 2021; UNCTAD 2021). There is need to develop a ‘multi-stakeholder technical support and capacity building facility to help developing countries access quality, gain from neutral advice on financial instruments, deepen financial markets and increase absorptive capacity to overcome fiscal and credit crunch’ (OECD 2023b).

The Sustainable Finance Working Group (SFWG) has identified that ‘lack of complementary non-financial regulatory frameworks and policies to the financial regulations on alignment approaches’ is discouraging flow of resources in green transition and climate action in developing countries. While developed countries are taking big initiatives aimed at reducing risks (including environmental, social and governance (ESG) criteria) to encourage green financing, resources are not reaching the countries most in need. There is need to remove bottlenecks for a more equitable and needs-based allocation of sustainable finance (OECD 2023b). As the United Nations (UN) Secretary-General warns, ‘only seven years remain to achieve the 17 SDGs and rescuing the SDGs means rescuing developing economies around the world’ (UN 2022b).

24.4 SDGs and Wellbeing

The G20-mandated OECD report suggested that ‘the development pathways required to meet the Paris Agreement objectives underlines the value of well-aligned policy packages in mobilising investment and social support for the transition while enhancing growth’ (OECD 2017). Pursuing climate action should not be seen as a trade-off to pursuing economic growth; in fact, they are complementary and mutually supportive as brought out by various studies on the linkage between growth and environment. ‘The very market failures to which we have called attention imply that there is an upside potential to addressing climate change—one which too suggests the desirability of greater climate action. There is the potential of finding a new, cleaner, more efficient and more attractive form of growth, with better health and less pollution, in which case the apparent costs of action may turn out to be negative. In this sense, for many parts of the story of transition we should think of action in terms of investment and innovation rather than cost’ (Stern et al. 2022).

Recognising the interconnectedness of economic, social, environmental and developmental factors, it is viewed that investing in a just green transition represents a key sector in addressing the ‘Great Divergence’ and achieving it will lead to stronger growth and development for all (Songwe et al. 2022). The challenge for policy-makers is thus to resolve the short-term trade-offs in the interest of long-term sustainable growth through appropriate policy reforms and incentives. Many SDG investments, such as physical and social infrastructure have positive financial returns, but long gestation periods. Research insights indicate that countries with a higher progress in SDG tend to do better in terms of subjective wellbeing (SWB) (Neve et al. 2020). It is observed that ‘uneven access to opportunities is associated with low inter-generational mobility in education and income’, which could adversely affect future economic growth (Heckman et al. 2009; Krueger 2012; Marrero and Rodriguez 2013; Narayan et al. 2018). Health (SDGs 3), education (SDG 4), sustainable and inclusive growth (SDG 8) and sustainable consumption and production (SDG 12) seem to have significant impact on reducing inequality, promoting sustainable growth and overall wellbeing. SDG 12 (responsible consumption and production) and SDG 13 (climate action) have, in fact, strong correlations with SWB which merit more academic and policy attention (Neve et al. 2020). The social indicators like life expectancy at birth, infant mortality rate, female secondary education, primary school enrolment and tertiary school enrolment have strong correlation among them, especially in LICs. For instance, infant mortality rate has strong negative association with primary, secondary and tertiary education. Life expectancy has strong and positive association with primary, secondary and tertiary education. Similar results, although with differing degree of correlation, are seen in MICs. These simple results indicate the importance of policy focus needed to achieve better quality of life.

Correlation between social indicators of development, per capita GDP: LICs

	LEB	IMR	SEEF	PSE	TSE
LEB	1	–	–	–	–
IMR	– 0.99	1.00	–	–	–
SEEF	0.97	– 0.93	1.00	–	–
PSE	0.96	– 0.99	0.89	1.00	–
TSE	0.96	– 0.91	0.97	0.89	1.00

Note LEB = Life Expectancy at Birth (no. Of years); IMR = Infant Mortality Rate (Per 1000 Live Births);

SEEF = Secondary Education (% Female); PSE = Primary School Enrolment (% Gross);

TSE = Tertiary School Enrolment (% Gross).

Source Based on WB, World development indicators database

Correlation between social indicators of development, per capita GDP: MICs

	LEB	IMR	SEEF	PSE	TSE
LEB	1	–	–	–	–

(continued)

(continued)

	LEB	IMR	SEEF	PSE	TSE
IMR	– 0.98	1.00	–	–	–
SEEF	0.96	– 0.98	1.00	–	–
PSE	0.43	– 0.47	0.45	1.00	
TSE	0.99	– 0.98	0.92	0.41	1.00

Source Based on WB, World development indicators database

Investments in physical infrastructure and green energy have large output and employment multipliers and thus significant benefits for sustainable development. Investments in health and education not only impact individual welfare but also growth prospects. Similarly, many other social sector investments—sanitation, potable water, etc.—may not have expected direct financial returns associated with them, but may improve healthy living and stimulate economic growth in the long run. Thus, it is evident that SDG progress and wellbeing go together. Some studies have identified education, health, climate change, sustainable urban infrastructure, sustainable food and land use systems, universal digital services as investment priority areas to accelerate achieving the SDGs (Sachs et al. 2019).

24.5 Life Economy: Transformative Approach to Development

The foregoing analysis clearly brings out that the global community has moved beyond GDP and that it is not just about economic growth, but about growth that is environment-friendly, socially inclusive and people-centric. The progress in SDGs is in the interest of all the countries, not the least, the developing countries. The wellbeing, both subjective and material, is closely inter-related with SDGs, and hence, acceleration in the pace of achieving SDGs is going to contribute significantly to improvement in the wellbeing. The moot question is: Can we achieve progress in SDG by merely addressing financing gaps? Although finance is critical, it is evident that the existing economic systems and policies that have over-relied on production and extraction are at the root cause of the environmental and socio-economic problems that we are faced with today. Hence, existing economic systems and models of growth need to give space for emergence of transformative systems and new paradigms of development, creating conducive environment for participation by local communities and private sector as partners in development. The experience across developing countries and the glaring gaps in SDGs reveal that SDGs should become endogenous to economic and social systems so that the progress would be natural and long-lasting. This requires transforming economic and social systems and transitioning towards a ‘Life Economy’ that makes it possible for individuals to pursue livelihoods and lifestyles that are in tune with the wellbeing of our planet and all of its inhabitants. Any such transition to Life economy would need to be based

on the principle of inclusivity and people-centric approach that promotes sustainable production and consumption. The Life economy would encompass businesses that prioritise social and environmental benefit and the wellbeing of all stakeholders (responsible production); finance that prioritises social and environmental stewardship (SDG-aligned finance); households, individuals and communities that adjust the way they consume and conserve natural and man-made resources (responsible consumption); and a supportive ecosystem, including policy and regulation, to enable common good outcomes. This is the emergence of the Life economy, at the centre of which are ‘for-benefit and purpose-driven enterprises’ that integrate social and environmental objectives with commercial means (Sabeti 2020). In the Life economy, production, consumption, finance, employment and other economic activities would promote the wellbeing of people and planet while minimising harms, delivering sustainable, equitable and inclusive growth. What is needed is a shift in values, mindset and action on the part of individuals and communities and governments to encourage growth of for-benefit and social enterprises.

We need to promote models of business that work for everyone, including employees, suppliers, customers, local communities and nature, putting the wellbeing of people and planet above profits. We need to explore innovative financial structures to move capital into these models and to provide incentives and support for them to fully integrate public benefit and sustainability into their core purpose and strategy (Ford Foundation for Social Justice 2022). In the recent years, there are evidences of green shoots towards adopting new approaches to development that is sustainable and that takes care of inter-generational equity across population and bio-diversity.

24.5.1 Life Economy: India G20 Initiatives

As noted earlier, LiFE as concept was introduced by India in November 2021 at COP26, That envisages replacement of ‘use-and-dispose’ approach with a circular economy. During India G20 Presidency, many initiatives have been taken to formulate a framework and principles for LiFE. The Development Working Group (DWG) through intense deliberations among G20 members formulated high-level principles for LiFE (HLPs). The Development Ministerial Meeting held at Varanasi on 12 June 2023 adopted ‘G20 High Level Principles on Lifestyles for Sustainable Development’. These principles call for promoting, among others: (i) inter-linkages between development, environment and climate agendas and their associated goals which are at the heart of Lifestyles for Sustainable Development approach; (ii) environment-friendly individual and community behaviour; (iii) sustainable production, including through sustainable value chains, technological transitions, innovations and investments in key areas; (iv) local communities, local and regional governments and traditional knowledge in supporting sustainable lifestyles (G20 India 2023) (Fig. 24.4).

Building framework for life economy and wellbeing. *Author’s depiction*

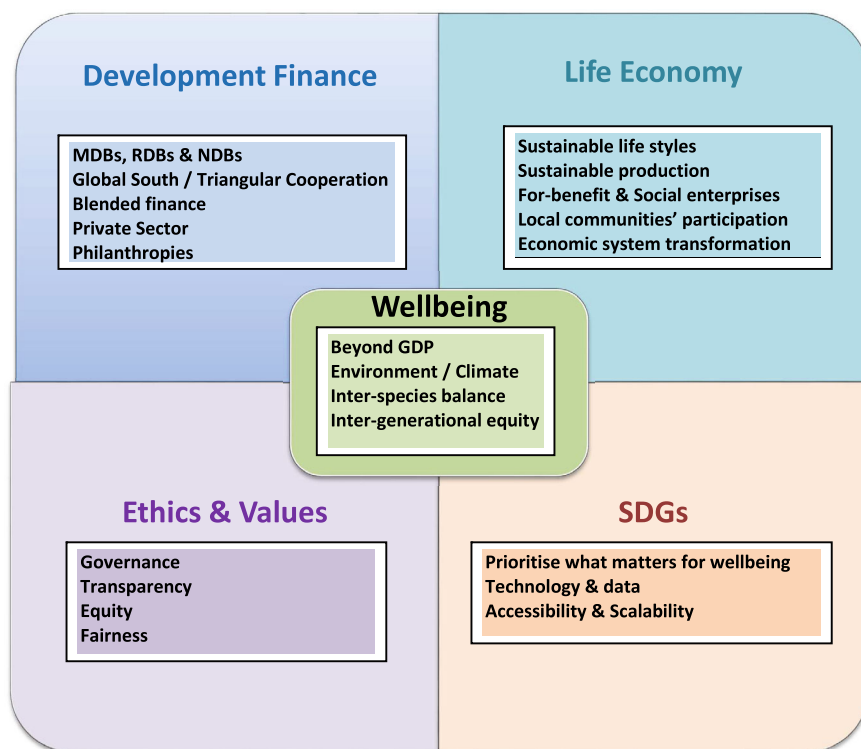


Fig. 24.4 2022 SDG dashboards by region and income group (levels and trends). *Source* Jeffrey Sachs et al. (2022)

The Task Force 3 (TF3) dealing with ‘LiFE, Resilience and Values for Wellbeing’ under Think20 (T20) India, at the side event held at Bhopal in January 2023 came out with Bhopal declaration which, inter alia, emphasised the need for development transformation to support transitions towards LiFE and responsible consumption based on sound value systems and ethical approaches (T20 India Task Force 3 2023). Apart from the G20 process, the criticality of promoting LiFE was recognised during bilateral meeting between the Prime Minister of India and the US President held in June 2023. The Joint Statement from the USA and India states ‘The leaders recognise that addressing sustainable consumption and production is a key component to achieving of the development, environment and climate ambitions of the 2030 Agenda for Sustainable Development and the SDGs. In this regard, President Biden welcomed Prime Minister Modi’s Lifestyle for Environment initiative (LiFE) as a successful national model to address the impacts of climate change, biodiversity loss, desertification and land degradation and resolved to work together to implement the G20 High Level Principles on Lifestyles for Sustainable Development’ (GOI MEA 2023). As the momentum towards Life economy gains pace, it is critical to address

some of the building blocks to make it sustainable and self-reinforcing in the long term.

24.5.2 Aligning Development Finance with the SDGs Through the Life Economy

Development finance agencies and governments have pursued the SDGs as independent goals, rather than as an integral part of economic development strategy. This has led to misalignment between development finance, budget making and pursuit of the SDGs. There is need to address this misalignment and prioritise the growth of the Life economy where SDG-aligned finance would be a critical element. It is seen that many countries are moving towards putting in place framework to promote sustainable finance (e.g. European Commission, 2023). The growth of the Life economy can enable the implementation of development projects in terms of corporate behaviour, labour and environmental standards, technology and materials, energy sources, consumption and contribute to advancing the SDGs as much as the projects' intended deliverables. There is scope for magnifying the impact of development finance by facilitating the creation of a multi-stakeholder platform for collaboration to unleash huge potential in annual development finance spending to propel the Life economy (Sabeti 2020, 2023). However, this calls for creating a conducive environment and system transformation that encourages for-benefit or social enterprises to take up economic activities that are pro-environment, socially inclusive and equitable.

24.5.3 Involving Business and Industry

The primary responsibility for achieving the SDGs lies with governments. However, governments on their own cannot achieve the 2030 Agenda. They need to take along private sector and all the stakeholders to play their part in financing sustainable development. The governments will need to pursue effective transformational reforms to promote sustainable long-term growth. Such domestic reforms can generate substantial resources to fill up SDG spending needs. There is also need for an extraordinary effort from the international community to bridge SDG financing gaps (Benedek et al. 2021). The industry or business would, on their part have to take interest in promoting SDGs. The new industrial revolution promises considerable opportunities for inclusive and sustainable development for manufacturers as they align their business models incorporating action plan towards achieving SDGs (PwC 2017). The 'Better Business, Better World' report revealed that pursuing sustainable and inclusive business models could unlock economic opportunities worth at least USD

12 trillion a year by 2030 and generate up to 380 million jobs, mostly in developing countries (Business Commission 2017). It is observed that not many people are aware of SDGs and hence it is prerequisite to increase awareness about SDGs and how they impact life. According to PwC's 'Make it your business: Engaging with the Sustainable Development Goals' report, 90% of citizens who were made aware of the SDGs said that it is important for businesses to sign up to the goals and 78% said they would change their buying behaviour because of the SDGs (PwC 2017). Increasingly, business ethics is determining the fundamental purpose of existence of a company in many organisations.

24.5.4 Local Communities' Participation and Governance Structure

It is increasingly being felt that involving local communities can help generate policies and programmes that are potentially effective in their impact on local development. It is observed that in many countries there is growing decentralisation of powers and resources to local governments as a move towards improving governance and sharing of benefits. Local communities across countries are playing active and assertive role in local development policies and programmes (Foster 2018). The UN High-Level Political Forum on Sustainable Development called for 'an increased critical role for local communities and civil society in getting the world back on track to achieving the Sustainable Development Goals by 2030' (UN Blog 2019). From a wellbeing perspective, it is recognised that all aspects of what constitutes a good life must be considered holistically, whether it's access to health care and education or a strong sense of connection to one's community. It is felt that 'process matters critically in achieving desired wellbeing outcomes and the most important shift in process is the requirement to give communities more voice and resources to drive change' (Bala et al. 2021). Many of the issues that are being dealt at the local or regional level cannot be sorted out from the centre. It suggested that the centre needs to play a listening and supporting role and a shift in the way government works on the issues and measures the outcomes. Hence, there is need for qualitative improvement in the governance structure. Increasingly, there's a move to devolve resources and decision-making, to co-design with communities and stakeholders (Bala et al. 2021).

24.5.5 Inclusive Innovations

It is considered very important to promote pro-poor and inclusive innovation for larger community benefits and building on ideas of innovation for the bottom of the pyramid (UNCTAD 2017; Prahalad 2005). The outcome of pro-poor innovation would be in the form of new concepts and methods, low-cost labour and materials and

huge scales of production that can serve markets previously ignored by traditional innovation. Similarly, the innovation process could be broad based to include grass-roots innovation movements that have potential to enhance the benefits by making the innovation process more socially inclusive. Further, fostering open and digital collaborations would greatly facilitate access to neglected people and regions and increase scalability benefits.

24.5.6 Supportive Eco-System for Economic Transformation

There is need to encourage partnerships across all sectors in creating a supportive ecosystem, including policy and regulation, for enterprises and finance that promote Life economy. In the Life economy, production, consumption, finance, employment and other economic activities would promote the wellbeing of people and the planet while minimising harms, to advance sustainable, equitable and inclusive growth. It is in the larger interest to promote the growth of for-benefit businesses that prioritise care for the environment and society through creating an enabling policy environment for these businesses and aligning development finance towards enterprises that promote LiFE and the SDGs. In this regard, it is important to encourage and support efforts of global organisations, governments, purpose-driven private enterprises and philanthropies to forge global partnerships for facilitating sustainable production, green transition and systemic transformation.

24.6 Conclusion

Several initiatives have been taken by the global community to address environmental degradation, climate change and gaps in SDGs. However, the progress is far from satisfactory. Historically, the focus on GDP growth in government policy and economic pursuits has led to over-exploitation of natural resources causing damage to environment, bio-diversity and social aspects of development. Research over the years has revealed that higher income levels do not necessarily mean higher well-being, especially in the context of adverse climate change, biodiversity loss, lack of access to basic amenities, social inequality and increased stress level. It is increasingly recognised that changing individual and community behaviour can make a significant positive impact on environment and climate change. ‘Lifestyle for the Environment (LiFE)’, the concept introduced by India in November 2021 at COP26 in Glasgow, envisages replacement of ‘use-and-dispose’ approach with a circular economy. It is aimed at driving ‘mindful and deliberate utilisation of natural resources and adopt sustainable consumption lifestyles’, to protect and preserve the environment. During India G20 Presidency, many initiatives have been taken to formulate a framework and principles for LiFE. The Development Working Group (DWG) and Task Force 3 (TF3) under Think20 (T20) have laid down principles and guiding policies for LiFE.

The Development Ministerial Meeting held at Varanasi on 12 June 2023 has since adopted 'G20 High Level Principles on Lifestyles for Sustainable Development'. The transition to LiFE requires exploring new models of development, promoting sustainable production that complements sustainable consumption. The progress in SDGs is in the interest of all the countries, not the least, the developing countries. The wellbeing, both subjective and material, is closely inter-related with SDGs. While it is critical to bridge the SDG finance gaps, it is evident that the existing economic systems and policies that have over-relied on production and extraction of natural resources are at the root cause of the environmental and socio-economic problems that we are faced with today. Hence, existing economic systems and models of growth need to give space for emergence of transformative systems and development models, by creating conducive environment for participation by local communities and private sector as partners in development. This requires transforming economic and social systems and transitioning towards a 'Life Economy' that makes it possible for individuals to pursue livelihoods and lifestyles that are in tune with the wellbeing of our planet and all of its inhabitants.

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