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# Financial Crises, Poverty and Environmental Sustainability: Challenges in the Context of the SDGs and Covid-19 Recovery

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# Financial Crises, Poverty and Environmental Sustainability: Challenges in the Context of the SDGs and Covid-19 Recovery

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*For the kids*
*who dream, create and pave the way*
*for a just and sustainable world*
*in this little peddle of our cosmos*
*that we call earth*

# Foreword

Humanity is facing a pandemic, an economic and poverty crisis and an ecological breakdown—we cannot afford to lose on any front. Governments have a unique chance to put their countries on sustainable trajectories that prioritize economic opportunity, poverty reduction and planetary health at once. The global public health and economic crisis created by the pandemic is creating a growing financial burden on all governments. The COVID-19 pandemic is estimated to push an additional 88 million to 115 million people into extreme poverty this year, and recovery spending has fallen short of nations' commitments to build back more sustainably.

Given these concerns, the post-pandemic recovery offers a unique opportunity to develop affordable and workable policies to usher in a more sustainable pro-poor and low-carbon world economy.

This publication therefore aims to foster an evidence-based understanding of the multiple and complex ways in which poverty and environmental dynamics interact in moments of economic crises, and how this interaction can be managed in a way that facilitates the transition, as part of the recovery process, to sustainability in the era of the Sustainable Development Goals (SDGs). The publication draws on experiences from around the world from not only the current pandemic-related financial crisis but also other recent financial crises including the Global Financial Crisis of 2008/9.

Regional Policy Coordinator, Jonathan Gilman
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# Foreword

The last three decades have delivered a succession of economic, environmental, food and health crises. Each crisis has revealed and exacerbated the deep fractures and divisions in our societies, which have remained unaddressed by recovery phases. This inability to both prevent and recover fairly from shocks and crises is indicative of an outdated and broken social contract that is no longer fit for purpose, and one that is unable to sustain the transformative vision of the SDGs.

This twentieth century social contract, defined as an implicit bargain between 'economic imperatives of growth and productivity, and the social imperatives of redistribution and social protection' (UNRISD 2016) needs to be overhauled in three fundamental ways. First, it must ensure human rights for all—importantly, this means bringing in those not fully benefitting from previous social contracts, such as women, informal workers and migrants. Second, it must ensure larger freedom for all in a fast-changing world, including security and protection as new challenges emerge. Third, it must spur the transformation of economies and societies to halt climate change and environmental destruction.

Grounded in broad-based participation, dialogue and the building of consensus, a new eco-social contract will be vital to deliver on the SDGs, mitigate the adverse impacts of the COVID-19 pandemic, and put strained state–citizen relations, asymmetric capital–labour relations, patriarchal gender relations and unequal North–South relations on a new footing. It can help define rights and obligations, promote greater equality and provide legitimacy, credibility and buy-in for much needed reforms to overcome future crises.

This book looks at the crises-poverty-sustainability nexus and presents new thinking needed to address interlinkages and complexity, through integrated policies and new development paradigms such as the global common good. A new eco-social contract will be essential to create the necessary trust and permanent platforms to define and defend the common good, tackle old and new social injustices, build resilience to inevitable future shocks and put the world on a pathway to sustainable development.

UNRISD, with the Green Economy Coalition, is launching a new eco-social contract network that will conduct research on transitioning towards just, fair and green economies and societies, in order to inform and influence international debates and ensure the uptake of research in policy decision-making and social movement advocacy. This book is an important building block in our endeavours to turn research into action and social change.

Director of the United Nations Research Institute for Social Development (UNRISD)
Geneva, Switzerland
June 2021

Paul Ladd

# Foreword

There have been many books, over many centuries, written about financial crises, enough to likely fill a small library. Likewise, a large literature is dedicated to different aspects of poverty and to the topics of nature and environmental quality. So perhaps there is no great urgency for another book on either finance, poverty or the environment. But there is a great urgency for one that links all three.

In the day-to-day world, linkages of all kinds are profound but largely invisible; they are there, but have to be sought out to be seen. A whole field of inquiry—systems science—has been devoted to making linkages visible and understandable. We have developed systems tools, such as econometrics for economists, causal diagrams for social scientists, numerical models for climate scientists, to uncover and comprehend these ubiquitous interconnections.

As this book shows, the linkages among financial crises, poverty and the environment are also widespread and important. National financial crises have spinoffs such as curtailed investment in education, which in turn is linked to the poor being unemployable, which in turn is linked to deplorable ongoing poverty. The same financial crises have links to worsening air and water quality, which then causes illnesses especially among the poor—and, again, miserable ongoing poverty and so on. This book expounds upon these and many other interconnections that hamper the well-being of people and the integrity of the rest of nature, all intensified by the pandemic.

But it also reports on linkages that lead to virtuous results. If nations could manage to avert financial crises, and if power and wealth could be shared more equitably, then these positive developments would set up new links: from new opportunities for the poor, to stronger support for protecting the environment, to a more secure financial basis for communities and countries. Perhaps the sustainable development goals can help realise these positive connections internationally.

This book is welcome because it raises our awareness about the important interconnections among a nation's financial crisis, its impact on poverty and its damaging effects on people and environment. But it also shows how linkages can be finessed to produce solutions—debt forgiveness, wealth redistribution and actions to advance climate and environmental justice. It makes visible the interconnections we have to grasp in order to find durable solutions to ending poverty.

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Joseph Alcamo

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The views expressed in this book are the sole responsibility of the authors and do not necessarily reflect the views of the SSRP, UNDP-UNEP Poverty-Environment Action or UNRISD.

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# 1 The Crises-Poverty-Sustainability Nexus in the Context of the Sustainable Development Goals and Covid-19

Andreas Antoniades, Alexander S. Antonarakis, Jonathan Gilman, and Isabell Kempf

**Abstract**

This chapter offers an introduction to the volume Financial Crises, Poverty and Environmental Sustainability: Challenges in the Context of the SDGs and Covid-19 Recovery. The first part examines the impact of the Covid-19 crisis on socio-environmental sustainability. The pandemic crisis has triggered multiple and interacting social, economic and environmental impacts. Mitigating these impacts post-pandemic will require policy actions intent on transforming our current unsustainable socio-environmental model, i.e. managing to use the Covid-19 crisis as an opportunity to build forward better. The second part of the chapter assesses the Covid-19 support packages and recovery strategies. We find that existing policy actions are falling short from the transformation that is required to bring our planet onto a sustainable socio-environmental path. For instance, we observe social exclusion and leaving behind those most in need, increase in atmospheric emissions, and loss of biodiversity. In this context, we argue for a rethink of the underlying assumptions that have determined the economy-environment interaction in our societies. We advocate the need to move away from the commercialisation of nature and a 'net-zero' rationale, towards a 'do no harm' and 'common good' approach. Our transition to sustainability requires nothing less than a new global eco-social contract. The third part of our chapter presents summaries of the volume's case-studies that inform the above analysis and demonstrate how the above challenges are manifested in countries and communities across the globe.

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**Keywords**

Financial crises · Sustainability · Inequality · Covid-19 · Recovery strategies · 'Do no harm' · Eco-social contract

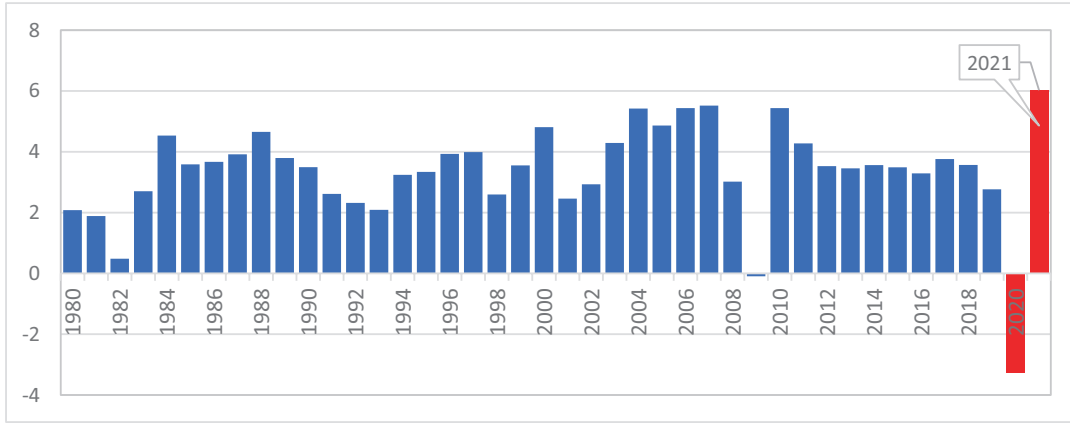
This volume is part of a joint initiative on 'Financial Crises, Poverty and Environmental Sustainability' by the Sussex Sustainability Research Project (SSRP) of the University of Sussex, the UNDP-UNEP Poverty-Environment Action for Sustainable Development Goals (UNDP-UNEP-PEA) and the United Nations Research Institute for Social Development (UNRISD). The aim of the initiative is to foster an evidence-based understanding of the multiple and complex ways in which poverty and environmental dynamics interact in moments of economic crises, and how this interaction can be managed in a way that facilitates the achievement the Sustainable Development Goals (SDGs) and our transition to sustainability.

In this context the Covid-19 pandemic is a critical event at multiple levels. It is a stark reminder of the fragility and vulnerability of our existence on planet earth. Human civilisation has mastered many aspects of the natural world, but the pandemic is a reminder that nature may have the last word. The pandemic has also shaken the boundaries of what is considered to be possible/impossible in our modern societies. Before the pandemic, nothing seemed capable of pausing the frantic pace of modern capitalist economies – the Covid lockdowns and shutdowns were beyond the realm of the 'possible' and 'imaginable'. Similarly, the actions taken by states across the globe to support the private economy and the labour market were unthinkable before the pandemic. In this sense, the pandemic crisis changed the 'horizon of the possible' of our times. Of course, this has come at a very high cost. As of 20 May 2021, more than 3.4 million people had died across the globe (WHO 2021). Furthermore, at the moment of writing this Introduction, new pandemic waves prove challenging to handle in developing countries, and rapid vaccination at a global level remains an elusive target.

The economic impact of the pandemic has been severe. This is reflected both in the historically unprecedented fall in economic growth rates in 2020 (Fig. 1.1), and in more comprehensive socio-economic indicators such as the Human Development Index (Fig. 1.2).

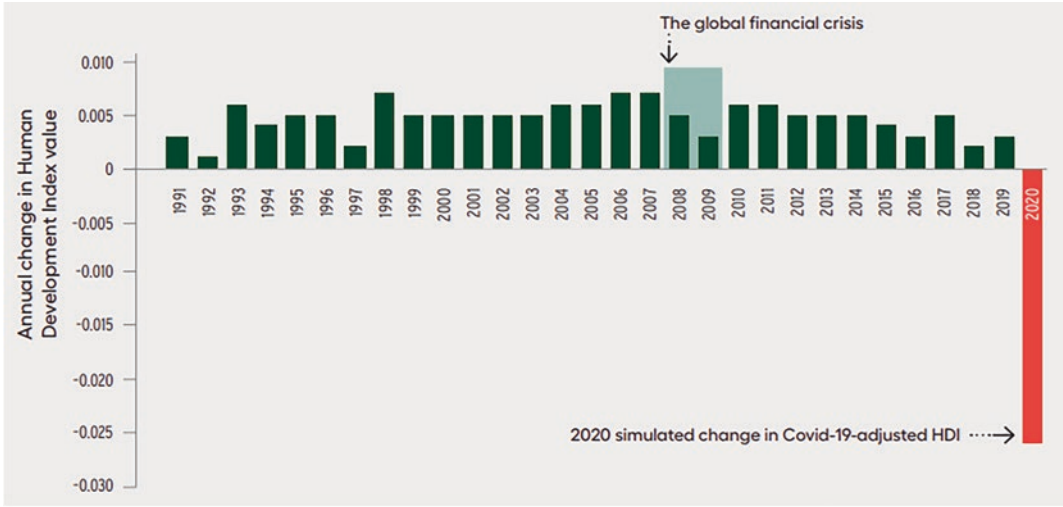
This collapse of economic activity and the lockdown measures have had visibly positive environmental effects (e.g. reductions in air and water pollution, reclaiming of land and waters by wildlife). Yet, past experience with financial crises teaches us that the environmental benefits of financial crises are short-lived, while at the same time the financial distress caused by the crises across economic sectors (government, corporations, households) sets in motion new or/and locks in old environmentally destructive patterns of action, from illegal logging for subsistence purposes to a fall in green R&D and loosening of environmental protection (see Antoniades and Antonarakis this volume).

It is indicative that after the Global Financial Crisis (GFC) of 2008/09, the world experienced the largest annual increase in $CO_2$ emissions on record (Fig. 1.3; IEA 2021; Peters at al. 2012). Pacca et al. (2020) find a similar pattern for a very large number of financial crises across the globe—any crisis-triggered positive environmental effects are short-lived and evaporate in the rebound-from-the-crisis period. International Financial Institutions are now projecting a divergent, uneven but robust recovery from the Covid-19 economic crisis, estimating global economic growth at 6 percent for 2021 (from −3.3. in 2020) (IMF 2021; Fig. 1.1). In this context, the IEA (2021) projects a strong rebound in global energy-related $CO_2$ emissions for 2021, that is estimated to be the largest annual increase on record after the recovery from the GFC in 2010 (Fig. 1.3). This will follow the decade of 'Great Stagnation' after the GFC which was characterised by mixed environmental trends (Cantone et al. 2021).




Source: International Monetary Fund, World Economic Outlook Database, April 2021

**Fig. 1.1** Global GDP 1980–2021 (% change).

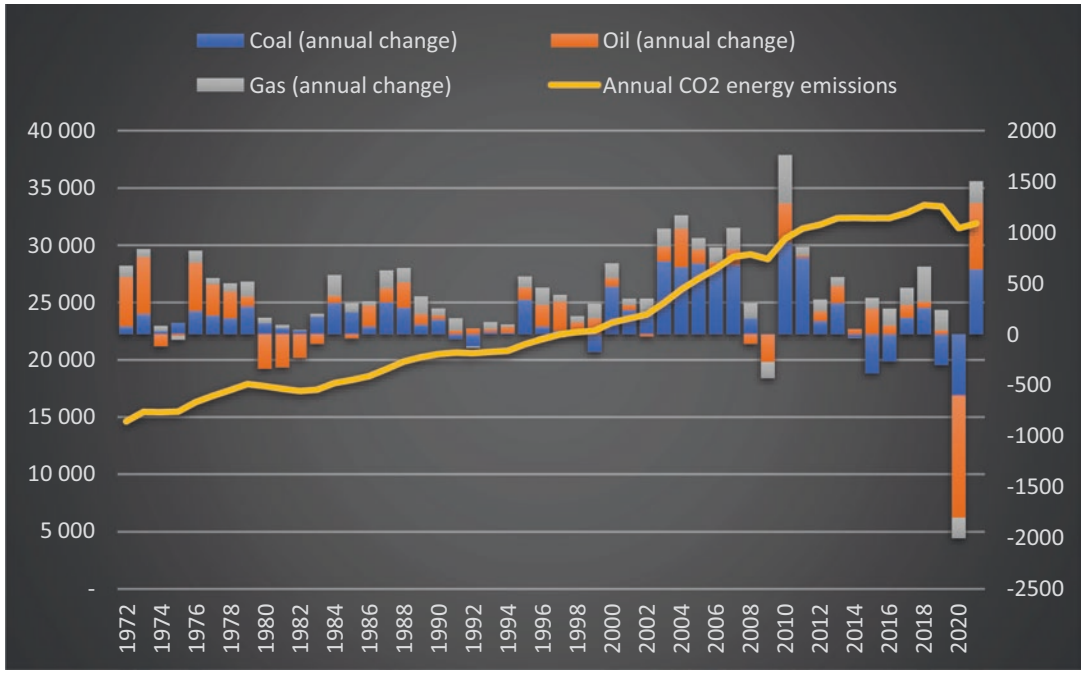



Source: Human Development Report 2020 (p. 57)

**Fig. 1.2** Change in Human Development Index value, annual

Other familiar crisis patterns (Antoniades and Antonarakis this volume) were also visible in 2020. For instance, there have been reports for increases in illegal logging and illegal resource extraction linked to loss of rural livelihoods and reduced monitoring and enforcement capacity (IUCN 2020). Similarly, the large number of unemployed people migrating from urban centres back to villages contribute to subsistence-related illegal activities such as logging and agricultural encroachment, and add new pressures on biodiversity, for instance via wildlife poaching or intensified nearshore fishing (ibid; and Rosado et al. this volume; Shepherd et al. this volume). Furthermore, pandemic-related restrictions and the corresponding economic crisis has led to the collapse of a wide range of environmental monitoring and protection activities, including protected area management, restoration programmes and wildfire fire management (IUCN 2020).

There is also the danger that the historically unprecedented economic support programmes that countries have utilised to support livelihoods and industries, in 'express mode', may (also) have adverse effects on global transition to sus-




Source: Authors' compilation based on IEA data

**Fig. 1.3** World energy related $CO_2$ emissions (million tonnes)

tainability. This may happen by locking in or prolonging unsustainable and environmentally destructive practices and industries that existed before the pandemic, by enhancing greenwashing rather than a green recovery, or by creating a new generation of 'zombie', debt-trapped corporations, households, countries (see next section).

In regard to the current crisis, it is also it is also worth keeping in mind, that, according to historical experience, epidemics/pandemics lead to significant and persistent increases in inequality within and across countries (Furceri et al. 2020). This evidence on past epidemics is in line with our recent research on the adverse impact of financial crises on multidimensional poverty indicators, e.g. on education, which is a critical route for escaping poverty and reducing inequality (Antoniades et al. 2020). The magnitude of the current crisis however is unprecedented. As Berkhout et al. (2021) note 'the coronavirus pandemic has the potential to lead to an increase in inequality in almost every country at once, the first time this has happened since records began'.

There is also evidence of a pandemic-triggered vicious cycle between lower growth, inequality and social unrest (Saadi Sedik and Xu 2020). The fact that the Covid-19 pandemic broke out at a moment when poverty reduction, food security and debt servicing in developing economies were already moving fast into the wrong direction indicates the magnitude of the challenge. Figure 1.4 brings together several vicious cycles that could conflate in the post-pandemic era.

Financial crises impact negatively on poverty and inequality dynamics, which in turn can increase the likelihood for another financial crisis. At the same time increased poverty and inequality may lead to changes in consumption, production and investment patterns that have a negative environmental outcome. To avoid a crisis-poverty vicious cycle, governments (and the private sector) prioritise growth rates above all other policy targets. In this manner, the recovery period is, at least partly, fuelled by unsustainable growth that is based on practices that are negatively affecting social development and environmental outcomes. This impacts

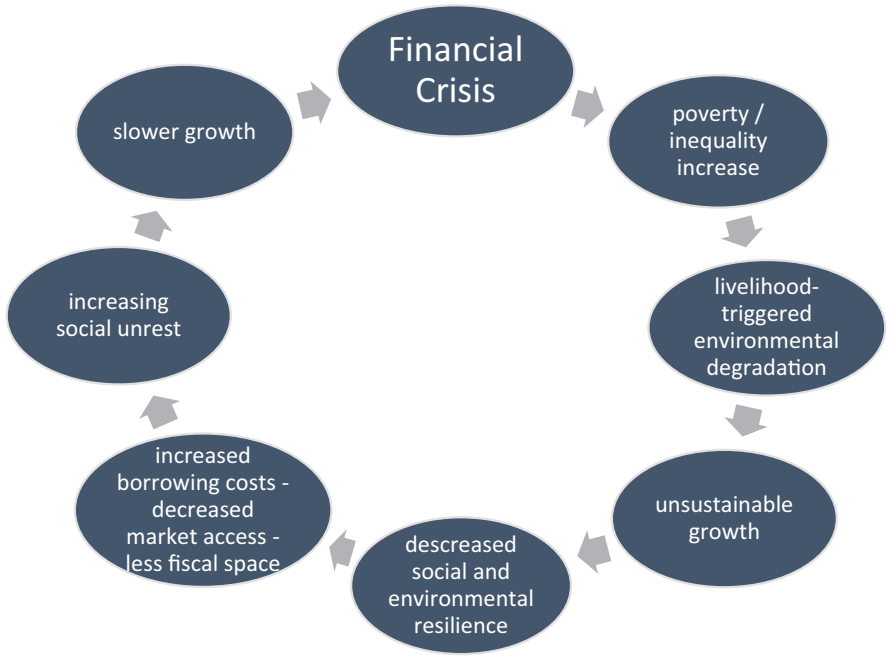



**Fig. 1.4** The financial crises—poverty—sustainability NEXUS

negatively on social (e.g. inequality, health) and environmental (e.g. ecosystem services capacity, ecosystem dynamics, climate change) resilience, exacerbating the overall crisis negative impact and vulnerabilities (see also Diwakar and Lacroix 2021). Increasing vulnerabilities lead to credit rating downgrades, increases in borrowing costs, can lock countries out of global debt markets, and can lead to debt sustainability problems, leading to new financial crises (see also Beirne et al. 2021). In this context, governments have less resources to deal with the sources and adverse dynamics that created the problem in the first place, let alone investing in needed climate adaptation measures and transition to sustainability. This impacts negatively on growth rates, decreases social well-being and increases the possibility of social unrest. This creates another vicious cycle, where increased social unrest leads to credit downgrades, slower growth, and more socio-political instability, that reduces further socio-environmental resilience.

Breaking away from these vicious cycles requires decisive policy actions both domestically and globally (see Mahajan and Singh this volume; Newell this volume). We cannot afford to leave the Covid-19 crisis morph into a vicious cycle. Our transition to sustainability depends on the way we will respond to the current crisis and our ability to create a new socio-environmental model that breaks away from the above crises-poverty-sustainability nexus. The remaining sections turn on to these issues.

## 1 Green Aspects of Covid-19 Support and Recovery Strategies: Building Back Better?

Provisional evidence and data on Covid-19 support measures are alarming. The Global Recovery Observatory (GRO) that is supported by UNEP offers the most comprehensive analysis of COVID-19-related fiscal rescue and recovery efforts in 50 leading economies. Figure 1.5 presents the latest GRO data, as of 03 December 2021, which indicate that out of a total US$16.97tr rescue and recovery spending only 4.4% went to ‘green projects’. Out of this US$16.97tr, $13.5tr went to immediate rescue efforts to manage the

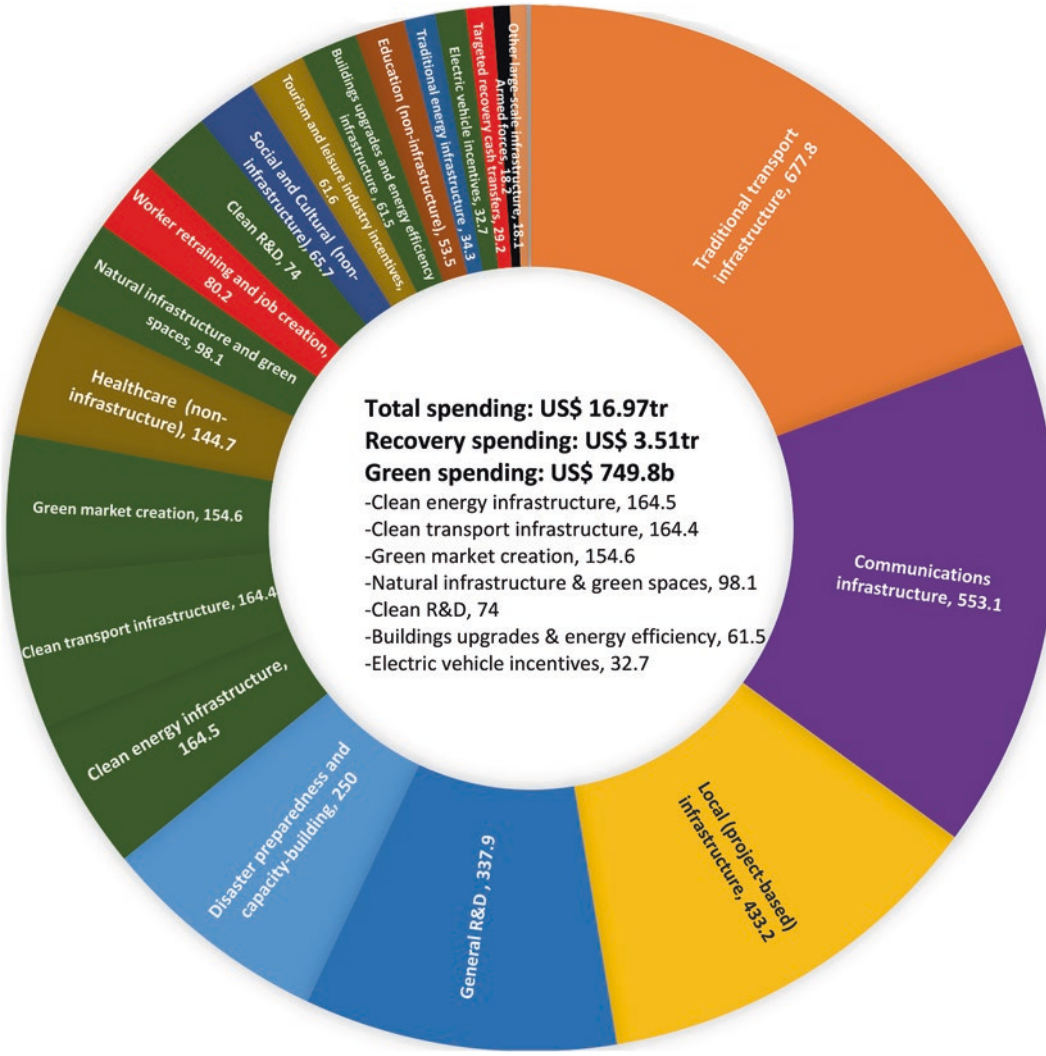



**Fig. 1.5** Global government recovery spending per sector during the COVID-19 crisis. Note: Data as of 3 December 2021, based on a sample of 50 countries. Green investments are indicated in dark green colour. Source: Authors' compilation based on Global Recovery Observatory (GRO) data

short-term effects of the pandemic, while $3.5tr was devoted to longer term recovery measures. Still, green investment is only 21% of this longer-term recovery spending. To contextualise this further, in 2020, only $368bn of $14.6tn COVID-induced spending (rescue and recovery) was green (2.5%), including (GRO 2021):

- $66.1bn invested in low carbon energy (mostly renewable energy projects and hydrogen and infrastructure investments, although these were largely concentrated in two countries, Spain and Germany);
- $86.1bn for green transport (electric vehicle transfers and subsidies, investments in public transport, cycling and walking infrastructure);
- $35.2bn for green building upgrades (mostly through retrofits, notably in France and the UK);
- $56.3bn for natural capital or Nature based Solutions (NbS)—ecosystem regeneration initiatives and reforestation (two-fifths was

directed towards public parks and counter pollution measures, notably in the US and China);
– $28.9bn in green R&D (renewable energy technologies, technologies for decarbonising sectors such as aviation, plastics, and agriculture, and carbon sequestration).

Respective data and trends are reported by other monitoring initiatives too. According to the OECD (2021) Green Recovery Database (GRD) that monitors the Covid-19 stimulus and recovery packages of 43 countries, as of 19 April 2021 the amount of money invested in measures with likely positive environmental impact was almost the same compared to the amount invested in measures that are expected to have mixed or negative environmental impacts (U$336 and 334 billion respectively). Mixed or negative measures included rolling back regulations with regard to water quality, air pollution and single-use plastics; reductions in environmentally-related taxes and fees for polluting activities; unconditional bailouts to emission-intensive industries such as airlines and fossil-fuel companies; and subsidies for fossil-fuel intensive infrastructure (OECD 2020a). Furthermore, the OECD estimates that the environmentally positive measures account for barely more than 2% of all Covid-19 rescue and recovery funding combined (OECD, 2021: 5).

The 'Greenness of Stimulus Index' (GSI) published by Vidideconomics (2021) points to a similar picture. Focusing on G20 and selected other advanced and emerging economies GSI finds that out of a committed aggregate US$4.6 trillion environmentally relevant stimulus worldwide, cutting across the sectors of agriculture, industry, waste, energy, transport, only US$1.8 trillion (or 40.1%) could be considered 'green'. Put differently a large part of the first wave of stimuli packages will have a negative impact on the environment, e.g. direct investments in fossil-fuel energy, investments in high emissions infrastructure, and waiving of environment/emissions related fees. Of course, this is only in terms of the quantifiable impact. According to GSI, 22 out of the 24 economies under examination have also implemented some form of 'deregulation of environmental standards', even if this was temporary, and in 16 out of 24 economies some of the bailout packages that were used had no environmentally-related conditionality. As countries move from rescue to recovery packages, there seems to be some momentum towards greener support programmes (ibid.), but damage has already been done.

The GSI findings are confirmed by the G20 Energy Policy Tracker (EPT), published by a large number of institutions, led by the International Institute for Sustainable Development (IISD). According to EPT, as of 5 May 2021, G20 countries have committed at least $646.43 billion in energy-related pandemic support. Of this, US$291.10 billion supported fossil fuel energy, as opposed to US$245.91 billion that supported clean energy. Furthermore, 83.2% of the G20 fossil fuel support was unconditional. Indicative measures here include expansion in oil and gas refinery capacity and distribution networks, new mining projects, new emission-intensive projects especially in the transport sector such as new roads, cancellation of lease payments for airport facilities, reduction in carbon energy prices for industries, introduction of floor prices for carbon allowances at auction in emissions trading schemes, extension of deadlines for pollution data requirements by industries, etc.

Clearly there is a misfit between the focus of the Covid-19 support programmes on fossil-fuels (both in terms of directly increasing emissions, and locking in patterns and practices that increase emissions) on the one hand, and the need for a rapid decarbonisation and energy transition in the global economy on the other.

Yet, the contrast between 'green' and 'not green' Covid-19 recovery projects does not exhaust the complexity of the challenge at hand. As many chapters in this volume make clear (e.g. Pichdara et al. this volume; Shepherd et al. this volume; Osakede and Adeleke this volume), improving basic infrastructure, such as roads, is a critical aspect for increasing resilience, and securing and ameliorating the livelihoods of millions of rural communities across developing countries, which, in turn, can have positive envi-

ronmental and social outcomes. Therefore, improving this needed infrastructure is an integral part of making the recovery from Covid-19 inclusive. If our 'building-back-better' locks out and excludes these precarious livelihoods and communities then it is bound to fail, leading to patterns, practices and activities that exacerbate the existing environmental crisis.

Similarly, 'green' does not have just one shade. What is included in the green recovery national strategies and how it impacts on the multiple environmental challenges ahead of us matters a great deal. For instance, addressing climate change is a necessary but not a sufficient condition to avoid a catastrophic environmental collapse. Biodiversity loss is an existential threat of equal proportion. With one fourth of all plants and animals currently threatened by extinction, and 30% reduction in global terrestrial habitat integrity caused by habitat loss and deterioration (UN 2019) the ecosystem on which our health and existence depend is under unprecedented stress. Of course, climate change and biodiversity loss are not independent from each other—they act as accelerators for each other both in periods of deterioration and amelioration. It is also worth keeping in mind that 'green investments' may have their own adverse environmental implications (e.g. increase in $CO_2$ emissions, land-use conversion, biodiversity loss) (Phoumin et al. this volume).

Beyond shades of green, the social dimension of the rescue and recovery programmes is critical for the environment and the transition to sustainability. As shown by Kempf and Dutta (2021) countries with effective health and social protection systems in place to provide universal coverage were better prepared for the Covid-19 crisis and its socio-economic impacts. They had institutional capacities to scale these systems and target vulnerable groups faster. This is key to avoid the vicious cycles that link financial crises, the environment and sustainability, as we described above. Yet, as evident in Fig. 1.5, overall, only a very small amount of the US$15.2tr rescue and recovery spending went directly to the social dimension, e.g. worker retraining and job creation (US$80.2b) and targeted cash transfers (US$29.2b). Furthermore, the rescue and recovery spending and its decision-making structure are characterised by gender imbalances that may reproduce structures of exclusion and inequality that undermine the needed just and inclusive transition to sustainability (UN Women-ILO 2021; UNDP 2021; UN Women 2020). Equally important, at-risk populations in vulnerable settings such as refugees living in camps, internally displaced persons, and indigenous communities risk being left behind in the adopted recovery strategies (UN Women 2020; see also Aslany and Brincat 2021; Hujo 2021).

Therefore, a 'green' vs. 'not green' dichotomy in the recovery from Covid-19 strategies and policies is not well-placed to capture the complexity of the challenge we face and guide us in the transformation required to achieve socio-environmental sustainability (see also Phoumin et al. this volume). For the later, we need also to open-up and where needed problematise, rethink or expand what we (need to) count as 'green'. To do this, we may need to recast some of the underlying assumptions and parameters that have determined the economy-environment interaction in our modern societies, as echoed by the trade unions in the World Economic Forum meeting in 2021: 'The choices made by world leaders and by business in 2021 will either heed the call of workers and civil society to reform the economic model and help create a just and sustainable future, or maintain business as usual and see a model of corporate greed entrench inequality, exclusion and despair perpetuating instability for our communities and our planet' (ITUC 2021).

## 2 Rethinking our Approach: From 'Net Zero' to 'Do no Harm'

Mainstreaming the environment in global and national policy-making has been a prolonged and difficult battle that is far from over. In most cases, the key messages and environmental issues have had to be formulated in a way that is comprehensible to policy actors, institutions and stakehold-

ers. The impact of the Stern Review on the Economics of Climate Change (2006) is indicative in this regard. The report caused global shock by quantifying the potential disastrous economic costs of climate change, i.e. a 5–20% annual decrease of global GDP indefinitely, if no action was taken. Along similar lines, the estimated total value to society of biodiversity and ecosystems services is more than US$140 trillion per year (estimate for 2011), close to two times of global GDP (in 2011) (Costanza et al. 2014; quoted in OECD 2020b). The contributions of such studies in policy mainstreaming the social and environmental emergency of our times, and clearly communicating its implications to key actors such as governments, financial institutions, businesses and households, is invaluable.

Yet, a price-tag approach to nature has not helped us in dealing with the actual environmental crisis in the past, and to a great extent has been co-opted by wider financialization of nature practices and dynamics that reproduce and/or exacerbate the environmental crisis. Considering the near impossibility of keeping an increase to global warming below 1.5C by 2030, the mass extinction that is happening in front of our eyes, and the increase in frequency and intensity of extreme natural events (climate or health related), we may be past the point that monetary representations of projected natural catastrophes are the right approach to adopt.

We need a new approach that moves away from financialisation and market-based logics that allow and reproduce the 'trading' and/or 'dis/re-locating' of environmental damage (see also Newell this volume). We need an approach that is not guided anymore by a 'net zero' approach to nature, i.e. that environmental damage can go on in some areas or domains so long as this damage is counterbalanced by actions we take in other areas or domains (see Duke et al. 2021). These approaches have allowed 'business as usual' that has been damaging the climate and ecosystems on which our existence depends upon to continue. It is time to replace 'net zero' with *'do no harm'* as a guiding policy principle in global environmental governance. Environmental destruction needs to be halted worldwide as a matter of urgency (considering 20–25% of our greenhouse gas emissions come from land cover change), and nature-based solutions with ecosystem regeneration in mind need to be brought to the forefront of this 'do no harm' policy principle. It is simply not enough to advocate for environmental improvement as a counter-balancing measure using the 'net zero' paradigm. This is all the more important considering the vital functions ecosystems and access to natural resources such as forests, land and water play for the livelihoods of a large part of the global population, in particular in the Global South (see also Mahajan and Singh this volume; Phoumin et al. this volume; Pichdara et al this volume; Shepherd et al. this volume; Rosado et al. this volume; Scharlemann et al. 2020). Today we have both the knowledge and resources to sustain such a shift in the global policy framework. The proposal for a global 'fossil fuel non-proliferation treaty' (Newell and Simms 2020; Fossil Fuel Treaty 2021) paves the way for this new thinking and approach.

This leads us to our second point. The current economic system deals with development, poverty reduction and the environment as a 'trade-off'. The dominant rationale is as follows: lifting people out of poverty requires high economic growth rates, while high economic growth rates are environmentally damaging. In such a reading, poverty and the environment stand at opposite ends as policy objectives. In this context, developing countries defend their 'right to development' against what they see as new forms of (green) imperialism and colonisation led by the global North. These are clearly fault lines produced by sedimented global structures of power, (under)development, and exploitation that have formed the world and its environmental crisis as experienced today (see also Bhambra 2021; Hinds this volume). Reaching sustainability requires to address these fault lines. The destruction of the environment for improving human livelihoods is not a necessary 'trade-off', it is itself a form of poverty and creates new forms of poverty by destroying sustainable livelihoods embedded in the natural environment and through the loss of biodiversity and access to natural

resources that are vital for human survival and well-being. The current coincidence of huge global wealth, income and wealth disparities and a looming environmental catastrophe call for a change in thinking and practice. In the context of an inclusive and just transition to sustainability, we need to mobilise resources globally aiming to create and support sustainable pathways out of poverty.

## 3 From 'Structural Adjustment' to 'Sustainability Adjustment': Towards a New Eco-Social Contract

In 2015, the international development community agreed on an ambitious agenda to "transform our world", with an unprecedented broad and transformative development vision enshrined in the 2030 Agenda for Sustainable Development. The Agenda is a response to a challenging global context—one marked by disparate progress in reducing poverty; high and rising levels of wealth and income inequality; the persistence of other multidimensional inequalities, including gendered forms; climate change and environmental destruction; insecurity and conflict; migration; precarious work; as well as accelerating demographic and technological change—all of which challenge the capacity of policy makers to steer the course of development to the benefit of people and planet (see Kempf and Hujo this volume).

In this context, the unprecedented socio-economic shock of the Covid-19 crisis is a critical conjuncture. Almost half of the UN member states (86 out of 193) have formally requested some form of financial support from the IMF, while more are expected to do so in the looming post-Covid-19 domino of financial crises, especially in developing countries (Ocampo 2021; Unicef 2021; Haughton and Keane 2021). In the past, International Financial Institutions responded to such financial support requests with 'structural adjustment' programmes that often exacerbated the socio-economic problems they aimed to tackle (see also Onyeiwu this volume). Today we have an opportunity to *build forward better*. The wide range of national and international financial support programmes currently activated, and those that are to be activated in the near future, should this time be used as 'sustainability adjustment' programmes, i.e. as programmes that explicitly aim to implement on the ground the transition to a global sustainable socio-environmental system that we urgently need. To ensure socio-environmental resilience and sustainability, the protection of livelihoods and the environment should be the starting point and driving parameter of these programmes. UNRISD (2016) has underlined the transformative power of integrated policies. For example, when climate change is treated as a social and political issue, and not only as a technical ecological one, policies can simultaneously address distributional aspects and climate justice. We should then aim to promote sustainable social development by reducing inequalities, promoting gender equality, and investing in much needed public services such as health and education for all. In this context, the evolving financial support programmes should come to define the new *eco-social contract* that will lead the way to a sustainable socio-environmental model in a participatory, inclusive and just way (see Kempf and Hujo this volume).

We conclude this section with three policy-related observations that emerge from the above analysis (see also UNEP 2020). First, policies for a sustained economic recovery amount to much more than just short-term fiscal stimuli of 1–2 years. Instead, transitioning from fossil fuels to a low-carbon, greener economy will require long-term commitments (5–10 years) of public spending and pricing reforms. As a consequence, the policies chosen for short-term (1–2 years) fiscal measures differ from the policies for a medium to long-term (5–10 years) green economic recovery and transition.

Second, public spending, pricing reforms, such as phasing out fossil fuel subsidies, and taxing carbon and environmental damages are necessary, but alone cannot create a sustainable socio-environmental model for the needed rapid transition to sustainability. We need an approach

that goes beyond a 'counterbalancing-environmental-destruction' rationale, towards a 'do no harm' approach encompassing environmental health and nature-based solutions. Moreover and equally important, the transition to sustainability encompasses deep social and cultural transformations that to materialise need to be owned, supported and led by people themselves. To be successful, the new eco-social contract requires the emergence of a new 'demos' through new global interactions and partnerships (see also Antoniades and Panizza 2017).

Third, the cost of transition to sustainability is different for different countries. The countries that have contributed least to the problem are the countries that face the largest challenges from climate change, and are those least able to bear the cost of climate adaptation and sustainability transition. To break-away from the vicious cycles of the crises-poverty-sustainability nexus we need to address collectively those historical legacies. This will ensure the just and inclusive nature of our transition to sustainability, and therefore its chances to succeed.

## 4 This Volume

The different contributions in this volume aim to explore the questions raised above, presenting new evidence and case studies on the crises-poverty-sustainability nexus that is at the heart of our inquiry. The volume opens with two scene-setting contributions. Peter Newell examines the need to fundamentally transform the relationship between finance, poverty and sustainability. He argues that the reason that such high levels of poverty persist in a world of such affluence is not for the lack of finance. It is because of finance's maldistribution and misalignment with social, environmental and developmental needs. Tackling exclusions, discriminations, inequalities and dispossessions that cause and entrench poverty opens up more effective ways to deploy finance for managing our transition to sustainability. This requires a re-thinking of basic notions of prosperity and growth. The author suggests that the SDGs provide potential levers to redirect finance towards this imperative of sustainability. But there also needs to be a power shift in who controls finance and the purposes for which it is deployed for the goals to realise this potential, combined with a recognition that the real wealth of nations resides in the environment which sustains us.

In Chap. 2 Antoniades and Antonarakis investigate the relationship between financial crises and the environment. First, they examine the effect of financial crises on atmospheric pollution, forest cover, and biodiversity from 1970 to 2015. Second, they focus on the Great Stagnation period, i.e. the period of slower growth rates that followed the decade after the Global Financial Crisis of 2008/09. The aim is to offer new insight on what the environmental impact may be from slower growth periods, advocated as a necessary step to achieve global sustainability. The authors findings demonstrate that financial crises do not have a unidirectional effect on the environment. They find that financial crises have a positive short-term impact on air pollution, mixed impact on forests, and a negative impact on biodiversity. They also find that the slower growth rates of the Great Stagnation do not inevitably lead to environmental improvement. Faster economic growth rates cause environmental damage, but slower economic growth rates on their own do not ensure environmental benefits and sustainability.

The next three contributions offer regional perspectives on the nexus between financial distress, poverty and environmental sustainability. Kristina Hinds offers a historical perspective on the sustainability conundrum of Caribbean states in the age of SDGs. Caribbean states have accumulated some of the highest debt to GDP ratios in the world, have suffered during the pandemic due to a breakdown of tourism, are at increased risk from environmental hazards, and follow contradictory approaches to growth that tend to negate the pursuit of sustainability. Hinds places this conundrum in its historical context and the way in which Caribbean countries were constructed predominantly on plantation slave labour systems as locations of extraction for the metropolitan colonial centres, based on low value mono-crop production. It is this structure of

exploitation and mode of integration in the global economy that has determined the model of economic development of the Caribbean states, and we need a significant rebuild of the global economy that recognises and deals in a just way with these legacies to bring an end to this model.

Han Phoumin, To Minh Thu, and Thim Ly use an innovative scenario impact assessment approach to investigate larger-scale transboundary synergies and trade-offs between economic development and poverty alleviation along the Lower Mekong Basin. To do this they use a Sustainability Index that includes more than 30 economic, social and environmental indicators based on SDGs. Their results illustrate that Mekong basin environment and communities will face diverse stresses depending on location and livelihood diversification strategies. For instance, one of the scenarios that includes all planned mainstream dams estimates the net economic benefits for the hydropower sector at US$ 32.8 billion, although unevenly distributed amongst the riparian countries. Yet, this is accompanied by significant ecological changes, severe loss of biodiversity, and adverse impact on livelihoods (e.g. up to 1.2 million people in Cambodia and VietNam would be put at risk, over and above the 'baseline' scenario). The authors present recommendations for creating and managing synergies between economic and socio-environmental sustainability.

Uche Osakede and Oluwayemisi Adeleke examine the effects of external government borrowing on infrastructure and human development in Africa. The authors use data from 49 African countries for the period 1990–2019. Using a panel threshold test, they find a lack of threshold effects of external debt on infrastructure and human development. Using a linear fixed effects model they find an insignificant effect of external debt on infrastructure and a significant negative effect on human development. They also find the existence of a threshold effect of external debt on GDP. Osakede and Adeleke's results suggest that borrowed funds are not productively channelled towards growth-enhancing investments in areas related to infrastructure and human development. As a result, the use of external funding may undermine the income potential of future generations and state capacity for debt repayment. These findings are very important in the Covid-19 context of increasing external borrowing.

The remaining five chapters aim to advance our understanding of the financial crises, poverty and environmental sustainability nexus in the context of the SDGs through detailed country case studies. Vijay Mahajan and Jeet Singh investigate the challenges for achieving the SDGs in India. Most people in India are traditionally dependent on natural resources for their livelihoods bringing ecological knowledge and understanding, but at the same time this dependency results in overexploitation of resources. To deal with this conundrum the authors suggest a twin investment strategy, where the regeneration of natural capital must go hand in hand with mass job creation and promotion of sustainable resource-based livelihoods. This will create a virtuous sustainability cycle. Reduced financial distress in the population will reduce the stress on the environment; and regenerating the degraded natural resources will improve resilience and livelihoods, accelerating further the positive environmental impact. The authors conclude by identifying funding pathways to achieve these synergies, including increasing public expenditure towards disadvantaged groups, rendering public expenditure more efficient and outcome-oriented, and diversifying the funding base beyond the state.

Steve Onyeiwu looks at the case of Ethiopia and assesses if the implementation of the Structural Adjustment Program (SAP) in the 1990s has helped to achieve social and environmental sustainability. The Ethiopian structural adjustment was centred on eliminating financial repression, developing the private sector, and promoting macroeconomic stability, with limited understanding on its impact on sustainable development. The author uses a Triple-Bottom-Line analytical framework to evaluate the impact of the SAP on economic, equity and environmental sustainability. Onyeiwu finds that the SAP in Ethiopia has been a failure for sustainability. It has been ineffective both in eliminating chronic poverty and preventing environmental degradation, with prob-

lems such as over-grazing, over-fishing, deforestation, and biodiversity loss persisting.

Andrew Shepherd and colleagues do an analysis of the poverty-environment-disaster management nexus in Zambia, and identify policy priorities to move people out of poverty in a sustainable way. There is a number of overlapping challenges. The political economy of Zambia leaves women and rural populations behind. The high dependence on maize has led to income volatility in small-holder farms and to soil degradation. Assets among poor households, especially women-headed households, are scarce, including fertilizer, transport, and mechanisation. Investment into resource conservation, such as fisheries, soil and water sustainability are lacking. Disaster risk management especially with droughts has been poor. Policy priorities would need to include stabilising farm incomes, increase household asset with particular focus on women-headed households, focus on land and water conservation practices, and build a more confident disaster response.

Christopher Rosado, Eveline Kurniati, and Mika Peck use the current Covid-19 pandemic to examine the determinants of community resilience in small-scale fisheries in North Bali, Indonesia. They define community resilience as the ability of a community to adapt, survive and potentially thrive despite stressors such as economic and environmental disasters. They develop a comprehensive analytical framework to assess this resilience based on ten vulnerability and resilience indicators, related to health, economics, and environment. The authors find that fisher community resilience was materialized from job diversification, local financial support systems, social networks, and existing networks with knowledge of conservation concepts. However, Covid-19 impacted community medical infrastructure, affected the control of supply chains and fish regulations, and has led to increases in more unsustainable reef fishing. Finally, they outline key policy recommendations suggesting urgent action to strengthen fisher networks and socio-economic and environmental sustainability.

Lonn Pichdara and colleagues tackle the issue of climate change resilience and vulnerability in rural communities in Cambodia. The authors observe that although climate change intervention programs have increased, there is limited evidence on the impact of these programs on the climate-poverty resilience of the targeted communities on the ground. To address this gap, they study a pilot project in Kampong Svay district in Cambodia that aimed to address interacting water-sanitation-food challenges, by developing climate-resilient infrastructure (e.g. construction of wells, water collection tanks, latrines, home gardens). The authors identify weaknesses related to the local targeting of the project, the lack of financial and technical support, and broader infrastructural issues (e.g. water and road accessibility) that constrained the impact of the intervention, and offer recommendations on how these weaknesses can be addressed and avoided in future programs.

Isabell Kempf and Katja Hujo conclude the volume by providing a sobering analysis on the need to finally move past the social contract of the twentieth century that was centred around balancing the economic imperatives of growth and productivity, with the social imperatives of redistribution and social protection. Failing to account for natural planetary boundaries, this social contract proved unable to stem environmental destruction, climatic changes, and extreme events such as the current pandemic. It has also failed to be fully inclusive of marginalized groups such as women, indigenous peoples, informal workers or migrants. The authors show why responding to this crisis and getting SDG implementation back on track demand a new contract fit for a new era – an *eco-social contract*. This new contract needs to be based on the inclusion of marginalised views, and progressive alliances with previously excluded groups. It needs to seek harmony and protect nature and the common goods, transform economies to deal with environmental destruction and social exclusion and inequality, and include a progressive fiscal contract for climate action and SDG implementation.

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# 2 Finance for the Common Good: Re-Thinking the Relationship between Finance, Poverty and Sustainability

Peter Newell

**Abstract**

This chapter examines the need not just for transitions, but more fundamental transformations, in the relationship between finance, poverty and sustainability. Conventional accounts posit that mobilising finance on an ever-larger scale, especially from the private sector, is a pre-requisite to tackling poverty and achieving the Sustainable Development Goals (SDGs). Here I argue that tackling many of the forms of exclusions, discriminations, inequalities and dispossessions that cause and entrench poverty (of which lack of access to finance is only one) also offer entry points for building a more sustainable society. I suggest that re-thinking basic notions of prosperity and growth opens up new political opportunities to deploy finance for the common good and away from destructive development. This requires a rebalancing of public and private finance and the re-embedding of finance within clearer and stronger frameworks of social control. The Covid crisis has exposed both the unsustainability of the current economic system and the vulnerability of the poorest in society. But it has also demonstrated the potential to lever public finance in bold and ambitious ways, to re-think work through universal basic income and job guarantee schemes, to convert industries to more socially-useful and sustainable purposes and to re-orient supply chains towards meeting local needs. The reason that such high levels of poverty persist in a world of such affluence is not for the lack of finance. It is because of its maldistribution and misalignment with social and developmental needs. This is where the SDGs can provide a useful, though not necessarily coherent, framework for directing finance to social need rather than the reproduction of finance being a goal in and of itself.

**Keywords**

SDG funding · Financial misallocation · Regulation · 'Re-commoning' · Sustainable society, prosperity

## 1 Introduction: Finance and its Limits

The aim of this chapter is to encourage a more nuanced and critical discussion about the relationship between finance, poverty and sustainability as efforts are increased to achieve the Sustainable Development Goals (SDGs). In par-

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ticular, I argue the need to foreground questions of *who* (which social groups) and *what* finance is for (which specific goals) and *which* governance mechanisms we might need to ensure that it contributes to, rather than undermines, the achievement of the SDGs.

To raise these questions is not to negate the obvious importance of finance to achieving the SDGS. Estimates vary of course, but some suggestions are that $220–260 billion in international public finance will be required to meet the SDGs with incremental financing needs of $1.4 trillion in low- and lower-middle-income countries (Schmidt-Traub 2016). Much of this will need to lever additional private finance towards this ambitious agenda. But we also need to challenge dominant narratives about 'de-risking' finance and the misallocation of risk between public and private actors where the former is expected to absorb risks to enable the private accumulation of profits by the latter. We also need to distinguish between different types of finance (Spratt 2015) to assess their role in supporting just and sustainable transitions where longer-term and more patient forms of capital will be of far greater value than short term and speculative investments with high demands for a short term return.

Currently, the drive to mobilise capital is often disconnected from an understanding of *where* and *for whom* and even *for what* that capital is needed. A major task for the SDGS and the governments expected to implement them is to steer that finance to where it is most needed, as well as redirect away from forms of destructive development which are incompatible with those SDGs which more obviously address sustainability around climate change, water, oceans, land and biodiversity. As I have argued elsewhere, well intentioned initiatives such as the Africa Renewable Energy Initiative (AREI) which aim to build at least additional renewable energy generation capacity of 300 GW by 2030 have focussed on calls by mainstream development actors to 'de-risk' private finance, while questions about what the finance was needed for, whose energy needs would be met, and even how we would know what those needs were, remained neglected. It is almost as if mobilising the finance is an end in itself. Lack of access to credit, inability to afford connection charges and distance from electricity infrastructures as barriers which inhibit poor people's access to electricity hardly feature at all in the rush to accommodate the preferences and needs of private capital to find new outlets for investment (Newell 2021). Challenging financialisation and the fetishization of finance as an end itself means repositioning finance as a means to achieving broader social and environmental ends which need to be articulated and guide decision-making.

Any discussion of the relationship between finance, poverty and sustainability also needs to be cognisant of growing concerns about the financialisation and commodification of nature which complicates and undermines the task of protecting the environment written into the SDGs by reducing the value of environments to assets and capital which can bought and sold. Experience to date suggests that luring private capital towards the goal of sustainability by financialising ecosystem services runs the risk of further impoverishing resource dependent poorer communities without the purchasing power and supportive ownership regimes to safeguard their 'natural capital'. Land grabs and green grabs and problematic carbon trading projects have shown what can result from attempts to 'sell nature to save it' (McAfee 1999; Fairhead et al. 2012; Bumpus and Liverman 2008; Leach and Scoones 2015).

Finance wields enormous power, especially at this historical juncture, what academics sometimes refer to a finance-led regime of accumulation (Arrighi 2010). The question, an open one, is whether this power can be directed towards more sustainable and inclusive forms of development. Historically, finance has played disruptive and key roles in unsettling incumbency (Perez 2002) and supporting key technological revolutions from the industrial revolution to Fordism and the IT revolution. Restless capital has unleashed 'creative destruction', pulling capital from one set of technologies and infrastructures and moving it to another where higher rates of return are anticipated. The hope is that it could do so again as we seek to decarbonise the global economy

and accelerate the decline of the fossil fuelled global economy as part of a clean energy revolution. Potentially, amid fossil fuel divestment, sovereign wealth funds shedding investments in fossil fuels and the falling price of renewable energy, we are seeing this dynamic at work again (Newell 2015). For it to fulfil that potential we need to address the politics and governance of the SDGs. Governance here refers not just to national level Green New Deals or global mechanisms of coordination and steering of finance to where it is most needed, but also and less popularly, questions of regulation, divestment from unsustainable development and ultimately the re-embedding of finance in frameworks of social control to ensure it serves the common good.

The SDGs provide one set of goals and indicators by which to steer and measure the positive potential of finance to enhance collective well-being. Agreed in 2015 and covering key aspects of planetary survival from life on the land to life below water, energy, climate and of course poverty and gender discrimination, they are universal in their appeal and comprehensive in their nature, driven by an elusive quest for development for all that 'leaves no one behind'. At the same time, the development community involved in the SDGs has been surprisingly silent about the causes of poverty and unsustainability and therefore the means by which the SDGs will address them. Without critical attention to the ways in which the global economic model is implicated in exacerbating these issues, there is little prospect that the SDGs will be any more successful than the MDG Millennium Developmental Goals that preceded them. If this prior conversation about the sustainability of the global economy itself, including the role of finance, is bracketed, progressive change is unlikely. On the United Nations 75th anniversary, (some) people around the world were asked to share their vision of 'The World We Want'. But the 'we' was poorly defined and it seemed only some versions were up for grabs and certain answers to that question, those incompatible with liberal capitalism, were off limits.

Nevertheless, the universal and interrelated nature of the SDGs in many ways provides a *potential* opportunity to advance a more globally inclusive and sustainable development path, since in theory economic and human development goals can no longer be pursued at the expense of social and environmental ones, nor addressed by displacing problems and responsibility elsewhere, since the goals are universal and apply equally to richer countries. Yet the global goals disguise many tensions between SDGs. Above all, growth is set up as an SDG in its own right whose pursuit in a conventional sense may well undermine the achievement of many of the other goals. To take just one example, achieving the goals of the Paris agreement is almost impossible through the pursuit of conventional economic growth (Simms 2015) and unless the climate crisis is adequately addressed, goals around improved food security and nutrition, access to water or even reducing conflict are almost certainly put out of reach.

A more radical reading of the Sustainable Development Goals (SDGs) would suggest that for developing countries to expand levels of production and consumption to achieve these goals will require that richer countries need to free up ecological space for growth in the global South to meet basic needs. As Daly suggests, 'The usual objection to limiting growth, made in the name of the poor…. Defends growth as an alternative to sharing which is unrealistic if not inconceivable' (1977: 107). Below I discuss the politics of redistribution that flow from this vision through proposals for a universal basic income scheme, ecological taxation, global 'Robin hood taxes' and the like. But proposals such as these have implications for a financial sector geared towards serving the needs of elites, despite efforts to support micro-finance as well as more pernicious efforts to extend credit to poorer families on unpayable terms resulting in spiralling indebtedness. If creating new sites of accumulation as an end in itself and fuelling mass consumerism are no longer tenable in a world seeking to live within limits rather than push against and beyond them, we need to rethink the role of finance and the institutions which oversee it such as banks, pension funds and investment firms, as well as multilateral development banks.

## 2 Towards an Alternative

My argument here is that we need to move beyond Green Keynsianism aimed at generating new jobs and investment opportunities in the green economy (OECD 2011; World Bank 2012) without attending to structural inequalities and ecological limits and towards Green economics which holds a very different view of the relationship between finance, poverty and sustainability (Cato 2008). This involves re-thinking prosperity: different goals and objectives (Jackson 2011; Hickel 2020) aimed at enhancing well-being and the pursuit of 'Plentitude' (Schor 2011). This goes beyond the conventional pursuit of debt-fuelled consumerism which is driving resource depletion (Dauvergne 2008). As Wilhite puts it (2016:8), 'For households in capitalist societies, credit and loans enable the purchase and use of a series of increasingly bigger houses over the course of a household's life cycle as well as new appliances and furnishings that are purchased, discarded and replaced at a rapid tempo'. Purchasing power is not aligned with income so that people can spend beyond their means to keep an unsustainable economy afloat through credit. For example, in the USA since 1970 average incomes have declined but purchasing power has increased due to credit and debt-financed consumption. The phenomena of pay-day loan companies lending people money at staggering rates of interest compounds this problem by locking people into poverty with unpayable debts. Wilhite notes, 'The most recent phase of credit-based, temporal expansion has allowed national and household economies to grow through mortgaging the future, permitting the continued exploitation of material resources in the form of land, fuels and minerals, as well as increases in pollution and carbon emissions' (2016:9). Addressing these underlying global debt dynamics, as Antoniades and Griffiths-Jones suggest, means attending to the 'elephant in the room', namely 'the accumulation of unproductive debt, growing inequalities of income and wealth and the increase in privately created, interest-bearing money' (2018: 3256).

Finance is key to both production and enabling consumption both of which need to be transformed if we are to maintain a habitable planet: living within personal and planetary means. This raises profound questions about the future role of finance in sustainable human development.

Firstly, it requires us to divest from destruction. *Un-funding* key projects and infrastructures driving climate change and therefore entrenching poverty presents a critical first step. At minimum, do no more harm. Allowing finance to continue to flow into projects and infrastructures that are incompatible with the SDGs, is to push their accomplishment further and further into the future. To take just one example, the world currently spends US$eleven million a minute according to the IMF on fossil fuel subsidies that are driving climate chaos (IMF 2021). This could be redirected into a global transition fund to finance renewable energy pathways in poorer parts of the world (Newell and Simms 2019). Yet rather than 'build back better', in response to the Covid crisis G20+ countries have pledged over $207 billion so far to fossil fuel projects (Energy Policy Tracker 2021). This chronic misallocation of finance has to stop.

Secondly, it requires *regulation of finance* fit for purpose. This means addressing the ungovernance of finance: closing governance blind spots where global financial flows in the energy sector are often not subject to social and environmental criteria or safeguards (Newell 2011). This includes public and public for private finance distributed by the Multilateral Development Banks (MDB) who provided over $9 billion in public finance for fossil fuel projects in 2016, with the vast majority of transactions approved after the Paris Agreement was reached. Indeed, the total MDB finance for oil and gas exploration more than doubled from 2015 to 2016, from $1.05 billion to $2.15 billion. The World Bank Group, the European Investment Bank and the Asian Development Bank were the largest financiers of fossil fuels in 2016. At the same time, renewable energy still made up less than a third of MDB energy finance (OCI 2017). But it extends into other areas too such as corporate governance.

Including the need for reform of core principles such as 'limited liability' which protects directors from the consequences of their investment decisions on society and the environment, and changes to incentive systems. For example, 90% of companies directly reward executives for production or reserves increases in some shape or form, a figure virtually unchanged since 2017. These targets encourage a focus on size over shareholder value, exacerbating stranding risks, whereas we need to replace direct production targets with value-focused metrics (Carbon Tracker 2020).

Thirdly and most ambitiously, it demands a greater degree of 're-commoning'. This implies not just bringing back the state into the regulation of finance for the common good, as argued above, but also more profoundly strengthening community control over resources through new models of ownership and profit-sharing (Newell 2019). This includes re-commoning through public and community ownership and social and solidarity economies (Amin 2009) that have flourished during the Covid pandemic oriented as they are to meeting social needs rather than wealth concentration. Finance for the common good establishes parameters and aligns and re-socialises finance by redirecting it towards the goals of a transition to a just and sustainable economy. There are many proposals about what the overall model might look like from doughnut economics (Raworth 2017), to sustainable consumption corridors (Di Guilio and Fuchs 2014) and proposals specific to tackling climate change such as 'contraction and convergence' (GCI 2018) or the 'greenhouse rights development framework' (GDR 2018). Taking the first of these, building on the idea of 'planetary boundaries' Kate Raworth (2017) proposes 'doughnut economics' as a way of describing the safe social operating space for humanity. A new economic model needs to address the 'doughnut', with a 'hole' of critical human deprivation in the middle below a social foundation representing the minimum amount of well-being for humanity, an ecological ceiling in an outer ring representing planetary resource limits, and between both of these is a safe and just space for humanity. With respect to the role of finance specifically, the work of UNEP and others on 'The financial system we need' which looks at the full range of levers and tools to use in moving towards a more sustainability economy offers a useful starting point (UNEP 2015).

Social control of finance for the common good implies shifts in the purposes and timeframes within which finance operates. This would imply a greater role for 'patient capital' that secures a return over a longer time frame. There are proposals for a Green Investment Bank and Green investment bonds going beyond the limited versions of these that have existed to date. Finance for the common good also includes green lending along the lines of proposals for a Green New Deal proposed by Greens in 2008 (GND 2008) in light of the financial crisis and given new life in 2019. As originally conceived, this had two main components. First, it outlines a structural transformation of the regulation of national and international financial systems, and major changes to taxation systems. And, second, it calls for a sustained programme to invest in and deploy energy conservation and renewable energies, coupled with effective demand management (GND 2008). The UN Secretary-General and the then Executive Director of the United Nations Environment Programme (UNEP), Achim Steiner (currently administrator of UNDP) and a further twenty-one UN organisations have also recently endorsed this call.

Within countries, finance can be raised and redistributed through a variety of means including limits on maximum income, a Universal Basic Income scheme and efforts to close tax loop holes and tax evasion strategies that continue to deny poorer states urgently needed finance to address a range of development challenges. In the case of the former, the basic income scheme, long supported by Greens, has gained support from a range of political quarters in recent years (Andersson 2009; Standing 2008; Raventos 2005). Its ambition is to enable a permanent rather than temporary exit from poverty and social exclusion. It implies an overhaul of the current benefits system whereby every woman, man and child would receive a weekly payment

as of right that is not means-tested and sufficient to cover basic needs. There are many versions of this. But in essence a Citizen's Basic Income is an unconditional, automatic and non-withdrawable payment to each individual as a right of citizenship (CIT 2017; Torry 2013; van Parijs 2004). It is aimed at encouraging flexible working patterns (across forms of paid, unpaid, voluntary and domestic work), providing financial independence and reducing poverty and unemployment. Though wealthier citizens would be entitled to the scheme, they would pay more into it in the first place through tax. It also helps to reduce personal indebtedness which unscrupulous financial actors such as pay-day loan companies and sub-prime lenders thrive on.

Proposals to address tax meanwhile might include closing tax havens, tax loops and adopting common global measures for country by country reporting and collecting tax to avoid evasion and avoidance. According to the Tax Justice Network, tax havens are estimated to shelter $12 or $13 trillion in private deposits, depriving governments of $250 billion a year in revenues. This must include measures to address transfer pricing which result in developing countries losing $160 in tax revenues each year (Jenkins and Newell 2013), as well support for 'publish what you pay' initiatives such as the Extractive Industries Transparency Initiative which encourage the full disclosure of profits made from resource exploitation. Progressive taxation on the other hand would target pollution and not labour. Ecological taxation follows the logic of taxing more what you want less of (pollution) and taxing less what you want more of (labour). In many cases this would imply higher levels of corporate taxation, but also preferential tax rates for local businesses and social enterprises. Micro-credit schemes and other forms of affordable finance for micro and small-scale enterprise are other elements that can help to build a sustainable economy.

Then there is the question of debt and its relief. Volz et al. (2020) propose the 'Debt Relief for Green and Inclusive Recovery Initiative' on a global scale to free up resources to support recoveries in a sustainable way, boost the resilience of economies and support a just transition to a low-carbon economy. But as well as relief of current debts to free up expenditure for post-Covid recovery and social protection, there is also the issue of historical debts. Environmentalists often refer to ecological debt incurred by richer countries overusing their share of the global commons through colonialism, extractivism and institutionalised unequal exchange within the global economy (Simms 2005). More specifically in the climate change context, there is ever more emphasis on loss and damage and compensation for vulnerable countries in the frontline of climate impacts but who have contributed very little to the problem (Roberts and Huq 2015; Roberts and Pelling 2019). This means not just enabling sustainability through redeploying finance, but also paying off accumulated debts. For many poorer and postcolonial countries in the global South, this will have to be part of any new global deal on finance for sustainable development.

## 3 Conclusions

In this chapter I have suggested the SDGs provide potential levers to redirect finance towards the imperative of sustainability. For example, goals 17.1 on improving domestic revenue collection and taxation and 17.3 on mobilising financial resources underscore the need to raise, redirect and govern finance more effectively. But there also needs to be a power shift in who controls finance and the purposes for which it is deployed for the goals to realise this potential, combined with a clearer vision of the appropriate relationship between finance and sustainability. The Covid-19 pandemic has shown that when the will is there, governments can use their power to mobilise vast amounts of capital for the welfare of their citizens, re-purpose industries through industrial conversation and intervene to protect the most vulnerable groups in society. Though we need to be cautious about whether state power could be used in this way to address the climate and ecological crisis, the experience of the pandemic has shown what activist and interventionist states are capable of and demonstrated that

there is strong public support to prioritise societal (and by extension environmental) wellbeing over short-term profit.

A more sincere and serious vision of a green economy needs to recognise then that the real wealth of nations resides in the environment which sustains us. A 'green economy' is not an investment opportunity; a globalised market economy producing a slightly different range of products through the same means of extractivism and uneven exchange, all the while fuelling mass consumerism through debt. A truly green economy would be an economy whose design was compatible with the primary constraint on human life: that we live within ecological limits. The central change that a green economy requires is from considering the economy, environment and society as intersecting but separate, to recognizing that the economy is located within society, which is in turn embedded within the environment. Discussions about the role of finance in addressing poverty and sustainability need to take place in a context of those prior political choices about to whom and for what purposes finance is to be mobilised and directed and whether this is compatible with the overall goal of preserving the place we call home on planet earth.

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# Financial Crises, Environment and Transition

3

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**Abstract**

The chapter contributes state-of-the-art perspectives and results for the poorly understood relationship between economic crises and the environment in the context of sustainability transition. We first develop a theoretical perspective on the relationship between crises and the environment using case study evidence from the literature. We point to key parameters such as the nature of each crisis and its context, the degree of socio-environmental resilience, the multiple environment and economic sectors involved, the diverse temporality of effects, the capacity of the countries involved, and the policy responses adopted. In the second part of the paper, we present evidence on the environmental impact of more than 400 financial crises during the period 1970–2015, focusing on atmospheric emissions, deforestation and biodiversity. We complement this analysis with evidence on the environmental impact of the Great Stagnation, i.e. the period of slower growth rates following the global financial crisis of 2008/09. Our findings demonstrate that financial crises do not have a unidirectional effect on the environment. We find short-term benefits to air pollution, decreases in biodiversity and some evidence of decreasing deforestation rates. Benefits can be short-lived, though, and may be accompanied by shifts in the involved actors' practices and behaviours that lead to negative longer-term impacts. Neither is the Great Stagnation associated with a unidirectional environmental impact, and there is worrying evidence of a worsening of biodiversity. We conclude that a slowdown in economic growth rates –even a prolonged one that acquires the characteristics of a 'new normal' does not inevitably lead to environmental improvement. Meeting the SDGs and transitioning to sustainability requires a paradigmatic policy shift that goes beyond a narrow focus on the rate of economic growth.

**Keywords**

Financial crises · Great Stagnation · Environmental sustainability · Air pollution · Biodiversity · Forests

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## 1 Introduction

Financial Crises have been recognized by the UN as a real threat to the global sustainable development agenda (UNCTAD 2015). The effects of financial crises can be severe and are not limited to the economic performance of countries (Antoniades et al. 2020). Financial crises are associated with reduced consumption of goods, reduced industrial production, reduced use of private means of transportation, and overall with reduced economic activity and energy consumption. One could then expect that financial crises may be good for the environment. Yet, in practice the relationship between financial crises and the environment is much more complex. The socio-economic hardship related to financial crises may generate environmentally adverse incentives and outcomes such as, use of cheaper but more polluting energy sources, illegal logging, slowdown in waste management activities, slowdown in green investments, neglect of environmental protection, and overall de-prioritisation of the environment in recovery strategies across all economic sectors, i.e. households, corporations and government.

The medium-term rate of economic growth, not just short-term economic shocks, can also have a significant impact on environmental sustainability. High economic growth rates have led to an increase in resource extraction, a deterioration in the natural environment and an increase in greenhouse gas (GHG) emissions. Working towards achieving synergies between socio-economic and environmental Sustainable Development Goals may require a re-evaluation of the current economic framework, to one that integrates environmental and planetary sustainability. In this context, "post-growth" has emerged as a new way of thinking about transitioning to prosperity without growth, at least as we construe it today (e.g. Jackson and Senker 2011).

Understanding and successfully managing the relationship between financial crises and the environment is then critical in our efforts to transition to sustainability. This was true and urgent before the pandemic, it is even more so now, when most countries around the world facing heightened economic uncertainty, hardship or distress. This chapter aspires to contribute to this aim, by presenting evidence generated by the research project 'Financial Crises and Environmental Sustainability'. The project was funded by the Sussex Sustainability Research Programme (SSRP), a partnership between the University of Sussex and the Institute of Development Studies in the UK. For more information see the official SSRP webpage at: https://www.sussex.ac.uk/research/centres/sussex-sustainability-research-programme/. Our analysis contributes to the state-of-he-art in the relationship between economic crises and the environment in two ways. First, by offering a global and long-term perspective our evidence comes to complement the existing body of literature that is dominated by case-study evidence. Second, by moving the focus beyond financial crisis episodes, we offer new insights on what may be the characteristics and environmental impact of the needed global adjustment to a new economic regime of slower growth in the post-pandemic world.

The remainder of this chapter is structured as follows. In the first part of the chapter, we offer a literature review on the existing state-of-the-art in the field of financial crises and the environment. Here we focus on findings from recent major financial crisis and try to map the main channels and parameters that define the environmental impact of financial crises. We also discuss how the study of the period of 'Great Stagnation' can expand this field of research and help us to better understand the relationship between the environment and periods of 'systemic slowdown'. Great Stagnation refers to the 'new normal' of slower growth rates that followed the decade after the Global Financial Crisis (GFC) of 2008/09. In the second part of the chapter, we focus on new global statistical evidence on the relationships discussed in the first part, i.e. financial crises and the environment, and Great Stagnation and the environment. Here we focus on and organise our analysis around three environmental domains: air quality, forests and deforestation, and biodiversity. The analysis on financial crises covers the period 1970-2015, whereas the analysis on Great Stagnation offers a trend analysis comparing the period before and after the Global Financial Crisis.

## 2 Financial Crises and Impacts on the Environment

### 2.1 The Debate on the Environmental Kuznets Curve

The literature on the relationship between the economy and the environment has been dominated by the issue of economic growth. In the recent past, this has been dominated by the 'Environmental Kuznets curve' hypothesis (EKC) (Yandle et al. 2004). The hypothesis points to an inverse U-shape relationship between per capita GDP growth and environmental quality. This is similar to the one found by Kuznets (1955) regarding the relationship between income growth and inequality. An initial stage refers to the transition of economies from rural agricultural production to industrial production concentrated in urban centres. This shift of economic structure towards industrial production leads to significant increases in energy use and economic activity. The latter have as a result an increase in greenhouse gas emissions and waste generation. Gradually, however, economic growth and development lead to a transformation in the economic structure and the composition of the economy away from polluting activities and towards cleaner practices. This change is associated with the shift from industrial production to a service-based economic structure and the introduction of new standards, and new green R&D spending and technologies (see for instance Kurgankina et al. 2019). At the same time, income growth leads to greater environmental awareness, changes in consumer preferences and increased demands for more environmentally friendly products and practices across the economy (McConnell, 1997; Shafik, 1994; Brasington and Hite, 2005). In this context, government agencies have also more resources, knowledge and interest to promote and safeguard environmental protection.

Yet, the empirical findings on EKC are inconclusive.[1] Furthermore, increased international trade and the globalisation of production have made environmental pollution and degradation 'mobile' and 'exportable'. Countries, specially 'developed' ones, have been shifting polluting activities in other countries and regions. Thus, while they have maintained their consumption patterns locally and nationally, they 'externalised' the resulting environmental damage to different locations. Thus, along with 'tax havens' we have also seen the emergence of 'pollution havens' (Cole 2004; Jänicke 1997; Stern et al., 1996; Peters et al. 2011). The highly integrated nature of the global economy, and the ability to export pollution, including material waste, makes the assessment of EKC challenging. Furthermore, in the current context of climate change and environmental emergency any notion of an affordable, benign or unavoidable 'phase' of environmental degradation is both outdated and dangerous. In this sense, the EKC hypothesis is a stern warning of the global effort required to protect livelihoods and human development while maintaining environmental sustainability.

Beyond EKC, research on the impact of financial crises on the environment is more limited and traditionally was dominated by case-study findings. A significant trigger for research in this area was the Asian financial crisis of 1997/98. Since then, the global financial crisis of 2008/09, the pressing need to understand how a crisis-prone debt-based global economy (Antoniades & Griffith-Jones, 2018) impacts on the needed transition to sustainability (Patterson et al. 2017; Newell 2021), the Covid-19 crisis, along with significant improvements in data availability over the last decade have reinvigorate research in this field.

### 2.2 Studies on Recent Major Financial Crises

The Asian Crisis of 1997/98 triggered a number of insightful studies questioning the impact that financial crises may have on the environment.

[1]For a literature review see Carson (2010); Alsamara (2021). For evidence in favour of EKC see also: Grossman and Krueger (1995); Panayotou (1993); Galeotti et al. (2006); Dasgupta et al. (2002), For evidence against the EKC see also: Harbaugh et al. (2002); Sirag et al. (2018); Dinda (2004); Perman and Stern (1999).

Dauvergne (1999) pointed to the fact that the crisis triggered simultaneously both negative and positive environmental impacts. Air and lead pollution decreased as there was a significant decrease in industrial production and vehicle use, yet an increase in untreated factories waste impacted negatively on water quality. In general, the crisis slowed investments in newer and cleaner technologies and firms prioritised cost reduction over health and environmental standards. Furthermore, the need to increase exports to address the balance of payment crisis led to an environmentally detrimental expansion in agriculture and fisheries, and a strong push for the development of large plantations (e.g. palm tree), a significant deforestation driver in the region. Furthermore, higher diesel prices and urban to rural migration led to different fishing practices that added further pressures on local fish supplies (see also Rosado et al., this volume), and economic hardship increased the pressures on endangered animals and national parks.

Siddiqi (2000) also analysed the significant slowdown in the automotive, construction, manufacturing, metal production and transportation sectors, with resulting decrease in $CO_2$ emissions. Yet, these benefits were counter-balanced by deferment of needed clean energy investments. He also points to a negative impact of the crisis on forests mostly due to pressures for firewood, timber, and agricultural land. This analysis is confirmed by Elliott (2011), who studied the effect of both the 1997 and 2008 financial crises in East Asia. She found that any positive impacts from the crises were short-lived, while negative impacts endured. The latter include pressures for 'further deforestation, agricultural expansion at the expense of water and soil quality, and lax enforcement of pollution regulations' (ibid. 179). Moreover, the priority for both government and the private sector in the post-crisis environment was investments that would generate 'quick returns to compensate for losses rather than pursuing longer-term environmental and financial sustainability' (ibid. 180). In contrast, Kasa and Næss (2005) illustrate the critical role that non-governmental organisations can play in favour of environmental protections in conditions of financial crises.

In contrast to the Asian Crisis, the epicentre of the Global Financial Crisis of 2008/09 was in advanced economies in the very core of the global economy. Studying the impact of this crisis on $CO_2$ emissions, Peters et al. (2012) found that the reduction in emissions was more short-lived than in any other financial crisis in recent economic history. The 5.9% rebound in $CO_2$ emissions, from fossil-fuel combustion and cement production, in 2010, not only offset the 1.4% decrease in 2009 but it was also the highest total annual growth ever recorded. The drivers for this rapid $CO_2$ emissions rebound included the quick return of strong growth in emerging economies (see, Antoniades 2017), a quick return to emissions growth in developed economies as a result of the unprecedented quantitative easing monetary policies, and an increase in the fossil-fuel intensity of the world economy, partly due to the rapid easing of energy prices that relieved pressure on energy consumption (Peters et al. 2012).

Botetzagias et al. (2018) have assessed the impact of the Global Financial Crisis in Europe on a wide range of environmental quality (GHG emissions, ozone pollution exposure, waste generated, recycling, energy intensity, renewable energy, forested area) and environmental policy (change in infringement cases, environmental expenditure, environmental taxes) indicators. They found no evidence that the economic crisis had a detrimental effect on either environmental quality or environmental policies. Rather they observed a rather positive effect for Eurozone countries and a non-significant one for non-Eurozone countries. As the authors note this may indicate that in the case of countries 'where public environmental concern and national policy making are more and better established, there is less room for watering down environmental performance and protection in the face of an economic downturn' (ibid., 44). Yet, combining the impact of the crisis with the impact of a Troika Programme (TP) (i.e. a conditionality-based financial support programme by the IMF, ECB, European Commission) leads to different results. Eurozone countries with no TP experience an increase in environmental spending and taxes, while countries in TP experience a decrease.

Similarly, in non-Eurozone EU countries they observe a rather better environmental quality yet more environmental-law infringement cases, while in non-Eurozone countries in TP the crisis loses its positive effect on environmental quality, and results in less environmental spending & taxes. These results point to the detrimental effect that excessive austerity can have on environmental quality and policies, even in advanced economies. Case-studies on specific European countries came to confirm some of these conclusions, and to reaffirm the short vs. long implications discussed in the context of the Asian Crisis (see for instance, Lekakis and Kousis 2013; Monteiro et al. 2018; Putkuri et al. 2014).

Anbumozhi and Bauer (2010) have examined the environmental impact of the Global Financial Crisis in Asia. Their findings point to similar dynamics to those observed in the Asian Crisis too. A fall in (global) demand and trade led to a fall in energy use that on its turn led to short term reductions in air pollution and pressure on water resources. Yet, at the same time investments in energy and environment were slowed (which, for instance, impacts negatively on the contamination of rivers and water quality) and both firms and households spent less on energy efficiency measures, green technology and equipment (for shifts in consumption patterns see also Jalles 2020). Furthermore, changes in land use put new pressure on forests for firewood, timber, or agriculture purposes (see also Elliott 2011).

With regard to the environmental impact of the Covid-19 triggered economic crisis, it is still early to draw any firm conclusions (recent literature reviews include: Shakil et al. 2020; Rume, 2020, EEA 2020). The government-imposed lockdowns and shut down of economic activity led to a historically unprecedented fall in energy use and greenhouse gas emissions—airplanes grounded, transportation frozen, trade slowed down, many firms and factories closed. Led by the reductions to ground transport, power requirements, industry and aviation (Le Quéré et al. 2020), the decrease in global fossil $CO_2$ emissions in 2020 is estimated at 2.6 $GtCO_2$, an annual decrease that has never been observed before (see Le Quéré et al. 2021; Lenzen et al., 2020).

Yet, it is indicative that to reach the Paris targets, decreases of similar magnitudes (1–2 $GtCO_2$) should continue to take place annually throughout the 2020s; an indication of the magnitude of the challenge that we currently face (Le Quéré et al. 2021; see also IEA 2020). At the same time, based on past experience, this fall in air pollutant emissions should be expected to be short-lived and may be overshadowed by a post-crisis bounce-back of emissions. Furthermore, as discussed above, the resulting increased economic hardship and inequality should be expected to trigger environmentally adverse practices and impacts (e.g. on forests, biodiversity, agriculture, consumer preferences, environmental protection). If these risks will be mediated by a just and inclusive global green new deal remains to be seen. Currently, as of March 2021, 86 countries have sought Covid-19 related financial support from the International Monetary Fund (IMF), an historically unprecedented number of countries in such a short period of time. This adverse economic impact of the crisis in developing countries could morph into new poverty, education and inequality 'traps' (Antoniades and Antonarakis 2020; World Bank 2020), that could exacerbate environmental degradation dynamics globally. Current international spending on recovery from the Covid-19 pandemic is falling short on environmental sustainability, with only $341 bn or 18% of rescue and recovery funding in the largest 50 economies considered 'green', including investments in infrastructure, transport, renewables, R&D, ecosystem regeneration and reforestation (O'Callaghan and Murdock 2021).

To conclude, the relationship between financial crises and the environment is not clear cut. Financial crises give raise to diverse and many times *opposing dynamics*. For instance, the reduction of economic activity may ease the pressure on available water resources with potential beneficial effects for water environment, but at the same time the adverse change in economic conditions for firms and households may result in more untreated waste dumped in rivers and seas, with exactly the opposite results. Similarly, reverse migration from urban centres to rural areas may alleviate some of the multiple unsus-

tainable patterns and implications related to excessive urbanisation. Yet, at the same time, these movements may have negative consequences related to agriculture expansion, logging, forestry, or fishing (e.g. see Dauvergne 1999; Elliott 2011; Rosado et al., this volume; Shepherd et al., this volume).

## 2.3 The Dynamic Relationship between Financial Crises and Environment

Building on the above findings we present the key dimensions determining the environmental impact dynamics of financial crises in the flow chart in Fig. 3.1. Financial crises can be sovereign debt, monetary, or banking crises (Laeven and Valencia 2018), and can be local, regional or global in scale. The context in which each crisis takes place also varies, and this can exacerbate or soften the impact of the crisis. In environmental terms, financial crises have both positive and negative effects, and these effects extend and vary across different environmental domains, economic sectors and industries. Furthermore, the effects could be immediate and only last during the years of crisis (or part of it), but could also be lagged and last beyond the end of the crisis. Financial crises solicit responses by governments (e.g. shifting of priorities, policy and resources) that directly feed into the impact of the crises and their environmental effects.

Figure 3.1 makes clear that the interplay between financial crises and environment is a complex one. Beyond triggering opposing dynamics, each financial crisis episode is characterised by a large number of *idiosyncratic variables*, including the nature of the financial crisis, its socio-political and ecological contexts and the global politico-economic environment in which it takes place. The degree of resilience built in the affected economic, social and environmental systems is also an important contextual variable (e.g. existence of automatic fiscal stabilisers, liquidity requirements in the banking sector, environmental legislation and enforcement, disaster preparedness, ecosystem resilience). Furthermore, the environmental impact of the crises is materialised across a *large number of environment-related domains* such as air, water, forests, biodiversity, agriculture, energy use, climate-change, environmental investment and R&D, and environmental protection. Capturing and analysing the interaction and knock-on effects between these domains is challenging (and in many cases data are scarce, outdated, or non-existent). For instance, air pollution (especially Sulphur Dioxide and Nitrogen Oxides emissions) contributes to acid deposition and eutrophication that impact negative on soil and water quality, with a wide range of pervasive negative effects 'on aquatic ecosystems in rivers and lakes and damage to forests, crops and other vegetation', as well as subsequent decreases in biodiversity and 'changes in species composition and dominance, and toxicity effects' (EEA 2018; see Weiskopf et al. 2020). This diverse *temporality of effects and consequences* across different environmental domains and actors is a key characteristic of the environmental effects of crises. Relatedly, existing case-study evidence suggests that any beneficial environmental impacts (especially on air and water quality) are short-lived. The main reason is the gradual return of economic activity after the break-out of the crisis. But other reasons, such as environmentally adverse shifts in firm and household practices may also play an important role. That is why, in many crisis episodes, emissions return to their pre-crises levels well before the end of the crisis period, and many times despite the fact that the involved economies are growing at a slower pace (Pacca et al. 2020).

Furthermore, the *nature of domestic structures, institutional arrangements and available resources* is an important intervening variable in the environmental impact of financial crises. For instance, countries with stronger environmental protection legislation, and better and well-resourced environmental protection mechanisms are in better place to reduce, neutralise or reverse the adverse environmental implications of crises. Reversely, the adverse environmental effects of crises are exacerbated by the weak state capacity and limited resources in many low- and middle-income countries. In a similar manner, excessive

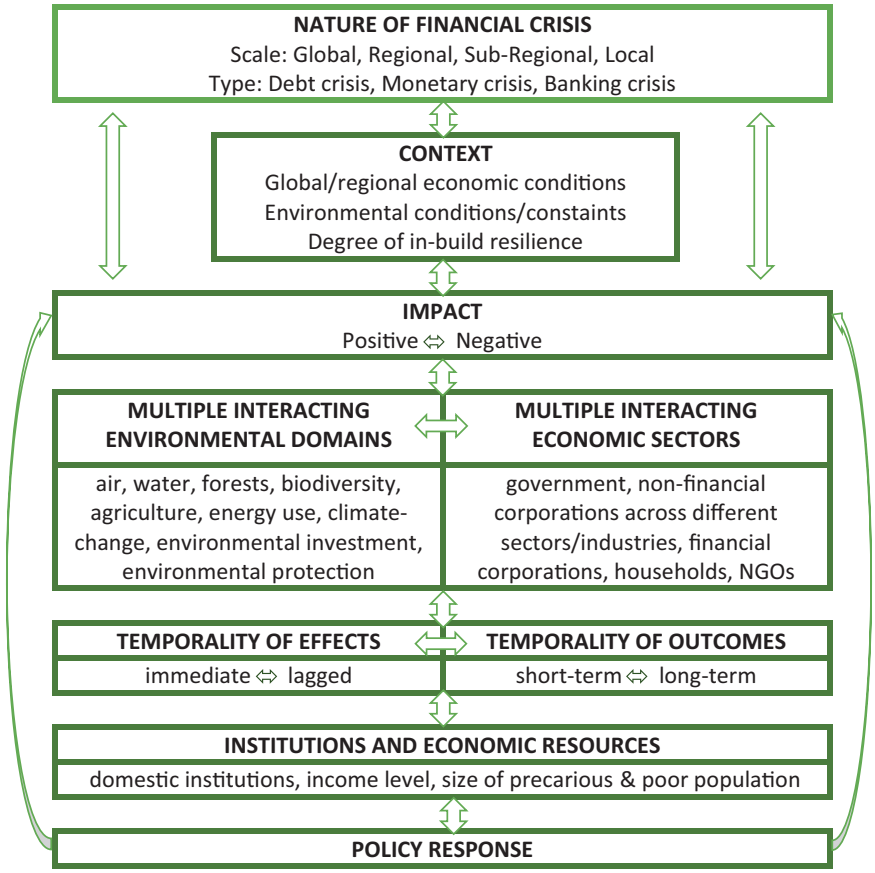


**Fig. 3.1** Flow Chart illustrating the dynamics between financial crises and environmental impacts, including the spatial scale and type of crisis, the types of environmental impacts, the temporal effects of these environmental impacts, the resources available to tackle the shock, and finally the policy response

economic hardship and *austerity policies linked to international economic adjustment programmes*, may not only prolong the economic crisis and the post-crisis socio-economic scar, but can also exacerbate the environmental impact of the crises, locking countries into lower environmental paths or even in environmental traps.

## 2.4 From Financial Crises to the Great Stagnation

The intensification of climate change and its impact over the last decades have thrown into sharp relief the urgent need to move away from an economic model that is based on ever-increased growth rates, respecting planetary boundaries. This have given rise to a new post-growth research paradigm (e.g. Jackson, 2016; Kallis 2018). Despite the diversity of approaches, common ground here is that if we are to reach a sustainable path on the planet, economic growth rates (and the corresponding energy and finite resources use and waste generation) should slow down. The experience from financial crises tell us that not all modes of economic slowdown lead to environmental improvements. Yet, financial crises, as 'shock events', may not be well-placed to map and understand the complex economy-environment-poverty interaction that will emerge from a slower-growth economic regime (see for instance the critique on this in Hickel 2020). A number of macroeconomic modelling and simulation studies have attempted to fill this gap (see

Victor 2011; Jackson and Victor, 2015; Hardt and O'Neill 2017; Barrett 2018). Yet, although these studies avoid a 'shock bias', they are limited in their capacity to model a complex, multifaceted, emergent social universe (Cantone et al. 2021).

To address these limitations in the existing literature we use the period of Great Stagnation as a real world 'experiment. Since the Great Financial Crisis of 2008/9 we have witnessed a slow and fragile economic recovery. Growth rates have remained low and below the historical trend (see Fig. 3.2 below), even with very low interest rates and unprecedented liquidity support by Central Banks. This below-trend growth has come off the back of the Global Financial Crisis, acquiring characteristics of a 'new normal' (El-Erian 2009), defined by Mervyn King (2019) as the period of 'Great Stagnation'. As Fig. 3.2 shows, the rupture in GDP trend is observed in both advanced and emerging economies. Therefore, this period of 'Great Stagnation' offers a real-world case-study to examine the impact of prolonged slower growth rates on the natural environment. The use of Great Stagnation as a case-study is not without its weaknesses, but it is the closest to a real world 'experiment' that we can get.

In the next section we shift our focus on empirically assessing the impact of financial crises and the Great Stagnation on specific environmental domains. Our analysis and findings draw from a set of studies that we conducted at the 'Financial Crises and Environmental Sustainability' (FCES) unit of the Sussex Sustainability Research Programme.

## 3 Financial Crises & Great Stagnation: Empirical Evidence on Air Quality, Biodiversity, and Forests

Case-study evidence allow us to map, understand and analyse the complex processes that are triggered by financial crises locally or regionally. Yet, at the same time it is important to develop a more macroscopic perspective on the environmental impact of the crises that would allow us to examine how this impact may change over different time-periods, to compare the impact of differ-

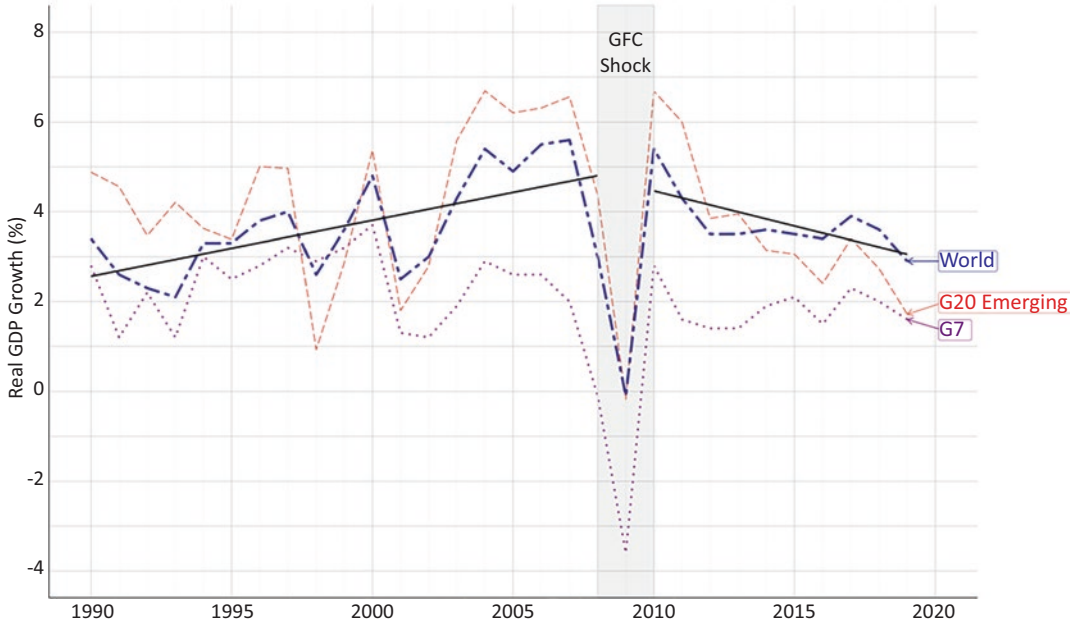


**Fig. 3.2** Real GDP growth (annual percentage change) from 1990–2019 (Cantone et al. 2021). The two regression lines represent the World GDP growth in periods 1990-2008 and then 2010–2019

ent crises, to test whether case-study evidence applies to broader contexts, and to map any broader environmental patterns and regularities emerging across financial crisis episodes that may add new information on their drivers and determinants. To contribute to this aim, we present evidence that is based on the statistical analysis of a large number of financial crises across the globe over the period 1970s to 2010s.

Furthermore, as mentioned above, we extend our analysis on the environmental impact of financial crises, by examining what happened to key environmental indicators during the Great Stagnation. This is a period when a great number of systemically important economies are growing at slower rates in comparison to historical trend (see Fig. 3.2). Thus, this is not a period of 'financial crisis' as such—it has more enduring characteristics that point to a 'new normal'. Examining environmental dynamics during this period can add new insights on the potential implications of a slower economic growth regime, and how the transition to such a regime should be managed to secure sustainability.

We present our findings below organised into three categories: atmospheric emissions, forests and deforestation, and biodiversity.

## 3.1 Atmospheric Emissions

### 3.1.1 Financial Crises during the Period 1970–2015

We have used a panel data approach to explore the relationship between financial crises and air pollutant emissions in 419 financial crisis episodes (Laeven and Valencia 2018) in more than 150 countries over the period 1970–2014 (see Pacca et al. 2020). In particular we examined the relationship between financial crises and Carbon Dioxide ($CO_2$), Sulphur Dioxide ($SO_2$), Nitrogen Oxides ($NO_x$) and Particulate Matter ($PM_{2.5}$). We used the Generalized Method of Moments (GMM) specification to estimate short-term effects and the Impulse Response Function to estimate medium-term effects (see Pacca et al. 2020 for details). Our main findings are as follows:

The break-out of financial crises positively impact air quality, as indicated by the case-studies mentioned in the previous sections. Furthermore, the intensity of the economic slowdown is a key driver of the magnitude of the impact. In particular, the break-out of financial crises is associated with reductions in $CO_2$, $SO_2$ and $NO_x$ emissions, while when a crisis is accompanied by an output loss (i.e. deviation of actual GDP from its trend; see, Laeven and Valencia 2018), the reduction in the above emissions is much stronger and extends to particle emissions ($PM_{2.5}$) that are especially dangerous for human health (Fig. 3.3).

Yet, the beneficial effect of these crisis-driven economic slowdowns on air pollution is short-lived. According to our estimates not only the beneficial effect fades away by the second year after the break-out of a crisis, but also in the medium-term appears to increase $PM_{2.5}$ emissions (see Fig. 3.4). In particular, in our model the positive impact on $CO_2$ emissions disappear the year after the breakout of crisis, whereas for $SO_2$, $NO_x$ and $PM_{2.5}$ emissions the positive impact disappears the second year after the break-out of a crisis. It is worth noticing here that this happens regardless of whether the involved countries continue to be in a financial crisis or not (more than 55% of crises in our dataset have a duration of 3 or more years). Thus, in most cases the financial crises outlive the short-term positive impact that their break-out had on air quality. Equally important, the only pollutant that we find consistent evidence for a medium-term effect is for $PM_{2.5}$; but as mentioned above the impact is adverse for air quality. We find that 4 years after the break-out of a crisis and up to year 10 there are increases in $PM_{2.5}$ emissions between 0.9 and 1.8%.

We also examined whether the environmental impact of financial crises is contingent to the countries income-level, using the World Bank classification of countries in four groups according to the level of their Gross National Income: high-income, upper-middle income, lower-middle income and low income. We find that the impact of economic crises on air pollutant emissions is contingent on the level of income and the broader economic structure of each country.

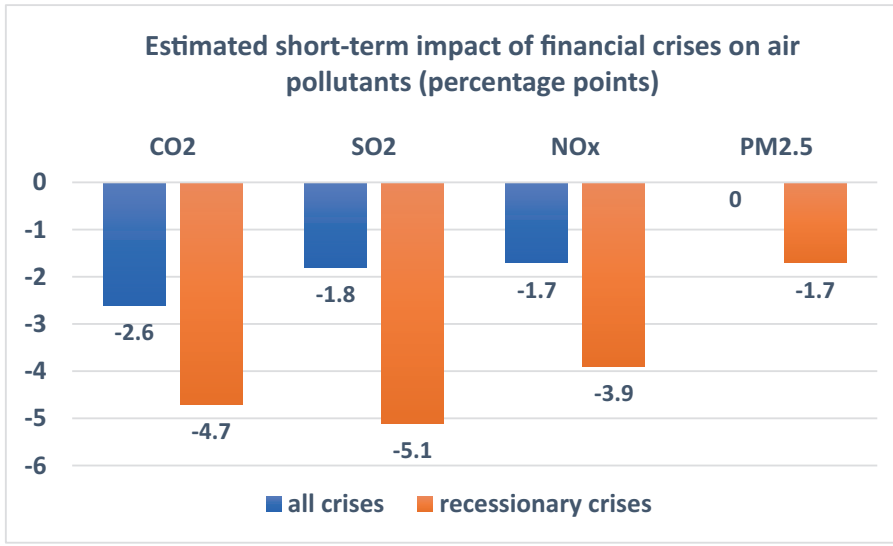


**Fig. 3.3** Estimated short-term impact of financial crises on air pollutants (percentage points)

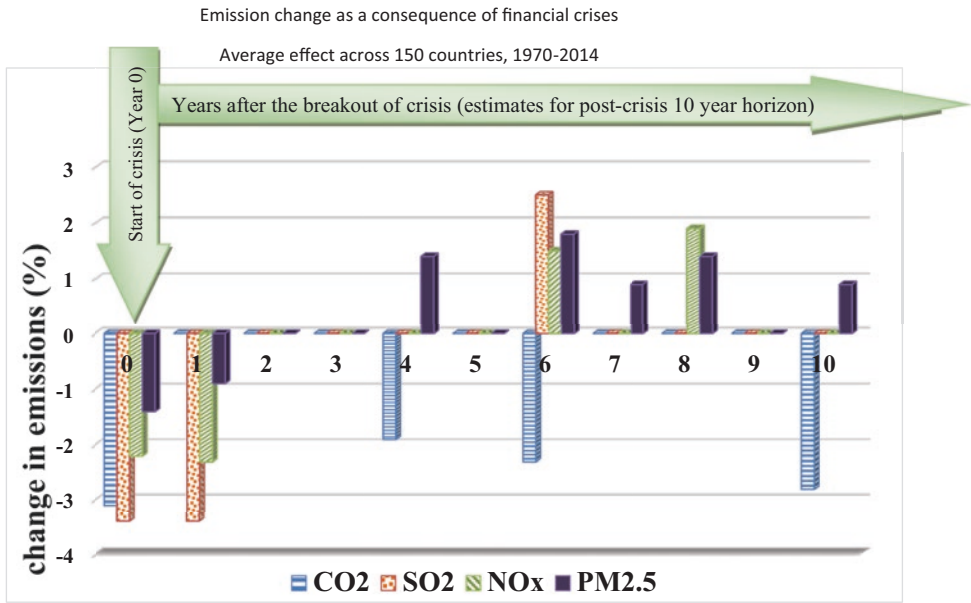


**Fig. 3.4** Estimated medium-term impact of financial crises on air pollutants

For instance, while financial crises in high income countries are accompanied by higher-than-average reductions in $CO_2$, $SO_2$ and $NO_x$ emissions, we find no impact on any of the pollutant emissions in low income countries (see Fig. 3.5).

We have also tried to estimate the impact of the financial crises on atmospheric emissions not in terms of changes in physical tonnage but in terms of their monetary damage (Antoniades, Antonarakis, Widiarto, 2020). In particular, we have examined the relationship between financial

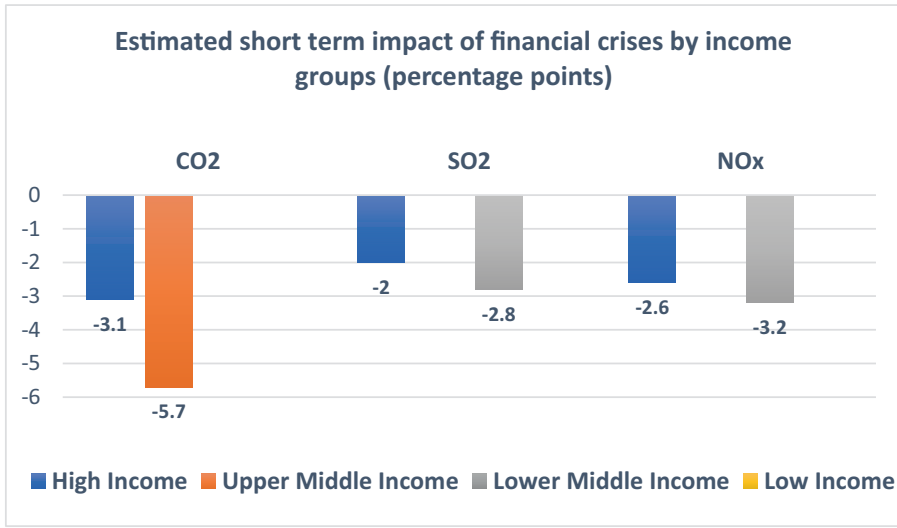


**Fig. 3.5** Estimated short-term impact of financial crises by income groups

crises, and *Particulate Emission Damage* and *Carbon Dioxide Damage*.[2] The aim here is to estimate the adverse *societal* effects of atmospheric emissions in periods of financial crises (see also Mohan et al. 2021). For this study we utilised a generalized least square panel data econometric modelling, aiming to assess changes for each year of all financial crises during 1980–2015 (ibid.)

We find that financial crises lead to significant increases in particulate emission damage, measured as foregone labour income due to premature death from exposure to particulate matter pollution. The average impact at global level is 0.16% of gross national income. Yet, again, this effect is different across different income groups. Low-income countries are those most severely affected (0.37%), followed by lower-middle income (0.13%) and upper-middle income countries (0.06%). We find no effect in high-income countries. These findings reveal to some degree the danger posed on human lives from shifting practices and pollution patterns during times of crises, and their unequal effects across developed and developing countries.

Finally, we examined whether the impact of financial crises on air quality has changed since the 1970s (Pacca et al. 2020). According to our findings the outbreak of crises in the 1970s and 1980s were mostly associated with reductions in nitrogen oxides ($NO_X$). In the 1990s, financial crises lead to reduction in both nitrogen oxides and sulphur dioxide ($SO_2$), which is emitted when fuels containing sulphur are combusted. Finally, we find that crises after 2000 are mostly associated with reductions in nitrogen oxides and carbon dioxide. These shifts in the environmental impact of financial crises over time, relate both to the characteristics of the different groups of countries that experience these crises in these different periods, and with broader changes in the structure and nature of global economy as a result

[2]The respective definitions according to the World Bank are as follows: **Adjusted savings: particulate emission damage:** Particulate emissions damage is the damage due to exposure of a country's population to ambient concentrations of particulates measuring less than 2.5 microns in diameter ($PM_{2.5}$), ambient ozone pollution, and indoor concentrations of $PM_{2.5}$ in households cooking with solid fuels. Damages are calculated as foregone labour income due to premature death [data available for 1990-2018]. **Adjusted savings: carbon dioxide damage**: Pollution damage from emissions of carbon dioxide is calculated as the marginal social cost per unit multiplied by the increase in the stock of carbon dioxide. The unit damage figure represents the present value of global damage to economic assets and to human welfare over the time the unit of pollution remains in the atmosphere. Carbon dioxide damage is estimated to be $20 per ton of carbon (the unit damage in 1995 U.S. dollars) times the number of tons of carbon emitted [data available for 1970–2018].

of the globalisation of economic production, increased trade and international shipping, and broader global economic integration. Yet, these findings point also to the difference that concerted policy intervention and technological advancements can make above and beyond any economic slowdown effects. For instance, the fact that at global level, we do not observe any crisis impact on $SO_2$ emissions after the 1990s must relate at least partially to the significant decrease in $SO_2$ emissions that was achieved by policy action on coal and fuel oils in Europe and North America, and improved abatement technologies such as desulphurization systems. For instance, in the 33 countries that participate in the European Environmental Agency, emissions of sulphur oxides ($SO_X$) have decreased by 74% between 1990 and 2011 (see EEA 2013; for uneven global trends see Aas et al. 2019).

### 3.1.2 The Great Stagnation

To examine the trend of atmospheric emissions during the Great Stagnation we used a dynamic panel data model with a GMM specification, using 2010 as the first year of Great Stagnation (see Fig. 3.2). We adopt a trend analysis approach aiming to examine whether there is a change in emission trends in the periods before and after the Global Financial Crisis. This analysis does not aim to establish causality but empirically to examine whether the 'new normal' in the global economy is associated with changes in $CO_2$ and $PM_{2.5}$ emission trends (Cantone, Antonarakis, Antoniades, 2021). We find no statistically significant evidence for changes in emissions trends at a global level, yet we observe statistically significant shifts at income-level. With regard to $CO_2$ emissions, the period of Great Stagnation is associated with increases in low-income countries (6.9%) and decreases in high-income countries (2.5%) that are mostly driven by Europe (1.8%). This is not surprising as the Great Stagnation has been driven by developments in high-income countries, while low-income countries have been the group least affected, maintaining relatively high growth rates before the Covid-19 pandemic. On the other hand, the Great Stagnation is associated with decreases in $PM_{2.5}$ in middle-income countries, more pronounced in upper-middle income countries. This may relate both to global efforts to increase awareness of the deadly implications of this type of air pollution, but also to concerted policy efforts in specific countries, for instance in China (Zhang et al. 2019).

## 3.2 Forests and Deforestation

### 3.2.1 Financial Crises during the Period 1980–2015

Existing case studies on the effects of financial crises on forest cover and deforestation have found contradictory results as stated in Section 2 above. For example, forest protection increased and environmentally damaging activities decreased in the Brazilian crises of 1998-2000 (Kasa and Næss 2005), while in South East Asia forest management and conservation decreased with increases in agricultural production (Dauvergne 1999; Siddiqi 2000; Pagiola 2001), and in Greece illegal logging increased during the 2008 crisis (Lekakis and Kousis 2013).

In recent work (Antonarakis et al. in prep) we examine the effects of financial crises on forests and deforestation against the Global Forest Watch dataset available from 2001. These datasets were collected at the national scale for over 170 countries with the impacts of financial crises tested using the Generalized Method of Moments (GMM). Here, preliminary results show that at the global level, financial crises are associated with reductions in deforestation rates (36 percentage points). These results support country-level literature on decreases in deforestation during a financial crisis (Dauvergne 1999; Elliott 2011). At income groups, the largest decreases in deforestation rates occurred in low-income countries compared to high-income countries (51 p.p. vs 18 p.p. respectively). The reasons for this may be related to drivers of deforestation, where in higher income countries are dominated by forestry, and in lower income countries are dominated by shifting and commodity agriculture (Curtis et al. 2018). Therefore, declines in commodity crops such as cattle, cocoa, coffee, soybean, and oil palm during financial crises may be linked to falling deforestation rates (see Antonarakis et al. in prep).

We have also examined the effect of financial crises from 1980–2014 on two forest related indicators, forest rents and net forest land $CO_2$ emissions, using a generalized least square panel data econometric model (see Antoniades et al. 2020). Forest rents (in % of GDP) are roundwood harvest times the product of average prices and a region-specific rental rate. Net forest land emissions refer to changes in atmospheric GHG emissions attributable to forest and land-use change activities. At the global level we found no effect between financial crises and these two forest indicators. Financial crises, though, are associated with an increase in net forest land $CO_2$ emissions in low- and high-income countries by 0.818 and 2.479 terragrams, respectively. Reasons for this worsening picture in forest land emissions during financial crises may be due to an increase in forest product exports from low-income countries (Mills Busa 2013), to increases in large scale forestry operations in high-income countries. This effect on low-income countries is matched by increases (0.8%) in forest rents.

#### 3.2.2 The Great Stagnation

We tested the effect of the Great Stagnation period on deforestation from the Global Forest Watch using a panel data model with a GMM specification. In this case we found no significant global-level decreases in deforestation during the stagnation period, with only effects in upper-middle income countries (−6.7%) and in Asia (−13%). New initiatives since 2010 are committed to halting deforestation and restore forests, such as the Bonn Challenge, the New York Declaration on Forests, zero deforestation policies and more. The lack of a significant effect on deforestation during this period suggests that the Great Stagnation may have delayed these international efforts as nations have increased land cover conversion and forest resources to support their economies.

### 3.3 Biodiversity

#### 3.3.1 Financial Crises during the Period 1980–2015

Biodiversity data, even though national reporting has been solicited by the Aichi Biodiversity targets from 2010, is difficult to find annually with consistent national reporting. We used a generalized least square panel data approach to investigate the effect of financial crises from 1980-2014 on Terrestrial Protected Areas obtained from the Environmental Performance Index—Yale (Antoniades et al. 2020). This metric is calculated as the proportion of each biome in a country that lies within a protected area, an important indicator related to natural resources exploitation and biodiversity protection. We find that financial crises are associated with a reduction in terrestrial protected areas globally (−0.57%). This reduction is pronounced for upper-middle income countries, at 1.05%, and low-income countries, at 0.85%, with no effect in high-income countries.

#### 3.3.2 The Great Stagnation

On testing the effects of the Great Stagnation period on biodiversity, we expanded our indicators to include terrestrial protected areas, species protection index, the species habitat index, fish stocks, and marine protected areas (Cantone et al. 2021; data used are from the Environmental Performance Index-Yale). The species protection index measures protected areas in relation to species distributions; the species habitat index measures changes in the suitable habitats of species providing aggregate estimates of potential population losses and extinction risk increases; fish stock status measures the percentage of a country's total catch that come from overexploited or collapsed taxa; and marine protected areas measures the percent of a country's Economic Exclusion Zone set aside as a marine protected area.

Overall, at the global level, the great stagnation is negatively associated with all biodiversity indicators except species habitat index (see Fig. 3.6). Terrestrial protected areas decreased by 3.7%, marine protected areas decreased by 22.8%, fish stocks decreased by 8.1%, and species protection index decreased by 2.6%. Only the species habitat index saw a small increase during this period by 0.055%. To better understand potential drivers behind these findings we also examined the impact of Great Stagnation on biodiversity indicators across income-groups and continents.

At *income-level* groupings, the Great Stagnation is associated with negative effects on terrestrial protected areas in lower-middle, upper-middle- and high-income countries (−3.6%, −1.7%, −2.4% respectively), a negative effect on species protection index for lower-middle, upper-middle and high-income countries (−2.8%, −2.4%, −1.3% respectively), a minor but robust positive effect on species habitat index for lower-middle, upper-middle and high-income countries (0.05%, 0.08%, 0.04% respectively), no significant effect for fish stocks, and a negative impact on marine protected areas for high-income countries (−33.1%).

At continental-level groupings, the Great Stagnation is associated with a decrease in terrestrial protected areas in the Americas (−1.4%), a decrease in species protection index and fish stocks in Africa (−1.8% and − 8.1% respectively), and a decrease in species protection index and marine protected areas in Europe (−1.5% and − 37.2% respectively). Species habitat index remains with a minor positive effect for all continental groupings, Americas, Africa, Asia, Europe (not Oceania).

Concerning Terrestrial Protected Areas (Fig. 3.6a), Lewis et al. (2019) also witnessed that from 2010 terrestrial protected areas have not increased and subsequently are not on track to meet the Aichi Biodiversity Target of 17% protected areas globally. A reason for this has been the slowing of new protected areas being set out by countries and the rapid removal of protected areas. This scaling back of protected areas, called

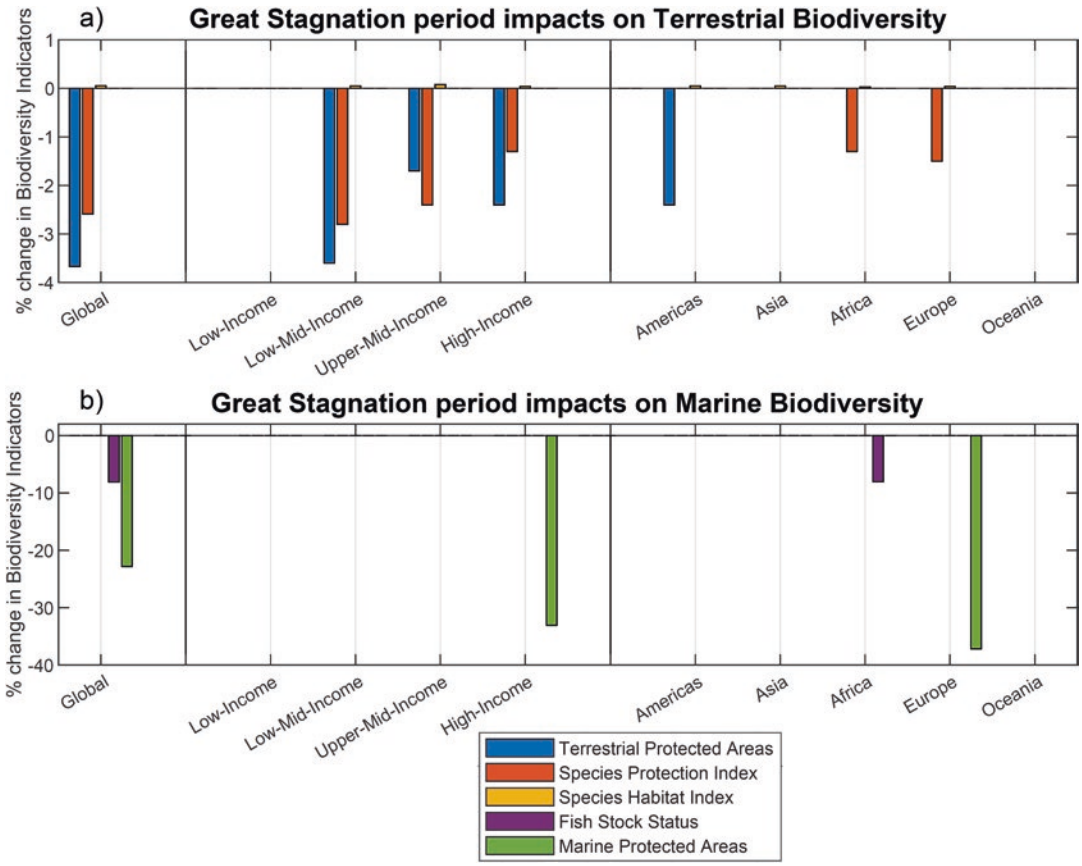


**Fig. 3.6** Great stagnation impact on biodiversity indicators at the Global level, at income groupings, and at continental groupings. Panel A shows terrestrial biodiversity indicators: terrestrial protected areas, species protection index and species habitat index. Panel B shows marine biodiversity indicators: Fish Stock Status and Marine Protected Areas

Protected Area Downgrading, Downsizing and Degazettement (or PADDD) is primarily caused by industrial activities, energy projects and local land pressures. Our regional groupings show that the negative impacts are driven by the Americas, where PADD has affected Brazil's protected area network (Pack et al. 2016) and with the USA having the highest negative footprint in this area between 2006-2016 (Lewis et al. 2019). Decreases in terrestrial protected areas may also be caused by post-GFC austerity policies or increasing financial distress which are adversely related to environmental protection (Lekakis and Kousis 2013; Botetzagias et al. 2018), or with an expansion of commodity driven agriculture in middle-income countries (Marques et al. 2019).

Marine protected areas have seen a large decrease during the Great Stagnation, concentrated in high-income countries in Europe (See Fig. 3.6b). This contradicts the UNEP-WCMC (2018) and Lewis et al. (2019) report of increases in marine protection globally from 2010–2017 of around 4% of the world's oceans. Yet, Lewis et al. (2019) also state that the growth has plateaued since 2014, and the growth in marine protection has disproportionately been in Asia and the Pacific. In Europe, along with a levelling-off effect after 2010, a reason may be that progress in designating Natura 2000 marine sites has been much slower than terrestrial sites due to the lack of detailed information on habitat and species distributions that hampers the introduction of appropriate management (European Commission 2018). On Fish Stocks, the large decreases in Africa (−8.1%) are matched by reports and evidence of large-scale deterioration in the region (McClanahan 2019; BBC 2018). The impacts of the Great Stagnation on the Species Protection Index are spread across most income groups and are concentrated in Africa (−1.3%) and Europe (−1.5%) (see Fig. 3.6a). The results on the Species Habitat Index are small and positive across most income groups (except low-income) and continents (except Oceania). These results suggest that species habitat destruction may be levelling off or improving, while protection for species is decreasing. A reason for this could be in the way the species habitat index is measured. Remote sensing is used to calculate the species habitat index based on natural growth of vegetation across space, yet any increases may not translate to effective conservation and protection of species.

## 3.4 Summary of Findings

### 3.4.1 Financial Crises

We have examined the influence of financial crises on the environment for the period 1970 to 2015. Overall, financial crises have a positive (albeit short term) impact on *air pollution*, mixed impact on forests and deforestation and negative impact on biodiversity. On air pollution, financial crises have an immediate beneficial impact on $CO_2$, $SO_2$ and $NO_x$, with an effect that ranges between 1.4 and 6.2 percentage points. The reduction in air pollution is contingent on the stage of economic development, with higher income countries experiencing the most comprehensive reductions in $CO_2$, $SO_2$ and $NO_x$ emissions. Yet, this beneficial effect fades away within 2 years from the start of the crises, giving rise to renewed pollution that neutralizes or even reverses positive gains made in the first years. Furthermore, we find that despite the fall in pollutant emissions, there is an increase in the social damage caused by air pollution during financial crises in developing countries (especially low-income). On *forests*, we find a beneficial effect of financial crises on deforestation rates at a global level. At income-level, the low-income countries have the largest decrease in deforestation rates, but experience increases in net forest land use emissions and forest rents. On *biodiversity*, financial crises are associated with a reduction in terrestrial protected areas globally (−0.57%), with effects in upper-middle and low-income countries. This shows financial crises do not provide overall reprieve for forests and biodiversity, with already worsening trends in the last decades made similar or worse by financial crises since the 1970s.

### 3.4.2 Great Stagnation

Overall, the Great Stagnation period has had a limited to beneficial impact on air pollution, limited impact on forests and deforestation and a worsening impact on biodiversity. On *air pollution*, the Great Stagnation is not significantly associated with emissions at the global level, but is associated with increases in $CO_2$ in low-income countries, decreases in $CO_2$ in high-income countries (mostly driven by Europe), and decreases in fine particulate emissions in middle-income countries. On *forests*, we do not find an association between the Great Stagnation and deforestation rates at a global level, but we do observe decreases in deforestation in upper-middle income countries, especially in Asia. On *biodiversity*, at the global level, the Great Stagnation is negatively associated with all biodiversity indicators except species habitat index. Terrestrial protected areas decreased by 3.7%, marine protected areas decreased by 22.8%, fish stocks decreased by 8.1%, and species protection index decreased by 2.6%. These effects were pronounced at middle- and high-income countries for terrestrial protected areas and species protection index, with a large negative effect on marine protected areas in high-income countries. Effects were also pronounced in the Americas (terrestrial protected areas), Africa (species protection index and fish stocks), and Europe (species protection index and marine protected areas).

## 4 Conclusion

Our findings demonstrate that financial crises do not have a unidirectional effect on the environment. The traditional reasoning that financial crises, being associated with slower or negative economic growth rates, should be good for the environment does not withstand empirical scrutiny. Even for air pollution where financial crises have the most demonstrable, immediate, and robust positive impact, it is short-lived and is accompanied by other changes that usually have longer term negative implications (e.g. changes in policy capacity and priorities, changes in consumption and production practices, changes in environmental protection). The negative impact on livelihoods (many times exacerbated by conditionality-based economic support programmes) and the focus on quick returns to compensate for losses during a financial crisis lock in or push to unsustainable growth and development pathways. On this basis, the punctuated slowdown in economic growth generated by economic crises should be considered part of the problem rather than part of the solution for transition to sustainability.

Furthermore, our findings indicate that even beyond a financial crisis context, a slowdown in economic growth rates—even a prolonged one that acquires the characteristics of a 'new normal'— does not inevitably lead to environmental improvement. Our evidence from the Great Stagnation indicates diverse results across regions, income-groups and environmental domains, in a moment we urgently need to align every corner of the planet to the target of environmental sustainability. These findings come to strengthen the findings from financial crises. *Faster economic growth rates cause environmental damage, but slower economic growth rates on their own do not ensure environmental benefits and sustainability.* This research comes to support the main thesis in the post-growth paradigm: the transition to sustainability will never come if it is left to the autopilot of lower growth rates. Sustainable economic development, therefore, requires us to take a path with Nature to achieve our collective wealth and well-being, rather than continue to undermine Nature's productivity, resilience, and adaptability (Dasgupta 2021). According to the Dasgupta Review (2021), transformative change is needed where we break the link between damaging production and consumption and Nature by enforcing standards for recycling and sustainable supply chains, include natural capital in our measure of success, not just GDP, and ensure, through better finance and education, that these changes become cemented for future generations.

Financial crises and periods of slower growth remain critical for our transition to sustainability. To play with the etymological roots of

these words,[3] crises are critical in the sense that they are moments of decision. Until today we used these moments to impose 'economic adjustment' policy templates that exacerbated the unsustainability of our socio-environmental order. We need a paradigmatic shift in international policy making—from focusing on trade-offs between growth and the environment to focusing on the environment as the most important factor for sustainable growth and living.

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[3] 'Crisis' from the Greek noun 'κρίσις' (krisis), meaning judgement, decision; deriving from the verb 'κρίνειν' (krinein), meaning to exercise judgement, take decision, come to a choice, think through.

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# 4 From Crisis to Crisis: Conundrums of Caribbean Existence in the Global Political Economy

Kristina Hinds

**Abstract**

Caribbean states are located on precipice of crises within the global economy, comprising highly trade open small islands forged of colonial processes as sites of extraction. The region has accumulated some of the highest debt to GDP ratios in the world, then the COVID 19 pandemic spun the region into further financial difficulties. Earnings dried up in tourism; unemployment rates spiralled with vulnerable segments of the region's communities becoming more vulnerable; and governments had to undertake additional spending to address the pandemic. To complicate matters, these states are acutely vulnerable to the consequences of climate change, lying within the Atlantic hurricane zone that annually threatens devastation. Sea level rise also poses an existential threat to the region. Despite these fragilities, Caribbean states and territories are in a bind when it comes to financing, mostly ineligible for concessionary finance due to their middle/high income developing country status. This paper explores the conundrums that Caribbean states find themselves in. It asserts that the space for Caribbean strategies is limited by disciplinary practices that seek to manage Caribbean states and territories as sites of extraction or leisure, with tendencies towards flirting with illegal activities. The paper makes a wider claim that the Caribbean's continued existence on the verge of crisis is a feature of its location and integration within the global economy. Moreover, the structure of the global economy poses challenges for attaining the SDGs. However, this chapter also proffers that Caribbean states and territories can exercise agency amid global structural constraints.

**Keywords**

SIDS · SDGs · Sustainable development · Colonialism · Tourism · Offshore sector

## 1 Introduction

The Caribbean region has fared well among developing countries within the global political economy (GPE). With a few exceptions, Caribbean states score respectably in develop-

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ment measures such as the United Nations (UN) Human Development Index (HDI) in which most are classified as exhibiting high human development and as upper income by the World Bank (see Table 4.1). As a result of these decent performances, several have graduated from access to concessionary financing (ECLAC 2011, p. 7). Still, these measures are deceiving as Caribbean countries face deficits in providing equitable and dignified living conditions for their people. They are also heavily indebted, with several having debt to GDP ratios exceeding the international benchmark of 60% (CDB 2020, p. 21; CDB 2019, p. 20). What is more, the region is heavily exposed to and reliant on conditions in the GPE, leaving the Caribbean vulnerable to external shocks and crises, which are compounded by the annual threat of hurricanes and other natural disasters. So, despite faring well in development assessments these are islands of precarity, as are most Small Island Developing States (SIDS).

Therefore, despite their relative progress, the small "islandness" of Caribbean states and territories leaves them with special challenges within the GPE. These challenges pose problems for them meeting the UN Sustainable Development Goals (SDGs). Further, these countries have experienced significant misfortunes since the novel coronavirus (COVID 19) pandemic destabilised the world. This chapter examines how existing in precarity and bouncing from crisis to crisis has affected the Caribbean. The chapter presents the contradictions of Caribbean approaches to development that leave the region perpetually exposed and contradict the SDGs. Specifically, the continued focus across the region on tourism driven growth and on earning revenue from heavily policed areas such as the offshore sector or citizen investor programmes to fund attainment of the SDGs can place Caribbean states and territories in a sustainability trap. Caribbean countries need growth to fund work towards the SDGs but face precarious growth situations reliant on sectors that may not align well with the sustainability. The chapter offers the premise that space for Caribbean strategies remains limited by disciplinary practices that lock Caribbean states in the global economy as sites of extraction, leisure or to be policed for their 'tendencies to illegality'. Thus, the chapter asserts that a notable part of the region's problem in pursuing the SDGs is the structure of the GPE. By the same token the SDGs themselves are hamstrung by the structure of the GPE.

## 2 Defining Caribbean States, Territories and SIDS

The Caribbean is a part of the world to which people can travel to play, to escape chilly climes, and more recently, to escape COVID 19 lockdowns. Pleasure, tropical fruits, rum, the people are all available for foreign enjoyment. These are locations of extraction, whether it is pleasure that is being extracted or some commodity like sugar or oil. On the other side of this playground is risk and illegality where the region pushes the limits of permissibility. Just as pirates once pillaged, today Caribbean people do so too, stealing tax revenues from wealthy states or selling passports at low cost (Hinds and Lorde 2018). These alleged tendencies to illegality must be managed and disciplined by places of 'seriousness', 'organization', and high-end technological innovation. These places responsible for managing the world are also the sources of Caribbean tourism.

These tropes that juxtapose the Caribbean with the developed countries often define the region. However, tropes are not true definitions. Although one could assert that all places that touch the Caribbean Sea constitute the Caribbean, this chapter takes a more limited approach. The focus in this piece is on the islands that are geographically located in the Caribbean Sea. The chapter also treats Belize, Guyana and Suriname, as Caribbean SIDS, despite Belize being located in Central America and Guyana and Suriname in South America, and despite them not being islands. When we

**Table 4.1** HDI trends and World Bank income classification[a]

| Country | 2000 | 2010 | 2014 | 2015 | 2017 | 2018 | 2019 | HDI rank 2019 | Human Development Classification 2019 | World Bank Income Classification 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| Bahamas | 0.80 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 58 | Very high | High |
| Barbados | 0.77 | 0.80 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 58 | Very high | High |
| Trinidad and Tobago | 0.72 | 0.78 | 0.79 | 0.79 | 0.80 | 0.80 | 0.80 | 67 | High | High |
| Cuba | 0.69 | 0.78 | 0.77 | 0.77 | 0.78 | 0.78 | 0.78 | 70 | High | Upper middle |
| Grenada | .. | 0.75 | 0.77 | 0.77 | 0.77 | 0.77 | 0.78 | 74 | High | Upper middle |
| Saint Kitts and Nevis | .. | 0.75 | 0.77 | 0.77 | 0.77 | 0.7 | 0.78 | 74 | High | High |
| Antigua and Barbuda | .. | 0.76 | 0.76 | 0.76 | 0.77 | 0.77 | 0.78 | 78 | High | High |
| Saint Lucia | 0.70 | 0.73 | 0.74 | 0.75 | 0.76 | 0.76 | 0.76 | 86 | High | Upper middle |
| Dominican Republic | 0.66 | 0.71 | 0.73 | 0.74 | 0.75 | 0.75 | 0.76 | 88 | High | Upper middle |
| Dominica | 0.70 | 0.74 | 0.74 | 0.74 | 0.74 | 0.74 | 0.74 | 94 | High | Upper middle |
| Saint Vincent and the Grenadines | 0.68 | 0.72 | 0.73 | 0.73 | 0.73 | 0.74 | 0.74 | 97 | High | Upper middle |
| Suriname | .. | 0.71 | 0.74 | 0.74 | 0.73 | 0.73 | 0.74 | 97 | High | Upper middle |
| Jamaica | 0.68 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 101 | High | Upper middle |
| Belize | 0.64 | 0.70 | 0.71 | 0.71 | 0.71 | 0.71 | 0.72 | 110 | High | Upper middle |
| Guyana | 0.62 | 0.65 | 0.67 | 0.67 | 0.68 | 0.68 | 0.68 | 122 | Medium | Upper middle |
| Haiti | 0.44 | 0.47 | 0.49 | 0.50 | 0.51 | 0.51 | 0.51 | 170 | Low | Low |

[a]Adapted from UNDP (2020); World Bank (2021). This World Bank classification uses GNI per capita thus: low income—$1035 or less; lower middle-income—$1036 to $4045; upper middle-income—$4046 to $12,535; high-income—$12,536 or more

refer to Caribbean states in this piece, this relates to the independent states comprising the Caribbean Community (CARICOM),[1] predominantly former British colonies. However, the chapter still includes other island-states (e.g. the Dominican Republic and Cuba). Further, the chapter analyses Caribbean territories, meaning the overseas territories and jurisdictions of metropolitan states (e.g. France, the Netherlands, the UK and the USA) existing in the region, as these territories pursue similar strategies to sovereign Caribbean states, even in the absence of full autonomy.

As for SIDS, this category is recognised within the UN context coming out of the 1992 Earth Summit, as a special group of developing countries with mini populations but facing mega exposure to environmental hazards. The SIDS category combines 38 sovereign UN member states and 20 non-sovereign jurisdictions (UN 2021). As noted previously, the SIDS category also includes places that are not islands (Belize, Guyana, and Suriname). Half of the 58 SIDS are in the Caribbean, making this region that with the highest concentration of SIDS. Thus, the SIDS designation is especially important for the Caribbean. SIDS are also noteworthy within the context of sustainable development. The sustainable development-SIDS linkage commenced in earnest in 1994 with the Barbados Programme of Action for Sustainable Development of Small Island Developing States (UN 1994, 2021). Caribbean states, working alongside other island states, exercised their agency to help carve out this special category within the global economy. However, this SIDS category and its connection to sustainable development operates within limits.

[1]CARICOM members: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat (a British overseas territory), Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago. CARICOM also has five (non-sovereign) associate members: Anguilla, Bermuda, British Virgin Islands, Cayman Islands, and Turks and Caicos Islands (CARICOM 2021).

## 3 The SDGs and the Caribbean

The seventeen SDGs build on the previous eight Millennium Development Goals, providing a global roadmap for development that surpasses the conventional economic growth approach. Between 2015 and 2030 the countries of the world are expected to work in partnership for human and planetary well-being (UN 2015). The SDGs and related targets are meant to be complimentary and states are responsible for deciding how they will achieve the related targets. The SDGs express laudable aspirations for the world that shift focus away from the economic necessities of global capital that structure the GPE along the developed-developing country binary. The SDGs ask states to work to refashion the GPE to create a more equitable world and a healthier environment but these ambitions swim against the powerful tides of global capitalism underwritten by asymmetrical relationships of power among states.

As a region significantly affected by climate change and populated by SIDS, the environmental goals of the SDGs are prominent, specifically: goal 7—affordable and clean energy -; goal 13—action on climate change-; and goal 14—life below water. To reiterate, the SIDS status of Caribbean states and territories has, at least notionally, elevated the place of sustainable development in the region. Moreover, successive conferences to address SIDS in Barbados (1994), Mauritius (2004) and Samoa (2014) have reaffirmed the centrality of sustainable development for SIDS, invoking both national and global responsibilities. Despite the longstanding SIDS-sustainable development framework, sustainable development often contradicts the heavy emphasis on tourism driven economic development as practised across the region. Further, development efforts in the Caribbean seem less focussed on sustainability in the environmental sense than they are on sustainability in the sense of economic viability.

Although most states in the region have made strides in poverty reduction, addressing extreme hunger and the provision of education (SDG goals 1, 2 and 4), there is unevenness across the

region. For example, Haiti, though having pride of place for pioneering statehood in the face of racialised colonial opposition, remains one of the most impoverished countries in the world. Additionally, most Caribbean countries have significant work to do in addressing poverty, hunger, education, and health. The COVID 19 pandemic has exacerbated these problems.

The ILO notes that 38% of businesses in Barbados and 17% in Trinidad and Tobago ceased operations as of May 2020. It continues to note that unemployment and under-employment across the region negatively affected households surviving on less than minimum wage, increasing the number of such households from 19.9% in January 2020 to around 45.5% by April 2020. This pandemic has also shown the severity of food insecurity and agricultural deficiencies with survey data showing that over a third of vulnerable households reported experiencing hunger and more than half saw harmful declines in their nutrition levels (Garavito, Beuermann & Álvarez, 2020 in ILO 2020, pp. 17, 29–30). The COVID 19 pandemic has also worsened inequalities in access to education particularly considering unevenness in technology provision. Further, the negative consequences of COVID 19 on the achievement of goal 3, that seeks healthy lives and well-being, cannot be denied in this region plagued by non-communicable diseases. Indeed, CARICOM states have the highest morbidity rates from NCDs in the Americas (Healthy Caribbean Coalition 2017) and NCDs increase the morbidity of COVID 19.

Notwithstanding sustainable development commitments, it is clear to any analyst of the region that the thrust of Caribbean development has been economic growth. Additionally, much of the emphasis on growth has revolved around finding viable ways of earning through the establishment of foreign exchange generating sectors, since these states need foreign exchange to pay for imports and to service their external debts. So, Caribbean states tend to focus on SDG goals 8 (decent work and economic growth) and 9 (industry, innovation, and infrastructure). However, the implementation of even these has been thinner than required to meet the broader environmentally sustainable and socially inclusive expectations of the SDGs. Addressing poverty, unemployment, and the provision of social services across the region have all hinged on countries' abilities to grow economically or to access loans while manoeuvring crises. In essence, the approach to development focuses on the expectation of trickle-down effects from economic growth, combined with state efforts to offer social provisions to address material well-being. Cuba is perhaps the most notable exception to the economic growth focus. Nonetheless, even Cuba has increasingly pursued externally oriented growth focussed approaches, building a competitive tourism industry post-Cold War (Padilla and McElroy 2007).

The regional obsession with growth and foreign exchange using tourism and other rent seeking activities such as the offshore /international business sector or citizen investor programmes (CIPs) can contradict attainment of the SDGs. Moreover, the region's middle/high income profile has locked most countries out of access to concessionary financing (except for climate financing) that could assist the region in attaining the SDGs. However, these incompatibilities between Caribbean approaches to development and its difficulties in accessing financing raise larger questions about fit between the SDGs and the GPE. Although the SDGs offer useful aspirations, they run counter to a global capitalist system that thrives on inequalities, environmental degradation, and predatory competition. The SDGs avoid the heart of problems in the GPE. In this connection, the mode of integration of the Caribbean within the global economy becomes important to consider.

## 4 (Post-)Colonial Context and Caribbean Integration in the Global Political Economy

The colonial history of the region gives texture to its integration in the global economy. Caribbean countries were constructed predominantly on plantation slave labour systems as locations of

extraction for the metropolitan colonial centres based on low value mono-crop production. The mono-crop nature of these colonies left them heavily reliant on imports and thus, very open to international trade. Little thought was given to the humanity of those enslaved across the Caribbean. Similarly, little thought was given to environmental implications of exploitative colonial activities which used the land and sea towards the end of wealth accumulation of plantation owners and their financiers. These colonies were available to be stripped and deforested as needed for the construction of plantations pursuing commercial agriculture for export to the world's metropolitan sites.

With the end of slavery in the nineteenth century, the extractive system continued as did the neglect of the well-being of the formerly enslaved majority populations. Only from the twentieth century did colonial officials across the Caribbean concentrate on the living conditions of the region's people, following a series of uprisings across the British Caribbean colonies in the 1930s. Even the Caribbean states that were independent by the early twentieth century, such as Cuba and the Dominican Republic, faced extraction by foreign investors that dominated their economies in the early twentieth century. Again, social improvements were secondary considerations. The history of extraction, limited social emphasis, neglect of the environment and authoritarianism influences the present. The global system of colonial conquest, expansion and exploitation has been essential to structuring the globalized world capitalist system and asymmetrical power relations that enliven it today. Developing countries, including Caribbean SIDS, have been crucial in building out this system and SIDS are among the most open economies in the GPE because of these processes of world building.

Having attained independence, Caribbean states are expected to fend for themselves, but they remain predominantly reliant on a single externally dependent economic sector. Caribbean states have also lost access to assistance available to them during the East-West Cold War stand off and have lost much of the preferential market access for their agricultural commodities with the movement towards reciprocity in trade that accompanied the establishment of the World Trade Organisation. In response, Caribbean states have used creative strategies to traverse the global economy, being unable to produce most products on the scale required for meaningful earnings from either agriculture or industrial commodity production.

If one considers the approaches that Caribbean states have pursued to fortify statehood, the emphasis on clientelist bargains combined with foreign investment stands out as the dominant approach during the twentieth century and loiters into the present. Former British colonies in the region sought to reverse colonial neglect using patron-client approaches to provide employment, housing, access to education and contracts. States struck up a bargain that balanced labour demands with capitalist profit-oriented agendas, courting foreign investment in tourism, agriculture and, where relevant mining (e.g. Guyana, Trinidad and Tobago-oil, Jamaica -bauxite). Until the 1980s, this system was propped up by preferential market access for Caribbean agricultural products, accompanied by price supports and foreign aid (Constant 2003, pp. 6–7). This snapshot captures several analysts' assessments of the patron-client relationships that have defined Caribbean governance and development strategies (D'Agostino 2003, p. 123; Hinds 2019, pp. 69–70; Marshall 1998, pp. 64–65; Stone 2013, pp. 67–70). This approach, so visible in the English-speaking parts of the region, does not fully hold across the board though. For instance, the history of Haiti's overtly authoritarian political practices, quite notably under the Duvaliers from 1957 to 1986, directly contradicts the idea that there was any Haitian "populist-corporatist" bargain (Trouillot 2013). Moreover, the country's current dependence on foreign aid and non-governmental organisations that deliver core services, mark the relationship as quite different from those that typify the region (Reno 2003, pp. 443–444; Hinds 2019, p. 41).

As for Caribbean territories, though affixed to industrialised states, these entities exercise autonomy and are expected to be generally self-

sustaining. The Puerto Rican model of development, important particularly during the mid-twentieth Century, illustrates an effort to engender economic viability using investment from the US mainland. This model, as innovated by Sir Arthur Lewis' so-called industrialization by invitation, was also tried across the Caribbean. The Puerto Rican focus on tourism, despite accounting for a far smaller share of GDP than characterises most of the region (around 10%), also aligns with the wider Caribbean tourism strategy (Croes and Rivera 2010). Further, the responses by the US Federal Government to Puerto Rico during the global financial crisis and following hurricane Irma, illustrate that this country too must navigate crises similarly to neighbouring independent states (Cortés 2018; Bonilla 2020). The development and marketing of tourism in the Netherlands Antilles also reflects the way in which these territories must find ways to support themselves and have pursued strategies akin to those of independent states in the region (Vanegas Sr and Croes 2003). We can further extend this parallel to the British Virgin Islands, that have gained some notoriety for the development of their offshore financial sectors, again as part of a strategy for viability and for working within the spaces that the GPE offers tiny jurisdictions. Like Puerto Rico, these jurisdictions and the US Virgin Islands have also taken advantage of tourism (Bresson and Logossah 2011).

In brief, Caribbean states and territories tend to focus their strategies on staying afloat in ways that are more influenced by their integration in the GPE than they are by the SDGs or other sustainability principles. Tourism has been the life raft of economic viability drawing on fine weather and the trope of the region and its people as exotic. Where countries possess mineral wealth, they extract this to their benefit. Otherwise, countries focus on 'clever' strategies that function within the gaps of permissibility in the GPE, invoking the trope of illegality (Baldacchino 2014; Hinds and Lorde 2018). Here I refer to offshore/international business sectors and citizen investor programmes (CIPs) as noteworthy examples.

One analyst describes the strategies of SIDS as 'pseudo-development' approaches in which they "…scramble to exploit one niche or opportunity, then another, moving as nimbly as possible from one to the next, or from one crisis to the next, as one dries up and (hopefully) another presents itself" (Baldacchino 2014, p. para. 3). In essence, Caribbean states and territories tend to focus keenly on remaining viable within a global economy in which they are of limited significance because they have tiny markets and lack economies of scale. Ironically, their pursuit of the SDGs is contingent on their ability to remain viable. Hence, these countries pursue the SDGs, to the extent that this pursuit is compatible with their navigation of the GPE. Human development and income statuses of Caribbean states then, are not so much linked to sustainable development as they are to the coloniality of operating within a global capitalist framework which opens specific spaces for them. What is more, Caribbean states have seen the costs of breaking with their placements within the world system. The 1980s US intervention in Grenada, the continued US embargo on Cuba, and the Haitian experience after daring to seek independence in the highly racialised colonial era are among those that discipline Caribbean states. Caribbean states can move beyond their placements as sites of extraction or playgrounds but at their peril. Therefore, they generally find ways to work through available spaces, playing to their strengths within the GPE by using 'pseudo-development' strategies that keep them awkwardly afloat.

## 5 Caribbean Tourism and the SDGs

Tourism has been the pillar of most Caribbean economies but its exposure to external demands, tastes and shocks causes it to be a somewhat unstable pillar. During the twenty-first century alone, Caribbean tourism has faced earning slumps following the 9/11 terror attacks, during the 2008/2009 global financial crisis, and most dramatically during the COVID 19 pandemic.

Still, the Caribbean is the most tourism intensive and tourism dependent region in the world, in terms of the value of economic contribution that this single sector provides (Cannonier and Burke 2019, p. 86; CTO 2020, p. vii).

Cannonier and Burke offer that tourism in the Caribbean drives economic growth and increases the money supply (p. 86). Bangwayo-Skeete and Skeete confirm this, noting that the sector has built service economies out of previously agrarian ones, improves living standards, creates jobs, and earns foreign exchange (2020, p. 4). Studying fifteen Caribbean states tourism performances between 1980 and 2015, Cannonier and Burke find that the sector generates employment, income and indirectly facilitates state investment in the health and education sectors. They reveal that a 1% increase in tourism can lead to economic growth of between 0.03% and 1%, depending on the country (Cannonier and Burke 2019, pp. 103–104). Other studies validate the tourism-economic growth connection and thus indicate that policy emphasis on tourism for economic development in the Caribbean has its merits (Lorde et al. 2011; Simundic et al. 2016; Vanegas Sr and Croes 2003). All the same, the emphasis on tourism does not necessarily redound to sustainability.

Speaking of the alignment between Caribbean tourism and the SDGs, two authors opine that: "There are inconsistencies across the Caribbean in designing new products and services that contribute to sustainable development and support for the SDGs." (Nair and Mcleod 2020). Of note is the fact that the Caribbean tourist industry is particularly vulnerable to the sea level rise consequences of climate change because coastal tourism dominates the region's tourist offerings (Scott et al. 2012, p. 885). Despite studies highlighting the implications of beach erosion and sea level rise for coastal tourism dating as far back as the late 1980s, this element of tourism development remains dominant in the region, with Scott, Simpson and Sim recording some 906 coastal properties across 19 Caribbean states and territories in 2012. They project that Anguilla, Belize, British Virgin Islands, Saint Kitts and Nevis, and Turks and Caicos Islands could lose about half of their coastal tourism properties with devastating economic repercussions, with a 1 m rise in sea level (Scott et al. 2012, pp. 891, 895). However, the guiding focus in Caribbean tourism has been marketability and profitability for the near to medium term.

To be fair, there have been region-wide efforts to encourage sustainable tourism and to develop a Caribbean policy approach. The 2005 *Caribbean Sustainable Tourism Policy Framework,* refashioned in 2020 under the same name, is worthy of note in this respect (CTO 2005; CTO 2020). Moreover, the United Nations World Tourism Organisation (UNWTO) has sought to provide a global framework to guide countries towards realising sustainable tourism sectors and products (UNWTO, UNDP 2017). Yet, across the region's states and territories, the approach to tourism remains largely focussed on commercial imperatives that have not mainstreamed either sustainability or development in the sense of the SDGs. Tourism remains a sector which can be both extractive and dirty, thus failing to address SDG 12 regarding sustainable patterns of consumption and production. The cruise tourism industry for example is known for posing harms via its disposal of waste in the Caribbean Sea (CTO 2020, p. xiv). However, the lucrative nature of Caribbean tourism within a mono-industry framework allows such practices to persist.

Caribbean states and territories will need to diversify their tourism offerings to adjust to volatility in tourism demand and to address the potential damages to their conventional tourism products that climate change may bring. Working towards the SDGs makes sense for tourism. The COVID 19 pandemic has brought some diversification, with emphasis being placed on attracting long stay visitors and digital nomads who can work remotely from the region during COVID lockdowns (Wyss 2020; Scott 2021). Nevertheless, limited diversification of Caribbean economies means that crises such as this pandemic put the region under severe financial stress, the competitive global economy placing further strictures on Caribbean SIDS. Yet, it bears repeating that Caribbean states do exercise agency in

the GPE as their 'clever' efforts at carving out rent-seeking sectors that can generate useful revenue show.

## 6 Rent Seeking: Offshore, Citizen Investor Programmes and the SDGs

An IMF study notes that Bahamas was the first location in the Western Hemisphere to house an offshore operation beginning with British and Canadian companies providing services to their wealthy clients in 1936, after which such operations began to develop in Anguilla, Cayman Islands, the British Virgin islands and then across much of the English-speaking Caribbean from the 1980s onwards (Suss et al. 2002, p. 4). Offshore sectors can comprise activities such as registration of international companies including shipping companies which then fly 'flags of convenience'; facilitating some administrative element of the work of multinational corporations; allowing firms and wealthy individuals to change their location to avoid the types or levels of regulation and taxation that they would face elsewhere. Legal and accountancy skills facilitate these activities and Caribbean states have been able to provide such skills to their benefit (Marshall 2007, p. 931). Companies operating in this sector also generate spill overs in tourism and the telecommunications sectors (Suss et al. 2002, p. 6).

The GPE has created a space for these offshore or international business activities which are able to generate foreign exchange with relatively low levels of capital investment, and Caribbean states and territories capitalise on this space. In Vlcek's evaluation, both British laws in the nineteenth century that facilitated "offshoring" and the nomadic character of capitalism facilitated the development of the region's international business sectors. Notably he observes that the capitalist profit motive cleverly encourages its participants to be self-seeking in pursuing loopholes that facilitate profit maximization (Vlcek 2009, p. 1468). It is these elements of capitalism that facilitate the development of offshoring and Caribbean states and territories have exercised their autonomy to benefit from such opportunities that capitalism presents. As I have stated elsewhere "The Caribbean has simply become a location in which states and territories use their sovereignty or their offshore character (in the case of non-sovereign jurisdictions) to participate in these economic options for their internal economic viability" (Hinds 2020, p. 131)
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Although having autonomy to operate these sectors, the region finds itself continually under surveillance and disciplinary efforts by the wealthy states of the world. This surveillance has been variously linked to money laundering related to the war on drugs, terrorist financing post 9/11 and continues. The aptly racialised "blacklisting" that countries have faced at the hands of the OECD, EU, USA and Canada during the late 1990s, and during the twenty-first century is the chief vulnerability that this sector faces. Caribbean countries have attempted compliance to keep these sectors alive but continue to find themselves on these unfavourable listings (Saunders 2018; Bartoszewsk and Morriss 2020). The disciplinary work of bringing taxes back on shore and rebuking activities offshore, threatens to close this Caribbean sector. The ability of these sectors to meaningfully contribute to the SDGs, again outside of goals 8 and 9 (decent work and economic growth, and industry innovation and infrastructure), is unclear unless the hope is that economic gains will fund other SDG efforts.

To offshore activities that attract international attention and suspicion, one can add CIPs that exist in five Caribbean states, Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis and Saint Lucia. These programmes contribute inflows of foreign exchange and avenues out of financial strain. Saint Kitts and Nevis launched its CIP in 1984 as the world initiator of such programmes (Hinds and Lorde 2018, p. 42). CIPs accounted for around 10% of Dominica's GDP in 2017, 40% in Saint Kitts and Nevis between 2014 and 2015 and in Antigua and Barbuda, around 25% of GDP in 2015 and 20% in 2017 (Hinds and Lorde 2018, p. 40). Unlike offshore/international business though, these CIPs seek investment, in exchange for passports

and citizenship, towards national development or real estate funds. The focus again is on economic and infrastructural development (SDG goals 8 and 9). However, the fund in Saint Kitts and Nevis is at least a Sustainable Growth Fund. CIPs do offer potential for being aligned with SDGs, being paid specifically into development funds. In fact, when Antigua and Barbuda, Dominica and Saint Kitts and Nevis were severely damaged by Hurricane Irma in 2017, they used these funds to help finance their recuperation. Nevertheless, in seeking to attract investment for recovery, Antigua and Barbuda dropped its investment level for a family of four from US$250,000 to US$125,000, just above the rate of US$100,000 in Dominica. These CIPs are some of the most affordable in the world and raise fears that they can be used by nefarious actors laundering money, evading taxes, or engaged in other unsavoury acts (Hinds and Lorde 2018, pp. 40–41). As such the OECD has listed all these Caribbean CIPs and even residency programmes in Barbados, Bahamas and Turks and Caicos Islands, that are not generally classified as CIPs, as high risk and as encouraging tax evasion (OECD 2021; Garside 2018). Such actions threaten the marketability of CIPs.

Like offshore/international business activities, CIPs developed to take advantage of opportunities that the GPE offered, specifically in this case the market for multiple citizenships in a globalising world. The CIP strategy has been a clever one and has assisted these states in weathering both the global financial crisis and the hurricane that they faced during 2017. However, CIPs are capricious, contingent on demand and threatened by policing of such activities by outsiders. Hence, their ability to support the SDGs or even continue to feed economic viability remains suspect.

## 7 Conclusion

The COVID 19 pandemic all but halted global travel with deleterious effects on Caribbean tourism. The ripple effects of this shock cannot be overstated for a region that relies heavily on just one or two sectors. Yet, the COVID 19 pandemic is but one, though to date the most severe, of the crises that Caribbean states and territories must find ways to exist through and between. Climatic shifts, natural disasters, financial booms and busts, fluctuations in world market prices and global health crises are all par for the course for the region's people and countries' debt profiles. This is the nature of Caribbean existence and has intensified in the present globalized era.

Caribbean countries have found ways to make it through, generally doing well among developing countries. However, their manoeuvrings for survival, keep them ever on the cusp of both improving their fortunes and harming them. Their fetishization of economic growth and earning foreign exchange is driven by their external exposure, and trade openness in particular, facets of their smallness and colonial legacies of overspecialization in one economic area. This obsession and the strategies and policy options that it creates, can contradict some efforts to achieve the SDGs. Despite repeated commitments, voicings of support and the creation of policy documents, Caribbean states and territories seem to respond mostly to the imperatives of economic viability as structurally dictated by their placement in the GPE, bobbing and weaving between crises. Moreover, the SDGs themselves require states to swim against the tide, seeking actions and results that contradict global capitalist forces. However, the COVID 19 pandemic may force some recalibration.

This pandemic offers an opportunity for the Caribbean and for the world to re-order priorities towards human well-being, as the SDGs require. It is here that Caribbean states and territories can activate their agency to review their strategies for existing in the world. Caribbean states and territories should move beyond contemplation of different ways of generating growth and maintaining livelihoods to implementation. COVID 19 has revealed the need for countries in the region to intensify initiatives that generate food security in agriculture and to increase other forms of local production. This domestic production should be linked to foreign exchange earning sectors, especially tourism, to kick start elements of sustainability. Caribbean countries could also benefit

from taking this moment to be more serious about the employment of renewable energy resources, which the region possesses in abundance, across households and in all sectors. Countries in the region cannot hitch their fates to initiatives such as CIPs or the offshore sector. This said, there may be space for these areas once the Caribbean is treated equitably rather than being over-policed in the global economy in ways that reproduce and draw on tropes that portray the region as a space of 'illegality". The Caribbean will likely always comprise open economies because of small size but, countries can seize this period of tumult presented by the COVID 19 pandemic to redress the unsustainable imbalances that have flowed from openness. Moreover, Caribbean states can continue to pursue and expand the use of novel options such as natural disaster clauses in loan arrangements and in seeking differentiated treatment in the global economy.

At this juncture it is critical that Caribbean people make demands on their states and the international community in pursuit of development that is truly sustainable. Yet, in the moments ripe for change, there are also moments ripe for continuity, and without dramatic changes to Caribbean systems of patron-clientelist governance and to the structure of the GPE, one wonders which will win the day. One author asks: "How could one not argue the case that global neoliberalism since the beginning of the 1980s has severely damaged not just regional economies but imaginations, the very dreams of transformation articulated in the past?" (Kamugisha 2019, p. 3). Whether Caribbean imaginative energies can be invigorated towards seizing this moment will be critical. Further, although the world may change in its uptake of technology across diverse areas of life or in requirements for travel, whether the structures that lock SIDS into vulnerability will change, is another story critically requiring SDG goal 17, that is global partnership, but global partnership towards a radical rebuild of the global economy. For Caribbean countries to receive the support they need to move away from contradictory approaches to growth that tend to negate the pursuit of sustainability, there would need to be shifts in the global economy that would accommodate more socialised or embedded liberal approaches to operating in the global economy. Whether the global partnerships required under SDG 17 can bring this, is to be seen.

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# 5 Sustainable Water Resource Development in the Lower Mekong Basin: Synergies and Trade-Offs across Borders and Sectors

Han Phoumin, To Minh Thu, and Thim Ly

**Abstract**

This chapter uses the results of the past two assessments of basin-wide water resource development scenarios to analyze potential benefits for economic development to meet the ambitious goal of the Lower Mekong Basin (LMB) countries for poverty reduction and, at the same time, analyze risks of potential trans-boundary trade-offs which will require appropriate mechanism to be in place. The scenario assessment results present both opportunities and risks associated with different levels of water resource development in the Mekong countries and its implications of the water diplomacy for both Lower and Upper Mekong basin. Each of the scenario results presents the trans-boundary trade-off which requires appropriate skills, capacities of the LMB riparian countries, and water diplomacy to discuss and negotiate for the solutions. Finally, this chapter provides some suggestions and policy implications for sustainable water resource development in the Mekong region.

**Keywords**

Scenario formulation · Socio-environmental impact assessment · Sustainability index · Transboundary conflicts · Water diplomacy

## 1 Introduction

The Mekong River basin has long been a beautiful, fertile region that is rich in resources. It is the source of many productive activities such as fishing, agriculture, hydroelectric power, transportation. Nowadays, however, the construction of dams and other projects, development and high population pressure, lack of proper management of water resources, and lack of cooperation amongst riparian countries have resulted in rising complications in water quantity and quality, biodiversity loss, and disasters such as drought and flooding. Water management in the Mekong region has, in practice, been dominated by energy and food objectives in an uncoordinated manner leading to the rapid degradation of water resources.

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In July 2019, the lowest water levels in history were recorded at all monitoring stations in the mainstream, and the amount of water flow dropped by 70–75% from the average of the same period in 2018. Moreover, the flood cycle has become irregular, severely affecting fishing, agricultural production, and people's lives. Amid these many challenges, there are opportunities in water resources management through the application of new technology in energy and agricultural production and better cooperation in water management amongst riparian countries. In fact, regional cooperation in the Mekong basin has become increasingly dynamic in recent years with the emergence of a new mechanism and the reshuffle of existing ones. Cooperation mechanisms amongst riparian countries and with external partners have provided platforms for the discussion of regional issues, including water resources management and sustainable development.

This chapter identifies major challenges in water resources development, using scenarios for foreseeable water resources development and planning, and evaluates the current Integrated Water Resources Management (IWRM) tools used in the Mekong and the water resources procedures of the Mekong River Commission (MRC). The chapter then explores ways to improve coordination amongst riparian countries and amongst water use activities in the region.

## 2 Challenges to Water Security in the Mekong River Basin

The Mekong River is the world's 12th longest river, at almost 4763 kilometres, flowing from the Tibetan Plateau in China at an elevation of about 5000 m. In China, the river runs through Yunnan Province and is known as the Lancang River. After leaving China, it flows through Myanmar, the Lao People's Democratic Republic (Lao PDR), Thailand, Cambodia, and Viet Nam into the sea. In this chapter, we use the name Mekong for both the upper and lower parts of the river. Throughout history, the river basin has been home to millions of people in its riparian countries. The river has been the source of food (rice, other crops, fish, etc.) and waterways for its people. Rice dominates agricultural production, at both the commercial and household levels. The Lower Mekong countries produced more than 109 million tons of paddy rice in 2017, with Viet Nam, Thailand, and Myanmar being the fifth, sixth, and seventh largest rice producers in the world, respectively. Furthermore, Thailand and Viet Nam are the second and third largest exporters in volume, and Cambodia is the eighth largest exporter (Statista 2018). Most rice production in the region is traditional lowland cultivation, in which water is the single most important component for production and the Mekong water is truly a valuable resource.

Total catches and production from Mekong fisheries (including aquaculture) totalled about 3.9 million tonnes in 2008, of which about two million metric tons were from capture fisheries. Fisheries account for nearly 12% of Cambodia's gross domestic product (GDP) and contribute more to the country's economy than rice production. In the Lao PDR, the fisheries value is equivalent to 7% of the country's GDP. Although proportionally less significant to the national economy, the Mekong fishery sectors in Thailand and Viet Nam add well over $750 million to their GDP each year. Millions of people rely on subsistence fisheries for food security, and fisheries support tens of thousands of businesses—from shops and food stalls that supply fishing families to boat builders and fishing gear suppliers. Capture fisheries make the largest contribution to the Mekong's fishery sector. In 2008, production was estimated at about 1.9 million metric tons, five times more than in 2000. About 1.6 million metric tons originate in the Mekong Delta in Viet Nam. The production of inland aquaculture in Cambodia, the Lao PDR, and Thailand is also increasing, but remains less important than capture fisheries (MRC 2018a).

The Mekong basin has considerable potential for hydropower development, serving both domestic and export markets. The Upper Mekong Basin in China has estimated hydropower potential of nearly 30,000 megawatts (MW), equivalent to that of all five Lower Mekong Basin

(LMB) countries (MRC 2010a). Unfortunately, this distinguishing feature is also the source of complications that have arisen in the past few decades. In 1986, China started damming the Lancang, its section of the Mekong, with Manwan Dam. Since then, it has completed another 10 mega-dams on the Lancang. The northernmost of the dams is Yunnan's 990 MW Wunonglong Dam, high in the Himalayas of the Diqing Tibetan Autonomous Prefecture, which was completed in 2019. The southernmost one in Jinghong is near the lush forests of Xishuangbanna. Apart from China, the Lao PDR possesses two hydropower dams—the Xayaburi Dam and Don Sahong Dam—in the mainstream of the Mekong. Thanks to its favourable geographic position, the Lao PDR has strong hydropower potential and it considers earnings from exports of hydroelectricity as a means to leapfrog development and reduce poverty. Indeed, hydropower is a lucrative sector, and the governments and media of countries with the potential for dams promote hydropower as a source of green and clean energy, superior to dangerous or polluting coal-based energy (Yoshida et al. 2020). However, dams bring various challenges such as deforestation, relocating local residents, designing dams that can facilitate the flow of fish and sediment, and coordinating operations.

In fact, the Mekong River basin faces a multitude of problems, such as changes to its natural flow, severe and more frequent droughts and floods, loss of sediment, biodiversity degradation, and saltwater intrusion, which could be aggravated in the future unless appropriate solutions are applied. Alterations to the natural flow regimes of the river and streams, with increased dry season flows and decreased wet season flows, have been recorded in riparian countries, as evidenced at Chiang Saen where the Mekong enters the Lower Basin.[1] In addition, riparian countries have suffered the adverse impacts of more acute droughts. To illustrate, the 2019 drought has brought the Mekong water level across the basin to a record low since June, with a serious inflow deficit to the Mekong compared with the yearly average – lower than ever recorded since measurements began 60 years ago. Besides, floods have worsened the state of the basin, putting the livelihoods of tens of millions of people living and working along the river in jeopardy. Another critical problem is sediment reduction, which is projected to drop by as much as 67% in 2020 and 97% in 2040 in the Mekong Delta (MRC 2018b). The sedimental poverty is likely to have detrimental effects on the agricultural productivity, geomorphology, and persistence of the delta landform (MRC 2018b). Under the impact of natural disasters and human exploitation, the basin is undergoing substantial loss of biodiversity. According to the WWF, the Greater Mekong Subregion (GMS) risks losing more than a third of its remaining forest cover within the next two decades (WWF 2020). Salinity intrusion in the Lower Basin in general and the Mekong Delta in particular has occurred earlier and deeper than in the 2015–2016 dry season, the period of historic salinity which caused $646 million of damage to the delta. In fact, saltwater intrusion has been very high since December 2019 and is projected to rise with high tides (Vietnam Disaster Management Authority 2020). It can be said that the severity is caused and exacerbated by both natural phenomena such as climate change and human activities such as the construction of dams.

The operation of upstream hydropower dams is seen as a catalyst for dramatic fluctuations in river levels and changes in the natural cycle of the river (Bainbridge and Vimonsuk 2020). The ecosystem deterioration is also imputed to hydropower projects, as these dams prevent the migratory pathways of fish and capture sediment behind their walls. An empirical study showed that more than half of the Mekong's 165 million metric tons sediment load has been trapped by 11 mega-dams on the mainstream in China (East–West Center and The Stimson Center Southeast Asia Program 2020). This aggravation of the Mekong spurs the active engagement of relevant stakeholders to ensure sustainable water use management, for the security and prosperity of the whole basin.

[1]For further details, see Basist and Williams (2020).

## 3 Scenarios Formulation for Impact Assessment

The Mekong River Commission Secretariat (MRCS) had undertaken two major studies of the basin-wide scenario assessment. The first scenario assessment was conducted in 2009 to prepare the basin-wide development strategy in which the study uses the CIA approach to assess the social, environmental, and economic impacts in the lower Mekong countries of Thailand, Lao PDR, Cambodia, Viet Nam. The assessment uses the Net Present Value to estimate positive and negative impacts on different sectors. The second study used a slightly different approach. Based on the results of the first study it examined the relationship and intensity of the impact of one sector investment on the other sectors.

### 3.1 The Scenarios Formulation: The First Basin Impact Assessment

The study included 13 scenarios. A comprehensive presentation is not possible here due to space limitations, but the scenarios could be broadly classified into three groups based on time and levels of intervention:

**The Definite Scenarios**—developments within the Upper and Lower Basins that were already under implementation and were in place in 2010. These include the completion of six of the cascades of hydropower dams on the Lancang River, referred to as the Upper Mekong Dam Scenario (UMD), and the completion of 25 hydropower projects in the tributaries of Lower Mekong Basin (LMB), which together with the UMD comprise the Definite Happening Scenario (DH).

**The Foreseeable Future Scenarios**—which comprise the developments in the DH plus the developments which each country has put forward as being within their plans to implement within the next 20 years. These comprise further hydropower development in the tributaries and on the mainstream and irrigation development. The scenarios have been structured to investigate the alternative impacts of these developments with and without different combinations of mainstream dams. In addition the Foreseeable Future Scenarios also consider various flood management projects within the Cambodian—Viet Nam floodplain

**The Longer-term Scenarios**—which represent a plausible continuation of the Foreseeable Future with the main purpose to examine the longer term hydrological changes and associated environmental impacts. These also comprise full potential developments in all sectors to explore the impacts of this very high level of basin development.

### 3.2 Scenarios Formulation: The Second Basin Impact Assessment

Through a series of national and regional stakeholder consultations, three main scenarios were considered and assessed for potential future planning in the LMB. Those scenarios were (a) an early development scenario (2007) or M1 scenario, (b) a definite future scenario (2020) or M2 scenario, and (c) a planned development scenario (2040) or M3 scenario. Each formulated scenario has a basin-wide scope and is composed of project developments. These developments were introduced as composite changes to an assumed *reference period*, which is defined by a 24-year time series from 1985 to 2008 of hydro-meteorological data (rainfall, evaporation, boundary water levels, etc.) broadly representative of the historic natural flow conditions of the Mekong River. The historical period was calibrated using a range of *exogenous drivers* that are not directly linked to the water infrastructure investments in the scenarios but have substantial influence on livelihoods; sustainability; and social, economic, and ecological conditions. Trends were statistically estimated for these exogenous drivers, which include population growth for each of the member countries at the level of the LMB. The combination of past hydro-meteorological data (or

patterns) and trends of exogenous drivers define the M1 scenario.

### 3.2.1 Early Development Scenario (2007)—M1 Scenario

The M1 scenario aims to assess the distribution of the benefits, costs, impacts, and risks of water resources development in the Mekong Basin as of 2007. The scenario defines the state of water infrastructure development as it was in 2007 when the flow regime of the Mekong mainstream was considered to be still in a natural state, except for the influence of Chinese dam impoundments in the Upper Mekong or Lancang River. The scenario includes the infrastructure and land use/cover changes as of 2007. In addition to modelling with the decision support framework, the impact assessment of the early development scenario was based on existing observations, studies, and assessments of historical changes in land use, development of (irrigated) agriculture, flood control structures, wetland areas and biodiversity, capture fisheries, and livelihood and well-being indicators. The assessment results allowed the member countries to consider whether the benefits, impacts, and risks of new water resources development are reasonable and equitable.

### 3.2.2 Definite Future Scenario (2020)—M2 Scenario

The M2 scenario aims to assess the distribution of the benefits, costs, impacts, and risks of water resources development in the Mekong Basin in 2020. The scenario includes all existing infrastructure development of hydropower to be in place by 2020. The impacts (positive and negative) of this scenario are inevitable (but negative impacts can be mitigated).

### 3.2.3 Planned Development Scenario (2040)—M3 Scenario

The M3 scenario aims to assess the distribution of the benefits, costs, impacts, and risks of water resources development in the Mekong Basin in 2040. In addition to the development in the M2 scenario, the planned development scenario includes all water resources development that is planned in the Mekong Basin. On a timescale, the scenario covers the water resources development that would be in place by 2040 if these plans were fully implemented. The formulation of the three main sub-scenarios was considered, building from the M3 scenario, in response to key policy questions arising from the stated objectives and interest of the riparian states as a result of climate change (M3CC), the high level of irrigation development, and flood protection, in addition to what is assumed under the M3 scenario.

Given the situation described above, there has been increasing pressure from the basin countries and project developers for the provision of an integrated basin perspective against which national plans and proposed projects can be assessed to ensure an optimal balance between economic, environmental, and social outcomes, and mutual benefits to the LMB countries. Table 5.1 presents the selected priority indicators for Cumulative Impact Assessment (CIA) that picked by disciplinary experts in social, environmental and economic framework.

Based on this framework, the scenarios (M1, M2, M3, M3CC) were assessed across three groups of indicators: social, environmental and economic. The scope of the assessment looks into the impacts on sustainability, cross-sector effects, and on transboundary effects. The results allow a direct comparison of all the main scenarios and sub-scenarios for each of the three indicators. The combination of the quantitative results and the more qualitative synthesis shaped a more robust and consistent assessment approach. The Delphi approach is also deployed for the expert judgment, trying to quantify the impacts based on the knowledge and experience of the experts from the riparian countries of the Mekong.

### 3.2.4 Sustainability Index

The sustainability index was based on the subset of Sustainable Development Goals (SDG) indicators, as listed in Table 5.2. Each indicator was assigned a sustainability value between zero (unsustainable) and one (highly sustainable). The sum over all sustainability indicators could then be compared across scenarios and the index analysed to identify which scenarios lead to sustain-

**Table 5.1** Selected indicators for CIA assessment framework

| Assessment approach | Dimensions | Strategic Indicators | |
|---|---|---|---|
| | | CIA Indicator Framework | MRC Indicator Framework |
| Qualitative & Quantitative synthesis | Social | Well-being<br>Employment | Living conditions and well-being<br>Employment in MRC sectors |
| | Environmental | Water flow conditions in mainstream<br>Water quality and sediment conditions in mainstream<br>Status of environmental assets | Water flow conditions in mainstream<br>Water quality and sediment conditions in mainstream<br>Status of environmental assets |
| | Economic | Economic value of MRC sectors<br>Contribution to national economy in terms of GDP | Economic performance of MRC sectors provided in Table 2.<br>Contribution to national economy |
| | Integrated | Resilience; Vulnerability | |

ability improvements or to sustainability losses. The vulnerabilities are linked to stressors related to environmental, social, and economic dimensions: (a) Environment (deforestation, loss of wetlands, intensification and increasing frequency of floods, depleting fish stocks, water quality decline, eroding riverbanks), (b) Social (declining food security, migration pressures, public health concerns, cultural identity due to activities or landscapes), and (c) Economic (income security based on existing livelihoods, crop prices, land title security, new livelihoods opportunities, market access conditions). Mekong basin communities can face a diversity of stresses depending on their location and their livelihood diversification strategy.

### 3.2.5 Cross-Sector Impacts

Cross-sector relationships can be positive or negative. Typically, positive cross-sector relationships are referred to as synergies. This implies that investments in one sector achieve improvements in this target sector, but also trigger improvements in one or more other sectors. Negative cross-sector relationships imply trade-offs. Investments in one sector lead to improvements in the target sector, but trigger losses in other sectors. Based on this understanding, the cross-sector indicator was calculated as the value improvement or value loss for each sector by comparing across the entire set of development and sub-scenarios. For instance, the comparison of hydropower output (in economic value) in scenario M1 (water infrastructure

**Tab. 5.1** (continued)

| | | | |
|---|---|---|---|
| **Quantitative analysis** | Integrated | Resource sustainability<br>Cross-sectoral synergies<br>Transboundary balance | |
| **Scenario comparison** | Climate change | | Greenhouse gas emissions<br>Climate change trend and extreme events<br>Adaptation to climate change |
| | Cooperation | | Equity of benefits derived from the Mekong River system<br>Benefits derived from cooperation<br>Self-finance of the MRC<br>Level of information sharing and participation |

Source: MRC, 2017

situation in 2007) and M2 (planned water infrastructure situation for 2020) results in what is gained for the hydropower sector through the additional investment defined by the 2020 scenario. This can be calculated for all sectors based on the outputs of the macroeconomic assessment approach. Dividing the sectoral value differences leads to an important insight:

(Fisheries Sector [M2] – Fisheries Sector [M1])/(Hydropower Sector [M2] – Hydropower Sector [M1])

The proportional relationship defines how much is gained or lost in one sector (e.g. fisheries) for every dollar gained in another sector (e.g. hydropower). For example, if the macroeconomic assessment indicated that the hydropower sector output increases in the 2020 scenario by $100 million and the fisheries output decreases in the same scenario comparison by $50 million, then the result shows that for every dollar gained in hydropower about 50 cents are lost in fisheries. Comparing all sectors identifies not only synergies and trade-offs but also how synergies and trade-offs shift as investments gradually increase or shift between sectors. From a wider systems perspective, these results can guide the management of cross-sector trade-offs and the realisation of conceivable synergies.

### 3.2.6 Transboundary Impacts

The transboundary impacts were calculated as the ratio of the two previous composite indicators (sustainability and cross-sector relationship) that can be attributed to the change in any of the three other countries. In other words, this indicator calculates (a) which percentage of the sustainability index change is due to transboundary impacts and (b) which percentage of cross-sector synergies/trade-offs is due to transboundary impacts.

Methodologically this was achieved in four steps. First the weight of each sector (shown in Table 5.2) was calculated for each scenario. Second, the scenario investment was mapped to its geographic location and communities are grouped into corridor zones. Third, the two values were multiplied with each other to gain sector-country coefficients. Then, the coefficients were multiplied with (a) the sustainability index change and with (b) the cross-sector effect. The result shows how much of the sustainability index change (comparing two scenarios) is due to transboundary effects and how much of the cross-sector synergy or the cross-sector trade-off results from investment in other Member Countries.

## 4 Key Results in Water Resources Development Scenarios in LMB

The current well-being of the Mekong people is relatively poor, and these millions of poor people exploit the natural resources of the Mekong Basin for their food security and livelihoods. At the same time, in response to the power demand to meet the energy consumption of Southeast Asia's emerging economy and to address the ambitious poverty reduction of the LMB, the LMB countries are looking at all possibilities—including the use of the Mekong water resources for generating income as well as poverty reduction to meet the Sustainable Development Goal (SDG) targets. The Mekong countries are seriously considering the possibility of developing hydropower because of the predicted increase in energy demand in Southeast Asia (predicted to almost double from 2015 to 2040) to meet the growing economy of southeast Asia, geopolitical dependency on oil in the Middle East, and global renewable energy trends (Han et al. 2019). In addition, the level of water resources development is clearly driven by markets and the private sector while most governments consider it fit for purpose for common goals.

Below sections are key results of the 2 scenarios assessment done by MRCS so far:

### 4.1 Results of the First Basin Impact Assessment

Table 5.3 summarises all the results of the scenarios in the first basin impact assessment

#### 4.1.1 Definite Scenario

The Definite Scenario creates a very significant change in flow regime by 2015–2020, caused mainly by the new storages being developed in China. These changes are inevitable and irreversible and bring about a departure from the natural flow regime, which hitherto has remained unchanged in the mainstream for over a century, notwithstanding the changing landscapes within the catchment over this period (the retention of runoff by forests having been replaced by the retention of rice fields in many areas).

The new storages in the UMB, supplemented by current but less significant development of hydropower reservoirs in the LMB, will cause dry season flows to increase and flood flows to decrease. An irreversible process of long term geomorphological adjustment, whilst locally significant in some locations in the short term, will be become more noticeable after 20 years.

This increase in dry season flows will be sufficient in volume to support all of the expanded mainstream irrigation proposals in the 20-Year Plan Scenario.

The irreversible changes in flow regime will result in a significant reduction in natural flooding which will diminish the productivity of wetlands and capture fisheries, as well as species diversity. Flooding extent will reduce by 249,000 ha or 5% in the LMB: in Lao PDR with 64,000 ha or 16%, in Thailand with 64,000 ha or

**Table 5.2** Indicators adopted and prioritized by MRC Member Countries

| | Lower bound | Upper bound | Priority |
|---|---|---|---|
| **Economic indicators** | | | |
| Economic loss due to disasters & *shocks* in % of GDP | 10% | 0% | High |
| Average farming household income | $3000 | $30,000 | High |
| Energy intensity (primary energy MJ per $ GDP) | 10 | 2 | Medium |
| Annual growth rate of real GDP per capita | −5% | +7% | Medium |
| Proportion of domestic budget funded by domestic taxes | 10% | 90% | Low |
| Foreign direct investments in % of total domestic budget | 1% | 5% | Low |
| Tourism as a proportion of total GDP | 5% | 20% | Low |
| **Social indicators** | | | |
| % of population below national poverty line | 50% | 0% | High |
| % of population with low food security | 50% | 0% | High |
| Loss of human life due to disasters | 1000 | 0 | Medium |
| % of population undernourished | 75% | 0% | Medium |
| % of population with access to electricity | 30% | 100% | Medium |
| % of people living below 50% of median income | 50% | 5% | Medium |
| % of children under 5 with malnutrition | 50% | 0% | Medium |
| Under-five mortality rate | 50 | 0 | Medium |
| % of Government spending on education | 5% | 25% | Low |
| Mortality rate attributed to unsafe water | 10 | 0 | Low |
| % of population using safely managed drinking water services | 0% | 100% | Low |
| % of wastewater safely treated | 0% | 100% | Low |
| % of youth (age 15–24 years) not in education or employment | 80% | 5% | Low |
| Number of agencies that have integrated mitigation, adaptation, impact reduction and early warning | 0 | 20 | Low |
| **Environmental indicators** | | | |
| Change in water-use efficiency over time | −5% | +5% | High |
| % of important biodiversity sites covered by protected areas | 0% | 100% | High |
| Level of water stress: Freshwater withdrawal as a proportion of available freshwater resources | 80% | 20% | Medium |
| Change in the extent of water-related ecosystems over time | −5% | +1% | Medium |
| Renewable energy share in total final energy consumption | 0% | 50% | Medium |

(continued)

**Table 5.2** (continued)

| | Lower bound | Upper bound | Priority |
|---|---|---|---|
| Proportion of fish stocks within biologically sustainable levels | 0% | 100% | Medium |
| % of land that is degraded over total land area | 20% | 0% | Medium |
| Sustainable fisheries as a percentage of GDP | 0% | 5% | Medium |
| Investments under an enforced disaster risk management strategy | $0 | $100 m | Low |
| Degree of IWRM implementation (0–100) | 0 | 100 | Low |
| Proportion of transboundary basin area with an operational arrangement for water cooperation | 0% | 100% | Low |
| Coverage of protected areas in relation to coastal areas | 0% | 100% | Low |
| Forest area as a proportion of total land area | 10% | 70% | Low |

Source: MRC 2017

16%, in Cambodia with 106,000 ha or 5%, and in Viet Nam by 11,000 ha or 1%. A significant part of the reduction of flooded areas comprises valuable wetlands.

There will be a significant reduction in flooding extent around the Tonle Sap: 39,839 ha or 3.2% in an average year, which will impact on the extent of inundated grasslands, forests and flood recession rice and the related livelihood values that these areas support.

One environmental hotspot on the mainstream in Northern Thailand and one hotspot on the Lower Sesan in Cambodia will be highly impacted by the ongoing developments in this scenario.

Capture fisheries, which are particularly relevant to rural livelihoods, will be reduced by an estimated 15% in Lao PDR, 3% in Thailand, 7% in Cambodia, and by 9% in Viet Nam, as a result of the flow changes (caused mostly by the UMB dams) and the blockage of fish migration (caused mostly by current tributary dam development in the LMB).

An irreversible process of long term river bed incision and bank erosion are induced, whilst locally significant in some locations in the short term, will become more noticeable after 20 years. Floodplain sedimentation will decrease within a decade with consequences for agricultural production, if not compensated with fertilizers. Also the discharge of fine sediments and associated nutrients to coastal water will decrease considerably with negative impacts on marine fisheries.

Notwithstanding the negative impacts on wetlands and fisheries productivity, the scenario will create a net economic benefit to the LMB countries of US$ 11,700 million NPV, mainly from new hydropower but also reduced flood damages and increased reservoir fisheries. However, the scenario put the livelihoods of about 887,000 vulnerable people at risk who are dependent on river's resources: 297,000 in Lao PDR, 46,000 in Thailand, 102,000 in Cambodia, and 442,000 in Viet Nam.

The key points of this scenario are that:

- The changes to flow regime are inevitable and irreversible and set in process a range of environmental and social impacts which will need to be recognised and addressed; and
- The new storages provide sufficient flow augmentation to meet the consumptive demands of the Foreseeable Future Scenarios.

### 4.1.2 LMB 20-Year Plan Scenario without Mainstream Dams

This scenario comprises development of 1.8 Mha of new irrigation within the LMB (with approxi-

**Table 5.3** Economic net present value by scenario, sector and country (US$ million) (Source: MRC 2010b)

| | Definite Scenario | 20-Year Plan w/o MS Dams | 20-Year Plan w/o Lower MS Dams | 20-Year Plan w/o Thai MS Dams | 20-Year Plan w/o Cambodia MS Dams | 20-Year Plan | 20-Year Plan + Climate Change | Long Term Devt Scenario | Long Term Dev't + Climate Change | Long Term Very High Dev't |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydropower | 11,491 | 17,603 | 25,002 | 28,706 | 30,333 | 32,823 | 32,823 | 37,865 | 37,865 | 38,787 |
| Irrigated Agriculture | 0 | 1,659 | 1,659 | 1,659 | 1,659 | 1,659 | 1,659 | 3,423 | 3,423 | 11,789 |
| Reservoir Fisheries | 91 | 107 | 132 | 202 | 169 | 215 | 215 | 420 | 420 | 473 |
| Aquaculture | 1,129 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,892 | 1,892 | 2,522 |
| Capture Fisheries Losses | -946 | -732 | -952 | -1,914 | -1,218 | -1,936 | -1,936 | -1,818 | -1,818 | -1,801 |
| Wetland Area Reduction | -228 | -176 | -178 | -225 | -178 | -225 | 101 | -260 | 36 | -310 |
| Eco-hotspots/Biodiversity | -85 | -220 | -240 | -330 | -305 | -330 | -415 | -435 | -525 | -700 |
| Forests | -153 | -183 | -228 | -349 | -254 | -372 | -372 | -731 | -731 | -822 |
| Recession Rice | -144 | -173 | -175 | -178 | -176 | -178 | 278 | -226 | 185 | -274 |
| Flood Mitigation | 461 | 360 | 360 | 360 | 360 | 377 | -273 | 408 | -296 | 432 |
| Saline Area Reduction | 20 | 25 | 23 | 21 | 23 | 27 | -2 | 22 | -2 | 16 |
| Riverbank Erosion | 0 | n | n | n | n | n | N | n | n | n |
| Navigation | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 |
| **Total LMB** | **11,700** | **19,596** | **26,729** | **29,277** | **31,739** | **33,386** | **33,404** | **40,624** | **40,514** | **50,176** |
| Country Comparisons | | | | | | | | | | |
| Lao PDR | 6,595 | 11,688 | 17,636 | 18,927 | 22,632 | 22,588 | 22,604 | 26,235 | 26,334 | 28,530 |
| Thailand | 1,095 | 2,750 | 3,913 | 3,970 | 4,223 | 4,410 | 4,445 | 4,644 | 4,730 | 5,396 |
| Cambodia | 693 | 1,446 | 1,351 | 2,237 | 1,143 | 2,237 | 2,628 | 5,049 | 5,216 | 11,013 |
| Vietnam | 3,317 | 3,711 | 3,828 | 4,142 | 3,741 | 4,151 | 3,727 | 4,697 | 4,233 | 5,237 |
| **Total LMB** | **11,700** | **19,596** | **26,729** | **29,277** | **31,739** | **33,386** | **33,404** | **40,624** | **40,514** | **50,176** |

Source: MRC, 2010.

mately 500,000 ha dry season irrigation) and 56 tributary dams either under construction or planned to be developed by 2030.

All the water demands for the planned irrigation over the next 20 years will be met with surplus flows into the delta over and above the baseline flows. There will be a small further decrease in flooding compared to that achieved in the Definite Future Scenario with small, but similar, incremental benefits and disbenefits.

The tributary dams will have a negative and largely local impact on capture fisheries offset mitigated in yield terms by the opportunity to increase reservoir fisheries. The tributary dams will create resettlement issues and the reduction in capture fisheries will have social impacts, particularly with regard to food security amongst those living along stretches of the rivers.

The new irrigation development will cause an increase in nutrients entering the river systems, which may have local impacts, but the large dilution effect in the mainstream will negate any significant trans-boundary impacts.

Changes in the ecology of the Tonle Sap Lake would be as a result of a reduction of nutrients entering the system due to a decrease in reverse flow (mainly caused under the Definite Future Scenario), but this may be partly compensated by increased loadings from agricultural return flows.

Capture fisheries would further decline compared to the Definite Happening Scenario. The decline is significant in Cambodia (8%) but less in other countries: Lao PDR (0%), Thailand (1%) and Viet Nam (4%).

This scenario would put up to 522,000 livelihoods at risk in addition to the 887,000 vulnerable resource users that could be affected in the Definite Happening Scenario. The increase is highest in Lao PDR: 404,000 people or 135%. The increase is less in the other countries: Thailand 0, Cambodia 110,000 people or 108% and Viet Nam 10,000 or 2%.

The NPV of benefits will be US$ 19,596 million NPV relative to the baseline (US$ 7896 million compared to the Definite Future Scenario), largely from tributary hydropower dams. The scenario would create 1.02 million job opportunities in all LMB countries, primarily in the hydropower, irrigation and fisheries (reservoir and aquaculture) sectors.

### 4.1.3 LMB 20-Year Plan Scenario without Lower Mainstream Dams

In this scenario, six mainstream dams above Vientiane are added to the previous scenario. This will not materially change the water quantity regime and thus the planned irrigation within the 20 year Scenario can still proceed.

The flow regime will be similar to that without mainstream dams and only marginally different from the Definite Happening Scenario with on average a 12% increase in dry season flows and a 3% reduction in wet season flows compared to the DHS. However, the conversion of the mainstream in the Northern part of Lao PDR into series of slow-moving waters between run-of-the-river hydropower schemes would create localised impacts for people dependent on the river system for their livelihood.

This scenario would put another five out of 32 environmental hotspots under stress, compared with the Definite Happening Scenario.

Capture fisheries production would be further declined compared to the Definite Future Scenario (11% in Cambodia, 7% in Viet Nam, 1% in Lao PDR and 2% in Thailand). The impacts on the flagship species, the Giant Catfish numbers, are expected to be severe.

An additional 1128 million vulnerable resource users would be affected in addition to those impacted by the Definite Future Scenario. The figure is highest in Lao PDR (485,000 people), followed by Viet Nam (328,000) and somewhat less in Thailand (155,000 people) and Cambodia (160,000).

The NPV of LMB benefits will increase to US$ 26,728 million NPV relative to the baseline, of which US$ 17,636 million will accrue to Lao PDR.

### 4.1.4 LMB 20 Year Plan Scenario with all Mainstream Dams

This scenario adds the five lower mainstream dams in Lao PDR and Cambodia to the previous scenario that included only the dams above

Vientiane. The net economic benefits of the hydropower sector is large (US$ 32,823 million out of total US$ 33,386 million NPV of the scenario). As in all Foreseeable Future Scenarios, new irrigation contributes US$ 1659 million of these net benefits (offset partially by losses to recession rice).

The benefits are unevenly distributed. Lao PDR invests and benefits most: US$ 22,588 million NPV) compared with US$ 4410 million NPV of Thailand, US$ 4151 million NPV of Viet Nam and US$ 2237 million NPV of Cambodia.

The 11 mainstream dams will have little effect on the flow regime created by the Definite Happening Scenario. However, the conversion of large reaches of the mainstream to a series of slow-moving waters between run-of-the-river hydropower schemes will create localised impacts for people dependent on the river system for their livelihoods.

Sixty percent of the ecologically valuable river channel between Kratie and Houei Xai would change to a series of connected impoundments. Important habitats like deep pools, rapids and sandbars would be lost largely, resulting in severe loss of biodiversity. Two of the four flagship species would be very severely impacted, even to the point of extinction.

Fourteen out of the 32 environmental hotspots would be highly impacted and another 9 moderately impacted; some of these sites are listed under the Ramsar Convention. The scenario could also result in significant changes in the ecology and primary productivity of the Tonle Sap system.

Capture fisheries production would be severely affected in both Cambodia (37% decline) and Viet Nam (28% decline). This decline is much less in Lao PDR (6%) and Thailand (2%).

The reduction in fisheries and the creation of impoundments on vast reaches the Mekong mainstream will have substantial negative social consequences in the affected areas, especially in Cambodia where conservatively the livelihoods of up to 1.2 million people would be put at risk over and above the Definite Future Scenario. Similar numbers would be affected in Viet Nam although arguably less severely. The number of people at risk of loss of livelihood in Lao PDR is potentially 600,000 and in Thailand some 470,000.

The large reduction of capture fisheries production may be partly offset by increases in aquaculture (including rice field and reservoir fisheries). However, increases in aquaculture are unlikely to benefit the poor people, many of whom would lose their wild fishing and who have no access to land, water and capital to fall back on.

### 4.1.5 LMB 20-Year Plan Scenario without Cambodian Mainstream Dams

This scenario contains nine mainstream dams but excludes the two dams in Cambodia (Stung Treng and Sambor) from the previous scenario.

Fish migration up the Mekong into the 3S Basin would still be possible and the ecologically very valuable stretch between Kratie and the Cambodia-Lao border would maintain its natural character. Only one of the four flagship species would be severely impacted, and the highly impacted environmental hotspots would reduce from 14 to 11.

When compared to the baseline condition, fisheries losses in Cambodia would reduce from about 37% reduction with all mainstream dams constructed to about 18% for this scenario. There would also be a significant reduction of fish losses in Viet Nam (14%) and a small 3% reduction in fish losses above the Lao/Cambodian border compared with all mainstream dams scenario.

For Cambodia, if this smaller reduction in fish production is simply proportioned amongst vulnerable resource users then the number of users affected would drop from about 1,200,000 for the ‘all mainstream dams’ case to about 350,000. Also, the number of vulnerable resource users in Viet Nam would reduce by 637,000 or 50%.

This scenario results in an NPV US$ 31,739 million which is a drop of US$ 1652 million compared to the ‘all mainstream dams’ scenario. The new job opportunities in Cambodia would also reduce from 271,000 to 156,000 while

those of the other countries would not change significantly.

#### 4.1.6 LMB 20-Year Plan Scenario without Thai Mainstream Dams

This scenario includes nine mainstream dams excluding the two in Thailand. In most respects, the impacts are similar to those with all eleven mainstream dams as the two Cambodian dams and the Don Sahong dam in Lao PDR will already be impacting on fisheries and other environmental values. The scenario has an NPV of US$ 29,277 million compared to US$ 33,386 million for the 'all mainstream dams' case.

#### 4.1.7 Mekong Delta Flood Management Scenario

This scenario is separate from the 20 Year Plan Development Scenarios in that it does not involve water consumptive projects (irrigation) nor mainstream and tributary hydropower developments. It relates to managing floods in the delta reaches of the lower basin (Viet Nam and Cambodia) and assesses the impacts and benefits of various flood reduction measures over the next 20 years. There are no direct implications for Lao PDR and Thailand as any impacts from this scenario are kept within the delta reaches and downstream of Khone Falls.

These planned flood risk reduction measures in the foreseeable future (10–20 years) in the Mekong Delta would have marginal positive and negative transboundary impacts. However, in the longer term, severe negative transboundary impacts could occur if large areas of presently flooded areas are developed for more intensive agriculture and are protected from flooding to provide greater protection levels for communities in the delta. All of these impacts could be increased by impacts of climate change and rising sea levels.

A basin-wide and multi-sector study needs to be initiated to study the long-term flood management options for the Mekong Delta to respond to growing pressures from land development, sea level rise, climate change, and upstream development plans.

### 4.2 Results of the 2st Basin Impact Assessment

Table 5.4 summarises key results of the second basin impact assessment.

#### 4.2.1 SDG-Based Sustainability Index

Table 5.4 shows the sustainability level for scenario M1 (early development scenario—2007), the differences between the main scenarios and M1, and the differences between sub-scenarios[2] and the main scenario M3 (planned development scenario—2040); with climate change (M3CC). The results of the SDG-based sustainability index indicate a rather low level of sustainability for Viet Nam's Mekong Delta. Another key insight is that the Lao PDR would incur the greatest loss for main scenario M2. Main scenario M3, on the other hand, would result in the same absolute loss of sustainability points for Cambodia and Viet Nam. Thailand would most likely experience the lowest reduction in sustainability across all scenarios. The sub-scenario perspective reveals that lower investment levels in hydropower would lead to more sustainable development pathways in all countries, in which the sustainability index would increase by between 1.12 points in Thailand up to 1.73 points in Cambodia. The comparison of the planned development scenario without hydropower (H1a) and the planned development scenario without mainstream hydropower (H1b) shows that this index suggests a similar impact from tributary and mainstream dams. The planned development scenario with hydropower mitigation investment (H3) indicates that substantial improvements in dam management and the implementation of mitigation measures can provide substantial gains in Cambodia. The planned development scenario with high agriculture and land use (sub-scenario ALU2) highlights that excessive agricultural expansion

[2]Three sub-scenarios for 2040 were developed to explore the interactions between water resources development and changes in climate. Comparisons between scenarios M3 and CC2, for instance, measure the effect of water resources development at the level of 2040 under a climate that is even wetter than mean projections.

**Table 5.4** Scenario impacts on SDG-based sustainability indicators

| | Scenarios | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M1 | M2-M1 | M3-M1 | M3CC-M1 | ALU1-M3CC | ALU2-M3CC | CC2-M3CC | CC3-M3CC | IRR1-M3CC | IRR2-M3CC | FP1-M3CC | FP2-M3CC | FP3-M3CC | H1a-M3CC | H1b-M3CC | H3-M3CC |
| CAM | 7.62 | −1.38 | −2.24 | −2.27 | 0.31 | −0.05 | −0.01 | −0.23 | 0.10 | −0.07 | 0.18 | 0.07 | 0.33 | 1.73 | 0.79 | 0.20 |
| LAO | 8.27 | −2.08 | −2.24 | −2.28 | −0.07 | −0.02 | −0.05 | −0.09 | −0.06 | 0.03 | 0.01 | 0.01 | −0.08 | 1.41 | 0.37 | −0.09 |
| THA | 8.70 | −1.18 | −1.47 | −1.51 | 0.02 | −0.03 | −0.02 | −0.27 | −0.05 | −0.01 | 0.04 | 0.00 | −0.04 | 1.12 | 0.58 | −0.08 |
| VIE | 5.41 | −1.22 | −1.70 | −1.24 | 0.04 | −0.38 | 0.04 | −0.17 | −0.24 | −0.32 | −0.14 | −0.29 | −0.29 | 1.18 | 0.52 | −0.11 |
| LMB | 29.9 | −5.85 | −7.63 | −7.68 | 0.30 | −0.49 | −0.04 | −0.76 | −0.24 | −0.37 | 0.08 | −0.21 | −0.08 | 5.44 | 2.27 | −0.08 |

*CAM* Cambodia, *LAO* Lao PDR, *THA* Thailand, *VIE* Viet Nam, *LMB* Lower Mekong Basin

ALU = agriculture and land use; ALU1 = planned development scenario without ALU; ALU2 = planned development scenario with high ALU; CC2 = planned development scenario with climate change (wetter climate); CC3 = planned development scenario with climate change (drier climate); FP1 = planned development scenario without flood protection; FP2 = planned development scenario with medium flood protection; FP3 = planned development scenario with high flood protection; H1a = planned development scenario without hydropower; H1b = planned development scenario without mainstream hydropower; H3 = planned development scenario with hydropower mitigation investment; IRR1 = planned development scenario without irrigation; IRR2 = planned development scenario with high irrigation; Lao PDR = Lao People's Democratic Republic; LMB = Lower Mekong Basin; M1 = early development scenario (2007); M2 = definite future scenario (2020); M3 = planned development scenario (2040); M3CC = planned development scenario with climate change (mean of warmer and wetter climate); SDG = Sustainable Development Goal.Source: MRC (2017)

**Table 5.5** Net Present Value (Net Gains from) for Flood Protection Investments ($ million)

| Scenario | Lao PDR | Thailand | Cambodia | Viet Nam | Total |
|---|---|---|---|---|---|
| Scenario M1 | 3 | 6 | 541 | 3061 | 3611 |
| Scenario M2 | 38 | 139 | 335 | 2014 | 2527 |
| Scenario M3 | 26 | 411 | 46 | 1384 | 1867 |
| Scenario M3 CC | 162 | 1264 | 337 | 3791 | 5554 |
| Scenario F1 | 12 | 21 | 0 | 0 | 32 |
| Scenario F2 | 355 | 2420 | 189 | 3858 | 6821 |

FP1 = planned development scenario without flood protection, FP2 = planned development scenario with medium flood protection, Lao PDR = Lao People's Democratic Republic, M1 = early development scenario (2007); M2 = definite future scenario (2020); M3 = planned development scenario (2040); M3CC = planned development scenario with climate change (mean of warmer and wetter climate)
Source: MRC (2017)

can lead to overall sustainability losses, as shown for Cambodia.

### 4.2.2 Benefits and Impacts

The main scenario M2 (definite future scenario—2020); is likely to provide very mixed outcomes for the Lao PDR. The development gains and increasing investments in infrastructure (e.g. irrigation) imply that more assets are exposed to extreme events, such as floods. The increasing risk can convert into increasing vulnerabilities if no additional protective or adaptive mechanisms are put in place. Floods are an important driver for community vulnerability. Table 5.5 shows the net present value (NPV) of investments in flood protection included in the relevant scenarios. The overall investment cost by the Lao PDR (M2: $23 million; M3: $99 million, M3CC: $119 million) would result in reduced exposure and thereby reduce vulnerability, and a positive NPV of $162 million for scenario M3CC. Extreme floods (1:100 years) would not be averted and would cause damages of around $144 million.

Thailand is likely to become a main beneficiary of the hydropower expansion planned for scenario M2. Vulnerabilities related to agricultural activities are likely to decline if irrigation expansion plans are being implemented. The NPV of investments in flood protection is nearly $1.3 billion for M3CC. The planned investments (M2: $83 million; M3: $149 million; M3CC: $178 million) would reduce flood-related vulnerabilities. Only 1:100-year events would continue to cause substantial damage, estimated at around $639 million per event.

For scenario M2, most impacts on Cambodia's community are likely to be negative. The vulnerability of communities is likely to increase substantially due to reduced food security, particularly increasing food prices. This might be partially mitigated if agricultural productivity improvements outpace population growth. However, the fisheries losses are likely to put pressure on the livelihoods of many communities in the Tonle Sap area. Adaptation strategies are likely to make outmigration necessary, which can lead to deep social problems, depending on how successful public investments will be in creating new employment opportunities. The NPV of investments in flood protection is about $337 million for M3CC. The planned investments (M2: $4 million; M3: $482 million; M3CC: $579 million) would mitigate flood-related vulnerabilities. Only 1:100-year events would continue to cause substantial damage, possibly up to $325 million per event.

Viet Nam is likely to experience a diversity of vulnerability-related effects. Fish-related losses are likely to be substantial for M2 (and M3), translating into economic losses and livelihood adaptation pressure. Some might be balanced by agricultural expansion, which would also compensate food security losses, particularly if land use change will continue diversification trends (including aquaculture and upland crops). Sediment losses are likely to demand serious investments to mitigate erosion and to maintain

agricultural nutrients inputs. Importantly, these changes need to be seen in combination with the increasing vulnerability of salinity intrusion due to the sea-level rise. Floods are part of life in Viet Nam's Mekong Delta and are typically connected with a range of positive effects (e.g. sediment, nutrients) and negative impacts. While positive effects are projected to decline sharply with upstream hydropower, negative effects are likely to be mitigated by substantial investments in flood protection (M2: $36 million; M3: $1 billion; M3CC: $1.25 billion). The NPV of investments in flood protection for M3CC is about $3.8 billion, which indicates that these investments are worth considering. However, investment plans would not cover 1:100-year events, which would cause substantial damages of about $3.2 billion.

## 5 Managing Sustainability: Cooperation for Water Management in the Mekong Basin

Subregional cooperation mechanisms serve as forums for riparian countries to consolidate their trust and enhance dialogue to jointly tackle common challenges on the basis of harmonising the benefits of all parties. The 1995 Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin signed by the four lower riparian states in 1995 led to the "evolution" of Mekong Committee into the Mekong River Commission (MRC). The 1995 Agreement has been hailed as a landmark achievement, adopted by the four lower riparian states in the "Spirit of Mekong Cooperation." The Agreement seeks to promote "sustainable development in the utilization, management and conservation of the water and related resources of the Mekong river basin, such as navigation, flood control, fisheries, agriculture, hydropower and environmental protection." Water issues are also prioritised in other mechanisms in the Mekong River basin, such as the Mekong–Lancang Cooperation (MLC) (Thu and Tinh 2019), the Lower Mekong Initiative (LMI), the GMS (GMS Secretariat 2018), Cambodia–Lao PDR–Myanmar–Viet Nam (CMLV), and the Ayeyawady–-Chao Phraya–Mekong Economic Cooperation Strategy. These mechanisms serve as platforms for conducting water diplomacy, as they fulfil the roles of norm builder, policy dialogue facilitator and coordinator, and information hub for transboundary water resources management. Data sharing is an important aspect in these dynamics. (Vannarith 2019). Amongst all datasets, water resources data sharing has recorded the largest number, solidifying the credibility of the MRC. It also serves as a platform for member states to promote the transparency of information related to pressing issues such as hydropower development. A key issue here is data exchange with China, which holds observer-status in MRC. Yet, the level of data sharing from China still falls short of the requirement for effective water resources management. Cooperation on data sharing has also drawn attention from external partners, such as the US (see Mekong Water Data Initiative n.d.; for further initiatives see also, To Minh Thu and Vu Thi Thanh Tu 2019).

The construction of hydropower dams has sparked controversy and increased strain amongst countries sharing the Mekong River, requiring a diplomatic approach to ease tension and mitigate the detrimental effects of these dams. Cooperative mechanisms facilitate water diplomacy through mutual notification, prior consultation, and dispute resolution. In this case, the MRC is an official platform for member countries to carry out their dialogue activities. Nonetheless, it should be noted that the MRC has no mechanism for basin-wide regulation of hydropower or other forms of sector development on the Mekong mainstream (Hung and Kenny 2017); rather, it provides a platform for diplomacy instead of arbitration and enforcement (MRC 2003b).

The first mainstream hydropower dam in the LMB, Xayaburi, is of great concern to riparian countries, donors, civil society, and non-governmental and international organisations due to its latent ramifications downstream. Before the Xayaburi proposal of the Lao PDR, hydropower projects in the lower river had only been constructed on the Mekong's tributaries, not on the

mainstream. All mainstream development proposals are required to undergo the prior consultation process and aim to come to a unified agreement on how to proceed. Up to now, 74 PNPCA projects have been submitted to the MRC, of which five projects have been under the prior consultation process while the rest have been initially informed and notified (MRC n.d.). This notice and consultation mechanism does not bind members to reach agreement, and the consulted countries do not have a veto to request a project to stop. Nevertheless, this institutionalised consultation process is a rare tool for the notified countries and relevant stakeholders and communities to give suggestions and for the initiating country to accept certain measures to avoid, minimise, and mitigate any potential adverse transboundary impact and to find a better way to share the benefits (for the case of the Pak Beng or Pak Lay mainstream hydropower development see Sotheary 2019).

Furthermore, the Mekong Agreement specified the MRC as the primary institutional mechanism for dispute resolution and asks for the MRC to 'make every effort to resolve the issue'. If the MRC is unable to remedy a dispute, the next step is for 'the Governments to take cognizance of the matter for resolution by negotiation through diplomatic channels within a timely manner'. Furthermore, Article 35 of the 1995 Mekong Agreement provides space for external parties to act as external arbitrators and mediators. Although the MRC cannot perform the function of an arbitrator, to some extent, it spurs relevant stakeholders to pursue a diplomatic approach to solving disagreements.

In the Five-Year Plan of Action on Mekong–Lancang Cooperation (2018–2022), MLC member states reached a consensus on enhancing cooperation in the fields of disaster prevention and mitigation as well as humanitarian assistance—ensuring food, water, and energy security—while exploring various solutions for supporting people affected by disasters and the impacts of climate change (Lancang–Mekong Cooperation China Secretariat 2018). These targets are concretised through a series of actions, including deepening Lancang–Mekong River flood and drought disaster emergency management, carrying out joint assessments of flood control and drought relief in the Mekong basin, and conducting joint studies on the early setting up of communication lines/channels for information sharing during emergencies such as floods and droughts on the Lancang–Mekong River (see also the LMI Disaster Response Exercise and Exchange; Parameswaran 2017; GMS Secretariat 2017).

The MRC has also played an important role in facilitating waterborne transport for economic and ecological development. The MRC Navigation Strategy's focus 'to increase the international trade opportunities for the MRC member countries' mutual benefit, and assisting in coordination and cooperation in developing effective and safe waterborne transport in a sustainable and protective manner for the waterway environment' (MRC 2003a: 38) can be seen as a foundation for water diplomacy amongst member countries in terms of waterway transport.

## 5.1 Facilitation of Multi-Stakeholder Water Diplomacy

Although state actors are major players in water diplomacy, the engagement of non-state actors in water resources management has been increasingly noticeable and evidenced in several mechanisms. In nature, the MRC is a purely intergovernmental organisation. However, it has been criticised for negligence of public voices in the basin community and concentrating exclusively on states' interests in water governance (Schmeier 2013). In 2003, the MRC's Public Participation Strategy was issued, stating that 'stakeholder involvement in decision-making about sustainable development is fundamental to achieving feasible, equitable and lasting solutions' (MRC 2003c: 3). This was buttressed by the issuance of the 2009 Communication Strategy, which emboldens people to access strategic documents, the minutes of Council meetings, programme documents, work plans, and functional data and research products (MRC 2009). This extends to

'para-diplomacy', which refers to the involvement of constituent units (regions) of (multi) national states in water diplomacy and helps enhance the effectiveness of water governance by engaging various actors' interests. The benefits of establishing and strengthening partnerships with epistemic community groups for capacity development and knowledge enhancement should also be appraised. The current Integrated Water Resources Management (IWRM) tools used in the Mekong and the water resources procedures of the Mekong River Commission (MRC), is an exemplification of how a new approach to river basin governance proposed by an epistemic community was acquired and put into operation by an interstate institution. In addition, in February 2020, the MRC organised the ninth MRC Regional Stakeholder Forum focusing on the Luang Prabang hydropower project (for other examples see ADB 2003). Such polycentric governance would not only vigorously boost robust river management through the diversification of problem solving, but also help achieve a greater sense of accountability and legitimacy (Sovacool 2011).

## 6 Conclusions and Policy Implications

All the scenarios examined in this chapter present significant trade-offs and trans-boundary tensions. For instance, a dam in one location has direct affects on fish catch production and these impacts are unevenly distributed in the LMB countries. These conflicts are seen as "food security" for the poor rather than an economic problem, because all scenario yields profitable NPV to all countries, but the question is how those benefit will be redistributed to the vulnerable resource users.

Although some positive outcomes have been achieved, subregional cooperation platforms show limitations. First, despite the existence of more than 10 cooperative mechanisms, cooperation on water management in the Mekong falls far below expectations. Dams have been built on the river mainstream, causing irreversible and long-term environmental and economic impacts for the countries in the Lower Mekong Delta, such as lack of water, loss of sediment, and unexpected changes in the ecosystem. While the MRC is the most capable institution and has the mandate for water resources management, China has refused to be a member of the MRC and thus its actions in the upstream are not bound by the MRC's rules and requirements. Second, the countries in the lower Mekong region have limited economic capacity to invest in regional programmes and thus rely on external support. Mekong countries lack ownership over the funding and sometimes control of the development projects. This form of cooperation makes them voiceless and powerless in asserting their own regional and national interests vis-à-vis the geopolitical agenda of their development partners. The involvement of regional powers and their competing interests have complicated the Mekong cooperation dynamics beyond the control of Mekong countries (Bosba 2018). Third, except for the MRC, which is an organisation, all other mechanisms are just forum-type policy consultation platforms for country leaders or specialists. There are no common rules for the use of water in the region, no mechanism with binding rules, and no dispute settlement mechanism. Fourth, the presence of so many cooperative mechanisms in a subregion of six countries inevitably leads to the overlapping and duplication of cooperative efforts. Fifth, there exist differences in the interests of Mekong countries as well as amongst the external partners, especially in the field of water resources management. Due to the pressure to speed up economic growth, the sustainable development aspect in many Mekong countries has not been paid enough attention; the 'power-shed' mindset is still dominant amongst regional policymakers. Finally, power politics and the trust deficit amongst riparian countries and partners makes it difficult to coordinate amongst different mechanisms for common goals.

Looking ahead, to take advantage of existing mechanisms and overcome the above-mentioned limitations, it may be advisable for riparian countries and partners to consider the following recommendations:

- *Rule-based Governance of Water Management*: Riparian and partner countries should promote more rules-based governance of water management in regional cooperation for water management by (a) encouraging riparian countries to adhere to international law on water management; and (b) establishing common standards and rules for IWRM, such as a code of conduct for the Mekong River basin. This code of conduct would help alleviate and prevent tensions in transboundary water management. It should consist of three main components: confidence building measures, preventive diplomacy, and dispute resolution mechanisms. Communication via a hotline, early warning, and the use of effective diplomatic staff are very important to prevent resource conflicts between riparian countries.
- *Implementation of the 1995 Mekong Agreement*: The member countries should embrace the implementation of the 1995 Mekong Agreement through the five procedures and their technical guidelines, as they will be the IWRM -based rules for water resources development to provide the most benefit and minimum environmental and social harm. The implementation of the five procedures will support the national and regional development objectives for sustainable development.
- *Regional Coordination and Data-sharing*: Members and partners should help strengthen the role and capacity of the MRC as a hub for water management and coordination amongst other mechanisms in the field of water management; and strengthen the implementation of the MRC procedures and technical guidelines. Information exchange and data sharing at all levels should be strengthened through bilateral and multilateral channels for regular updates, especially regarding new developments in the basin. Data sharing is crucial in both the rainy and dry seasons for equitable water resources management and disaster prevention and management. Riparian countries should coordinate to promote synergy amongst Mekong regional cooperative mechanisms. In the field of water resources management, major partners such as ADB, the US, Japan, Korea, and the European Union are important as they can provide the resources, technology, and knowledge to serve regional economic development; and assist in seeking long-term and fundamental technology and policy solutions for sustainable development and environmental protection. In addition, the Association of Southeast Asian Nations (ASEAN) should play a more central role in facilitating policy coordination and paving the way for elevating water governance and diplomacy in the Mekong River basin to a regional agenda.
- *Water-use cooperation*: The member countries should envisage the future changes that will have significant impacts on water resources management in the Mekong basin, especially what the changes will be and the spatial distribution patterns of such changes. Riparian countries should also find alternative development opportunities that are less dependent on hydropower and extensive water use production. Cooperation should be promoted amongst Mekong riparian countries regarding the equitable and sustainable use of the Mekong River's resources, including water resources, on the basis of harmony of interests and with the aim of achieving sustainable development for the entire Mekong River basin.
- *Manage Trans-Boundary Conflicts*: Any transboundary issues/conflicts should not be looked on as exclusively negative. Healthy conflict management can lead to growth and innovation, new ways of thinking, and additional management options. However, it is important to understand transboundary conflicts clearly, i.e. the fish losses and environmental damage which impinge on social and food security. Then, the negative impacts or conflicts could be effectively managed by reaching a consensus that meets the needs of all stakeholders. The goal is for all to 'win' by having at least some of their needs met.
- *Transparency and Public Consultation*: Transparency and public consultation are amongst the keys to the success of transbound-

ary issues. Transparency would help to create an enabling environment for community participation and especially enhance the role of women. This could be extended to the coordination of identifying and monitoring impacts so that mediation services may be offered early in the process to prevent tensions from leading to conflict. Relevant governments should take a multi-stakeholder approach, encouraging the participation of government agencies and other groups such as academia, the private sector, and non-governmental organisations in subregional cooperation activities in a bid to strengthen mutual trust and understanding and to seek new thoughts and ideas for future manoeuvres. The participation of the private sector in the process of designing and implementing cooperation programs should also be part of the process.

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**Disclaimer** Any view expressed in this chapter is solely the responsibility of the authors, not reflected the views of the organizations.

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# 6

# Government Borrowing, Infrastructure and Human Development in Africa: A Panel Threshold Approach

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**Abstract**

In this paper, we examine the effect of external borrowing on infrastructure, human development and economic growth in Africa. Using the panel threshold regression, we explored whether the threshold effect that often characterize the debt-growth nexus also applies to key drivers of economic growth, inequality and sustainable development such as infrastructure and human development. Data for the study covered the period 1990 to 2019 for 49 countries in Africa. Using the panel threshold test, findings showed non-existence of a threshold effect of external debt on infrastructure and on human development. The result from the fixed effect model showed insignificant effect of external borrowing on the index of infrastructure and significant negative effect on human development. The result support literature evidence of a threshold effect between borrowing and economic growth. Findings suggest that borrowed funds are not channeled towards growth-enhancing investment such as improvements in infrastructure and human condition, and the use of funds in this form undermine the income potential of future generation and chances of debt repayment. With the current global economic crisis initiated by the COVID-19 pandemic, external borrowings are notably on the increase and policy directive to ensure the use of borrowed funds for the advancement of infrastructure and human development is paramount in order to reduce the chances of falling deeper into an already existing financial distress in the African region.

**Keywords**

Government debt · Infrastructure · Human development · Threshold regression

## 1 Introduction

African economies are generally identified in the group of developing countries and public borrowing is quite high in the region. As at 2017, 19 African countries had exceeded the 60 percent debt-to-GDP threshold set by the African Monetary Co-operation Program (AMCP) for developing economies (IMF 2018). Surpassing this threshold meant that these countries were

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highly vulnerable to economic changes and their government had reduced ability to provide support to the economy in the event of a recession (Onyekwena and Amara 2019).

Borrowing can be beneficial particularly in economies with substantial development challenges such as those in the African region. This would mean that borrowed funds are used to finance growth-enhancing investment in areas such as infrastructure, health care, and education. Government borrowing can also be appropriate as part of temporal counter-cyclical fiscal policy; to boost demand and other economic activity in economic downturns (Kose et al. 2020; Ndoricimpa 2020). However, high government debt can limit the size and effectiveness of fiscal stimulus during downturns, weigh down productivity enhancing investment and hence dampen long-term growth investment (Kose et al. 2020). The negative effect of government debt is observed not only in developed but also developing economies (Intartaglia et al. 2018).

The empirical relationship between government debt and GDP has often been characterized by an inverse U-shaped relationship such that positive debt impact is observed on economic growth until the point where the debt to GDP ratio exceeds a threshold level and a negative impact is experienced. Despite the consensus among most researchers about the existence of this relationship, there is no clarity about the specific threshold where government debt to GDP ratio starts to exhibit negative influences on economic growth, and the extent of the negative impact on growth (Alzahrani 2018; Baum et al. 2013; Eberhardt and Presbitero 2015; Siddique et al. 2016). There are also suggestions that government debt does not have significant effect on economic growth in developed and developing economies (Schclarek 2004).

While studies in the literature have commonly focused on the role of public borrowing on economic growth, not much is known about the relationship that characterize debt and potential drivers of inequality and sustainable development mainly in terms of infrastructure and the human development index. Focus on this relationship is motivating specifically for Africa as the region is characterized by poor infrastructure development and very low human development indices (UNDP 2016). The inadequate and poor performing infrastructure is recognized as a major obstacle to reaching higher growth rate and achieving sustainable development (Khan et al. 2020; Zolfaghari et al. 2020).

In this paper, we examine the role of public external borrowing on infrastructure and human development in Africa with findings also shown for debt effect on economic growth. This paper focuses on the debt growth nexus to contribute to literature evidence in this regard as there is yet no consensus among researchers regarding the nonlinear relationship. We explore whether the nonlinear relationship that often characterize debt and growth is observed in the debt-infrastructure and debt-human development nexus. We examine the nonlinear impact of debt on infrastructure and human development as well as economic growth using the Panel Threshold Regression (PTR) model introduced by Hansen (1999). This method has the advantage of estimating the debt threshold level from the sample rather than selecting them arbitrarily.

This paper contributes to the literature on debt and sustainable development in a number of ways. First, this study contributes to the scant literature on the debt infrastructure and HDI relationship in Africa. Second, the focus on the role of public borrowing on infrastructure and the HDI gives empirical insight to whether public borrowing in the African region increases the chances of debt repayment and does not undermine the income potential of future generation in creating an enabling environment for increased productive capacity and income. Third, to the best of our knowledge, this study is the first to investigate the debt infrastructure and HDI relationship in Africa, exploring whether a nonlinear effect exists. Fourth, we contribute to the extant literature discussion on the debt-growth link in Africa.

Our study is divided into five sections. Section two, provides the review of literature. Section three shows the methodology applied. Section four presents the empirical results and discussion of findings while section five covers the study conclusion.

## 2 Literature Review

Studies have generally associated infrastructure improvement to an increase not only in economic growth but also in reduction in income inequality and human development. For instance, Calderón (2009) and Calderón and Servén (2010) showed that improvement in infrastructure has a positive impact on long-run growth and a negative impact on income inequality. Findings by Whajah et al. (2019) showed that public indebtedness has a negative effect on inclusive growth that works to promote reduction in income inequality. Mohanty et al. (2016) also showed significant role of infrastructure improvement in attaining high Human Development in India. Similar finding was shown by Kusharjantoa and Kim (2011) in Indonesia and in a cross country study by Sapkota (2014) with focus on the role of infrastructure on the components of the HDI. Asongu and Nwachukwu (2016) also associated improvements in the human development index in sub-Sahara Africa with infrastructure development captured using mobile phone as a means of knowledge diffusion. Using data from African economies, Oladipo (2019) also showed significant effect of infrastructure on human development with findings also indicating the existence of bidirectional effect. With key role of infrastructure on development, government spending on infrastructure will raise the possibility of improving human development as well as economic growth.

In examining the debt growth nexus, the argument of an inverse U-shaped relationship as shown in most studies, follows from the role debt plays as a stimulant for aggregate demand (Elmendorf and Mankiw 1999; Kose et al. 2020). Negative effects of debt on economic growth are noticed in the long run where high debt burden and long term interest rates induce a crowding out of private investment (Gale and Orszag 2003; Kose et al. 2020; Kumar and Baldacci 2010). Regarding the nonlinear effect of debt on growth, countries at the early stages of development generally experience growth as they make use of borrowing to finance investment opportunities yielding high rates of return due to lower levels of capital stock. With increase in debt stock, the ability to repay borrowed funds often becomes difficult especially with rise in interest payment (Cecchetti et al. 2011; Kose et al. 2020). Negative effects of debt on growth can also be linked to proposition of the debt 'overhang' theory that high debt can lead to distortionary taxes discouraging new domestic and foreign investments, which, in turn, slows down capital accumulation (Diamond and He 2014; Krugman 1988; Sachs 1989). Increase in debt levels can also reduce growth by lowering total factor productivity and hinder government incentives to engage in technology improvement, infrastructure and more efficient use of resources (Kose et al. 2020; Poirson et al. 2004).

In terms of the turning point of the debt growth relationship, studies generally do not show uniform results. Rogoff and Reinhart (2010) for instance provided evidence of a weak relationship between government debt and long-term growth when debt-to-GDP ratio is below 90%, but above this level, the impact of debt on economic growth is negative. Checherita-Westphal and Rother (2012) show that the effect of debt on growth becomes negative when debt to GDP ratio is above 90–100%. Findings by Baum et al. (2013) suggested positive short-run effect of debt on economic growth only to the point where debt-to-GDP ratio is less than 67%. At this point the impact faded away, and turned negative for debt-to-GDP ratio above 95%. Findings by Afonso and Jalles (2013) pegged the turning point at which the impact of debt on economic growth turned negative at 59%. Evidence by Woo and Kumar (2015) showed that beyond 90% of GDP, government debt induces negative impact on economic growth. Using data for a sample of 18 countries in the Organization for Economic Corporation and Development (OECD) Cecchetti et al. (2011) estimate a threshold level of 95% for government debt to GDP ratio. Caner et al. (2010) find the threshold level at 77% beyond which public debt hampers growth for a panel data set of 25 developed and 74 developing economies. They also showed lower threshold level of 64% for developing countries.

In examining the turning point between debt and growth, studies have sometimes made use of

simple descriptive statistics (Rogoff and Reinhart 2010). The simplest and the most common method applied for testing non-linearity is with the use of a quadratic term in the growth regression (Checherita-Westphal and Rother 2012). The spline regression has also been used in this regard. Kumar and Woo (2010) made use of the spline regression for a sample consisting advanced and developing countries to determine the turning point of public debt to GDP ratio.

The use of quadratic term in the growth equation to capture the turning point between debt and growth is criticized based on exogenous determination of thresholds (Karadam 2018). To overcome this challenge, non-linear panel data method specifically the Panel Threshold Regression (PTR) is often preferred. This method allows estimating the debt threshold level from the sample rather than selecting them arbitrarily (Hansen 1999). However, in PTR model, observations are mostly divided into a small number of (mostly two) distinct regimes depending on the values of threshold variable. There is also the Panel Smooth Transition Regression (PSTR) model developed by Gonzalez et al. (2005). The PSTR model, has essentially the same features as the PTR model but allows the regression coefficients to change gradually when moving from one group to another. The threshold regression approach was applied by Chang and Chiang (2009), to investigate the nonlinear relationship between government debt ratio and growth for a sample of 15 OECD countries for the period 1990–2004. Minea and Parent (2012) also made use of this approach to examine the nexus between debt and growth. Karadam (2018) made use of this approach in examining the debt growth relationship using unbalanced panel of 135 countries (24 industrial, 111 developing) for the period 1970–2012. Among other things, findings showed that the direction of the effect of public debt on growth changes smoothly from positive to negative depending on the level of indebtedness. The debt threshold was also shown to be lower for developing countries implying that public debt can hurt growth at lower levels of debt for those economies relative to advanced countries. Findings for the threshold effect of debt on development have also been examined by Zaghdoudi (2018) for a panel of 95 developing countries, with evidence indicating the existence of a non-linear relationship between external debt and the HDI.

The extant literature mainly covers the threshold effect of debt on growth and is scant with respective findings for infrastructure and human development. Besides, the existing literature examining the debt, infrastructure and human development relationship are not very common.

## 3 Methodology

### 3.1 Empirical Model

We analyze the debt-infrastructure relationship empirically using the baseline linear specification stated as:

$$INF_{it} = \mu_i + \alpha Debt_{it} + \beta Z_{it} + \varepsilon_{it} \qquad (6.1)$$

where $INF_{it}$ is infrastructure, and $Debt_{it}$ is government external debt to GDP ratio in country $i$ at time t for $i = 1, \ldots, N$ and $t = 1, \ldots, T$. $\mu_i$ represents individual fixed effects, while $\beta Z_{it}$ is the vector of control variables. We include four control variables that potentially affect infrastructure in an economy; GDP per capita, trade in percent of GDP, population growth and globalization. We expect to see a positive effect between debt to GDP ratio and infrastructure where borrowed funds are efficiently utilized to promote investment in infrastructure. This effect may however disappear and turn negative with high debt burden suggesting that the threshold effect exists. We also expect to see positive effect of increase in GDP per capita on infrastructure assuming higher infrastructure investment accompanies increase in macroeconomic income. Increase in trade volume is generally observed where countries operate open border policy. In this case the ease of movement of goods across countries and knowledge transfer aids production techniques and rise in income invariable suggesting higher investment generally plus spending on infrastructure. Increase in population relative to income induces a strain on fiscal spending and hence is

expected to impact negatively on investment in infrastructure. More globalized economies have the potential for improved infrastructure through improvement in knowledge base and technology.

We examined the model for debt-human development relationship using the linear specification model stated as:

$$HDI_{it} = \mu_i + \alpha Debt_{it} + \beta W_{it} + \varepsilon_{it} \quad (6.2)$$

Where $HDI_{it}$ is the human development index used to capture human development, and $Debt_{it}$ is government external debt to GDP in country i at time t for $i = 1, \ldots, N$ and $t = 1, \ldots, T$. $\mu_i$ represents individual fixed effects, while $\beta W_{it}$ is the vector of control variables. Additional control variables include per capita income, gross investment, trade openness, population growth, infrastructure and globalization.

We measure the level of overall human development, using the human development index (HDI), which was developed by the United Nations Development Program (UNDP) in 1990, aiming to provide a yardstick of human development of all member countries of the United Nations. Thus we used HDI and its component indexes as a dependent variable because its principles are reflected in the SDGs framework as it also sets health- and education-related goals together with income or poverty goals (Sapkota 2014).

Increase in debt to GDP ratio is expected to raise the HDI where borrowed funds are efficiently utilized to stimulate consumption, health care use and investment in education. This effect may turn negative where a threshold effect exists between debt and HDI. Increase in income should ordinarily translate to higher consumption as well as spending on other components of the HDI. In the same way, rise in investment should also raise income as well as the HDI. Trade openness is expected to induce improvement in human condition, by expanding the range of people's choice, influx of improved technology and knowledge transfer. However where there are limitations to harnessing the benefit of trade such as shortage of physical infrastructure and poor competitiveness of domestic firms, trade openness may not induce the expected positive effect on the HDI (IMF 2001; UNECA 2013). Population growth induces a strain on fiscal finance in health and education and hence may negatively influence the HDI. Improved infrastructure is expected to positively influence HDI as it raises the potential for increase in income, literacy and health. Globalization generally, erodes national boundaries, integrates national economies, cultures, technologies and governance. This process influences the health condition of a population in terms of better technology transfer. The erosion of national boundaries also has impact on the level of literacy, progressive societal change and income potential of a country. Hence globalization is expected to have strong effect on the HDI.

To empirically analyze debt-growth relationship, the baseline linear specification for growth regression can be written as:

$$GDP_{it} = \mu_i + \rho Debt_{it} + \theta W_{it} + \varepsilon_{it} \quad (6.3)$$

Where $GDP_{it\,it}$ is real GDP per capita, and $Debt_{it}$ is government external debt to GDP in country i at time t for $i = 1, \ldots, N$ and $t = 1, \ldots, T$. $\mu_i$ represents individual fixed effects, while $\theta W_{it}$ is the vector of control variables. In line with earlier studies showing a link between debt and growth, we include variables measuring growth specifically gross fixed investment, trade openness, infrastructure and globalization. We expect to see a nonlinear effect between debt and economic growth as shown generally in the literature. It is also expected that a rise in income of production factors that accompany increase in investment, will lead to a rise in per capita income. The effect of trade openness on income cannot out-rightly be defined as it will depend on the competitiveness of domestic products in the international market. The effect of globalization is expected to be positive as increased rate of societal improvement that comes with globalization can induce better production methods and raise the potential for improved industrial activities.

In line with Hansen (1999) eqs. (6.1)–(6.3) are examined using the fixed-effect panel threshold model. To do this, we first fit a single-threshold model and examined the boot-strap results.

Where the F-statistic is significant, we reject the linear model and fit a double- or triple-threshold model. The choice of fitting a double or triple threshold is determined by the probability value of the F-statistic for the threshold effect test from the bootstrap result. We examined the PTR rather than the PSTR as the latter is essential same as the PTR but only differs in terms of examining a smooth transition. Our interest is not whether the transition is smooth or not but mainly to determine the nature of the relationship between debt, infrastructure and HDI and whether the association is linear or nonlinear as commonly shown in the debt growth nexus.

For each equation specified for infrastructure, HDI and growth, we first fit a single-threshold model in the form;

$$y_{it} = \mu + X_{it}\left(q_{it} < \gamma\right)\beta_1 \; + \; X_{it}\left(q_{it} > \gamma\right) \beta_2 \; + \mu_i + \varepsilon_{it} \tag{6.4}$$

Where the variable $y_{it}$ is the dependent variable, $q_{it}$ is the threshold variable in this case external debt, $\gamma$ is the threshold parameter that divides the equation into two regimes with coefficients $\beta_1$ and $\beta_2$. the parameter $\mu_i$ is the individual effect, while $\varepsilon_{it}$ is the disturbance term.

Testing for a threshold effect is the same as determining whether the coefficients are the same in each regime. The null hypothesis and the alternative hypothesis (the linear versus the single-threshold model) are

$$H_0 = \beta_1 = \beta_2; H_a = \beta_1 \neq \beta_2 \tag{6.5}$$

The F-statistic is constructed as

$$F_1 = \frac{S_O - S_1}{\sigma^2} \tag{6.6}$$

Under $H_0$, the threshold γ is not identified, and $F_1$ has nonstandard asymptotic distribution. $S_O$ is the RSS of the linear model.

In the case of a multiple thresholds, we fit the model sequentially. For a double-threshold model for instance, the specification is stated as:

$$y_{it} = \mu + X_{it}\left(q_{it} < \gamma_1\right)\beta_1 + X_{it}\left(\gamma_1 \leq q_{it} < \gamma_2\right) \beta_2 + X_{it}\left(q_{it} \geq \gamma_2\right)\beta_3 + \mu_i + \varepsilon_{it} \tag{6.7}$$

Here, $\gamma_1$ and $\gamma_2$ are the thresholds that divide the equation into three regimes with coefficients $\beta_1$ $\beta_2$ and $\beta_3$. In the case that we reject the null hypothesis in a single-threshold model, then we must test the double-threshold model. The null hypothesis is a single-threshold model, and the alternative hypothesis is a double-threshold model. The F-statistic is again used to determine the preferred threshold. We use the F Test approach to test the existence of threshold effect. The specification of the F-test is similar to that earlier presented. The procedure continues until the appropriate threshold is determined using the F-statistic.

## 3.2 Data Source

The data for external debt as a percentage of GDP, real GDP per capita, investment, population growth and trade openness (trade to GDP ratio) are obtained from World Development Indicators provided by the WorldBank (2019). Data for infrastructure index is obtained from the African infrastructure index provided by the African Development Bank ADB (2018) while that for the Human development Index is obtained from the Human Development Data provided by the United Nations Development Program. We made use of the Konjunkturforschungsstelle (KOF) index of globalization introduced by Dreher (2006) because of its comprehensiveness and data availability. Based on time period for which data is available for all the variables of interest, the study covered the period 1990 to 2019.[1] The analysis was carried out using Stata 16 software.

[1]We dropped 5 countries with missing data for debt from the analysis (Libya, Morrocco, Namibia, South Sudan, and Seychelles) to enable us estimate the threshold model. We also made use of moving average to update our data to 2019.

# 4 Results

## 4.1 Summary Statistics

We begin the presentation of results by showing the summary statistics of the variables used in Table 6.1.

The summary statistics show considerably high level of average external debt to GDP at about 76%.[2] Average per capita income at local currency unit is approximately 1858.532. This value is however associated with high standard deviation of about 2724. This can be related with the heterogeneous nature of the data set. Average gross investment/GDP at approximately 21% is low and depicts low level of economic activities in the region. Trade/GDP ratio of 0.63 depicts less trade compared to GDP. Population growth rate is observed as 2% on the average with a negative minimum value of −6.8%. Negative population growth is commonly associated with the outbreak of an epidemic, famine or war (Giattino et al. 2020). Records of pandemics such as that of Ebola in some African economies and even the recent COVID- 19 pandemic typically induce a fall in population growth rate. Mean value of infrastructure index is also low at 21%. The index for human development of 0.43 groups African economies in the category of countries with low human development (UNDP 2018). Average globalization index of 44.1 suggests that the region is less globalized relative to western industrialized societies. The value is less than average globalization index in the globe of 60 as far back as 2004 (Dreher et al. 2008).

[2]The data set for external debt to GDP ratio showed that countries in the African region had external obligations to GDP of over 100% value with some showing over 900% external borrowing to GDP. Countries in this category with high debt value observed with a frequency of thirty time period (the highest in the frequency count) includes Djibouti, Equatorial Guinea, Libya, Morrocco, Namibia, Seychelles and South Sudan. Some of the countries were dropped from the analysis due to large missing data points for external debt.

## 4.2 Threshold Effect Test and Estimation Results

Table 6.2 presents the results of the panel threshold test for linear and single threshold model using infrastructure index as the dependent variable.

In Table 6.2, the single-threshold model estimator is 181.5245 with 95% confidence interval [178.6556, 184.9181]. The F statistic is insignificant. Therefore, we reject the single threshold model and fit a linear model. The result indicate non-existence of a threshold effect between external debt and infrastructure unlike what is often observed in the debt-growth relationship. Based on the result suggesting a linear relationship between debt and infrastructure, we examined the relationship between the variables using the fixed effect model and examining the hausman test statistic (Hausman 1978). Findings are shown with additional control variables in the model. Table 6.3 presents the result for the Fixed-effects (within) regression model using infrastructure index as the dependent variable.

Our variable of interest, Debt/GDP showed no significant effect on infrastructure improvement. This suggests that public borrowing is not channeled towards investment in infrastructure in the region. This has implication on the sustainability of debt servicing as investment in infrastructure has the potential to raise income and economic advancement. The result for other variables suggest key role of per capita income and globalization in promoting infrastructural development in the African region. The estimates however showed stronger effect of globalization (0.722), than per capita income (0.00164) on infrastructure development. As expected, findings show negative effects of increase in population size (−0.821) on infrastructure development. Rise in population induces a strain on fiscal spending especially in highly informal economies that characterize African countries where the tax base is generally low.

The result for the threshold effect test with HDI as the dependent variable and external debt as the threshold variable is shown in Table 6.4.

**Table 6.1** Descriptive statistics

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| External debt/GDP | 75.93724 | 81.36694 | 2.555617 | 915.9496 |
| GDP per capita | 1858.532 | 2724.636 | 102.598 | 22942.58 |
| Gross investment/GDP | 20.85051 | 8.762361 | 2.42436 | 93.54746 |
| Trade/GDP | 0.62635 | 0.419769 | 0 | 3.479965 |
| Population growth | 2.37106 | 1.101118 | −6.76622 | 8.117929 |
| Infrastructure index | 20.87873 | 18.43709 | 0.005702 | 94.96979 |
| HDI | 0.435225 | 0.190275 | 0 | 0.801 |
| Globalization | 44.13761 | 10.39428 | 19.2 | 72.7 |

**Table 6.2** Threshold effect test: dependent variable infrastructure index

| | Threshold variable: external debt | | |
|---|---|---|---|
| Threshold | Threshold | Lower | Upper |
| Th-1 (single) | 181.5245 | 178.6556 | 184.9181 |
| $H_0 = \beta_1 = \beta_2$ (linear model)<br>$H_a = \beta_1 \neq \beta_2$ (single threshold model) | 2716.66 (0.2067) | | |

Note: F-statistic reported for hypothesis test with p-value in bracket

**Table 6.3** Fixed-effects (within) regression results. Dependent variable: index of infrastructure

| Variables | FE regression estimates |
|---|---|
| External debt/GDP | 0.000596 (0.00185) |
| GDP per capita | 0.00164*** (0.000143) |
| Trade/GDP | 0.680 (0.825) |
| Population growth | −0.821*** (0.236) |
| Globalization | 0.722*** (0.0314) |
| Constant | −18.81*** (1.635) |
| Observations | 1470 |
| Number of id | 49 |
| R-squared overall | 0.5302 |
| Hausman | 17.23<br>Prob>chi2 = 0.0041 |

Note: Fixed effect estimates reported with standard errors in parentheses
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

In Table 6.4, the single-threshold model estimator is 287.5681 with 95% confidence interval [265.2056, 309.9744]. The F statistic is insignificant suggesting a linear relationship rather than a U-shaped effect of debt on HDI. We therefore, reject the single threshold model and fit a linear model. This result is however contrary to findings by Zaghdoudi (2018) showing the existence of a nonlinear relationship between external debt and the HDI for a panel of 95 developing countries. Our result show that the threshold effect between external debt and the HDI does not exist in the African region. We therefore fit a fixed effect model based on the hausman test statistic. We controlled for other variables that influence HDI in the model. Findings for the fixed effect model are shown in Table 6.5.

Contrary to expectation, we find negative effect of borrowing on HDI. With a 1% increase in external debt/GDP, the index of human development falls by approximately 0.01%. This suggests that external debt does not improve welfare in Africa and that borrowed funds are not invested in sectors that promote human development such as health and education. The chance of increase in inflation rate that accompany unproductive fiscal spending of borrowed fund can also account for the negative effect of external borrowing on HDI as rise in prices reduces consumption basket accessible by individuals and households. Similar finding of negative effect of external borrowing on the HDI was observed by Imide and Imoughele (2019) with evidence provided using country data for Nigeria. Findings by Zaghdoudi (2018) also showed negative effects of external borrowing on the HDI using panel data set for developing countries but this is only beyond the debt threshold value. The result further showed

**Table 6.4** Threshold effect test: Dependent variable HDI

| | Threshold variable: external debt | | |
|---|---|---|---|
| Threshold | Threshold | Lower | Upper |
| Th-1 (single) | 287.5681 | 265.2056 | 309.9744 |
| Hypothesis: | | | |
| $H_0 = \beta_1 = \beta_2$ (linear model)<br>$H_a = \beta_1 \neq \beta_2$ (single threshold model) | −1433.52 (1.0000) | | |

Note: F-statistic reported for hypothesis test with p-value in bracket

**Table 6.5** Fixed-effects (within) regression results. Dependent variable: HDI

| Variables | FE regression estimates |
|---|---|
| Log external debt/GDP | −0.00724*** (0.00142) |
| Log GDP per capita | 0.0219*** (0.00220) |
| Gross fixed capital formation | 0.000563*** (0.000113) |
| Trade openness | −0.0125*** (0.00346) |
| Population growth | 0.00695*** (0.000963) |
| Infrastructure | 0.000743*** (0.000111) |
| Globalization | 0.00468*** (0.000177) |
| Constant | 0.114*** (0.0185) |
| Observations | 1470 |
| Number of id | 49 |
| R-squared | 0.746 |
| Hausman | 29.51<br>Prob>chi2 = 0.0001 |

Note: Fixed effect estimates reported with standard errors in parentheses
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

significant positive effect of per capita income, gross investment, population growth, infrastructure and globalization on the HDI. These findings are in line with expected result except for population growth that showed positive rather than expected negative effect on the HDI. The result for positive effect of an increase in population growth on the HDI can be explained by the social capital potential of population growth. With rise in population, individuals have access to social capital in terms of family support during illness or periods of financial crisis that in turn influences wellness and wellbeing. As an engine of development, trade should ordinarily lead to steady improvements in human conditions by expanding the range of people's choice, knowledge transfer and improved technology. However, the results in this study show negative effects of trade on human development. This can be linked with the inability of economies in the region to achieve their full potential for trade expansion as they are characterized by insufficient and poor availability of physical infrastructure (IMF 2001; UNECA 2013). It can also be associated with the lack of international competitiveness that characterize most firms in developing countries as they are locked in production and exports of primary commodities (UNECA 2013).

We present results for the threshold test for GDP per capita in Table 6.6.

In Table 6.6, the single-threshold model estimator is 37.2698 with 95% confidence interval [36.3882, 37.5961]. The F statistic is significant. Therefore, we reject the linear model and fit a double and a triple-threshold model to determine the threshold that best suits the data. Based on the result for the threshold test, the double-threshold model is accepted with highly significant F-statistic. We reject the triple threshold model with evidence of insignificant F-statistic. The estimated threshold variable $\gamma$ is approximately 37.2% for the single threshold model and 120.8% for the double threshold model. The result support literature finding of a threshold effect of debt on growth.

We further present the results adding control variables that influence economic growth.

The result in Table 6.7 show negative effect of external debt on economic growth. With a 1% rise in debt, growth falls by approximately 37%. This finding support evidence that increase in debt levels can reduce growth. Contrary to expectation, we find that increase in gross investment did not raise per capita income. Increase in investment should ordinarily lead to a rise in the productive capacity of an economy. However

**Table 6.6** Threshold effect test: Dependent variable GDP per Capita

| | Threshold variable: external debt | | |
|---|---|---|---|
| Model (threshold) | Threshold | Lower | Upper |
| Th-1 (single) | 37.2698 | 36.3882 | 37.5961 |
| Th-21 (double) | 120.8353 | 118.4511 | 121.3882 |
| Th-23 (triple) | 37.2698 | 36.1274 | 37.5961 |
| $H_0$ (linear model)<br>$H_a$ (single threshold model) | 80.63 (0.0800) | | |
| $H_0$ (single-threshold model)<br>$H_a$ (double threshold model) | 160.01 (0.0033) | | |
| $H_0$ (double-threshold model)<br>$H_a$ (triple threshold model) | 53.65 (0.6700) | | |

Note: F-statistic reported for hypothesis test with p-value in bracket

**Table 6.7** Panel threshold regression estimation results; Dependent variable: GDP per capital

| Variables | Estimation results |
|---|---|
| Log external debt/GDP | −0.374*** (0.0137) |
| Gross fixed capital | −0.00633*** (0.00119) |
| Trade/GDP | −0.348*** (0.0355) |
| Infrastructure index | 0.0141*** (0.00113) |
| Globalization | 0.0155*** (0.00184) |
| C_regime 1 | 0.191*** (0.00920) |
| C_ regime 2 | 0.270*** (0.0141) |
| Constant | 6.456*** (0.118) |
| Observations | 1470 |
| R-squared | 0.719 |
| Number of id | 49 |

Note: Double threshold estimation results reported with standard errors in parentheses
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

where investment is in areas that an economy does not have competitive advantage, it will mean that the impact of the investment will not translate to a rise in output. In addition, where an economy invests heavily in industrial promotion activities with less focus on the requisite skills and education to take advantage of the potential that is associated with gross investment, the effect between capital formation and output will likely be negative. Findings further show negative significant effect of trade openness on economic output. Findings for negative effect of trade openness on output can be associated with the poor competitive nature of firms in developing economies in the international market. (UNECA 2013) In line with expectation, the result showed significant positive effect of infrastructure improvement and globalization on macroeconomic income.

## 5 Conclusion

Empirical findings in the literature often show the existence of an inverse U-shape relationship or otherwise threshold effect between external borrowing and income. In line with this position, we examined the effect of external borrowing on infrastructure and human development exploring whether the inverse U-shape relationship exists between the variables. We also examined the debt-growth relationship to add to literature findings in Africa. Using the panel threshold test, findings showed non-existence of a threshold effect of external debt on infrastructure and on human development. The result from the linear model suggest insignificant effect of external debt on infrastructure and significant negative effect on the HDI. The result however showed the existence of a threshold effect of external debt on GDP. Based on the empirical findings of this study, there are indications that governments in the region do not significantly channel spending of borrowed funds to raise infrastructure provision. The evidence shown also suggests that external borrowing is not productively utilized and hence does not promote improvements in human development. The use of public borrowing in this way, undermines the potential of debt repayment in future. Fiscal spending especially of borrowed resources should be targeted at improving infrastructure and human develop-

ment to attain any form of sustainable development. This is particularly important especially with the current outbreak of the COVID-19 pandemic that inevitably compels countries to resort to borrowing in order to cushion the economic effect of the virus. Where borrowed funds are not adequately directed to finance growth-enhancing investment such as improvements in infrastructure and human condition, the chances of debt repayment in the future will be slim and economies in the region will invariably be faced with deeper financial crises in the years to come.

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# 7 Lives, Livelihoods and Environment: The Challenge of Sustainable Development Goals in India

Vijay Mahajan and Jeet Singh

**Abstract**

Most people in India are traditionally dependent on natural resources such as land, water and forest for their lives and livelihoods. The historical dependency on natural wealth on the one hand brings rich traditional ecological knowledge and on the other hand creates tension due to over-exploitation of resources. This paper attempts to address this complexity by proposing a twin strategy to achieve the SDGs related to lives, livelihoods and environment in India. This twin strategy includes (a) improving the lives and livelihoods of India's population, which is in the first decade of the demographic dividend phase, and (b) regenerating the degraded natural resources of India—the Jal, *Jangal, Jameen, Janvar aur Jalvayu*– water, forests, land, livestock and wildlife and *jalvayu*—the climate. The combination of the above two targets has the potential to attain SDGs in India. However, the shortage of financial investment due to prolonged public financial crisis and COVID-19 pandemic in 2020 have adversely affected the prospect of achieving these targets on time. In this context we suggest re-calibrating various available public and private financial mechanisms to work towards the twin strategy suggested in this paper.

**Keywords**

Twin strategy · Environmental regeneration · Resource based-livelihoods · Investment needs estimates · SDG funding

## 1 Introduction—How India Has Addressed the SDGs So Far

Financial and economic crises have been endemic to developing countries throughout the second half of the twentieth century, from the time many of them regained independence from colonial rule. Between 1998 and 2008, major financial and economic crises originating in the developed world, hit many of the developing countries too. Then in 2020, the COVID pandemic has had a global impact on the lives and livelihoods of a large number of poor people in developing countries. Thus the prospect of achieving the Sustainable Development Goals (SDGs) by 2030, just a decade away, has become more remote.

In this chapter, we look at how the financial and economic crisis, exacerbated by the pan-

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demic, has impacted India's ability to invest in SDGs related to the lives and livelihoods of Indians and India's environment. In particular, SDG 3 (health), SDG 4 (education) and SDG 5 (gender equity) deal with the "lives" of Indians, SDG 1 (no poverty), SDG 2 (zero hunger), SDG 8 (decent work and economic growth) deal with their livelihoods and SDG 13 (climate action), SDG 14 (life below water) and SDG 15 (life on land) deal with the environment.

We worry that, on the one hand, the financial distress caused by such crises triggers coping strategies by the poor, which may put stress on the environment (such as overuse of common property resources). On the other hand, due to fiscal stress, governments are not able to sustain, let alone extend, social safety net programs. So, when both the poor are in distress and the governments are fiscally stressed, what can be done? The Indian Prime Minister has responded with a slogan that the nation should become "Atma Nirbhar" (self-reliant), which also means that the people have to depend a lot more on their own means.

We take inspiration from the Sendai Framework for Disaster Risk Reduction 2015–2030 (UNDRR 2020). This framework calls for all-inclusive collective action from private stakeholders—both communities and corporate, while unambiguously stating the primary role of the state. We believe the same approach needs to be taken for the SDGs. All stakeholders—individuals, communities, associations, companies and other private agencies at various levels need to contribute to the effort to achieve the SDGs by 2030, the government has to be the primary player and financier.

This paper highlights the importance of twin strategies to achieve the SDGs in India. These involve investing in (a) improving the lives and livelihoods of India's population, which is in the first decade of the demographic dividend phase, and (b) regenerating the degraded natural resources of India—the Jal*, Jangal, Jameen, Janvar aur Jalvayu*– water, forests, land, livestock and wildlife and *jalvayu*—the climate. The latter will in turn improve the lives and livelihoods of Indians. The paper presents estimates of the level of investments required and explores some new ideas to increase the resource base and diversify it beyond just the government's budgetary resources. We end on an optimistic note that if indeed the required policy correctives are made, there is still a decade to achieve the various SDGs related to improvement in the lives, livelihoods of Indians and the environment of India.

## 2 *Jal, Jangal, Jameen, Janvar, Jalvayu*—The Basis of Lives and Livelihoods

Agriculture with its allied sectors such as livestock and fishery is the major source of livelihood for India's population (FAO 2020). Agriculture provides basic livelihood to 263.1 million people which accounts to 58% of total workforce of the country (IBEF 2020).

### 2.1 *Jal*—Water

Agriculture is dependent on water supply—primarily rainfall, and then from its storage in surface structures as well as in underground aquifers. Reduction in rainfall in many regions over the last few decades, coupled with peak seasonality of rain in other regions, causing floods and runoff to the sea, has led to the paradox of water excess and scarcity in the country, sometimes in the same month across regions and definitely across months in the same region. India has 20 large and small river basins, but as per the *Falkenmark Index*, 12 river basins are water scarce with less than 1000 $m^3$ water per capita per annum. Furthermore, the water demand in the country is expected to increase by 34% by 2025 and over 78% by 2050 (India. IITM n.d.). India's gross irrigated crop area of 82.6 million hectares (mha) is the largest in the world. This went up from 22.6 mha in 1951 (India. Ministry of Agriculture and Farmer Welfare 2019). In the first two decades 1950 to 1970, the increase was due to dam fed canal irrigation systems. Since then, a large part of the increase is based on groundwater extraction through borewells and

that poses severe problems of environmental sustainability.

### 2.2 *Jangal*—Forest

India's forest land has also gone through significant changes in the last three decades. The share of tropical wet evergreen forest has decreased from 8% of total forest land in 1987 to mere 2.6% in 2019 (FAO 2003; FSI 2019). Tropical moist deciduous, sub-tropical pine forest and sub-tropical dry evergreen forest recorded decline in area during this period.

Agricultural and livestock rearing are both very dependent on forests, to ensure well-distributed rainfall as well humus content in the soil. Thus forests are a critical resource for the majority of people living in this sub-continent indirectly. But for many the dependence is more direct. Out of a total of 600,000 plus villages in India, nearly 173,000 villages are located in and around forests (TERI 2018). These villages are dependent on forest for collecting non-timber forest produce (NTFP), fuel, fodder, cattle grazing, water, timber etc. These forest dependent villages have over 200 million people living in them.

### 2.3 *Jameen*—Land

Currently, agricultural land accounts for nearly 49% and forest land comprises 23% of the total landmass (India. Ministry of Statistics and Program Implementation 2016). However, drastic changes were recorded in the quantity and quality of agricultural land and forests in India in the last few decades. The degradation of these basic resources adversely affected other natural resources such as water, wildlife, biodiversity and climate.

India's cultivable land area of about 160 mha is the second largest in the world, after the United States. Between the 1950s and 2020, the cultivable land area has gone up about 8–10 mha. Desertification is another major challenge that India's landmass is facing. About 29.3% of the total 328.7 mha is degraded and deserted. The total degraded and deserted land accounts for 82.6 mha of forest, non-forest and agriculture land spread across the country. Disturbingly, the degradation of land resources increased from 81.46 mha in 2003-05 to 82.62 mha in 2011-13 (India. Indian Space Research Organization 2016).

### 2.4 Livelihoods and Jal, Jangal, Jameen

The degradation of natural wealth has further led to rural deprivation and loss of livelihood leading to mass distress out migration from villages. This interconnectedness is not a new revelation, as it has been well-studied both from economic and ecological perspectives across the globe. McLeman (2017) in his working paper for the UNCCD argued that the degradation of natural resources especially land is a major push factor in the rural-urban migration. He also observes that this push factor is further mediated by social, economic, demographic, political and environmental factors.

As per the national census data, the total number of migrant population has increased from 315 million in 2001 to 456 million in 2011. A substantial number in this population moved from rural areas to cities in the search of jobs. In the erstwhile natural resource dependent forest areas, the local tribal population sees migration in as many as 60–80% households.

## 3 Investment Required Sources for SDGs

As stated above, India needs to invest in improving the lives and livelihoods of India's youthful population with a median age of 27. For this, greater investments need to be made in health and education and in regenerating the degraded natural resources—water, forests, land, livestock and wildlife and the climate. In addition, direct investments will have to be made in infrastructure and promotional activities related to people's livelihoods.

## 3.1 For Lives—Health and Education

India's planned development trajectory after independence in 1947 has an important place for education and health. The first national education policy of India was enacted in 1968 and the first national health policy was issued in 1983. Both of these crucial policies have been updated several times since their inception. India renewed its health objective in 2017 and educational objectives in 2020 by adopting new national policy documents. Both of these policy documents raised concerns about low public investment and promised adequate public investment to strengthen the health and education system in the country.

The New Education Policy, 2020, reiterates India's old promise of investing minimum 6% of GDP on education (India. National Education Policy 2020). However, data of last few years suggest that the public expenditure in India is around 3% of the GDP. The National Health Policy—2017 also promises to increase public expenditure on health to 2.5% of the GDP (India. National Health Policy 2017). However, this promise has not reflected in the public spending after enactment of the policy.

Public investment on health and education in India has always remained lower than not just developed countries but developing countries with large populations and comparable income levels such as Indonesia and also of others in the region such as Sri Lanka and Bangladesh. There has, however, been an upward trend in investment (Fig. 7.1).

The out of pocket expenditure is very high for education and health in India. Realizing this, the National Health Policy, 2017 envisaged decrease in out of pocket expenditure on health care from current 60% to 30% by increasing public health expenditure (India. Ministry of Finance 2021b).

However, the promise to increase public expenditure both in the health and education sector needs yet to be acted upon. India is short of nearly one million teachers and 0.2 million medical/paramedical professionals in rural health institutions (India. Loksabha 2018). Moreover, a huge shortage of health institutions in rural areas deprives underprivileged communities (India. Ministry of Health and Family Welfare 2019). The educational and health wellbeing in India requires more investment in activities such as construction of more schools, developing necessary infrastructure in new and old schools, sanitation, drinking water, teacher recruitment and teacher training. Similarly a huge investment is required to build more health facilities in rural areas, recruitment of medical and paramedical human resources in rural areas, availability of medicines and ambulances (Sen et al. 2010).

## 3.2 For Livelihoods—Wage and Self-Employment

### 3.2.1 Agriculture

In 2016 the Government of India noted that the public expenditure on agriculture and allied sector was low at 2.76% of the GDP as against recommended 4% of the GDP by a high power committee in 2007 (India. NITI Aayog 2017). Gross capital formation in agriculture (for land levelling, soil improvement, wells and borewells, canals, ponds, tanks, dams, farm equipment, tractors, polyhouses, etc.) has been in the range of 2.5–3% of the GDP and of this, the share of the private sector (mainly individual households) has been about 15–25%. Thus individual households have contributed over 0.5% of the GDP, which means about INR 1 Trillion.

### 3.2.2 Non-Agricultural Wage Employment

As agriculture, which was a major source of livelihoods showed low growth and was saturated in terms of employment, rural workers needed alternatives. Public works programs offering mainly manual labour doing earthwork, were quite common for a long time. This was elevated to a justiciable right after the landmark Mahatma Gandhi National Rural Employment Guarantee Act was passed in 2005 by the Indian Parliament. Under the Act, the Mahatma Gandhi National Rural

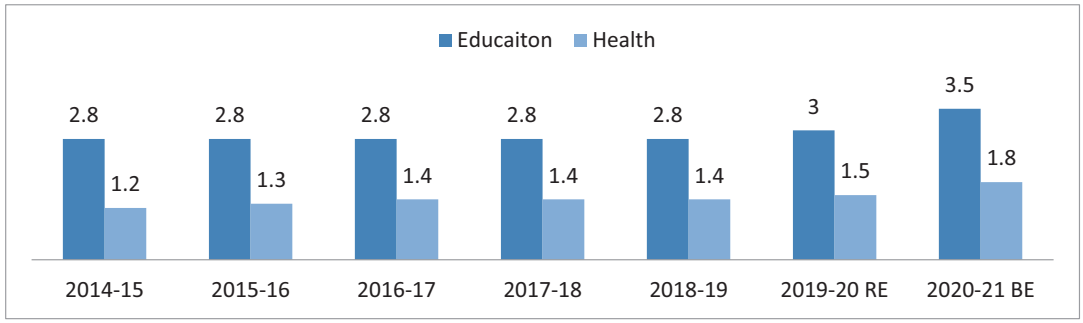


**Fig. 7.1** Public investment on health and education (per cent of GDP). Source: India. Ministry of Finance (2021a). Economic Survey, 2020-21 (Vol. 2)

Employment Guarantee Scheme (MGNREGS) is said to be the world's largest such program. Cumulatively, since 2006, the program under MGNREGS has generated 31.3 billion person days of work with a total expenditure of INR 6.27 trillion, thus becoming the number one ranked public employment program in the world. Yet, this has not been enough to curb rural-urban migration.

Thus the urban informal sector is the next refuge for landless and marginal farmers seeking work away from the village. In cities, they work as manual labourers in construction, transport, retail trade, security and myriad urban menial services. Unfortunately, the working conditions and remuneration levels remain very poor and enforcement of minimum wages or social security legislation is difficult due to the highly dispersed nature of employers as well as the high mobility of workers across employers.

Self-employment in the non-farm sector as the major source of livelihood for a majority of the population remains a distant goal. India has been investing proactively to create jobs through supporting non-farm self-employment initiatives. There are many credit based schemes at the central and state level. Over the years, investment in these schemes has also increased. The allocation for credit-based MUDRA scheme has also increased substantially between 2015–16 and 2021–22 (MUDRA 2021). Yet, these enhanced investments have not had a full positive impact on employment creation.

## 3.3 For Environmental Regeneration

The COVID pandemic provided a platform to many global and national institutions to amplify their voice to advocate nature based solutions to transform economies (Singh 2020). The Adaptation Gap Report, 2020 released by UNEP reiterated that nations require investing more on climate action. The report suggests that developing countries require annual 140 billion USD to 300 billion USD by 2030 for climate adaptation (UNEP 2021). This cost is high compared to their size of economy, but essential to survive in extreme climatic changes. The degradation of natural capital for economic growth has both ecological and economic cost.

According to a study carried out by The Energy and Resource Institute (TERI) in 2018, the land degradation through various processes in India cost around 2.5% of the country's GDP (at 2014-15 price). The study further concluded that India needs INR 2.95 trillion (2014-15 prices) to reclaim the already degraded/deserted landmass of the country (TERI 2018). However, the actual expenditure of the Government of India for resource regeneration is much lower. The

National Biodiversity Authority in 2019 calculated that INR 0.28 trillion was spent in 2016-17 on regeneration of biodiversity. The report further estimated that various public schemes related to sustainable environment require yearly investment of INR 1.16 trillion (India. National Biodiversity Authority 2019).

## 3.4 Overall Requirement of Financing and where Can it Come from

India has been struggling to balance its overall revenue and expenditure. The Fiscal Responsibility and Budget Management Act, 2003 sets a target to keep the fiscal deficit at 3% of the GDP. However, successive union governments have used escape provisions of the Act to breach this target. Recent fiscal deficit estimations are alarming. As per the revised estimate for 2020-21 the fiscal deficit will be as high as 9.5%. It is expected to decrease in the next financial year i.e., 2021-22, however it will remain 6.8% of the GDP (India. Ministry of Finance 2021a, b). The highly stressed public finance has the responsibility to invest more in lives, livelihood and environment to attain SDGs in the next one decade.

In a recent overview paper for the State of India's Livelihoods Report, 2020 (Mahajan 2021), one of the authors estimated that India needed to generate 120 million new livelihoods in the 2021–30 decade. Further he estimated the funds required for this at INR 120 Trillion, to be invested in the first 6 years of the decade, to ensure optimal results by 2030 (Table 7.1).

The total investment is estimated to be INR 120 trillion, which is about 60% of India's GDP in 2020–21, which fell by about 8% from the previous year due to the pandemic. However, the Indian economy is seeing a V shaped recovery in 2021 and thus it should be possible to make these investments. Indeed, these investments will act as a booster for inclusive economic growth.

The investment levels in the economy are likely to go up from the current 30% of the GDP and government expenditure will also go up as the tax to GDP ratio rises. As the investment has to be concentrated in the first 6 years of the decade to show results by the end of the 10 year period, it amounts to INR 20 trillion per annum. Thus the investment in livelihoods for all needs only about 10% of GDP per annum or about a third of the current annual investment in the economy, for the first 6 years of the current decade.

**Table 7.1** Estimated need and possible sources of funds for livelihoods for all by 2030

| Source of funds | Investment required in INR Trillion from 2021 to 2026 | Individual House-holds | Commu-nity collec-tives | Corpo-rate CSR | Banks and financial institutions | Corpo-rate invest-ments | Govt budget |
|---|---|---|---|---|---|---|---|
| Regeneration of natural resources | **12** | Minor | Minor | Minor | Minor | Minor | **Major** |
| Agricultural diver-sification and value chains / collectives | **8** | Minor | **Medium** | Minor | **Medium** | **Medium** | Minor |
| Infrastructure in small towns | **20** | Minor | Minor | Minor | Minor | **Medium** | **Major** |
| Education and skill development | **20** | **Medium** | **Medium** | Minor | Minor | **Medium** | **Major** |
| Health care | **10** | **Medium** | **Medium** | Minor | Minor | **Medium** | **Medium** |
| Micro and small enterprises in non-metros | **50** | **Medium** | **Medium** | Minor | **Major** | **Medium** | Minor |
| Total in INR trillion in the first six years | **120** | **Only a small part of this investment is expected from the government. Rest will come from other sources listed above.** | | | | | |

The faster and sustained recovery of Indian economy after COVID-19 pandemic is a good sign; however, often it puts higher pressure on natural wealth. The faster economic recovery after the oil crisis of 1973 and 1979, fall of USSR in 1991 and Asian financial crisis in 1997 are few examples to mention here, which led to faster growth in the rate of environmental degradation (Mulchandani 2020). Therefore, the twin approach suggested in the beginning of this paper for greener economic recovery is important.

The good news is that much of the investment is not expected from the Government. The rest will come from other sources listed above, namely Households, Community Collectives, Corporate CSR, Banks/financial institutions, and Corporate Investments. In the table above, we have indicated that while the government will have to play a major role in financing of regeneration of natural resources, infrastructure and education and health, in agricultural diversification and in micro and small enterprises, the main financing source will be households and banks/financial institutions.

## 4 Yet, the Government Has to Continue to Be the Lead Financier

We already spoke about the applying to the SDG context, the Sendai Framework for Disaster Risk Reduction 2015–2030.This framework calls for all-inclusive collective action from private stakeholders and governments, while unambiguously stating the primary role of a state. This fits well with the Indian situation.

The government has the primary responsibility to invest in wellbeing of human and nature. The national commitment to work towards agenda 2030 is part of this responsibility. Successive health and education policies in India intended to invest 9% of GDP in these two sectors, but the average has been around 4% of the GDP. Similarly, India's investment to achieve SDGs by 2030 requires investment equivalent to 10% of its GDP, however, it is spending only about 4% (Jitendra 2019).

India has had a long history of systematically addressing poverty through planned allocation of resources for poverty alleviation programs. At the very base, to ensure food security, there has been a public distribution system for food grains. In 2013, this was made into a justiciable right through the National Food Security Act 2013, under which as many 800 million persons get highly subsidised wheat and rice. Over the years, other social safety net programs were added to take care of children, women, the elderly, the disabled and so on.

The combination of higher economic growth, with a compounded average growth rate of 7.5% pa over 2000–2020, coupled with poverty alleviation programs mentioned above, had dramatically brought down poverty in India. According to India's Voluntary National Review (VNR) of Sustainable Development Goals (SDG) at least 271 million people were lifted out of multi-dimensional poverty from 2005–06 and 2016–17 (Pandey 2020). As per the global Multidimensional Poverty Index that was released in July 2019, the number of people living under multidimensional poverty decreased to around 370 million in 2016–2017 from 640 million people in 2005–2006. This reduction of numbers in multidimensional poverty by 270 million was historic and unprecedented, though some of it has been undone in 2020.

India's policy response to degradation of the environment is also nearly 50 years old and institutionalised attempts to preserve natural wealth especially land, water and forest in India started in early 1970s, including nationwide programmes such as for the development of drought prone areas, desert areas, waste land and watershed development programs were executed. These initial policies and programs have evolved further in the last two decades and led to promulgation of new policies, laws and execution of new programs.

The above mentioned major developments in India indicate that the country recognized both the poverty and environmental challenges and responded with significant public resources, despite being a developing (low per capita income) country till 2015 and a lower middle

income country since then, as per the World Bank classification.

Despite good intentions, signing up on firm commitments, and openness to new programs, practices and knowledge, India lags behind as it has not been investing adequately in these goals. There are a number of reasons behind the shortfall in investment. These include a persistent fiscal deficit, a high dependence on government for financing and low returns on the investments made, due to poor execution, including, leakages, delays, and apathy.

We argue, however, that public spending through grants alone is not enough to take care of all the investment needs of the various SDGs related to health, education, poverty reduction, livelihoods and environmental regeneration. We need to encourage individual households and community collectives to use loans to address the SDGs. We turn next to how to do this in the Indian context.

## 5 Additional Financing for SDGs on Lives, Livelihoods and the Environment

### 5.1 Individual Household Financing

The concept of a human family is based on the idea that the parents invest in their progeny, initially providing for all the needs from nutrition to shelter and later investing in food, clothing, education and healthcare. The National Sample Survey Office (NSSO) monthly per capita consumption expenditure data for 2011–12 indicated that an average rural household expenditure on education was 4.2%, and on health care was 5.9% of their total expenditure.

In the case of education, India is spending on education around 4% of GDP as a public expenditure and around 2.5% of GDP as private expenditure; together it is spending around 6.5% of GDP on education (Motkuri and Revathi 2020). In the case of healthcare, expenditure is 3.54% of the GDP, of which 1.28% is the share of public expenditure, the rest being private. What is worse, out of the private expenditure as much as 65% is out-of-pocket, due to low coverage of health insurance. Therefore, the Economic Survey 2020-21 recommended an increase in public investment on healthcare services as envisaged in the India National Health Policy 2017 (India. Ministry of Finance 2021a, b).

Households remain the largest single investors in livelihood promotion, whether by investing in natural capital, such as land and water development, or in human capital such as education and skill development, or in physical capital such as building and equipment. They also contribute to significant building of social capital in the form of collectives such as self-help groups, cooperatives and farmers' producer organisations.

There were nearly 90 million farm households in India, of which only 20 million had an income exceeding expenditure, as per NSSO 2012–13. Thus these 20 million farm households made an average investment of over INR 50,000 per annum per household. Unfortunately, a large part of the individual household investment has gone into borewells, which provide an irrigation solution for a few years, but eventually deplete groundwater and thus do not have a positive effect on the environment. The government can, by changing policy on groundwater use regulation, encourage farmers to do the reverse—invest in farm ponds, farm bunds and other water harvesting structures, so as to capture rainwater runoff and recharge the depleted groundwater aquifers.

### 5.2 Community Financing

Community financing for education and health was well-established as a tradition. Earlier, a large number of schools and hospitals were endowed by wealthy people and run on charitable lines. Similarly creation and management of vil-

lage ponds, for domestic and irrigation purposes, village grazing lands, and village forests was in the hands of the community with the ruler's local representative acting as an overseer. While some funds did come from the ruler, there was a lot of contribution in terms of voluntary labour and materials. That tradition was eroded as the notion of the welfare state took over after Independence and the government took away all initiative from communities and local elites.

During the COVID pandemic, several micro-examples emerged, of efforts to create livelihoods based on regeneration of natural resources in search of livelihoods. In many places, returnee migrants, when they came back to their native villages, started working on regenerating the degraded natural resources of their village, with the hope of staying back and making a living. (The Hindustan Times, 30th July 2020).

For livelihood financing, apart from encouraging loans from banks to families below the poverty line, the Government of India and Reserve Bank of India encouraged National Bank for Agriculture and Rural Development (NABARD) to take up promotion of women's self-help groups (SHGs) for savings and credit as far back as 1992. This savings-led microfinance model has now become the largest financial inclusion programme in the world covering nearly 110 million households. Banks provide bulk loans of average size of INR 246,000 to SHGs to on-lend to their members for amounts as small as INR 5000, though the average is close to INR 25000. Total bank loans outstanding to SHGs on 31 March 2020 were INR 1.09 trillion. In addition to the above channel of self-help group loans being on-lent to individual poor households for income generation, microfinance loans are also available to individuals for some economic activity such as dairy farming, food processing and handicraft production or running a retail shop or a repair shop. In the year ending Mar 2021, microfinance loan amounts from channels other than SHGs were nearly INR 1.7 trillion.

## 5.3 Donor and CSR Financed NGO Efforts

The donor and corporate social responsibility (CSR) financing are important financial mechanisms in India, especially for supporting innovative sustainable development ideas. The untied nature of the fund largely handled by professionals makes these financial resources more impactful. Both CSR and national and international donor financing have played an important role in the development of the country. Moreover, the size of the fund has also enlarged substantially in the last few years.

According to a report, the domestic philanthropic funding has increased from INR 125 billion in 2010 to INR 550 billion in 2018. Out of the total domestic philanthropic fund, 60% came from individual donations (Dasara 2020). CSR expenditure was estimated at INR 192 billion in 2017-18 out of which nearly INR 5.70 billion went for activities related to environment sustainability (India. National Biodiversity Authority 2019). In the financial year 2019-20, 60% of the CSR fund was invested in sectors like health, education and poverty reduction. Only 6% of the fund was invested in projects related to environmental sustainability.

These donor funds, though much smaller than government funds, play a very important role in testing innovative approaches to development problems. For example, with donor funding from the Mafatlal family charity and German donor funding, in 10 years, the NGO Bhartiya Agro Industries Foundation's DHRUVA project in Gujarat promoted wadis (homestead orchards) in about 30,000 acres of degraded forest land and regenerated not just the entire region but also revived the economy of the area. (Sawant and Ajwani 2020). The idea was picked up by the National Bank for Agriculture and Rural development (NABARD) which has since then assisted 552,755 tribal families with INR 23 billion of investment, mostly grants, by 31 Mar 2020 for Wadi type of projects, with support from the same German donor agency which worked on the BAIF DHRUVA Wadi project.

## 5.4 Banks and Financial Institutions

### 5.4.1 National Bank for Agriculture and Rural Development (NABARD)

The financing of regeneration of natural resources by the government budget resources can be augmented by loans from agencies like National Bank for Agriculture and Rural Development (NABARD). NABARD has been implementing Natural Resource Management (NRM) projects for watershed development and Wadi (homestead orchard) programme since 2007 with support from KfW and GIZ, two German government Development Corporation agencies. Titled the Umbrella Programme on Natural Resources Management (UPNRM), its objective was to experiment and master holistic, participatory and financially sustainable livelihood solutions. These were to be advocated for inclusion in NRM policies and programs of the GoI. Banks and FIs would also be encouraged to develop financial instruments for improving the livelihoods of the rural poor based on the sustainable use and management of natural resources.

By January 2015, NABARD had supported more than 250 projects under the UPNRM with investments totalling EUR 61 million, in 21 states and one union territory. Only 6% of the total cost was allocated as grants. The grant was used primarily for capacity development. As a result since its inception in 2007, the programme's portfolio has led to the provision of livelihood opportunities to 300,000 India's rural poor. NABARD then initiated a collaboration between UPNRM and commercial banks in order to encourage further dissemination of the loan approach. The programme ultimately hopes to achieve one loan project per village, or around 600,000 loan projects (GIZ 2020). If the average loan size is INR one million, that would imply additional loan financing of INR 600 billion. In September 2020, NABARD announced a new INR150 billion Rural Infrastructure Assistance to State Governments (RIAS), to encourage states to undertake projects for regeneration of natural resources. This fund will supplement the resources available to the states.

### 5.4.2 Banks Loans for Livelihoods

India has had a long tradition of using its vast banking system for developmental purposes. In 1980, a program called Integrated Rural Development Program (IRDP) was launched where banks gave loans to government identified families below the poverty line, while the government gave a principal subsidy of between 25% and 50% of the loan. Most of these families were landless or marginal farmers, so the loans were mainly for livestock activities—with milch buffalo rearing becoming the most common activity under IRDP loans. This program has continued with different names since then.

To enhance the flow of credit to Micro, Small and Medium Enterprises (MSMEs), in April 2015, the GoI launched the Pradhan Mantri Mudra Yojana (PMMY) scheme for giving non-farm income-generating loans up to INR one million by banks without requiring any collateral security. By March 2020, 244.8 million loans had been given under the PMMY, worth INR 12.30 trillion. About 68% of the loans were given to women and 51% to persons in disadvantaged categories known as Scheduled Castes/Tribes and Other Backward Classes. The employment effect, however, was muted as every additional livelihood seemed to have required nearly INR 0.8 million of bank credit.

### 5.4.3 Bank Financing for Environmental Regeneration

Few long-term loans are available for tree planting on degraded land, regeneration of grazing land, and these need to be enhanced. Finally loans for individual water conservation structures such as farm ponds and for land development and soil improvement should also be made available. For financing renewable energy, the Indian Renewable Energy Development Agency (IREDA) and some banks like the State Bank of India, ICICI Bank and the RBL Bank have established special lines of credit for loans to households and companies to install renewable energy

products like solar PV, solar thermal, wind and biogas (Mahajan 2021). This is the most appropriate way to finance this work, rather than government budgetary spending.

## 6 Conclusion

Natural wealth, especially land, water and forest is the backbone of Indian rural livelihood that feeds the majority of the poor and disadvantaged population. However, all of these resources are depleting rapidly leading to mass distress out migration from rural areas. The degradation of natural capital is certainly an environmental concern but it has also adversely affected basic human requirements such as health, education, wage employment and agriculture in the country. The SDGs pertinent to life, livelihood and environment are highly entwined and therefore in a country like India, an integrated approach is required to attain them. Given the interconnected nature of SDGs, cohesive policies, institutions and finances is the need of the hour. In the Indian context the regeneration of natural capital such as land, water and forest must go hand in hand with mass job creation in the short run and promotion of sustainable resource-based livelihood in the long run.

The huge shortfall in investment to achieve SDGs on time is one of the biggest concerns that further affect any attempt to address SDGs through an integrated approach. SDGs pertinent to lives, livelihoods and the environment require annual investment of more than 15.5% of the GDP (3% health, 6% education, 2.5% natural resource regeneration and 4% agriculture). While all of this is not expected to come from the government, given the "public goods" nature of these investments, even if the government bears two-thirds, it will completely consume all the tax revenue. While successive governments have had the intention to increase investment in human and environmental development, the fiscal limitation does not allow them to invest more than 50% of total resources in these sectors. To achieve SDGs pertinent to these sectors, new financing models need to be explored and promoted. This paper has suggested some.

At the same time, the public expenditure needs to be made more efficient and outcome oriented. Moreover, public expenditure should largely be aimed at the disadvantaged groups. For example, expenditure on public financed professional education is not as welfare promoting as the same expenditure on universalizing primary and secondary education. Finally, to ensure sustainability of the public investment, there should be an element of cost recovery through user fees on an affordable basis.

Thus the five *mantras* for ensuring that there is adequate financing for SDGs in India are

(a) Enhance the tax to GDP ratio so that there are more resources for public expenditure
(b) Enhance the share of public expenditure on health, education, livelihoods and the regeneration of natural resources
(c) Increase the efficiency of public expenditure to achieve more outcome for the same level of expenditure
(d) Increase the share of public expenditure that specifically benefits the disadvantaged groups, so that it becomes more inclusive and equitable
(e) Increase the sustainability of public expenditure by charging user-fees.

We end on an optimistic note that with a rise in the investment level and resultant economic growth over this decade, there will be a rise in the tax to GDP ratio and this will enable increase in public expenditure. Combining public expenditure with individual, household, community and private corporate expenditure in a synergistic fashion, it will be possible for India to achieve the SDGs by 2030.

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# 8 The Nexus of Structural Adjustment, Economic Growth and Sustainability: The Case of Ethiopia

Steve Onyeiwu

**Abstract**

Following the near collapse of the Ethiopian economy in the early 1990s, as well as unsustainable internal and external imbalances, high inflation rates, negative interest rates and very high debt ratios, Ethiopia implemented a Structural Adjustment Program (SAP), with the support of multilateral and bilateral donors. The goals of SAP include the stabilization of the economy in order to restore macroeconomic and financial stability, as well as the stimulation of medium and long-term growth. The Ethiopian structural adjustment policies were aimed at eliminating financial repression, encouraging the development of the private sector, fostering competition throughout the economy, and promoting the process of market-determination of all prices, including exchange rate and interest rate (African Development Bank Group, *Ethiopia Structural Adjustment Programme Project Performance Evaluation Report (PPER)*).

While SAP has spurred a robust and an unprecedented economic growth in Ethiopia for over two decades, there has been inadequate assessment of the impact of that growth on sustainable development (Ethiopia's economic growth rate has averaged about 10% within the past decade, making it one of the fastest-growing countries in the world.). Most of the studies of the Ethiopian SAP have focused mainly on economic growth and macroeconomic stability. This chapter uses a Triple-Bottom-Line (TBL) analytical framework to evaluate the impact of SAP on the three dimensions of sustainability: economic, equity and environmental sustainability (A Triple-Bottom-Line (TBL) analytical framework transcends economic growth *per se*, but also considers equity and environmental sustainability). Information and data for the TBL analysis were gathered through secondary sources, content analysis of Ethiopian media publications, interviews of a cross-section of Ethiopians, and visits to different regions of the country. Results from the research suggest that, while Ethiopia's structural adjustment has satisfied the economic dimension of the TBL, it has not been socially inclusive and environmentally sustainable.

**Keywords**

Structural Adjustment Program · Triple-Bottom-Line framework · Sustainability approach · Poverty dynamics · Inequality · Environmental degradation

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## 1 Introduction

Ethiopia is regarded as one of Africa's success stories.[1] From being saddled with poverty and economic instability, especially during the devastating famine of the 1980s that attracted global attention, the country has achieved impressive economic growth rates within the past two decades or so (Moller and Wacker 2017). Unlike many African countries, it has done so on the basis of an Agricultural Development Led Industrialization (ADLI) strategy (Gebreeyesus 2013, p. 8), rather than on reliance on minerals. Ethiopia's impressive economic growth came after the implementation of structural adjustment programs (SAP), trade and financial liberalizations in the 1990s. But some perplexing questions remain about Ethiopia's SAP:

- Through what channels did structural adjustment foster economic growth in Ethiopia?
- To what extent has the country's adjustment programs promote economic development, equity and environmental sustainability?
- Is Ethiopia's economic growth sustainable in the long-term?
- What policies are needed to foster a more sustainable development trajectory in Ethiopia?

Although previous studies have assessed the impact of Ethiopia's SAP [see, for instance, Abadi and Alemu 1996, Kassahun 2002], there are a number of unaddressed important issues. First, most of the previous studies focused on macroeconomic, external sector and financial performance of the Ethiopian economy, trivializing or completely neglecting issues about equity and environmental sustainability. Many of the previous studies were also premature, as they embarked on assessing SAP just a few years after its implementation. As the World Bank has often pointed out, SAP is supposed to be a long-term policy measure, whose impact can only be felt several years after implementation. Thus, this chapter departs from previous studies in two important ways: it evaluates SAP in Ethiopia using the triple bottom line of economy, equity, and environmental sustainability; and it does so after almost three decades of implementation of SAP. The chapter is structured as follows. Following the Introduction in Sect. 1, Section 2 discusses Economic Reform and Financial Stabilization in Ethiopia. Section 3 analyzes the relationship between Structural Adjustment, Financial Sustainability and Economic Growth in Ethiopia. Section 4 focuses on a Triple Bottom Line Evaluation of Structural Adjustment Policies in Ethiopia, while Sect. 5 summarizes the paper's conclusions.

## 2 Economic Reform and Financial Stabilization in Ethiopia

To understand the genesis of Ethiopia's economic and financial stabilization policies, a brief detour to the country's checkered history is necessary. Prior to the 1990s, the Ethiopian economy was in tatters. Governed for many years by a system that impeded modernization and economic development, the Ethiopian economy not only stagnated but also was buffeted by chronic poverty and unemployment. The monarchy's reticence and lethargy in promoting economic development, amid rising expectations by restive students, organized labor, the military, and peasants, led to a failed coup in 1960.[2] One of the aftermaths of the botched coup was the introduction of some reforms by the monarchy, including agricultural modernization. Despite those reforms, Ethiopia continued to face serious economic and financial crises that not only crippled the economy, but precipitated widespread social unrests by university students and organized labor (Teffera 2012).

[1] Africa has had a number of "success stories" in the past four decades. They include Ghana, Mauritius, Botswana, South Africa, Tunisia, Morocco and Senegal. Quite often, those success stories quickly turn into disappointments, as in the case of Tunisia, Morocco, Ghana and South Africa.

[2] The coup was said to have been motivated by the fact that, compared with the newly independent African states, Ethiopia was "far behind in economic development, education, and living standards." (Clapham 1968, p. 502).

The malcontent in the country eventually culminated in the removal of the monarchy in 1974, and its replacement by a socialist-oriented military junta known as the Derg (Koehn 1975, p.12). In doing so, however, Ethiopia skipped the critical capitalist epoch of historical materialism, a slip that would later weaken the economic foundations of the Derg regime. With no capitalist foundation, and imbued with a very weak industrial base, as well as an atrophied entrepreneurial class, the state monopolized the economy, became omnipresent and overbearing. The results of state control of the Ethiopian economy under the Derg were as devastating as the economic policies under the monarchy (Woldesenbet 2020, pp. 76–77). The Ethiopian economy under the Derg was characterized by agricultural stagnation, a crippling famine, chronic poverty, unemployment, and lack of opportunities (Girma 1987; Turner 1986). The Derg administration collapsed in 1991 under the weight of economic crisis, political instability and the pro-democracy fervor that swept across the globe in the later 1980s, following the abrupt demise of the Soviet Union.

The new administration that took over power after the collapse of the Derg regime was led by Prime Minister Meles Zenawi, under the platform of the Ethiopian People's Revolutionary Democratic Front (EPRDF) [Shewadeg 2019]. Though an avowed Marxist, he embraced neoliberalism and began implementing economic and political reforms designed to shift the economy from state control to a market-based economy.[3] The reason for this change may be found in what Clapham (2006) describes as the "politics of emulation." Since the mid-nineteenth century, successive Ethiopian ruling elites have strived to promote economic development by copying development paradigms from other countries (Clapham 2006, p. 137).

After the introduction of a new constitution in 1994, Ethiopia adopted a parliamentary system of government and held elections in 1995, ushering in a new democratic era in the country. Unlike some African countries that implemented market-based economic reforms under undemocratic regimes, Ethiopia's economic reforms came in tandem with political reforms and democratization.[4] The three major pillars of Ethiopia's structural adjustment are summarized in Table 8.1, and they include the following (Tashu 2003):

Fiscal Reform: A centerpiece of Ethiopia's fiscal reform was to provide essential social services, while reducing budget deficits (Tashu 2003). Fiscal reform was also aimed at signaling to the private sector that the government wished to pursue fiscal sustainability, and assure the private sector that there won't be future tax increases to cover a bloated budget. The maintenance of a healthy fiscal balance has often been a challenge for developing countries. Of all the functions of government, service delivery (health, education, water supply, waste management, affordable housing, etc.) is considered by the citizens as the most important. On the other hand, the provision of an optimal level of social services may require raising taxes, import duties and other levies that hinder private sector development. Thus, Ethiopia's fiscal reform focused on finding an acceptable balance between fiscal/financial sustainability and optimal provision of social services. It appears, however, that the Ethiopian government tilted the balance toward private sector development. This is manifested in the current situation in which Ethiopia suffers acute housing shortages, poor infrastructures, inadequate schools and health centers, etc.

[3] Socialist-oriented regimes sometimes embrace neoliberal economic and financial sustainability policies for pragmatic reasons, as in the cases of Ghana under Jerry Rawlings, and Brazil under Luiz Lula da Silva. With the Soviet Union no longer in existence to provide financial support, these regimes turn to the West and its affiliated multilateral financial institutions, who in turn demand implementation of neoliberal policies as a quid pro quo for support.

[4] These days, bilateral and multilateral donors tend to support only economic reforms undertaken by democratic regimes. Financial support is mostly conditioned on the implementation of political reforms, democratization and good governance.

**Table 8.1** Fiscal, financial and external sector reforms in Ethiopia in the 1992/93–2000

| Measures | Instruments | Goals |
|---|---|---|
| Fiscal Reform | Reduction of public expenditures<br>Increase in the number of goods attracting import duties<br>Broadening of the tax base<br>Rental income tax<br>Customs tariff rate reduction | Revenue improvement<br>Modest increase in expenditures<br>Reduction of overall deficit. |
| Monetary and Financial Reform | Discontinuing with financial repression<br>Interest rates liberalization<br>Establishment of private commercial banks and insurance companies<br>Introduction of indirect monetary policies (example: introduction of treasury bill auctions)<br>Introduction of a modern legal and institutional framework for the National Bank of Ethiopia | Removal of financial repression<br>Mobilization of savings and investment<br>Competition and efficiency in the financial sector |
| External Sector Reform | Reduction of import tariffs<br>Liberalization of payment and exchange regulations<br>Currency devaluation<br>Establishment of exchange bureaus<br>Introduction of import duty drawback system | Export promotion<br>Balance of payments equilibrium |

Source: Summarized from information in Tashu (2003)

Monetary and Financial Reforms: The goal was to ensure a money supply growth rate that was commensurate with the targeted level of economic growth, inflation and balance of payments. Under these reforms, credit would be allowed to grow to support the private sector. To incentivize both lenders and borrowers, and hence mobilize investible funds, the financial sector was liberalized to generate positive interest rates.

External Sector Reforms: The main focus was to achieve a desirable balance of payments outcome. This was to be accomplished through export promotion, greater integration with the global economy, import tariffs reduction, liberalization of exchange rates and payment systems, currency devaluation, import duty drawback, and the establishment of foreign exchange bureaus.

Privatization and Deregulation: To promote private sector development, market-based investment and labor codes were introduced, while regulations on land renting and licensing in general were relaxed. With the exception of the telecommunications and airline sectors, where the state still retains ownership, all other sectors were privatized.

As is typical of neoliberal policies, no explicit provisions were made for the protection and empowerment of vulnerable groups, or those who might be hurt by reforms. It is implicitly assumed that the development of the private sector through liberalization would automatically benefit the poor and vulnerable. I evaluate the veracity of this assumption in Sect. 4 of this chapter.

Perhaps more than any country, Ethiopia's SAP has been supported by both bilateral and multilateral donors in substantial ways, so much so that it has been the highest recipient of Overseas Development Assistance (ODA) in Africa in the past two decades or so (Table 8.2). With a total of 233 World Bank projects as of 2020, Ethiopia is amongst the top African countries in terms of World Bank projects in Africa. A crucial question, however, is whether Ethiopia's structural reforms are sustainable without donor support? It has been suggested that adjustment programs in Africa succeed only to the extent that donors pump lots of funds into the economy of an adjusting country. The next section evaluates the impact of SAP on Ethiopia's economic growth.

**Table 8.2** Top 10 ODA recipients in Africa. Annual averages (USD million)

| | 2010–15 (%share) | 1970–79 | 1980–89 | 1990–99 | 2000–09 | 2010–15 | Number of World Bank Projects (as of 2020) |
|---|---|---|---|---|---|---|---|
| Ethiopia | 6.7 | 398 | 1158 | 1344 | 2412 | 3582 | 233 |
| DRC | 6.2 | 815 | 1028 | 428 | 2266 | 3323 | 188 |
| Tanzania | 5.4 | 849 | 1717 | 1537 | 2265 | 2891 | 288 |
| Kenya | 4.8 | 587 | 1231 | 1001 | 1030 | 2599 | 281 |
| Egypt | 4.6 | 5262 | 3275 | 4450 | 1537 | 2463 | ? |
| Nigeria | 4.2 | 333 | 155 | 321 | 2761 | 2268 | 252 |
| Mozambique | 3.9 | 133 | 922 | 1651 | 1924 | 2111 | 179 |
| Uganda | 3.2 | 147 | 500 | 1043 | 1544 | 1694 | 241 |
| Ghana | 3.0 | 324 | 644 | 890 | 1301 | 1637 | 264 |
| Morocco | 3.0 | 942 | 1548 | 1187 | 974 | 1630 | |

Source: OECD

## 3 Structural Adjustment, Financial Sustainability and Economic Growth in Ethiopia

Orthodox economists usually focus on economic growth rates as the main indicator for the efficacy of an economic policy initiative. According to the World Bank (1994, p. 132), "the most telling indicators of success of adjustment efforts is the change in per capita GDP growth." On that count, economic reforms and liberalization in Ethiopia have unambiguously succeeded. As Table 8.3 shows, Ethiopia has achieved very impressive growth rates within the past three decades. At the beginning of the implementation of economic and financial reforms in 1992, Ethiopia grew at a negative rate of 8.9%. In less than a decade, growth soared to about 10% in 2000, reaching an all-time high of almost 13% in 2005. Growth has remained mostly in the double digits for the past 15 years.[5] This is unprecedented, considering that African countries typically experience booms and bust cycles in their growth process (Collier and Gunning 1999). Could the resilience of Ethiopia's economic growth be attributed to the fact that it has been "pampered" by donors with massive infusion of aid?[6] Could it be because of its adoption of an Agricultural Development Led Industrialization (ADLI) strategy, rather than reliance on minerals? While these questions are beyond the scope of this chapter, it is instructive to note that Tadesse and Abafia (2019) argue that improvements in Ethiopia's financial sector contributed to the country's economic growth in both the short-and long-run. There are three major drivers of Ethiopia's economic growth:

*Agriculture and Agro-processing:* Between 2005 and 2013, Ethiopia's agricultural sector grew by an average annual rate of 7.8%[7] (Table 8.4). As a result, about 31% of the GDP growth rate during 2011–2013 came from the agricultural sector, though this was down from the 54.7% that the sector contributed to GDP growth during 2004–2005. Animal husbandry is a major component of Ethiopia's agricultural section. Despite the recent expansion of the industrial and service sectors, Ethiopia remains a country of herdsmen. According to the International Fund for Agricultural Development (IFAD),

[5]Ethiopia's economic growth plummeted to an all-time low of about 1.9% in 2020, due to the COVID pandemic. The country's robust economic growth is expected to rebound in 2021 and reach an impressive rate of about 9% by 2022 (IMF database: https://www.imf.org/en/Publications/WEO/weo-database/2020/October/weo-report?)

[6]Gebregziabher (2013) argues that Ethiopia's economic growth was facilitated mainly by the massive infusion of aid in the country. If so, it may suggest that SAP does not by itself spur economic growth. It has to be combined with aid in order to be successful.

[7]See Ethiopia: Agricultural Risk Assessment Study, *Platform for Agricultural Risk Management* (PARM), December 2016.

**Table 8.3** Ethiopia: post-structural adjustment macroeconomic performance, 1992–2019

| Year | GDP growth (%) | Investment (% of GDP) | Inflation rate (%) | Merchandise trade (% of GDP) | Real interest rates (%) | Gross national savings (%) |
|---|---|---|---|---|---|---|
| 1992 | −8.9 | 10.6 | 21.0 | 9.6 | −6.5 | 6.6 |
| 1993 | 13.4 | 16.4 | 10.0 | 11.1 | 0.6 | 7.5 |
| 1994 | 3.5 | 17.5 | 1.2 | 20.3 | 11.0 | 9.2 |
| 1995 | 6.1 | 12.3 | 13.4 | 20.5 | 2.1 | 13.5 |
| 1996 | 13.5 | 17.5 | 0.9 | 21.3 | 13.7 | 12.2 |
| 1997 | 2.8 | 13.4 | −6.4 | 19.8 | 10.3 | 10.0 |
| 1998 | −4.1 | 15.1 | 3.6 | 26.6 | 10.7 | 12.5 |
| 1999 | 6.3 | 15.2 | 7.9 | 26.0 | 8.2 | 7.4 |
| 2000 | 9.9 | 20.2 | 0.7 | 21.2 | 1.3 | 16.7 |
| 2005 | 12.6 | 22.4 | 11.7 | 40.3 | −2.6 | 17.1 |
| 2008 | 11.2 | 21.2 | 44.4 | 36.5 | −17.1 | 20.7 |
| 2010 | 10.6 | 25.5 | 8.1 | 36.5 | | 24.4 |
| 2012 | 8.7 | 37.1 | 24.1 | 35.2 | | 31.1 |
| 2015 | 10.4 | 39.4 | 9.6 | 31.0 | | 31.4 |
| 2017 | 10.1 | 39.0 | 10.7 | 23.5 | | 29.2 |
| 2019 | 7.4 | 38.5 | 14.6 | | | 32.5 |

Source: World Development Indicators Database

**Table 8.4** Annual percentage change, unless indicated otherwise

| | 2017 | 2018 | 2019e | 2020f | 2021f | 2022f |
|---|---|---|---|---|---|---|
| **Real GDP Growth (constant market prices** | 10.1 | 7.7 | 9.0 | 3.2 | 3.6 | 8.5 |
| Private Consumption | 5.6 | 5.3 | 5.1 | 3.0 | 3.3 | 4.7 |
| Government Consumption | 8.3 | 3.6 | 7.2 | 19.4 | 1.2 | −1.7 |
| Gross Fixed Capital Investment | 6.9 | 6.8 | 12.4 | −0.6 | 3.1 | 14.6 |
| Exports, Goods and Services | 6.0 | 5.0 | 3.0 | −12.0 | 12.0 | 13.0 |
| Imports, Goods and Services | −7.5 | 0.2 | 0.6 | −1.0 | 2.5 | 3.2 |
| **Real GDP Growth (constant factor prices)** | 10.2 | 7.7 | 9.0 | 3.2 | 3.6 | 8.5 |
| Agriculture | 6.7 | 3.5 | 3.8 | 3.4 | 3.5 | 4.0 |
| Industry | 18.7 | 12.2 | 11.5 | 6.0 | 7.0 | 9.0 |
| Services | 8.6 | 8.7 | 12.0 | 1.1 | 1.3 | 12.0 |
| **Current Account Balance (% of GDP)** | −8.3 | −6.2 | −5.1 | −4.7 | −4.5 | −4.6 |
| **Fiscal Balance (% of GDP)** | −3.3 | −2.9 | −2.5 | −4.0 | −3.5 | −1.9 |
| **Debt (% of GDP)** | 58.9 | 55.3 | 52.7 | 51.9 | 51.3 | 50.3 |

Source: World Bank, *Macro Poverty Outlook Update,* June 8, 2020

Ethiopia has the largest livestock population in Africa, as well as being the continent's top producer and exporter of livestock. Ethiopia exports livestock mainly to Saudi Arabia, Egypt, and the United Arab Emirates. Data from the Food and Agriculture organization (FAO) show that Ethiopia has about 3.7% of the world's 1.5 billion head of cattle. Specifically, Ethiopia has 54 million head of cattle (or 0.5 cattle per person). What is instructive is that Ethiopia's cattle have a far smaller area of land to graze than many other African countries, which may result in overgrazing, destruction of the ecosystem and loss of biodiversity (see Sect. 4). Ethiopia's vibrant livestock sector has spurred a virile agro-processing industry that has led to the export of leather products –shoes, jackets, fur coats, bags, purses, belts, etc.

Apart from livestock, Ethiopia's economic growth has been boosted by coffee production and exports. As the largest exporter of coffee

in Africa, coffee exports generated $2.9 billion during the 2017–2018 fiscal year, though it fell short of the $4 billion targeted by the government. To boost coffee and other exports, the Ethiopian Central Bank devalued the currency (Birr) by 15% in October 2017.[8]

*Services and Tourism:* Financial services, tourism, and real-estate have also been contributing to Ethiopia's economic growth. Since 2008/09, the services sector has superseded agriculture as a major contributor to GDP. As of 2018, this sector contributed 39.3% of GDP, while agriculture contributed 36.3% (UNDP, 2018). Apart from being a major contributor to GDP, services have also been growing faster than agriculture (see Table 8.4). But this presents a dilemma in Ethiopia's and multilateral organizations' efforts to alleviate poverty. Services jobs benefit mostly educated and semi-educated urban dwellers. Think about hotel staff: receptionists, cooks, security guards, etc. They all have basic education, which most of the rural dwellers don't have. As discussed in Sect. 4, this is one of the reasons for the inequities of economic reforms in Ethiopia.

*Infrastructural Boom:* Investment in infrastructures has been a major driver of growth in Ethiopia (Moller and Wacker 2017). Ethiopia features a few signature infrastructural projects that have become the talk of the globe. The controversial Grand Ethiopian Renaissance Dam (GERD), formerly the Millennium Dam, was built at a cost of $5 billion. It is expected to generate hydroelectric power of about 6 gigawatts, the largest in Africa.[9] China has been the major driver of Ethiopia's infrastructural boom, as a financier and supplier of construction services. In two decades, for instance, China provided $86 million for the construction of a ring road in Addis Ababa; $12.7 million for the Gotera Intersection; $800 million for the construction of Ethiopia's first six lane highway, as well as the $4 billion Ethio-Djibouti Railway line.[10] China constructed the Africa Union (AU) headquarters in Addis Ababa for $200 million, and donated it to the organization.

## 4 Triple Bottom Line (TBL) Evaluation of Ethiopia's Structural Adjustment Policies

The right question to ask about economic and financial reforms in Ethiopia is not whether it has spurred economic growth, but whether it has fostered sustainable development. Sustainable development was originally defined in the Brundtland Commission's report, "Our Common Future," as "development in which present generations find ways to satisfy their needs without compromising the chances of future generations to satisfy their needs" (Brundtland 1987). As the field of sustainable development has grown, so has the ambiguity surrounding the precise meaning of sustainability (Onyeiwu et al. 2011). Arguments have ensued over whether the correct term should be sustainable growth or sustainable development; whether something can be classified as weak or strong sustainability, and whether certain aspects of sustainability are viable indicators (Daly 1990; Ayres 2008; Rigby et al. 2001). As of 1995, there were 386 definitions of sustainability, a number which has surely risen in the time since (Jacobs 1995). In this chapter, I adopt the concept of sustainability espoused by Sachs (2015, p. xiii), which contends that sustainable development is about "the interlinkages of eco-

[8] See A. R.A. Shaban, "Ethiopia central bank announces 15% devaluation of Birr," *Reuters*, October 10, 2017 (https://www.africanews.com/2017/10/10/ethiopia-central-bank-announces-15-percent-devaluation-of-birr//)

[9] K. Salam, "The Blue Nile Is Dammed," *Foreign Policy,* July 24, 2020 (https://foreignpolicy.com/2020/07/24/the-blue-nile-is-dammed/)

[10] J. Marsh, "Skyscrapers, trains and roads: How Addis Came to Look Like a Chinese City." CNN Report, September 2018 (https://www.cnn.com/style/article/addis-ababa-china-construction-style/index.html)

nomic, social, and environmental change." I also subscribe to the notion that SAP must transcend market fundamentalism and foster economic dignity, defined as the ability of individuals to achieve economic security, self-worth, respect, unimpeded access to health, ability to take care of loved ones and optimal utilization of one's capabilities (Sperling 2020; Sen 1999).

I argue that a Triple Bottom Line (TBL) or sustainability approach is a more robust framework for evaluating the impact of SAP in Ethiopia. For a country with a checkered history of poverty, inequality, and ecological challenges, assessing the impact of SAP solely based on market orthodoxy is not only disingenuous, but also perpetuates the very processes and mindsets that have continuously reproduced the country's sordid socio-economic profile. A sustainability approach to the analysis of SAP requires the use of the three bottom line of Economy, Equity and Environmental Sustainability. When one of the three legs of the sustainability tripod is defective, then economic reforms cannot be said to have generated sustainable development. In the next section, I explore whether Ethiopia's economic and financial reforms have been sustainable, in the sense of meeting the three criteria of the TBL.

*The TBL Methodology for Ethiopia:* Qualitative information is as important as quantitative data in evaluating the extent to which economic and financial reforms have impacted the economy, equity and the environment. Indeed, one effective way of studying African economies is not only through statistical analysis, but via interactions with the people; participant-observation; hearing the stories of a broad segment of the population; their challenges, opportunities, and aspirations. Information for the TBL analysis in this chapter was gathered during four visits to Ethiopia (2009, 2011, 2018 and 2019). The visits consisted of interviews with rural and urban dwellers in the north and south of Ethiopia. I also visited the country's major urban areas: Addis Ababa, Awassa, Bahir Dar and Gondar. There were also visits to markets, coffee farms, animal husbandry, fishing cooperatives, agro-processing plants, and eco-tourist sites. Other places visited include: hospitals and clinics, high schools and universities; churches, museums, farms, families, etc. These visits enabled me gain insights into living conditions, opportunities, and challenges across a broad section of the Ethiopian economy and society. The goal of this section is to weave my observations with secondary sources of information, to gain a more holistic understanding of the impact of Ethiopia's economic reforms. In other words, this holistic approach provides contexts and new interpretations to previous analyses of structural adjustment in Ethiopia.

## 4.1 Economy

Structural adjustment in Ethiopia satisfies the economic dimension of the TBL. As Table 8.3 shows, the country has achieved impressive economic growth rates since the implementation of structural adjustment. From a negative growth in 1992, growth has been mostly in the double digits in the past two decades.[11] Per capita income rose from $183 in 1995 to $570 in 2010, and then reached an all-time high of $602 in 2019. Table 8.3 also shows that Ethiopia's macroeconomy has improved significantly since the implementation of reforms. While inflation remains a challenge and has been mostly in the double digits,[12] indicators like debt, fiscal deficits, and current account balance remain at sustainable levels. Investment received a major boost after the implementation of reforms, from 10% of

[11]The decrease in growth in the late 1990s was a result of the war with Eritrea in 1998–2000, as well as a severe drought during 2002–2003.

[12]Ethiopia's structural adjustment policies and high growth rates have resulted in persistent increases in the rate of inflation, from just 0.7% in 2000 to almost 16% in 2019 (Table 8.3). To slow down inflation, the Ethiopian Central Bank raised interest rates by 2 percent in October 2017.

GDP in 1992 to nearly 40% in 2015. Perhaps because of its impressive growth performance, commitment to economic reforms and good governance, Ethiopia has continued to be the highest recipient of bilateral and multilateral aid in Africa. Additionally, stellar growth rates have resulted in declining poverty rates in the country, from 71% in 1995 to about 30% in 2018 (Table 8.5). As poverty declined and income rose, so also did living standards. Mobile telephone subscriptions rose from about eight per 100 people in 2010 to 42 in 2015 (Table 8.5).

Some of the mechanisms by which growth has reduced poverty in Ethiopia include the following:

- *Income Diversification and Mitigation of Shocks:* As Table 8.4 shows, industry (mainly agro-processing) and services are the major drivers of Ethiopia's economic growth. The growth of these sectors has created job opportunities and alternative income sources with which poor households use in mitigating shocks. Poverty in Ethiopia is often driven, among other things, by exogenous shocks and vulnerability (Dercon 2005). These include illness, loss of a family member, famine, unfavorable climate conditions (such as excessive rainfall, drought, and locust invasion), loss of employment, harvest failure, etc.
- *Increase in Demand for Agricultural Products:* increases in per capita income and job opportunities in the industry and service sectors have spurred demand for agricultural products. Trade liberalization has also boosted the exports of agricultural products, especially coffee and beef, resulting in rising incomes for rural farmers and herders. Ethiopia's Agricultural Development Led Industrialization (ADLI) strategy has also spurred an increase in the demand for agricultural and dairy products.
- *Improved Access to Markets:* construction of roads, as well as the introduction of government-subsidized mass transportation (trains, buses, and trams) have enabled farmers and herders to have better access to markets.
- Better access to agricultural inputs, including seedlings, fertilizers and extension services (Teka and Lee 2019).

Although the poverty rate has been declining, Ethiopia remains one of the poorest countries in Africa (Dercon and Hill 2009, p.3; Dorosh et al. 2012). It is not too far-fetched, therefore, to assert that Ethiopia's economic growth has been one without structural transformation (Dorosh et al. 2012). The growth elasticity of poverty in Ethiopia is very low (World Bank, 2019). China and Ethiopia have grown almost at the same rates in the past two decades, but poverty has declined faster in China. In the early 2000s, China's poverty rate was about 32%, while Ethiopia's was 39%. By 2015, however, China's poverty rate had fallen to 0.7%, whereas Ethiopia's remained high at 31% (World Development Indicators database). One reason why the poverty elasticity of growth in Ethiopia has not been as high as expected is because Ethiopia's growth has not been accompanied by structural change, as most Ethiopians are still employed in the low-productivity agricultural sector and reside in rural communities with little or no social services (health centers, schools, electricity, clean water, roads, etc.). Despite the country's ADLI strategy, Ethiopia remains a country of poor farmers and herdsmen. One lesson from Ethiopia is that economic reforms and

**Table 8.5** Per capita income and poverty in Ethiopia

| | 1995 | 1999 | 2004 | 2010 | 2012 | 2013 | 2015 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|
| Poverty Rate (at $1.90 per day PPP, % of population) | 71.1 | 61.2 | 37.2 | 33.5 | 32.9 | 32 | 31.2 | 29.9 | – |
| Per Capita Income (constant 2010 US$) | 183 | 191 | 215 | 341 | 389 | 419 | 482 | 570 | 602 |
| Mobile Telephone Subscriptions (per 100 people) | 0 | 0.01 | 0.21 | 7.82 | 22.13 | 26.89 | 41.96 | – | – |

Source: World Development Indicators

financial liberalization do not always lead to structural transformation. Yet, without structural transformation that draws surplus labor from the rural economy to a growing industrial sector, productivity will remain low and poverty will be endemic in the rural sector (Lewis 1954).

## 4.2 Equity

As Shadish et al. (1991, p. 19) point out, the goal of reforms should be to "improve the welfare of individuals, organizations and society." While Ethiopia's economic growth has reduced the poverty rate, it has not been inclusive and equitable. Poverty has fallen faster in urban areas than rural areas. In urban areas, it fell from 26% in 2011, to 15% in 2016, whereas it decreased modestly from 30% to 26% in rural areas during the same period.[13] The inequity inherent in Ethiopia's economic reforms is vividly manifested by the number of children in poverty. According to the United Nations Children's Fund (UNICEF), 'nearly 36 million children in Ethiopia are poor and lack access to basic social services."[14]

During my visits, I observed a very wide contrast in the living conditions of rural and urban Ethiopians. Rural consumption has grown by less than 1% per year during 2011–2015, compared with 6% in urban areas.[15] According to the World Bank, the poorest rural dwellers in Ethiopia did not experience any real consumption growth between 2005 and 2016. As well, the severity of rural poverty was higher in 2016 than in 2005. Ethiopia's ranks as number 173 out of 189 countries in the Human Development Index (HDI ranking in 2019), and it has consistently ranked amongst the countries in the far bottom of the HDI.[16]

I witnessed pervasive evidence of chronic poverty in rural Ethiopia, compared with urban residents. In several villages, uneducated and unskilled youths migrate to urban areas, but became unemployed and resorted to low-income activities and street begging. Mass migration of poor women and children from the Somali region of Ethiopia has exacerbated urban congestion. About 80% of the residents in Addis Ababa live in slums. Only 7% of houses in the city are connected to a sewer system, and almost a quarter of residents have no access to a toilet. There is only one room in about 35% of the houses in the city, causing overcrowding, poor sanitation and high prevalence of disease.[17] Prunier and Ficquet (2015, p. 401) further describe the environmental situation in Addis Ababa in the following ways: "while neighborhoods progressively became more built up, access to basic services has not always kept pace. The hygiene situation is alarming, rates of access by households to basic services are overwhelmingly insufficient; existing infrastructure was not conceived for the growing population densities, and a good deal of community sanitary infrastructure has been abandoned—degrading the environment."

One reason why growth in Ethiopia has not been equitable and inclusive is that there are many Ethiopians with little education and skills. At 52% literacy rate, Ethiopia is amongst the 13 African countries with the lowest literacy rates.[18] The lack of education and skills implies that there are few conduits, short of cash transfers and subsidies for essential goods and social services, through which growth can trickle down to the vast majority of Ethiopians.

[13] World Bank Report, *Ethiopia Poverty Assessment: Poverty Rate Declines, Despite Challenges,* April 2020 (https://www.worldbank.org/en/country/ethiopia/publication/ethiopia-poverty-assessment-poverty-rate-declines-despite-challenges)

[14] United Nations Children's Fund (UNICEF) Report, *Multi-dimensional Child Deprivation in Ethiopia*, 2018 (https://www.unicef.org/ethiopia/reports/multi-dimensional-child-deprivation-ethiopia-first-national-estimates)

[15] World Bank Report, *Poverty and Equity Brief*, April 2020 (https://databank.worldbank.org/data/download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/SM2020/Global_POVEQ_ETH.pdf)

[16] United Nations Development Programme (UNDP), *Human Development Index Ranking*, 2019 (http://hdr.undp.org/en/content/2019-human-development-index-ranking)

[17] Habitat for Humanity, Great Britain, "Slum Housing in Ethiopia." https://www.habitatforhumanity.org.uk/blog/2017/11/slum-housing-ethiopia-modernise/

[18] Literacy rate applies to people 15 and above. See World Bank, *World Development Indicators* (https://data.worldbank.org/indicator/SE.ADT.LITR.ZS)

Another source of the inequity in Ethiopia relates to the government's ADLI strategy. The push for agro-allied industrialization in Ethiopia has resulted in landlessness for many peasant farmers (Baye 2017, pp. 32–33). Land ownership in Ethiopia is vested in the state. The government has prioritized industrialization, which has led to land reallocation to global corporations, at the expense of subsistence farmers. This would not have been a problem, if the agro-allied industries were able to employ landless farmers. While many agro-processing plants are located in rural communities of Ethiopia, they have generated little or no linkage effects with the local economies. During my visit to a winery owned by a French company, I found that the grapes were produced through mechanized farming, and the winery itself was very capital-intensive. Its employment effects have been very marginal. The company has a small store at its entrance where it sells wine, mainly to tourists that pass through the highway where the company is located. A bottle of wine sold at this store was about US$5, in a country where the per capita income is only $600 per year. In other words, the vast majority of the residents of this community are unable to afford the product. The employment of landless farmers by agro-allied industries has been limited by several factors, including the fact that most of the farmers lack basic education and skills, making them unemployable in agro-processing plants and manufacturing firms in general.

The inequity of growth in Ethiopia is also manifested in the fact that most rural Ethiopians do not have access to quality social services, especially those who reside in the Somali, Afar, the southern parts of SNNPR, and the southern and eastern parts of Oromiya (World Bank, April 2020). Rural dwellers in these regions lack access to schools, transportation, health centers, portable water, electricity, Internet, financial services, and roads. Inequality and lack of inclusiveness are not peculiar to Ethiopia's rural communities; they are also manifested in the urban areas. Examples abound about educated youths unable to obtain gainful employment in urban areas. One classic case is that of a young man in his late 20s who holds a Bachelor's degree in engineering and a Master's in finance. He went for a master's degree in finance because he could not find a job as an engineer. Under the illusion that a master's degree in finance would improve his odds of obtaining a job, he could not find a job after an expensive master's degree in finance. He borrowed money and bought a rickety car, which he uses as a cab. There are also examples of young university graduates who end up in low-paying service sector jobs – as hotel cleaners, receptionists, tour guides, etc. Ethiopia has become the largest source of immigrants to Yemen, who use the country as a gateway to oil-rich Gulf countries, particularly Saudi Arabia. About 90% of migrants in Yemen are Ethiopians, mostly youths with little education.[19]

## 4.3 Environmental Sustainability

As discussed earlier on, economic reforms and financial liberalization have promoted economic growth in Ethiopia. It has also spurred inflation, especially for manufactured goods and services (Table 8.3). Thus, farmers and herdsmen are not only paying market prices for goods and services previously subsidized by the government prior to reforms, but those prices are rising very fast. To generate enough income to support their consumption of goods and services, farmers and pastoralists have to produce more, leading to over-utilization of agricultural land and overgrazing of pasture. The allocation of land to agro-industrialists has reduced the availability of farming and grazing land, forcing farmers and herders to utilize the same piece of land over and over again. Arable land per person in Ethiopia decreased from 0.19 hectares per person in 1993 to 0.14 in 2001 (World Development Indicators). It has remained flat at this level since then.

This has resulted in loss of soil fertility and destruction of natural ecosystems. The image that catches the attention of a first-time visitor to the

[19] D. Botti, and M. Phillips, "Record numbers of refugees and migrants arrive in Yemen amidst intensifying and complicated war," *Relief Web*, August 2019 (https://reliefweb.int/report/yemen/record-numbers-refugees-and-migrants-arrive-yemen-amidst-intensifying-and-complicated)

South of Ethiopia is that of animals everywhere; on the highway jostling for space with motorists; on sprawling farmlands; on street corners. The reason is that the increasing scarcity of grazing land has forced herders to traverse vast large swaths of areas in search of pasture. It is not uncommon to find very young boys tending to scores of animals, trekking several miles in search of a depleting stock of pasture. The overuse and depletion of resources can be observed from the pattern of fishing in Ethiopia. In the town of Awassa, I visited a fishing cooperative made up of young men and women in their 20s. They send out a group of members daily on boats to fish, and another group would clean up the fish and sell them to restaurants and households. Because fishing is done daily within the same area of the river, the fish they catch look very tiny. Interviews with some members of the cooperative revealed that the cooperative was becoming more and more frustrated because of the depletion of the stock of fish in the river. But because of their need to generate income due to the lack of alternative avenues for employment, they had no choice but to continue fishing on a daily basis.

About half of the poor in Africa live in four countries: Ethiopia, DRC, Nigeria, and Tanzania (Onyeiwu 2015, p. 61). Although Ethiopia's poverty rate has declined since the implementation of economic and financial reforms, chronic poverty remains endemic in the country, especially amongst farmers and herders in rural villages. Chronic poverty in Ethiopia has led to unsustainable farm practices and patterns of animal grazing that are destructive to the natural ecosystem. For instance, lacking the resources to purchase stoves, kerosene, gas cookers and other modern appliances, farmers resort to the use of animal dungs and biomass as energy sources, rather than use them as soil nutrients. The use of wood for energy has contributed to the rapid pace of deforestation in Ethiopia, causing a 72.5 K hectares decline in forest cover between 2002 and 2019.[20] It lost about 18% of its total tree cover, as well as a 3.8% decrease in total area of forest cover. Deforestation has also contributed to Ethiopia's loss of biodiversity, which has caused wild animals to lose their natural habits.[21] In other words, Ethiopian farmers and herders, in response to the economic hardships imposed by structural adjustment, are unwittingly vitiating and undermining the physical and ecological basis of their existence.

The excessive use of natural resources, as a result of poverty, creates a cycle of low productivity, low yields, low income, poverty and unsustainable use of resources. A New York University study reported that 60% of Ethiopians live in areas that are susceptible to serious human-induced environmental degradation. This, according to the report, is caused by the "clearance of woodlands and forests, unsustainable arable farming techniques, the use of dung and crop residues for fuel rather than as fertilizer, and overstocking of grazing land."[22]

The scarcity of farmland and pastures has been exacerbated by the habit of agro-processing companies fencing off their land and preventing farmers and herders from gaining access (Kuto et al. 2018, p. 35). In many cases, security guards are employed to prevent locals from farming or grazing on company land. Where these lands contain pristine lakes, the locals are prevented by the companies from having access to them. Effluent wastes from agro-processing companies are dumped in lakes and agricultural lands, thus degrading the natural eco-system and undermining the livelihood of rural Ethiopians. According to Kuto et al. (2018), "hundreds of dangerous chemicals for the production of flowers are being

[20] A report by the Global Forest Watch (GFW), an organization that uses an open-source web application to monitor global forests in near real-time. See GFW's report on Ethiopia at www.globalforestwatch.org/dashboards/country/ETH/?category

[21] One evidence of this is the sight of monkeys abandoning their natural habits and hanging around highways, as well as mingling with tourists. The highway between Addis Ababa and Bahir Dar in Northern Ethiopia is filled with hundreds of monkeys trying to adapt to human-induced disruptions of their natural habitats.

[22] A. Evans, Resources, Risk, and Resilience: Scarcity and Climate Change in Ethiopia, August 2012. Center on International Cooperation, New York University. https://cic.nyu.edu/sites/default/files/evans_security_ethiopia_2012.pdf

used. After using these chemicals, the industry directly discharges chemicals in Lake Dambal. These toxic chemicals are affecting aquatic life, people and animals which are using the lake water."

Ethiopia's high poverty and illiteracy rates have fostered a high population growth rates. The country's population growth rate was less the 2% in 1980, but peaked at about 3.4% in 1994 before stabilizing at about 2.6% in 2019. Its population more than tripled from just 35 million in 1980 to 115 million in 2019. Ethiopia has become the second most populated country in Africa, after Nigeria. Meanwhile, agricultural land has not increased that much, rising from about 31% of total land area in 1993 to 36% in 2016 (World Development Indicators). Ethiopia's rapid rising population has negatively affected the environment in several ways. The first is through rural-urban migration. About 80% of the population reside in rural communities. This has led to competition for limited resources and opportunities in the rural areas. Lacking opportunities in the rural areas, rural dwellers, particularly youths, migrate to urban areas, which themselves had already become congested due to rapid urban population growth.

## 5 Conclusions

Ethiopia's structural adjustment policies have been successful, when viewed with the lenses of neoclassical economics and market fundamentalism. Economic growth has been unusually strong, and key indicators of macroeconomic stability (investment, private sector development, debt, real interest rates, trade openness, etc.) have improved. But when judged from the perspective of sustainability or the triple bottom line, structural adjustment in Ethiopia has been a failure. A major conclusion from this chapter is that, both in the short and long-run, structural adjustment and stabilization policies are ineffective in eliminating chronic poverty and preventing environmental degradation. While these policies are associated with economic growth and poverty reduction, adjusting countries remain endemically poor, inequitable and under tremendous ecological stress. In the case of Ethiopia, the chapter has shown that the gains from economic growth have not been broadly shared amongst the population. After nearly three decades of structural adjustment, Ethiopia remains a very poor country. Extreme poverty and inequality have led to unsustainable agricultural practices such as over-grazing, over-fishing, deforestation and biodiversity loss. Although the Ethiopian government characterizes its development strategy as a "green growth strategy," the chapter finds the opposite: the country's growth process has resulted in biodiversity loss, deforestation, rural-urban migration, and urban congestion. The paper finds evidence to support the notion that the Ethiopian government's and multilateral financial institutions' attempts to alleviate poverty, with structural adjustment and an agricultural development led industrial development strategy, have fostered inequality, and undermined the country's unique and endangered biodiversity (Wolfgram 2006). Ethiopia's case shows that market-based economic reforms and financial stabilization policies, while improving economic performance, exacerbate inequality and degrade the environment. Consequently, countries whose overarching objectives are to foster economic and financial stability, while at the same time eliminate poverty, foster social inclusion and environmental sustainability, should either eschew structural adjustment or proactively explore ways by which it could be equitable and environmentally sustainable.

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# 9 Layered Crises Preventing Poverty Reduction: An Analysis of Zambian Poverty Dynamics and Policy Implications

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**Abstract**

Zambia is experiencing structural distress marked by high levels of severe/food poverty, chronic poverty and impoverishment. Poverty trends are strongly linked to environmental sustainability issues, such as deteriorating fish stocks, soil fertility, drought and floods, and disaster risk. They are also underpinned with further effects such as inability to cope with health shocks, early marriages and divorces, and alcoholism. Long term urban-rural, inter-provincial and gender inequalities are exacerbated by highly contested politics with weak policy development and implementation, both of which sets of contextual factors significantly constrain state action on poverty reduction. The context is also one of macro-economic vulnerability—Zambia is still an LDC, mineral dependent, revenue-deficit and debt-distressed. The 2010s witnessed a recent period of sharp shocks to the incomes of the poor (2016–2019) preceded by years of systemic stressors driving a slower

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decline in income, savings and assets which increased the vulnerability to the recent shocks faced by households and the onset of Covid 19. In this context, policy priorities would include stabilising farm incomes, developing a stronger household asset base, focusing on resource conservation in farming and fisheries, and building a stronger and earlier policy response to disasters.

**Keywords**

Rural-urban poverty · Gender-based poverty dynamics · Covid-19 · Environmental shocks · Debt distress · Disaster risk management

## 1 Introduction[1]

Zambia has a high incidence of poverty especially but not only in rural areas, where nearly 3 out of four households were in poverty in 2015, compared to nearly one out of four in urban areas (LCMS 2015). Much poverty is under the 'food poverty' line, especially in rural areas and for many women headed households. In 2015 there were almost 3 times as many 'food poor' as moderately poor (Diwakar and Bwalya 2021). While poverty is most widespread and deepest in rural areas, urban poverty barely declined between 2010 and 2015 (LCMS 2015), and the qualitative evidence reveals a rise in urban township poverty since 2015, rising sharply between 2017 and 2020 as a consequence of coinciding macro shocks on employment corresponding with rising costs of living (Bond et al. 2021). For the Zambian population as a whole the numbers and proportion of the extremely poor *increased* from 54.2% in 2010 to 60.8% in 2015 (LCMS 2015). Phone surveys by Innovations for Poverty Action during the pandemic recorded widespread loss of incomes, especially for some women, and widespread depletion of savings, to cover basic expenditures on food and health (Billima-Mulenga et al. 2021).

The country's macro-economic context is a challenging one for poverty reduction. Between 2000 and 2014, the annual real gross domestic product (GDP) growth rate averaged 6.8%, but then slowed to 3.1% per annum between 2015 and 2019, mainly because of falling copper prices, declines in agricultural output and hydroelectric power generation due to insufficient rains. During the previous decade the government has invested heavily in badly needed infrastructure, but this has left it unsustainably indebted, and in 2020 in default. Debt servicing and public sector salaries leaves little over for development expenditures. Kwacha devaluation against the dollar has led to inflation, notably in food prices, which are of considerable significance for Zambia's poor, most of whom are net purchasers of food. Drought in 2016 and 2019 led not only to very significant food insecurity but also electricity load shedding which had a highly negative impact on small and medium businesses and employment. With Covid economic activity was in recession in 2020 with double digit inflation, and per capita growth was projected to be negative through 2022 (World Bank, 2021). 2020 has seen the country default, opting to bow out of a $42.5 million Eurobond repayment in November 2020; together with the severe effects of the Covid pandemic on top of the 2019 crises.

The political context has also become challenging: having had multi-party elections for three decades, with an exchange of power between the two major political blocs, the trend in the 2010s has been towards concentration of power in the Presidency and political manoeuvres to avoid the incumbent Patriotic Front government losing power. This has had several pertinent consequences: stagnation in policy making around poverty reduction: the policies in place have been there for most of two decades; a lack of serious commitment to implementation of at least two programmes with poverty-reducing potential—the Food Security Pack and the Social Cash Transfers—while two patronage based policies focused on supporting the pivotal volatile

[1]Where not stated the sources for this chapter are several reports published as part of the Zambia poverty dynamics research, about to be uploaded http://www.chronicpovertynetwork.org/poverty-monitoring/zambia

and low return maize economy have at least continued to receive proper budgetary allocations—the Farming Inputs Subsidy Programme and the Food Reserve Agency (Hinfelaar 2021).

Furthermore, disaster risk management, which was previously treated in a politically neutral way, became a political football during the major 2019 drought, which led to widespread hunger and near-famine conditions in parts of the south and west, which were electorally opposition strongholds. Whereas previous droughts had seen food reserves released to counter drought-induced food price inflation and hunger, on this occasion leadership of the Disaster Management and Mitigation Unit (DMMU) was politicised, and the ruling party decided not to give the liberal opposition party the United Party for National Development any bandwidth as a result of the famine. At the same time a maize export ban was lifted temporarily to permit well placed firms to export the maize which was critical for food security, and maize millers loyal to the ruling party were given milling contracts by the DMMU, some of the proceeds of which filtered back to the ruling party. Potential critical voices in the government were silenced, and widespread suffering was allowed to continue as political loyalty was emphasised above anything else, even in the food distribution which eventually took place through the District Commissioners' and District committees.[2]

A related issue is that of energy supplies: in 2019 the supply of hydro-electricity from the Kariba dam was curtailed due to the same drought, a repeat of the situation which had occurred in 2016, and previously. Electricity was strongly rationed and there were unpredictable power outages, especially in Zambia's low cost housing areas ('townships') where most of the urban poor live. Enterprises dependent on electricity were badly affected, having to close, or change hours of operation, and employment was significantly reduced. The low tariffs and absence of investment in diversifying electricity supplies in Zambia[3] is a contrasting story to that of Kenya, where a similar energy crisis in 2000 led to massive investment in renewables during the subsequent 20 years. In Zambia, the emergency use of diesel generators also led to increased carbon emissions (Ahmed et al. 2021).

This then was the context in which the research reported in the chapter took place. This study synthesizes mixed methods research evidence on poverty, its dynamics, and its drivers in Zambia. The individual studies relied on data from the national Living Standards Measurement Surveys (LCMS) 2010 and 2015, the Rural Agricultural Livelihoods Survey (RALS) 2012, 2015, 2019, pre-Covid qualitative data collected during 2019–2020 across 9 provinces and sites, 5 rural and 4 urban (160 life history interviews and related focus group discussions and key informant interviews). During Covid a small sub-sample of those households were re-interviewed.

Due to its debt situation, Zambia has made social cash transfer beneficiaries a one-off phone payment of K2400 (US$ 107) but has not had the resources to develop a broader or more substantial response to distress during the pandemic. Nevertheless, some recipients reported investing the payment into a micro-business (CPAN 2021).[4] Covid has thus been an important shock in its own right *and* layered on the pre-existing, multiple crises discussed above, no doubt exacerbating existing inequalities (gender, urban-rural, income). This paper discusses these challenges, focused on the intersection of issues relating to environmental sustainability, disaster risk, macro-economic vulnerability, and linked socio-economic issues, which together combine to severely constrain poverty reduction prior to and during Covid19, a situation likely to continue into the medium and long term without significant changes in policies and politics.

[2]Key informant interviews in 2019 and 2021.

[3]Batidzirai et al. (2017).

[4]CPAN (2021) Zambia Covid Poverty Monitor: April 2021 http://www.chronicpovertynetwork.org/covid19-poverty-monitor/zambia-april

## 2 Overview of Poverty Dynamics in Zambia

Poverty dynamics refers to the dynamic movements around a poverty line, in this case the national poverty line or an income approximation. People are identified as chronically poor if they are poor for a number of years (the intervals depending on the timing of surveys); impoverished if they become poor having been non-poor; escaping poverty if they cross the poverty line in an upwards trajectory; and a sustained escape from poverty would be where a household starts poor, then crosses the poverty line, and at a third point in time remains out of poverty.

What do we know about poverty dynamics during the 2010s? Between 2010 and 2015 a 'synthetic panel'[5] revealed that static profiles were most common, with estimates of chronic poverty and never-poor status each accounting for between one third and one half the population when using national poverty lines. Most chronically poor households are found predominantly in rural areas, and most never-poor households are located in urban areas. In between these extremes are still considerable shares of poverty mobility, up to 27% of the population (Diwakar and Bwalya 2021). It appears that most of the impoverishment during the 2010–15 period occurred in rural areas. We expect that during 2015–2020 there will also have been impoverishment in urban areas, due to load shedding and the Covid pandemic significantly affecting businesses and employment.

There was also a high level of inter-provincial variety in rural poverty dynamics patterns, when examining data on smallholder farmers from the Rural Agricultural Livelihoods panel Survey (RALS) spanning 2012–2015–2019.[6] The three urbanised/mining provinces (Lusaka, the Copperbelt, and North-Western) had the highest share of never-poor households, and amongst these the Copperbelt and Lusaka also had the most sustained escapers, alongside Central Province (Fig. 9.1). This likely reflects the higher share of urbanisation in these provinces spurred by growth along the railway line from Livingstone to the Copperbelt, where poverty rates are by and large lower than in rural areas of the country. It is possible that the presence of mining has also spurred diversification into off-farm activities as an avenue out of poverty. Reflecting this narrative, and linked to its capital status, only Lusaka Province had fewer than 50% of households that were chronically poor (Diwakar et al., 2021).

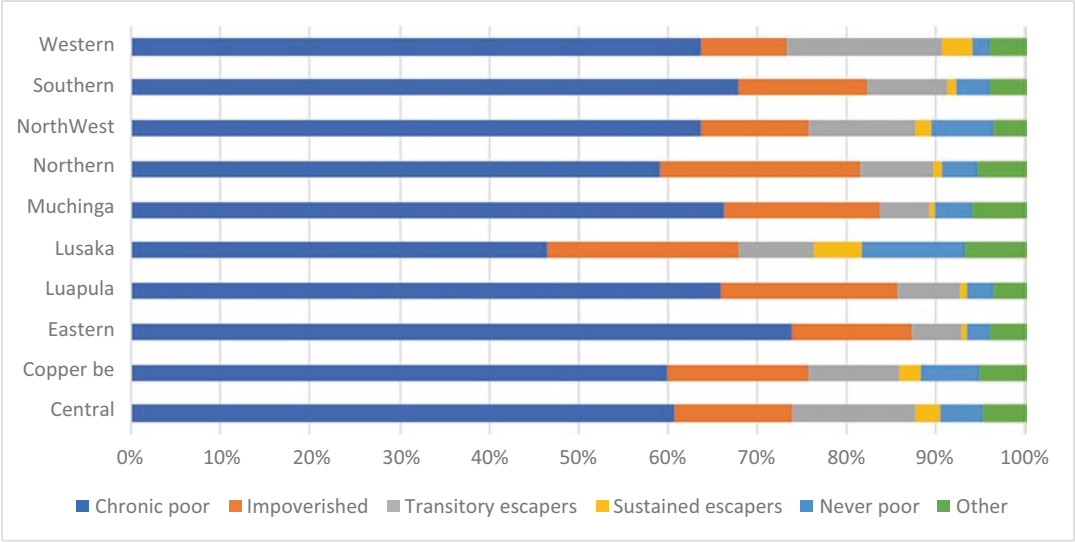
Though the urbanised/mining provinces more generally had a greater share of households that were never-poor, they also had large shares of transitory escapers, along with Southern, Central, and Western Provinces. We know that there is a high level of chronic poverty in rural Zambia, and a very low level of sustained escapes, regardless of the poverty line selected (see below). The majority of rural agricultural households (65%) have been living in chronic poverty, with some significant geographic variations. Rates of chronic poverty were highest in the Eastern Province, with almost three in four households living in chronic poverty, compared to 47% of households in Lusaka province (Diwakar et al., 2021).

## 3 Widespread Chronic Poverty: Interlocking Multiple Stressors

As we have seen, chronic poverty remained widespread in rural areas, and significant in urban areas, with further downward mobility and heightened risks of destitution as a result of Covid in 2020–2021. Constraints include livelihoods based on declining or highly variable natural resource bases (soil fertility, forests and fish stocks), com-

[5]This is a panel constructed from repeated cross-section surveys to derive synthetic panel data estimates of poverty dynamics statistics. It provides bounded estimates for the poverty dynamics, which can be quite wide.

[6]Due to data limitations, the income variable does not include various aspects of agricultural inputs or labour costs, imputation of non-cash expenditures, and other income. The metric is best regarded as a cash inflow variable (referred to hereafter as income for convenience). It is compared to the $1.25 poverty line, as middle ground between the low national poverty line and $1.90 international poverty line (see Diwakar et al., 2021).




*Source: Diwakar et al. (2021)*

**Fig. 9.1** Percentage of rural households in the different poverty categories by province (over the period 2012–2015-2019). *Source: Diwakar* et al. *(2021)*

bined with others including uncompetitive maize marketing, and the dominance of the maize crop in Zambian farming generally; dependence on farming with no or little education and/or high dependency ratios; women and youth headed households being unable to access enough land and irrigation for an agriculturally based escape. This combination of constraints meant that diversification and capital accumulation routes out of poverty have become challenging.

There are rural occupations which are likely to provide livelihoods below the poverty line. In rural areas, these include piece wage labour (*ganyu*); charcoal burning and firewood or reed collection; much fishing and farming, some beer brewing and selling. These occupations frequently face declining or highly variable natural resource bases: declining soil fertility and increasingly variable rainfall; diminishing farm sizes; soil depletion; declining fish stocks, river and lake levels, and flooding; deforestation—among the qualitative research sites only in Northwest Province could a somewhat viable return be made from producing charcoal or collecting firewood. In addition, inherited farm holdings have shrunk, and access to fertilisers to mitigate declining soil fertility has not been easy, nor are they a sole or long-term solution to the problem.

Soil fertility is a frequently cited factor that contributed to poor crop harvests in the qualitative research. Soil depletion was a complaint among chronically poor households in all qualitative research sites except one where there was a dambo or wetland (Eastern Province).[7] Traditional methods of cutting down trees to prepare land and provide ash as fertiliser were still the main farming practice where there were trees. There was evidence of using some intercropping and growing beans, which were both nutritious and fixed nitrogen. However, conservation farming methods were not very evident, despite their promotion in Zambia over several decades, and there was a lack of knowledge and discussion on both intercropping and soil management. Farai describes how poor soils, lack of fertiliser and poor rainfall undermine her farming endeavours and vision:

[7]Dambos are not always reliable however: in Western province, in times of drought, locals also farmed in dambos and by the river banks for survival. In 2018, floods submerged crops thus severely crippling agriculture in the area.

> *For the 2019/2020 farming season, Farai has planted maize at her farm and is expecting to harvest 6 bags of maize. "I have been cultivating a bigger portion of land over the years but the yield remains quite poor due to soil infertility", she complained. She believes that access to fertiliser will greatly help the yields as the soil fertility at her farm has deteriorated over the years resulting in her farm of about four Lima.*[8] *She mentioned that it is slowly becoming very hard to predict rain as their livelihoods are dependent on farming. She believes with the right amount of rain and fertiliser; she can raise her crop harvest from 6 bags to 60.* (Bond et al. 2021)

There is a need to reconsider and re-invest in broader soil and water conservation in Zambia, given the long standing and well researched challenges faced in promoting conservation farming (CA), whose constituent components have generally only been partially adopted by small farmers. There is some evidence of positive results from CA: 'The definition of CA has generally been considered to include minimum tillage (basins and ripping), maintaining crop residues on the field, and crop rotation with legumes. In the field, it was clear that most farmers were applying all three principles, though usually not on large areas of land. The Conservation Agriculture Scaling Up has succeeded in increasing the area under CA, particularly among the Large Farmers, partly by intervening with input packages containing inputs such as legume seed and herbicides. For Family Farmers, the area under minimum soil disturbance is increasing, yet optimal legume production is still constrained by insufficient seed quantities . The use of herbicides and rippers have also helped to increase land area under CA. Compatibility of the land with CA practices and principles is a factor influencing its uptake; it is the [Mid-Term Evaluation] team's assessment that CA solutions in CASU may need to be tailored more precisely for each area and group of farmers in order to achieve the set targets.' (FAO, 2016).

In addition to adjusting the approach to different agro-ecological contexts, complementary interventions may also be needed (Thierfelder et al. 2018). Soil and water conservation is generally challenging to promote, and there are few silver bullets. Zambia would benefit from a root and branch reconsideration of what might work in its different agro-ecological and socio-economic contexts, taking into account the range of approaches which has worked elsewhere, as explored in a systematic mapping exercise (Thorn et al. 2016).

Fishing as a way of life is more common in Luapula, Northern and Western provinces due to abundancy of water resources. Three out of five rural research sites had fishing as a major livelihood and one which in the past had provided a good living. Fish stocks in the two lake sites had declined prior to fieldwork in 2019/2020, and government attempted to manage this by regularly banning fishing for at least 4 months of the year, though the Northern Province site lake had international borders which made the fishing ban difficult to impose. The riverain site had seen the river dried up after several years of drought. Depleted fish stocks were widely attributed to growth in the fishing population and poor fishing techniques. Government was encouraging fisherfolk to turn to farming or livestock keeping as alternative livelihoods. Aggressive fish traders, sometimes not local to the area, are also reported to be a feature of the fishing communities in Luapula and Northern Provinces. While assets are important in fishing, few chronically poor households own their own boats or many nets, and often work for others to catch fish and/or rent a boat. Owning your own net or other fishing asset allowed fishermen to earn more, as Porsha describes. *Her father gave her husband additional fishing nets to improve his fishing. This improved the husband's ability to catch fish such that he even started to hire more people to help him with the fishing.*

The declining natural resource base of small-scale farming and fishing is a serious and long-term issue in rural Zambia. Combined with patchy and incomplete conservation efforts - soil conservation programmes, fishing bans and net size regulations, partial adoption of conservation farming (Umar et al. 2011), the paucity of assets among the chronically poor, and a growing frequency of droughts, which undermine farming,

[8] 1 Lima is 0.25 hectares.

fishing and livestock livelihoods: this nexus is a key policy issue now and for the future.

Strong gender-based divisions of labour persist, in farming, fishing, domestic work, and the division of responsibilities. However, with the pressure on employment of recent decades, there is a noticeable shift towards more women entering the labour market and generating a growing portion of income, especially in urban settings. This gives women increasing independence but can also result in a power dynamic where some husbands prevent wives from entering the labour market.

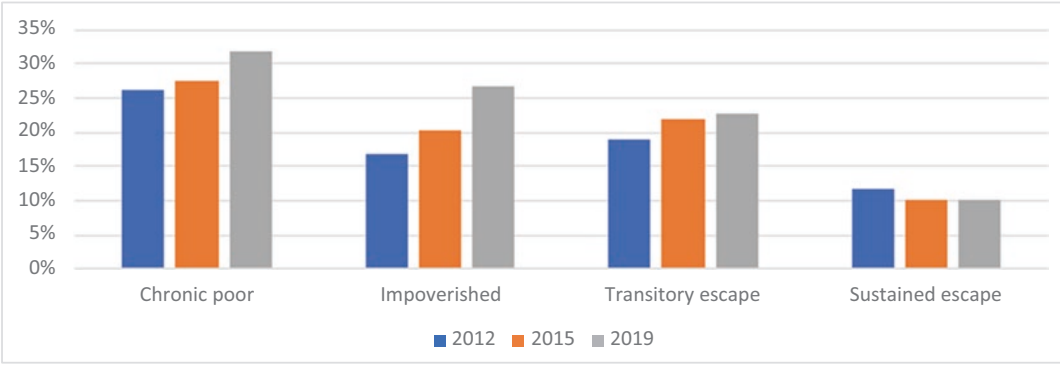
Women headed households comprise around a quarter of all households and a high proportion of the chronic poor (Fig. 9.2)—driven by the absence of a male earner; the tendency of male migrants not to support children especially if they have a new family, and a married woman's vulnerability to her husband's death, divorce, or migration. The 2018 Demographic and Health Survey (ZSA 2019) recorded over half of divorced or separated women had experienced physical violence and nearly a quarter sexual violence (p313). In the qualitative research, children of divorced parents usually accompany their mother, and frequently lose access to food as well as education. Most women are aware of their rights and engage in legal action, but after the ruling, have no power to enforce compliance. As a result, divorced women were more vulnerable to downward mobility and to dependence on relatives and their children. Boron (a rural woman temporary escaper) narrated how her older brother had to support her mother after she divorced her husband:

> *My mother and father were still married. My brother advised that we travel to K, see dad and serve him with the divorce notice. After everything was settled, my brother bought mum a plot in K and built us a three roomed mud house. Life was good, my brother used to send us money, food, seed and fertilizer because we used to farm for eating and selling.*

A few chronically poor and temporary escapers reflected how divorced women resorted to transactional sex and prostitution as a source of income. Candy (rural woman temporary escaper), a mother of nine, narrated how when she was young was forced into prostitution in order for her to provide for children. "*After divorce from my first husband, I became a transactional sex worker to provide for my children. It was during this time that I had other children so that their fathers would support us*".

In the life histories there is limited evidence of SCT being allocated to divorced women. Modesty (a woman temporary escaper, Simu) was one of the few exceptions:

> *She said she was lucky to benefit from social welfare. She got K180 in December 2018, April 2019 and another K180 in early December 2019. This money, once it comes, goes a long way in meeting various households needs especially payment of school fees. She got enrolled by the department of social welfare because of divorce. She used the court documents to be considered for financial support.*




Source: Diwakar et al. (2021)

**Fig. 9.2** Share of women headship by year and poverty trajectory. Source: Diwakar et al. (2021)

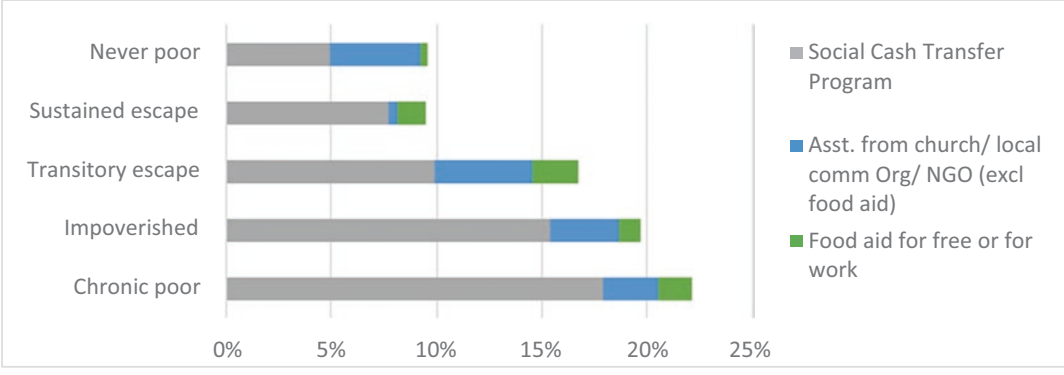
This demonstrates how having access to social cash transfers would make a significant difference for the many poor women headed households in Zambia. However, although we know that social cash transfers can make a significant difference to the consumption and economic activities of the poorest (Handa et al. 2018) they have been intermittent, unpredictable, and have left many chronically poor people out (Fig. 9.3). This includes older people who are often chronically poor. During the Covid pandemic there has been an effort to reconstruct and revitalise the social cash transfer programme, so hopefully results will be better in future.

Provincial variation in chronic poverty has been marked. The results from Fig. 9.6 suggest that Luapula, Northern, and Western provinces are most vulnerable to chronic poverty. These are also the three provinces with the highest depth of poverty in both 2010 and 2015. Rates of chronic poverty are also higher in Eastern and Muchinga provinces relative to the country-wide average. Figure 9.4 above also shows that only Central, North Western, and Southern provinces generally fall within the country-wide range of people living in chronic poverty or never poor. This then illustrates the extent to which national averages can be misleading or fail to capture the variety of subnational differences especially for people in chronic poverty or the never poor who face relatively static poverty trajectories over time (Diwakar and Bwalya 2021). This analysis suggests that, while policies to prevent impoverishment and promote escapes can be relatively uniform across the country, there may need to be significant variation in the emphasis and policies to tackle chronic poverty from province to province. These would need to be based strongly on addressing the context-specific natural resource management issues mentioned previously.

## 4 Narrowing Escape Routes

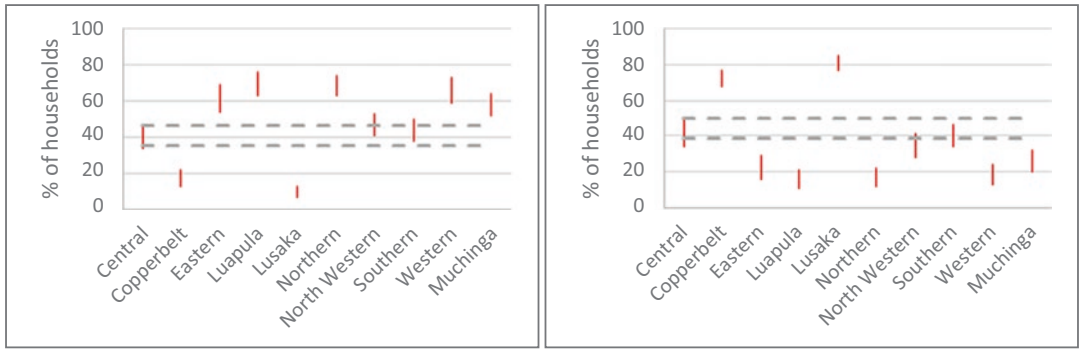
The overwhelming story in Zambia during the 2010s is that there are few escapes from poverty, that temporary escapes are often not converted into sustained escapes, and as a result sustained escapes can be hard to find. Combining the quantitative and qualitative evidence together, we can see two broad socio-economic pathways, often supported by improved savings, asset development and collaborative spousal relationships, characterising sustained escapes from poverty.

Firstly, a combination of education (completed primary in rural areas, or lower secondary in urban areas), access to electricity, and on and off-farm diversification was a common pattern underlying sustained escapes. Completing lower secondary education (at least) is associated with




*Source:* Diwakar et al. (2021)

**Fig. 9.3** Receipt of assistance by poverty trajectory, 2019. *Source:* Diwakar et al. (2021)




Source: Diwakar and Bwalya (2021) The grey dotted lines represent the national average bounded estimates, and the red vertical lines the province average bounded estimates.

**Fig. 9.4** Estimates of the always-poor (left) and the never-poor (right), 2010–2015. Source: Diwakar and Bwalya (2021)

resilience—being able to resist falling back into poverty, and was especially important in towns and cities. Access to electricity enabled diversification as well as children's education. The rollout is slow in rural Zambia (4% have access, compared to 67% in urban areas); many could benefit from faster electrification, especially off grid. Diversification is often central to a sustained escape—within farming especially away from maize, which has been a major source of reduced rural incomes (Diwakar et al. 2021), and is a major limitation on diet diversity (Mwanamwenge and Cook 2019), towards other crops and livestock, and away from farming to nonfarm jobs and businesses, most commonly in retail. Crop diversification has been found to increase farm income, and food security, and is promoted by extension, irrigation, asset endowments, and market access (Mofya-Mukuka and Hichaambwa 2018).

Commonly different members of a household pursue different economic activities. Diversification into the rural nonfarm economy, commonly retail trading, is often a source of protection against poverty. Being close to roads and markets by comparison increases the probability of a sustained escape, as these infrastructures help reduce some sources of risk. However, women or young adult headed households face significant constraints in diversification, as do severely poor households.

Secondly, in smallholder farming an increase in own cultivated land (which could be purchased, inherited or access through a traditional authority) was not only associated with an increased probability of a sustained escape from poverty, but was also typically accompanied by increased use of irrigation—whether own cultivated, rented in, borrowed in or a garden. Rates of irrigation increased between the first and last wave of the RALS panel for all trajectories, highest in 2019 for sustained escapers, followed by the never-poor. The most common use of irrigation was irrigated gardens (Diwakar et al., 2021). Livestock ownership was also important, and the only significant correlate of a sustained escape from the lowest ($0.70) poverty line, indicating how important livestock can be to the poorest people.

From the qualitative research we can observe key moments in these sustained escape trajectories included, firstly in young adulthood: most sustained escapers had not got further than primary education, with few exceptions (mainly women). However, they had a strong focus on their own children's education, which was beneficial to the sustained escape, for example, an educated daughter helping with purchasing goods to trade. The value of a young couple pulling together was very evident. Relatedly, women's routes out of poverty are largely through collaborative spousal relations in livelihoods during marriage and petty trade/

trading. However, these are constrained by widespread teenage pregnancy and early marriage frequently followed by divorce, and caring responsibilities where there are high dependency ratios, especially in rural areas.

Compared to other countries where the Chronic Poverty Advisory Network (CPAN) has worked, savings institutions are becoming more widespread but not omni-present in Zambia, as reflected in its recent 2020 FinScope survey (Finscope Zambia 2020) showing that while financial inclusion through mobile money has increased significantly, especially in towns and cities, still a third of the population is financially excluded, another third still dependent on informal institutions, and more so in rural areas. Asset accumulation often through savings is a critical aspect of escaping poverty; but in Zambia poor and impoverished people have been struggling to hold onto assets as downward pressures have bitten hard especially during the 2015–20 period. The accumulation of assets was common amongst sustained escapers through savings (from profits from goods or produce sold) and/or through social capital—inheritance or gifting capital or land from kin, sometimes combined with allowances and connections with people in political positions or provision of farming inputs or skills. Commonly livelihood diversification would follow by combining livelihoods: either fishing + farming + trading/bartering + money lending or formal employment + trading. Assets included houses, land (farm and/or urban land to develop), shops, vehicles, livestock, boats & fishing nets.

What was noticeable for both young adult and middle aged sustained escapers was the capacity to withstand hard times reflected by family strife, alcohol abuse, poor health, loss of assets (e.g. in one case a council destroyed a market stall). Despite these difficulties, gradual improvement in well-being over time manifested in more food, education of children, better housing, and a widening asset base. In recent years they have been able to buffer the tougher economy and take advantage of gaps in the market. In rural areas retaining physical strength was especially important; failure to do so could be a source of impoverishment, for example in older age.

It is very clear that sustaining escapes from poverty diversification and asset accumulation has been supported by social capital, as well as universal health and education services. This has been easier in urban areas where physical infrastructure and services have been more available. Services in rural areas have been significantly more limited, though there our field researchers noted many new investments in social infrastructure. Social capital to see children through education and deal with out of pocket health expenditures has often made the difference between escaping poverty and remaining poor in many cases. However, sometimes meeting these expenditures can be at the expense of food consumption, savings and investment in businesses.

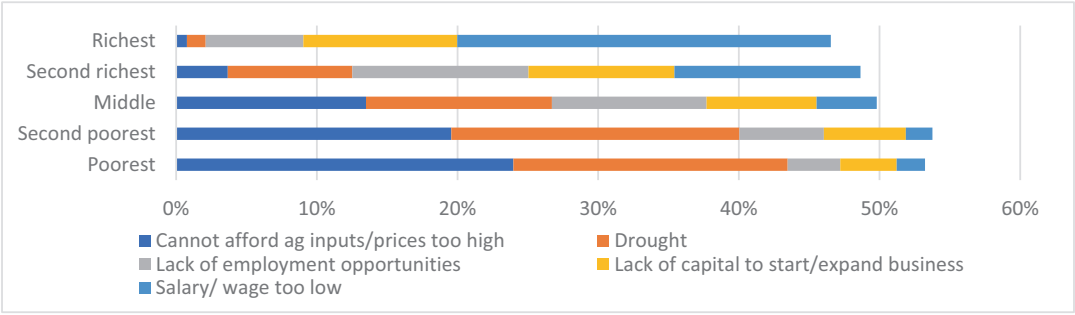
## 5 Growing Downward Pressures 2015–19, and Covid 19 in 2020

The downward pressures of the last five years have been extreme. Not only has economic growth slowed, inflation also spiked in the drought periods of 2015–6 and again during 2019 and even more during Covid. In rural areas, a decline in the mean total income between 2012 and 2019, particularly pronounced for 2019, when there was a big decline in income from maize sales in particular. Even the poorest people saw their incomes decline over this period (Diwakar et al., 2021). The qualitative data also records this last period as devastatingly bad, framed by a depression in 2016 caused by load shedding, drought, devolution and impacts on availability of credit, a drought which generated near-famine conditions in largely opposition-held south and west of the country, and a looming debt crisis limiting public expenditure on services. The 2016 and 2019 droughts had a devastating impact on farm incomes and informal sector incomes, especially those dependent on electricity supplies. Political competition also led to widespread ‘gassing’ incidents amid an increasingly unforgiving political environment—as the incumbent president moved to consolidate power in the presidency and oppress opposition

politicians (Hinfelaar 2021). Moreover, as we have seen, declining and unpredictable rainfall, limited access to markets coupled with high food prices, chronic food insecurity, and poor healthcare are some of the structural constraints preventing rural Zambians from escaping poverty (UNDP, 2015).

Economic drivers of descent into poverty in rural and urban areas in the qualitative data include high inflation, limited economic and livelihood options, not being well-endowed with assets, practicing low return and subsistent income generating activities, closure of industries, and limited access to start-up capital for business. Some of these are reflected in the quantitative data, where respondents report the top five reasons they perceive their households to be 'worse off' in 2015 compared to a year earlier (Fig. 9.5). In the qualitative data, rural areas are particularly affected by late delivery of farm inputs, price controls for farm produce and exploitative 'briefcase' buyers for farm produce. Social drivers of descent include; little or no education, which provides significant protection against impoverishment as well as support for escapes from poverty; poor health, larger households and limited social and physical infrastructure. Gender related drivers of poverty descent in urban and rural areas mainly involve unfair division of labour and limited implementation of laws relating to gender. Gender factors specific to rural areas include, teenage pregnancies, teen marriages, and school dropouts due to long distances to school, financial constraints and social cost. A World Food Programme (WFP) report noted that women headed households lost assets while male headed households accumulated them on average during 2016–17, immediate post-drought years. Environmental factors include changing rainfall patterns which affects planning for farmers; poor rainfall which affects farm yields and power production; and severe droughts, magnified by global warming.

Covid19 has brought significant loss of income, resilience and food security. Zambia's partial lockdown from March 2020 led to loss of employment for some, with little subsequent rehiring; loss of business income for many, following a big slump in demand; significantly increased cost of basic needs including food, partly because of devaluation of the Kwacha, partly because of continued high maize prices following the 2019 drought, and the increased cost of farm inputs; and there was also a decline or non-receipt of remittances, of special significance to some of the poorest people. Many failed to save, and increased borrowing to survive (CPAN 2021). High frequency phone surveys in June and November/December 2020 recorded similar findings (IPA, 2021). After the second survey round 59% reported income losses, more than 40% of adults reported reducing meal portion sizes or the number of meals, one out of five respondents said they had no way of getting emergency assistance, and two out of five said it would be very difficult, indicating a dearth of social capital and social cohesion (IPA 2021), supported by CPAN's qualitative research.




*Source:* Diwakar and Bwalya (2021)

**Fig. 9.5** Subjective top five reasons households are 'worse off' in 2015 vs 2014. *Source:* Diwakar and Bwalya (2021)

Women experienced much steeper job losses and reduction in earning than men. Although a few respondents reported increased earnings, livelihoods and wellbeing had clearly not returned to pre-Covid levels (IPA 2021). And it should be noted that a phone survey in Zambia would not cover much of the poorest—those without phones, or electricity to charge them.

Asset sales during Covid19 also increased from 25% to 35% of households reporting it in the two rounds of the IPA survey; over half of respondents depleted savings, two out of five households borrowed even though they might not be able to repay and almost one fifth stopped loan payments (IPA 2021). CPAN's qualitative research noted widespread disposal of household assets as a result of downward pressures and shocks even before Covid struck, such as due to illness and death. Impoverished and transitory escaper households reduced their land holdings between 2015 and 2019, although in the RALS survey both categories surprisingly recorded an increase in overall asset values. Some enterprises, like beer brewing/selling were liable to asset confiscation. On top of the de-asseting which has already taken place, the Covid-related asset sales can be expected to bring many households into chronic poverty.

Among environmental shocks, the drought leading to near famine conditions in 2019/20, followed on from droughts in 2018 and 2015, on top of shrinking farmland holdings. The RALS survey records a massive drop in maize income (Fig. 9.6), and with Zambia's maize occupying three fifths of farmland, most of it in the small scale sector, this is a very sensitive indicator of income. Adding to these rural pressures are the reduced availability of land, the deterioration of land quality especially soil fertility and corresponding rising fertiliser needs, but also rising fertiliser prices and chronic delays availability of subsidised fertiliser. All of this sharpened by increasingly frequent droughts, and in some cases flooding.

> *The 1992 drought was a huge blow to the maize farming as no single cob of maize was harvested. The insurance company however covered the cost of the loan from Lima Bank and that was the end of Diana and her husband's access to the loan service. The lack of access to credit sustained the down fall of their farming career and they resorted to selling out of most of their assets as a means of survival. They also depended on government and Oxfam for handouts*. (INT102, Diana, Sustained Escaper)

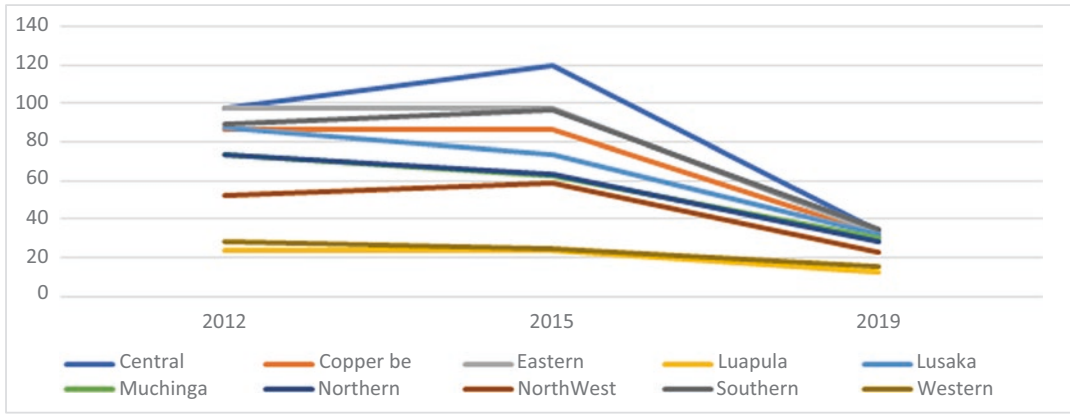
Demographically, households with a large number of younger and/or older persons are vulnerable to poverty descents (Diwakar et al., 2021), at least in part reflecting the smaller amount of per capita assets or land size typically in larger households. Zambia's population growth will put even more pressure on the demand for jobs, health care and other social services (World Bank 2020). The rising costs of housing, education, farm inputs and other services have also made escaping poverty increasingly challenging and contributed to impoverishment.

Health shocks too can lead to the sale of assets, and reduced food consumption to pay medical bills. Deaths are strongly present in life history accounts, with significant negative effects. Alcohol abuse was also common, frequently bound up in the often-impoverishing processes of separation and divorce, along with infidelity and gender based violence (Bond et al. 2021). Our data provides examples of households where different forms of illness has led to poverty descent. Households which were once non-poor have been made chronically poor due to illnesses and deaths.

> *"After my husband died, we started struggling with fertilizer and now we do not farm that much and this affects our eating, we do not eat well because we cannot farm enough food. We were eating three meals a day before my husband died but now we only have 1 to 2 meals a day, it is a constant struggle. The death of my spouse was the biggest shock in my life, my livelihood changed very much and now we struggle with everything. I have no financial assistance now. Even thatching the house I need to pay someone, but I have nothing to pay them. Now we live as if there is no person and yet there is a person…"* (Clementina, chronically poor woman)

## 6 Conclusion and Policy Priorities

Zambia's combination of persistent high and deep poverty levels, an unsustainable debt burden, environmental decline and climate volatility, and the effects of highly contested politics on




*Source: Diwakar et al. (2021)*

**Fig. 9.6** Per capita income from maize production by province over time. *Source: Diwakar* et al. *(2021)*

policy development and implementation including disaster risk management, mean that its poverty will persist into the future unless there is significant action on several fronts backed by some political change. Projections through to 2060 show Zambia as still having very large numbers of poor people in business-as-usual scenarios; even the best case scenario with pro-poor policies and investments shows poverty reducing gradually, but only after 2030 (Rafa et al. 2021).

The shrinking natural resource base for rural livelihoods combined with the growing incidence of drought and flood episodes and a politicised disaster risk management response are important aspects of the explanation for persistent rural poverty. Strong policy responses are needed at least on these three fronts if persistent rural poverty is to be challenged in the coming years. The market disruptions during the Covid pandemic have further stressed vulnerable rural households, some having sold assets to survive, for example.

The political economy analysis shows a pattern of government budget allocations which historically favour the urban and formal sector segment of Zambian society, with women, urban poor and rural areas left (far) behind. The political system is one of enduring presidential executive power and a politization of the bureaucracy, in which loyalty to the ruling party is key (Hinfelaar 2021). This has undermined the possibility of downward accountability to citizens which could otherwise be expected to drive poverty reduction in a competitive political system. Assuming this political system remains in place, progress will then depend on the initiatives individual presidents and their ruling parties can make.

It is to be hoped that the combination of near famine conditions in 2019, unsustainable debt and the continuing Covid pandemic may be enough to create conditions for a turning point in policy making. Zambia is a middle-income country since 2011 because of the level of its national income, but it remains a Least Developed Country (LDC), because it is economically vulnerable and has a 'human asset' deficit (especially in maternal mortality and undernourishment). It will be challenging for Zambia to graduate from LDC status without tackling its human development and economic vulnerability records.

A key issue which policy needs to respond to is a nexus of rural economic, environmental and disaster risk management constraints on smallholder farm and rural income, part of which also affects the urban informal sector. Indeed, the main dimensions of this crisis are the (a) volatility of farm income, which was hugely reduced during the year of our study, 2019, but had previously been significantly reduced in 2016, in both cases as a result of drought having an impact on farm production; (b) a process of de-asseting over the decade, where, as a result of repeated

shocks and stresses households have sold or otherwise lost and not been able to replace assets; and (c) a long term failure to develop adequate alternative sources of soil fertility and soil moisture as bush fallowing systems have run out of fallow land; and (d) inadequate disaster risk responses.

Volatility of income growth is a major inhibitor of reducing poverty at national level (Shepherd et al. 2017), and here at micro-level too. Farm households with diversified farms and some nonfarm economic activity have done significantly better than those highly dependent on maize, Zambia's main crop. Policy remains heavily focused on maize and supporting soil fertility with subsidised fertilisers. Some diversification into beans and groundnuts has been promoted recently by the Farmer Input Support Programme (FISP) but the emphasis remains strongly on maize. Fisherfolk facing declining lake and river fish stocks have been advised to diversify into farming, but also livestock. Such policy trends need to be strengthened, and the focus on maize reduced in favour of other crops, livestock, and nonfarm economic activities. The FISP accounted for 5% of government expenditure in 2020, so there is major potential to reform this aspect of policy.

The second dimension relates to the scarcity of assets among poor households. If a household had a source of manure with which to fertilise its farmland it would need access to means of transport to get the manure to farm fields which might be some distance away. Carts and oxen are rare, but access to them would be an important asset for such farm households. The equipment to irrigate plots of land could also reduce the effects of climate volatility. Strengthening the policy focus on livestock would be especially beneficial: the majority of chronically poor rural Zambians have very few livestock other than a few chickens, and it is a potential source of manure (which would help to address the soil fertility crisis), milk, cash income, and a savings medium in a situation where the latter are scarce. Zambia could learn from Rwanda's Garinka programme, which distributes cows and smaller stock to poor households who can manage them, and this has consistently proved an escape route from poverty (Shepherd et al. 2020). Re-asseting poor households will be a major aspect of future poverty reduction in Zambia. Poor women headed households should be a particular focus, since they tend to have lost access to assets. Asseting programmes could be built on the foundation of a social cash transfer scheme, if that foundation could be made more reliable and predictable than it has been. Social cash transfers also need to be able to adapt to changing circumstances to assist in warding off disaster. While there was a one-off phone payment to SCT recipients during Covid this was barely enough to mitigate the effects of the pandemic.

The third and related dimension is the inadequacy of public and private investment in resource conservation. Land remains a major asset, as are fisheries for poor rural Zambians. Over the decades a number of NGOs have promoted 'conservation agriculture', which advocates minimum soil disturbance, permanent soil coverage by living or dead biomass, and diversification of crop rotations, but adoption has been partial, due to the labour intensity required, lack of mechanisation services for smallholder farmers, market access issues and a variety of context specific social and cultural issues (Zulu-Mbata et al. 2016).

There is a need to move from conservation agriculture to conservation practices which can work given farm household circumstances and constraints (Rodenburg et al. 2020), and for the state to give much stronger support to soil and water conservation. Zambia could learn from the successes and failures in other countries such as Ethiopia (Dalka 2018) where adaptation of soil and water conservation design to local context was found to be the major issue; likewise a systematic review found that there were no universal factors governing adoption of Soil and Water Conservation n smallholder farming (Wauters and Mathijs 2014). In identifying suitable approaches in Zambia this systematic mapping (Thorn et al. 2016) could be a useful starting point.

The fourth dimension is the extent that disaster risk management processes succeed in

providing relief when it is needed. Despite a well worked out legal basis and policy revised in 2015, an institutional system, and an operational plan developed in 2019 (African Risk Capacity/Government of Zambia 2019), the government's Disaster Management and Mitigation Unit led a slow response from government to the 2019 drought. While this may have been for political reasons, the country needs a system which is capable of overriding political reluctance in specific cases to ensure that natural hazards do not become disasters leading to long term impoverishment.

While the debt crisis has meant that the public expenditure to underpin such policies and programmes is currently under extreme pressure, some of this pressure could be released if subsidies on fertiliser were reduced, and with rising copper prices there may be scope in the medium term to undertake the investments mentioned above, as well as rebuild poor people's access to education and health which will inevitably be priorities.

The international community has a role here—in working with the Zambian government to postpone and restructure its debt so that it is able to make greater public expenditure available to put poverty reducing measures on a much firmer footing and enable a post-Covid recovery, with long term commitments to significantly greater heath, education and social protection expenditure. The IMF's continued tendency to impose austerity in its negotiations with governments needs to be restrained by the Fund's major shareholders. The international community also has a role to play in working with Zambian stakeholders to restructure and de-politicise the disaster risk management function of government. And it could provide enhanced support for resource conservation in farming, fishing and forestry. This could be technical as well as financial support to identify and promote successful resource conservation measures which also promote or allow for poverty reduction. This is not an easy thing to do—many resource conservation approaches tend to exclude the poorest because they don't own enough land, or fishing boats and equipment, to be central to programming, for example. Specialist UN agencies like FAO and UNEP should be capable of providing such assistance.

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# Resilience of Small-Scale Fisheries to COVID-19: A Case Study from North Bali, Indonesia

10

Christopher Rosado, Eveline Kurniati, and Mika Peck

**Abstract**

Globally, small-scale fishing communities are often left behind in terms of economic, social and political research and policymaking. This study aims to fill the gap by investigating impact on, and resilience of Indonesian fisher communities to the COVID-19 pandemic using a case study from North Bali. We developed 10 permeable vulnerability and resilience indicators to interpret COVID-19 impacts on small-scale fishers. Data was collected through semi-structured telephone interviews, in-person interviews, focus group discussion and site visits. We explored the cross-cutting indicators through three categories of health, economics, environment and potential impacts on achievement of the UN Sustainable Development Goals (SDGs). We found that fisher community resilience materialized from social networks, diversified economic opportunities and strong cultural community-level governance, with villagers adjusting social, economic, and religious behaviors to mitigate spread of COVID-19. Economic resilience emerged through previous experience with economic downturns, job diversification and holistic local financial support systems. Environmentally, community members were familiar with conservation concepts, with existing networks of fisher groups encouraging sustainable practices, however ecological impacts are expected from the shift from deep water fisheries to more unsustainable exploitation of inshore reef fisheries and reduced coastal management. SDGs are impacted through susceptibilities in health infrastructure, minimal control of supply chain and loosely regulated fishing that expose the challenges COVID-19 brings to small-scale fishers. Policy recommendations emerging from this study suggest urgent action is required to strengthen fisher networks to (1) improve transparency and access to markets, especially domestic and direct sales, (2) support fishers in seeking assistance from relevant agencies to secure insurance, financial and other social support to secure their livelihoods, (3) integrate environmental considerations into sustainable recovery and avoid rolling back regulations as a short-term means to stimulate economic growth.

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**Keywords**

Small scale fisheries · COVID-19 · Community resilience · Indonesia

## 1 Introduction

The virus first emerging in Wuhan, China, spread globally with a ferocity that has not been seen in recent history and exposed the fragility of social, health and economic systems worldwide. The highly infectious viral strain, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), began transmitting from human to human in late 2019 prompting the World Health Organization (WHO) to designate the outbreak as a health emergency in January 2020. As the virus now known as COVID-19 spread, the status was quickly escalated to pandemic by March 2020 (Hua and Shaw 2020; Shereen et al. 2020). In Indonesia, a national health emergency was declared in March 2020 shortly after the implementation of nationwide social restrictions, Pembatasan Sosial Skala Besar (PSBB) (Djalante et al. 2020). On April 24th 2020, an official travel ban was put in place by the Government of Indonesia to mitigate spread of the virus (Aditya and Suhartono 2020b; Garda World 2020). This ban restricted nonessential travel of citizens as well as imposed regulations affecting import and export of staple commodities in container shipments to and from Indonesia (Akhlas 2020; Rahman 2020) (Fig. 10.1). Supply chains and demand in the fisheries sector suffered from regulations imposed to mitigate virus transmission.

As the largest archipelagic nation, and the second largest fish producer in the world, Indonesia is fisheries dependent with the sector encompassing 2.56% of its GDP in 2016 (CEA 2018; FAO 2018). Most of the wild-captured fish are generated from small-scale fisheries (CEA 2018). In 2017 the Indonesian Ministry of Marine and Fishery Affairs estimated there were 2,700,000 small scale fishers in local waters (KNTI 2020). The pandemic and its socioeconomic knock-on effects are possibly the most severe challenge to Indonesian small scale fisher livelihoods in this generation. However, Indonesia as a nation and people have a wealth of experience dealing with over 24,000 hazard events in the last 20 years. Known among development practitioners as the "supermarket of disaster hazards" because you can find almost every hazard in Indonesia, Bali and its fishers have faced direct and indirect impacts from bombing, volcano, earthquake and other hazards since 2000 (Vun et al. 2018). In this chapter we explored vulnerability and resilience of small-scale fishers during the COVID-19 pandemic in North Bali, Indonesia, aiming to gain a better understanding of how these communities are impacted and how they respond to the multiple stressors resulting from this global event.

## 2 Scope and Approach

### 2.1 Study Location Fisheries in North Bali

The focus area of this research is Les Village in Buleleng district, North Bali (Fig. 10.2). Buleleng District, the largest Province in Bali with an area of 1366 km$^2$, stretches from the North-West to the North-East of the Island. The district contains 157 km of coastline with many local economic activities reliant on its marine resources including fisheries (aquarium and food fish), aquaculture (shrimp, fish, seaweed, pearl oyster) and tourism. Seven out of ten sub-districts (Gerogak, Seririt, Banjar, Buleleng, Sawan, Kubu Tambahan and Tejakula) in Buleleng participate in some form of fisheries production (BPS Provinsi Bali 2017). Both seafood and aquarium fisheries trade can be found in the sub-districts of Gerogak and Tejakula.

### 2.2 Research Framework, Data Collection and Analysis

Community resilience is defined differently by different stakeholders (Patel et al. 2017). For this study, community resilience is understood to be a process of change supported by elements of diversified economic and social systems in place

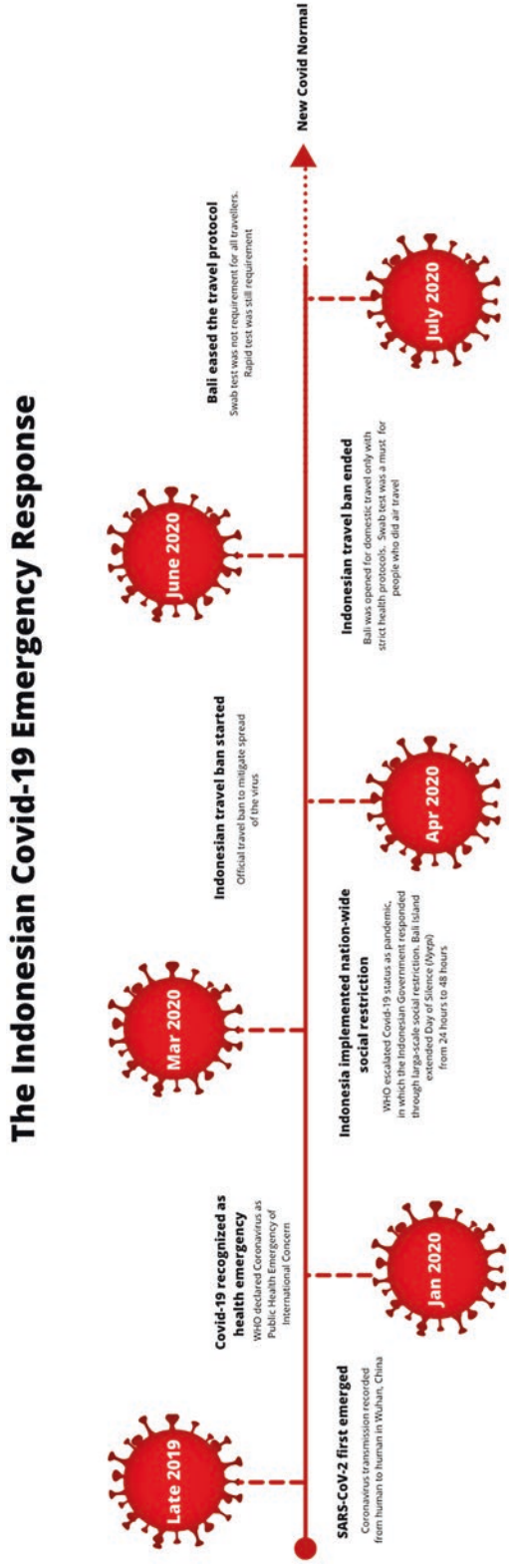



**Fig. 10.1** Timeline for the Indonesian response to Covid-19

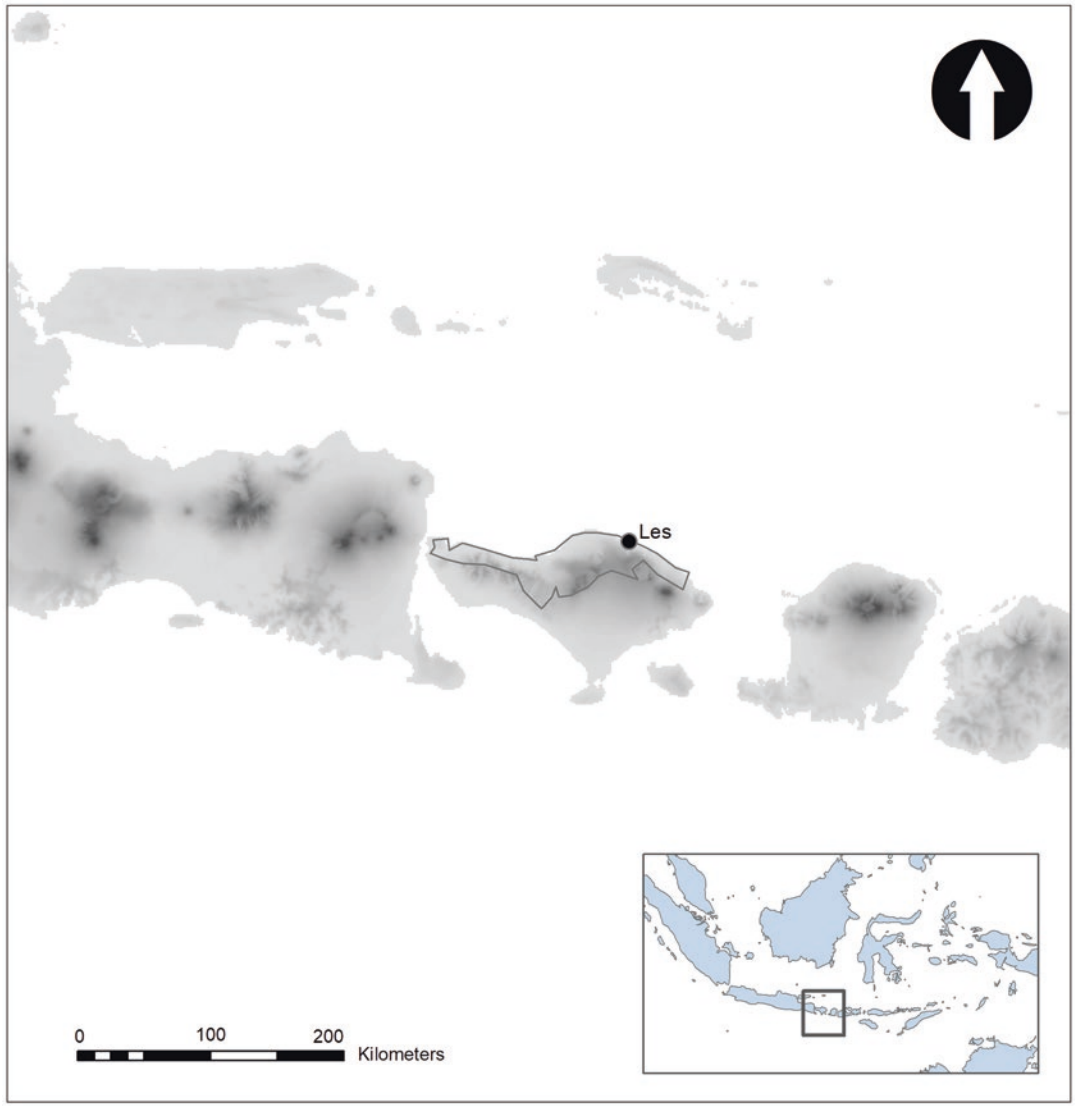



**Fig. 10.2** Map of the study region, Buleleng (North Bali, Indonesia) shown in outline, with Les village identified on map

that can not only withstand initial damage, but also recover quickly from impacts, providing a pathway to thriving in post stressor scenarios. In essence, community resilience is the ability of a community to adapt, survive and potentially thrive despite stressors such as a pandemic, natural disaster, or global conflict.

To understand the multifaceted impacts of the pandemic, a cross sectoral review of literature from fisheries management, community development and COVID-19 was used to develop a research framework. A mesh of influences supported the creation of the resilience indicators developed for this study most notably but not limited to: nine core elements of community resilience identified in Patel et al. (2017), six capital fields described in Stanford et al. (2017) FLIRES check which combines Sustainable Livelihoods Approach with RAPFISH methodology, application of multilevel resilience lens suggested by Leite et al. (2019), COVID-19 susceptibility scale created in Peters (2020) and

forecasting of virus transmission against healthcare capacity in Bali described by Wirawan and Januraga (2020). The preliminary research criteria were based on reoccurring themes throughout the spectrum of literature that indicated potential for resilience and vulnerability, incorporating the nuances of fisheries and COVID-19. The criteria were then tested through initial interviews and refined based on the relevance expressed from the local perspective, resulting in ten indicators which encapsulate resilience and vulnerability to COVID-19 in small-scale fisher communities.

The resulting analysis framework consists of 10 permeable indicators, summarized below, to capture cross-cutting elements of health, economic, social and environmental issues to enable interpretation of COVID-19 impacts on small scale fishers.

**Resilience Indicators**

1. **Fisher Households** – demographics of fishers, households, and the surrounding community in relation to potential spread and severity of infections
2. **Medical Infrastructure** – takes stock of government healthcare infrastructure and accessibility of services capable of dealing with potential outbreaks and general healthcare
3. **Preparedness** – explores the community experience of engaging with healthcare services prior to COVID-19 and local behavior that can impact community health
4. **Social Adaptability** – evidence of community willingness to adapt social and cultural activity to mitigate impacts of COVID-19
5. **Communication** – considers formal and informal channels used to disseminate information and messaging locally
6. **Historical Data** – examines how local knowledge, community networks and social dynamics can manifest resilience
7. **Household Income Diversification** – considers income opportunities and the diversity of livelihoods locally available
8. **Fisheries Supply and Demand** – focuses on changes in supply and demand impact on the fishing activity
9. **Fisher Income** – direct and indirect financial impacts to ability to generate income from fishing
10. **Financial habits** – saving, debt, assets and access to credit in relation to resilience to COVID-19

The fishers participating in this case study fall under the Indonesian government classification of small scale fishers, who are defined as "fishing to meet daily needs and operating with or without a fishing boat less than 10 gross tonnage (GT), in accordance with Law No. 7/2016 "Protection and Empowerment of Fishers" (Halim et al. 2019). From March to December 2020 our study followed 10 small scale fishers and their family from the village of Les in the Buleleng district of North Bali to capture changes at the community level. An interview guide with key questions built around the indicators was developed and used during monthly check-ins to track changes. Interview questions varied based on the fisher, fishing group association and their target fish. Overall, the fishers were asked what has changed with respect to social and economic norms due to COVID-19 and how the community is navigating the changes. A series of semi-structured telephone interviews were conducted from March to June as lockdowns prevented non-essential travel between villages. From June to December in-person interviews, focus group discussion and site visits were used to collect data.

There are two level of data analysis: (1) Through the lenses of vulnerability and resilience, based on 10 indicators that are broken down into the dimensions of health, economics and environment as they interact with social dynamics during COVID-19 and (2) Considering the results against the United Nations Sustainable Development Goals. The information is finally integrated within evidence-based policy recommendations.

## 3 Results

Results are interpreted through the ten resilience and vulnerability indicators below.

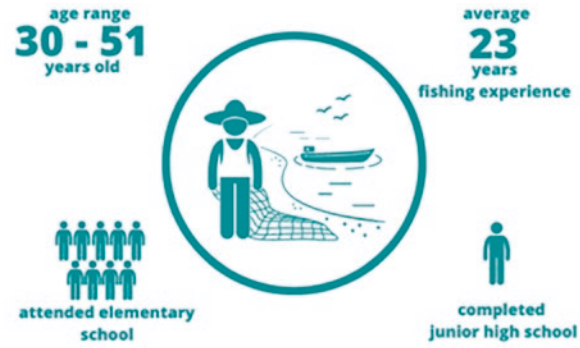
### 3.1 Fisher Households

At Les village in North Bali, the fishers range from 30 to 51 years old with an average 23 years of fishing experience. Nine out of the 10 fishers in the case study have attended elementary school with only 1 completing junior high school. The households are multigenerational with an average of 6 people living in a home, 2 of which under the age of 18 and 2 over the age of 57, which is the current retirement age Indonesia. The children under 18, who still live at home, are all attending school, ranging from kindergarten to high school (Fig. 10.3).

### 3.2 Medical Infrastructure

The nearest hospitals to Les village are located in the Bali's main cities of Singaraja, 35 km West, and Denpasar, 80 km South (Fig. 10.4). Community health centers (Pusat Kesehatan Masyarakat also known as Puskesmas) and auxiliary health services (Pembantu, Mobile and Posyandu) support the main community health centers in areas outside of the hospitals immediate area of coverage (Table 10.1).

Puskesmas, are government mandated community health clinics which provide primary health care services at the sub-district level. Auxiliary health services that support Puskesmas include: Puskesmas Pembantu, Mobile Puskesmas and Posyandu which help to diversify delivery of health services and increase reach. The Puskesmas Pembantu is a smaller version of the standard health center that provides health services only during limited hours, usually from morning to midday. A Mobile Puskesmas is a car or a motorbike equipped with medical equipment and medication which travels once or twice a week to more remote villages. Posyandu (Pos Pelayanan Terpadu) is a specialized health service provider that focuses on specific health services such as maternity-child care, family planning, enhancement of nutrition intake, vaccination, education in basic sanitation and disease prevention information.



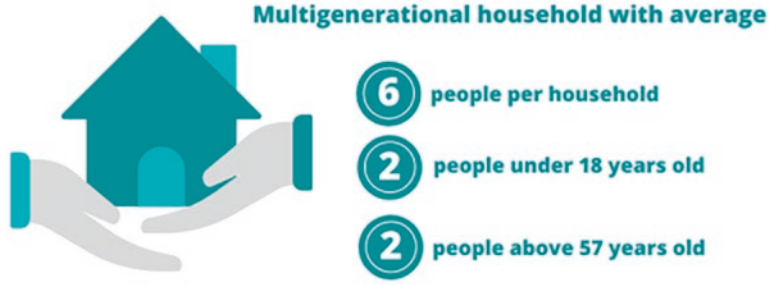




**Fig. 10.3** Summary of Fisher Household resilience indicator

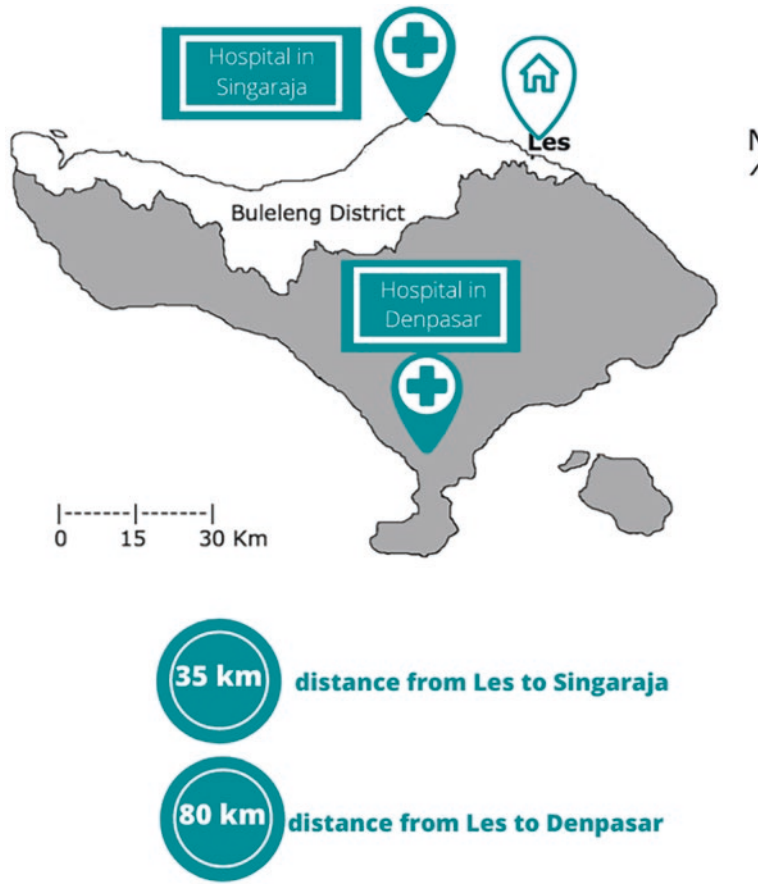



**Fig. 10.4** Distance from the study site (Les, North Bali) to major hospitals

**Table 10.1** Population and health access in Tejakula Sub-district (BPS Kabupaten Buleleng 2019) highlighting access to healthcare in relation to population (healthcare facility/1000 population). Grey row illustrates healthcare comparative provision at the study site of Les

| Location | Population | Health Facility (per 1000 population) | | | | | Paramedic (per 1000 population) | |
|---|---|---|---|---|---|---|---|---|
| | | Puskesmas | Puskesmas Pembantu | Mobile Puskesmas | Posyandu | General Practitioner | Midwife | Nurse |
| Tejakula Subdistrict | 61342 | 0.03 | 0.13 | 0.11 | 1.06 | 0.03 | 0.28 | 0.05 |
| Les | 8040 | 0.00 | 0.12 | 0.00 | 1.12 | 0.12 | 0.12 | 0.25 |

## 3.3 Preparedness

The Balinese government promotes prevention practices (BPBD Provinsi Bali 2020), which are in line with World Health Organization recommendations. Fishers in this study have a history of maintaining health insurance and utilizing the nearest health providers whether it be hospital, Puskesmas or auxiliary health support services before the pandemic. Indonesia has a National Health Insurance program JKN (Jaminan Kesehatan National) administered by the Healthcare and Social Security Agency (BPJS). For the employed workers the premium is split by

employer and employee (Heriyanto 2018). The fishers from Les with stable alternative employment (60%) other than fishing, had employer provided health insurance (BPJS Kehsehatan). The remaining fishers (40%) have the Indonesian Health Card (KIS), which is a fully subsidized health insurance program under BPJS provided by the Indonesian government to ensure that all Indonesian citizens are protected by comprehensive, fair and equitable health insurance for low income members (Heriyanto 2018).

### 3.4 Social Adaptability

In Les adjustments to economic, social and religious norms were imposed on locals. The wet markets reduced operating hours from 12 to 8 h daily, as they were identified as potential infection hotspots from end of March to mid-May. Only residents were allowed in and out of the community during April and everyone who passed the checkpoints were required to wash hands. From May essential travel between villages was allowed but the government monitored travel in and out of the community until June.

Celebrations and community gatherings were cancelled during March and April as Bali worked to understand the prevalence of the virus on the island (Erviani 2020; Winterflood 2020). Schools were closed in March once the pandemic risk was recognized by the national government (Dagur 2020). Island-wide schools were closed but, depending on local resources, the classes were moved online to some degree. The elementary schools in Les transitioned online, with the parents responsible for picking up and dropping off assignments once a week. Middle school and high school students had a similar system, picking up and dropping off assignments once a week and studying remotely.

### 3.5 Communication

Community captures information about the pandemic through personal communication, local government messaging and social media. The local government disseminates information via signage placed around the community as well as announcements from the Puskesmas. The community was initially made aware of recommended prevention protocol by the local government and Pukesmas through weekly loudspeaker announcements in the morning at the local wet market. Government further reinforces health protocol through banners which are displayed along main roads, police stations and schools in the village. The local Pecalang (traditional community guards) along with police remind and monitor villagers to follow mask wearing protocol at traffic junctions.

The most prevalent source of information is personal interactions using phones and face-to-face communication with friends, family and neighbors who often pass along updates from wet market announcements. The villagers are familiar with social media, commonly used to coordinate events and share news about family and friends. The most used social media platform among fisher households is Facebook. During COVID -19 Facebook posts about news, government announcements and local awareness videos are shared, but infrequently.

### 3.6 Historical Data

Local fishers hunt for both aquarium and a range of food fish. There are numerous fisher groups in Les and adjacent villages where many fishers are affiliated with more than one fisher group. In North Bali, the most caught food fish are Grouper, Snapper, Fusilier, Mackerel, Scad, Squid, Octopus and Tuna. Traditionally, a variety of fish for consumption can be caught year-round and, depending on the target species, some months are better than others. Most fishers believe that later in the year, from October to December, is the best time to catch the most sought-after food fish. Whereas, the season for aquarium fishing is from March to November, however there is no clear consensus among fishers on fishing seasons.

The practice of marine aquarium fish collection in Les village took off in the 1980s after locals were encouraged by middlemen looking to

export endemic species abroad. The sudden high demand for aquarium fish coupled with unsustainable fishing practices introduced by an influx of more experienced non-local fishers lead to the depletion of local fish stocks and damage of coral reefs by the early 2000s (Frey 2013; Muswar et al. 2019; Pasaribu-Guzina 2013). To counteract the damage to the environment various non-governmental organizations stepped in to help protect the coral reefs and fish stock by introducing sustainable fishing methods around North Bali.

### 3.7 Household Income Diversification

Fishers in Les are familiar with juggling multiple jobs simultaneously. Pre-Covid all the fishers had at least one alternative income source. Additional income comes from permanent and periodic secondary livelihoods such as alternative target fishing, construction, service, hospitality and tourism with households averaging six members balancing 2–3 income streams. Excluding the fishers, households maintained two additional semi-steady sources of income by working in a rotation of construction, restaurants, and shops.

### 3.8 Fisheries Supply and Demand

Before COVID-19 middlemen collected aquarium and seafood fish daily and shipped to end customers regularly. However, during COVID-19, the aquarium fish middlemen operate with inconsistent schedules, based on the amount of cargo space for export available. The middlemen during COVID-19 typically purchase fish for 3 days in a row followed by closures for up to a week or longer until cargo space is available again. Aquarium fishing trips have reduced from an average of 24 days a month to 11 days a month in response to a lack of demand.

Food fish is more stable than aquarium fish demand, but there are new market forces creating challenges in selling daily catch. There is a resurgence of fishing for consumption by novice fishers causing an abundance of reef fish at local markets. Additionally, local seafood demand connected to tourism has disappeared and a lack of cold storage has increased instability. The middlemen are hesitant to purchase the daily catch at pre-COVID-19 prices and have adjusted for this risk by purchasing the fish in the same quantity but at a reduced price. The increased abundance of reef fish available in the local market has driven down both demand and price simultaneously.

### 3.9 Fisher Income

Fisher monthly incomes, before COVID-19, ranged from ~100.00–280.00 USD (1.5–4 million IDR) depending on their skill, ocean conditions, and demand. Income from aquarium trade, compared to previous years, has experiencing a 41% decrease in daily income since April 2020 until the time of writing (December 2020). The value of the seafood caught locally depreciated by as much as 50% in April and May and stabilized at 25% lower than before COVID-19 from June 2020 to date. However, the income earned from seafood fishing varies greatly depending on the target fish. The range of daily income earned among the fishers has reduced from ~17.00–70.00 USD (250 K to one million IDR) to 3.50–17USD (50 K–250 K IDR). This downturn in fish value is most evident in higher value fish, such as tuna, with a price reduction of nearly 50%, dropping from ~2.40 to 1.18 USD (35 K to 17 K IDR) per kg. Before the pandemic, when the weather permitted, tuna fishers could typically earn up to 70.00 USD (one million IDR) per night. The reduction in daily income of fishers in 2020 is illustrated in Fig. 10.5.

### 3.10 Financial Habits

Commonly the fishers and households in the community work for a daily income. Financial planning beyond daily needs, religious ceremonies and fees related to children's education is not

common practice among fishers. Half of the fisher households habitually save money in a bank, while the remaining fishers choose to save cash in other secure locations or not at all. However, all the fishers expressed difficulty in managing expenses during COVID-19 with 70% claiming it is impossible to save money during the pandemic.

In Indonesia, aside from traditional banks, villages also have access to credit through community financial institutions called Lembaga Perkreditan Desa more commonly known as LPD. LPD is a village government-run savings and loans financial institution. Five out of ten fishers have some form of business-related debt, that predated the pandemic, that they are now responsible for paying off. In the village there are various sources of financial support available that can provide loans to fishers. Sixty percent of the fishers occasionally take out loans to make payments on debt. Additional options to secure credit are available in the village, those the fishers access include fisher groups, friends, family, middlemen, local stores and banks.

## 4 Discussion

In early 2020 debates surfaced among governments, media, and the public around tradeoffs between health responses to manage the virus and negative economic impacts (Eichenbaum et al. 2020; Fetzer et al. 2020; McFall-Johnsen 2020; Vaitilingam 2020; Verner 2020). Based on this paradigm the indicators in this study are examined through health, economic as well as environment impacts as these are interconnected to fishers' livelihood and Sustainable Development Goals. Although findings are encapsulated in health, environment and economic sections, many indicators are crosscutting shaping resilience and vulnerability simultaneously. For example, increase in villagers fishing provides food security but can also jeopardize local biodiversity by overfishing reef fish. Likewise, a vulnerable health infrastructure can be supported through strong social adaptability to adhere to COVID-19 protocol. Nevertheless, health protocol such as social distancing limits local coastal management leading to build up of trash and unchecked fishing practices.

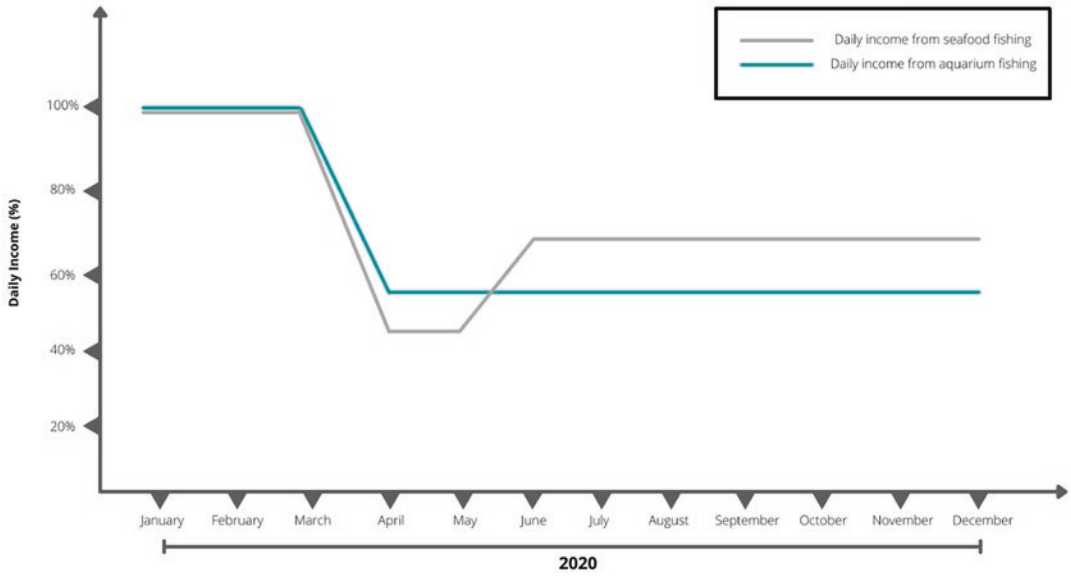



**Fig. 10.5** Reduction in daily income of fishers from seafood and aquarium fishing in 2020, based on interviews in Les village, Bali, Indonesia

## 4.1 Community Vulnerability

### 4.1.1 Health

The potential for the Indonesian health care system to become overwhelmed from outbreaks is high, based on the low number of medical professionals, infrastructure, and services available in relation to the population (Wirawan and Januraga 2020). In Les, for example, only a single GP attends a population of 8040 (Table 10.1) compared to an average of 3.5 per 1000 population across the OECD. In addition, fisheries as a business, is a high-risk activity in terms of COVID-19 exposure, often requiring extended interaction with other fishers and buyers. The fisher's households with an average of 6 people living together also poses high risk for spread, and challenges to isolate, if someone becomes ill.

Bali, with a population of 4,300,000 (Wirawan and Januraga 2020) before COVID-19, had a total of 6948 hospital beds available on the island with only 446 of those being intensive care unit beds (Wirawan and Januraga 2020). Medical infrastructure, for a population of 61,342 in the Tejakula Sub-district, includes only two Puskesmas and no major hospitals within the sub-district (BPS Kabupaten Buleleng 2019). Before COVID-19 the management of the health system in rural areas was already challenging with staff in the health system network undertaking dual practice, supplementing the lower salary paid to public servants with private practices (Syah et al. 2015). The local dedicated staff of the community health centers often split work between public and private health providers adding to the fragility of an already limited health infrastructure. The high workload of the general practitioners at Puskesmas is a concern since they commonly have double duties as managers and clinicians treating dozens of patients in a day. Due to the low numbers of general practitioners in rural areas the government authorizes midwives and nurses to provide primary care at Puskesmas and auxiliary units (Syah et al. 2015). Children health services in Les were paused during lockdowns, from April to June 2020. Except for prescheduled vaccines, the interruption of the Posyandu service meant that health checks for infants, and toddlers key services, were not available for community members until June 2020.

The local Puskesmas most notable communication channel with the community is to announce weekly updates and COVID-19 protocol by loudspeaker at the traditional markets in the morning. This announcement from the market is then passed along the community by word of mouth. While this is effective in reaching many people at once, it leaves lots of room for misunderstandings. Currently the wives of the fishermen in the village believe that it safer to buy food and products at the side of the road around the village than in the wet market. The increasing trend of vendors selling produce on the roads, rather than the market, minimizes the number of community members that hear the announcement directly.

### 4.1.2 Economic

The aquarium fish catch is primarily exported to aquarium businesses abroad, whereas the seafood catch is split between local/regional consumption and export of the higher value fish such as tuna. COVID-19 lockdowns impeded the ability to supply fish abroad because of logistical challenges. A reduction in demand, limited access to buyers and abundance in local supply has damaged small-scale fisheries livelihoods.

As the local fishers explain, the supply chain traditionally has been reliant on the ability of the middlemen to access regional and international markets. The fishers have no direct access to the local collectors or retailers to sell the aquarium fish, so they are economically reliant on middlemen. Tuna which is often sold directly to middlemen that in turn sell to the hotels, restaurants and exporters are purchasing infrequently, or not at all because of lack of cold storage. Daily fishing income decreased by as much as 50% during lockdown, and in the months following the initial lockdown the daily income stabilized at 20–30% lower than income before COVID-19 (Fig. 10.5).

In response to the decline in demand from middlemen the frequency of aquarium fishing has reduced as there is no access to buyers otherwise. Some tuna fishers have chosen to stop fishing altogether until the price of tuna or demand rises to a point that is economically viable, con-

sidering effort and the cost of fuel. Reef fish can be caught and sold daily to local buyers in the village or eaten. Consequently, fishers increased the number of days in a month spent targeting reef fish, creating an abundance in local markets and pushing the value of fish per catch down. The reduction in value of reef fish forces the fishers to collect bigger catches to maintain pre COVID-19 income levels.

#### 4.1.3 Environment

Local risk to the environment that COVID-19 brings is an influx of unemployed adults returning to the village after losing jobs in the tourism and service industry in the city. Fishing activities now have an extra emphasis on catching reef fish for local consumption compared to before COVID-19. This is due to the reduction in demand for traditional catch and unemployed family members returning to their home village and becoming novice fishers to contribute to their households. There has been a significant increase in fishing activity nearshore, with 40% of the participants increasing the number of days in a month they fish for reef fish. Moreover, novice fishers do not have experience of how coral reef ecosystem degradation at Les village has affected biodiversity. The fishers may understand the message of conservation and see its merits but oppose it because it threatens their livelihoods and way of life (Jentoft 2020). The experienced permanent fishers have seen the connection between population decline of targeted species and local extinction of some reef fish such as Blue Tang, Emperor Angel and Blue-face Angel (LINI 2015). Pandemic fishers are a trend island-wide with the pressure on reef fisheries unlikely to reduce until the tourism sector returns.

Even before the pandemic, trash in the ocean had been a global eight million metric ton (NOAA 2021) problem annually. In 2015 Indonesia was identified as the world's second largest contributor to ocean plastic (Jambeck et al. 2015) which directly affects beaches around Bali with tons of plastic arriving annually with the wet season (Mogul 2021). Covid-19 has exacerbated this with the production of personal protective equipment, takeout and delivery packaging. The global plastic packaging market size is projected to grow from USD 909.2 billion in 2019 to 1012.6 billion by 2021, annual growth rate of 5.5% (Adyel 2020). The pandemic has also limited social gatherings, including beach and underwater clean ups, that communities in North Bali periodically do during non-Covid times. Most communities have not organized a beach cleanup since late 2019 meaning trash has accumulated in many areas, this is additional to reduced ecosystem monitoring and coupled with increased fishing pressure.

### 4.2 Community Resilience

#### 4.2.1 Health

The various local partial lockdowns from March to June 2020 affected everything from religious ceremonies at temples to the full closure of popular tourist beaches. The Balinese government leveraged strong cultural ties (Aditya and Suhartono 2020a) and community governance in the nearly 1500 villages to limit COVID -19 transmissions. Across the island traditional guards known as Pecalang in Bali, who normally maintain village security and customary ceremonies (Christensen 2013) have been mobilized to monitor travel between communities and enforce other temporary closures such as beaches (Pangestika 2020). Religious leaders along with worshipers have embraced social distancing by limiting access to temples and temporarily stopping ceremonies. During the partial lockdown beginning in April the temples were only open to the priest, with community members encouraged to pray at home. Youth groups supported the effort and coordinated volunteers to secure access points in and out of the village daily. Fishers from the community also supported the youth and Pecalang by joining guard duty.

Many of the vendors who normally have stalls in the traditional market have relocated to roadside locations in recognition that the customers were hesitant to enter markets, due to inability to social distance, and fears of increased risk of infection. There is now a substantial increase in mobile vendors selling items out of their cars,

trucks and even motorbikes along the main roads adjacent to the traditional market. After months of partial lockdown, ending in June 2020, without any major outbreaks the official restrictions have eased allowing daily life to resume with the new normal protocols such as social distancing, mask wearing and remote learning for children. Locals can visit the temple again and the fisher groups are actively organizing around local coastal management issues but limiting physical interaction to distribution of aid to support group's members and biannual meetings connected to major religious ceremonies.

### 4.2.2 Economic

Small scale fishers in the village are tackling the economic impact of COVID -19 head on. The fishers and many in the community are comfortable with wearing different professional hats, collaborating, and supporting each other during tough times. On average the fishers have 23 years of experience and can trace their tradition of fishing back 3 generations. This legacy of fishing indicates that most fishers have experienced several economic shocks such as the Bali bombing, Mt. Agung erupting and now COVID -19 (Laula and Paddock 2020).

The aquarium fishing season in North Bali typically runs from March to November with these months the most profitable for local aquarium fishers. Unfortunately, in March 2020, global lockdowns impeded Bali fishery exports as the fishing season began, causing an unexpected slump in demand. Although 90% of the fishers participating in this study consider aquarium fishing as their primary livelihood, as a coping mechanism, when faced with previous economic downturns they diversified their income streams. Fishers began targeting food instead of aquarium fish, since there was still a local demand, and taking on day labor opportunities such as construction. Likewise, other working household members transition between tourism, hospitality and other local opportunities available. The average fisher household had three out of six family members employed before COVID-19. As the full impact of the pandemic set in the average number of family members working fluctuated from three to two working adults, with a significant amount of turnover among those who managed to stay employed. Despite the loss of one income source the households have been able to consistently secure alternative forms of day labor.

An additional layer of resilience for the fishers in our study comes from the various options available to secure credit locally. The village economy has different forms of credit available that allows the fishers to take out loans with favorable and flexible terms that considers local context. The fisher groups are the most common sought-after provider of small loans because of understanding of the sectors challenges. An example of this flexibility during the pandemic is the decision by some of the fisher groups to defer full payments and only collected the interest on outstanding loans.

### 4.2.3 Environment

The village of Les is fortunate to have had many interventions from local government and non-governmental organizations working with the community to improve coastal management over the course of decades. The traditional fishers have experienced the impact of overfishing and understand the importance of sustainable practices. Past overfishing led to the introduction of more sustainable fishing methods, using barrier and scoop nets, from the early 2000s until today (Frey 2013; Pasaribu-Guzina 2013). Scattered along North Bali there are many coral restoration projects which also help to build a local knowledge with firsthand experience in ecosystem management. Further capacity building on coastal management continues to provide knowledge on destructive fishing practices and coral reef restoration to the fisher groups. Most recent intervention took place in December 2020 implemented by the Indonesian government. The Indonesia Coral Reef Garden was launched in Bali installing artificial structures around the island with 7.4 hectares of reef restoration spread across the Buleleng district, engaging thousands of locals in conservation while injecting temporary income to mitigate the impacts of COVID-19.

Globally tourism has slowed down because of COVID-19, and this translated to a severe drop in arrivals in Bali. Based on projections in 2018 Bali was expected to have 18.2 million tourists visit the island in 2020 (Wood 2018), however the actual number of arrivals was 1.05 million (Statista 2021). According to a National Geographic article published in 2019 the average tourist produces 1.7 kg of trash compared to a local with 0.5 kg of trash per day—and only 50% of that trash is managed properly (Siddharta 2019). The benefit from a reduction of tourist numbers is the decrease of trash produced locally since 2020, but further research is needed to understand the full impact that included increased single use plastic and a reduced focus on coastal management.

## 5 Conclusion

Resilience materialized from social networks, diversified economic opportunities and strong cultural community level governance with villagers adjusting social, economic, and religious behaviors to mitigate spread of COVID-19. Transformation of activities to adjust to the new 'COVID-19 normal' have been supported by religious, government and informal networks creating a community culture built around following health protocols. The ability to utilize social capital and mobilize villagers in implementation of health safety protocols provided a level of stability during difficult times. Mobilization of the Pecalang Balinese traditional guards incorporated the islands cultural governance system, and with it the trust and support of the local communities. The Indonesian health insurance system has been socialized to most of the community and, with that, familiarity, and confidence in the health system.

Economic Resilience has materialized at community level by leveraging previous experience with economic downturns, job diversification and a holistic local financial support system. The experience from previous economic shocks have made transitioning between livelihoods a familiar practice among the fishers, with many even developing a network of friends they can contact for day labor when fishing is not an option. The fisher groups also support members with favorable terms for loans in times of need providing cushion and further establishing camaraderie within the community.

In terms of the environment, community members are familiar with the concept of conservation and aware of the importance of fisheries management. There is a knowledge base of sustainable fishing practices, and a network of fisher groups that encourage sustainable practices. This is evidenced by fishers and locals in the community coming together during COVID-19 to remove nets left by less experienced and outside fishers, however local interventions such as this have become less frequent with social distancing measures in place. The shift to closer inshore reef fisheries is likely to have had an impact, however long-term impacts are currently unknown. Trash has been a big problem in Bali for many years especially evident on beaches and in the ocean. The reduction in tourists has reduced the amount of trash produced on the island, but the increased use of single use plastic and personal protective equipment pose a threat to coastal ecosystems in the future.

### 5.1 Implications on the United Nations Sustainable Development Goals (SDGs)

It is of interest to understand how the SDGs might be impacted by the global pandemic from the perspective of small-scale fishers. Based on community vulnerability analysis we found several SDGs potentially impacted (Table 10.2), including SDG1 (Efforts to eradicate poverty), SDG2 (Zero hunger food security and nutrition), SDG3 (Good health and wellbeing), SDG8 (Decent work and economic growth) and SDG 14 (Life below water). The key impacts are through susceptibilities in health infrastructure, minimal control of supply chain and loosely regulated fishing that expose the challenges COVID -19 brings to small scale fishers.

Health vulnerabilities surface around the fragility of the medical infrastructure, and extremely low capacity to respond in case of a COVID-19 outbreak. The allocation of infrastructure and the focus of medical practitioners on the pandemic causes other services to be pushed aside, and could set back Indonesia's overall progress on health (SDG3). In addition, the limited communication strategy using loudspeakers and signage can lead to misunderstandings that damage trust between the government and citizens at a time when compliance is most needed.

Many economic weaknesses to COVID-19 stem from the supply chain and the reliance on tourism (SDG8). Access to buyers is heavily influenced by middlemen, tourism, and international exports that leave the fishers in a weak position to collectively negotiate prices and manage fish stock (SDG2). The lack of budgeting practices at a household level poses a risk to prolonged economic slowdown as savings and credit are used up (SDG1). The compounding effect of low or no savings, with little bargaining power, leaves fishers economically defenseless.

Novice fishers pose a risk of introducing unsustainable and destructive fishing practices to the coastal environment (SDG14). The focus on COVID-19 has taken attention away from standard coastal monitoring and conservation efforts, such as monthly beach cleans to remove plastic pressure on local reefs which have not happened regularly since the COVID-19 lockdowns were introduced in 2020.

## 5.2 Policy Considerations

All actions taken to manage the pandemic come with tradeoffs. Most government responses to balance impact of their policies erred on the side of caution with health protocols throttling leniency to maintain economic activity. The most common responses to the pandemic, according to the Oxford COVID-19 Government Response Tracker (Hale et al. 2020), include school closing, travel restrictions, bans on social gatherings, emergency investment in healthcare, new forms of social welfare provision, augment health systems and management of economic consequences of these actions. By the end of 2020 Indonesia appears to have followed suit with the common government responses to address social and economic challenges. According to the World Bank Social Protection and Jobs Responses to COVID-19 report (Gentilini et al. 2020), Indonesia has implemented elements of social assistance such as cash transfers, social insurance and supporting labor market through training. Some of the policies implemented included relaxing terms of loans for informal workers and tax for all workers, eliminating tax completely for lower income earners (WIEGO 2020). However, these high-level solutions may not

**Table 10.2** United Nations Sustainable Development Goals (UN SDGs) associated with Resilience Indicators in this study

| Resilience Indicators | Health | | Economic | | Environment | | SDGs |
|---|---|---|---|---|---|---|---|
| | Resilience | Vulnerable | Resilience | Vulnerable | Resilience | Vulnerable | |
| Fisher Households | | x | | | | | 3 |
| Medical Infrastructure | | x | | | | | 3 |
| Preparedness | x | | | | | | 3 |
| Social Adaptability | x | | | x | x | | 3, 8, 14 |
| Communication | | x | | | | | 3 |
| Historical Data | | | x | | | x | 8, 14 |
| Household Income Diversification | | | x | | | | 8 |
| Fisheries Supply and Demand | | | | x | | | 8, 2 |
| Fisher Income | | | | x | x | | 2, 14 |
| Financial Habits | | | | x | | | 1 |

always align with the local context. There is a need to understand specific types of vulnerabilities and allow health officials to plan and allocate accordingly (Peters 2020). Small scale fishers are deeply entrenched in the community, providing food security and stewardship of local marine resources. These fishers need to be engaged when designing responses to not only match their vulnerabilities but leverage resilience.

The policy recommendations that emerge from this study suggest the urgent need to strengthen fishing communities with targeted policies. We suggest action to strengthen fisher networks with the aims of:

- *Improving transparency and access to markets, especially domestic and direct sales.*
  The small-scale fishers are removed from buyers by layers of middlemen which take percentages from sales. While middlemen do add value in marketing, the lack of transparency in supply chains reduces competition among middlemen and the negotiation power of fishers. By improving supply chain transparency small scale fishers can take a more active role in supply and demand of fish.
- *Support fishers in seeking assistance from relevant agencies to secure insurance, financial and other social support to secure their livelihoods.*
  The extended economic slow-down caused by COVID-19 has drained savings and/or increased the debt of fisher households. The number of small-scale fishers in Indonesia is an estimate which means these informal workers are also at risk of being excluded from government support programs. One pathway for meeting the needs of small-scale fishers would be for local government to provide the fisher groups formal recognition. This would not only be beneficial in getting a clearer idea of numbers of fishers but also information on ecosystem health, fishing practices and local supply chain.
- *Integrate environmental considerations into sustainable recovery and avoid rolling back regulations as a short term means to stimulate economic growth.*
  The recently passed Job Creation Act in late 2020 has been met with calls for annulment. Fishers, environmentalist, and law experts claim 'that the new law also threatens the degradation of Indonesia's coastal and marine ecosystems for the sake of infrastructure development and tourism', 'giving concession or permit to foreign fishing vessels in territorial waters is a very ill-advised policy' and 'with the passage of the Job Creation Act, we are looking at ecological apocalypse', among other strong criticisms (Gokkon 2020). Additionally, waste management has taken back seat to COVID-19 focused policy. Strengthening the waste management systems should be included in the COVID-19 recovery strategy as the increase in associated plastic waste will eventually find its way to the ocean. Addressing this could also be the opportunity to create green jobs.

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# 11

# Challenges of Targeting Poor and Vulnerable Groups to Reduce Climate Change Vulnerability: The Case of a Water and Sanitation Project in Kampong Svay District, Cambodia

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**Abstract**

The escalating climate change-related disasters around the world are a serious threat to human existence and human livelihoods. Rural people living in developing countries, especially those of the poorest, are believed to be particularly vulnerable to climate change. As the number of climate change programs designed to help the poorer households has grown, concern has also arisen over their ability to participate and the extent to which they benefit from those programs. There is limited documented evidence on whether climate change intervention programs have supported communities to become resilient to climate change or to recover from extreme events. This case study focuses on a pilot project called 'Climate Proofing Integrated Rural Community Development in Kampong Svay district, Kampong Thom province', designed to deal with water shortage, lack of sanitation issue, and food supply, by building climate-resilient infrastructure: construction of wells, water collection tanks, latrines, and home gardens. The results show that four factors are hindering the poor and other vulnerable beneficiaries from getting benefits from the intervention program: lack of family labor for the elder, extreme heat, different priorities such as waning commitment from poor households, and lack of financial and technical support.

**Keywords**

Climate proofing · Poverty · Vulnerability profiles · Project implementation challenges · Impact assessment

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## 1 Introduction

Climate change and poverty issues are still the main challenges for developing countries. Millions of people are living in poverty and face the adverse consequences of climate change. The countries most affected by climate change are



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the poor ones because they lack infrastructure and they have low capacity, weak institutions, and weak governance to adapt to the impacts of climate change. This new burden has caused governments, international and non-governmental organizations to design and implement intervention programs to reduce poverty and to build community capacity for resilient livelihood to climate change.

Cambodia is considered among the most affected countries by natural hazards, and the decline in natural resources due to 77 percent of the population living in rural areas and depending on agriculture (mostly rainfall-irrigated rice) for their food and income activities (Yusuf and Francisco 2009; NIS 2019). Kampong Thom province is located next to Tonle Sap Great Lake, the central part of Cambodia, and it is prone or vulnerable to flooding and drought (lack of water, leading to poor sanitation) and the associated losses in terms of human life, physical infrastructure damage, reduced agricultural yields, and livestock numbers (NCDM 2020).

To deal with these drought and sanitation issues, the Ministry of Rural Development of Cambodia with Cambodia Climate Change Alliance's (CCCA) funds has implemented a pilot program from 2015 to 2019 with technical supports from Caritas Cambodia, an international organization, on building pilot climate-resilient wells (tube and pumped wells) and rainwater collectors for improving access to clean water, home gardens for improving access to food, and latrines for improving the sanitation for the affected communities in Kampong Svay District, Kampong Thom Province, where serious drought has happened.

In this study, we investigate a case study of the above-mentioned pilot program of the Ministry of Rural Development (MRD) designed to be resilient to climate change and extreme events—mainly drought, to improve the water and sanitation in Kampong Svay District, Kampong Thom province. The study discusses the main factors/challenges hindering the poor and vulnerable beneficiaries of the pilot program, and makes recommendations for future climate change programs.

## 2 Literature Review

The escalating climate change-related disasters around the world are causing a serious threat to human existence and their livelihood. Rural people living in developing countries, especially those of the poorest, are believed to be particularly vulnerable to climate change. As the number of climate change programs designed to help the poorer households has grown, concern has also arisen over their ability to participate and the extent to which they benefit from those programs. Some studies on intervention programs on forest conservation via payment for ecosystem services (PES) showed that the beneficiaries of many PES and community forestry programs are relatively better-off (Porras 2010; Zbinden and David 2005). There is limited documented evidence on whether climate change intervention programs have supported communities to become resilient to climate change or to recover from extreme events (Yavinsky et al. 2015).

A review of the literature of past studies shows that several factors limit the ability of the poor in benefitting from those projects. The rural poor are in general greatly dependent on rain-fed agriculture for their income, have low levels of education, have limited resources, and little access to financial resources, networks, and information. These socio-economic constraints play a big role in preventing the poor from successfully implementing climate change adaptation and mitigation projects or even to participate at all (Tirivangasi and Nyahunda 2019).

Even when the poor households are eligible to participate in the climate change programs, their abilities to obtain benefits from those programs and to successfully carry them out are limited due to various challenges, including lack of drought preparedness and inadequate irrigation systems, inaccessibility to water sources, food insecurity, and lack of climate change education (Tirivangasi and Nyahunda 2019).

In Cambodia, there exists a similar pattern for problems of climate change adaptation of the rural poor. According to Nang et al. (2014), more often than not, poor households do not have sufficient support from local and national institu-

tions, whereas medium-wealth families have higher adaptive capacity because of their diversified incomes, better access to financial resources, and more capital availability. The authors argued that the rural poor need more support from various organizations, including the government, NGOs, and the private sectors to enable them to invest in long-term coping measures in areas such as assets accumulation, livelihood diversification, and the adoption of agriculture technologies that allow for an increase in productivity and income.

Therefore, according to the literature review, those vulnerable groups are hard to get benefits from intervention programs due to a range of factors including inadequate irrigation system for rice farming and other agricultural activities, low skill labor and education, inaccessibility to water sources, food insecurity, lack of climate change education (lack of drought/flood preparedness), limited network and information, limited resources and ownership of land (especially the landless poor), and little access to financial resources.

## 3 Resilient Infrastructure and Beneficiary Selection Criteria

MRD had a climate change intervention program called 'Climate Proofing Integrated Rural Community Development in Kampong Svay district, Kampong Thom province' from 2015 to 2019, a joint effort between MRD and Caritas Cambodia, funded by the Cambodia Climate Change Alliance. The program was focusing on the improvement of access to clean water, improved sanitation, and assisting resilient livelihoods to climate change by providing climate-resilient infrastructure (construction of eight wells, four latrines, and 12 pilot home gardens), building the adaptive capacities of local communities and authorities, and integrating climate change issues into national and sub-national planning. The project aimed to benefit 50 percent of MRD officials at the national and subnational level and 30% of the general population in the province (Chin and Kim 2016).

The pilot resilient infrastructure included constructing 8 wells (Figs. 11.3 and 11.4) (drilled deep and considered a viable method for providing water consumption for all year round), four latrines and rainwater collectors (constructed in higher location to avoid flood), and 12 home gardens (a dripping system—designed for less care and less water consumption, aiming to be workable and produce vegetables and food during the dry seasons).

The main criteria of the beneficiaries for receiving the latrines, wells, and home gardens were those who do not migrate to work outside the village; having enough labor capacity to ensure the maintenance of equipment; being willing to plant or participate after direct support had ended, and being poor households.

For home gardens, commitment and availability of labor force were also considered in selecting beneficiaries. Through these home garden projects, the village families grew mixed vegetables including Bok choy, Curly cabbage, and lettuce (Fig. 11.1).

For latrine site selection (Fig. 11.2), higher locations less prone to flooding were prioritized. The latrines were built at schools and traditional ceremony areas that are accessible to all villagers (Figs. 11.3 and 11.4).

Poor families were also targeted as beneficiaries by using the Identification of Poor households (ID Poor) and they could show those IDs to the village or commune chief, requesting to be selected as a beneficiary. Elder households without children's supports were also classified as poor.

## 4 Methodology

The study employed a qualitative approach and drew on secondary and primary data. Secondary data used the latest Cambodia's commune database and collected from a desk review of policy documents, research reports, national and international studies, and journals on poverty alleviation and climate change.

**Fig. 11.1** Home garden, considered as using less water and less care

**Fig. 11.2** Latrine and rainwater collector for improving sanitation

Primary data was collected in May 2019 from 13 key informant interviews (KIIs) with separate men and women, children, disabled people, commune councilors, village chiefs, and provincial rural development officials and 3 focus group discussions (FGDs) with separated men and women groups (Table 11.1). Each FGD was composed of about 6–10 men and women aged from 20 to 60 years old. KIIs and FGDs used semi-structured interviews. We analyzed the qualitative data from FGD and KII using thematic analysis. The participants for the KII and FGDs are as the following:

## 5 Study Site

Four villages (among the total 8 villages) in four communes of Kampong Svay district (Fig. 11.5), Kampong Thom province were selected for the

**Fig. 11.3** Deep drilled well (up to 80-meters depth) for year-round water access

**Fig. 11.4** Pumping well for year-round water access

study as suggested by MRD's staff in 2019 where the climate change programs were implemented. The areas had a serious drought and shortage of water. There were 938 households or about 4700 people in the four villages (Table 11.2). Three of the villages are located close to the Stung Saen river that flows into the Tonle Sap Great Lake (Fig. 11.5).

According to the commune database 2018, about half of the total population in the four villages were female and 67 percent of the total population were adults of age between 15 to 60 years old. The average size of the family was 4 people per family (NIS 2020).[1] Approximately, 76% were literate with 51% of the people having finished primary school and 21 percent graduated high school (NIS 2018).

[1]Census 2019 report

**Table 11.1** Key informant interviews and focus group discussion conducted in Kampong Svay District, Kampong Thom Province

| No | Target groups | KIIs | FGDs (# of people) |
|---|---|---|---|
| 1 | Women and female household heads | 1 | 1 (11) |
| 2 | Men | 1 | 1 (5) |
| 3 | Children (aged below 15) | 1 | 0 |
| 4 | ID poor households | 2 | 0 |
| 5 | Older people (aged above 60–70) | 1 | 0 |
| 6 | Disabled people | 1 | 0 |
| 7 | Beneficiaries in general | 1 | 0 |
| 8 | MRD project staff | 2 | 0 |
| 9 | Commune and village chiefs | 3 | 1 (4) |
| **Total** | | **13** | **3 (20)** |

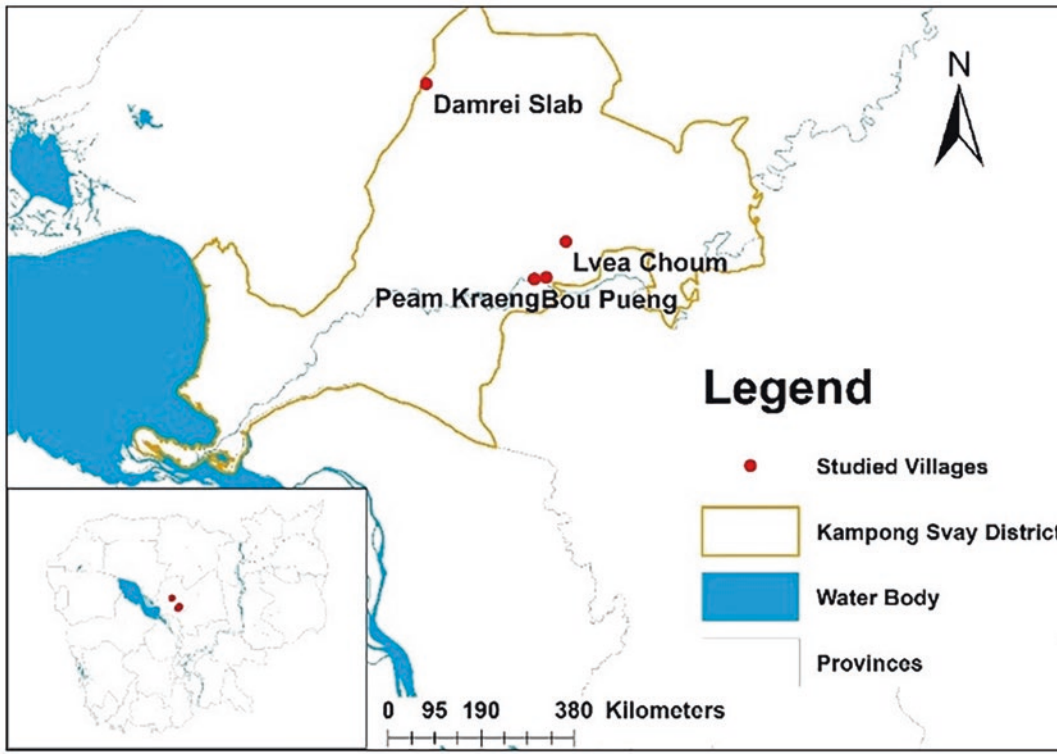


**Fig. 11.5** Map of the studied villages (Authors made based on NIS 2010)

Rice farming is a common occupation in the areas. About 80–90% of all the farmers in the villages depended on rains for their rice fields. Only a small percentage, 10%, of the villagers who have rice fields with the irrigation system or near the drainage, could plant rice twice per year. Vegetables such as garlic, water spinach, banana, papaya, jackfruit, and mango are usually planted around the house land. Raising animals such as chicken, pig, and cow are also secondary income and food supply. Furthermore, around 20 migrated workers migrated to Thailand for the whole year in Damrey Slab village (interviewed village chief). Fishing is also a food source for the community.

**Table 11.2** Families accessing rural facilities by village (in percent) (authors' calculations based on the General Population Census 2019 (National Institute of Statistics, 2020)

| Village name | Energy for cooking | | | Energy for lighting | | | Toilet | | | Water for domestic consumption | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Firewood | Electricity | LPG and others | City power | Battery | others | Not use toilet | Improved toilet | Unimproved toilet | Piped into dwelling | Wells | Surface water | Bottled water |
| Bou Pueng | 97.89 | 0.70 | 1.41 | 3.52 | 93.66 | 2.81 | 45.77 | 52.11 | 2.11 | 3.52 | 0.00 | 55.64 | 40.85 |
| Damrei slab | 98.31 | 0.00 | 1.69 | 89.83 | 8.47 | 1.69 | 11.86 | 83.05 | 5.08 | 1.69 | 98.3 | 0.00 | 0.00 |
| Lvea Choum | 91.67 | 0.44 | 7.90 | 79.39 | 18.42 | 2.20 | 9.21 | 34.21 | 56.58 | 5.26 | 94.31 | 0.00 | 0.44 |
| Peam Kraeng | 98.57 | 0.00 | 1.43 | 64.64 | 32.86 | 2.50 | 16.79 | 78.93 | 4.29 | 0.00 | 2.15 | 97.86 | 0.00 |
| Average | 96.61 | 0.29 | 3.11 | 59.35 | 38.35 | 2.30 | 20.91 | 62.08 | 17.02 | 2.62 | 48.69 | 38.38 | 10.32 |

Source: General population census 2019 (NIS, 2020)

According to the census 2019, the common energy use for cooking is firewood (96 percent), followed by LPG (3%) (Table 11.2). The lighting energy is electricity from the national grid (city power) is 59%, followed by car battery (38 percent). Regarding clean water and sanitation, about 21% of the total households did not have toilets and 38 percent used surface water such as rivers or ponds for domestic consumption.

## 6 Results

### 6.1 Profile of Different Vulnerable Groups

Table 11.3 summarizes the information received from different vulnerable groups about their current jobs, difficulties, current needs, benefits from MRD's climate change intervention program, and what type of program they need in the future if MRD has the budget to run a similar program on building community resilience to climate change.

The common jobs and earnings were mainly from rice planting. Other secondary sources included raising cows, serving as saving assets, and raising poultries, planning vegetables, and fishing for daily food consumption. The difficulties during the studied period in May 2019 were lack of water in the dry season for daily consumption (body washing, cooking, drinking, etc.) and agriculture (irrigation for cropping), dirt roads (slippery during the rainy season), lower price of rice, infertile soil, and insects destroying crops/rice. The difficulties for children included taking care of their younger siblings, having not enough water, required them to collect water from the far wells, having not enough budget for education.

The benefits they received from the climate change intervention program of MRD included more access to water. However, the water was still limited in the dry season. The beneficiaries improved their hygiene due to having a latrine and had vegetables from the home garden. The home gardens also helped the beneficiaries to be able to save money from buying vegetables from the markets.

What they need from future programs are irrigation systems for their crops, seeds, more wells, more latrines, training skills on vegetables, dealing with insects, raising animals, fertilizers, a health care center, child care/health-food support, and scholarships for education.

### 6.2 Factors that Hinder the Project Beneficiaries

#### 6.2.1 Lack of Family Labor

The results showed that the pilot program of offering home gardens to the poor and older households had a low rate of success (30–40%)

**Table 11.3** Profile of vulnerable groups in Kampong Thom

| Vulnerable groups | Income and food sources | Difficulties | Current needs | Benefits from MRD's program | Future needed program |
|---|---|---|---|---|---|
| Women-headed household | Farming (rice, vegetables, and some fruits), selling grocery or food, raising animals (chickens, pigs, and cows) | Lack of water during the dry season, difficulty to travel or commute around during the rainy season due to slippery and muddy road, the market price of rice keeps getting lower | Irrigation system for farming, skills to negotiate the price of their agricultural products in the market, skills in planting crops and raising animals, clean water to use in the dry season | Because of the wells, they are now able to save some money as they don't have to buy water as before. It is now more hygienic to defecate as they have a proper latrine to use. They can save water from the water collection tank and can earn some extra money from the home garden. | Irrigation system provision, training on price negotiation skills in the market, training on how to plant crops and raise animals effectively, provision of more efficient wells (that give water during the dry season as well) |

(continued)

**Table 11.3** (continued)

| Vulnerable groups | Income and food sources | Difficulties | Current needs | Benefits from MRD's program | Future needed program |
|---|---|---|---|---|---|
| Elderly | Farming (rice, vegetables, and fruits), fishing | Lack of water during the dry season, the farmland is infertile | More wells, irrigation system, fertilizers for the farmland, health care, and medicines | They get clean water from the wells to use daily as well as for cultivating the home garden. They also get fresh vegetables to eat from the home garden and can defecate hygienically at the latrine given. | Provision of more wells (dig deeper) and irrigation system, providing fertilizers to make the farmland fertile, increasing health care centers, and providing medicines |
| Children | Depended on parents | Having to take care of younger siblings, lack of clean water in the dry season, not having enough money to go to school | Support with childcare, clean water supply, financial support for their education | Their health is improved since they have a clean latrine to go to and get fresh vegetables to eat from the home garden. They also have more water to use since they have a water collection tank. | Childcare support (for their younger siblings), provision of more wells, monthly financial support, or scholarship programs |
| Disabled people | Farming (rice and some fruits such as pomelo, banana, jack fruit, and mango), fishing, and raising animals (chickens, pigs, cows) | Drought damages rice and crops, lack of water for farming, farmland is not fertile | Coping mechanisms for drought, irrigation system, fertilizers | They get fresh vegetables to eat from the home garden, have a hygienic latrine to go to and get more water to use from the wells and water collection tanks. | Training on how to cope with drought, provision of water pumps, more wells, and irrigation system, providing crop seeds and fertilizers to make the land fertile |
| Poor household | Farming rice, planting vegetables, fishing | Lack of water during the dry season, insects problem, losing fishing nets when there's a strong wind, crops damage when there's too much rain | Irrigation system, more wells, pesticides to kill insects, skills in taking care of crops | The vegetables from the home garden help save them some money from the food budget. The water from the water collection tank is also helpful as they don't have to buy water from outside. They also benefit from the latrine as now they do not have to defecate at random places and it's much more hygienic to have a latrine | Support with irrigation system, building more wells, training on how to cultivate crops more effectively and how to deal with insects |

Source: based on group discussion and key informant interviews (2019)

**Table 11.4** Perceived changes in climate in the rainy and dry seasons in 2019

| Months | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Before (the 1990s) | | | | | | | | | | | | |
| Rice season | | | | | Rainy season rice | | | | | | | |
| Season period | 6-month dry season | | | | 6-month rainy season | | | | | | dry season | |
| Temperature and wind | Windy and dry (average 28 C[a]) | | hotter | The hottest (33-38 C[b]) | Normal temperature average 32.30 C[c] | | | | | | Windy and dry (average 28 C[a]) | |
| Frequency of rain | High frequency of rains within the period | | | | Normal rains (heavy) within the period | | | | | | Rain | |
| After (2019) | | | | | | | | | | | | |
| Rice season | Dry season rice | | | | | Rainy season rice | | | | | Dry season rice | |
| Season period | 7-month dry season | | | | | 5-month rainy season | | | | | Dry season | |
| Temperature and wind | Windy and dry (average 28 C[a]) | | hotter | The hottest (33-42 C)[b] | | Normal temperature, average 32.50 C[c] | | | | | Windy and dry (average 28 C[a]) | |
| Frequency of rain | A low frequency of rains, but with great intensity and lightning strikes, then (?) the longer period | | | | | More dry and less rain with greater intensity with lightning strikes within the period | | | | | Less rain | |

[a] Heng
[b] NIS (2008)
[c] Based on data from FGD, KII interviews in 2019)

because the home gardens need laborers in taking care of and in watering, weeding, filling water in the tank, making organic fertilizer, etc. It needs a lot of care and it needs a person in charge with full physical capability. Therefore, providing this home garden to any disabled, older people, or any households that lack labor would be a problem.

According to a poor household in Damrey Slap village:

> I got the home garden from the MRD project and I had also some challenges. Firstly, both my husband and I are getting old and we do not have enough energy for planting in the home garden since before the project. It is quite hard to plant vegetables in the home garden. We also tried to plant in the home garden two times but unfortunately, all plants were damaged and without knowing the exact reasons, even after we followed the instruction from the training. When the project staff came to check, I told them the truth and let them take back the home garden and provide it to other households which can plant the vegetables on it.

### 6.2.2 Climate Change (Extreme Heat)

According to the provincial department of rural development, home vegetable gardens were still a challenge due to climate change, and specifically extreme heat. Most wells in communities were dried up in the dry seasons, even though they were deeper. Villagers reported that the rainy season has increasingly become delayed, staying dry during the traditionally wet months of June and July. In May 2019, the change was extreme with the continuously increasing heatwave leading to temperatures of 42 °C (Table 11.4). Usually, the full rain period is in October and then there was a small rain period in December and January. The villagers observed this unusual change worsening since 2014.

The local perception of climate change is still unclear. What they can observe is that the seasons have changed. One KII villager said that "if the sky wants to rain, it rains and it does not care whether it is a rainy or dry season".

Below are some of the villagers' observers of the changing season of rainy and dry:

> "The seasons have changed. The rainy was delayed, shortened, with greater intensity, more lightning strikes, and the dry season was longer than before" (a villager in Damrey Slab village). This has led to lower rice yields (a drop from 5 tons per ha to 3.5 tons) and the destruction of planted rice crops due to lack of water.

> "It used to rain continuously in the rainy season, but now it rains one time and is delayed for a while until the next rain" (Poor villager in Damrey Slab Village).

The village chief said 'MRD project development helps to improve hygiene. However, the wells could only help some parts of water shortage issues. Because the MRD project provided only 8 wells. The other 13 wells were constructed by the villagers. To solve this issue, people buy additional water tanks which contain 5000 L worth of 13,000 riels/tank. Nearly 100 percent of villagers are using wells.'

'Digging and restoring more pond is more helpful for the extreme heat in the areas', said MRD's staff. Ponds can store a larger amount of water for the commune consumption during dry seasons.

According to the observations and discussions with the farmers who were the beneficiaries in those isolated villages, the local farmers were still practicing their traditional farming depending entirely on the weather even if there are perceived changes in climate in 2019. They planted rice in the wet season that starts in May and harvest the rice in September and the average productivity was 1.5–2 tones/ha. But since 2013, for those who had rice fields near to drainage structure, big canal and small canals, they could plant twice per year: the first is from May until August and the second is from August until September (FGDs with female groups in Damrei Slap village).

Sometimes, droughts and floods happened, and they could not do anything to prevent or adapt to the floods and droughts, affecting their rice fields. The farmers just waited to see how much of their crop was left after the drought or flood. There were reports of lower yields affected by floods and droughts.

'In the rainy season, there were no rains, but hot and dry in June and July 2019. Those dried periods in the rainy season killed 840 ha of rice fields (completely destroyed rice fields) in the whole commune…[and led to] fewer yields because the rice did not produce appropriate seeds. The average yield was 3.5 tons of rice per ha. The previous year, we could get 4 to 5 ton per ha. Therefore, the damage from the irregularity could cause loss of rice yield from 0.5 to 1.5 tonne per ha.'

### 6.2.3 Livelihood Strategy for Poor Households (Different Priorities)

The beneficiaries of the poor households usually prioritized their work in earning labor wage work by migrating to work in other locations, resulting in leaving the home gardens unused.

Selecting criteria to get home garden were (1) no-migration worker (stay permanent in the village) (2) hard-working, (3) poor, etc. But after those poor households received the home gardens, they still migrated for labor wage work, abandoning the home gardens. This contrasted with the initial criteria in selecting beneficiaries (no migration households). The poor households lost commitment and they prioritized labor wage work in rice farming, instead. As a result, they did not work with home gardens. In contrast, medium and better-off households have more labor, more diversified income sources, which lead to more successful in-home gardens compared to poor households.

According to the MRD's official:

> There are several reasons why the villagers failed in this home garden: (1) they consider the home garden as a second or third income source (not the primary one), i.e. they can have other options for much higher income such as labor wage work or going to work in a garment factory in the city or go to the forests. It is not necessary to take care of the home garden because if they do not do it, they can still survive.

After providing for 1 year, only those beneficiaries whose primary job was vegetable growers were still growing vegetables in the provided gardens. The MRD technical staff mentioned 'this is a great lesson learned when selecting the beneficiaries, that we need to think about the beneficiaries' primary jobs and make sure that we give the home garden to the vegetable growers if we wanted to see success after the project end' (MRD's project implementer).

There are also other major problems too. According to the district governor in Kampong Svay: 'the biggest priority for the community in this district is rehabilitating road 30 Kanha along the canal' because it is the main road for transporting the rice to the market (Fig. 11.6).

Villagers asked also for support on best practices in cropping and animal raising, as well as the construction of canals to irrigate the rice fields for dry season rice farming. The common needs/difficulties of the groups included water, work (employment), rice, dealing with the impact of climate change (especially the drought), and school.

### 6.2.4 Technical Support from the Government

Most of the poor households have low education and no skills and they need help financially, and the poorest need the most and continuous support. Some villagers who can fix broken wells or gardens need access to funds to buy spare parts. Even though there was a village committee established to take care of and fix problems with the new infrastructure, the maintenance is still limited.

According to FGD with Children in Bopeung Village:

> 'Well: it's far from home, and some villagers use it, but they are not willing to do the maintenance. The difficulties with the project included the broken well, there is no spare parts and no one can fix it', said the commune chief in Sangkor Commune. Maintaining the well, latrines, water collectors, and home gardens are the main challenges and those maintaining activities need cooperation from both the beneficiaries, other public users, and local authorities.
>
> For home gardens: the high material costs of installing the home gardens are a challenge for the community. However, the MRD staff suggested that the villagers can use their local resources such as poles rather than the expensive equipment and materials.

**Fig. 11.6** Muddy roads along the 30 Kahna Canal after the rains on the way to Kampong Svay District

## 7 Conclusion and Recommendations

The recent Rectangular Strategy phase IV of the Royal Government of Cambodia (RGC) has as one of its target 'Inclusive and Sustainable Development'(Rectangle 4). This includes: (1) Promotion of agricultural and rural development. (2) Strengthening sustainable management of natural and cultural resources. (3) Strengthening management of urbanization. (4) Ensuring environment sustainability and readiness for climate change (RGC 2018). Water, electricity, road, and human resources are the main priorities for the national development goals from 2018 toward 2030 and beyond. Therefore, the commune councilors at the sub-national level (commune) usually plan and prioritize all the budget allocation for these four areas.

The RGC's commitment to dealing with climate change is demonstrated through a number of adopted strategies and policies, such as the National Strategic Plan on Green Growth 2013–2030, Cambodia Climate Change Strategic Plan 2014–2023, National Environment Strategy and Action Plan 2016–2023, and the National REDD+ Strategy. These are aiming at using social and environmental funds effectively to ensure economic development with low-carbon emission and resilience to climate change (RGC 2018). MRD's rural development policy 2019–2023 has emphasized the importance of climate change: 'Climate change poses a threat to existing and future rural infrastructures, including high costs for adaptation, maintenance, and potential negative impacts. The major response to climate change for physical infrastructure typically involves some kind of "climate-proofing" or re-engineering to deal with the more extreme weather conditions. This has both "hard and soft elements" involving engineering, non-engineering, and planning responses' (MRD 2019).

MRD's pilot program to tackle climate change especially in drought and sanitation in Kampong Svay District, Kampong Thom Province, contributes to the water shortage issues. The project beneficiaries voiced their supports and requested scaling up of provision of wells, latrines, home gardens, and rainwater collectors. The pilot project did help in improving water access and sanitation but its impact was limited in terms of food supply and income generation. The program has also met a number of technical implementation challenges. For instance, some dug wells in Moha village, Chey commune, Kampong Svay district had water with foul smells that made the locals hesitant to use it. There was also a lack of maintenance support. One of the wells was broken as the soil fell and closed the water hole. The beneficiary asked help from the authority to restore the well but there was no intervention. The locals shared that they do not always have the resources needed to fix the wells by themselves.

Overall, there are four factors hindering the poor and other vulnerable beneficiaries from getting benefits from the intervention program: lack of family labor for the elder, extreme heat, different priorities such as waning commitment from poor households, and lack of financial and technical support. These findings suggest that there are some remaining issues that need to be improved for future interventions to support the poor and other vulnerable groups coping with climate change. Strengthening climate-resilient infrastructure by increasing water and road accessibility are two key elements. Some specific recommendations follow:

- The present condition of the rural roads in Kampong Svay district are poor during the rainy season with slippery conditions and vehicles getting stuck in the mud. Heavy trucks and tractors have damaged the dirt roads. Restoring the muddy roads along the 30 Kahna canal in Kampong Svay District is the key to improve the well-being of the community as it is the main road for transporting rice and other products to the market. Rehabilitating more roads in remote areas to ease the travel arrangements would also help.
- The lack of water during the dry season has been raised by many villagers (Table 11.2): "The villagers and my family face the same problem; we don't have enough water for our daily consumption or to use for gardening dur-

ing the dry season each year" (KII, female respondent). A number of actions could help addressing this challenge, including:

- Increase water sources for the villagers such as digging more commune ponds for storing water in the dry season and provide more water storage tanks to more households.
- Study the quality of the groundwater sources carefully before digging the wells, and seek support from technical staff to help solve related problems such as smell in the water.
- Set up teams to monitor the quality of the water regularly (every 3–6 months), and offer continuing support with fixing/maintaining the wells.
- Finally, improve access to water for disabled people (e.g. in the design of the latrines).

- Water shortage in the dry season is also a problem for rice cultivation. There was a serious water shortage during the dry season. So, farmers had to buy water for their rice field (1 ha cost 80$ in 2019, and 90$ in 2020), while the price of other agricultural inputs (fertilizer, labor, pesticide) was also increasing, in a context where agricultural markets have not been stable. Needed actions in this regard include more commune ponds to store water in the dry seasons, and planting more trees to increase forests and groundwater storage. Forming an agricultural association to help each other in the communities, and collectively get technical and financial support from the private sector, government, and NGOs in terms of agricultural inputs and markets, would also help addressing these challenges.
- Home gardens were abandoned because the beneficiaries (mostly poor households or elders) had to perform other work to generate income, as the home garden alone did not provide enough income for poor households. Also, the villagers could not afford to repair the garden by themselves: "Home garden tools are hard to replace when they are broken, like a drip system. Plus, they are expensive," (KII in Moha village). Actions to increase the positive impact of the home gardens include:
  - Better targeting of the beneficiaries (e.g. target vegetable growers) and better analysis of how households primary jobs may impact on their capacity to maintain home gardens.
  - Increase awareness among the beneficiaries on the project's ownership, and provide relevant agricultural training to the beneficiaries at an early stage. Follow-up programs should assess and focus on gaps in the existing training/knowledge amongst beneficiaries, as well as on how synergies between the jobs of the beneficiaries and the projects' outputs can be maximised.
  - Provide a variety of seeds and more agricultural inputs to increase production and income.
  - Ensure frequent monitoring and continuous support from the ministry (e.g. new tools, fix broken garden parts).
  - Assist the beneficiaries with finding markets that buy crops from home gardens at a good price. The respective plan as stated in MRD Policy 5: 'Diversify Rural Economy and SMEs' should be accelerated and given priority.
  - Establishing agricultural associations, e.g. chicken raising group, cow raising group, vegetable growing group to help one another in terms of sharing experiences and having bargaining power.
- The integration of climate change issues into the commune council annual planning activities with budget allocation should be expanded. The climate is getting drier, and there was less rain with greater intensity and lightning strikes in 2019 and 2020. This affects disproportionally women-headed and poor households that should be supported. It is also important to increase awareness on the impact of climate change on rice production and livelihood among local leaders and policymakers. There is also a need for specific infrastructure

such as lightning prevention equipment to prevent more death of animals and humans.

- Finally, there is a need to build capacity so as the beneficiaries of these programs to be able to maintain wells, home gardens, and latrines independently, not solely relied on MRD's technical support.

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# Why Recent Crises and SDG Implementation Demand a New Eco-Social Contract

12

Isabell Kempf and Katja Hujo

**Abstract**

The twentieth century social contract—an implicit bargain between economic imperatives of growth and productivity, and the social imperatives of redistribution and social protection—has broken down and cannot sustain the transformative vision of the 2030 Agenda. The breakdown of the social contract has manifested itself in multiple global crises and the deep divisions in our societies. Analyses of the current COVID-19 crisis have documented that inequalities in many dimensions have grown, and people are feeling left-out and left-behind. The failure of the economic model to account for the natural boundaries of our planet has led to environmental destruction and human precarity because of climate change, extreme weather events and health pandemics such as COVID-19. In this chapter we will show why responding to the crisis and getting SDG implementation back on track demand a new eco-social contract; what the claims are of different actors, and how we can build an inclusive and sustainable eco-social contract through inclusion of marginalised views and progressive alliances with previously excluded groups.

**Keywords**

Eco-social contract · 2030 agenda · Inequality · Global crises · SDGs · Climate change

## 1 Introduction: Threats to our Global Compact—How Multiple Crises Undermine the 2030 Agenda for Sustainable Development, and why we Need a New Eco-Social Contract

In 2015, national governments agreed on an ambitious agenda to "transform our world", with an unprecedented broad and transformative development vision enshrined in the 2030 Agenda for Sustainable Development. The Agenda is a response to a challenging global context—one marked by disparate progress in reducing poverty; high and rising levels of wealth and income inequality; the persistence of other multidimensional inequalities, including gendered forms;

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climate change and environmental destruction; insecurity and conflict; migration; precarious work; as well as accelerating demographic and technological change (UNRISD 2016a). Five years into the Agenda, the obstacles for achieving its transformative vision are bleaker than ever. The world is struggling with a global health pandemic which has thrown the global system into its worst crisis in almost one century, undermining past progress and threatening to affect economies and societies for years to come. Even before the crisis, many Sustainable Development Goals (SDGs) were not on track and inequalities were increasing (UN 2020; Hujo and Carter 2019).

Against this backdrop of urgent challenges and crises, many voices are demanding a new twenty-first century social contract which encompasses a shared vision and stipulates rights and obligations, as well as accountability mechanisms. This new social contract needs to be fully inclusive while also promoting climate justice and halting environmental destruction, what UNRISD calls an eco-social contract (UNRISD 2016a, 2021).

This chapter sets out to analyse how multiple crises and an unsustainable global economic model have undermined progress towards the SDGs, and what needs to be done to put this global compact for sustainable development back on track. It discusses the concept of a new eco-social contract as a potential pathway to create the necessary alliances for transformative change, and to commit various stakeholders—from the local to global levels—to urgent joint action. The key message is that successful implementation of the SDGs requires a raft of changes to policies and institutions so that they are democratic, inclusive and promote gender and environmental justice, coupled with alternative economies and transformative social policies.

The chapter is divided into five sections: the second section analyses how recent crises, and in particular COVID-19, have impacted poverty, inequality and the environment. The third section discusses the demands of various actors for a new social contract, comparing differences and similarities. Section 4 approaches the social contract debate from a conceptual and historical perspective, and takes stock of the variety of real-world social contracts in the global North and South, analysing the factors that led to the unravelling of these contracts during the period of neoliberal reforms and hyper-globalisation. Section 5 presents positive examples of policies and institutions which reflect the idea of a renewed eco-social contract and could serve as a benchmark for future strategies. Here we outline seven key contours of a new eco-social contract, and present some initial ideas on the process of creating such a contract.[1]

## 2 Stalled Progress: The Impact of Recent Crises on Poverty, Inequality and Climate Change

There are a number of reasons why multiple crises and SDG implementation demand a new eco-social contract. The first one is that recent crises—and in particular the ongoing global health pandemic of COVID-19 which is still wreaking devastating socioeconomic impacts across countries—threaten to reverse previous progress on poverty, equality and SDG implementation. According to the World Bank (2020), for the first time since the 1990s, absolute poverty rates are on the rise. Projected poverty rates in 2020 are similar to those in 2017; hence, the impacts of COVID-19 are expected to set back progress towards ending extreme poverty by at least three years. World Bank estimates suggest that South Asia will be the region hardest hit, with at least 49 million additional people, followed by sub-Saharan Africa (SSA) with between 26 million and 40 million more people in extreme poverty. In a similar manner, SDG 2 is under threat. The number of persons suffering from hunger and food insecurity is on the rise, and this began even before the outbreak of the pandemic. Almost 690 million people were undernourished in 2019, up by nearly 60 million from 2014. About 2 billion people were affected by moderate

[1]The authors are grateful for excellent background research and support provided by Paramita Dutta.

or severe food insecurity in 2019, and the estimated figure for chronic hunger in 2020 rose by more than 130 million people as a result of COVID-19 (FAO et al. 2020).

Inequality continues to increase within and among countries as a result of recent crises, undermining achievement of SDG 10. Young workers are twice as likely to live in extreme poverty than adult workers. Rural areas are home to 85% of people without access to electricity, according to UN DESA (2020). In *The Inequality Virus*, Berkhout et al. (2021) document how the COVID crisis brings different forms of inequality to the surface, including income and gender inequality as well as discrimination based on race. According to Oxfam "it took just nine months for the top 1000 billionaires' fortunes to return to their pre-pandemic highs in 2020 but for the world's poorest people recovery could take 14 times longer, more than a decade"(Berkhout et al. 2021, p. 8). Women—and, in the United States of America (USA), especially women of colour—are more likely to lose their jobs during the COVID-19 crisis, stalling or even abandoning their careers and financial security. Ethnic minorities have also been disproportionately affected. In the United Kingdom, 22% of people from Black, Asian, and minority ethnic backgrounds (BAME) lost their jobs, well above the average of 9% (McKinsey Global Institute 2020a). Employment impacts of the current pandemic are also more pronounced than they were during the financial crisis of 2008–9. According to the ILO (2021), 114 million jobs were lost in 2020, which, in combination with working-hour reductions within employment, resulted in working-hour losses approximately four times higher than in 2008–9.

The failure of our global socioeconomic model to produce sustainable development, which some see even as an inherent tendency (Fraser 2021), has resulted in an urgent climate crisis, which the 2030 Agenda and the Paris Agreement aim to tackle. Economic incentives at all levels—global, country, firm and individual—have become more focused on extracting maximum value from economic processes rather than investing in strengthening systems for the future. According to the Emission Gap Report (UNEP 2020) the world is still heading for a steep temperature rise in excess of 3 °C this century—far beyond the Paris Agreement goals of limiting global warming to well below 2 °C and pursuing 1.5 °C. This has led to calls for a green recovery from the COVID-19 pandemic, which could help put the world on track towards 2 °C, and growing commitments to net-zero emissions by 2050. The pace of climate change also seems to be accelerating. The year 2019 was the second warmest on record and the end of the warmest decade on record, bringing with it destructive wildfires, hurricanes, droughts, and other climate-related disasters. These, in turn, have an impact on poverty and hunger (UN DESA 2020).

Consumption and production patterns that are not sustainable result in depletion of natural resources, pollution and environmental deterioration (UN DESA 2020). Deforestation and biodiversity threats caused by unsustainable supply chain production increase the likelihood of future epidemics (SDSN and IEEP 2020). According to the Dasgupta Review (Dasgupta 2021: p. 114 and 123), we have failed to manage our global portfolio of assets sustainably. Estimates show that between 1992 and 2014, produced capital per person doubled, and human capital per person increased by about 13% globally; but the stock of natural capital per person declined by nearly 40%. While humanity has prospered, it has come at a devastating cost to Nature. The report stipulates that estimates of our total impact on Nature suggest that we would require 1.6 Earths to maintain the world's current living standards.

## 3 Claims for a New Social Contract: Actors and Contestations

Considering the linked social and ecological crises faced worldwide, a number of organisations and movements are calling for the creation of a new social contract between people, between citizens and governments, and between people and nature. The United Nations Research Institute for Social Development (UNRISD) introduced

the concept of a new eco-social contract in 2016 (UNRISD 2016a) and is currently catalysing debates and activities related to it (UNRISD 2021). Disparate, but connected voices such as the Black Lives Matter and the Extinction Rebellion movements, the UN Secretary General, the International Trade Union Congress (ITUC 2020) and the World Economic Forum (WEF) are each in their own way championing a new ecological and social contract. Below we review the claims raised by some of these voices.

On Mandela day, 18 July 2020, the UN Secretary General stated that "the response to the pandemic, and to the widespread discontent that preceded it, must be based on a New Social Contract and a New Global Deal that create equal opportunities for all and respect the rights and freedoms of all" (United Nations News 2020b). He called on governments to implement affirmative action programs and policies to resolve historic inequalities in gender, race or ethnicity, and to break the vicious cycle of corruption. He further said that a new social contract, between governments, people, civil society, business and more, must integrate employment, sustainable development and social protection, based on equal rights and opportunities for all. The UN Secretary General's proposal includes social safety nets, universal health coverage and the possibility of a universal basic income. To combat climate change, he urges a greening of the economy to both protect the planet and create new jobs. He also calls for a renewed networked multilateralism including governments, trade unions, social movements, business and civil society.

Trade unions are also calling for a new social contract, as reflected in the International Trade Union Congress (ITUC) demands during the World Economic Forum on 26 January 2021: "The choices made by world leaders and by business in 2021 will either heed the call of workers and civil society to reform the economic model and help create a just and sustainable future, or maintain business as usual and see a model of corporate greed entrench inequality, exclusion and despair perpetuating instability for our communities and our planet" (ITUC 2021). They suggest five steps towards a new social contract (1) creation of climate-friendly jobs with a just transition to achieve net-zero carbon emissions; (2) rights for all workers, regardless of their employment arrangements; (3) universal social protection, with the establishment of a Social Protection Fund for the least wealthy countries; (4) equality and ending all discrimination such as by race or gender; and (5) inclusion, to combat the growing power of monopolies and oligarchs, ensure that developing countries can actually develop their economies, and build tax systems that provide the income governments need to meet the needs of people and the planet (ITUC 2021).

Business itself is preparing for its role in a new social contract. The McKinsey Global Institute proposes a systemic role for the private sector in targeting vulnerable groups through the provision of affordable goods and services such as housing and child care, which they describe as "more cost-effective for the social contract than aiming to stabilise incomes" ( 2020b: p. 12). This would also include digital identification, payment channels and data for better targeting benefits to the neediest. Businesses have expressed a number of demands regarding their role in a twenty-first century social contract, summarised by BSR (2020) as stakeholder capitalism; skills development and career pathways; economic security and mobility; a just transition to net zero emissions; and worker data protection.

Social movements such as Fridays For Future (2021), Black Lives Matter (2021) and Extinction Rebellion (2021) demand urgent climate and environmental action, intergenerational justice, and gender and racial equality, as well as direct participation in decision making, for example through citizen assemblies. They are calling for a new eco-social contract that is inclusive and participatory and brings in all actors under legally binding commitments in favor of social justice and the environment. The Treaty Alliance (2021), a network of advocacy groups, wants to hold business accountable through laws on supply chains and calls for a binding treaty on business and human rights which would make social and environmental standards legally enforceable.

Figure 12.1 shows similarities and differences between the different claims and proposals put forward: the circle in the middle shows those demands that are similar, while the outside boxes list those that are more specific to the different actors.

When comparing the demands of trade unions to those of business (ITUC 2021; McKinsey Global Institute 2020b; BSR 2020), the concepts of non-discrimination and the need to address climate change are common concerns, but business puts emphasis on targeted social policies and safety nets, while trade unions argue in favor of universal social protection for all and in all countries. Both workers and business are asking for just transitions to achieve net-zero emissions without compromising social justice. While business actors submit that this will be achieved through creation of high-quality jobs in the green sector and new skills development, trade unions demand concrete policies for job creation, education and health in this transition. The UN and social movements are both asking for urgent climate action, promotion of equality and social justice, while also demanding an end to racial and other group-based discrimination. While the UN sees this happening through networked multilateralism, many movements question the capacity of nation states and governments, and want more direct citizen participation in decision making and enabling (policy) environments for alternative economic models.

What emerges from the different stakeholder views on a new social contract is a broad consensus on the urgency to act, along with significant differences of perspective regarding the substance and scope of necessary reforms, as well as the distribution of costs and benefits associated with change processes. Now as in the past, the social contract idea is a contested one. Moreover, it is not necessarily a progressive one (Hickey 2011). A social contract will reflect ideational

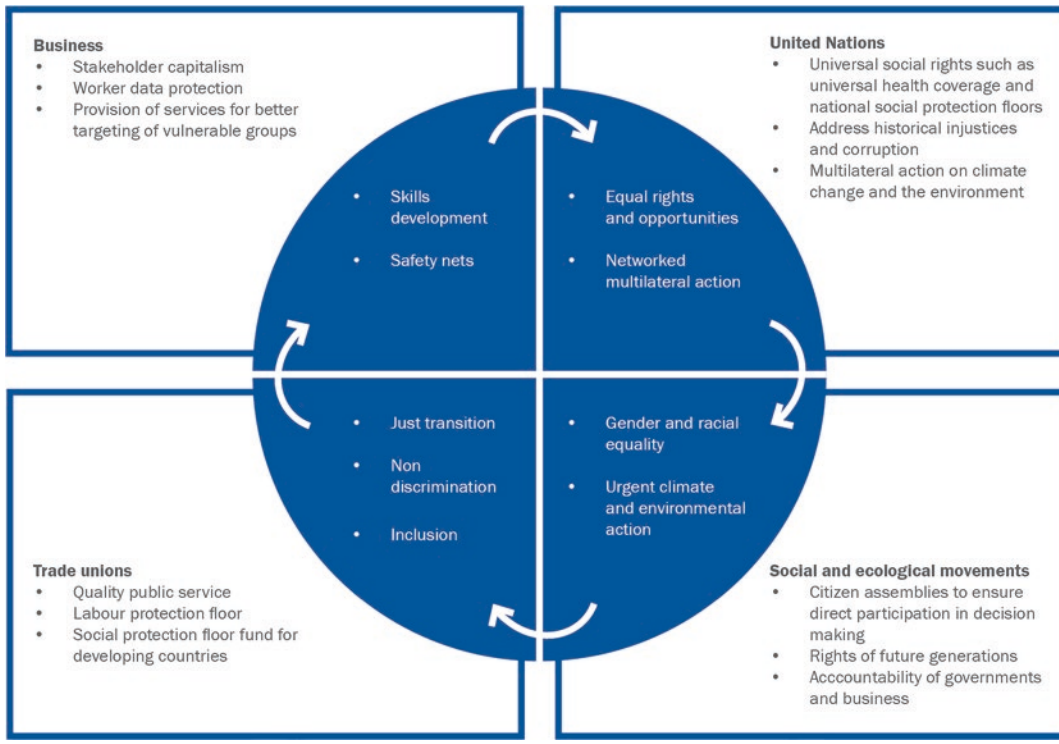


**Fig. 12.1** Claims and proposals by stakeholders. Source: Author elaboration

struggles and the outcomes of bargaining processes between actors with unequal power resources and influence. And while the idea of a social contract is associated with the notion of consent, it can be necessary to opt for contestation instead of agreement, a pathway chosen by several of the social movements discussed in this section. In this sense, it is important to distinguish between the process of negotiating a social contract vis-à-vis its outcomes, as well as between ideal types of social contracts and real-world examples, ideas which we elaborate in more detail in the next section.

## 4 Looking Back to Build Forward Better: Recognising the Diversity of Social Contracts, Challenges and Lessons Learned

When different actors demand a new social contract, as discussed in the previous section, what are they referring to? A social contract is usually understood as a mutually beneficial agreement between free individuals, which ensures legitimacy for rulers and protection against oppression of the ruled (which could be interpreted as an equivalent to the modern notion of rule of law), and reflects a concern for the common good and a just society. In the pragmatic words of the World Bank (2019, p. 124), it is "a policy package that aims to contribute to a fairer society".

Concerns for social justice and equality were key features in twentieth century social contracts, which were commonly understood as more equalised relations between capital and labour. This was achieved through substantial expansion of social policies in industrialised welfare states during the so-called golden age of capitalism. Bargaining processes between employers, workers and governments set out to combine productivity-led growth with enhanced well-being of workers and their families. The expansion of social security coverage and access to public services led to greater equality, opportunities and trust of citizens in their governments (Kidd et al. 2020), with positive impacts on tax compliance and state revenues (Moore 2008; Hujo and Bangura 2020). Increasing decommodification of labour led to a substitution or supplementation of money wages with social wages, social security and other benefits, which made workers less dependent on the vagaries of markets while protecting them in times of social contingencies such as maternity, sickness, disability or old age (Polanyi 1944; Esping-Andersen 1990). Post-war social contracts at the national level were underpinned by a global normative framework and a commitment to international cooperation, as a growing number of states agreed to respect human rights, abide to the UN Charter and foster cooperation for development and peace.

Beyond the social contracts associated with Western welfare capitalism, which are still frequently seen as the benchmark for democratic state-society relations, different types of social contracts can be identified across the non-Western world. Several of them are associated with communitarian or philosophical thinking related to religious or indigenous communities (Mårtensson 2014). For example, ancient Islamic philosophy emerging in medieval Maghreb developed the idea of a social contract as a just state and membership of a community of believers, although reality related to the first, implying good governance and fair taxation, typically fell behind ideals (Bennison 2014).

In sub-Saharan Africa, communitarian approaches dedicated to the common good for all, such as *Ubuntu*—"I am because we are"—illustrate how political philosophy in the global South differs from understandings of social contracts associated with Western philosophers such as Rousseau, Locke or Hobbes (Chemhuru 2017). Communitarian philosophy implies that individuals define themselves through their relationship with the community. Humans are embedded in social relationships and interdependencies, with common interests, goals and values. Association and participation become key features of social life (ibid). This approach is also reflected in the concept of *Buen Vivir*, the Living Well paradigm, which is recognised as the normative foundation for national development strategies in the consti-

tutions of Bolivia and Ecuador. *Buen Vivir* is a holistic and culturally inspired vision which promotes harmonious relationships between humans and nature, and a balance between material needs and immaterial needs such as recognition and affection (Paz Arauco 2020).

Next to such communitarian visions which have shaped social contracts in the global South, different types of social contracts between rulers and the ruled were forged in the colonial and post-colonial periods in Africa (Nugent 2010), though arguably not all of them lived up to communitarian values such as Ubuntu. Social contracts established by newly independent governments were concerned with nation-building and state legitimacy. These social contracts took different shapes, with the more developmental ones deriving their legitimacy through state-led economic development and public provision of basic services such as health and education (Nugent 2010). They also included negotiations over tax payments, with the type of tax-welfare regime influenced by colonial heritage (Mkandawire 2009, Mkandawire 2020): for example, former labour reserve economies in Southern Africa displayed higher taxation and higher social expenditures, compared to cash crop economies such as Ghana or Uganda. In the latter countries, peasants maintained their land, revenues were mainly derived from trade taxes and public social protection was limited, with predominantly informal and community-based systems.

Different manifestations of social pacts can be found in countries with important agricultural sectors. In agrarian-led development models, social contracts face the challenges of unequal land distribution and exposure of smallholders or landless workers to various types of risks. Agrarian social pacts linked producer organisations, politicians and bureaucrats for policy formulation and coordination, or incorporated farmers into rural-based political parties. These pacts were sometimes associated with a specific design of social policy, universal and tax-financed benefits, which are better adapted to the realities of rural workers and producers who tend not to be covered by contributory social insurance which is typical for urban wage workers in manufacturing or services (the latter shaping social contracts in continental welfare states such as Germany). They also included a range of other measures such as producer subsidies, price controls or rural development policies. Examples of these agrarian social pacts can be found in the Nordic countries, but also in India, Poland or Senegal (Sheingate 2008; Palme and Kangas 2005). As is the case with other types of social contracts, agrarian pacts did not necessarily lead to egalitarian outcomes: large commercial farmers would usually dominate negotiations. As a result, support policies often benefitted larger farmers and capital-intensive producers to the detriment of smallholders and subsistence farmers (Sheingate 2008).

A social contract of sorts also evolved in some resource-rich countries with mineral rents owned and distributed by the state. Often associated with a political regime type labelled resource nationalism, this contract reflects a close relationship between natural resources, economic development and national identity (Koch and Perreault 2019).[2] While some progressive natural resource-based contracts could be forged (see Sect. 5), resource bargains in mineral-rich countries are frequently characterised by elite capture and distributional conflicts (Hujo 2012, 2020). Lopsided elite bargains, rent-seeking, corruption and illicit state capture of mineral rents upended the developmental post-independence social contract in Zimbabwe, for example (Saunders 2020). Mounting discontent with political leadership and elite settlements, as well as stifled political voice and economic and social opportunities, in particular for young persons, were the focus of civil society contestation during the Arab Spring (Bayat 2017). Arguably, oil-rich countries, except for Libya, were less affected by the upheavals compared to countries such as Egypt or Tunisia (Ross 2011), but radical regime shifts in mineral-

[2]The authors define resource nationalism as "… a geopolitical discourse about sovereignty, the state, and territory, as well as the rights and privileges of citizenship, national identity, and the values a group assigns to resources like oil, gas and minerals" (Koch and Perreault 2019: 2).

rich Latin American countries such as Bolivia, Ecuador or Venezuela show that oil-backed leadership is not set in stone.

Looking at the variety of social contracts across countries of the global North and South, the question arises of which factors led to their crisis or demise. First, far from living up to their ideals, real-world social contracts were shaped by power asymmetries, entrenched inequalities and financial constraints. They created insiders and outsiders, for example between formal and informal workers, often due to the greater bargaining power of organised workers, with less powerful unions and non-organised workers excluded (Mesa-Lago 1978). These social contracts also reinforced gender inequalities—between men as main income earners and women as dependents. They usually did not include groups such as migrants, refugees, or persons unable to participate in formal paid work, on equal terms, creating stratified and fragmented systems (Standing 2009).

Second, while determinants are context-specific and related to historical legacies and shifting political and economic constellations, a common factor undermining social contracts was the ideological turn in the global political economy that started in the late 1970s. The twentieth century social contracts began unravelling during the period of neoliberal policies and accelerated globalisation. They were increasingly replaced by new types of contracts that emphasised individuals' responsibilities for their own well-being and social protection, sidelining communal values, redistribution and public provision. While state retrenchment was less pronounced in the global North, the new ideology slowly permeated established welfare states through commercialisation of social policy, promotion of social investment states, employment activation policies and cuts in public social benefits (Cantillon and Van Lancker 2013; UNRISD 2016a). Social contracts in the global South were even more quickly hollowed out as a result of debt crises and austerity (Nugent 2010). Post-colonial African social contracts, in particular the developmental-productive types, were especially hard hit, failing on their developmental promise, which effectively resulted in choiceless democracies (Mkandawire 2006; Nugent 2010). State-citizen relations and political legitimacy worsened as a result of shrinking fiscal resources, deteriorating public services and the social costs of structural adjustment. Donor bargains bypassed citizens and shifted government accountability related to development outcomes from national electorates to external actors, while policy space shrunk as a consequence of loan conditionality (Hujo and Bangura 2020; Nugent 2010).

Since then, few social contracts have survived the assault on state-led social development models across the world, with the global climate crisis, multiple economic and financial crises, and the global health pandemic COVID-19, exacerbating the challenges the SDGs set out to address.

The discussion of social contracts so far has been silent on contracts between people and nature, an issue that extends beyond national borders and present generations (O'Brien et al. 2009). One could argue that the SDGs (and the Paris agreement) as a follow-up to the Rio Declaration and other milestones in global environmental governance are an agenda to fix our broken contract with nature, committing key stakeholders such as governments and business actors to protect natural resources and biodiversity, and to address climate change and pollution. This is all the more important as increasing impediments to access natural resources such as land, clean air and water, fishing grounds or forests due to land grabs, commercialisation or degradation, has alienated large parts of the global population from existing social contracts, undermining citizens' trust in the contract and delegitimising governments (Willis 2020; O'Brien et al. 2009). It also impeded traditional custodians of the commons such as indigenous peoples to sustain their livelihoods and protect the natural environment. A paradigm shift is warranted: The rights of nature concept challenges twentieth century social contracts as based on the idea of nature as "resource", to be owned, used (and even degraded). Instead, the idea of planetary boundaries and doughnut economics (Raworth 2017) show how societies, economies and nature are

interconnected and necessary for sustainable development and the survival of humankind.

In addition to the shifts in the global political economy discussed above, two other global trends have a bearing on the viability of existing social contracts: demographic change and technological progress (UNDP and UNRISD 2017). Digitalisation, automation and artificial intelligence have created new global divides that exclude a large proportion of unskilled and informal workers from social progress and threaten to push countries and their populations in the global South further behind. While these processes bear both opportunities and risks, what is important here is how digitalisation and its impact on the world of work has led to calls for a new social contract that is "fit for purpose", suggesting "a gradual shift towards the individual, portable and transferable build-up of social accounts" (Adecco Group 2017: p.2; Meagher forthcoming). With a focus on individualised and portable social protection systems and calls on the state to assume greater responsibility for basic income protection, more equal capital-labour relations and the promise of dignified jobs are less and less part of the equation in these proposals (Meagher forthcoming; Behrendt et al. 2019).

Finally, demographic change such as ageing and migration creates challenges for labour markets, the financing of social insurance programmes, and social inclusion (ISSA 2019; UNDP and UNRISD 2017; Hujo 2019): Decoupling the fate of younger workers from the rising costs associated with ageing through privatisation of pension programmes, a fashionable approach of the 1990s, is now largely considered unsuccessful, as it has resulted in further exclusions and rising old-age poverty (Hujo 2014). And while the generational contract could not be saved through privatisation, requiring constant adjustments of contribution rates and pension ages, young workers are also increasingly affected by tight labour markets, precarious employment and increasing demands regarding experience and skills levels, as discussed in Sect. 2. Last but not least, migrants and refugees are still struggling to find their way into social contracts that were negotiated between national constituencies without paying sufficient attention to the transnational dynamics and mobility which are key features of our globalised system (Hujo 2019).

Identifying lessons learned from these varied experiences and contemporary challenges, it becomes clear that the social contract is not a Western concept. Indeed, it can and has been used in various contexts in the global South and can represent powerful communitarian values. Everywhere, social contracts are shaped by historical and contextual factors and change over time, in response to changing political settlements or socioeconomic conditions, as the discussion of the impact of neoliberal globalisation, demographic and technological change and multiple economic, environmental and health crises has shown. Finally, social contracts are more or less binding and explicit, often exclusionary, and they run the risk of representing dominant powers in society rather than the common good.

## 5 The Way Forward: Pathways towards a New Eco-Social Contract to Achieve Sustainable Development for People and Planet

The UN Secretary General's warning that "In an interconnected world, none of us is safe until all of us are safe" (United Nations News 2020a), echoes the idea that individual well-being is closely linked to that of the community, as laid out in Sect. 4. Indeed, the philosophy of Ubuntu echoes the same conviction. A new eco-social contract will need to be based on solidarity and the common good, replacing an attitude of "us against them" with an "all of us united" stance—whether against COVID-19, climate change, or any of the other challenges enumerated throughout this chapter. Most recently development thinking is picking up this idea of the common good as a central objective for development cooperation, as the example of Germany shows (German Development Institute 2021). Figure 12.1 in Sect. 2 shows where claims of very different groups of actors coincide. They coalesce

around issues such as environmental protection and just transition, a changing world of work that combines higher productivity and skills with social protection, good governance and human rights as well as greater equality. Differences and trade-offs exist, and must be negotiated openly in a fair and transparent way. Some movements (and authors such as Willis 2020) suggest that a new eco-social contract should be informed by citizens through citizen assemblies bringing new perspectives and expertise to combat climate change and serving as a counterbalance to vested interests. Grassroots participation and the inclusion of previously excluded voices are especially necessary when it comes to the process of how to get to a new eco-social contract. Southern voices and indigenous peoples' traditional knowledge have been neglected in this debate, yet much can be learned from them, in particular regarding the sustainable management of natural resources.

Bringing the green and the social agendas together through integrated rights-based policies would represent real progress towards a new eco-social contract. The SDG framework forges interlinkages between the three pillars of sustainability. This has helped to overcome the idea of developing first, and cleaning up later. We must design and implement policies in an integrated and coherent manner. Poverty eradication, for example, needs to be pursued hand in hand with environmental protection, with 70% of the GDP of the poor depending on the environment and natural resources (UNDP-UNEP 2015). Social policies need to be designed in tandem with economic and resource mobilisation policies to promote sustainable and transformative outcomes (Hujo 2020; UNRISD 2016a). In the COVID-19 crisis, economic, health and crisis management need to be integrated for measures to be successful. In some Middle Eastern countries, for example, existing social infrastructure was scaled up for emergency income support during the pandemic, but their social protection systems "have several shortcomings when it comes to shock-responsiveness, including limited coordination between social protection, disaster management and humanitarian actors, a lack of contingency funds and limited national social registries" according to research undertaken just prior to the crisis (Tebaldi 2019). While progress or regress in one goal has direct consequence on other goals, priority is given most of the time to the economy leading to too little climate or environmental action, too late. Willis (2020), for example, describes the current climate politics in the United Kingdom as a silent stand-off, with neither citizens nor state representatives willing to make the first move, instead of seeing climate action as a social contract between citizens and political actors necessary to improve lives, livelihoods and nature. Her argument is that citizens are waiting for political will and signals to tackle the urgent crisis before making changes to their lifestyles, while politicians wait for voters to claim climate action through votes for green agendas.

Further, demographic shifts due to climate change–induced migration, the need to care for the elderly, and changes in labour markets driven by new technologies make a review of current social contracts urgent. As we have seen in previous sections, not only are there different kinds of social contracts. Ideas also differ on how to establish a contract with nature, what a new eco-social contract should look like and how it should be implemented. Coming to terms with the multitude of perspectives and context-specificities will require decentralised participatory dialogues and decision making ultimately in favor of climate action, social justice and the common good. Here the concept of consensus found in many African traditional societies and indigenous peoples' cultures across the globe is important. According to Gyekye (1997), consensus means that the community arrives at a decision by taking into the account the opinions and concerns of all, who in turn agree to abide by the decision that is best for the common good. Yet, any consensus must also respect the human rights of individuals. The COVID-19 crisis has shown that it is possible to put in place laws and policies to protect the common good (for example, the health of the population) and also finance social and economic sectors that were hit by lockdown restrictions (travel, cultural events, restaurants, etc.). However, state capacity to do so has differed greatly between the

global North and the global South, as exemplified in the fiscal stimulus gap affecting much of the global South, while multilateral financial support is still insufficient (ILO 2020). For a new eco-social contract to be sustainable, both the question of the commons (for example keeping global warming under 2 °C) and the way of financing them needs to have a broad consensus in society and globally. Arriving at such a consensus might not be a smooth process as we stated before—contestation and bargaining, protests and collective action, broad alliances between more and less powerful groups, are necessary to challenge and overcome the status quo.

Based on the above analysis of previous contracts and their flaws, and seeking to ensure that relevant research is used in support of SDG implementation and the sustainability transition, UNRISD is now undertaking further elaboration of the idea of an eco-social contract introduced in 2016. The vision differs fundamentally from the twentieth century social contracts, some of which we reviewed above. A new eco-social contract is one that will be grounded in accountable state-society relations and contribute to sustainable development for people and the planet by reinvigorating the following principles (UNRISD 2021):

**Human rights for all:** A new eco-social contract must surpass the twentieth century welfare state settlements by ensuring human rights for all, including those excluded from previous social contracts or relegated to a secondary role, such as women; informal workers; ethnic, racial and religious minorities; migrants; and LGBTQIA+ persons. This requires a human rights-based approach that goes beyond formal-employment-dependent social benefits. Universal human rights and inclusion resonate with the SDGs in various ways. Consistent with its promise to address inequalities, the 2030 Agenda commits "to leave no one behind", to ensure "targets [are] met for all nations and peoples and for all segments of society" and "to reach the furthest behind first" (UNGA 2015, p. 3). In the previous section we discussed reasons for the breakdown and exclusion of certain groups from different social contracts. However, there are also examples where social contracts have been extended to previously excluded groups, from religious minorities gaining access to social services (Mir et al. 2020), to domestic workers getting access to social protection and labour rights (Rojas-Scheffer forthcoming), to new rights granted to sexual and gender minorities such as LGBTQIA+ groups (Kaplani and Carter 2020). Progress has also been achieved in extending labour rights and social protection to informal workers, and small and medium-sized enterprises (SMEs), although coverage rates continue to be low for these groups, exposing them to extreme hardships during systemic crisis such as the COVID-19 pandemic (ILO 2020).

**A progressive fiscal contract:** A new eco-social contract must go hand in hand with a new fiscal contract that raises sufficient resources for climate action and SDG implementation, and fairly distributes the financing burden. According to the OECD (2020), the pandemic pushed developing countries into a shortfall of USD 1.7 trillion for 2020 in addition to an existing gap of USD 2.5 trillion in annual financing to achieve the 17 SDGs by 2030. Directing just 1.1% of the total global financial assets (valued at USD 379 trillion) would be sufficient to fill the gap in financing the SDGs (OECD 2020). Indeed, it is not merely reallocation of resources but the more intractable allocation of political will that are necessary here, in the form of a new multilateral agreement on financing the SDGs, debt relief and innovative financing solutions at national levels. Here again we see the interconnections across goals, however, with domestic financing schemes with progressive distributional impacts supporting social integration by creating a social contract within society (between economic sectors, between rich and poor and different social groups) and between society and governments (Hujo 2020). A fiscal contract for the SDGs should favour financial instruments which are supportive of environ-

mental goals and the sustainability transition (UNRISD 2016a).

**Transforming economies and societies:** A new eco-social contract must be based on the common understanding that we need to transform economies and societies to halt climate change and environmental destruction, and promote social inclusion and equality. According to UNRISD (2016a), transformative change requires addressing root causes of problems instead of symptoms, which requires structural, normative and behavioural changes that are arguably difficult to achieve, not the least because they are related to entrenched inequalities and power asymmetries. Transformative change demands deep seated structural changes in order to overcome long-term stratification patterns that are likely to have impacts for future generations, locking people into disadvantage and constraining their choices and agency. Such structural change can be catalysed through innovative social policies in areas such as social pensions, education, health care, employment, equal opportunity, based on universal approaches that enhance the role of the state and community organisations, and with strong regulatory frameworks and monitoring by citizens (UNRISD 2016a). It is also highly compatible with alternative economic approaches such as social and solidarity economy (Utting 2015), new sustainability metrics used by enterprises (Utting and O'Neill 2020), as well as just transition strategies which create synergies between social and climate justice (Morena et al. 2019).

**A contract with nature:** A new eco-social contract must recognise that humans are part of a global ecosystem. It must protect essential ecological processes, life support systems and the diversity of life forms, and pursue harmony with nature. While the term green growth might suggest continued economic growth driven by green technologies, there is a need to assess real-life trade-offs, social dimensions and planetary boundaries. Indeed, economic growth cannot remain a predominant goal unless it is decoupled from natural resource use and adverse environmental impacts. This includes changing consumption and production patterns to ensure climate and inter-generational justice, which illustrates the link between resource use and equity (Cook et al. 2012). Moreover, the Rights of Nature approach describes inherent rights of ecosystems and species, as living beings that need to be given a voice and protected by law. It is based on the recognition that the development and survival of human beings depend on a healthy environment and biodiversity. By early 2021, 17 countries had enacted local or national rights of nature legislation. Ecuador was a pioneer here, amending its constitution in 2008 to include the rights of nature. There is an increasing understanding of the concept and associated legal action through the work of the UN Special Rapporteur on Human Rights and the Environment and Earth Jurisprudence (United Nations Special Rapporteur 2019) who is amplifying calls for Earth-centric rather than anthropocentric development. Earth jurisprudence (Berry 2002) considers the governance and regulations of relations between all members of the Earth community, not just between human beings, and is as thus an important aspect of a new eco-social contract.

**Addressing historical injustices:** A new eco-social contract must be decolonised, informed by indigenous knowledge, social values and capacities from the global South. It must remedy historical injustices and combat the climate crisis fairly through just transitions. This demand, originating in the trade union movement, refers to securing workers' rights and decent work while economies are shifting to sustainable production and lifestyles (Morena et al. 2019). Addressing historical injustices is also paramount in view of the triple injustice associated with climate change: unequal distribution of impacts, unequal responsibility for climate change, and unequal bearing of costs for mitigation and adaptation (UNRISD 2016a). A new eco-social contract needs to replace the colonial tradition of resource exploitation with participatory and sustainable use of natural resources, as well as benefit

sharing. The historical injustice of colonialism created mistrust and discrimination and is still institutionalised. Self-determination and recognition of indigenous peoples' rights will be a vital part of applying traditional knowledge in climate change adaptation. The international indigenous peoples' movement has brought youth voices into the debate at the national and international levels as well, through UN and civil society supported networks and their own regional organisations.[3] Traditional systems of resource management have been analysed in the literature (Ghai and Vivian 1992; Sarfo-Mensah and Oduro 2007; Chianese 2016; Wehi and Lord 2017) but have not found their way into mainstream public policy or action. There are still few examples of marginalised groups being brought into social contracts through the broad distribution of the benefits of resource extraction, as is the case of the indigenous majority population in Bolivia (Paz Arauco 2020; Koch and Perreault 2019).

**A contract for gender justice:** A new eco-social contract must recognize that previous social contracts have been built upon an unequal sexual contract (Pateman 1988). It must go hand in hand with a contract for gender justice in which activities of production and reproduction are equally shared by women and men (UNRISD 2016a; Esquivel and Kaufmann 2017), and where sexual orientations and expressions of sexual identity are granted equal respect and rights. In light of recent backlashes, there is a continued need for empowerment and solidarity among social movements fighting for gender justice, including LGBTQIA+ groups (Kaplani and Carter 2020). UNRISD (2016b) research in China, India and Indonesia has shown that End Violence Against Women campaigns were more effective when they were able to catalyse solidarity with other organisations, such as human rights or religious organisations.

**New forms of solidarity:** A new eco-social contract requires new bottom-up approaches to transformative change for development, bringing together social movements and progressive alliances between science, policy makers and activists. It must unite broad coalitions against as climate change, inequalities and social fractures. Greater inclusion and access to rights does not happen automatically; it is the result of political strategies and collective action putting pressure on public opinion and decision makers (UNRISD 2016a; Köhler 2020; Phillips 2020), as showcased by powerful movements such as Black Lives Matter, Me Too and Fridays for Future, but also marches of indigenous peoples, the landless and peasants in Brazil and India.

A new eco-social contract must connect science, policy, research and action communities in prognosis, diagnosis and dialogue for action. The contract, in terms of process and outcome, will reflect a reconfiguration of a range of relationships that have become sharply imbalanced—those between state and citizen, between capital and labour, between the global North and the global South, between humans and the natural environment. It will be based on rebalancing hegemonic gender roles and relations rooted in patriarchy. Through co-construction and mutual learning it will help define rights and obligations, give a voice to marginalised groups, promote greater equality and solidarity, and provide legitimacy, credibility, trust and buy-in for reforms underpinning transformative change. Eventually, a binding, well-resourced and accountable eco-social contract will serve to reduce inequalities in all their dimensions, help us to recover from COVID-19 in an equitable and transformative way, and improve our resilience for shocks and crises yet to come.

[3]The UN OHCHR fellowship program for young indigenous peoples and minorities representatives has provided excellent capacity, voice and an international platform to many young leaders which have formed their own international network.

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