Shaping the Post-COVID-19 Development Paradigm in India: Some Imperatives for Greening the Economic Recovery

Shailly Kedia¹,², Rita Pandey³ and Ria Sinha¹

Abstract

The COVID-19 pandemic has thrown many challenges for governments across the globe. Building on an initial understanding of the fallouts of the pandemic and the learning from the coping and management responses so far, this article first identifies some necessary elements and notions critical in shaping the post-pandemic development paradigm. The article also examines India’s post-COVID-19 economic package to understand the gaps and the elements we need to build further on for greening the economic recovery. This analysis has benefitted from inputs and insights received from the representatives of industry and subject experts through a webinar and a survey based on a structured, open-ended questionnaire.

Keywords

Greening economic recovery, COVID-19, post-pandemic development paradigm, SDGs, inclusive and just development

I. Introduction and Context

The COVID-19 pandemic is seen as the biggest health crisis and disruption since the Spanish flu, with profound impacts on every aspect of human life. Given the uncertainty around how deep this crisis is, these are still early stages to foresee the...
complete social, economic and geopolitical fallouts of the disruptions caused by the pandemic.

This is borne out by the fact that the International Monetary Fund (IMF) has made a major revision in the global growth rate over a very short period of time. The IMF World Economic Outlook (WEO) report of April 2020 projected the global economy to contract sharply by −3 per cent in 2020, much worse than during the 2007–2008 financial crisis (IMF 2020a). In the WEO report released in June 2020, the global growth is projected at −4.9 per cent in 2020, 1.9 percentage points below the April 2020 forecast, and at 5.4 in 2021, as against 5.8 in the April 2020 report. For India, growth projections are at −4.5 and 6.0 per cent for 2020 and 2021 respectively. Given the origins of recent pandemics in environmental destruction, the post-COVID-19 development paradigm in India or anywhere else in the world needs to consider sustainable development.

Striving towards sustainable development has been the overarching goal of the international community since the UN Conference on Environment and Development held in 1992 at Rio de Janeiro. Green growth and green economy as related concepts are considered as a subset of ‘sustainable development’, where measures of green growth and green economy have a greater focus on the economy and the environment through fiscal instruments, market instruments and technology. Pearce et al. (1989) in a landmark book, *Blueprint for a Green Economy*, argued that the basis for a green economy lies in understanding the interdependencies between the economy and the environment. Under the approach, measures put in place as a response to economic shocks are grouped in three broad categories: Green Keynesian; Green Schumpeterian; and Pigovian (The Energy and Resources Institute and Global Green Growth Institute [TERI-GGGI], 2015).

Bowen (2014) and Custers (2010) characterize the green growth paradigm as ‘Green Keynesian’, which fulfils the social criterion of promotion of employment (multiplier effect) and the ecological criterion of correcting market failures through countering capitalism’s inherent tendency to deplete and degrade natural resources. Green Keynesianism calls for fiscal measures to encourage shift from reliance on fossil fuels towards clean energy and technological interventions to discourage waste generation and promote resource efficiency. Many analysts agree with a stronger role of the ‘state’. After the 2008 financial crisis, many scholars framed the green fiscal stimulus as ‘Green Schumpeterian’, whereby scholars argue for policy interventions like green stimuli that promote technological advancement in renewable energy and environmental technology in response to economic crisis (Larcom & Swanson, 2011; Samad & Manzoor, 2011; Smith, 2012; Van Der Ploeg & Withagen, 2013). These authors argue for the greening of national industrial policies to focus on sustainable production and consumption to bring disruptive changes in resource-intensive systems. Shkarupa et al. (2016) argue for national innovation systems and for ecological modernization, and Swain (2014) suggests the greening of industrial policy. Jänicke (2012) discusses the growing eco-industry and resulting interventions for economic sustainability, including the phasing out of environmentally unsustainable practices. Another perspective is the ‘Pigovian’ perspective, which recognizes that there is a need for policy instruments such taxes to address the various market imperfections that fail
to internalize environment-related externalities (Bowen & Fankhauser, 2011). The role of the ‘state’ or governments is the key under all the three categories of Green Keynesian, Green Schumpeterian and Pigovian. This is also demonstrated by the measure put in place in response to the 2008 financial crisis, which is discussed later in the article.

Although it is too early to draw lessons for future economic models and social contracts both internally and at the global level, the past few months have been of great learning and, in many ways, pointers to certain transformational shifts, towards some of which we may have already set our sails, and many such steps will follow, for instance, models of work from home, online delivery of several health- and education-related services, governance, social security, technological solutions for nationwide communication and surveillance, which have sprung up in the past 3–4 months.

First, this article discusses the method followed in this study (Section II). Building on an initial understanding of the fallouts of the pandemic and the learning from the coping and management responses so far, the article identifies some necessary elements and notions critical in shaping the post-pandemic development paradigm (Section III). We then examine the related elements of the recovery packages provided by a number of countries in addressing the 2008 crisis and how well they had delivered on their objectives. This is based on the analysis of 162 economic measures announced during the 2008 financial crisis. The 162 measures are analysed to examine the lessons that may be relevant to the present context (Section IV). Then, we critically examine India’s post-COVID-19 recovery package to understand the gaps and the elements we need to build further on for greening the economic recovery (Section V). This analysis benefitted from inputs and insights from the representatives of industry and subject experts (Section VI). Section VII concludes the article.

II. Research Questions and Methods

The objective of this article is to discuss key imperatives for greening economic recovery in India which will help in shaping the post-COVID-19 development paradigm in the country. By examining the experience in India and around the world, this article aims to contribute to the emerging body of knowledge on post-COVID-19 development. Research questions covered include:

RQ 1: What key elements and notions are critical in shaping the post-pandemic development paradigm?

RQ 2: What lessons can be drawn from the 2008 financial crisis in terms of greening economic recovery packages?

RQ 3: How can India’s post-COVID-19 recovery package be made more responsive to the needs of environmental sustainability?

The approach taken in this study involves mixed methods involving quantitative and qualitative analysis. The quantitative analysis is based on the analysis of 162 green fiscal and economic measures announced during the 2008 financial crisis.
A database for these 162 measures is prepared, and the fiscal measures are classified in various categories based on types of instruments, such as government spending. Once the analysis of these measures is undertaken, qualitative inputs are sought from representatives of industries and also from subject experts. A structured, open-ended questionnaire is used. Figure 1 depicts the break-up of the respondents’ profiles.

III. Elements and Notions Critical in Shaping the Post-pandemic Development Paradigm

*Global Treaty for Controlling Such Health Crises*

According to O’Callaghan-Gordo and Antó (2020), COVID-19 and many zoonotic infectious diseases of recent times have had origins in environmental degradation and climate change. Thus, the response to the pandemic must not only consider the health of humans but also the planetary health. This recognition can be the necessary starting point in guiding the choice of public policies, as well as those of economic actors, financial sector and producers and consumers towards preservation of natural ecosystems.

Three major causes of zoonoses (a disease which can be transmitted to humans from animals) have been highlighted: (a) increased risk due to the consumption and trade of wild animals; (b) land use change through deforestation, thus narrowing safe distance with the wild; and (c) the human body being more vulnerable to some zoonoses due to a decrease in immunity (WHO, 2012). The common thread between these appears to be the present models of production and consumption, which in the globalization era may have become more and more specialized and thus environmentally unsustainable.

Crossley (2020) argues that the role of development cannot be undermined in fighting poverty and hunger, and therefore there is a need to emphasize the role of development in finding a solution to such events, and that the ‘ecological anxiety disorder’ should not allow losing sight of the reasons for consumption and trade in wildlife. The regulation and modernization of animal agriculture, which can vastly lower the risk of zoonotic diseases, should be on the table as a possible solution.
This clearly is a complex multidisciplinary issue that needs more scientific research in finding appropriate measures to control such crises. Given that the nature of the disease is global and trade in wild animals is likely to be the origin of this pandemic and other diseases in the past, a global treaty would be required, notwithstanding endless hurdles in this process.

**Need for Resilient and Just Social and Economic Systems**

An important lesson during the pandemic that has deeply touched our lives is compassion and coexistence. We need to further build upon this notion of empathy to achieve just economic, social and governance systems. This can happen when we do not limit these concepts as merely falling in the purview of civil society during difficult times but systematically explore them for building up efficient and scalable businesses, service delivery systems, institutions and governance models that are just and resilient.

For instance, recent initiatives and technological advancements such as Aadhaar, Jan Dhan and smartphone applications, which have been considered as some of the major achievements of the government, have at best partially served the purpose during the pandemic. We need political will and technological support to strengthen governance and empower people to cope better (portable social security). It is quite evident that the human suffering during the pandemic has not been due to financial or food grain shortages but more due to weak governance relating to weak systems and institutions.

It must be emphasized that this human-to-human compassion will need to be translated into human-to-nature compassion. We can draw lessons from different cultural and religious beliefs and good practices in this context. Some of the ways to internalize and integrate this in the development policies will require awareness of concepts of coexistence and compassion, which we have learnt during this pandemic.

Some examples of other learning include the work-from-home model, which works well for many sectors without compromising on work productivity, models for delivery of many health- and education-related services and the *Aarogya Setu* smartphone application for nationwide quick communication about and surveillance of the status of the disease. As is rightly understood, these make perfect economic sense, as well as having huge positive implications for climate change, ecosystems and the sustainable development goals (SDGs).

**Rethinking Economic Models**

Production and consumption systems need to be rethought. This emerges from the fact that nature can no longer be compromised and instead needs to be viewed as an asset class. Natural resources become assets when people have rights to access their benefits (Boyce, 2001).

Unsustainable production and consumption are perceived as systemic risks. We cannot afford to ruthlessly exploit natural resources, generate waste and clean
up later. This old model is unsustainable. In particular, food production, distribution and consumption will require a systematic overhaul, not only from the point of view of land use but also from the perspective of conservation of biodiversity, health of agricultural ecosystems, risks and resilience of food systems against climate change and biodiversity loss and nutrition and health of people. Hence, the critical question is: what regulatory and fiscal and monetary policy changes are required to protect the environment in terms of conservation as well as for sustainable consumption and production?

The first step to achieve a systematic change is through integration of environmental goals and targets, risks and resilience in strategic planning, budgeting and fiscal and financial sector policies. To periodically measure, monitor and report on natural assets and identify course correction measures, strong institutional mechanisms should be in place.

**Nature-based Solutions and Infrastructure**

Infrastructure building is seen as a great enabler in achieving the SDGs. Investment in natural infrastructure has received little attention. The preconceived notion that technology can provide an answer to all issues is flawed. The importance of natural infrastructure in improving resilience against climate impacts, in sustaining livelihoods and in health has been proved beyond doubt. The present need is to evaluate and integrate these into development planning policies and programmes. This includes identifying areas where restoration measures are essential. This is especially relevant for hilly and coastal areas. Government support and practices that are harmful to, for example, wetlands and mangroves, agricultural and forest ecosystems, etc., should be identified and reformed. The need for clean air, water and sanitation for increased resilience to pandemics and other diseases, besides human development and empowerment, cannot be emphasized more. It is important to recognize systemic risks and identify the underlying causes. A sustained effort beyond stimulus is required in addressing and building resilience against these risks.

To conclude, the above list by no means is a comprehensive list of ideas and opportunities that the pandemic has thrown at us. This, at best, is an illustration of a perspective on the direction of policy shifts towards a resilient and just development paradigm. This viewpoint incidentally appears to be leaning towards green and tech-smart development. It also shares the broad sentiments of the stimulus packages rolled out post the 2008 financial crisis and the calls for greening the post-COVID-19 recovery packages.

For instance, Green Economy as a new policy paradigm was revived following the 2008 financial crisis, along with the idea of ‘green stimulus packages’, whereby large-scale public investment in specific sectors related to energy and environment could kick-start a green economy. Green recovery as a concept seems relevant globally, post COVID-19, as a means to push transitions towards sustainable, resilient and just social and economic systems. This is aptly illustrated in a letter titled ‘Green Recovery: Reboot and Reboost our Economies for a Sustainable Future’ dated 14 April 2020. In this letter, an alliance of European
politicians, business leaders and environmental activists have urged nations to increase green investment in the bloc to develop ‘a new model of prosperity’ based on sustainability, protection of ecosystems and transformation of food systems (European Union [EU], 2020).

IV. International Experience From the 2008 Economic Shock

The global economic crisis in 2008 had resulted in a massive economic decline in economic activities across most of countries in the world. Nearly all Organisation for Economic Co-operation and Development (OECD) countries suffered a fall in gross domestic product (GDP) and trade flows and increased unemployment rates due to the global economic crisis. The developing economies were not spared, as the crisis spread to the rest of the world through various transmission mechanisms such as the domestic banking sector’s exposure to the global financial markets, decline in world trade and reduction in global aggregate demand. In the ongoing crisis due to COVID-19, there will be a mammoth adverse impact on the Indian economy. Both the World Bank’s and IMF’s assessments of global growth present a grim picture as the global economy hits the worst recession since the Great Depression in the 1930s (World Bank, 2009).

We now analyse the economic stimulus packages as a response to the 2008 financial crisis based on the idea of ‘green stimulus’, whereby large-scale public investment in specific sectors related to energy and environment was seen as a means to kick-start a green economy (TERI-GGGI, 2015). Table 1 presents the

### Table 1. Economic Stimulus Package and Green Component in Countries Following the 2008 Economic Shock

| Countries          | Stimulus Package (USD billion) | Green Component (USD billion) | Green Component (%) |
|--------------------|--------------------------------|-------------------------------|--------------------|
| Australia          | 43.8                           | 9.3                           | 21.2               |
| Canada             | 31.8                           | 2.8                           | 8.8                |
| China              | 647.5                          | 216.4                         | 33.4               |
| France             | 33.7                           | 7.1                           | 21.1               |
| Germany            | 104.8                          | 13.8                          | 13.2               |
| India              | 13.7                           | 0                             | 0.0                |
| Japan              | 639.9                          | 36                            | 5.6                |
| Mexico             | 7.7                            | 0.8                           | 10.4               |
| South Africa       | 7.5                            | 0.8                           | 10.7               |
| Republic of Korea  | 38.1                           | 36.3                          | 95.3               |
| United Kingdom     | 34.9                           | 3.7                           | 10.6               |
| United States      | 787                            | 94.1                          | 12.0               |
| EU                 | 38.8                           | 22.8                          | 58.8               |

*Source: Barbier (2010).*
economic stimulus packages and green components in 2009 for various countries. As shown in Table 1, People’s Republic of Korea had the highest share of green component in its fiscal stimulus package, followed by the European Union (EU) and China. India, back then, had a relatively small economic stimulus and no green component. Countries such as China and the Republic of Korea, which invested more on green technologies, went on to become leaders in these technologies.

A number of studies have documented the impact of green stimulus measures, and some of these are summarized here. The cumulative impact of all the green stimulus measures in the United States resulted in a rise in jobs from 2 million to 10.9 million between 2009 and 2012, with the majority of the increase occurring in 2011 (Mundaca & Richter, 2015). EU countries reported benefits in terms of market demand for clean energy and reduction in greenhouse gas emissions (ECPI, 2016; Mission, 2020). Benefits in the case of China included increase in energy efficiency, reduction in pollution levels, increase in domestic demand of solar photovoltaic (PV) panels and increase in green jobs (ECPI, 2016; Mission, 2020). In the case of Republic of Korea, while the share of renewable sources in generation grew by 2.2 per cent between 2006 and 2016, there was no significant reduction in coal dependence over this period (Jung, 2015). There is also uncertainty around the benefits in jobs created, as it has been difficult to distinguish between wind, solar PV, solar thermal power, nuclear power and coal-fired power generation (ECPI, 2016; Jung, 2015).

According to an analysis by IEA (2020), the most successful stimulus packages as a response to the 2007–2008 crisis were stimulus funding for interventions based on proven policy schemes, targeted technologies that were ready for deployment, tackling of structural barriers of investments and interventions considering the wider benefits, including social, energy security and industrial policy objectives.

| Table 2. Green Stimulus by Type of Instruments | Number of Instruments | Green Share (%) |
|-----------------------------------------------|-----------------------|-----------------|
| Government spending                           | 140                   | 86.4            |
| Fund                                          | 4                     | 2.5             |
| Green technology spending                     | 53                    | 32.7            |
| Infrastructure investment                     | 50                    | 30.9            |
| Plan/policy                                   | 4                     | 2.5             |
| Programmatic spending                         | 5                     | 3.1             |
| Research spending                             | 4                     | 2.5             |
| Transitory subsidies                          | 20                    | 12.3            |
| Other measures                                | 22                    | 13.6            |
| Loans                                         | 3                     | 1.9             |
| Tax/fee                                       | 19                    | 11.7            |
| **Grand total**                               | **162**               | **100**         |

Source: Authors’ analysis based on GPRC (2009), HSBC (2010), ILO (2010) and Strand and Toman (2010).
Table 3. Break-up of Types of Stimulus Measures

| No. of Instruments | Green Share (%) |
|--------------------|-----------------|
| Traditional investment | 53 | 32.7 |
| Infrastructure investment | 50 | 30.9 |
| Loans | 3 | 1.9 |
| Enabling support | 109 | 67.3 |
| Fund | 4 | 2.5 |
| Green technology spending | 53 | 32.7 |
| Plan/policy | 4 | 2.5 |
| Programmatic spending | 5 | 3.1 |
| Research spending | 4 | 2.5 |
| Tax/fee | 19 | 11.7 |
| Transitory subsidies | 20 | 12.3 |
| **Grand total** | **162** | **100** |

*Source:* Authors’ analysis based on GPRC (2009), HSBC (2010), ILO (2010) and Strand and Toman (2010); Annexure 1.

Table 2 provides a break-up of green components of the stimuli by different instruments. It is shown that a total of 162 different types of instruments were used by different governments in the countries examined by us (Annexure 1). Direct government spending for various purposes dominated the narrative and accounted for over 86 per cent of the total expenditure. The component of loan-based measures was miniscule, to the tune of 1.9 per cent.

In yet another categorization, measures can be further segregated into traditional investment by government and enabling support to support through spending in technology, research, subsidies and programmes (Table 3). It can be seen that the share of the latter category is higher at 67.3 per cent, indicating that a bulk of the measures focused on spending by the government.

V. Economic Recovery Measures Post COVID-19 Pandemic

*International Responses to COVID-19*

Central banks have taken a series of measures to provide liquidity to banks and markets, including additional longer-term refinancing operations or a reduction of minimum reserve requirements.

- The US Federal Reserve has reactivated commercial paper funding facility to facilitate the flow of funding to corporates through short-term funding markets and established two facilities to support credit to large employers through loan and bond purchases in primary and secondary markets; it has also set up another facility to support lending to small businesses.
In order to safeguard the smooth transmission of monetary policy within the euro area, the European Central Bank (ECB) has launched the Pandemic Emergency Purchase Program (PEPP), a temporary asset purchase programme for private and public sector securities.

The Bank of England has launched a term funding scheme to support SMEs’ (small and medium enterprises) lending and the COVID-19 Corporate Financing Facility to support liquidity among larger firms, and is providing liquidity to the banking sector through expanding its liquidity facilities.

India Announced an Economic Package of ₹20 Trillion

- Major rate cuts by the Reserve Bank of India (RBI), such as in policy lending rates, cash reserve ratio (CRR) and liquidity coverage ratio, for providing cheaper cash to banks have been instigated.
- Loan freeze for a period of 3 months on term loans has been permitted.
- Provision of special windows for corporate borrowers and rural industries has been created.
- To infuse more money into the monetary systems, RBI has been injecting additional liquidity in the banking system to keep bond yields down.
- To attract foreign investors, and to secure access to global indexes, India has opened up a wide range of its sovereign bond markets to overseas investors.

Figure 2. Economic Packages in Key Economies as Percentage of GDP as on June 2020

Source: IMF in Statistica (2020).
Notes: *Percentage calculated by Statista using values provided by the source.
**Includes additional spending by state governments on fiscal stimulus measures, but does not include increased spending on the health system as a result of COVID-19.
***Does not include second amendment to extend the scope of the State aid Temporary Framework adopted on 8 May 2020, as amounts not provided by the source.
****Does not include additional spending on health infrastructure.
• To ease the fiscal deficit of state governments, state administrations have been permitted to borrow more for the present year.
• To stabilize the capital market, all capital and debt market services have been exempted from the lockdown.

Figure 2 illustrates the comparative picture of economic packages in terms of spending by some developed and emerging countries as a percentage of GDP in response to COVID-19.

As of June 2020, most G20 member countries had committed to fiscal stimulus packages as a response to the coronavirus pandemic. Among the G20 countries, Japan, with a spending of ¥117.1 trillion, had the largest fiscal stimulus package in terms of spending, which amounts to about 21.1 per cent of its GDP (Statistica, 2020).

How Does India Fare?

India’s prime minister announced a special economic package for ‘Atmanirbhar Bharat’ or a ‘self-reliant’ India which would better integrate India with the world. The package is to the tune of ₹20 trillion, which is about 10 per cent of India’s GDP (GOI, 2020) (Table 4). The package has five pillars: economy; infrastructure; system; vibrant demography; and demand. The economic package is expected to cover land, labour, liquidity and laws. The package is focused on agriculture and micro, small and medium enterprises (MSMEs), and rightly so, as these are the main drivers of the Indian economy. This is a marked shift in thinking that used to see cities as engines of growth and thus emphasized investment in cities. For the agriculture sector, some long-pending reforms have been announced, and at the same time, there is a push for investment in infrastructure. Both are welcome moves but need to be backed by a change in the mindset and capacities of institutions that can make a difference on the ground by implementing them in the right manner. While reforms have been announced for MSME and provisions for credit has been made by adding one more layer between the banks and MSMEs banking with the hope that the understanding of MSMEs market and business is better of intermediary institutions is better than that of the banks. MSMEs too have a lot of catching up to do in terms of streamlining of tendering, procurement, supply chains, digitization, technology, etc. Many of the smaller ones will need nudging and hand-holding. Are financial intermediaries equipped with the mindset and capacity to rise to the occasion? Only time will tell.

Table 5 provides a comparative assessment of short-term relief measures across various economies as a response to COVID-19.

Notwithstanding the differing views on the size of the economic package, ‘Atmanirbhar Bharat’ as a concept of change in development paths seems to have the potential to deliver on green growth. Although the concept needs to be unlocked more going forward, for now, it is clear that agriculture and allied sectors and MSMEs will get a renewed focus. On face value, this also appears in sync with the thinking of EU political alliance, although clearer interpretations of the two will inform the debate on such comparisons further. Yet these give us sufficient basis to believe that deep structural and policy changes could on the anvil to
**Table 4. Economic Package by the Indian Government in Response to COVID-19**

| Package | Announcement Date | Quantum |
|---------|-------------------|---------|
| Tranche 1: Businesses, including MSMEs | 13 May 2020 | • ₹3 trillion collateral-free automatic loans for businesses, including MSMEs  
• ₹200 billion subordinate debt for MSMEs  
• ₹500 billion equity infusion through MSME fund of funds  
• ₹300 billion liquidity facility for NBFCs/FCs/MFIs  
• ₹450 billion partial credit guarantee schemes for NBFCs  
• ₹900 billion liquidity injection for Discoms |
| Tranche 2: Poor, including migrants and farmers | 14 May 2020 | • 30 million farmers with agricultural loans of ₹4.22 trillion availed the benefit of 3 months’ loan moratorium.  
• Interest subvention and prompt repayment incentive on crop loans, due on 1 March, extended up to 31 May 2020.  
• 25 lakh new Kisan Credit Cards sanctioned with a loan limit of ₹250 billion  
• Liquidity support provided to farmers post COVID-19  
• State governments to utilize SDRF for shelter, food, water, etc. for migrants  
• More support will be provided to migrants who are returning home. |
| Tranche 3: Agriculture | 15 May 2020 | • ₹300 billion additional emergency working capital for farmers through NABARD  
• ₹2 trillion credit boost to 25 million farmers under Kisan Credit Card scheme  
• MSP purchases of over ₹743 billion  
• Additional support for animal husbandry and fishery  
• ₹1 trillion Agri Infrastructure Fund for farm-gate infrastructure  
• ₹100 billion scheme for formalization of MFE has been announced.  
• ₹200 billion for fishermen through PMMSY  
• An animal husbandry infrastructure development fund of ₹150 billion  
• NMPB will green an 800-ha area by developing a corridor of medicinal plants along the banks of Ganga. |

(Table 4 continued)
(Table 4 continued)

| Package                   | Announcement Date | Quantum                                                                 |
|---------------------------|-------------------|-------------------------------------------------------------------------|
| Tranche 4: New horizons of growth | 16 May 2020       | • Introduction of commercial mining in the coal sector through revenue-sharing mechanism instead of a regime of fixed rupee/ton system; liberalization of entry norms; exploration-cum-production regime for partially explored blocks; production earlier than scheduled will be incentivized through rebate in revenue share. |
|                           |                   | • Infrastructure development of ₹500 billion                           |
| Tranche 5: Reforms        | 17 May 2020       | • ₹150 billion for protection of healthcare workers                      |

Source: GOI (2020).

Note: MSME—Micro, small and medium enterprises; NBFCs/FCs/MIFs—non-bank financial companies/finance companies/microfinance institutes; Discom—distribution companies; SDRF—State Disaster Response Fund; NABARD—National Bank for Agriculture and Rural Development; MSP—minimum support price; MFE—micro food enterprises; PMMSY—Pradhan Mantri Matsya Sampada Yojana; and NBPB—National Medicinal Plants Board.
### Table 5. Short-Term Relief Measures to Combat COVID-19

| Relief Measure                  | India                                                                 | Worldwide                                                                 |
|---------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------|
| **Direct cash payments**        | • ₹500 is being provided to each female Jan Dhan account holder, and ₹1,000 for senior citizens, poor widows and the disabled.  
  • Payments for MNREGA and front-loaded PM-KISAN payments have been hiked.  
  • ₹100 billion from the PM CARES Fund is being used to provide food and accommodation to migrant workers. | • Canada is providing CAD2,000 for 4 months (from April 2020) to those who have lost their jobs, are sick or have to stay at home.  
  • The United States is providing a one-time payment of US$1,200 to its citizens.  
  • Hong Kong is providing a cash handout of HKD10,000 for each permanent resident aged 18 and above. |
| **Financial assistance to corporations** | • ₹900 billion loan to be provided against state (government) guarantee to power distribution utilities (Discoms) to mitigate the liquidity crisis in the power sector  
  • Financial support to NBFCs, as in Table 1 | • The United States created a US$500 billion fund to bail out failing corporates in aviation and healthcare.  
  • The French government has announced that it will provide a bailout of €7 billion to Air France–KLM.  
  • The French government has earmarked €20 billion for bailout. |
| **Loans for small businesses**   | • India to provide a collateral-free loan scheme to MSMEs, loans for critical MSMEs and mega ‘fund of funds’ to provide liquidity (details mentioned in Table 1) | • Most countries have offered small businesses emergency loans and fast access to credit during this period.  
  • Many nations are also providing tax relief for these businesses.  
  • Japan’s government has schemes to cover two-thirds of the rent of small businesses for up to 6 months. |

*(Table 5 continued)*
| Relief Measure                  | India                                                                 | Worldwide                                                                 |
|--------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------|
| Payments to employees          | • The TDS/TCS rate has been reduced by 25%, which is expected to put ₹500 billion in the hands of people. | • The United States has announced a Paycheck Protection Programme to help small businesses keep their employees on payroll. |
|                                |                                                                       | • The United Kingdom has a scheme to provide grants covering up to nearly 80% of the salary of workers if companies keep them on their payroll. |
|                                |                                                                       | • Denmark also has a similar scheme to pay 75% of employees’ salaries to avoid mass layoffs for a time span of 3 months. |
|                                |                                                                       | • Thailand has allotted US$18 billion to provide financial aid to temporary workers, contract workers and the self-employed. |

*Source: Business Line (2020).*

**Note:** MGNREGS—Mahatma Gandhi National Rural Employment Guarantee Scheme; PM-KISAN—Pradhan Mantri Kisan Samman Nidhi; PM CARES—Prime Minister’s Citizen Assistance and Relief in Emergency Situations; Discom—distribution companies; NBFCs—non-bank financial companies; MSME—micro, small and medium enterprises; TDS—tax deducted at source; and TCS—tax collected at source.
watch out for in the country in terms of opportunities contained in these provisions for green, resilient, just, and sustainable development.

**VI. Framework for Greening the Economic Recovery in India: Insights From Expert Consultations**

To understand the perspectives of stakeholders on the economic package announced by the government of India, as well as on the long-term vision for economic development, and as a validation exercise for our review of international experience, we consulted academics, subject experts and industry representatives through a webinar. Some of the important findings from the stakeholder consultation are listed below:

1. There were no conflicting viewpoints among the respondents, and all of them felt that the present pandemic situation should be leveraged to realize the SDGs and NDC (Nationally Determined Contributions) commitments.
2. SDG-aligned budgeting or green budgeting can be used as a framework for better alignment of government spending on environmental objectives and the SDGs. This will be a good starting point in eventually moving towards the integration of environmental concerns and concepts into development planning and budgeting.
3. The government should incentivize green industries. For improved environmental outcomes, relevant policies need to be aligned and the state- and local-level institutions strengthened.
4. According to large companies, international investors and financial institutions are becoming conscious of ESG (environment, social and governance) parameters. Encouraging the industries to follow ESG requirements would also attract more investors. Respondents from the industry were in favour of institutionalization of transparent self-reporting mechanisms of agreed parameters, including risks to industry and the environment. Data should also be comparable for various parameters.
5. If a green recovery path has to be pushed, the government will need to stimulate market demand for environmental goods and services. Incentives linked to the adoption of green labels (Eco-mark, ZED [Zero Defect, Zero Effect] and other internationally accepted labels) hold potential.
6. Investment in green infrastructure, such as cold storage facilities for farm produce, locally sourced transport fuel, renewable energy projects, resource efficiency, micro-grids and special economic zones, focusing on environmental goods and services would be needed. There is a need for creating holistic incentive packages for green MSMEs which include not only financial incentives but also the facilitation of intellectual property–based resources and marketing support to green MSMEs. According to some stakeholders, setting up a fund for greener MSMEs looks promising.
7. There can be some increase in taxes in luxury sector items and items that have harmful impacts on health and the environment.

Table 6 presents a snapshot of potential green recovery measures across sectors based on the consultations and review of international experience.
| Table 6. Potential Green Recovery Measures Across Sectors in India |
|---------------------------------------------------------------|
| **Short Term** | **Medium Term** | **Long Term** |
| Demand | - Promoting livelihood- and natural resource-based economic activities that generate environmental gains. | - Increasing awareness related to environmental goods and services. | - Promoting infrastructure development for education, especially in rural areas. |
| | - Introduction of vehicle scrappage programmes within stimulus packages to phase out old cars. | - Enhancing global citizenship and education for sustainable development. | - Creating new jobs in green industries like renewable energies. |
| | - Addressing infrastructural bottlenecks and supply-side constraints such as restrictive market rigidities in employment generation. | - Enhancing competitiveness of environmental goods and services and e-commerce sectors. | - Regulating sectors related to responsible business conduct and ESG parameters. |
| Demography | - Creating opportunities for green skills in both rural and urban areas. | - Enhancing information technology (IT)-related infrastructure for education. | - Encouraging change in behaviour, e.g., encouraging conservation of energy. |
| | - Reskilling and retaining the workforce. | - Enhancing global citizenship and education for sustainable development. | - Promoting circularity across supply chains. |
| Economy | - Creating opportunities for green skills in both rural and urban areas. | - Enhancing global citizenship and education for sustainable development. | - Preventing waste and promoting water use efficiency in agriculture and industry. |
| | - Continuing aggressive taxing and direct revenues by taxing fossil fuels and luxury goods. | - Enhancing competitiveness of environmental goods and services and e-commerce sectors. | - Promoting investments in safe public transport and work-from-home options. |
| | - Pushing more investment in environment priority sectors through banking sector policies related to COVID-19 recovery. | - Enhancing global citizenship and education for sustainable development. | - Enhancing infrastructure investment for safe public transport and work-from-home options. |
| Infrastructure | - Strengthening local bodies and municipal corporations dealing with additional biomedical waste and municipal solid waste. | - Promoting water use efficiency in agriculture and industry. | - Promoting investments in safe public transport and work-from-home options. |
• Providing concessional and incentive-based credit for the environment
• Providing conditional incentives for green technology and infrastructure upgrades

System
• Reforming existing decision-making processes, including transforming state budgeting and national budgeting into SDGs-linked mapping exercises
• Strengthening adoption of systems of certifications such as ZED (Zero Defect, Zero Effect), Eco-mark and other labels and standards
• Increasing sustainable public procurement

• Promoting disposal and use of agricultural residues
• Promoting resource efficiency
• Promoting management of urban and industrial waste
• Increasing infrastructural spending on health and social care projects, as well as digital infrastructure to build greater capacity and resilience
• Upgrading technology in renewables and industry 4.0
• Providing outcome-based funds for technology and infrastructure upgradation in MSMEs
• Formulating a plan, including a finance plan, for investment in green infrastructure
• Boosting public–private partnerships (PPPs) in infrastructural development
• Changing the attitude towards infrastructural risks
• Strengthening health systems

Source: Kedia et al. (2020).
VII. Conclusion

The pandemic period has been a time of great learning. Coping measures that sprung up during this time should in many ways be seen as pointers to the transformational shifts—both permanent and temporary—towards some of which the world and India may have already made the first moves, and many more of which will follow. Building on the learning so far, the article identifies some necessary elements and notions critical in shaping the post-pandemic development paradigm. Some of these not only find an echo in the post-COVID-19 economic package rolled out in India but are also in sync with self-reliance or the ‘Atmanirbhar Bharat’ and ‘vocal for local’ calls by the prime minister of India. Successful implementation of various measures announced will be critical, given that India does not have much to showcase on this front. The package has not given much attention to the building blocks of implementation—institutional capacity, technology, scientific research, innovative business and delivery models—especially in the context of agriculture and MSMEs, which are the two focus sectors of the economic package. Also, as the concept of self-reliance is fully unpacked going forward, it will need to be nuanced such that it does not imply nationalization, which can be more damaging to the environment and economy.

While some transitional shifts will emerge organically and will need support and participation from the central and state governments to flourish; the transformational shifts will require a purposive and policy nudge from the government. The rationale for greening economic packages in India emanates from the fact that government interventions are required to nudge practices from ‘business as usual’ to a more sustainability-focused development path. The sustainability agenda must be seen not as a ‘disruptor’ but as a ‘corrector’.

A review of international experience shows that in the medium and long term, if recovery packages are targeted well, these can be used as means to promote environmental sustainability by nudging industry players to upgrade technologies, adopt government norms and inject investments into developing environmental goods and services that would have markets in the near future. There is strong evidence to suggest that the economic packages provided in response to the 2008 financial crisis produced the intended results in some countries. Indian policymakers too can learn lessons from this experience and design stimulus packages with investments (including public expenditure) targeted at interventions in India that include proven policy schemes, targeted technologies that are ready for deployment, tackling of structural barriers of investments, energy policy, industrial policy and interventions considering wider socio-economic benefits.

The consultation exercise reveals that while governments are expected to focus more on immediate relief measures in the short term, the attention should gradually shift to implementing medium- and long-term reforms in factor markets, and reforms for the correction of externalities to incentivize environmentally sustainable choices for transformational shifts. ‘Atmanirbhar Bharat’ as a concept of fundamental change in development paths indicates the necessity for sustained effort beyond the recovery package. On face value, it appears in sync with the thinking of EU political alliance. Clearer interpretations of both will inform
the debate on such comparisons further. Yet these give us sufficient basis to believe that deep structural and policy changes are be on the anvil to watch out for in terms of how policymakers bring about policy reforms to nudge the country towards green, resilient, just, and sustainable development.

Acknowledgement

The present article draws heavily from a co-authored paper of Kedia et al. (2020), ‘Greening post COVID-19 economic recovery in India: A case for green fiscal stimulus’, May 2020. Discussion Paper, The Energy and Resources Institute (TERI) and Global Green Growth Institute (GGGI). Detailed acknowledgements in that discussion paper apply here as well. We thank Souvik Bhattacharjya (TERI), Jonathan Donald Syiemlieh (TERI), Saswata Chaudhury (TERI), Mani Juneja (TERI), Manish Anand (TERI), Swati Ganeshan (TERI) and Nitin Bajpai (TERI), all of who contributed to sectoral inputs in the discussion paper. We also thank Mr Arupendra Nath Mullick of TERI Council for Business Sustainability for facilitating consultations with the business and industry sector in India.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.
## Annexure 1. Green Stimulus Measures Announced After the 2008 Financial Crisis

| Name of Instrument | Sector | Type of Instrument |
|--------------------|--------|-------------------|
| **Austria** | | |
| ÖBB (Austrian railways investments) | Rail | Infrastructure investment |
| Energy-saving renovation charge | Energy efficiency | Transitory subsidies |
| Science, research and development, innovation expenditures | Renewable/energy efficiency | Research investment |
| Globalization ‘campaign’ | Renewable/energy efficiency | Research investment |
| Green technologies | Renewable/energy efficiency | Research investment |
| Car-scrapping premium | Car | Transitory subsidies |
| Energy-saving cheques | Energy efficiency | Infrastructure investment |
| **Belgium** | | |
| Energy subsidy to households | Energy efficiency | Transitory subsidies |
| Green investments | Renewable/energy efficiency | Infrastructure investment |
| Investments in energy-efficient public buildings | Building | Green technology investment |
| Reduction of household electricity costs | Energy efficiency | Transitory subsidies |
| Fund for the reduction of the global energy cost (FRCE) | Energy efficiency | Transitory subsidies |
| Suspension of car tax on new vehicles | Car | Tax/fee |
| Reform of car tax | Car | Tax/fee |
| Green transport infrastructure spending | Car/rail/bus | Infrastructure investment |
| Premium for new car purchases | Car | Transitory subsidies |
| CO₂-friendly renovations of houses | Building | Infrastructure investment |
| Corporate innovation and energy efficiency credit | Energy efficiency | Infrastructure investment |
| **Brazil** | | |
| Support to automotive sector | Car | Green technology investment |
Czech Republic

Reinforcement of investment in transportation infrastructure
Increased expenditure with respect to extended access to transportation
Extension of the VAT deductions for passenger cars
Subsidy programme
Reinforcement of the PANEL subsidy programme

Denmark

Suspension of car tax on new vehicles
Reform of car tax
Green transport infrastructure spending
Premium for new car purchases
CO₂-friendly renovations of houses
Corporate innovation and energy efficiency credit

Finland

Transport infrastructure projects
Allocation for basic road maintenance
Water supply and sewer works
Allocation for basic rail maintenance
Green technologies investments

France

‘Grenelle de l’Environnement’
Public investments in development of network industries
Car bonus
| Name of Instrument                                                                 | Sector                              | Type of Instrument                  |
|-----------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| Rail                                                                             | Rail                                | Infrastructure investment           |
| Plan to develop a zero-carbon-emissions vehicle, including R&D support             | Low carbon                          | Green technology investment         |
| Investment on renewable energy and hydro energy                                    | Renewable                           | Green technology investment         |
| Sustainable agriculture, renewable energy                                          | Climate change/renewable            | Green technology investment         |
| Building efficiency                                                               | Building                            | Infrastructure investment           |
| Railway networks and water management projects                                     | Rail                                | Infrastructure investment           |
| Beyond the stimulus package: ‘Eco-tax’ on carbon emissions                          | Low carbon                          | Tax/fee                             |
| **Germany**                                                                      |                                     |                                     |
| Expansion and rehabilitation of federal transport infrastructure with KfW programme | Rail/highway/sewage car             | Infrastructure investment           |
| Vehicle tax suspension                                                            | Car                                 | Tax/fee                             |
| Car bonus                                                                         | Car                                 | Transitory subsidies               |
| Car loans                                                                         | Car                                 | Loans                               |
| Car tax reform                                                                    | Car                                 | Tax/fee                             |
| Transportation                                                                    | Car/rail/bus/building               | Infrastructure investment           |
| Energy efficiency of buildings fund                                               | Renewable/energy efficiency         | Fund                                |
| Central innovation programme for SMEs (ZIM) promoting applied research for environmental improvement | Renewable/energy efficiency         | Green technology investment         |
| Energetic building renovation programme of KfW                                   | Energy efficiency                   | Green technology investment         |
| Green investment                                                                  | Renewable/energy efficiency         | Green technology investment         |
| Green job                                                                         | Job                                 | Programmatic spending               |
| Renewable Energy Sources Act                                                       | Renewable energy                    | Green technology investment         |
| Transfer Renewable Energy and Efficiency (TREE) project                            | Renewable energy                    | Green technology investment         |
India
Allocation to National Highways authority of India (NHAI)  
Accelerated Power Development and Reform Programme  
Provision for Brihan Mumbai Storm Water Drainage Project  
Highway  
Energy efficiency  
Water  
Infrastructure investment
Italy  
No increase of highway toll  
Renewable energy and energy savings  
Car stimulus package: fuel-efficient vehicles  
Rail investments  
Highway  
Renewable/energy programme  
Car  
Rail  
Tax/fee  
Green technology investment  
Transitory subsidies  
Infrastructure investment
Japan  
Creating jobs  
Grant to create infrastructure for local energy  
Subsidies for agriculture, forestry and fishery sectors  
Projects for the acceleration of the dissemination of environment-friendly home electric appliances  
Acceleration of the dissemination of environment-friendly vehicles  
Job  
Energy efficiency  
Climate change  
Building  
Car  
Building  
Low carbon  
Renewable  
Low carbon  
Climate change  
Energy efficiency/renewable energy efficiency  
Overall  
Green technology investment  
Green technology investment  
Green technology investment  
Green technology investment  
Green technology investment  
Tax/fee  
Plan/policy
‘Green Economy and Social Reform’ plan  
(Annexure I continued)
| Name of Instrument                                                                 | Sector                  | Type of Instrument          |
|-----------------------------------------------------------------------------------|-------------------------|-----------------------------|
| **Lithuania**                                                                      |                         |                             |
| Introduction of object source improvement in insulation and energy efficiency in public buildings | Energy efficiency       | Green technology investment |
| **Peoples Republic of China**                                                       |                         |                             |
| Car sector support                                                                | Car                     | Research investment         |
| Cut in the sales tax for cars                                                       | Car                     | Transitory subsidies        |
| Low-carbon vehicles                                                                | Car                     | Transitory subsidies        |
| Energy efficiency in rail                                                          | Rail                    | Infrastructure investment   |
| Green lining China’s economic stimulus plans: energy efficiency in grids            | Grids                   | Green technology investment |
| Energy conservation, emission control and environmental protection projects          | General environment     | Programmatic spending       |
| Improved sewage ports and waterways                                                | Water                   | Green technology investment |
| Sustainable development                                                            | Climate change          | Green technology investment |
| Technical innovation, industrial restructuring                                      | Infrastructure          | Infrastructure investment   |
| Public transportation investments in railway, road, irrigation and airport          | Rail                    | Green technology investment |
| Investment in solar power capacity                                                 | Renewables              | Infrastructure investment   |
| Rural development                                                                  | Rural development       | Infrastructure investment   |
| Post-quake reconstruction works                                                    | Infrastructure          | Infrastructure investment   |
| Planning to increase subsidies for farmers                                          | Agriculture             | Transitory subsidies        |
| Tax cut                                                                           | Clean technology        | Tax/fee                     |
| Wind sector, low-carbon power                                                      | Renewable/low carbon    | Green technology investment |
| Beyond the stimulus package: green investment in renewable energy                  | Renewable energy        | Green technology investment |
| Beyond the stimulus package: Investment in energy efficient buildings               | Building                | Infrastructure investment   |
| Beyond the stimulus package: energy consumption to be reduced from standard coal    | Efficient energy        | Plan/policy                 |
| Beyond the stimulus package: renewable energy target                               | Renewable energy        | Plan/policy                 |

(Annexure I continued)
| Country   | Sector-specific support                                                                 | Environmental actions                          | Energy savings and efficiency                | Support to automotive sector                  | Infrastructure investment |
|-----------|----------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------|----------------------------------------------|--------------------------|
| Poland    | Investment in renewable energy from national fund for environmental protection         | General environment Fund                      |                              |                              |                          |
| Portugal  | Installation of solar panels and micro-generation                                      | Renewable energy Green technology investment   |                              |                              |                          |
| Slovenia  | Sector-specific support Car/building/renewable/energy efficiency                        | Climate change Infrastructure investment       |                              |                              | Transitory subsidies    |
|           | Environmental actions                                                                  | Energy efficiency Infrastructure investment    |                              |                              |                          |
|           | Support to the strategic projects in the field of clean and technologically advanced industry | Road                                           |                              |                              |                          |
|           | Energy rehabilitation of buildings in public ownership                                 | Car                                            |                              |                              |                          |
|           |                                                                                       | Climate change Green technology investment     |                              |                              |                          |
| Spain     | Sector-specific support Car/building/renewable/energy efficiency                        | Building                                       |                              |                              | Infrastructure investment |
|           | Environmental actions                                                                  | Climate change Infrastructure investment       |                              |                              |                          |
|           | Energy savings and efficiency                                                          | Energy efficiency Green technology investment  |                              |                              |                          |
|           | Support to automotive sector                                                           | Road                                           |                              |                              | Transitory subsidies    |
|           |                                                                                       | Car                                            |                              |                              |                          |
|           | (Annexure 1 continued)                                                                 |                                               |                              |                              |                          |
| Name of Instrument                                           | Sector                              | Type of Instrument                              |
|--------------------------------------------------------------|-------------------------------------|------------------------------------------------|
| **Sweden**                                                   |                                     |                                                 |
| Energy efficiency                                            | Energy efficiency                   | Green technology investment                      |
| Climate investments                                          | Climate change                      | Green technology investment                      |
| Other measures for protecting the climate                    | Climate change                      | Green technology investment                      |
| **Netherlands**                                              |                                     |                                                 |
| Schiphol/aviation/flight tax                                 | Aviation                            | Tax/fee                                         |
| Waterways, locks and inland ports                            | Water                               | Infrastructure investment                        |
| Faster implementation of FES environmental and sustainability projects | Climate change                      | Green technology investment                      |
| Car-scraping schemes                                         | Car                                 | Green technology investment                      |
| Sustainable farming                                          | Climate change                      | Green technology investment                      |
| Electronic cars                                              | Car                                 | Green technology investment                      |
| Energy investment tax credit                                 | Renewable/energy efficiency         | Tax/fee                                         |
| Residential energy savings                                   | Energy efficiency                   | Green technology investment                      |
| VAMIL/MIA (SMEs' tax reduction for ecological investment)    | Climate change                      | Tax/fee                                         |
| Sustainable energy                                           | Renewable/energy efficiency         | Green technology investment                      |
| Spatial economy (Van Geel motion)                            | Land use                            | Green technology investment                      |
| Sustainable business                                         | Business                            | Green technology investment                      |
| **United Kingdom**                                           |                                     |                                                 |
| Warm front project                                           | Energy efficiency                   | Green technology investment                      |
| Accelerated decent home programme by providing funds to houses with energy efficiency and heating measures | Energy efficiency                   | Green technology investment                      |
| Cut in VAT                                                   | Energy efficiency                   | Tax/fee                                         |
| Expansion in railway network capacity                        | Rail                                | Infrastructure investment                        |
| Support to energy and resource efficiency                    | Renewable/energy efficiency         | Green technology investment                      |
| Decentralized small-scale and community low-carbon energy programme | Low carbon programme | Green technology investment |
|---------------------------------------------------------------|----------------------|----------------------------|
| Low-carbon vehicles                                           | Car                  | Fund                       |
| Support to low-carbon industries and advanced green manufacturing | Low carbon          | Green technology investment |
| Accelerated call for trans-European transport projects (TEN-T) | Energy efficiency    | Green technology investment |
| Plan to spend budget reserves on energy and internet infrastructure | Energy efficiency    | Infrastructure investment |
| Climate change financing by EIB                               | Energy efficiency    | Loans                      |
| EBRD additional credit for green and infrastructure investment | Climate change       | Infrastructure investment     |
| British Waterways network infrastructure                      | Renewable/energy efficiency | Infrastructure investment |
| Expenditures on flood defence infrastructures                 | Water                | Infrastructure investment |
| Low-carbon power                                               | Water                | Infrastructure investment |
| Jobs in the low-carbon sector                                  | Low carbon           | Infrastructure investment |
| **United States**                                              | Job                  | Programmatic spending       |
| Clean energy                                                  | Renewable energy     | Green technology investment |
| Highway construction                                          | Highway              | Infrastructure investment   |
| Investment in building and home energy conservation programmes | Building            | Infrastructure investment |
| Tax credits for energy efficiency improvements                | Energy efficiency    | Tax/fee                     |
| Rail, high-speed rail investment                               | Rail                 | Infrastructure investment   |
| Low-carbon vehicles                                           | Car/bus              | Tax/fee                     |
| Tax incentives to spur savings and green jobs                 | Renewable            | Green technology investment |
| Energy efficiency and renewable energy programmes             | Renewable/energy efficiency | Green technology investment |
| Federal loan for renewable-energy systems and electricity transmission | Renewable | Green technology investment |
| Modernizing of nation's electricity grid                       | Grid                 | Green technology investment |
| Name of Instrument                                                                 | Sector          | Type of Instrument          |
|----------------------------------------------------------------------------------|-----------------|-----------------------------|
| Army corps of engineers (water) and others                                        | Water           | Infrastructure investment   |
| Water infrastructure projects                                                    | Water           | Infrastructure investment   |
| Improvement of national parks                                                     | Climate change  | Infrastructure investment   |
| ARRA extending the PTC for the sectors under TARP                                 | Renewable       | Fund                        |
| Carbon capture                                                                    | Low Carbon      | Green technology investment |
| DoE loan guarantees                                                               | Energy          | Loans                       |
| Capital subsidy for a new plant                                                   | Renewable       | Transitory subsidies        |
| Job creation                                                                      | Job             | Programmatic spending       |
| The proposed Waxman–Markey American Clean Energy and the Security Act of 2009    | Green policy    | Tax/fee                     |
| (ACESA)                                                                          |                 |                             |

**Source:** Authors’ analysis based on GPRC (2009), HSBC (2010), ILO (2010) and Strand and Toman (2010).
Note
1. Information from 21 countries is collated; these countries include Austria, Belgium, Brazil, Czech Republic, Denmark, Finland, France, Germany, India, Italy, Japan, Lithuania, People’s Republic of China, Poland, Portugal, Slovenia, Spain, Sweden, Netherlands, the United Kingdom and the United States.

References
Barbier, E. B. (2010). Global governance: The G20 and a global green new deal. Department of Economics & Finance, University of Wyoming.
Bowen, A. (2014). Green growth. In G. Atkinson (Ed.), Handbook of sustainable development (pp. 237–251). Edward Elgar.
Bowen, A., & Fankhauser, S. (2011). The green growth narrative: Paradigm shift or just spin? Global Environmental Change, 21(4), 1157–1159.
Boyce, J. (2001). From natural resources to natural assets. New Solutions: A Journal of Environmental and Occupational Health Policy, 11(3), 267–228.
Business Line. (2020). Comparing India with the rest of the world. Hindu Business Line, 14 May 2020. Retrieved September 12, 2020, from https://www.thehindubusinessline.com/economy/stimulus-package-coronavirus-nirmala-sitharaman-finance-minister-narendra-modi/article31580614.ece
Crossley, É. (2020). Ecological grief generates desire for environmental healing in tourism after COVID-19. Tourism Geographies, 22(3), 1–11.
Custers, P. (2010). The tasks of Keynesianism today: Green new deals as transition towards a zero growth economy? New Political Science, 32(2), 173–191.
ECPI. (2016). South Korea move from green economy to creative economy. Seoul: ECPI.
EU (European Union). (2020, March). Taxonomy: Final report of the technical expert group on sustainable finance. EU.
GOI (Government of India). (2020). PM’s address to the Nation on 12.5.2020. https://www.pmindia.gov.in/en/news_updates/pms-address-to-the-nation-on-12-5-2020/?comment=disable&tag_term=pmspeech.
GPRC (Government of the People’s Republic of China). (2009). China’s stimulus helps meet green goals. http://www.china-embassy.org/eng/gyzg/jjmy/t560080.htm.
HSBC. (2010). Delivering the green stimulus. HSBC Climate Change & Global Research.
IEA. (2020). Green stimulus after the 2008 crisis: Learning from successes and failures. IEA. https://www.iea.org/articles/green-stimulus-after-the-2008-crisis.
ILO (International Labour Organization). (2010). Green stimulus measures. ILO.
IMF (International Monetary Fund). (2020a). The great lockdown through a global lens. IMFBlog. IMF.
Jänicke, M. (2012). “Green growth”: From a growing eco-industry to economic sustainability. Energy Policy, 48, 13–21.
Jung, Y.-M. (2015). Is South Korea’s green job policy sustainable? Sustainability, 7(7), 8748–8767.
Kedia S., Sinha, R., Pandey, R., et al. (2020). Greening post COVID-19 economic recovery in India: A case for green fiscal stimulus. Discussion Paper, New Delhi: The Energy and Resources Institute and Global Green Growth Institute. Retrieved September 12, 2020, from https://www.teriiin.org/sites/default/files/2020-06/GER_dp_0.pdf
Larcom, S., & Swanson, T. (2011). Economics of green economies: Investment in green growth and how it works. In P.-M. Dupuy (Ed.), Harnessing foreign investment to promote environmental protection incentives and safeguards (pp. 97–128). Cambridge University Press.
Mission2020. (2020). Green stimulus: Case studies from 2008–2009. https://mission2020.global/wp-content/uploads/Green-stimulus_case-studies-from-2008-2009.pdf

Mundaca, L., & Richter, J. L. (2015, February). Assessing ‘green energy economy’s stimulus packages: Evidence from the US programs targeting renewable energy. Renewable and Sustainable Energy Reviews, 42(2015), 1174–1186.

O’Callaghan-Gordo, C., & Antó, J. M. (2020). COVID-19: The disease of the anthropocene. Environmental Research, 187(2020), 109683–109683.

Pearce, D. W., Markandya, A., & Barbier, E. (1989). Blueprint for a green economy. Earthscan.

Samad, G., & Manzoor, R. (2011). Green growth: An Environmental technology approach. Pakistan Development Review, 50(4), 471–490.

Shkarupa, O. V., O. I. Karintseva, et al. (2016). Innovation potential of ecological modernization for green growth of economics: A case study. International Journal of Ecology and Development, 31(1), 73–82.

Smith, L. (2012). Are green and growth compatible? Environmental Law and Management, 24(1), 11–16.

Statistica. (2020). Value of COVID-19 stimulus packages in the G20 as share of GDP 2020. https://www.statista.com/statistics/1107572/covid-19-value-g20-stimulus-packages-share-gdp/

Strand, J., & Toman, M. (2010). “Green stimulus,” economic recovery, and long-term sustainable development. World Bank.

Swain, A. (2014). India’s green industrial policy: Pursuing clean energy for green growth. Economic and Political Weekly, 49(9), 19–21. http://www.jstor.org/stable/24479168

TERI-GGGI. (2015). Green growth and sustainable development in India. TERI and GGGI.

Van Der Ploeg, R., & Withagen, C. (2013). Green growth, green paradox and the global economic crisis. Environmental Innovation and Societal Transitions, 6, 116–119.

WHO. (2012). Climate change and infectious diseases. WHO.

World Bank. (2009). Republic of Korea’s green stimulus. World Bank.