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BACKGROUND PAPER

Synergies between the 2030 Agenda and Paris Agreement: An Overview

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Background Paper

Synergies between the 2030 Agenda and Paris Agreement:

An Overview

1. Introduction

The 2030 Agenda for Sustainable Development and the Paris Agreement on climate change were negotiated in parallel and adopted in 2015 within a few months of each other. The former is a voluntary agreement endorsed by the world's leaders at the UN Sustainable Development Summit in September 2015. The latter is an agreement reached by Parties to the United Nations Framework Convention on Climate Change, a legally binding international treaty. The climate change commitments – nationally determined contributions (NDCs) – that countries have made in the context of the Paris Agreement are not themselves legally enforceable, though countries are required to maintain their NDCs, to monitor and report on progress, and to scale up ambition over time.

The Sustainable Development Goals (SDGs) which form the centerpiece of the 2030 Agenda include SDG 13 on tackling climate change and its impacts. This goal makes reference to the lead role of the UNFCCC in the domain of negotiating international climate policy, but it also embeds action to tackle climate change firmly in the 2030 Agenda. Likewise, there are multiple targets elsewhere in the SDGs which bear upon climate change mitigation, adaptation and resilience building (even if the language is not always explicit). This reflects the recognition by UN negotiators that many global goals, from poverty eradication and ending hunger to conserving biodiversity and protecting our oceans, will be unattainable if climate change is left unchecked, also the recognition that going forward actions to achieve social and economic objectives need to be aligned with climate change objectives.

This paper explores the interconnections and interdependencies between the SDGs and the Paris Agreement, including countries' NDCs.

In Sections 2 and 3, the paper views these linkages, first, from the perspective of the SDGs and those responsible for their attainment, including at the sectoral level – asking what alignment with the Paris Agreement means for the design and

implementation of SDG strategies, plans and policies; then, from the perspective of climate and those responsible for climate policies and actions – asking what alignment with the 2030 Agenda implies for these, giving particular attention to the commitment in the 2030 Agenda to “leave no one behind” (LNoB) and its intersection with the commitment of countries to a ‘just transition’ towards a zero-carbon economy.

Section 4 summarizes research done principally by WRI and GIZ on the experience to date of selected countries with aligning the 2030 Agenda and Paris, distilling broad lessons. [This complements a companion background paper on country experiences prepared by TERI.]

Section 5 provides an overview of various tools which have been developed in the past few years to map and analyze the climate (NDC)-SDG interlinkages. Each tool provides a slightly different perspective on the links between the two agendas. Some have greater policy richness than others, working at a more granular policy or project level, while others provide a broad perspective on alignment between the two agendas.

Section 6 concludes with a few reflections on the implications of the interlinked nature of these two agendas/agreements – for policy coherence and institutional alignment, for financing and other means of implementation, and for monitoring and reviewing progress.

This paper addresses the following questions: (1) how would unmitigated climate change impact the prospects for achieving various sustainable development goals; (2) how far can actions to achieve one or more of the other SDGs be designed to attain climate benefits (SDG 13 and the Paris Agreement) simultaneously and cost effectively; (3) how far can actions to address climate change – whether mitigation or adaptation – advance progress towards other SDGs; (4) can the 2030 Agenda provide a framework for climate policies and actions which ensures that no one is left behind and vulnerable groups are protected; (5) what lessons have governments and others learned to date about the benefits and challenges of more closely aligning implementation of these two agendas?

The following section highlights the need to pursue new macroeconomic growth and sectoral development paths consistent with both the SDGs and the Paris Agreement, notably its temperature targets of 1.5 and 2 degrees C.

2. Aligning implementation of the SDGs with the Paris Agreement: macro and sectoral perspectives

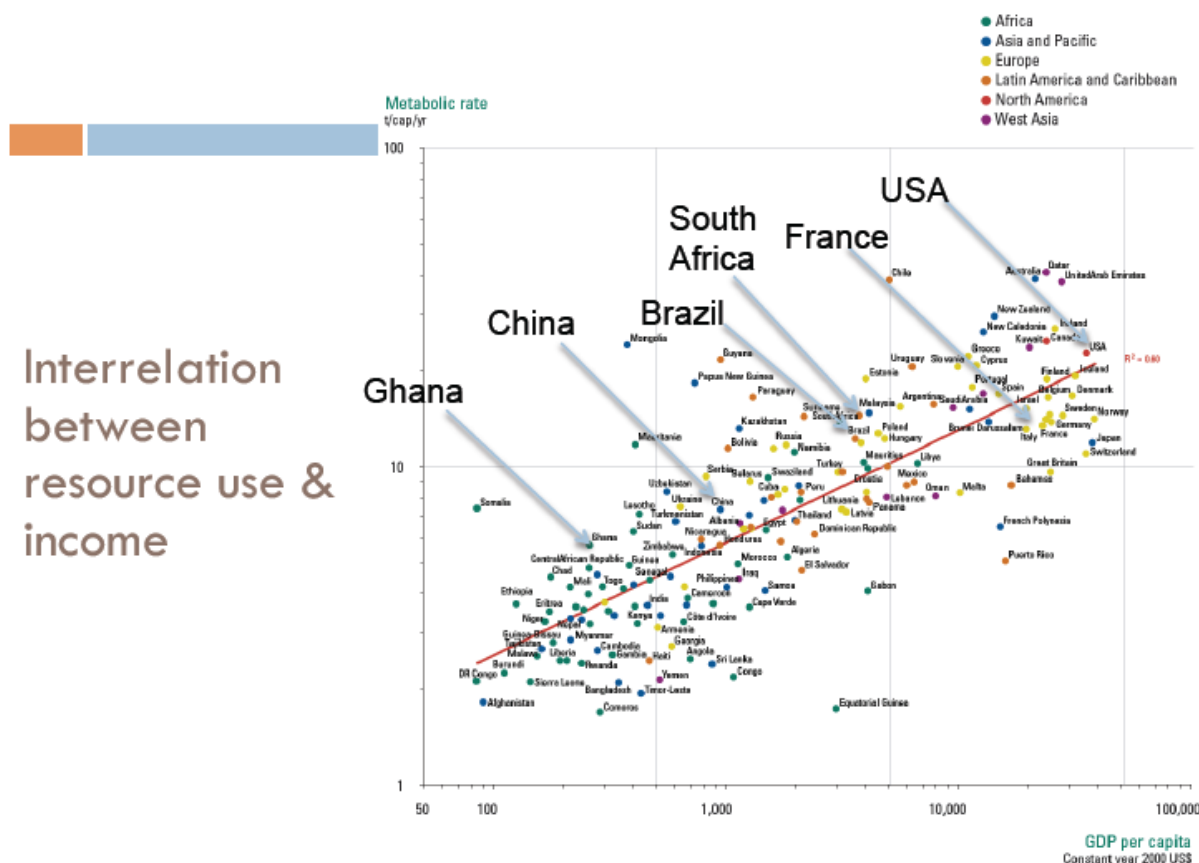
Governments are concerned above all for improving the well-being of their people and to that end with providing enabling conditions, services, and opportunities. A healthy environment and a stable climate system are increasingly well understood as essential conditions for realizing this objective. That realization is well represented by the universal endorsement of the 2030 Agenda for Sustainable Development, with its interlinked goals and targets.

Broad macro considerations

Perhaps the biggest challenge facing governments in coming years is to reconcile policy agendas aimed at achieving and sustaining high standards of well-being of their people with the need to move swiftly and decisively to decarbonize their economies and take other measures to protect the health of the planet in the interest of future generations. At the same time, they will need to factor the necessity of climate change adaptation into future development plans.

The magnitude of the challenge is suggested by Figure 1, which shows the rather strong association between a country's per capita income and its resource use. As the figure shows, with few exceptions developed countries have not made very attractive role models of how to decouple economic growth and rising living standards from environmental degradation and rising greenhouse gas emissions.

Figure 1. Global interrelation between resource use and income
(175 countries in the year 2000)



Source: International Resource Panel (2011):
<http://www.resourcepanel.org/reports/decoupling-natural-resource-use-and-environmental-impacts-economic-growth>

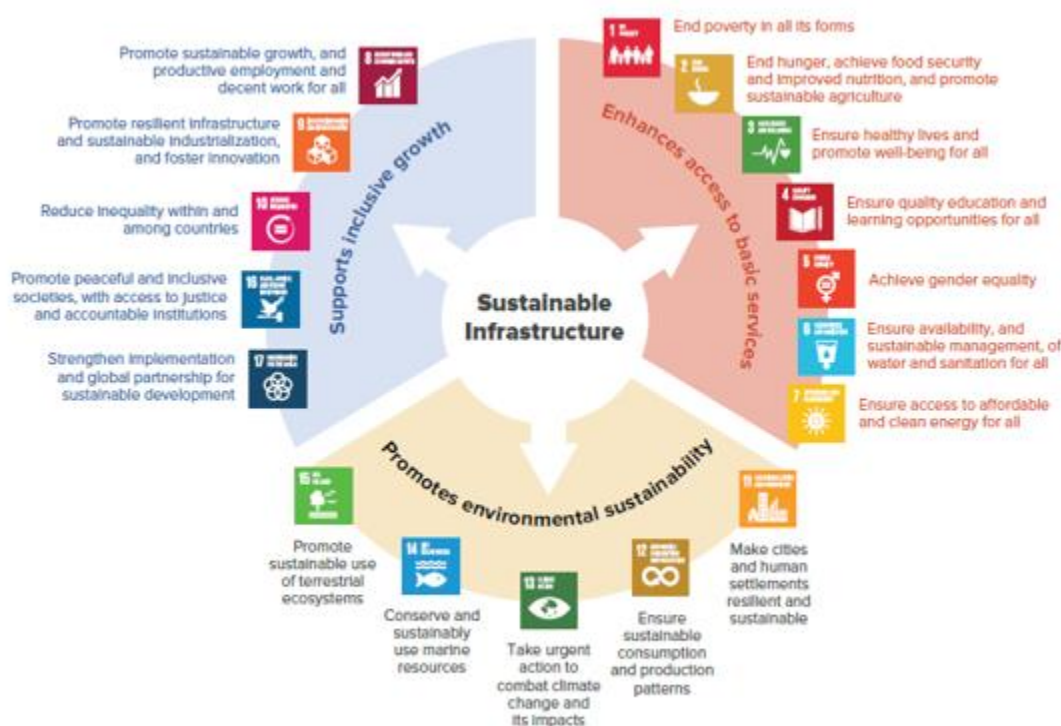
If the growth-carbon-pollution-resource-degradation link is to be severed, countries need to have confidence in the viability and sustainability of new low-carbon, climate-resilient and socially equitable growth paths. These need to be not only mapped out but successfully pursued. Recent analytical work (notably the work of the New Climate Economy initiative¹) has sought to demonstrate not only viability but superiority of such growth paths in achieving sustainable development outcomes. Meanwhile, technology trends and cost trajectories – e.g., for renewable energy, storage and other technologies – point to a future where a low-carbon economic transition is driven increasingly by economic factors with diminishing need over time for government subsidies, mandates or other support

¹ <https://newclimateeconomy.net/>

measures. To the extent that these cost reductions and technological improvements continue at somewhere near historic rates, the costs of transition should remain relatively low in relation to GDP and total investment.

Infrastructure planning and investment will be crucial to pursuit of new development paths, given its long life and strong lock-in effects. In next 15 years the world will build infrastructure worth around \$90 trillion, more than the entire current stock. Seventy percent of that investment will be made in developing and emerging economies. The investment choices they make will be crucial to determining whether the infrastructure of the future is sustainable or not. Low-carbon and resilient infrastructure is critical to achieving many SDGs (Figure 2).

Figure 2: Sustainable infrastructure is essential foundation to achieve the SDGs



Source: Global Commission on the Economy and Climate, 2016, based on Bhattacharya, Chattopadhyay and Nagrah (2016)

Given lock-in and long life, planning and investment decisions today must consider what will be the viability of the infrastructure installed now in 20, 30 or 40 years. In the case of energy-generating and -using infrastructure, this means anticipating whether fossil fuel dependent infrastructure will become stranded assets with more stringent government climate policies. In the case of climate-resilient

infrastructure, the question is one of location – e.g., where infrastructure is to be built in low-lying coastal regions -- and of stringency of specifications – i.e., building in redundancy or other features now to withstand extreme weather events or other climate-related events in future. Natural infrastructure is now more widely considered as an attractive, low-cost option for certain infrastructure needs, including water supply and coastal protection.

Sustainable infrastructure planning and investment presents in the clearest terms the interdependencies of the two agendas – climate and sustainable development – in part at least because the nature of infrastructure forces governments and other decision makers to take the long view.

As the New Climate Economy report of 2016 explains: “Boosting investment in sustainable infrastructure can stimulate demand at a time when many economies are struggling. For inclusive development: Infrastructure is key to the delivery of a number of essential services. It provides a foundation for much of the SDGs’ vision for inclusive development. For the climate: Infrastructure underpins all the major sources of greenhouse gas emissions: our energy systems, transport systems, buildings, industrial operations and land use.”

SIDA: Review of NDC-SDG Linkages and Dialogues on Climate and Development

In cooperation with Swedish Embassies in several countries, the Swedish International Development Agency (SIDA) has convened stakeholder dialogues to discuss alignment between the 2030 Agenda and climate actions². In particular, the discussions addressed: the pursuit of climate-compatible development policies; development benefits of implementing NDCs; priorities and challenges of adapting to climate change; and strategies for addressing trade-offs between climate and development agendas.

While some dialogue participants expressed the view that development should be prioritized over environmental impacts in the short-term, others underscored the

²https://www.sida.se/contentassets/d69702947cb241d1ab77c414af6f9bcd/integrating_climate_action_into_national_development_planning_webb.pdf

potentially high costs of waiting to address climate change and other environmental issues³.

Maltais (2019) provides a summary of the consultations in Cambodia, Tanzania, Uganda, Vietnam and Zambia. The discussions in Cambodia highlight dilemmas faced by many developing countries: “Given Cambodia’s ambition of becoming an upper middle-income country by 2030, more understanding was called for on trade-offs between sustainability and development agendas. Policies for managing trade-offs are required, and questions about how Cambodia can best combine industrialisation policies with the SDGs need to be addressed.” (p.12)

The global SDGs have been conceived as indivisible precisely to discourage focus on progress towards one goal or target to the neglect of others, with a risk to *sustainable* development. Thus, for example, SDG target 8.1, with its emphasis on strong economic growth performance, if pursued without regard for other targets under goal 8, would most likely drive increased carbon emissions. SDG target 8.4, on the other hand, calls for decoupling growth from environmental degradation, which would moderate if not neutralize emissions growth.

Sectoral plans and policies

Analysis of the various SDG targets and indicators suggests that, in most cases, progress towards specific socio-economic goals and targets reinforces progress towards climate goals, and vice versa, but in some cases there may be difficult trade-offs to be addressed (e.g., providing universal, affordable energy access while transitioning rapidly away from carbon-based energy; expanding transportation infrastructure without increasing greenhouse gas emissions apace).

- Sustainable energy for all (SDG 7)

The Sustainable Energy for All (SE4All) initiative launched by the previous UN Secretary General has brought to the fore of development discussions the imperative of providing clean and affordable energy to the many poor people who still lack access to electricity and clean cooking fuels/technologies.

³ <https://sdg.iisd.org/news/swedish-dialogue-series-addresses-ndc-sdg-alignment/>

This initiative and the growing recognition of energy's centrality to rising living standards and economic development inspired and informed the formulation of SDG 7.

The goal and its targets wed social equity with climate action. The dramatic reductions in renewable energy costs of the past two decades have brought this marriage ever closer to consummation. Off-grid renewable energy can, in many locations, provide cost-competitive electricity to rural, remote populations that form the bulk of the 1.2 billion people without energy access. This market is growing very rapidly, with off-grid solar recording annual growth of about 60% since 2010. By the end of 2017, off-grid solar had reached roughly 73 million households, or over 360 million people (NCE 2018).

Scaling up affordable, clean, efficient, and culturally appropriate alternatives to traditional biomass cookstoves remains a major challenge in many developing countries. Where LPG or natural gas are not feasible options, improved biomass cookstoves may offer some improvement in indoor air quality and black carbon emissions. The IEA estimates that universal access to clean cooking alone could avoid 1.8 million premature deaths per year in 2030, free up billions of hours, and improve livelihoods for hundreds of millions of women (IEA 2017). The switch to cleaner cooking options would also significantly reduce GHG emissions and ambient temperature over this century (Lacey *et al.*, 2017).

- *Food security with sustainable and resilient agriculture (SDG 2)*

As the world's agriculture expands to feed a growing population, pressures on forests, fertile lands, and fisheries are expected to continue apace. So too will the greenhouse gas emissions associated with forest conversion and agricultural production. Potential trade-offs exist between different SDG 2 targets: for instance, unsustainable agriculture productivity improvements (2.3) may constrain the maintenance of ecosystems (2.4). Negative interactions of this type can be exacerbated by biofuel production, depending on feedstock, as a means of increasing the share of renewable energy in the energy mix (7.2), which in turn may threaten food security (2.1). (ICS, 2017, p.228.)

With new science and technology and a renewed appreciation of traditional knowledge and of crop genetic diversity, more sustainable approaches to feeding a growing population are available and are increasingly being deployed, though

there is still tremendous need for scaling up. Moreover, climate change itself is intensifying pressures on food and other crop production, and agriculture will need to adapt to avoid future food insecurity and hunger, especially in the most vulnerable agricultural regions.

The shift to more sustainable forms of agriculture combined with strong forest protection could deliver by 2030 over US\$2 trillion per year of economic benefits and generate over 70 millions of jobs, mainly in the developing world⁴. It could also improve food security including by reducing food loss and waste (a third of all food produced is lost or wasted along the food chain), and deliver roughly a third of the mitigation needed to stay within a 2-degree C temperature rise (Griscom *et al.*, 2017). At the same time, restoration of forests, degraded lands, and coastal zones will strengthen defenses and boost adaptation to climate impacts, from more extreme weather patterns to sea-level rise (NCE 2018b⁵).

- *Sustainable cities (SDG 11)*

Urbanization continues at a rapid rate in much of the developing world. As cities expand and new cities emerge, their spatial planning will make a tremendous difference to their social inclusiveness and environmental sustainability. Cities which have developed with weak urban planning and zoning regulations and with rapid growth of the private vehicle stock have paid a heavy price in terms of air pollution and traffic congestion costs.

Where the elements of physical infrastructure – the roads, transport networks – have not yet been laid in concrete or steel, there is an opportunity to avoid lock-in to car-based urban transport systems and to opt instead for other transport modes, including a mix of public transport and non-motorized transport (NCE 2018). To the extent that private vehicles remain a part of the transport mix, greater reliance on ride sharing and an eventual transition to electric vehicles are likely, especially as storage options improve, EV costs decline with scale and learning economies, and charging infrastructure is more widely deployed.

Densification of cities with decent, affordable housing and mixed zoning to facilitate short commutes is one key element of smart city design. Planning

⁴ Business and Sustainable Development Commission (2016), *Better Business, Better World*. London.

⁵ <https://newclimateeconomy.report/2018/executive-summary/>

sustainable cities with a view not just to social inclusion (SDG targets 11.1, 11.2, 11.3) but to environmental sustainability (11.6, 11.b) holds the prospect of realizing sizeable local health, employment and productivity benefits while also minimizing cities' carbon footprints per dollar of GDP and per resident.

Harnessing the SDG-climate synergies while minimizing trade-offs across key sectors of the economy can deliver multiple co-benefits. These co-benefits enhance the attractiveness of the investments from a social perspective; the policy environment will be critical to ensuring that these social benefits get internalized to drive private investment decisions.

3. Situating climate actions in 2030 Agenda (including 'leaving no one behind')⁶

IPCC (2018) examines synergies and trade-offs between climate mitigation and adaptation actions, on one side, and various sustainable development outcomes, on the other. With respect to mitigation, it finds that “the number of synergies between mitigation response options and sustainable development exceeds the number of trade-offs in energy demand and supply sectors; agriculture, forestry and other land use (AFOLU); and for oceans (very high confidence). ... The 1.5°C pathways indicate robust synergies, particularly for the SDGs 3 (health), 7 (energy), 12 (responsible consumption and production) and 14 (oceans) (very high confidence). ... For SDGs 1 (poverty), 2 (hunger), 6 (water) and 7 (energy), there is a risk of trade-offs or negative side effects from stringent mitigation actions compatible with 1.5°C of warming (medium evidence, high agreement).” (pp. 447-448).

While only a handful of countries' Nationally Determined Contributions (NDCs) under the Paris Agreement make explicit reference to the Sustainable Development Goals (SDGs)⁷, many recognize the links between climate actions and social and economic development. “Some countries include concrete examples of specific co-benefits of their intended climate actions, such as health benefits from reduced air pollution; improved energy access and security; improved water quality

⁶ The Reference Manual of CDKN (2016) provides examples of where putting in place the mechanisms for delivery of NDC commitments – whether governance, financing, or monitoring and review – can also contribute to advancing towards various SDGs beyond SDG 13.

⁷ See e.g. the INDCs/NDCs of Bolivia, Cuba, Egypt, Guatemala, Indonesia, Jordan, South Sudan, Swaziland and Uganda. Not surprising that few countries reference the SDGs, given the timing of issuance of many INDCs before SDGs were formally adopted by Heads of State and Government at the UN SDG Summit in September 2015.

and management; social progress, including poverty reduction, increased well-being and job creation; economic diversification; and synergies between adaptation and mitigation actions towards building resilience, particularly in areas of agriculture and forestry, as well as relating to food security.” (UN, 2017, South-South Cooperation)

Beyond lingering concerns over growth performance under tight carbon constraints, many developing countries still confront the “fierce urgency of now” with respect to lifting their people out of extreme poverty. At the same time, the IPCC’s 1.5° C report reminds us of the urgency of strong climate action, with a window of barely over a decade to contain risks of severe climate consequences. So, we are faced with a dilemma: the poor (and especially the poorest) are apt to be the most vulnerable to climate change, and at the same time there is a risk that they may bear too heavy a burden from forceful climate action.

Leaving no one behind is one of the key commitments of the 2030 Agenda for Sustainable Development. It is therefore imperative that it be considered in relation to climate policies, insofar as they impact the poorest and most vulnerable. While some climate policies could, if not properly designed, adversely impact the poor, climate policies can also be explicitly designed with a view to the benefits provided the poor. For instance, the poor and vulnerable groups could be targeted for training to qualify for job opportunities, e.g., in the renewable energy industry.

How practically can climate policies and actions adhere to the objective to leave no one behind? How can they be designed and implemented in such a way that they, at the very least, do not impose a heavy burden on poor people or other vulnerable groups (e.g., workers in ‘sunset’ industries like coal) and, at best, yield income, health and other benefits for them?

In light of the critical need for countries to raise the ambition of their NDCs in the coming period, providing assurances that climate action can be made compatible with the LNoB objective is crucial to be able to mobilize broad political support for strong action.

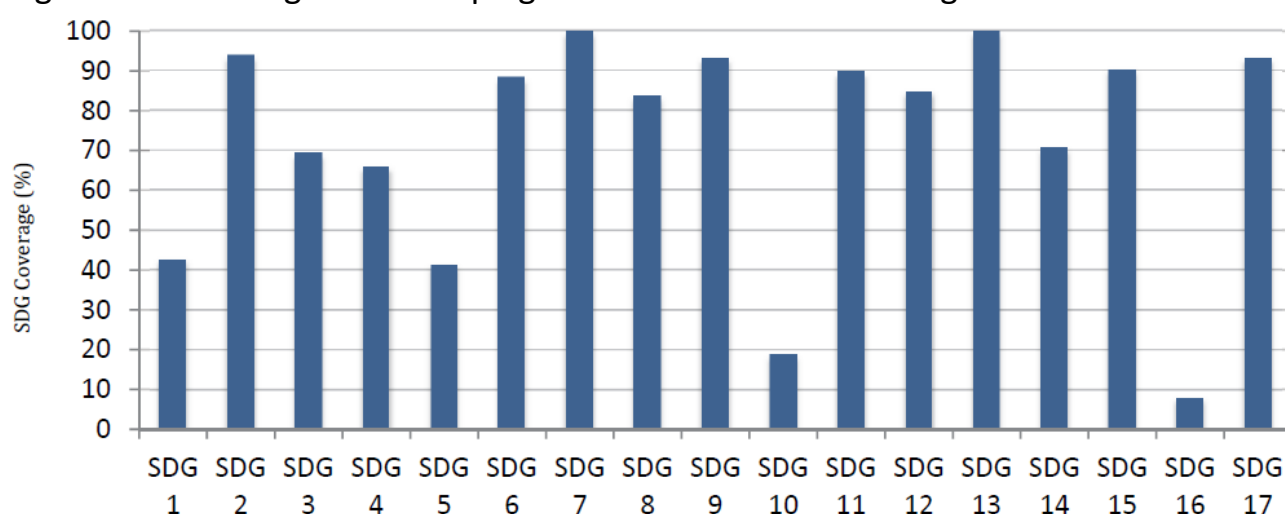
Aspects to consider in designing and implementing climate actions may include:

- addressing potential negative effects of climate efforts on the poor and vulnerable;

- paying closer attention to where climate policy (including adaptation) needs to be directed to realize benefits for the poor;
- seizing opportunities for addressing equity and poverty in climate-cum-development policy design.

Although a number of NDCs highlight the need to contribute to inequality reduction and adopt a gender perspective, few include concrete measures to do so. Figure 3 shows the percentage of developing countries' NDCs linking to different SDGs and their targets.

Figure 3: Percentage of developing countries' NDCs addressing SDGs

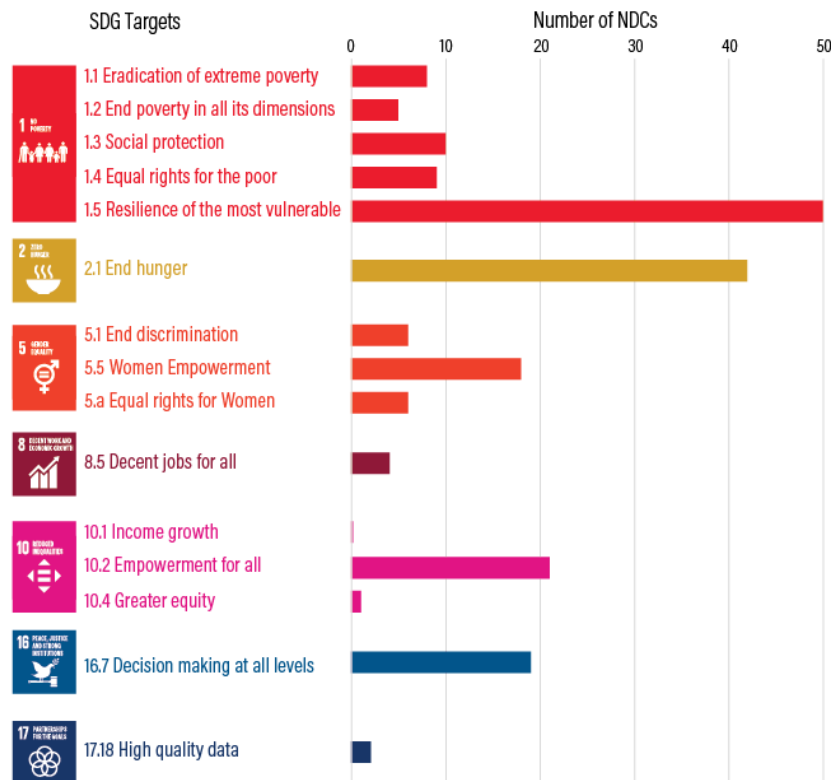


Source: Climate Change secretariat analysis of developing countries' NDCs.

The high percentages of NDCs addressing goals 7 (Energy), 2 (Agriculture), 9 (Industry and Infrastructure), 11 (Sustainable Cities), 13 (Climate Change) and 17 (Means of Implementation and Global Partnership) should not be surprising. What is noteworthy is the low percentage of NDCs referencing goals 10 (inequalities), 16 (peace and justice), and 1 (poverty eradication). Climate actions, as spelt out in NDCs, are not yet widely understood as integrally related to policy objectives like poverty eradication and inequality reduction.

This observation is corroborated by data from Climate Watch's NDC-SDG Linkages online database, which shows that the first round of NDCs have addressed key SDG targets for the pledge of "leaving no one behind" in a limited and uneven fashion (Figure 4).

Figure 4: Alignment of NDCs with SDG targets relevant to leaving no one behind



Source: Climate Watch, NDC-SDG Linkages online database:
<https://www.climatewatchdata.org/ndcs-sdg>

Net carbon neutrality by mid-century can be achieved only through a major transformation of energy systems and structural changes to economies. We know from history – the industrial revolution, the IT revolution -- that structural changes can be disruptive, that they require adjustments and some are better able to adjust than others. The adjustments will be in the sectoral composition of GDP in economies around the world, in the sectoral allocation of capital and labor, and in the kinds of skills required by workers in the emerging versus declining sectors. Sectors here should be fairly narrowly defined, as many shifts will occur within the broad energy sector, for example, from fossil-fuel-powered electricity to zero-carbon sources, from internal combustion engine vehicles to electric vehicles, from cement and steel to other building materials. Some jobs will be destroyed, others created. The net effect on employment is unknown. One critical concern is the transferability of skills from jobs phased out to those phased in – e.g., from fossil-fuel power plant operation and maintenance to renewable energy plant O&M.

Concern over fostering a ‘just transition’ to a zero-carbon future, one that provides adequate social protection, reskilling and productive redeployment of impacted workers, and adjustment assistance for their communities, was prominent during the 2018 Conference of the Parties to the UNFCCC in Katowice, Poland. A number of countries have created commissions, undertaken studies and formulated measures designed to foster a ‘just transition’ as part of their national climate change strategies (NCE 2018). Measures to foster a ‘just transition’ represent one way in which governments are aiming to leave no one behind in the context of climate action.

Viewing climate policy through the lens of ‘leaving no one behind’ should remind policy makers that, among the criteria they need to consider when deciding on the desirability of a particular policy, distributional impacts – especially on the poor and vulnerable groups – need to be considered, along with effectiveness in achieving objective or target; political feasibility; cost effectiveness; administrative simplicity.

Whether specific attention needs to be given in climate policy design to impacts on the poorest or other vulnerable populations will depend on the circumstances. Bearing in mind the intent of SDG target 16.7 to provide voice to the voiceless, and in the spirit of ‘leaving no one behind’, countries may wish to consider incorporating legal provisions for a ‘just transition’ in future climate change legislation or amendments to current legislation and implementing regulations.

A number of countries have already begun to reflect ‘just transition’ considerations in national institutions and policies (NCE 2018a). For instance, on 26th January 2019, Germany’s “coal commission”—a committee established by the Government and made up of coal sector stakeholders tasked to explore the terms for a fair and feasible German coal exit—came to a landmark compromise agreement on a full exit from coal by 2035-2038 (Sartor 2019, IDDRI). Uruguay has implemented ILO guidelines for a ‘just transition’ while Canada has established a federal task force on ‘just transition’, including social dialogue and union participation. China has created a \$15 billion dollar fund for retraining, reallocating and early retirement of some 5-6 million people adversely affected by reducing coal and steel overcapacity. Examining countries’ NDCs, South Africa refers to the need for an “inclusive and just transition to a climate resilient economy and society” but without any specifics of national policies. Worrall et al. (2018) observe that, although South Africa’s

government has put in place employment policies to develop renewable energy skills, a national reskilling program is not in place and there has been no analysis of the distributional impacts of the energy transition or the socio-economic impacts of phasing out coal. On the other hand, the National Planning Commission has been leading a stakeholder consultation process to develop consensus on what a ‘just transition’ to a low-carbon society means for South Africans⁸.

There are other examples⁹ of initiatives by non-state actors as well as government pension funds – e.g., the Just Transition Fund in the Appalachian region of the USA, and the UK and French government pension funds which have decided to factor ‘just transition’ into their climate policies and engagement priorities. [See Robins et al. (2018).] In Australia’s Port Augusta, workers and their unions at a dying coal-fired power plant successfully lobbied to have a solar thermal plant built in its place, enabling workers to transfer their skills and keep their employment.

Leaving no one behind in climate policy extends beyond addressing displacement of workers in declining industries. Other difficult questions governments may confront include: what would phase out of coal-fired power generation mean for the affordability of electricity to the poor? how can affordable access be ensured?

4. How are NDC-SDG linkages being addressed by governments so far?

What are different approaches, entry points for governments to align climate policies/actions and the broader SDG agenda more closely in practice?

UNDP has been advising national governments on implementation of both the 2030 Agenda and their climate commitments since 2015. It has recognized the value of more closely aligning implementation efforts between these two agendas. In a 2017 note, it identifies a number of entry points for working to achieve such alignment (see Figure 5).

⁸ See WRI blog (Cynthia Elliott):

⁹ See http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2019/01/world-map_v4.jpg

Figure 5: Entry points for NDC-SDG alignment in national governments



Source: UNDP (2017), *Aligning Nationally Determined Contributions and Sustainable Development Goals*.

Despite growing recognition of the opportunities for realizing synergies between the two agendas, many countries report that linking up the sustainable development and climate change agendas is challenging, since both have their own history, community of actors and political dynamics. National-level implementation of the 2030 Agenda and the Paris Agreement generally proceed on different tracks, with distinct institutional, policy and monitoring frameworks. In most countries, environment ministries steer the climate change agenda while more central

cabinet-level institutions, such as offices of the president or prime minister or planning and finance ministries, are entrusted to coordinate SDG implementation. Limited coordination reduces the ability of policy makers to identify linkages and opportunities for joint pursuit of national climate and sustainable development targets (Bouyé et al. 2018).

However, a growing number of countries aim to foster alignment and synergies between the SDG and climate agendas. Drawing on WRI and GIZ research, this section captures key entry-points that early movers have used to address SDG and climate linkages both in planning climate actions and in setting their national targets and priorities to advance the global SDGs at the national level.

Analysis of linkages with the SDGs in climate policy planning

Many countries have highlighted the main sustainable development benefits of their NDC, with some referencing specific SDGs. Only a few, though, have aimed at systematically assessing the impact of climate actions on the SDGs in order to foster SDG-NDC integration and build a stronger case for advancing climate action.

Ex-ante SDG assessment of new climate policies/actions. A handful of countries have taken into account the impact of proposed climate policies on the SDGs in formulating their climate plans. Indonesia was a pioneer in considering benefits for the SDGs in selecting actions for its NDC. More recently, with the support of WRI, Kenya undertook an SDG impact assessment of the actions proposed for the National Climate Change Action Plan 2018–22. Carried out in close collaboration with both climate change and SDG focal points in sector ministries, the assessment identified SDG-climate synergies and trade-offs to inform the selection of key low-carbon, climate-resilient development opportunities. The assessment also calls for planning specific measures for inequality reduction and gender equality.

Ex-post SDG impact assessment of the NDC. Some countries have undertaken an assessment of the impacts of their existing NDC on the implementation of the 2030 Agenda. Mexico's experience (see Box) shows that the active involvement of sector ministries in such an analysis builds an understanding of climate-sustainable development linkages, enables the identification of policy incoherence within and across sectors, and helps get greater buy-in across the government to advance the NDC in synergy with the SDGs.

Regular assessment of climate-SDG synergies in NDC and long-term strategy implementation. Some countries plan to monitor closely impacts and expected benefits from climate actions for sustainable development priorities. For instance, Germany's Climate Action Plan 2050 calls for alignment with the SDGs in advancing the objective of GHG neutrality and requires economic and social impact assessment of climate sectoral targets at regular intervals.

Indicators tracking SDG-climate synergies and trade-offs. Countries can set indicators monitoring the evolution of the impacts of their climate actions on the national SDG priorities. Kenya's national climate change action plan 2013-2017 includes indicators on climate-sustainable development synergies and trade-offs. For instance, one indicator measures the average cost of public transportation per journey, to monitor whether improvements in energy efficiency of the vehicle fleet come with higher ticket prices.

Box: Mexico's analysis of the co-benefits from its NDC for the national implementation of the SDGs

In 2018, the Office of the Presidency of Mexico and SEMARNAT (the Secretariat of Environment and Natural Resources) released a study proposing a co-benefits approach to an integrated implementation of the 2030 Agenda and the Paris Agreement, with support from GIZ on behalf of BMZ. Drawing on a review of literature on common sustainable development co-benefits of climate action, the study maps the intersections between the NDC and the SDGs and provides options to foster SDG benefits from climate actions. These options were identified through an inter-ministerial and multi-stakeholder process.

The analysis shows that all climate actions under the NDC can generate sizable co-benefits for SDG implementation, the greatest synergies lying in the sectors of agriculture and land use, land-use change, and forestry. NDC actions with the biggest benefits were proposed as priority "development accelerators".

Underscored in the study was a lack of concrete ways of realizing potential co-benefits for poverty eradication (SDG 1), gender equality (SDG 5) and inequality reduction (SDG 10).

This study has helped develop a compelling development case for NDC implementation and secured greater buy-in from line ministries for NDC mainstreaming in policy planning.

Consideration of linkages with the NDC in setting priorities for the national implementation of the SDGs

Countries have considered climate commitments in various ways when formulating nationally-relevant SDG targets and setting policy priorities.

Alignment of nationally adapted SDG targets with climate commitments. The national commitments defined in the NDC, which often have a 2030 timeline, are particularly useful in translating climate-related SDGs at the national level, given that SDG targets were quantified only at the global level or remain unspecific. A few countries, including Ethiopia, Finland, and Sweden, have embedded the Paris goals of climate resilience and carbon neutrality in their national SDG targets. The carbon neutrality goal is one of the two overarching priorities in Finland's National Implementation Plan for the 2030 Agenda.

Measures fostering climate-SDG synergies highlighted in NDCs. The formulation of national SDG targets is also an opportunity to tackle sustainable development challenges that are identified in NDCs as a condition for moving climate actions forward. For example, Uganda's NDC underscores the importance of SDG 7 given the need for greater access to modern energy to reduce reliance on wood fuel and decrease deforestation. In turn, SDG 7 related targets embedded in Uganda's national development plan aim at increasing electricity access from 14 to 30 percent of the population through the provision of renewable energies and liquefied petroleum gas that will replace firewood and charcoal in rural areas.

Analysis of climate-SDG linkages in development policy planning.

Efforts at embedding the two sets of goals in national, sector and local development plans often lack an integrated approach. The issuance of different guidance for mainstreaming SDGs and the NDC tends to overload planning processes and does not help policy makers identify linkages between these agendas. Early country experiences suggest that the few following elements are among those that can provide incentives and support for policy and project planners to address climate and sustainable development policy linkages.

Guidance enabling integrated planning for the climate and SDG agendas. Updates of standard planning guidance, to be followed by all institutions, can spur and

support sector and local planners to identify linkages and select priorities based on benefits for the two agendas. Among the best practices are requirements in Bangladesh's Seventh Five Year Plan for mainstreaming the poverty-environment-climate disaster nexus in project design, budgetary, and monitoring processes, and Mexico's Planning Law and Climate Change Act that were revised in the past two years to align the national development plan with the SDGs and the Paris Agreement.

Capacity building to identify and address policy linkages. Since the formulation of national development plans typically engages a wide range of governmental, parliamentary, and non-state actors, several countries, including Ethiopia, Togo, Colombia, and Indonesia, have used this planning process to build understanding of the implications of both agendas for national development.

Monitoring of SDG-NDC joint integration in policy planning. In some countries, planning and finance ministries have started to assess alignment of national and sector development plans and budgets with both the NDC and the SDGs. In 2019, Uganda updates its evaluation of annual budgets with this in view. These assessments could look at how to address trade-offs and missed opportunities for synergies.

Development cooperation's support to address SDG-climate linkages

National efforts at addressing SDG-climate linkages need to be supported by a more integrated approach to capacity building and technical assistance for NDC and SDG implementation. Donor support has tended to focus on climate action and the SDGs as relatively separate issues, but a number of initiatives are starting to link the two. They include UNDP's mainstreaming, acceleration and policy support (MAPS) and NDC support program that help address SDG-climate linkages and monitor benefits from climate actions for the SDGs; the 2030 implementation initiative implemented by GIZ on behalf of BMZ, which, for example, supports the Office of the President in Mexico (in charge of SDGs) in fostering a joined-up implementation with the Paris Agreement; and WRI technical assistance that helps countries carry out SDG impact assessment of climate actions and embed an integrated planning approach to SDG and climate actions in planning guidelines and tools for sector and local development strategies and projects.

5. Tools to map interconnections between SDGs and climate commitments

There have been several exercises to date which have mapped climate commitments (normally but not always as reflected in NDCs) against the SDGs – e.g. WRI, GIZ, TERI, DIE, SEI, Climate Analytics, ECN, New Climate Institute and others. This section reviews the main findings as well as limitations of this work. Several tools are qualitative in nature, with little quantified evidence. Quantification in turn ranges from rough scalar ratings to specific estimates of different impacts of climate actions on other sustainable development outcomes – e.g., employment, health, access to energy. The tools which rely on NDC language face the challenge that many NDCs make at best rather general references to sustainable development objectives.

Many countries and regional groupings (e.g., the European Union) had climate policies in place well before the adoption of the Paris Agreement in 2015. The (Intended) NDCs submitted by countries in the lead up to or soon after the adoption of the Paris Agreement provide an indication of the initial ambition of individual countries' efforts to reduce greenhouse gas emissions (with GHG targets set for 2025 or 2030) and, in many cases, to adapt and build resilience to climate change. They also enumerate in greater or lesser detail the policies and other measures designed to achieve the stated emission, renewable energy and other targets. Many developing countries' NDCs contain two (sets of) targets – the first unconditional and the second conditional on enhanced international finance and other support to decarbonization.

One task governments have faced in the aftermath of Paris is aligning the NDCs with existing national climate plans and policies, to increase the likelihood of delivering on their NDCs. At the same time, the need to deliver on climate commitments implicates multiple economic sectors, so better integrating climate planning and policy into the mainstream of economic development planning has also been imperative. In light of the prevalent concern that vigorous climate mitigation measures could constrain economic growth, there is a growing recognition of the need to map and as far as possible quantify links from climate action to social and economic outcomes as reflected in various SDGs and targets. At the same time, it is increasingly appreciated that by no means do all links from climate action to the economy involve trade-offs; indeed, if well-designed and

executed, climate policies can yield significant co-benefits for economy, society and environment. (This growing body of evidence on the positive economic opportunities for ambitious climate action is well documented in the various reports of the New Climate Economy initiative.)

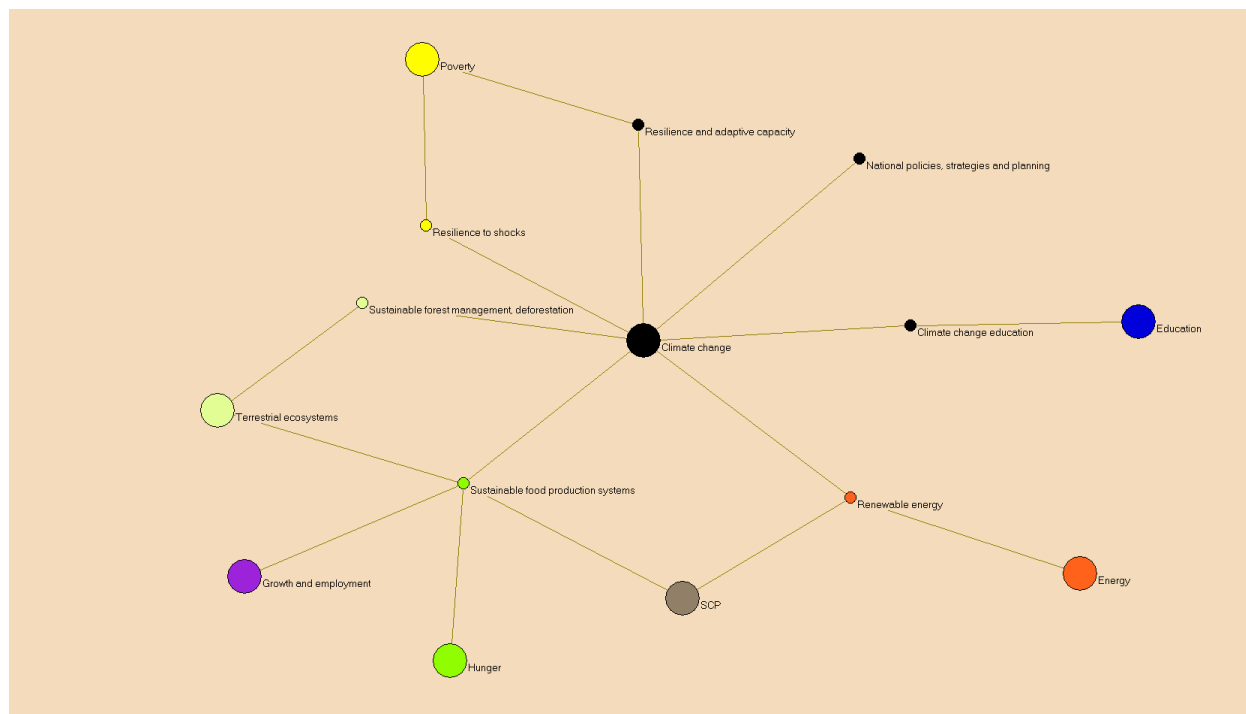
What follows is a review of a number of mapping and analytical tools looking at the interrelationships, whether positive or negative, between climate actions and various dimensions of sustainable development.

UN-DESA: mapping linkages among SDGs

The SDGs themselves are interlinked through targets by design. That was one of the principle ways by which UN negotiators ensured that the three dimensions of sustainable development – economic, social and environment – were adequately balanced throughout the goal set. The interlinkages were mapped originally by the UN Department of Economic and Social Affairs in a 2015 working paper¹⁰. That paper draws on a textual analysis of the wording in the targets, to make the connections between different goals. Figure 6 below contains a mapping of the connections from SDG 13 (climate change) to seven other SDGs, based on the software tool used in that paper. (Naturally, there are other connections which science suggests but which are not well captured in the language of the goals and targets themselves – e.g., the implications of climate actions for health – SDG 3.

¹⁰ Le Blanc, D. (2015), Towards integration at last? The sustainable development goals as a network of targets, DESA Working Paper No. 144, March. (https://www.un.org/esa/desa/papers/2015/wp141_2015.pdf) Note that there is no reference to NDCs in this paper; the analysis is purely on the SDGs themselves and their linkages. The NDCs had not yet been adopted or even in many cases published.

Figure 6: Links between SDG 13 and other SDGs as captured in target language



Source: based on the database for Le Blanc, D. (2015), Towards integration at last? The sustainable development goals as a network of targets, DESA Working Paper No. 144, March. (https://www.un.org/esa/desa/papers/2015/wp141_2015.pdf)

This pioneering work spawned a number of other studies which refined the linkage analysis, for example by indicating the direction and intensity of the interaction between any two targets under different goals (cfr. Nilsson et al., 2016; ICS, 2017). This subsequent analysis went beyond the textual one of Le Blanc in that scientific evidence, informed judgment and data/indicators were invoked to determine direction and intensity of interactions.

Pradhan et al. (2017), A Systematic Study of SDG Interactions

Pradhan *et al.* (2017) perform a statistical analysis on the UN Statistics Division's indicator data sets for tracking progress on the SDGs. The intent of the analysis is to identify the extent and strength of synergies (strong positive correlation between two indicators) and trade-offs (strong negative correlation) across pairs of SDG indicators. Their analysis shows that SDG 3 (Good health and well-being) is mostly associated with synergistic co-benefits and SDG 12 (Responsible consumption and production) is largely linked with trade-offs (Figure 7).

More generally, SDGs 12 (Responsible consumption and production) and 15 (Life on land) are found to be associated with a high fraction of trade-offs with other SDGs. This is not surprising given the historic association between growth on the one hand and natural resource use, environmental degradation and biodiversity loss on the other. What this suggests is that, at least to date, growth and environment have not been substantially decoupled, with perhaps a few exceptions (see Figure 1 above).

Figure 7: Top synergies and trade-offs between goals based on correlations



Source: Pradhan et al. (2017), op.cit. Figure 3.

Linking NDCs and SDGs

The following tools each had as its explicit objective to map and analyze the links between climate actions/policies and sustainable development objectives as reflected in the SDGs and targets.

WRI/Climate Watch

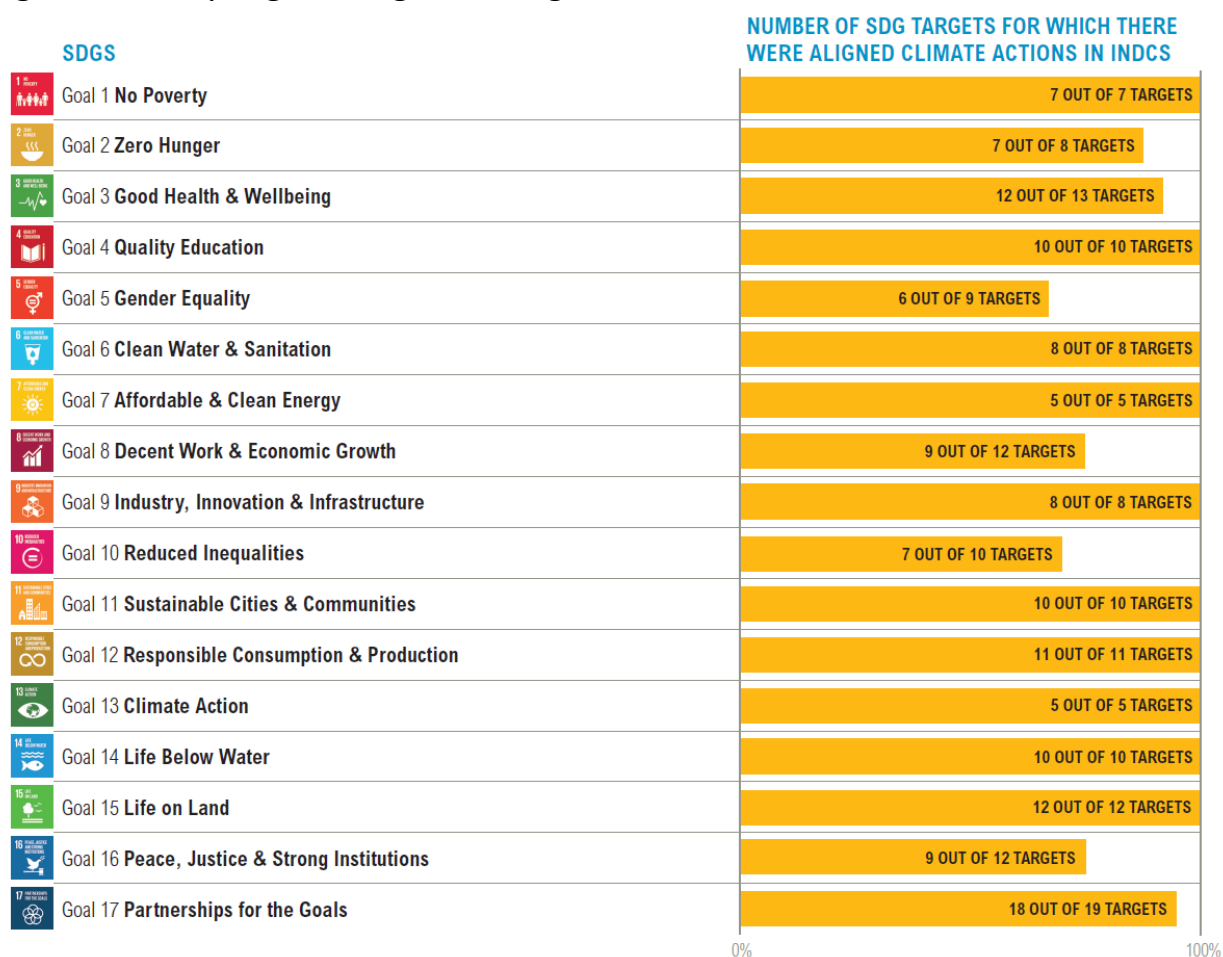
The World Resources Institute (WRI)¹¹ was the first to perform a textual analysis of countries (Intended) Nationally Determined Contributions against SDG targets. The initial analysis found that climate actions in a near universal sample of (I)NDCs align with 154 of the 169 targets of the SDGs.

Figure 8 shows that, for ten of the 17 SDGs, all their targets are addressed by at least one country's NDC. For the other seven goals, at least two-thirds of their targets are addressed by at least one country's NDC. The analysis behind this figure is global, which is one reason why the coverage of the SDG targets by NDCs is so extensive. An analysis done for an individual country shows that the SDG target coverage is more limited to specific SDGs and targets that are priorities for that specific country. (See Figure 9.a for Colombia, Figure 9.b for Uganda.)

Subsequently, WRI constructed a searchable NDC-SDG linkages database that enables users to explore how each country's NDC links with each of the 169 targets of the 2030 Agenda. The database is integrated under [ClimateWatch](#), an online platform designed to empower policymakers, researchers, media and other stakeholders with the open climate and development data. The tool is bidirectional as it provides both an SDG and an NDC entry point to visualize the linkages. Upcoming features will include the possibility to filter the linkages by sector and by type of climate action (i.e. mitigation or adaptation).

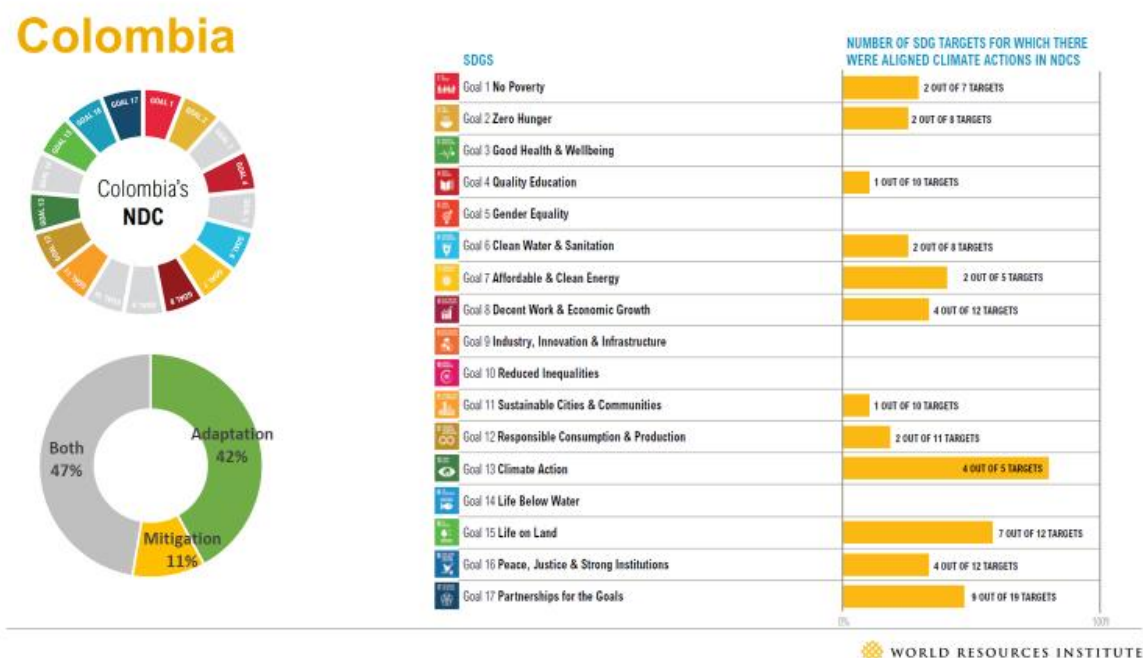
¹¹ Northrop et al. (2016), Examining the alignment between the intended nationally determined contributions and sustainable development goals, WRI Working Paper (https://www.wri.org/sites/default/files/WRI_INDCs_v5.pdf)

Figure 8: Analyzing the Degree of Alignment between the SDGs and INDCs



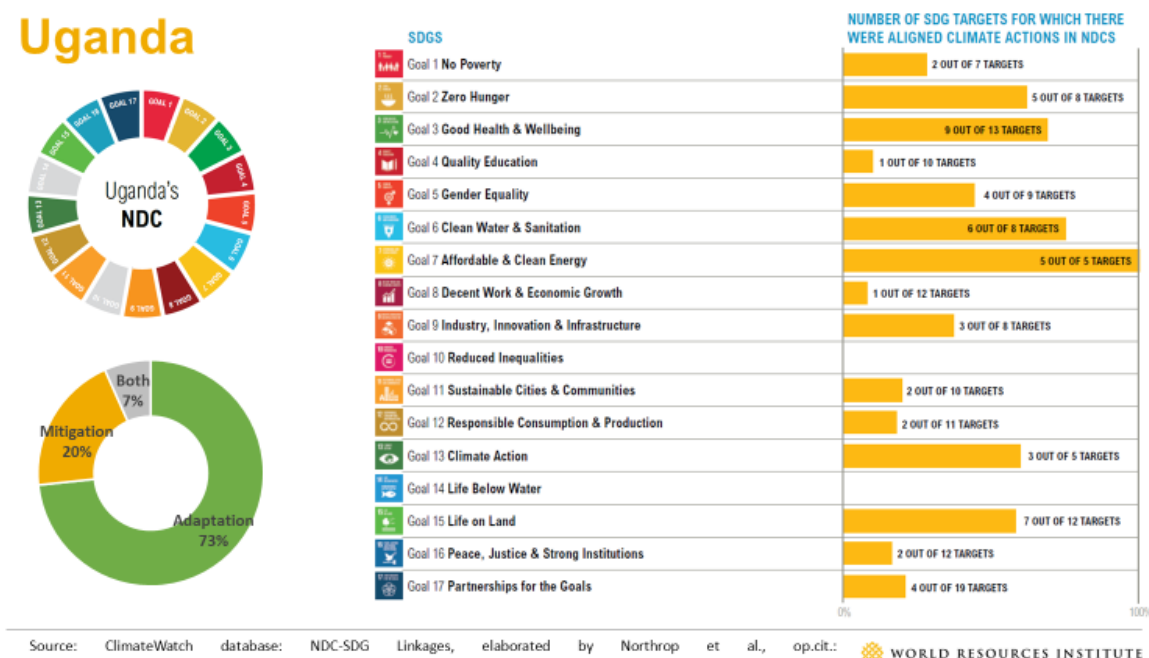
Source: ClimateWatch database: NDC-SDG Linkages, elaborated by Northrop et al., op.cit.: <https://www.climatewatchdata.org/ndcs-sdg>.

Figure 9.a: Alignment of Colombia's NDC with SDG Targets



Source: ClimateWatch database: NDC-SDG Linkages, elaborated by Northrop et al., op.cit.: <https://www.climatewatchdata.org/ndcs-sdg>.

Figure 9.b: Alignment of Uganda's NDC with SDG Targets



Source: ClimateWatch database: NDC-SDG Linkages, elaborated by Northrop et al., op.cit.: <https://www.climatewatchdata.org/ndcs-sdg>.

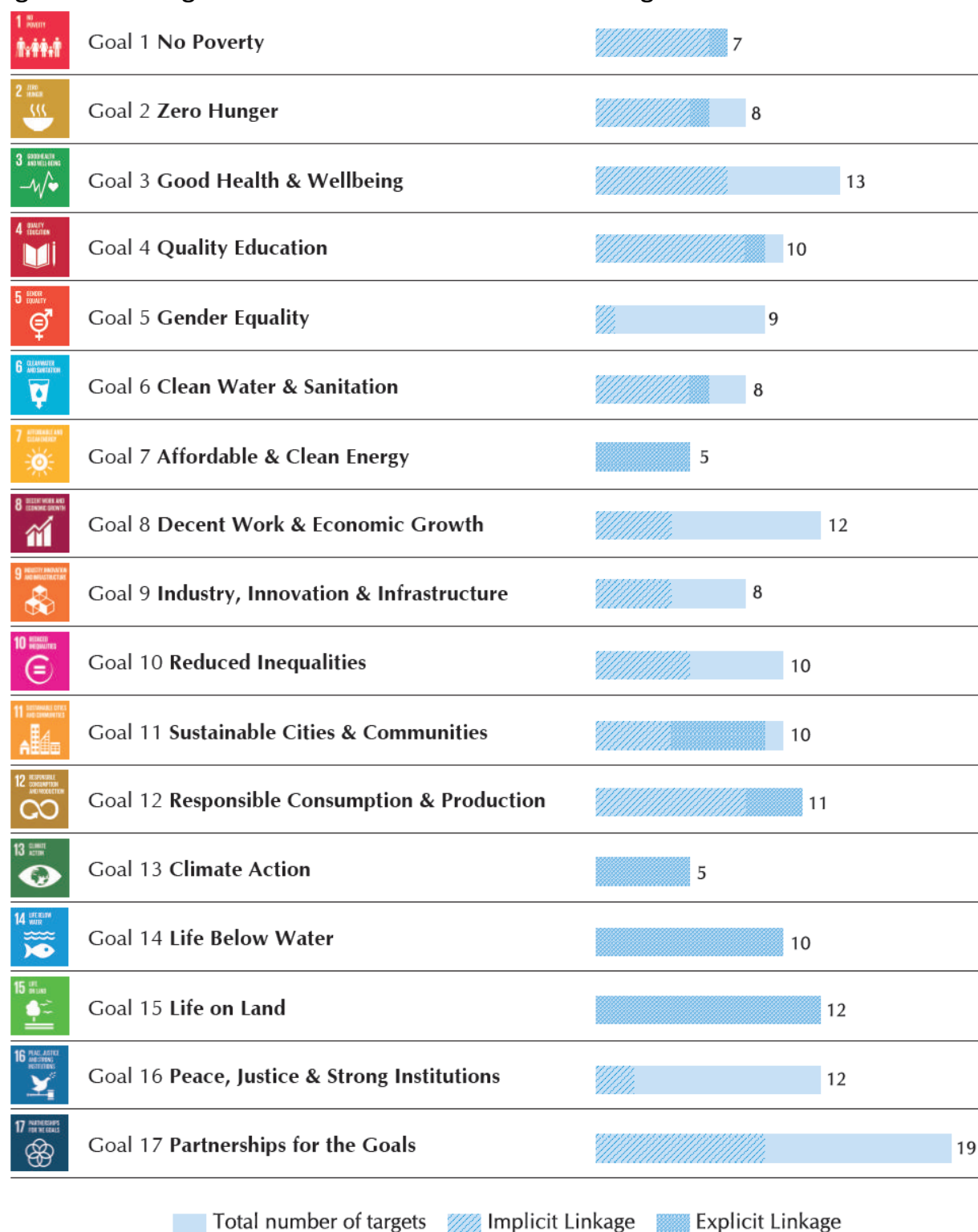
TERI

The TERI (2017) study on the SDG footprint of NDCs actually looks from both directions – how targets of the SDGs treat climate change and how NDC language links to language in the SDG targets.

Figure 10, reproduced from the TERI study on the SDG footprint of Asia's NDCs, starts with the SDG targets and identifies explicit or implicit references to climate change actions or concerns.

With regard to links from NDC language to SDGs, the TERI analysis is broadly consistent with Figure 3 above from the United Nations' analysis of South-South cooperation – viz., it finds few references in NDCs to goals 4, 5, 10 and 16. It notes that “there are only 4 mentions of mainstreaming gender concerns in the NDCs whereas SDGs envisage mainstreaming gender in national policies” (p.20).

Figure 10: Recognition of climate concerns in SDG targets



Source: TERI (2017), *SDG Footprint of Asian NDCs*. New Delhi: The Energy and Resources Institute; http://www.ndcfootprints.org/pdf/asiareport_july.pdf.

While considering ‘implicit linkage’ from an SDG target to climate change allows flexibility to go beyond precise linguistic references, it also introduces a significant degree of discretion.

The TERI study also calculates an index of the strength of linkage from a country’s NDC to a given SDG target by considering a number of criteria and assigning scores on each: whether SDGs and linkages are mentioned in the NDC; whether there is a keyword match between the NDC and the SDGs, and whether the matching keyword is in the NDC’s background/context section or in its goals; whether the matching keyword in the NDC is qualitative or quantitative. The last criterion provides perhaps the strongest indication of close alignment between the two – i.e., where the NDC goal provides a quantification of an SDG target.

DIE and SEI

The SDG-NDC Connections tool developed by DIE and SEI permits a somewhat more refined analysis of interlinkages between the two¹². One important innovation is to classify NDC climate actions under a number of thematic headings and then to link those action types to the SDG targets. Thus, rather than simply searching for ‘agriculture’ or ‘food’ language in NDCs and then relating that to SDG 2 targets, this tool groups ‘agriculture’ related NDC measures into a number of categories of action – e.g., crop diversification, soil management, agroforestry – and then calculates what percentage of all SDG 2 relevant climate actions fall under each of these types. For instance, is agroforestry a more frequent type of agricultural intervention mentioned in NDCs, or is soil management, or crop diversification?

Ambition to Action: Project of New Climate Institute and ECN

The *NDC Update Report* of May 2018, prepared by the New Climate Institute and ECN, has a special focus on linking NDCs and SDGs. It employs the **SDG Climate Action Nexus (SCAN) tool** developed together with GIZ and Climate Analytics to examine linkages between the two agendas.

¹² <https://klimalog.die-gdi.de/ndc-sdg/>

The tool is intended to address a perceived limitation of purely language-based analyses of NDC-SDG linkages. As the report states, it is designed to help policymakers assess “whether the climate actions they are considering to achieve their NDC targets are likely to reinforce or undermine the SDGs”. It notes that the NDCs were not systematically developed across countries and sectors with a consideration of the development co-benefits that could result from specific policies and measures contained therein. So, tools which rely on the wording of NDCs are likely to miss important connections between climate actions and the SDGs.

The SCAN tool has been developed in two variants – one looking at mitigation actions and one looking at adaptation. It draws heavily upon the peer reviewed literature on climate actions’ impacts on social, economic and environmental variables – as summarized e.g. in the IPCC assessment reports. Rather than mapping language in NDCs against SDGs and their targets, the tool groups climate actions into broad categories – e.g., in the case of mitigation, actions which reduce fossil fuel combustion (renewable energy, energy efficiency improvements). Links from these action types to various SDG targets – e.g., air pollution, health – can be either positive or negative, or both. The tool provides a brief explanation of the nature of a linkage but does not rate its strength, as that is thought to be context specific.

The tool (see Figure 11) details over 500 potential linkages between specific mitigation actions and the SDG targets, of which over 80 per cent represent situations where climate action may positively impact development¹³. Those positive impacts are most heavily concentrated in five SDG areas: SDGs 7 (growth, employment), 8 (industry, infrastructure, innovation), SDGs 11 (sustainable cities), 12 (sustainable consumption and production), and SDG 15 (life on land). One of the strongest messages emerging is that some types of mitigation action lead to almost exclusively positive potential impacts on the SDG targets, and some lead to a mix of positive and negative potential impacts.

¹³ http://ambitiontoaction.net/wp-content/uploads/2018/10/Key_findings_final.pdf

Figure 11: SCAN tool linkages from climate actions to SDGs



Source: http://ambitiontoaction.net/wp-content/uploads/2018/10/Key_findings_final.pdf

Some of the results seem counterintuitive and at odds with those provided above by Pradhan *et al.* The positive associations between various energy- and industry-related climate measures, on the one hand, and growth and employment (SDG 8), on the other, suggest a delinking of CO₂ emissions from economic growth. This is consistent with the new growth narrative of the New Climate Economy work but not consistent with the historical record.

Other findings of the report include:

Data issues: the challenge posed by the significant amount of resources required to monitor progress on the two agendas simultaneously.

Finance issues: when governments focus on those mitigation actions with significant development impacts, public money can be used to guide climate investments to where they yield the highest social and economic benefits.

Policy and institutional issues: coherence between the two agendas remains a challenge in many countries where institutions governing the 2030 Agenda and

climate action are distinct and with differing amounts of authority within government bureaucracies [see section 4 for discussion].

Sectoral issues: the SDG framework can provide a good starting point for identifying linkages between sector actions and development impacts, and can provide a common language that can aid communication and coordination among sectors and with the national government.

The report notes: “Knowledge about these potential synergies, and especially about the trade-offs [between climate actions and development objectives], can help prevent or reduce negative impacts if these are taken into account from the start; the way a mitigation action or policy is planned and implemented can significantly influence its impact on broader development objectives.” (p.3)

From a climate policy perspective, the report notes, understanding where mitigation actions can reinforce the achievement of the SDGs may increase countries’ confidence and political buy-in to put forward more ambitious NDCs, a process required every five years under the ambition/ratcheting mechanism of the Paris Agreement.

UNDP Climate Action Impact (CLIP) Tool

The United Nations Development Programme (UNDP) has developed a tool to assess, at a project level, the social, economic and environmental impacts of specific investments made as part of a country’s climate change efforts, particularly as reflected in its NDC. Table 1 provides the results of an application of the tool to a distributed solar power project in Kenya. The table provides both qualitative descriptions and quantitative estimates.

While the primary assessment using the CLIP-Tool is done at action or project level, a compilation of data from all ongoing post-2015 NDC and SDG actions allows a review of progress towards the NDC and SDG targets, to determine whether actual outcomes are meeting the intended objectives and to inform corrective actions as needed. Also, UNDP’s CLIP-Tool permits aggregation to calculate how far the cumulative impacts of multiple climate actions/projects may contribute towards achieving various SDGs. Such an assessment can then

inform decisions on scaling up ambition of climate actions and may also be able to unlock additional sources of climate finance (Soezer et al. 2018).

Table 1: Overview of qualitative and quantitative impacts of BBOXX activities in Kenya

Impacted SDG	Qualitative Impact	Quantitative Impact by 2018
SDG 3 – Good Health and Well-Being	The replacement of kerosene lamps with solar home systems (SHS) has a positive impact on consumers' health and it is expected to reduce flu-like symptoms and eye problems which have been reported as key health impacts of indoor air pollution.	300,000 people will get access to clean energy and 206 people will receive health insurance.
SDG 4 – Quality Education	SHS improves children's learning environment at home, whereby children can do their homework and study in the evenings using cleaner, safer and better-quality light. BBOXX 17 ¹² was also found to be a suitable system to support digital learning programmes.	An average of two out of five beneficiaries of the BBOXX systems are school-going students. Hence, about 60,000 pupils will be able to study for longer hours.
SDG 5 – Gender Equality	BBOXX hires female employees on both permanent and temporary basis, including female technicians and in key decision-making positions.	57 women will be employed and trained and finance of SHS for up to 75,000 women in rural communities will be provided.
SDG 8 – Decent work and economic growth	BBOXX is expanding its market to the Kakuma Refugee Camp. By supporting refugees to establish enterprises such as solar kiosks or service centres, they will be actively increasing the number of people involved in the clean energy value chains as distributors or technicians.	BBOXX provides decent work conditions and stable income to fix term 147 employees and additional 228 sales agents across the country.
SDG 9 – Industry, Innovation and Infrastructure	Trine is offering an innovative model of raising finance through crowd investing. BBOXX makes their products more affordable through its innovative pay-as-you-go model that utilizes mobile money platforms. BBOXX is also introducing smart solar systems with a remote monitoring system and an energy service fee for repair and maintenance to achieve the maximum lifetime of the technology.	Trine raised € 6 million of impact investment and offered access to affordable finance for BBOXX. Through BBOXX's pay-as-you-go model the costs of SHS will become affordable and accessible to 46,000 rural households in Kenya.
SDG 12 – Responsible Consumption and Production	BBOXX promotes recycling of batteries and other waste such as printed Circuit Board (PCB), metals from written off control units and panels and plastics from TV casing, torches and other appliances as well as cables from bulbs and torches through a partnership with Associated Battery Manufacturers (ABM).	BBOXX ensures appropriate recycling and disposal of 20,789 kg of batteries and 1,586 kg of other E-wastes.

Source: UNDP

¹² BBOXX 17 is one BBOXX lighting kits, specifications of the product can be downloaded here: <http://www.bboxx.co.uk/wp-content/uploads/2014/01/BBOXX-BB17-KIT-DATASHEET.pdf>

Source: Carbon Mechanism Review Special Issue; https://www.carbon-mechanisms.de/fileadmin/media/dokumente/Publikationen/CMR/CMR_2018_02_I4C_Special_eng_bf.pdf.

Assessment

Following is a brief comparative assessment of the strengths and shortcomings of the different tools reviewed.

Table 2: Comparison of features of tools for mapping and analyzing climate-SDG linkages

Tool	Direction	Entry points	Evidence used	Note on methodology	Uses / when is the tool most helpful?
UN-DESA: mapping linkages among SDGs (2015)	SDG → SDG	SDG targets	keywords	Textual analysis of the wording in the targets to establish connections between targets and goals, which are then visually represented using network analysis techniques.	Understand overall interconnections between SDGs through targets.
WRI: NDC-SDG Linkages Database on ClimateWatch (2016)	SDG ↔ NDC	SDG targets, NDCs	keywords and NDC activities	Textual analysis of countries' NDCs using keywords and identifying specific activities within the NDCs. Linkages can be visualized on the Global Linkage Map, through individual Country Pages, and searchable NDC Content pages.	Broad-based overview of how NDCs address specific SDG targets at global and national levels. Identify potential partnerships around specific NDC-SDG linkages.
TERI: SDG Footprint of the NDCs (2017)	SDG ↔ NDC	SDG targets, NDCs	keywords and NDC activities	Calculates an index of the strength of linkage based on: whether SDGs are mentioned in the NDC; whether there is a keyword match and whether the matching keyword is in the NDC's background section or its goals; whether the matching keyword in the NDC is qualitative or quantitative; and whether the NDC goal provides a quantification of an SDG target.	Broad-based overview of the linkages between NDCs and SDG targets at national and regional levels, and linkages between SDGs and climate change.
DIE and SEI: SDG-NDC Connections	NDC → SDG	SDG targets, NDCs, SDG themes	NDC activities, SDG indicators	NDCs were analyzed to identify specific activities, which were then classified using a number of criteria (including relevance to SDG target indicators) to establish linkage to SDG targets.	Broad-based overview of how NDCs address specific SDG targets at global and national levels. Identify potential partnerships around specific NDC-SDG linkages.
New Climate Institute, ECN, TNO, Climate Analytics, GIZ: SDG Climate Action Nexus (SCAN)	Climate actions → SDG	mitigation and adaptation actions, SDG targets	activities, existing literature on climate-development links	Mitigation and adaptation actions were classified by type of activity and sectors and a matrix of activities and linkages to SDG targets was created based on peer-reviewed literature and expert reviews. The linkages are classified as either positive or negative.	Develop deeper understanding of whether specific mitigation or adaptation actions are likely to reinforce or undermine a particular SDG or SDG target.

Table 2: Comparison of features of tools for mapping and analyzing climate-SDG linkages (cont'd)

Tool	Direction	Entry points	Evidence used	Note on methodology	Uses / when is the tool most helpful?
Pradhan et al. (2017): A Systematic Study of SDG Interactions	SDG → SDG	SDG indicators	SDG indicator datasets from 227 countries	Statistical analysis on the UN Statistics Division's indicator data sets for tracking progress on the SDGs to identify the extent and strength of synergies and trade-offs across pairs of SDG indicators.	Understand interactions between SDG indicators.
UNDP: Climate Action Impact (CLIP) Tool	Climate actions → SDG	climate actions and projects	activities, indicators used to track activities	Activities are classified according to impact categories that are linked to the relevant SDGs. Each category is associated with a set of indicators with descriptive, qualitative and quantitative information requirements. (All information requested from users is voluntary, though at a minimum, it should include all qualitative sections, and it is recommended that they further include quantitative information with indicative targets.) The tool then compiles and visualizes potential sustainable development impacts of the climate action or project.	Guide policy-makers or project implementers in determining likely sustainable development impacts of specific mitigation or adaptation projects and track those impacts over time.

Source: elaboration of WRI authors.

Taken together, the tools described in the preceding pages provide a good indication of the most significant expected co-benefits from climate action for various sustainable development goals and targets. Not all linkages from climate action to SDGs will be positive, and the tools also permit identification of the significant expected trade-offs which policy makers need to address. They vary in methodological approach, but most are similar in intent: that is, examining how climate actions could be expected to impact on various social, economic and environmental targets contained in the SDGs. In some tools, the direction of analysis can be reversed, to indicate how achieving various SDG targets can contribute to climate change mitigation and adaptation objectives.

One study (Pradhan et al.) provides an indicator-level analysis to examine synergies and trade-offs across all the SDGs, globally and at country level, using historical and current data for the official global SDG indicators. There is no presumption of causality from climate action to SDGs, or vice versa. The study simply reports evidence of when two indicators move together in the same direction, or when they move in opposition directions, and how strong the positive or negative correlations are. Positive correlations of at least a certain value (0.6) are classified as synergies and negative correlations of at least -0.6 are classified as trade-offs. The study indicates that, while the preponderance of correlations are positive, there are a number of trade-offs which would need to be addressed if the SDGs and their targets are to be achieved in their entirety and sustainable development advanced with a balance of social, economic and environmental objectives.

Knowing this does not provide specific policy guidance, as these correlations reflect interdependencies among multiple processes and variables. Similarly, there may be multiple leverage points for weakening or even breaking the trade-offs between indicators. For instance, positive correlation between positive outcomes like improved population health and life expectancy, on the one hand, and negative outcomes like natural resource depletion, on the other, are traceable to the fact that, historically, economic development has followed a resource- and energy-intensive path, with the energy largely provided by fossil fuels. If, however, improvements in materials and energy efficiency can be sustained, and other types

of energy substituted for fossil fuels at competitive cost, then the link between rising prosperity, on the one hand, and resource depletion and global, regional and local pollution, on the other, can be weakened if not severed.

The CLIP tool comes perhaps the closest to allowing a concrete assessment, both ex ante and ex post, of how various projects and related investments for climate mitigation and adaptation are contributing to advancing other sustainable development objectives. The ability, within the tool, to aggregate impacts across projects does in principle permit a national government to examine the macro impact of multiple specific interventions on the 2030 Agenda.

In sum, governments have a growing array of tools to help map and analyze linkages between climate actions and the SDGs. Which one best suits a particular need is for each government to determine. As they move forward with implementing the two agendas, the existing tools may need to be adapted or complemented by new tools which provide greater granularity in assessing how specific climate policy interventions quantitatively contribute to specific national sustainable development targets elaborated from the global goals and targets. The links from macro or sectoral development policies to climate outcomes, notably GHG emissions, tend in general to be more straightforward to quantify.

6. Conclusions: maximizing synergies, minimizing trade-offs between agendas

We live in a world increasingly affected by climate change and where, if we fail to take decisive mitigation measures, temperature rise will continue and soon exceed the Paris targets of 1.5° C and even 2° C.

So it becomes ever less useful to talk about development plans and policies in a vacuum. Those plans must factor in climate change. And given the increasingly ambitious actions that will be needed by governments to reduce their countries' greenhouse gas emissions and to adapt to climate change, climate change actions must increasingly take into account the social and economic impacts both negative and positive. Thus, there is an imperative of linking these two agendas.

Similarly, development strategies and investment plans must increasingly integrate climate considerations – whether impacts on greenhouse gas emissions or

implications for climate change adaptation. As countries build and renovate the infrastructure that will be needed to sustain inclusive social and economic progress through this century, no country can afford to ignore how infrastructure investments will impact climate change mitigation and adaptation.

The ever tighter interdependencies between climate actions and development plans and policies suggests that governments should consider what adjustments they may wish to make to planning and policy making processes to facilitate realizing synergies and minimizing trade-offs across the two agendas. This may include changes to institutional arrangements, for example lines of responsibility and requirements for collaboration of relevant government offices, ministries and agencies.

To facilitate more coordinated and coherent planning and policy making linking these two agendas, governments will want to be able to identify where the benefits from more closely aligning the two agendas are likely to be greatest. The mapping and analytical tools described above can assist in that identification. As far as possible, governments would like to be able to quantify the co-benefits of climate policy for other sustainable development objectives, and the co-benefits of other sustainable development policies for climate mitigation and/or adaptation.

Insofar as governments succeed in capturing synergies from more closely aligning climate actions and the SDGs, this should augment the public benefits from its policy efforts or investments. Higher social returns on investments yielding both climate and non-climate benefits should serve not only to attract additional financial resources. Where private returns from such “co-benefit” oriented investments are also higher, this may serve to attract additional private finance.

Recalling a point made above, based on the *NDC Update Report*, from a climate policy perspective, understanding where mitigation actions can reinforce the achievement of the SDGs may increase countries’ confidence and political buy-in to put forward more ambitious NDCs when they are required to revisit them every five years under the ambition/ratcheting mechanism of the Paris Agreement.

There may also be economies from more closely aligning the monitoring and reporting of progress on the two agendas, although they will no doubt have their own distinct features and processes given the especially critical role of transparency and accountability in the Paris Agreement. As the implementation of the two agendas is increasingly coordinated if not fully integrated at the national level, it makes perfect sense to find ways to streamline monitoring and reporting of progress towards both the Paris goals and the SDGs. Indeed, perhaps one positive spillover from Paris to the SDGs could be a more rigorous review of SDG progress and systematic follow-up to support accelerated implementation of the 2030 Agenda.

References

Bouyé, M., *et al.* (2018), Connecting the dots: Elements for a joined-up implementation of the 2030 Agenda and Paris Agreement, GIZ and WRI, July.

Business and Sustainable Development Commission (2016), *Better Business, Better World*. London.

CDKN (2016), *Planning for NDC Implementation Quick Start Guide and Reference Manual*, Climate and Development Knowledge Network, with Ricardo Energy and Environment.

Griscom, B.W., *et al.* (2017), Natural climate solutions, PNAS, 31 October.

International Council for Science (ICS) (2017), *A Guide to SDG Interactions: From Science to Implementation*, Paris. <https://council.science/cms/2017/05/SDGs-Guide-to-Interactions.pdf>

Intergovernmental Panel on Climate Change (IPCC) (2018), Chapter 5: Sustainable Development, Poverty Eradication and Reducing Inequalities, in *Global Warming of 1.5° C*, Special Report.

International Energy Agency (IEA) (2017), *Energy Access Outlook*, Paris.

International Resource Panel (2011), *Decoupling Natural Resource Use and Environmental Impacts from Economic Growth*, UNEP.

Kamau, M., *et al.* (2018), *Transforming Multilateral Diplomacy: The Inside Story of the SDGs*, Taylor and Francis.

Lacey, F.G., *et al.* (2017) Transient climate and ambient health impacts due to national solid fuel cookstove emissions, PNAS, 23 January.

Le Blanc, D. (2015), Towards integration at last? The sustainable development goals as a network of targets, DESA Working Paper No. 144, March.

Maltais, A. (2019), *The Swedish Dialogue Forum Series on NDC and SDG alignment Final report to the NDC Partnership on the events delivered in Vietnam, Tanzania, Cambodia, Zambia, and Uganda in 2018*, SEI report, Stockholm Environment Institute, February.

NDC Update Report, May 2018, New Climate Analytics and ECN.

New Climate Economy (NCE) (2016), *The Sustainable Infrastructure Imperative*.

NCE (2018a), *Climate Solutions: Ensuring a Just Transition*, Factsheet.

NCE (2018b), *Unlocking the Inclusive Growth Story of the 21st Century*.

Nilsson, M., D. Griggs and M. Visbeck (2016), Map the interactions between Sustainable Development Goals, *Nature*, Vol. 534, 16 June.

Northrop, E., H. Biru, S. Lima, M. Bouyé, and R. Song (2016), Examining the alignment between the intended nationally determined contributions and sustainable development goals, Working Paper, Washington. D.C.: World Resources Institute.

Obersteiner, M., et al. (2016), Assessing the land resource – food price nexus of the Sustainable Development Goals, *Sci. Adv.* 2016:2 (Environmental Engineering).

Pradhan, P., et al. (2017) A Systematic Study of Sustainable Development Goal (SDG) Interactions, *Earth's Future*, AGU Publications.

Robins, N. et al. (2018), *Climate change and the just transition A guide for investor action*, Grantham Research Institute on Climate Change and the Environment, London School of Economics, December.

Sartor, O. (2019), Just transitions for the coal sector are going mainstream, but policies also need to be strengthened, IDDRI Blog, 5 March.

<https://www.iddri.org/en/publications-and-events/blog-post/just-transitions-coal-sector-are-going-mainstream-policies-also>

Soezer, A., et al. (2018), Tracking the Impacts: Quantifying Significant SDG Impacts of NDC Actions, *Carbon Mechanism Review*, Special Issue: Innovate4Climate.

TERI (2017), *SDG Footprint of Asian NDCs*. New Delhi: The Energy and Resources Institute.

United Nations Climate Partnerships for the Global South and United Nations Climate Change Secretariat (n.d. or 2017), *Catalysing the Implementation of Nationally Determined Contributions in the Context of the 2030 Agenda through South-South Cooperation*.

United Nations Development Programme (UNDP) (2017), *Aligning Nationally Determined Contributions and Sustainable Development Goals: Lessons Learned and Practical Guidance*, November.

Von Stechow, C., et al. (2016), 2° C and SDGs: united they stand, divided they fall? *Environmental Research Letters*, 11.

Worrall, L., et al. (2018), *Enabling a just transition to a low-carbon economy in the energy sector Progress and lessons in Emerging Markets*. A report prepared for the HSBC Centre of Sustainable Finance by the Overseas Development Institute, December.