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Limiting global warming to 1.5^{0}C while attaining the Sustainable Development Goals: the role of climate finance in Africa

With every news cycle the urgency of tackling climate change announces itself ever more starkly. Reports of record heat waves, unprecedented forest fires, crop failures, bleached coral and melting ice sheets are underscored by new scientific studies warning that the earth could enter a "hothouse" state.[1]

The Intergovernmental Panel on Climate Change (IPCC) has underscored this picture of runaway climate change, warning of the extreme difficulties of meeting the 1.5C global warming target that gives the best chance of avoiding this fate.[2] Yet for all the difficulty, restricting climate change to 1.5 degrees remains possible. For that to happen, every country has a responsibility to contribute to climate change mitigation, defined as "stabilization of concentrations of greenhouse gases in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[3] That means ensuring that energy systems, cities, transport and agriculture are developed in line with a low carbon future, and preserving forests. However, countries have very different shares of this responsibility and capacities to act and Africa's share of both current and past GHG emissions is low.

At the same time, the effects of climate change are already being felt severely. African countries have experienced some of the worst climate change impacts, although they have done least to cause the problem. This requires significant efforts to ramp up climate change adaptation, as well as addressing the loss and damage caused by irreversible climate change.

The first section of this paper sets out the scale of the global climate challenge, the scale of financing needed to address mitigation and adaptation needs, Africa's role in mitigation and the financial impacts of already occurring climate change.

The second section looks at the overlap between climate change objectives and the Sustainable Development Goals, including the role and limitations of the US$100 billion per year climate finance target.

The third section looks at how much finance is required to meet nationally determined contributions (NDCs), both globally and in Africa.

The fourth section looks at the current state of climate finance in Africa, identifying the largest donors and recipients, the nature of the finance provided, and its sectoral and regional biases. It profiles the major multilateral climate funds, MDBs operating in Africa and

[1] Watts, J. (2018) "Domino-effect of climate events could move Earth into a 'hothouse' state", *The Guardian* 7 August, https://www.theguardian.com/environment/2018/aug/06/domino-effect-of-climate-events-could-push-earth-into-a-hothouse-state

[2] IPCC (2018) *Special report on global warming 1.5 °C*, http://ipcc.ch/report/sr15/

[3] European Commission (2017), *Seventh national communication and third biennial report from the European Union under the UN Framework Convention on Climate Change*, p.287, http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/459381_european_union-nc7-br3-1-nc7_br3_combined_version.pdf Adapted from the operational definition and criteria for eligibility used in the OECD-DAC Policy Markers.

bilateral climate finance, looking at the access that Africa has had to these funds.

The fifth section looks at whether adequate climate finance is being provided for Africa to implement its NDCs. Whereas the earlier sections of the paper focus on aggregate figures, this section draws on the experiences of three specific countries with differing developmental profiles (Egypt, Ethiopia and Kenya).

The sixth and final section of the paper will offer specific recommendations on the extent of Africa's climate finance needs, what that represents in relation to existing financing, particular gaps that need to be addressed, and the best means to channel financing (including through increased pledges for the recapitalization of the Green Climate Fund).

Africa and the scale of the global climate challenge

Africa's current contribution to global greenhouse gas emissions

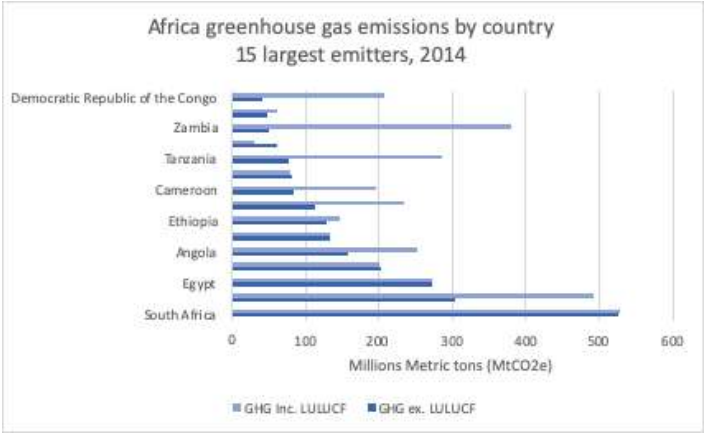
In 2017, global greenhouse gas emissions amounted to 53.5 gigatonnes of carbon dioxide equivalent (GtCO2e), an increase 0.7 GtCO2e on the previous year.[4] Just short of three quarters (73%) of greenhouse gas emissions (GHGs) relate to carbon dioxide, followed by methane (CH4) emissions (18% of the total).[5] There was emissions growth in both of these areas in 2017, after showing almost no growth in 2015 and 2016.

There is evidence that emissions continued to rise in 2018. Notably, the IEA found that "energy-related CO2 emissions rose 1.7% to a historic high of 33.1 Gt CO2." China, India, and the United States alone accounted for 85% of this net increase in emissions.[6]

By comparison, Africa's share of global greenhouse gas emissions remains small at around 3 GtCO2e per year.[7] Africa accounts for around 3.8% of total GHG emissions annually, although it is home to 17% of the global population. Africa's fair share of the global effort is smaller still once historical responsibility and economic capacity are taken into account.[8]

Although Africa's economies are growing rapidly, experiencing growth of 4.6% over the 2000 to 2016 period, the continent also only contributes a small share of the current global growth of greenhouse gas emissions. [9] In essence, because the starting point for Africa's GHG emissions is very low, even rapid growth in percentage terms is relatively small in terms of the global total.

For a country-by country breakdown of Africa's greenhouse gas emissions, we have used 2014 figures. At that time, total greenhouse gas emissions in Africa (excluding LULUCF) were 2,830 MtCO2e.[10] About half of this total (1,460 MtCO2e) was accounted for by GHG emissions from just 5 countries: South Africa (the highest, with 525 MtCO2e), followed by Nigeria, Egypt, Algeria and Angola.



Africa's projected contribution to global greenhouse gas emissions in future

Projecting further ahead, Africa's role in overall greenhouse gas emissions is set to remain a very small proportion of the global total, even if its emissions continue to grow.

[4] UN Environment (2018) Emissions Gap Report, p.xv, https://www.unenvironment.org/resources/emissions-gap-report-2018

[5] Oliver and Peters (2018), p.1

[6] IEA (2019) Global Energy and CO2 status report 2018, p.3, https://www.iea.org/geco/

[7] The regional figures used here are therefore drawn from WRI data.

[8] Sy, A. (2015) Africa: Financing Adaptation and Mitigation, Brookings Institution; Climate Equity Reference Calculator (accessed 20 August 2019), https://calculator.climateequityreference.org/

[9] GDP figures from OECD Development Centre (2018) *Africa's Development Dynamics 2018*, https://www.oecd.org/publications/africa-s-development-dynamics-2018-9789264302501-en.htm

[10] WRI,(2019) Climate Watch Data, https://www.climatewatchdata.org/ Accessed 18 August 2019. 2014 GHG data excluding LULUCF. 2014 Figures including LULUCF are 4,249 MtCO2e. However, there remains considerable uncertainty over LULUCF due to data limitations and these are also subject to significant annual variations.

Overall, the "baseline" scenario for global greenhouse gas emissions assumes that these could increase to 65 GtCO2e by 2030. These would reduce to 59 GtCO2e if current policies (unconditional NDCs) are successfully applied, or 56 GtCO2e if conditional NDCs are also achieved.[11]

For a reasonable chance of reaching 1.5 degrees, by contrast, global emissions should fall by more than half by 2030 (to around 25 GtCO2e), reaching about 10 GtCO2e in 2050 and just 10 GtCO2e (mainly from agriculture) in 2100.[12]

In other words, the "emissions gap" between total greenhouse gas emissions under this 1.5 degree scenario and expected emissions if NDCs are fully implemented is around 30 GtCO2e. The 2018 Emissions Gap report from UN Environment calculates a 29 GtCO2e gap if conditional NDCs are fulfilled, or up to 32 GtCO2e if only unconditional NDC pledges are met.[13] These figures can vary according to what assumptions are made, but there can be little doubt that there remains a huge gap between current commitments (in NDCs) and what is actually needed to have a reasonable chance of achieving a 1.5 degree temperature target.

It is equally clear that, whatever scenario is used, Africa's greenhouse gas emissions account for a small part of this overall picture. Africa's total GHG emissions are projected to increase from around 3 GtCO2e [3,000 MtCO2e] currently to 3,925 MtCO2e by 2030 under a "baseline" scenario of no additional policy action being taken.[14] Under the 1.5 degree "low emissions demand" scenario Africa's fair share of mitigation by 2030 would be just 220 MtCO2e below this baseline.[15] Further opportunities exist for emissions reductions in Africa, but these should be financed by developed countries.

Global and regional emissions reduction scenarios

Rising energy use is the core global challenge in addressing climate change – without significant shifts in how energy is produced and used, CO2 emissions from energy could contribute about half of the projected GHG emissions increase from 2010 to 2050.[16] Under this "baseline" scenario, This corresponding to an approximately 80 per cent anticipated increase in global energy demand (the assumption being that some efficiency gains are made but).

In 2017, UN Environment made a sectoral analysis of the global emissions reduction potential of the agriculture, energy, transport, forestry, buildings and industry sectors by 2030 at a cost of under USD100/tCO2e, and found that sufficient opportunities exist to close the global emissions gap to achieving a 1.5 degree target.[17] According to this study, the greatest affordable potential for emissions reductions can be found in the energy sector (notably, solar and wind generation, and more efficient appliances) and agriculture – although some caution should be applied to the specific scenarios envisaged, since some imply large scale deployment of controversial technologies such as large scale hydropower, nuclear power, and carbon capture and storage (including Bioenergy with Carbon Capture and Storage, or BECCs).

Although the Emissions Gap report does not offer a regional breakdown, it can be assumed that the vast majority of these reductions would be achieved outside of Africa, since Africa starts from a very low baseline where affordable and reliable energy access has not yet been achieved for a large proportion of the population.

A similar estimate from the IFC suggests US$23 trillion (US$22,633 billion) in "climate investment opportunities", spanning infrastructure, energy, energy efficiency and agriculture.[18] The vast majority of this figure relates to the East Asia Pacific region (US$16 trillion, 70.9%), with US$783 billion (3.5%) of potential

[11] UN Environment (2018), p.xvii
[12] Civil Society Equity Review (2018) *After Paris: Inequality, Fair Shares and the Climate Emergency* p.6. These figures are based on the IPCC 1.5 report, and the Low Energy Demand scenario developed in Grübler et al. *Nature*.
[13] UN Environment (2018), p.xvii
[14] WRI (2019).
[15] EcoEquity and Stockholm Environment Institute (2018) Climate Equity Reference Calculator, https://calculator.climateequityreference.org/
[16] OECD (2011) *Environmental Outlook to 2050*, p.72. This scenario assumes that some efficiency savings are made (a 50% increase in energy-related emissions compared to an 80% increase in demand) but not full decarbonization.
[17] The UN Environment 2017 Emissions Gap report found that global emissions could be reduced by 33 (range 30–36) GtCO2e/year in 2030, compared with the current policy scenario of 59 GtCO2e/year through reductions of prices up to US$100/tCO2e. A mitigation potential of 38 (range 35–41) GtCO2e could be achieved if some newer and less certain mitigation options were included.
[18] UNFCCC (2018) Biennial assessment and overview of climate finance flows: Technical Report, p.101 [para 344], https://unfccc.int/topics/climate-finance/resources/biennial-assessment-of-climate-finance ; IFC (2016) Climate Investment Opportunities in Emerging markets, https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/new+ifc+report+points+to+%2423+trillion+of+climate-

investment identified in sub-Saharan Africa and a further US$285 billion (1.2%) in the Middle East and North Africa region. The IFC sees transport as offering the largest share of this potential investment (US$499 billion in sub-Saharan Africa), followed by buildings and renewable energy.

It should be stressed that these are not complete figures, but draw on a sample of "national climate change commitments and other policies in 21 emerging markets, representing 62 per cent of the world's population and 48 per cent of global GHG emissions."[19]

Finance needed for a global and regional transition

The IPCC estimates that annual investment of US$2.38 trillion is needed between 2016 and 2035 in global energy generation and distribution systems alone, if we are to have a reasonable chance of limiting global warming to 1.5° Celsius.[20] This is equivalent to 2.53 per cent of average annual gross domestic product (GDP). Just over three quarters (77%) of this figure is needed for energy supply, with the remainder for the demand side.[21]

Estimates of a similar scale are offered by the International Renewable Energy Agency (IRENA), which suggests that total investment in the energy system between 2016 and 2050 should amount to US$110 trillion, or around 2 per cent of average annual GDP.[22] It further estimates that the level of *additional* investment to "set the world on a more climate-friendly path above current plans and policies" is US$15 trillion by 2050. This figure includes increased costs for electrification (electricity must increase as a proportion of overall energy use in low-carbon pathways), renewable energy and energy efficiency technologies. However, these costs would likely be significantly outweighed by the relative savings in terms of dealing with additional costs of climate change impacts, as well as health benefits (reduced air pollution) and fossil fuel subsidy reductions.[23]

Further significant investment is also needed for cleaner transport (>US$2.73 trillion annually) and other infrastructure (water, sanitation and telecommunication, >US$1.52 trillion) according to OECD estimates.[24] This means the annual investment needs to meet the 1.5 climate goal while also delivering on the SDGs (including SDG7 on energy access) would be in excess of US$6.4 trillion per year.[25]

Even just taking into account the climate finance proportion of these figures it is notable that this is of a different order of magnitude to the amounts that currently pass through development financial institutions. It would require "special efforts and innovative approaches."[26]

No equivalent figures of the scale of investment needed in Africa as a whole exist, but there are specific estimates for energy generation and transmission. Once again, it is notable that the

The International Renewable Energy Agency (IRENA) has estimated that Africa requires on average US$32 billion of investment in renewable energy per year between 2015 and 2030, with a further US$25 billion per year for transmission and distribution infrastructure.[27] However, it should be noted that IRENA's scenario on which these figures are based is one that anticipates a doubling of the share of renewable energy in the global energy mix rather than consistency with a 1.5 degree temperature target. The IRENA scenario envisages renewables as only two-thirds of new electricity generation capacity. Within this total, the specific sources would vary according to region – with greater scope for concentrating solar power (CSP) in North Africa and geothermal in East Africa. It also includes hydropower (of all scales) in its scenario for all of Africa except North Africa.

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[19] IFC (2016), p.vi . The IFC study takes INDCs as its starting point.

[20] IPCC (2018) section 4.4.5.1 , p. 371. These "medium confidence" estimate is based on the mean average of seven different annual investment needs models, ranging from US$ 1.38 trillion to US$3.25 trillion (using 2010 US$ exchange rates)

[21] IPCC (2018) Section D.5.3 and Section 4.4.5.1.

[22] It should be noted that this headline US$110 trillion figure is falling as estimates for renewable energy infrastructure continue to be revised downwards.

[23] IRENA (2019), p.32

[24] IPCC (2018)

[25] IPCC (2018), Box 4.8, p.373. It should be noted that the transportation and other infrastructure draw on OECD estimates for a 2 degree rather than 1.5 degree climate goal, so the overall investment required could be significantly higher.

[26] Bodnar, P. et al., (2018) Underwriting 1.5°C: competitive approaches to financing accelerated climate change mitigation. *Climate Policy*, 18(3), 368–382, doi:10.1080/14693062.2017.1389687. ; see also IPCC (2018) 4.4.2.3, p.361

[27] IRENA (2015), *Africa 2030: Roadmap for a Renewable Energy Future*. IRENA, Abu Dhabi. www.irena.org/remap, p.7

Another partial estimate for the energy sector has been provided by the IEA, which suggests that investments of US$ 34.2 billion per year are needed to ensure energy access for all in sub-Saharan Africa by 2030. This consists of US$ 32.5 billion per year for electricity access and US$ 1.7 billion a year for clean cooking.[28]

What proportion of the overall investment needed should be climate finance?

Public climate finance should covers the "incremental costs" of choosing low rather than high carbon options. If coal power generation is cheaper than solar power, for example, climate finance should cover the price difference that allows African countries to focus on solar power without taking a financial hit for doing so. In practice, some of the largest "incremental costs" are far less tangible than a comparison between different electricity generation choices. As climate change heightens countries' vulnerability, the cost of borrowing money increases, making investment more expensive. This is also an incremental cost to be factored in.

Climate finance should also cover the gap between the mitigation efforts that are achievable domestically in developed countries and what is actually needed for these countries to meet their fair share. If developed countries are to meet their global responsibilities, it is clear that they cannot do this domestically, so they must invest in activities that help sustainable low and zero carbon development in the global South.

A further, important rationale for public climate finance is its ability to drive investment to places where the private sector is unwilling or unable to go. Despite its self-image, private investment is often conservative and finds new sectors and technologies, while institutional investors in the developed world still treat markets in large portions of the global South as too "risky".

Public money has been disproportionately directed to high-risk projects, demonstrating new technologies or establishing markets before private sector actors become involved.[29] The focus on using public climate finance to "leverage" private investment as a form of co-financing can be unhelpful in this regard, since it ignores the important role that public investment plays in setting the direction of future investment.[30]

At present, almost half of global investments in the renewable energy sector are being financed by public agencies and state-controlled enterprises, as private financing has stagnated in absolute terms since around 2008. There is nothing unusual about this, as Semieniuk and Mazzucato point out, since "the public share of finance in directed historical energy transitions was often even higher."[31]

The financial impacts of already occurring climate change

Climate finance should also cover the costs of adaptation and loss and damage. On the adaptation side, the UNEP *Adaptation Finance Gap Report* estimates that US$140 – 300 billion in adaptation financing will be needed by 2030 (roughly 6 to 13 times greater than the international public finance available today), with between USD 280 – 500 billion per year needed by 2050.[32] The UNEP report notes that the costs of adaptation measures are increasing, and that estimates that focus on policy implementation and take greater account of specific national circumstances generally report higher adaptation costs.[33]

A significant share of these adaptation costs will fall on African countries. According to a UN Environment report on *Africa's Adaptation Gap*, the unavoidable effects of increases in global emissions that have already taken place will cost Africa US$7 to 15 billion per year by 2020.[34] Even under a scenario where global warming is limited to 2 degrees of warming, Africa could face adaptation costs of US$50 billion per year by 2050.[35] Based on current pledges and policy

[28] UNECA (2018) *Achieving SDG7 in Africa*, p.8; IEA (2017) *Energy Access Outlook 2017*

[29] Mazzucato, M. and G. Semieniuk, G. (2018) "Financing renewable energy: Who is financing what and why it matters", *Technological Forecasting and Social Change*, 127:8–22.

[30] Mazzucato, M. and G. Semieniuk, G. (2018), pp.9-10

[31] UN Environment (2018), p.54

[32] United Nations Environment Programme (UNEP) (2016), The Adaptation Gap Finance Report, http://web.unep.org/adaptationgapreport/sites/unep.org.adaptationgapreport/files/documents/agr2016.pdf, p.xii.; the comparison to current figures draws on Grimm J. et al, Germanwatch (2018), p.9

[33] UNEP (2016), p.xiii

[34] Schaeffer M. et al. (2013) *Africa Adaptation Gap Technical Report: Climate-chage impacts, adaptation challenges and costs for Africa*, AMCEN/UNEP/Climate Analytics, p.32, https://reliefweb.int/report/world/africa-s-adaptation-gap-technical-report

[35] Schaeffer M. et al. (2014) Africa's Adaptation Gap 2 Technical Report. Bridging the gap – mobilizing sources, AMCEN/UNEP/Climate Analytics, p.iv, https://www.unenvironment.org/resources/report/africas-adaptation-gap-2-bridging-gap-mobilising-sources

projections, Africa would face adaptation costs of around US$15 billion per year by 2030, and US$65 to 70 billion per year by 2050. If these policies were not delivered upon or effective and the world steered a course towards 4 degrees of warming by 2100, the costs to Africa could reach US$100 billion by 2050.[36]

"Loss and damage" is harder to quantify. This term refers to climate change impacts that go beyond what people can adapt to. According to the UNFCCC, loss and damage can result from both extreme events (e.g. hurricanes, droughts, floods) and "slow onset" processes (e.g. sea level rise or glacial retreat).[37] It is an outcome of inadequate investment in climate adaptation and a global failure to cut greenhouse gas emissions quickly enough.

Many aspects of loss and damage are not economically calculable, such as cultural losses related to the displacement of indigenous populations or biodiversity loss through species extinctions. But when economic losses can be measured they are often dramatic. For example, the impact of Hurricane Maria on the Caribbean island of Dominica in 2017 caused loss and damage in the region of US$1.4 billion, or 226 per cent of its GDP.[38] There is a real risk that the devastating impacts of climate change could destabilise countries, fuel conflict and collapse whole economies.

The US$100 billion target is for mitigation and adaptation finance, whereas the Paris Agreement treats loss and damage as a separate and distinct category, so it should receive additional financial support above and beyond this figure.[39] Climate Action Network, an international coalition of NGOs working on climate change, suggests that at least $50 billion per year in loss and damage financing is needed by 2022, increasing to approximately US$300 billion per year by 2030.[40] There are various proposals on how to raise this additional finance, including via a Climate Damages Tax.[41] Such a tax would be generated from a levy on oil, coal and gas extraction, set at a consistent global rate based on how much climate pollution (CO^2e) is embedded within the fossil fuel. The suggested starting rate is US$5 per tonne from 2020, rising by US$5 per tonne each year after that, to incentivise the phase out of fossil fuels.

A stark demonstration of how climate change drives global inequality has also been provided by researchers at SOAS and Imperial College, who found that climate change is increasing capital costs in developing countries - adding, on average, an extra US$1 to every US$10 of loan interest.[42] This is a reminder that climate change affects the whole of the global economy, and climate finance is likely to be relatively ineffective unless broader economic policies – including trade agreements and export finance – are also made compatible with climate objectives.

The cost of overshooting the 1.5^{0}C goal

The cost of climate change that is already happening is estimated at US$140 – 300 billion in adaptation financing needed by 2030, with between US$280 – 500 billion per year needed by 2050.[43] The UNEP report notes that the costs of adaptation measures are increasing, and that estimates that focus on policy implementation and take greater account of specific national circumstances generally report higher adaptation costs.[44] Ultimately, though, adaptation cost estimates are highly dependent on the pace of mitigation.

The core of the problem, examined in more detail in the remainder of this paper, is that Africa is required to take a greater share of the global mitigation effort while facing worsening climate impacts and greater adaptation costs. More climate finance could play an important role in plugging the gap, but it currently falls way short. A failure to adequately finance Africa's

[36] Schaeffer et al. (2014), p.10
[37] Warsaw International Mechanism for Loss and Damage, https://unfccc.int/topics/adaptation-and-resilience/workstreams/loss-and-damage-ld/warsaw-international-mechanism-for-loss-and-damage
[38] Richards, J., D. Hillman and L. Boughey (2018) *Climate Damages Tax: a guide to what it is and how it works*, https://www.stampoutpoverty.org/cdtreport/ , p.6
[39] As advocated by BOND DEG (2018), Written submission to the UK Aid for Combatting Climate Change Inquiry
[40] CAN (2018) Submission on the Scope of the Technical paper Exploring Sources of Support for Loss and Damage and Modalities for Accessing Support.
[41] Other international financial mechanisms have also been proposed, including Financial Transaction Taxes, or levies on international aviation and shipping. See Durand, A. et al. (2016) *Financing Options for Loss and Damage* https://www.die-gdi.de/discussion-paper/article/financing-options-for-loss-and-damage-a-review-and-roadmap/
[42] Buhr, B. and U. Volz (2018), Climate Change and the Cost of Capital in Developing Countries, UN Environment, https://unepinquiry.org/publication/climate-change-and-the-cost-of-capital-in-developing-countries/
[43] United Nations Environment Programme (UNEP) (2016), The Adaptation Gap Finance Report, http://web.unep.org/adaptationgapreport/sites/unep.org.adaptationgapreport/files/documents/agr2016.pdf , p.xii.
[44] UNEP (2016), p.xiii

current NDCs or support more ambitious future NDCs would also jeopardize the ability to meet the Sustainable Development Goals (SDGs).

Climate change and the SDGs in Africa

SDG Goal 13: Climate action and the US$100 billion per year target

SDG13 urges all countries to "take urgent action to combat climate change and its impacts", and includes a specific commitment that developed countries should meet their pledge of "mobilizing jointly US$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions."[45]

Developed countries also claim to be on track to meeting their US$100 billion pledge, although some major caveats should be applied to this. First of all it should be noted that the US$100 billion per year figure written into the 2009 Copenhagen Accord (and affirmed in Paris in 2015) has no basis in actual needs or obligations. As we have shown above, the US$100 billion is also several orders of magnitude short of what is actually needed to meet climate change mitigation and adaptation needs, and address loss and damage.

In 2016, a number of developed countries published a climate finance *Roadmap to US$100 billion*, which they claim shows that they are on course to meet the US$100 billion per year target for climate finance by 2020.[46] It is based on an earlier technical report by the OECD which does not offer a single projected figure for 2020 finance, but instead demonstrates a range of possible scenarios. [47]

According to subsequent OECD analysis, public climate finance now stands at US$54.5 billion in 2017 (the latest available figures), an increase from US$39.5 billion in 2013.[48] The *Roadmap* assumes that this figure would reach US$67 billion by 2020, with the rest of the US$100 billion sourced from multilateral development banks and private money that is "mobilized" (co-financed) by public investments.[49]

These reports and scenarios reflect considerable uncertainties, such as currency fluctuations, that could vary the overall outcome considerably. More troublingly, they also treat market-based and concessional loans as equivalent in value to grants, rather than calculating their grant-equivalence.[50] This significantly inflates and distorts the outcome in terms of benefits for recipient countries. As Oxfam has pointed out, climate finance should only count "net climate-specific assistance", since "anything outside of this does not constitute a net financial transfer to developing countries in support of climate action."[51]

The climate finance achieved in terms of net climate-specific assistance is far lower than the figure claimed by the OECD and developed countries: between US$16 and 21 billion per year based on 2015-2016 figures (the OECD claimed US$48 billion per year in the same time period).[52]

With the OECD reports and *Roadmap* claiming to use conservative assumptions about private sector finance, it is likely that any shortfall in the US$100 billion figure by 2020 would be plugged by more generous assumptions about the proportion of private sector finance that can be attributed to climate goals.

The OECD and *Roadmap* also include around US$2 billion in export credit in their figures, although this is a controversial choice. Export credit, far from "mobilizing" new finance, simply ensures that companies from the developed country providing the export credit win tenders rather than rivals from other countries (including those located in the country where projects take place).[53]

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[45] Sustainable Development Goal 13A, https://sustainabledevelopment.un.org/sdg13

[46] Australia, United Kingdom et al. (2016) *Roadmap to US$100 billion*, https://www.ctc-n.org/resources/climate-finance-roadmap-us100-billion-0

[47] OECD (2016) 2020 Projections of Climate Finance Towards the US$100 Billion Goal: Technical Note, https://www.oecd.org/environment/cc/Projecting%20Climate%20Change%202020%20WEB.pdf

[48] OECD (2018), Climate finance from developed to developing countries: 2013-17 public flows, OECD Publishing, www.oecd.org/environment/cc/Climate-finance-from-developed-to-developing-countries-Public-flows-in-2013-17.pdf, p.4

[49] OECD (2016), p.4

[50] Roberts, T. And R. Weikmans (2016) "Roadmap to where? Is the '$100 billion by 2020' pledge from Copenhagen still realistic?", https://www.brookings.edu/blog/planetpolicy/2016/10/20/roadmap-to-where-is-the-100-billion-by-2020-pledge-from-copenhagen-still-realistic/

[51] Carty, T. And A. le Comte (2018) *Climate Finance Shadow Report 2018*, Oxfam, p.8

[52] Carty, T. And A. le Comte (2018), p.8

[53] Kowalzig, J. (2015) "OECD report on climate finance: Fit for purpose or well on the way to meet the $100 billion promise?",

As with all of the SDGs, the climate change goal does not include regional targets. It does, however, stress the importance of "raising capacity for effective climate change-related planning and management in least developed countries and small island developing States."[54] 33 of the 47 LDCs are in Africa.

SDG 13 also gives prominence to the need to "Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries" (SDG 13.1), an adaptation goal that is also particularly important to Africa.

Neither of these objectives has been particularly well addressed by international climate finance. Around US$9 billion per year in climate finance went to LDCs, according to OECD data, amounting to around 18 per cent of the total in 2015-2016.[55]

Adaptation also continues to represent a relatively small share of overall climate finance. Only around 20 per cent of reported public climate finance – or US$9.5 billion per year – was allocated to adaptation in the 2015-2016 period, with a further 9 per cent supporting "cross-cutting" projects, while 71 per cent was mitigation-focussed.[56]

The proportion of adaptation finance is considerably higher in sub-Saharan Africa, where almost half of the finance passing through the main multilateral climate is dedicated to adaptation. However, given the negligible contribution of sub-Saharan Africa (except for South Africa) to global greenhouse gas emissions, this proportion remains far too low.[57]

It should also be noted that the self-reporting of climate finance under the OECD DAC markers, which is the basis for most climate finance estimates, tends to result in systematic over counting of climate finance in general, and adaptation finance in particular.[58] A review of over 5,000 projects reported as supporting adaptation objectives found that three-quarters of these appeared to be over counted.[59] This finding has been supported by similar reviews.[60]

Although the emphasis here is on identifying synergies between SDGs and NDCs, there are also substantive trade offs required between certain SDGs and the NDCs.[61] For example, some energy-related NDC activities, such as bioenergy, would most likely increase competition for water and soil resources, and in a number of cases would pose a threat to ecosystems and biodiversity.

Keeping Africa's emissions low while increasing energy access

Africa has the lowest greenhouse gas emissions of any region, which is closely related to the fact that it has the lowest energy consumption per capita of any region.[62]

The core challenge facing the continent, or more particularly sub-Saharan Africa, is to ensure reliable and affordable energy access for all. 590 million people still lacked electricity access by 2016, and 783 million lacked access to clean-cooking solutions in 2015.[63] North Africa has close to 100 per cent electrification, but there is a far more mixed picture in sub-Saharan Africa, where urban electrification rates range from as low as 4 per cent (South Sudan, Central African Republic) to 100 per cent (Cabo Verde and Mauritius), while rural electrification ranges from 1 per cent (Central African Republic, Chad, Democratic Republic of Congo, Djibouti, South Sudan, Burkina Faso, Guinea, Guinea- Bissau and Niger) to 100 per cent (Mauritius).[64]

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http://www.germanclimatefinance.de/2015/10/08/well-way-meet-100-billion-promise/

[54] Sustainable Development Goal 13B, https://sustainabledevelopment.un.org/sdg13

[55] Carty, T. And A. le Comte (2018) Climate Finance Shadow Report 2018, p.18. This represents only a small increase on the US$7.4 billion a year for the 2013-2014 period.

[56] Carty and le Comte (2018), p.16

[57] Watson, C. and L. Schalatek, L. (2019) Climate Finance Regional Briefing: sub-Saharan Africa, https://us.boell.org/cff_7_2018

[58] Carty and le Comte (2018), p.12

[59] Weikmans, R. J. Timmons Roberts et al. (2017). Assessing the credibility of how climate adaptation aid projects are categorized, Development in Practice, vol. 27, no. 4, pp. 458-471, http://dx.doi.org/10.1080/09614524.2017.1307325

[60] Michaelowa, A., and K. Michaelowa (2011) "Coding Error or Statistical Embellishment? The Political Economy of Reporting Climate Aid." World Development 39 (11), pp. 2010–2020; Junghans, L., and S. Harmeling (2012) Different Tales from Different Countries, a First Assessment of the OECD 'Adaptation Marker'. Briefing Paper, https://germanwatch.org/en/download/7083

[61] Dooley and Kartha (2017); Dzebo et al. (2018) "The Sustainable Development Goals viewed through a climate lens", SEI , p.3

[62] EIA (2018) Energy implications of higher economic growth in Africa, p.1; UNECA (2018) *Achieving SDG7 in Africa*, p.3: "The average per capita consumption of 200 kWh per year in sub-Saharan Africa remains the lowest in the world. This compares unfavourably to 1,600 kWh in the European Union; 1,075 kWh in India and 4,066 kWh in China."

[63] UNECA (2018), pp.5-6

[64] UNECA (2018), pp.5-6

Achieving SDG7 (clean, reliable, sustainable energy access) remains a top priority but progress is extremely variable, and achieving this without increasing emissions is a challenge that requires significantly more investment than is currently available.

The overall picture is clear: Africa requires a significantly larger effort to achieve universal clean energy access, while at the same time keeping GHG emissions in check. It also contains many of the countries most vulnerable to the effects of runaway climate change, despite the fact that it has done the least to cause the problem.

Sustainable agriculture, forestry and other land use

According to some analyses, Africa's largest potential to contribute to greenhouse gas emissions reductions potentially lies in agriculture, land-use and land-use change and forestry (LULUCF) (sometimes referred to as Agriculture, Forestry and other land use, or AFOLU).[65] At a global level, the AFOLU sector is responsible for around 10 to 12 GtCO2e of anthropogenic greenhouse gas emissions, just under a quarter of the global total. These emissions come mainly from deforestation, agricultural emissions from livestock, soil and nutrient management.[66]

There is significant overlap between attempts to reduce AFOLU emissions and meeting SDG goal 15, which is focused on efforts to "protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss."

In terms of climate objectives, AFOLU is well reflected across the full range of needs identified by African countries in their Nationally Determined Contributions (NDCs), with 84% of INDCs indicating agriculture as a priority sector for mitigation, and 98% of these including measures related to LULUCF.[67] The same sector is also critical to many countries' adaptation needs. However, as we shall see below, this focus is not particularly well reflected in the climate finance priorities of MDBs and bilateral climate finance.

Climate-resilient infrastructure, cities and transport

Several other structural factors could be expected to drive GHG emissions increases in Africa, unless significant financial and technological support is provided for zero or low-carbon development.

Africa is urbanising rapidly, with its cities amongst the fastest growing in the world – requiring significant investment in urban planning, sustainable transport infrastructure and building efficiency if this shift is to be achieved without a huge spike in energy consumption.[68] Africa also accounts for a rising share of the global population, with a projected increase from 1.32 billion currently (17 per cent of the global total) to 1.68 billion by 2030 (19.8 per cent of the global total).[69]

Africa is also vitally lacking in key transport infrastructure (roads, rail, ports). Continued economic growth would likely result in significant industrialization, which could account for over half of Africa's projected growth in energy consumption on some estimates, although it should be noted that many of the associated emissions will be "exported."[70]

The challenges implied in ensuring that Africa develops sustainable infrastructure and urban spaces are also key to achieving climate change mitigation. Achieving SDG9 (building resilient infrastructure, and promoting inclusive and sustainable industrialization) and SDG11 (make cities and human settlements inclusive, safe, resilient and sustainable) are as integral to the objectives of climate change mitigation.

The full range of these objectives tend to be considered in the 44 NDCs (and INDCs) submitted by African countries. However, the scope of climate finance to support the achievement of these goals is limited, with a disproportionate funding focus generally placed on the energy sector.

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[65] Nwamarah, U., J. Dunham and G. Hinojosa (2018) Gap Analysis Report: African Nationally Determined Contributions (NDCs), https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/AfricanNDCsGapAnalysisReport.pdf p.12

[66] IPCC AR5, chapter 11, p.816

[67] Nwamarah et al (2018), p.12

[68] EIA (2018), p.1

[69] United Nations, Department of Economic and Social Affairs, Population Division (2015). *Population 2030: Demographic challenges and opportunities for sustainable development planning* (ST/ESA/SER.A/389) p.2. Africa has the fastest population growth rate of any region currently. The projected global total population in 2030 is 8.5 billion compared to 7.7 billion currently. It is important to note that population is a relatively weak explanatory factor in climate change terms, since the richest segment of people accounting for the vast majority of emissions.

[70] EIA (2018), p.4. GDP is a very poor metric for judging the progress of a society or the well-being of its people, but even if Africa embraces development models that improve peoples' lives and livelihoods without focussing narrowly on economy growth, it is likely that GDP would continue to grow

Climate change adaptation, loss and damage and the SDGs in Africa

In addition to SDG goal 13 highlighting the importance of climate resilience, adaptation projects or programmes are likely to contribute to a number of other SDGs. The Climate Investment Funds Pilot Programme for Climate Resilience (PPCR), for example, claims to have directly contributed to 9 of the 17 SDGs: 1 (no poverty), 2 (zero hunger), 5 (gender equity), 6 (clean water and sanitation), 7 (affordable and clean energy), 9 (industry, innovation and infrastructure, 11 (sustainable cities and communities), 13 (climate action) and 14 (life below water).[71] It claims that all US$985 million of approved funding for this adaptation programme contributes to the poverty reduction goal, with US$737 million contributing to gender equity and US$453 million to improved industry and infrastructure (goal 9).

At present, the majority of public adaptation finance is focused on the water and wastewater sector and the agriculture, forestry, land-use and natural resource sector (US$11 billion and US$4 bn respectively, although these figures are open to question).[72]

Overall, the mitigation-bias of climate finance means that far too little is still being done to address this fuller range of adaptation needs. For example, Sub-Saharan Africa receives only around 16% (US$4 billion) of international public adaptation finance but is expected to bear the highest adaptation costs per unit of gross domestic product (GDP). According to a UN Environment report, estimated adaptation costs represent less than 1% of African GDP (in a below 2˚C world) but as much as 6% of African GDP of climate change exceeds 4˚C by the end of the century.[73]

Global ambition and Nationally Determined Contributions

The first round of NDCs put the planet on course for global warming of more than 3^{0}C, with potentially devastating consequences for people and the planet.[74]

Developed countries, which have done the most to cause climate change and have the greatest capacity to contribute to global mitigation and adaptation efforts, fall furthest short. Assessing the NDC pledges of the richest countries according to their fair share of the global contribution, the commitments from the 28 EU countries and from the US represent just one fifth of their fair share, while Japan's commitment represents only about 1/10th of its fair.[75] Moreover, the EU as a whole and USA are amongst the many countries that are currently on track to miss their stated goals.[76]

The provision of adequate climate finance is not only a moral imperative for achieving a fair distribution of the effort to avert climate change, but is also a practical necessity.
Even if wealthy countries substantially increased their mitigation efforts, they cannot possibly meet their fair share of the global goal through domestic action alone. They therefore need to provide substantial finance, technology and capacity support to enable developing countries to go well beyond their fair share of mitigation action.[77]

Poorer countries, including most African countries, have made NDC pledges that are close to or exceed their fair share of mitigation, although they will nevertheless need to do more – with international support – for the world to reach a below 1.5°C or even 2 °C pathway.[78]

African countries also have far greater mitigation potential than is currently being realized. But there is an important catch: increasing the ambition of Africa's NDCs relies on their being an adequate and predictable flow of international climate finance. As we shall see in section XX, that goal has not yet been achieved.

The estimated global cost of meeting all of the NDC pledges is estimated at US$58-135 billion per year by 2030, taking into account only the unconditional

[71] Climate Investment Funds (2019) CIF projects and sustainable development goals, p.3
[72] UNEP (2016) Adaptation Gap report; Nwamarah et al. (2018), p.18
[73] UNEP (2015) Africa's Adaptation Gap 2 Technical Report http://africanclimatefinancehub.net/wp-content/uploads/2017/09/Africas_adaptation_gap_2_Bridging_the_gap_mobilising_sources_2015.pdf ; Nwamarah et al. (2018), p.18
[74] Climateinteractive.org ; described another way: "If the current Nationally Determined Contributions (NDCs) are fully implemented, the carbon Budget for limiting global warming below 2°C will be 80 per cent depleted by 2030, UNEP (2017) Emissions gap; UN Environment (2019) *Global Environmental Outlook*, p.44.
[75] Civil Society Review (2015) Fair Shares Civil Society Review, p.2
[76] UN Environment (2018).
[77] Civil Society Equity Review (2018) *After Paris: Inequality, Fair Shares and the Climate Emergency*, p.8
[78] Civil Society Review (2015)

NDCs.[79] The largest share of these costs (US$42-90 billion, or 67-74%) take place in OECD90 countries, largely because of the higher reductions compared to baseline, with the remaining US$15-45 billion in non-OECD90 countries.[80]

According to Hof et al., the costs of achieving the additional reductions of the conditional NDCs is estimated at about US$39–56 billion per year, of which US$33–46 billion is in non-OECD90 countries.[81] "About one-third of the difference in non-OECD90 abatement costs between the conditional and unconditional NDCs is due to the difference in costs in South Africa, which has a very large range in their NDC reduction target."[82]

The estimated cost of bridging the gap between meeting all of the NDC pledges (including conditional ones) and achieving a 2 degree goal would range between an additional US$234 and US$400 billion per year [assuming emissions of 42GtCO2e by 2030]. According to Hof et al, the additional costs are about twice as high again (or 5-6 times as high as the NDCs overall).[83]
However, this study assumes that a 1.5 degree goal would see emissions of 39 GtCO2e by 2030, way in excess of the 25 GtCO2e cited in the Emissions Gap Report (and Low Energy Demand scenario). So the total annual cost would likely be considerably higher still *[at present, no proper cost estimates exist for the cost of reaching 25 GtCO2e by 2030]*

Other estimates suggest a similar picture. The overall cost of implementing developing country NDCs could be US$4.2 trillion, with Africa accounting for US$2.8 trillion of this figure.[84]

However, it should be noted that the US$4.2 trillion global figure is likely to be a significant under-estimate because numerous developing countries – including most of the largest non-Annex I greenhouse gas emitters – have not put specific figures on the cost of meeting their NDCs.[85]

The international climate finance component of this figure is also relatively small, at just over US$42 billion per year.[86] However, this figure should also be treated with considerable caution as it refers only to specifically costed "conditional" pledges. A far larger number of countries require international climate finance than have put a specific number to their conditional NDC pledges, including most of the major recipients of climate finance currently.

Finance required for Africa to implement its NDCs

Almost US$2.8 trillion of the US$4.2 trillion that developing country NDCs say is required by 2030 relates to the mitigation and adaptation needs of African countries.[87]

This US$2.8 trillion figure is based on the estimates that 44 of Africa's 54 countries have written into NDCs (or, in some cases, INDCs). However, the US$4.2 trillion global

[79] Hof et al. (2017) "Global and regional abatement costs of Nationally Determined Contributions (NDCs) and of enhanced action to levels well below 2 °C and 1.5 °C" Environmental Science and Policy, https://doi.org/10.1016/j.envsci.2017.02.008 p.33, p.38 It is worth underscoring that abatement costs of achieving the NDC targets are very sensitive to the assumed socio-economic assumptions.
[80] Hof et al. (2017), p.34
[81] Hof et al. (2017), p.34
[82] Hof et al. (2017)), p.33 [see also other estimates: https://www.carbonbrief.org/analysis-developing-countries-need-3-5-trillion-to-implement-climate-pledges-by-2030; IRENA
[83] Hof et al. (2017), p.35
[84] Vidal (2016) https://www.theguardian.com/global-development/2016/apr/22/climate-change-study-poor-countries-4tn-2030-avert-catastrophe-paris-agreement; https://www.carbonbrief.org/analysis-developing-countries-need-3-5-trillion-to-implement-climate-pledges-by-2030. A trillion here refers to 1,000 billion, or a million million. The numbers here are based on International Justice Initiative/University of Tasmania data table, reprinted in Vidal (2016), which we have updated. The most significant of these updates relate to figures for South Africa (significant increase from INDC) and India (a significant decrease).
[85] The major GHG emitters from the non-Annex 1 list that have not costed their NDCs include China, South Korea, Saudi Arabia, Indonesia, Mexico and Brazil. Iran has not submitted an NDC. India and South Africa are the two largest non-Annex 1 countries to identify financial needs, although neither have identified a "conditional" figure requiring international climate finance to be fulfilled.
[86] Own calculation, based on IJI/University of Tasmania (2016).
[87] Own calculation updated from IJI/University of Tasmania (2016). South Africa's INDC includes just US$60 billion in identified finance, whereas its NDC identifies an estimated US$1,380 billion in mitigation and a further US$380 billion in adaptation needs. The NDC document itself does not clearly identify these figures, but was subject to further analysis by, amongst others, UN Environment – see UN Environment (2018) Aligning Climate Finance to the effective implementation of NDCs and LTSs, https://unepinquiry.org/publication/aligning-climate-finance-to-the-effective-implementation-of-ndcs-and-to-ltss/ p.18. India's NDC, by contrast, identifies US$1 trillion in needs compared to US$2.5 trillion in its INDC.

figure is likely to be a significant under-estimate because numerous developing countries – including most of the largest non-Annex I greenhouse gas emitters – have not put specific figures on either the cost of meeting their NDCs or stated what they would need by way of international climate finance.[88]

26 of the African countries that have submitted NDCs have identified a "conditional" component to be met with the support of international climate finance component. This amounts to US$378 billion to 2030 (the annual figure comes to less than US$37.8 billion per year as, in some cases, the projected time period for financing begins before 2020).[89]

However, it should be noted that many of the largest African countries, including the seven counties with the highest current greenhouse gas emissions currently (South Africa, Nigeria, Egypt, Algeria, Angola, Libya and Ethiopia) did not put specific requests for the international (i.e. conditional) component of the NDCs, so the actual climate finance need to meet these goals is likely to be far higher.[90] Of the major African recipients of international climate finance currently, only Morocco has identified a "conditional" component in its NDC.

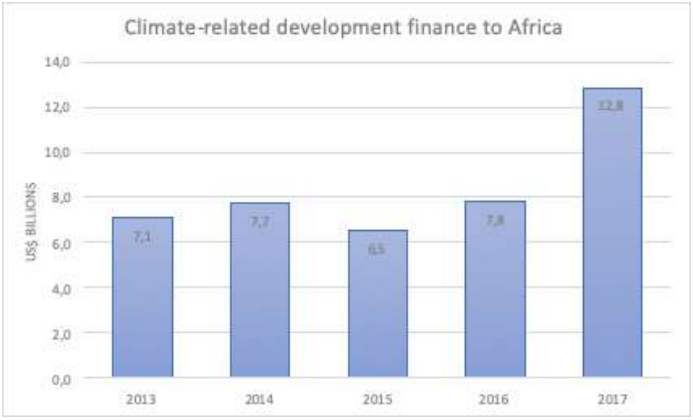
In a separate survey of NDCs focused on renewable energy, IRENA found that over US$1.7 trillion would be needed to be invested globally for renewable energy targets identified in NDCs to be met, adding 1.3 terawatts (TW) of installed capacity – a 76 per cent increase from current figures.[91] US$226 billion of this total investment would be required in Africa, adding 93 GW of installed capacity.[92] US$125 billion of this figure related to conditional targets and therefore requiring international climate finance support.

Climate finance in Africa

Africa received US$12.76 billion in "climate-related development finance" in 2017, according to OECD data.[93] US$4.2 billion of this figure was dedicated to energy expenditure, while a further US$2 billion was directed towards agriculture and forestry. [show a table?]

This figure represents a significant increase on previous years, where a range of between US$6.5 billion and US$7.8 billion was reported.

In 2017, 24 per cent of the reported climate-related finance to Africa was in the form of grants, with the remaining 76 per cent using debt instruments (loans and credit lines).[94]



In global terms, Asia remains the main beneficiary of public climate finance flows. The difference is especially marked in terms of financing from multilateral development banks, with sub-Saharan Africa receiving just 9 per cent of MDB financing, compared to 41 per cent to the Asia-Pacific region.[95] This is significant because MDBs remain the largest source of international climate finance. In 2017, US$8.3 billion (65%) in public climate finance was channelled via

[88] The major GHG emitters from the non-Annex 1 list that have not costed their NDCs include China, South Korea, Saudi Arabia, Indonesia, Mexico and Brazil. Iran has not submitted an NDC. India and South Africa are the two largest non-Annex 1 countries to identify financial needs, although neither have identified a "conditional" figure requiring international climate finance to be fulfilled.

[89] Own calculation, based on IJI/University of Tasmania (2016).

[90] Two of these seven countries, Angola and Libya, did not submit NDCs at all.

[91] IRENA (2017) Untapped Potential for Climate Action: Renewable Energy in Nationally Determined Contributions, https://www.irena.org/publications/2017/Nov/Untapped-potential-for-climate-action-NDC, p.8

[92] IRENA (2017), p.8, p.201.3 GW of this identified need is for off-grid renewables, of which 1.2 GW would be in Africa. These are estimated to provide energy access to approx. 140 million people.

[93] OECD (2019) OECD DAC Climate-related Development finance, "lower bound", https://public.tableau.com/views/Climate-relateddevelopmentfinance-RP/CRDF-Recipient?:embed=y&:displaycount=no&%3AshowVizHome=no%20#3 Accessed 21 August 2019

[94] OECD DAC (2017)

[95] UNFCCC (2018), p.81

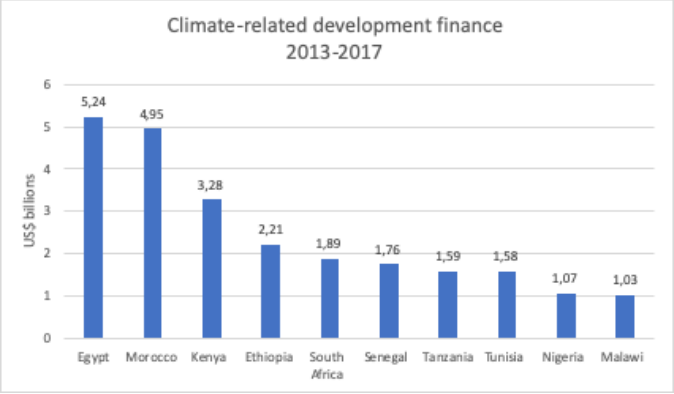
multilateral development banks, compared to just US$619 million (5%) via other multilateral channels, including UN climate funds. A further 30 per cent (US$3.84 billion) in bilateral finance was reported from OECD countries.

Africa receives a relatively larger proportion of bilateral climate finance, with sub-Saharan Africa accounting for around 30 per cent of this figure, around two-thirds of which was provided as grants.[96] However, it should be noted that figures for bilateral finance vary considerably depending on how this is counted. The OECD-DAC "upper bound" for climate-related development finance reporting includes activities where climate objectives are said to be a "significant" element in a project's goals, but not necessarily the "principal" element. Under this method of counting, Africa received US$18 billion in climate finance per year, and the bilateral share was (US$8.4 billion) slightly exceeded the funds channeled through MDBs.

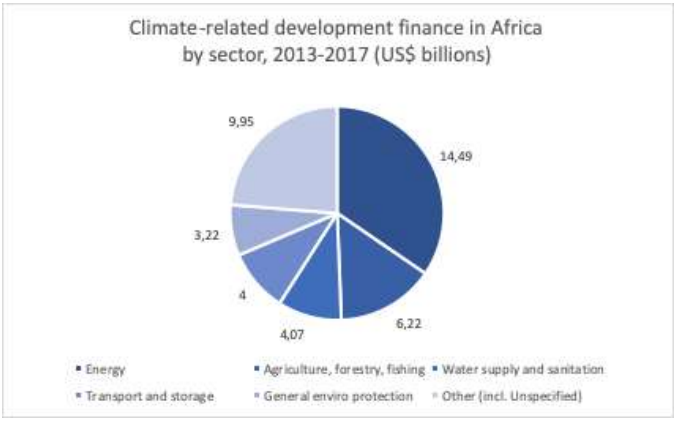
The OECD DAC system relies on self-reporting, and the criteria for inclusion of climate change as a "significant" objective of development finance is often applied quite flexibly. As a result, the figures used in this report related to the "lower" bound of activities for which climate change is the "principal" objective.

General Trends

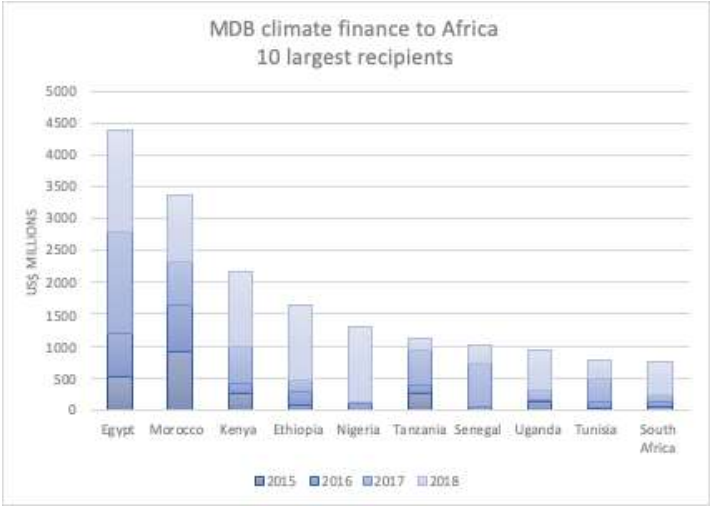
The largest recipients of climate finance in Africa are Egypt (US$5.2 billion from 2013 to 2017) and Morocco (US$4.95 billion over the same period), followed by Kenya, Ethiopia and South Africa – as shown in the chart below.



Energy financing accounts for the largest share of climate finance to Africa, with US$14.5 billion (35%) in the five years from 2013 to 2017. Agriculture, forestry and fisheries (US$6.2 billion, 15%), water supply and sanitation (US$4.1 billion, 10%), transport and storage (US$4 billion, 10%) and general environmental protection (US$3.2 billion, 8%) are the other major categories of expenditure. The amounts and percentages here are likely to be an underestimate, since these sectors are also likely to account for some of the reported finance that is unallocated, unclassified or reported as multisectoral, while other reporting categories (e.g. government and civil society, or banking and financial services) might ultimately benefit the named sectors.



The largest recipients of climate-related finance from MDBs (based on data from the past 4 years) are Egypt, Morocco, Kenya, Ethiopia and Nigeria.



Green Climate Fund

The GCF is the world's largest dedicated multilateral climate fund, which currently commits around US$1.5 billion in funding annually.[97] It was established under

[96] UNFCCC (2018), p.87

[97] GCF Independent Evaluation Unit (2019) *Forward-Looking Performance Review of the Green Climate Fund* (2019), p.xxxii .

the UN Framework Convention on Climate Change (UNFCCC) and also serves the Paris Agreement.

The GCF's initial resource mobilization took place in 2014, in line with SDG13 which urged its operationalization and capitalization. US$10.3 billion has been pledged to the GCF so far, mostly by developed country governments. However, only US$7.1 billion is available for project and programme financing after the Trump Administration withheld US$2 billion of the previous US administration's US$3 billion commitment and over US$1 billion was eroded away by currency fluctuations.[98] US$5.3 billion (75 per cent of the total available) has so far been allocated to 111 projects and programmes, of which 46 should be partly or wholly implemented in Africa.[99] New funding support is being pledged as part of a "recapitalization" process taking place in 2019.

The GCF is considered essential to the implementation of developing countries' national contributions in the fight against climate change.[100] Its mandate is to promote a "paradigm shift towards low-emission and climate-resilient development" within the context of sustainable development, while providing other economic, social, developmental and environmental benefits with its funding in addition to targeted climate action and taking a gender-sensitive approach in all its funding.[101]

The GCF is governed by a 24 member Board (with a further 24 alternate members), which decides on funding proposals as well as all key policies. Board membership is evenly split between government representatives of developed and developing countries, including three members (and three alternates) from African countries at any one time, as well as a further member (and alternate) from Least Developed Countries, which is also often filled by a representative of an African government. In 2019, Sudan is one of two Board co-chairs, with further Board members from Liberia, Senegal and Tanzania, and alternates from Angola, Egypt, Gabon and South Africa.[102]

GCF funds are supposed to be distributed evenly between mitigation (reducing the emission of climate-harming greenhouse gases) and adaptation (helping vulnerable countries and communities to be better prepared for the consequences of the climate change that is already happening).

The GCF does not distribute funding directly, but works through a series of "accredited entities," or partner institutions. There are a series of formal rules defining the scope of the partnership, setting out the scale of joint activities, their scope ("direct access" within one country or region, or international), level of environmental or financial risk, and the types of financial instruments they can use.

"Direct access" is central to the GCF's stated mission, but so far the vast majority of approved funding (82 per cent) is committed via international accredited entities. The 10 largest accredited entities alone account for 75 per cent of the GCF funding that has so far been committed.[103] However, 14 regional or national "direct access" entities have been approved to work in Africa so far – a list that includes government ministries, non-profit organisations, regional development banks, commercial banks and financial services companies.

Overall, 63 per cent of GCF funding has been approved for mitigation and 37 per cent for adaptation-related activities (taking account of the relative weightings of cross-cutting activities that involve both objectives). However, allocating the Fund's resources according to grant equivalence reveals a portfolio with 52 per cent of GCF funding committed to adaptation and 48 per cent committed to mitigation.[104]

The GCF has also provided support for capacity-building and readiness to 120 countries, a list that includes most African countries.[105] 92 readiness grants worth US$2 million have been approved in Africa, of which about half have been disbursed.[106]

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[98] Pledges were in donor countries' own currencies, which have generally depreciated against a strong US dollar. See GCF IEU (2019), p.110

[99] GCF Dashboard (Accessed 20 August 2019), https://www.greenclimate.fund/what-we-do/portfolio-dashboard

[100] At the UNFCCC level, countries present their plans in the form of Nationally Determined Contributions (for mitigation) and National Adaptation Plans. The GCF is an "operating entity of the financial mechanism of the UNFCCC." See http://unfccc.int/cooperation_and_support/financial_mechanism/items/2807.php (accessed 17 August 2019)

[101] GCF Governing Instrument, https://www.greenclimate.fund/documents/20182/1246728/Governing_Instrument.pdf/caa6ce45-cd54-4ab0-9e37-fb637a9c6235

[102] GCF (2019), Board Members (Accessed 24 August 2019), https://www.greenclimate.fund/boardroom/board-members

[103] IEU (2019), p.83. Nine of these ten are international development institutions, and the tenth is a regional entity (Development Bank of Southern Africa)

[104] IEU (2019).

[105] IEU, p.100

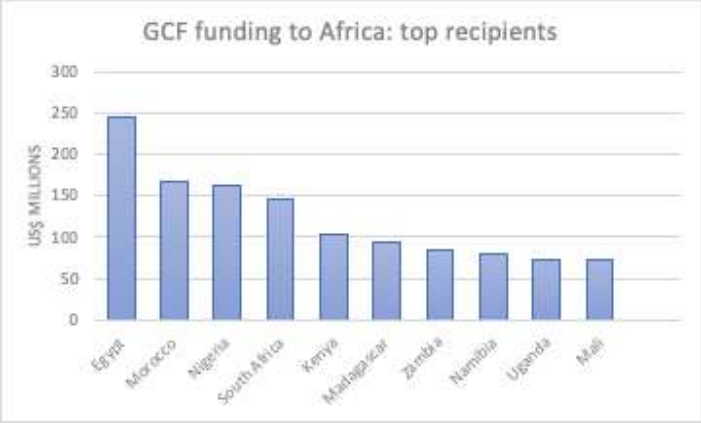
[106] GCF (2019) GCF in Africa

Africa is currently the largest regional recipient of approved GCF funding. US$2.1 billion out of US$4.95 billion in approved GCF funding (42 per cent) was allocated to projects and programmes in Africa, spanning 35 different countries.[107] However, disbursement delays mean that only 14 of these countries host funded activities that are already "under implementation."[108]

	Africa (US$ mn)	Total (US$ mn)
Mitigation	853	2,196
Adaptation	534	1,174
Cross-Cutting	653	1,648
Total	2,041	5,108

Source: IEU, p.166 (figures at 28 Feb 2019)

The largest individual country recipients of GCF funding are also Egypt (US$245 million) and Morocco (US$167 million). A table of the 10 largest recipient countries is shown below, although it should be noted that with relatively limited funding approvals to date, any individual project could significantly alter the balance.



Climate Investment Funds

The Climate Investment Funds (CIFs) are administered by the World Bank and operate in partnership with regional development banks including African Development Bank (AfDB) and European Bank for Reconstruction and Development (EBRD).

The CIFS have approved US$6.29 billion in funding since their inception in 2008, out of a total US$8.2 billion in pledges.[109] One-third of this amount (US$2.09 billion) relates to projects and programmes in Africa. This total is sub-divided across four different funds: the Clean Technology Fund (CTF), Forest Investment Programme (FIP), Pilot Programme for Climate Resilience, and the Scaling-Up Renewable Energy Programme for Low Income Countries (SREP). The CTF is by far the largest of these, accounting for about two-thirds of approved funding (US$4.2 billion).

The CIFs finance programmatic interventions in selected developing countries, with 21 of Africa's 54 countries having received money from them (see table, below). Individual large-scale proposals (in the case of the CTF), national or regional-level programmes are considered. However, the CIFs have been widely criticized for setting up a parallel structure that bypasses the UNFCCC and its principles. In working through a handful of multilateral development banks, the CIFs have failed to adopt a truly "country-driven" approach.[110] They are also heavily skewed towards mitigation, which accounts for 86 per cent of approved funding (compared to the 50:50 balance sought by the GCF).[111]

[107] GCF/B.23/Inf.12, p.6. Funding has been allocated to projects/programmes in the following countries: Benin, Burkina Faso, Burundi, Cameroon, Chad, Comoros, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eswatini, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Morocco, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, United Republic of Tanzania, Togo, Tunisia, Uganda and Zambia

[108] IEU, p.165

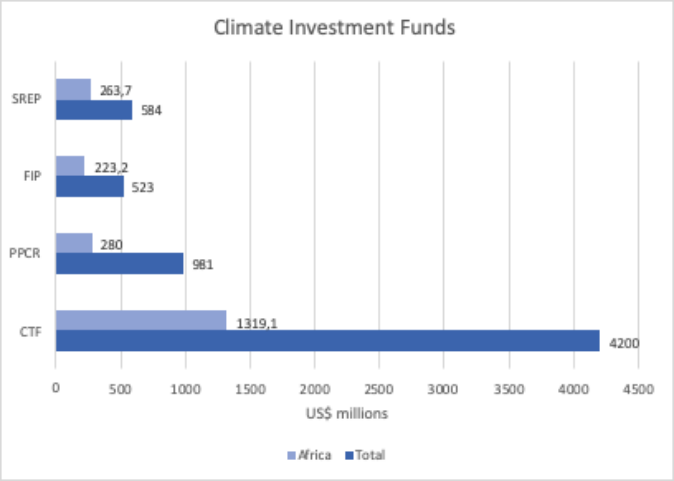
[109] A significant proportion of CIF pledges, including 19% of those for the Clean Technology Fund, are in the form of loans. 14 countries have funded the CIFs: Australia, Canada, Denmark, France, Germany, Japan, Korea, Netherlands, Norway, Spain, Sweden, Switzerland, UK and the United States.

[110] Civil society organisations and networks (2019) Open letter to Trust Fund Committee Members, https://www.actionaidusa.org/news/over-100-groups-call-for-sunset-of-the-climate-investment-funds/

[111] Civil society organisations and networks (2019)

The largest individual recipient countries in Africa are Morocco (US$645 million[112]), South Africa (US$490 million), Egypt (US$152 million) and Mozambique (US$118 million). The majority of these funds are for renewable projects – most notably, for large-scale concentrated solar power in Morocco and South Africa, and wind power in Egypt and South Africa. The Clean Technology Fund's renewable energy investments account for 63 per cent of all CIF funding to Africa, and renewable energy is the focus of three-quarters of CIFs funding on the continent.

The chart below shows the overall allocation of approved funding across the four CIFS funds, as well as the share of this that is approved in Africa.



The African countries for whom CIFs funding has been approved are listed in the table below:

Country	Amount (US$ millions)	Fund
Morocco*	645,2	CTF
South Africa	490	CTF
Egypt	151,7	CTF
Mozambique	118,4	FIP, PPRC
Niger	100	PPRC
Zambia	90	PPRC
Ghana	76,8	FIP, SREP
DRC	66	FIP
Liberia	50	SREP
Rwanda	50	SREP
Burkina Faso	38,5	FIP
Tanzania	37,2	SREP
Kenya	32,9	SREP
Nigeria	32,2	CTF
Ethiopia	31,3	SREP
Mali	28,6	SREP
Maldives	25,9	SREP
Cote d'Ivoire	15	FIP
Uganda	4,2	SREP
Lesotho	1,8	SREP
Madagascar	0,3	SREP

The CIFs were created in 2008 as interim funds, with the idea that they would "take necessary steps to conclude its operations once a new [UNFCCC] financial architecture is effective." Despite the fact that this new architecture is now in place, with the GCF fully operational, the CIFs are seeking recapitalization in 2019. A number of recipient countries have signed a letter in support of extending the lifespan of the CIFs.[113] However, with the CIFs seeking contributions in same funding cycle as the GCF, there is a significant risk that contributions to the former would undermine the latter. A network of civil society organisations and networks recently wrote an open letter asking that any new public finance should be directed to the GCF rather than the CIFs, with the latter applying the sunset clause outlined in their original mandate.

This need not result In shortfalls for existing CIFs programming, which could be completed in one of two ways without negative implications for recipient countries. The first of these would be to approve the use of loan "reflows" to cover the funding gap. As noted by the World Resources Institute,

Reflows are estimated to be around $665 million between fiscal 2018-2022. This revenue stream could be front-loaded by issuing bonds, allowing the CTF to extract more juice out of its existing assets. This would cost donors no new money; all it would take would be a decision by the CTF committee. This measure would provide meaningful financial firepower. If bonds could be issued with CTF reflows as collateral, $1.4-1.6 billion for new projects between fiscal 2018 and 2022 would be unlocked.[114]

[112] This figure includes the entire approved amount for the CTF's MENA-CSP program, since all 4 projects approved as part of this are in Morocco.

[113] Climate Investment Funds (2019) Joint Ministerial Statement, https://www.climateinvestmentfunds.org/news/joint-ministerial-statement

[114] Martinez-Diaz, L. (2017) What should President Macron's Climate Summit Deliver on Finance?,

A second, arguably preferable way to deal with this issue would be for any continuing plans that are still relevant and in need of funding to be supported via the GCF. There have already been discussions between the GCF and the administration unit of the CIFs regarding nine unfunded investment plans of the CIFs. The GCF could pick up any plans that it would still be beneficial to fund although, as the GCF Secretariat has noted, some of the unfunded CIF plans "have been superseded."[115]

Global Environment Facility

The Global Environment Facility (GEF) was established in 1991 and is an operating entity of the financial mechanism of the UNFCCC and Paris Agreement. It also serves as the financial mechanism for several other UN conventions, including on biodiversity and desertification.[116] As such, climate change is just one of a number of GEF focal areas.

The GEF received US$4.43 billion in pledges for the 2014-2018 period, of which US$1.26 billion were intended to support climate change. For the 2019-2022 period, the GEF has been pledged US$ 4.1 billion (from 30 countries). Its climate change funding is set to fall below US$900 million for this seventh replenishment period, reflecting the growing role of the GCF.

As of November 2018, the GEF had reportedly approved over 1000 climate-related projects, worth an estimated US$3.6 billion.[117]

UNFCCC climate funds: Adaptation Fund, Least Developed Countries Fund and Special Climate Change Fund

The UNFCCC operates two funds focused on adaptation (Adaptation Fund and Least Developed Countries Fund, LDCF), as well as a Special Climate Change Fund (SCCF) that supports both adaptation and technology transfer.

The Adaptation Fund has so far approved US$532 million in grant funding since it became operational in 2009, with US$163 million of this in sub-Saharan Africa and a further US$48 million in the Middle East and North Africa (MENA) region.[118]

The LDCF has approved US$1.16 billion in grant financing for 250 projects since 2002.[119] It is operated by the Global Environment Facility (GEF). US$810 million of this approved funding is in sub-Saharan Africa, with a further US$35 million in the MENA region.[120] The Fund's main priority is to help LDCs to develop National Adaptation Programs of Action (NAPAs).

The SCCF has approved US$350 million in grant funding for 78 adaptation and technology projects, which includes US$34 million in sub-Saharan Africa and further US$43.5 million in the MENA region.[121] The SCCF is operated by the GEF.

The Adaptation Fund, LDCF and SCCF have been beset by a lack of predictable or adequate finance. The Adaptation Fund's main source was supposed to be a 2% levy on the sale of Clean Development Mechanism (CDM) carbon credits, but this has dried up since that market collapsed in 2011 and it is now mainly reliant on developed country voluntary contributions.[122] All three of these funds have already been eclipsed, in terms of their scale of funding, by the GCF.

The Adaptation Fund is arguably the most notable of these UNFCCC funds because of innovations in terms of its structure and governance. Recipient countries take the leading role in decision-making (which is by consensus), with between 63 and 69 per cent of Board

https://www.wri.org/blog/2017/09/insider-what-should-president-macrons-climate-summit-deliver-finance

[115] GCF (2018) Report on the Activities of the Secretariat, https://www.greenclimate.fund/documents/20182/1674504/GCF_B.23_Inf.01_-_Report_on_the_activities_of_the_Secretariat.pdf/638c71bd-f3cb-f338-2c0e-771d5dde0af6 paragraphs 36-37

[116] Watson, C. and L. Schalatek (2019) The Global Climate Finance Architecture, https://climatefundsupdate.org/about-climate-finance/global-climate-finance-architecture/

[117] Watson, C. and L. Schalatek (2019)

[118] Climate Funds Update (2019), Adaptation Fund https://climatefundsupdate.org/the-funds/adaptation-fund/ ; https://climatefundsupdate.org/data-dashboard/regions/

[119] Global Environment Facility (2019) Least Developed Countries Fund, Accessed 21 August 2019 https://www.thegef.org/topics/least-developed-countries-fund-ldcf

[120] According to the LDCF's 2016 program evaluation report, 64 per cent of funding was to Africa.

[121] Global Environment Facility (2019) Special Climate Change Fund, Accessed 21 August 2019 https://www.thegef.org/topics/special-climate-change-fund-sccf ; https://climatefundsupdate.org/data-dashboard/regions/

[122] Grimm, J., L. Weischer and D. Eckstein (2018) The future role of the Adaptation Fund in the international climate finance architecture, https://germanwatch.org/en/15936 p.22

members from developing countries.[123] Projects need to be approved by Designated Authorities (DAs) at national level, with the aim of ensuring coherence with national plans, and the fund has put a cap of 50 per cent of available funds passing through multilateral institutions in order to improve the chances of National Implementing Entities (NIEs) receiving funding.[124] The Adaptation Fund is also pioneering "enhanced direct access" for devolving funding and decision-making to a local level.

Finance beyond Official Development Assistance: China's Belt and Road initiative

Climate-related development finance is far from the only source of finance to Africa that could impact upon the continent's ability to address climate change.

Notably, in 2018 China pledged a further US$60 billion to projects aligned with its Belt and Road initiative, with a particular focus on funding to Kenya, Tanzania, Ethiopia, Djibouti and Egypt. This breaks down as a mix of grants (US$15 billion), interest-free and concessional loans (US$15 billion), non-concessional credit lines (US$20 billion), a special fund for China-Africa development (US$10 billion), and a fund for imports from Africa (US$5 billion).[125]

China has loaned around US$125 billion to Africa between 2000 and 2016, according to data from the John Hopkins University China-Africa Research Initiative, although concerns persist that this is fostering a "debt trap".[126]

No full assessment of this funding exists to examine its potential climate implications. Tackling climate change is now cited as one of the key priorities of China's new funding, and it would point to "green infrastructure" developments (including significant rail projects in Kenya, Ethiopia, Angola, Djibouti and Nigeria, as well as the Addis Ababa Light Rail transit) as evidence of this. However, these rail projects also provide infrastructure to accelerate minerals and fossil fuels extraction, and China has also funded fossil fuel projects (notably Nigeria's Edo State Oil Refinery).

Climate finance and NDCs: are current demands being met?

The first round of NDCs (and INDCs) vary significantly in terms of their levels of ambition and detail, the depth of the analysis, and the extent of efforts to reach out beyond government for "stakeholder" feedback.

This section looks at whether climate finance is adequately meeting the needs identified in NDCs, but it should also be noted that these documents do not always offer an adequate or complete expression of peoples' needs in response to climate change. A recent study of adaptation commitments in the NDCs of LDCs found that most of these documents understate the costs of adaptation.[127] 33 of these 47 countries are in Africa.

The worsening impacts of climate change will also increase loss and damage costs, which are not currently well-reflected in NDCs.

On the mitigation side, an overall analysis of countries' respective roles in closing the "emissions gap" to achieve a 1.5 degree target found that poorer countries, collectively, meet their fair share while wealthier countries fall far short.[128] However, significant scope remains for a greater share of global emissions reductions to take place in Africa, *conditional* on the provision of adequate climate finance.

This section takes a closer look at the NDCs of a sample of 3 countries and the climate finance that they have received, and whether current demands are being met. Since NDCs are intended to cover the 2020-2030 period, it is obviously too soon to judge whether they will be achieved. However, the record of existing climate finance can serve as a guide in considering whether MDBs and bilateral finance is responsive to requirements set by recipient countries, as well as showing whether current action is effectively laying the groundwork for the NDC to be fulfilled. It can also be used to consider what changes might be required to the NDC in the round of revisions of these plans that is scheduled by 2020.

[123] Grimm et al. (2018) , p.27
[124] Grimm et al. (2018), p.11
[125] Shepherd, C. and B. Blanchard (2018) China's Xi offers another $60 billion to Africa, *Reuters* 3 September https://www.reuters.com/article/us-china-africa/chinas-xi-offers-another-60-billion-to-africa-but-says-no-to-vanity-projects-idUSKCN1LJ0C4
[126] Shepherd and Blanchard (2018)
[127] IIED (2019) *LDC NDCs: adaptation priorities and gaps to address*, https://pubs.iied.org/17709IIED/ p.2
[128] Holz, C., S. Martha and T. Athanasiou (2017) *Fairly sharing 1.5: national fair shares of a 1.5 C-compliant global mitigation effort*, International Environmental Agreements, DOI 10.1007/s10784-017-9371-z, p.1

Egypt

Egypt currently has Africa's 3rd highest greenhouse gas emissions, totalling 272 MtCO2e based on 2014 figures. In global terms, its current and historical responsibility for climate change remains small, however, accounting for 0.52% of total global emissions.[129]

At the same time, Egypt is extremely vulnerable to climate impacts with heat waves posing a risk to health, food security and the tourism sector; sea level risk threatening Alexandria and its other coastal cities, and fluctuations in the flow of the Nile also posing risks to food, drinking water supplies, fisheries and health.

Egypt's NDC was submitted in 2017, unchanged from its 2015 INDC, and is relatively unspecific in how the country's adaptation or mitigation needs are to be met. It prioritises the adaptation needs of coastal zones, water resource management and irrigation, and the agricultural sector.[130]

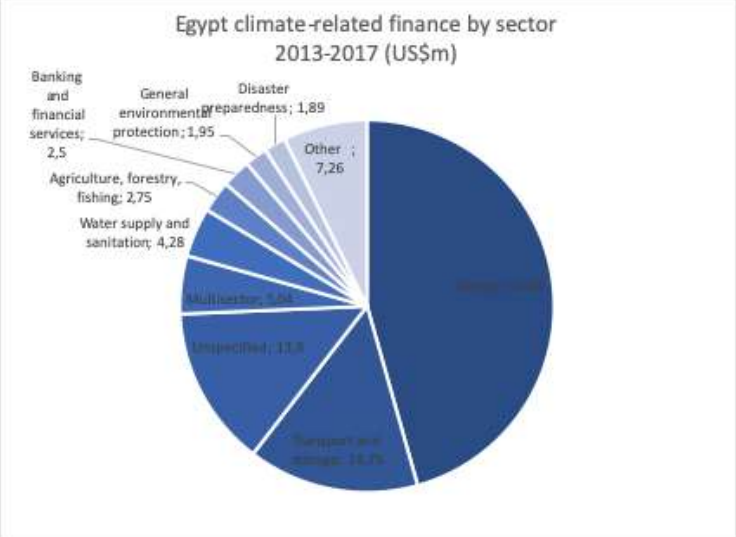
The NDC also identifies a number of mitigation policies and actions, which are mainly associated with the development of "low carbon energy systems." These include improving end user energy efficiency, scaling up renewable energy generation, reforming (but not eliminating) fossil fuel subsidies, upgrading (but not eliminating) "old fossil fuel power plants" – as well as supporting Carbon Capture and Storage "if proven economically feasible" and co-generation.[131] Industrial and building efficiency as well as public transport development needs are also mentioned but (with the exception of specific upgrades to the Cairo metro) not clearly specified.

The estimated cost of implementing these adaptation and mitigation measures is put at US$73 billion for the 2020-2030 period, although neither the basis for this figure nor the extent to which it should be met by international climate finance is spelt out.[132]

Far greater detail on Egypt's adaptation needs and mitigation opportunities can be found in its Third National Communication, submitted to the UNFCCC in 2016.[133] This also breaks down mitigation into "four main pillars: more efficient use of energy, especially at the point of end use; increased utilization of renewable energy as a substitute for non-renewable energy sources; accelerated development and deployment of new energy technologies – particularly next-generation fossil fuel technologies that produce near-zero harmful emissions and open up opportunities for CO2 sequestration, in addition to the new generations of nuclear power; and bio sequestration of carbon in terrestrial ecosystems, including soils and biota."[134] It should be stressed that a number of these technologies are highly controversial and/or unproven.[135]

Egypt is the largest recipient of climate finance in Africa, although the US$5.2 billion in reported finance for the five year period from 2013-2017 is far smaller in terms of scale than the US$73 billion for the decade covered by the NDC.

The largest share of climate-related finance to Egypt is focused on the energy sector, which accounts for 45.6% (US$2.39 billion) of the total received from 2013-2017, followed by transport and storage (14.8%).



The largest provider of climate finance over the same period was the EBRD (US$1.78 billion), followed by the World Bank (US$971 million), EIB (US$677 million), France (US$626 million) and the IFC (US$212 million). The vast majority of this financing (95% in 2017) is in the form of loans.

[129] Egypt Profile, CAIT Climate Data Explorer, 2017; EcoEquity and SEI (2018)
[130] INDC, pp.7-8
[131] INDC, pp.10-11
[132] INDC, p.13
[133] Egypt (2016) National Communication 3, https://unfccc.int/documents/77569
[134] Eygpt (2016), p.19
[135] See, for example, CIEL (2019) *Fuel to the Fire*; FERN (2018), *Six Problems with BECCS*; Global Witness (2019) *Overexposed*, https://www.globalwitness.org/en/campaigns/oil-gas-and-mining/overexposed/

In 2017, the Asia Infrastructure Investment Bank (AIIB, US$206 million for the construction of 11 solar PV plants) and GCF (US$183 million for renewable energy and adaptation) are significant new entrants in the climate finance landscape, although they still fall some way short of the levels of financing provided by the EBRD (US$887 million) and World Bank that year.[136] It should also be noted that three-quarters of the AIIB's contribution should not be counted as climate finance, in the sense of transfers from wealthy (Annex I) countries, since these account for only 27% of its capitalization (compared to between 60 and 100 per cent for other MDBs and multilateral funds). [137]

Climate finance overstated; tied to export credit

The inclusion of the construction of new lines on the Cairo metro in Egypt's INDC is anachronistic, because the anticipated completion date of these projects (at the time that document was written) was prior to 2020, although project delays have now pushed these back to 2023. Nevertheless, they offer a useful example showing how climate finance is actually put together and reported.

Funding for the Cairo metro accounted for several of the largest single climate finance projects reported from 2012-2015, and is likely to do so in 2019 as well. The construction of metro line 3 is expected to cost EGP97 billion (US$5.8 billion), with a further EGP30 billion (US$1.8 billion) estimated as the cost of constructing metro line 4 to Giza.[138]

The EIB has offered a €600 million loan (US$654 million) but this is not reported to be concessional finance, so is not recorded as part of climate finance contributions.[139]

In 2012, a US$341 million concessional loan was offered by Agence française de développement (AFD) towards the building of line 3, while the Japan International Cooperation Agency (JICA) offered a US$284 million loan towards building line 4. Both of these loans were categorized as having climate change as their "principal" objective and, between them, they account for 86 per cent of the total recorded climate finance in Egypt that year.[140] Yet these loans may well be miscategorised, since OECD DAC guidelines suggest that the label "significant" (rather than principal) should be used if a climate purpose is explicitly stated but is "not the fundamental driver or motivation for undertaking [a project]", as seems likely in this case.[141] In fact, a subsequent US$228 million loan from the French ministry of economy for the same project was labelled as "significant" – a clear example of how reporting can be inconsistent.

Although the concessional finance was not directly "tied" to exports from the donor countries, in the case of both the French and Japanese funding it was explicitly negotiated to be so. In 2014, the French government agreed to provide a €172 million (US$187 million) concessional loan with a 20 year grace period and 0.1% interest towards the construction of line 3, as part of an agreement tied the award of construction contracts and the purchase of trains to a French consortium.[142] This was accompanied by a further €172 million credit facility from COFACE, France's export credit agency.

The Japanese loan, meanwhile, was agreed off the back of a prior 7.9 billion yen (US$94 milion) "buyers credit agreement" with the Japanese Bank for International Cooperation.[143] This is also a form of export credit. The

[136] In its OECD DAC reporting, the GCF is relatively conservative in its reporting of climate finance compared to other institutions, with most of its funding reported as having "significant" rather than "principal" climate relevance (thus, it does not feature in the "lower bound" of OECD aggregate figures).; the AIIB funding relates to the Solar PV Feed in Tariffs program, https://www.aiib.org/en/projects/approved/2017/egypt-round-II-solar-pv-feed-in-tariffs-program.html

[137] OECD (2018), p.20

[138] The dollar conversion uses 2016 prices, consistent with OECD DAC figures Accessed August 2019

[139] EIB (2011) Cairo Metro Line 3, https://www.eib.org/en/projects/pipelines/all/20100613 ; OECD DAC database. A further €350 million EIB loan was reportedly agreed in August 2019 for the redevelopment of line 1 of the Cairo Metro, http://english.ahram.org.eg/NewsContent/3/12/313877/Business/Economy/Egypt-to-seek-%E2%82%AC-mln-from-EIB-to-develop-Cairos-old.aspx

[140] OECD DAC database, http://www.oecd.org/dac/financing-sustainable-development/development-finance-data/CRDF-RP-20122013.xlsx

[141] http://www.oecd.org/dac/financing-sustainable-development/development-finance-data/CRDF-RP-20102011.xlsx col. 1652

[142] Ahram (2014) France to fund new trains for Egypt's metro, http://english.ahram.org.eg/NewsContent/3/0/117913/Business/France-to-fund-new-trains-for-Egypts-metro.aspx

[143] JBIC, Export Loan for Metro Construction Project in Egypt, https://www.jbic.go.jp/en/information/press/press-2010/0903-6093.html . JBIC notes the trade motivations of the respective bilateral donors, noting that "many manufacturers in Europe, Asia, North America and elsewhere

JICA loan itself was part of a "Special Terms for Economic Partnership" arrangement to "transfer Japanese technologies in metro construction, railway operations and maintenance, through partnership between Japanese and Egyptian companies."[144]

This type of arrangement is fairly typical of the largest bilateral infrastructure projects counted as climate finance.

Redirecting energy investment

Public climate-related energy finance to Egypt supports a mix of renewable energy (wind and solar) as well as fossil fuel (gas) projects. Although this is consistent with Egypt's NDC, the "lock in" effect of rehabilitating old gas-fired power plants (the largest reported climate finance project of 2016, with a JICA loan of US$372 million) or upgrading gas distribution and refineries (various EBRD projects) is far from compatible with a 1.5 degree climate target.[145] More urgently, investments in fossil fuels still outweighs renewable energy investment.

The EBRD is currently the largest international provider of climate finance to Egypt. While the Bank has made a virtue of its "Green Economy Transition" approach, its fossil fuel lending continues to outweigh investments in renewable energy. As of August 2019, the EBRD reported a US$1.26 billion fossil fuel lending portfolio in Egypt, compared to US$1.09 billion in renewable energy investment.[146] The fossil fuel portfolio includes investments in on and offshore exploration and drilling; oil refinery upgrades; gas flaring reduction; a gasoil, LPG and LNG port; new gas-fired power generation and the expansion of old gas-fired power generation (with relatively minor efficiency gains).

The EBRD's renewable energy lending is focussed on two main projects: a series of solar PV investments in the 1.8 GW Benban solar complex (one of the first utility scale solar plants in Egypt), and the construction and operation of a further 4 GW of wind and solar power under the country's feed-in-tariff programme. It should also be noted that the EBRD's fossil fuel projects tend to attract higher levels of co-financing than their renewable energy equivalents

The same could be said of most other multilateral and bilateral donors. The IFC has over US$200 million in equity investments in upstream oil and gas exploration and refineries, for example.[147] Germany is a major lender in the power sector, meanwhile, with KfW (the German development bank) financing 8GW in new gas generation capacity, alongside a consortium of 15 commercial banks covered by a German Export Credit Agency and guaranteed by the Egyptian government.[148]

Egypt is also undergoing a significant programme of cuts to fossil fuel subsidies, with financial support from the World Bank's Energy Subsidy Reform Facility, and under pressure from the International Monetary Fund, which made energy subsidy reform a condition of a US$12 billion loan agreement, secured in 2016.[149] The scale of fossil fuel subsidy reform outweighs that of climate finance, with subsidies cut from an estimated EGP 89 billion (US$5.1 billion) in 2018-2019 to EGP 53 billion (US$3 billion) in the 2019-2020 financial year.[150] While subsidy cuts are welcome and necessary, IMF loans and their conditionalilties have long caused social harm and the current programme, unfortunately, appears no different. The rising cost of public debt, exacerbated by the falling value of the Egyptian pound, has increased poverty and economic vulnerability.[151] The cuts to consumer fossil fuel subsidies are also

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are vigorously engaged in business activities to win orders for transport infrastructure. In the bidding for this project, a Japanese consortium competed with a European consortium for which a representative export credit agency offered favorable financing terms."

[144] JBIC (2012) Signing of a Japanese ODA Loan Agreement with Arab Republic of Egypt, https://www.jica.go.jp/english/news/press/2011/120319_01.html

[145] Global Witness (2019) pp.11-13

[146] Own analysis, EBRD project database accessed 23 August 2019. https://www.ebrd.com/work-with-us/project-finance/project-summary-documents.html?c8=on&s2=on&s3=on&s10=on&keywordSearch=

[147] Urgewald (2019) *World Bank Group Financial Flows Undermine the Paris Climate Agreement*

[148] OECD/IEA (2018), p.124

[149] Kamal, D. (2019) IMF and Egypt reach agreement on economic review for final $2bn loan installment, https://www.thenational.ae/business/economy/imf-and-egypt-reach-agreement-on-economic-review-for-final-2bn-loan-installment-1.862753

[150] Middle East Monitor (2019) Egypt cuts fuel subsidies by 40.5%, electricity by 75%, https://www.middleeastmonitor.com/20190417-egypt-cuts-fuel-subsidies-by-40-5-electricity-by-75/

[151] Middle East Monitor (2019); Hamed, Y. (2019) Egypt's Economy Isn't Booming. It's Collapsing.

regressive – raising energy prices, with a disproportionate impact on poorer people.[152] This is not a necessary consequence of fossil fuel subsidy reform – which could be combined with shifting subsidies towards social protection programmes and renewable energy - but a byproduct of policy choices promoted by the World Bank and IMF.

Adaptation needs

Adaptation finance makes up a relatively small proportion of the climate finance received by Egypt, despite it playing a central role in the country's NDC. Egypt received just US$86 million in international climate finance for adaptation in 2016 and 2017.[153] The majority of this amount can be traced to two projects.

The first of these projects is a US$31 million GCF grant for "Enhancing climate change adaptation in the North Coast and Nile Delta Regions", to be implemented in partnership with UNDP and co-financed by US$74 million from the government of Egypt.[154]

The second major recipient of adaptation finance is a project titled "Promoting Resilience in Desert Environments" (PRIDE). This involves a US$62 million loan (US$24 million of which is counted in 2017 figures) and US$1 million grant from the International Fund for Agricultural Development (IFAD), and a further US$14 million from the Egyptian government, with the private sector expected to make up the difference.[155] The scheme is located in the lower Nile region and is focused on increasing agricultural productivity through improved rainwater harvesting, as well as improved water monitoring. As with the GCF project, this is fully in line with Egypt's NDC priorities – but the combined effect of these projects is negligible compared to Egypt's overall adaptation needs.

Kenya

Kenya is one of the countries most vulnerable to climate change, despite having done very little to cause it – contributing just 0.1 per cent of total global emissions (in historical terms), and just 0.13 per cent of total global emissions in 2017.[156] Kenya is home to 0.66 per cent of the global population.

Kenya has nevertheless proposed a reduction in greenhouse gas emissions of 30 per cent (42.9 MtCO2e) relative to a business-as-usual scenario of 143 MtCO2e by 2030. Kenya's baseline emissions were reported to be 73 MtCO2e in 2010.[157]

Kenya's greenhouse gas emissions reduction target is the headline figure in an NDC that is otherwise fairly thin on detail. But this has been considerably fleshed out in a subsequent analysis by Kenya's Ministry of Environment and Natural Resources, which breaks down the 30 per cent emissions reduction into target ranges for six sectors (energy, transport, industry, waste, forestry and agriculture).[158] This further analysis suggests that the largest proportion of GHG emissions reductions will come from the forestry sector, with further reductions (compared to the BAU scenario) expected in the electricity sector through progress in developing renewable energy resources (geothermal, wind and solar).[159] "Climate smart agriculture", increasing both agricultural productivity (mitigation) and climate resilience (adaptation), is also a core goal.[160]

Alongside significant mitigation efforts, the NDC stresses that "adaptation is Kenya's priority response to climate change." A detailed National Adaptation Plan (NAP) for 2015-2030 was released in 2016, which

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https://foreignpolicy.com/2019/06/07/egypts-economy-isnt-booming-its-collapsing-imf-abdel-fattah-sisi-poverty/

[152] Middle East Monitor (2019)

[153] OECD DAC. This figure counts finance with both "principal" and "significant" climate elements.

[154] GCF, Enhancing Climate Change Adaptation in the North Coast and Nile Delta Regions in Egypt, https://www.greenclimate.fund/projects/fp053

[155] IFAD (2019) IFAD and Egypt to promote resilience in desert environments with a US$81 million investment, https://www.ifad.org/en/web/latest/news-detail/asset/41026637

[156] Government of Kenya (2015) Intended Nationally Determined Contribution, p.6 . The NDC also points out that Kenya's per capita emissions of 1.26 MtCO2e remain considerably below the 7.58 MtCO2e global average; Vadronick, M. (2019) Ambitious climate policy requires a better federalism, https://www.downtoearth.org.in/blog/climate-change/ambitious-climate-policy-requires-a-better-federalism-65859

[157] Government of Kenya (2015), p.2; This figure has since been revised to 70 MtCO2e. Ministry of Environment and Natural Resources (2017) Update of Kenya's Emissions Baseline Projections and Impact on NDC Target, p.1

[158] Government of Kenya (2017), Nationally Determined Contribution (NDC) Sector Analysis Report: The Evidence Base for Updating Kenya's National Climate Change Action Plan, p.1

[159] Ministry of Environment and Natural Resources (2017), p.7

[160] For a breakdown of the different uses of this term, see Action Aid (2017) Climate Smart Agriculture causes confusion, https://actionaid.org/publications/2017/climate-smart-agriculture-causes-confusion

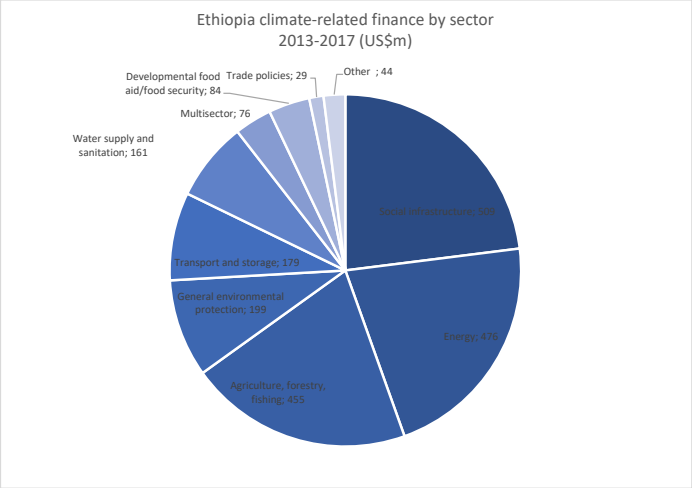
elaborates a series of macro-level adaptation actions as well as plans for 20 sectors.[161]

Kenya's adaptation plans take as their starting point the fact that climate change is already having a significant impact on the country, with rising temperatures, irregular and unpredictable weather patterns resulting in droughts and floods, while coastal regions are threatened by rising sea levels. It poses a threat to food security and biodiversity, as well as damaging infrastructure, increasing health costs and reducing the quality and quantity of water resources. Kenya's NDC puts estimates the economic losses as a result of climate change at 3 per cent of the country's GDP, and the government states that these costs are "reversing progress on poverty alleviation, economic growth and stability, and putting at risk Kenya's sustainable development goals." [162]

Overall, Kenya's NDC suggests that "more than US$40 billion is required for mitigation and adaptation actions across sectors up to 2030", although it is not stated what proportion of this should be provided as international climate finance.[163]

By comparison, Kenya received just US$3.3 billion in international climate finance from 2013 to 2017 (or up to US$4.5 billion if the "upper bound" of OECD figures is used). The largest share of this total was directed towards the energy sector (US$1.5 billion), followed by Agriculture, Forestry and Fishing (US$614 million), and Water Supply and Sanitation (US$360 million).

At current rates, climate finance would provide only a small share of the total need expressed in the NDC (up to 20 percent). It is heavily biased towards mitigation, although adaptation is the greatest climate finance priority for Kenya.



The largest providers of international climate finance were the World Bank (US$1.1 billion), followed by Japan (US$469 - 773 million), France (US$431 million), the EIB (US$333 million) and AfDB (US$328 million).[164]

Electricity: renewables versus fossil fuels

Electricity generation accounts for the largest share of Kenya's projected greenhouse gas emissions increase in the 2030 BAU scenario, rising from 6 MtCO2e in 2015 to 42.7 MtCO2e by 2030.[165]

This reflects a 10-fold expected increase in electricity generating capacity, from 2,33MW (installed capacity, April 2017) to 23,000 MW by 2030, driven by the country's rapid industrialisation.[166] This is consistent with Kenya Vision 2030, the country's long-term development blueprint, which aims to establish it as "a newly industrializing, middle income country."[167] Industrial uses already account for 60 per cent of total electricity demand.

Electricity access in Kenya is also rising fast. According to the World Bank/Sustainable Energy for All (SE4All) database, just 19 per cent of the population had electricity access in 2010, rising to 56 per cent in 2014 and 64 per cent in 2017.[168] The Kenyan government's stated goal is universal access by 2020 (with 70 to 80

[161] Government of Kenya (2016) *Kenya National Adaptation plan: 2015-2030*
[162] NDC (2015), p.1, National Policy on Climate Finance (2016), p.vi
[163] Jura (2017), p.12
[164] OECD DAC. The variation in Japan's figures depends on whether OECD "upper" or "lower" bound is used, and relates to [x project]
[165] Government of Kenya (2017), Nationally Determined Contribution (NDC) Sector Analysis Report: The Evidence Base for Updating Kenya's National Climate Change Action Plan, p.29 [NB with renewables unit costs falling fasted than previously expected, their competitiveness outstrips the BAU scenario meaning that this was likely to have been an overstatement]
[166] Gordon (2018), p.15; Gitonga, J. (2017) Kenya Country Profile, https://eneken.ieej.or.jp/data/7463.pdf , p.10; African Review (2017)
[167] SDG p.3
[168] World Bank, Access to Electricity (% of population), Ethiopia and Kenya, https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=ET-KE&name_desc=false

per cent grid access, and 20 to 30 per cent relying on off-grid systems.[169]

Renewable energy (including hydropower) currently accounts for 87 per cent of Kenya's electricity generation. The key challenge is not phasing out fossil fuels, therefore, but avoiding their introduction into the electricity mix as production is expanded.[170] As the Government's own NDC update report notes, "the vast majority of the [projected energy sector] emissions increase (93%) is related to new fossil fuel electricity generation projects."[171]

Developing cleaner energy requires climate finance in the form of grants (especially for rural access) and long-term concessional loans, since the higher upfront capital costs of renewables still required development and climate finance to make them viable. It should also be noted that the additional energy system costs associated with a low rather than high carbon pathway range between US$5 and US$30 billion once grid expansion, fuel switching in the transport sector and demand-side efficiency measures are taken into account.[172] These "incremental costs" should also be met by climate finance.

The overall benefits to Kenya of investing in renewables are high since, if finance is available, then the country's abundant solar, wind and geothermal resources make them the best option economically as well as environmentally. The record of the MDBs in energy finance in Kenya is woeful, however. Instead of focusing on renewable resources earlier, the World Bank, African Development Bank, EIB, IFC, Multilateral Investment Guarantee Association (MIGA) and International Development Association (IDA) have recently co-financed a number of multi-speed diesel (MSD) power plants in Kenya, which entered into use in 2013-2014.[173] These diesel plants are increasingly relied upon to provide backup as climate change has reduced the reliability of hydropower, with the result that GHG emissions from Kenya's electricity generation sector have increased significantly.

The IFC has also agreed to co-finance a coal-fired power station, through a US$98.5 million invested in a cement company project that includes a 15MW coal power plant, as well as making a US$50 million equity investment in Africa Oil, which is engaged in upstream oil and gas exploration (in conjunction with Tullow Oil, a UK-based multinational).[174]

The IFC is also providing indirect financial support via a number of financial intermediaries to a US$2 billion, 981MW coal fired power station planned in Lamu, which forms part of the US$24 billion Lamu Port-South Sudan-Ethiopia (LAPSSET) Corridor project.[175] The main investment in this project is a US$1.2 billion loan from the Industrial and Commercial Bank of China (majority owned by the Chinese government).[176] Investing in Kenya's first coal fired power station goes entirely against the Paris Agreement objectives, while the Lamu megaproject risks significant environmental damage, and poses a threat to the livelihoods of local farmers and fisheries according to local environmental campaigners.[177] Plans for the Lamu coal plant are currently halted after a Kenyan court revoked its environmental license.[178]

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[169] Gordon, E. (2018) The Politics of Renewable Energy in East Africa, https://www.oxfordenergy.org/publications/politics-renewable-energy-east-africa/?v=04c19fa1e772 , p.15 ; The 100% access goal (and 70% grid access target) are written into the Last Mile Connectivity project, see Kenya Power, Last Mile Connectivity (accessed 24 August 2019). https://www.kplc.co.ke/content/item/1120/last-mile-connectivity

[170] African Review (2017) Kenya: renewables hit 87 per cent of power generation, http://www.africanreview.com/energy-a-power/power-generation/kenya-renewables-hit-87-per-cent-of-power-generation

[171] Government of Kenya (2017), p.29

[172] SEI (2017), *Energy pathways for achieving Kenya's nationally determined contribution to global efforts to mitigate climate change*, p.1

[173] The US government's OPIC was also a significant investor, as well as private finance. See http://documents.worldbank.org/curated/en/378561515431197950/text/1250-ICR-Report-IPPs-Kenya-3Jan2018-01032018.txt

[174] Urgewald, p.13, p.26. The Tullow Oil project also raises Free Prior and Informed Consent concerns, see Oxfam (2017) Testing Community Consent: Tullow Oil Project in Kenya, https://www.oxfam.org/en/research/testing-community-consent-tullow-oil-project-kenya

[175] Accountability Counsel, Kenya: Lamu Coal-fired Power Plant, https://www.accountabilitycounsel.org/client-case/kenya-lamu-coal-fired-power-plant/

[176] Banktrack, Lamu Coal Power Project: financiers, https://www.banktrack.org/project/lamu_coal_power_project#financiers ; Sourcewatch, Lamu Power Project, https://www.sourcewatch.org/index.php/Lamu_Power_Project#cite_note-bank17-24

[177] Save Lamu, http://www.savelamu.org/ ; Accountability Counsel

[178] McVeigh, K. (2019) Kenya's first coal plant construction paused in climate victory, https://www.theguardian.com/global-development/2019/jul/11/kenya-first-coal-plant-construction-paused-climate-victory

Geothermal

While all of the energy sector related climate finance to Kenya is consistent with the NDC, the clear bias towards big utility scale projects. MDBs and bilateral funders have been particularly keen to support geothermal energy projects, most recently via a US$420 million loan to the Olkaria project from the Japan International Cooperation Agency in 2016. This comes on top of well over US$1 billion in loans from France's AfD, the African Development Bank, the European Investment Bank (which has offered non-concessional loans), Germany's KFW, and the World Bank to Olkaria and other geothermal projects. Geothermal projects also account for the majority of the finance provided to Kenya by the Climate Investment Funds, with Kenya recently included in a multi-country Clean Technology Fund programme in order to offer further investment for geothermal energy.[179]

There can be very good reasons for development banks to invest in geothermal, which has significant upfront investment costs and is perceived as too risky by the private sector in early stages of its development.[180] However, with geothermal energy now well established in Kenya, private sector finance is not in short supply. The desire to show private sector co-financing (and/or to make profitable reflows) seems now to be directing climate finance towards further geothermal projects in Kenya that would be financially viable without concessional support – despite a significant shortfall in other areas, notably adaptation.[181]

The geothermal projects in Kenya have also consistently violated the rights of local people. The EIB's Complaint Mechanism found that the involuntary resettlement plan at Olkaria violated its Indigenous Peoples policy and resettlement standards in several ways, and it is far from clear that these criticisms have been addressed.[182] The World Bank Inspection Panel also found fault with the resettlement process, and a failure to apply its own Indigenous Peoples policy in the case of the Maasai people.[183] Instead of responding to these complaints, KenGen doubled down on these violations by filing charges against Maasai villages in the High Court of Kenya (although it later withdrew the suit).[184]

This is part of a broader concern that needs addressing as Kenya seeks to meet its NDC targets – since geothermal, wind and solar power projects (especially at utility scale) could all find that access to land becomes a significant cause of delay and conflict with local populations.[185]

Off-grid energy and cookstoves

In order to meet SDG7 – the universal energy access goal – significant investment is required in both offgrid renewables (solar home systems and mini-grids), as well as cleaner cooking options.

Kenya is well placed for such investment, with a recent assessment of renewable energy prospects in the country finding that its "biggest strengths as an investment destination lie in off-grid and micro-grid solutions," with Kenya now serving as an "innovation hub" for such projects.[186] Despite high profile successes, however, off-grid renewables and micro-grids continue to attract far less international climate finance from than utility-scale projects.

A similar story could be told of efforts to reduce emissions from biomass. Household cooking accounts for the majority of total final energy consumption – 72 per cent in 2014 – with smoke from the biomass used on traditional cookstoves also causing significant health issues.[187] 35 million people (75 per cent of the population) still rely on biomass for cooking. Further investment should be targeted in developing cleaner

[179] Climate Investment Funds, DPSP II: Concessional Finance Program for Geothermal Generation, https://www.climateinvestmentfunds.org/projects/dpsp-ii-concessional-finance-program-geothermal-generation

[180] World Bank (2018) Geothermal Energy on a hot path, https://www.worldbank.org/en/news/feature/2018/05/03/geothermal-energy-development-investment

[181] For example, the UK and Germany raised concerns that concessional financing was not required when the Clean Technology Fund committee discussed supporting geothermal projects in Kenya. See https://www.climateinvestmentfunds.org/projects/dpsp-ii-concessional-finance-program-geothermal-generation

[182] Bankwatch, Olkaria Geothermal Development Kenya, https://bankwatch.org/project/olkaria-geothermal-development-kenya

[183] Bretton Woods Project (2016), Lessons from Kenya, https://www.brettonwoodsproject.org/2016/06/lessons-from-kenya-why-the-world-bank-must-apply-the-indigenous-peoples-policy-consistently/

[184] Bankwatch, Kengens Intimidation of Local Community NGO: Letter to development banks financing the Olkaria Geothermal Project, Kenya, https://bankwatch.org/publication/kengens-intimidation-of-local-community-ngo-letter-to-development-banks-financing-the-olkaria-geothermal-project-in-kenya

[185] SEI, p.6

[186] Gordon, p.26

[187] SEI (2016b), p.4

alternatives, including more investment in upstream research and development, manufacture and distribution; and finance to help end-users make the switch without having to pay more.[188]

Ethiopia

Ethiopia was the first of the Least Developed Countries to submit an INDC, in June 2015, and this became the country's NDC when it ratified the Paris Agreement in March 2017.[189] The core contribution is to set a fixed target to limit net greenhouse gas (GHG) emissions in 2030 to 145 MtCO2e or lower, which is equivalent to a 64 per cent reduction compared to a "business as usual" (BAU) scenario by 2030.[190]

Based on 2014 figures, Ethiopia's greenhouse gas emissions are 150 MtCO2e (around 0.3% of the global total) and the BAU scenario envisages these reaching 400 MtCO2e by 2030.[191] If LULUCF is excluded from the figures, BAU emissions by 2030 are projected to be 185–257 MtCO2e in 2030.[192]

To set this in context, Ethiopia's population of 97 million (2014) is double that of 1990, while GDP has grown 367% from 1990 to 2014.[193] Per capita emissions have remained relatively constant at around 1.35 tCO_2e/capita, compared to a global average of 4.98 tCO_2e/capita, or 16.5 tCO_2e/capita for the average US citizen.[194]

Ethiopia's mitigation target is more ambitious than the majority of countries. The NGO Climate Tracker rates Ethiopia's NDC as one of the view that is "2°C compatible", while claiming that in terms of mitigation ambition it is actually compatible with a 1.5°C goal.[195]

The NDC is being implemented within the framework of Ethiopia's Climate Resilient Green Economy Strategy (CRGE) strategy, which in turn forms part of the country's national development plan (Second Growth and Transformation Plan, GTP II).[196] The development plan envisages an annual average real GDP growth rate of 11 per cent with the aim of Ethiopia becoming a "lower middle-income country" by 2025 through "inclusive economic growth."[197] The green economy strategy is based on four pillars:

1. Improving crop and livestock production practices for higher food security and farmer income while reducing emissions;
2. Protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks
3. Expanding electricity generation from renewable sources of energy for domestic and regional markets
4. Leapfrogging to modern and energy-efficient technologies in transport, industrial sectors, and buildings.[198]

Ethiopia's NDC estimates a US$150 billion cost of implementation. This is not broken down into conditional (supported) and unconditional

[188] SEI (2016b), p.6 ; Lambe, F., Jürisoo, M., Wanjiru, H. and Senyagwa, J. (2015). *Bringing Clean, Safe, Affordable Cooking Energy to Households across Africa*

[189] https://www.ndc-cluster.net/country/ethiopia

[190] https://www.ndc-cluster.net/country/ethiopia

[191] https://ndcpartnership.org/climate-watch/ghg-emissions, data source: CAIT.; INDC.

[192] Climate Action Tracker (2019) Ethiopia: current policy projections, https://climateactiontracker.org/countries/ethiopia/current-policy-projections/

[193] Wang-Helmreich, H. and F. Mersmann (2018) *Implementation of Nationally Determined Contributions: Ethiopia Country Report*, https://newclimate.org/2018/11/30/implementation-of-nationally-determined-contributions-ethiopia-country-report/ , p.4; World Bank (2019) World Development Indicators; Federal Democratic Republic of Ethiopia [FDRE] (2016) *Second National Communication to UNFCCC*, https://unfccc.int/documents/106847

[194] World bank, CO2 emissions: metric tons per capita, https://data.worldbank.org/indicator/en.atm.co2e.pc

[195] Climate Action Tracker (2019) Ethiopia, https://climateactiontracker.org/countries/ethiopia/ Climate Tracker suggests that they have not assessed Ethiopia's target to be 1.5°C compatible because it is conditional (on receipt of international climate finance, technology transfer and capacity building). However, Climate Tracker do not explained why an LDC that is heavily indebted should be offering an unconditional target in the first place, which seems a highly unjust assumption.

[196] Federal Democratic Republic of Ethiopia [FDRE] (2011) *Ethiopia's Climate Resilient Green Economy Strategy*, http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/laws/1188.pdf

[197] Federal Democratic Republic of Ethiopia [FDRE] (2016) *Ethiopia Growth and Transformation Plan II* https://www.greengrowthknowledge.org/national-documents/ethiopia-growth-and-transformation-plan-ii-gtp-ii , p. ix

[198] Federal Democratic Republic of Ethiopia [FDRE] (2011) p.2 ; these four pillars are also at the core of Federal Democratic Republic of Ethiopia (2015) *Intended Nationally Determined Contribution (INDC) of the Democratic Republic of Ethiopia*, p.2

(unsupported) components, although the NDC states that future research will be conducted specify such figures.[199]

The US$150 billion figure is actually drawn from the CRGE strategy, which established this as a 20 year target, amounting to US$7.5 billion annual spending. More recent analysis of the country´s needs has shown that this is likely to be an underestimate. The National Adaptation Plan (NAP-ETH), launched in 2017 and submitted to the UNFCCC in March 2019, puts the annual cost of implementing its 18 adaptation priorities as US$6 billion per year.[200] But a 2014 study found that national budgetary resources for "climate-change relevant actions" amounted to US$440 million per year.[201] International climate finance is a long way from plugging this gap.

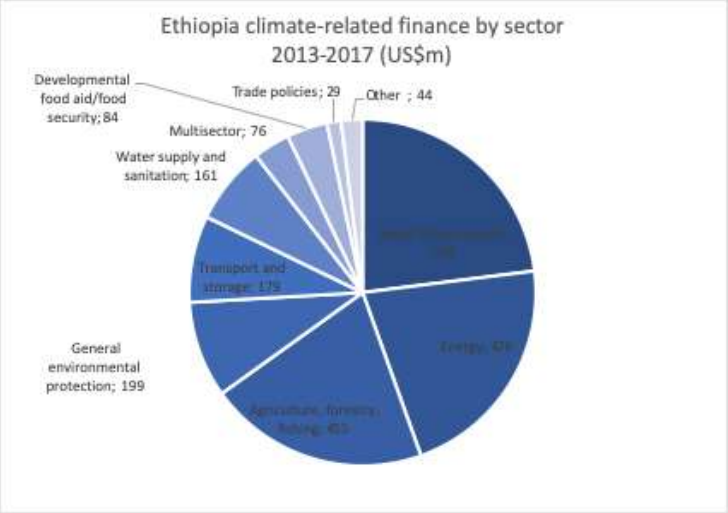
Climate finance falling short

Ethiopia received an estimated US$2.21 to US$3.9 billion in climate finance in the 2013 to 2017 period (averaging out at US$440 million to US$780 million per year).[202] The top sources of climate finance to Ethiopia from 2013 to 2017 were the World Bank (US$974 million), African Development Bank (US$254 million), USA (US$154 million), Norway (US$153 million) and France (US$138 million).[203]

While international climate finance to Ethiopia has steadily increased over the past 5 years, it is important to note that these increases mainly correspond to a bigger share of debt financing – which accounted for 73 per cent of the US$904 million in 2017, compared to just 36 per cent of the US$176 million in 2013.[204]

The debt financing reported as international climate finance is concessional, but since loans are typically in US dollars this leaves the country vulnerable more to currency fluctuations. Moreover, increases in climate loans come in a context when Ethiopia is already struggling to contain its escalating public debt.[205]

The distribution of climate finance between sectors does not show a particularly close alignment to the priorities set out in Ethiopia's NDC. According to OECD data for 2013-2017, the largest reported category of climate finance is expenditure on "social infrastructure" (US$509 million), followed by the energy sector (US$476m) and agriculture, forestry and fishing (US$455 million). The first category, in particular, reflects the over-statement by donor countries of the climate relevance of their Official Development Assistance to Ethiopia.



The largest single example of this is the Productive Safety Net Programme (PSNP), a long running development scheme to tackle rural poverty and food insecurity. While this is of undoubted relevance to the country's adaptation objectives, the PSNP has multiple objectives and would likely have been undertaken without the climate rationale, so should at most be deemed of "significant" climate relevance, in OECD reporting terms, or as just having "climate components". The World Bank's IDA, Canada and the UK have reported their PSNP funding this way, but the USA and Ireland – which are also major donors to the programme – have reported their funding as being of "principal" climate relevance.

A smaller but even more clear cut case of misreporting is the USA's claim that its "Evidence to Action" programme "for strengthening family planning and reproductive health service delivery" is principally

[199] FDRE (2015), p.9
[200] Federal Democratic Republic of Ethiopia [FDRE] (2019) *Ethiopia's National Adaptation Plan*, p.63
[201] Eshetu, Z. et al (2014) *Climate finance in Ethiopia*, ODI, https://www.odi.org/publications/8203-climate-finance-ethiopia p.50
[202] OECD upper and lower bound figures, https://public.tableau.com/views/Climate-relateddevelopmentfinance-RP/CRDF-Recipient?:embed=y&:display_count=no&%3AshowVizHome=no%20#3
[203] These figures assume the OECD "lower bound."
[204] The remainder of Ethiopia's climate finance comes in the form of grants: 64% of the 2013 total, and 27 % of the 2017 total.
[205] See, for example, IMF (2018) Ethiopia: Remarkable Progress Over More Than a Decade, https://www.imf.org/en/News/Articles/2018/12/04/na120418-ethiopia-remarkable-progress . The IMF notes that "Ethiopia remains at high risk of debt distress."

about climate change.[206] These are just some of the many misleading examples of how climate finance is mis-stated in self-reporting by donor countries.[207]

Adaptation and mitigation

In terms of mitigation, the largest share of Ethiopia's emissions reductions compared to BAU by 2030 are expected from the forestry sector (130 MtCO2e) and agriculture (90 MtCO2e).[208] According to the CGRE, "the majority of abatement potential is… captured by 5 initiatives: lower emitting techniques in agriculture, fuelwood efficient stoves, afforestation/ reforestation, [agricultural] yield increasing and power exports.[209]

On the adaptation side, Ethiopia remains one of the countries most vulnerable to climate change (22nd in the ND-Gain Country Index).[210] The goal set out in the NDC is "to increase resilience and reduce vulnerability of livelihoods and landscapes in three pillars; drought, floods and other cross-cutting interventions."[211] This is expanded upon considerably in the new National Adaptation Plan (NAP-ETH), which identifies 18 priority actions and programmes over a 15 year period, encompassing the agriculture, forestry, health, transport, power, industry, water and urban development sectors.[212]

Many of the country's development priorities cut across mitigation and adaptation objectives – which is reflected in the NDC. However, there are also potential contradictions. A key part of the energy strategy relies on electricity generation from the Grand Ethiopian Renaissance Dam, currently under construction, but this project is highly controversial, with evaporation losses from the dam's vast reservoir threatening to significantly increase water stress in Egypt, which has caused significant international tensions.[213]

Forestry

The forestry sector accounts is expected to contribute a reduction of 130 MtCO2e compared to BAU by 2030. In absolute terms, Ethiopia's remaining forests are a significant carbon sink. In 1994, Ethiopia's forests were projected to yield negative emissions of -224 Mt CO2e, although this figure had fallen to -62 Mt CO2e by 2013. The reductions claimed by 2030 rest on the assumption that deforestation and forest degradation would have continued at a significantly faster rate and become a net contributor to emissions – whereas the NDC targets a forestry sector with negative emissions of -40 Mt CO_2e in 2030.

The key drivers of change at present are deforestation to make way for agricultural land (50%) and forest degradation due to fuelwood consumption (46%), according to Ethiopian government figures.[214] Norway is the largest contributor of climate finance for forestry, including through REDD+ programmes, although arguably a more significant contribution to these goals is the revision of the country's forestry law to over greater community rights in forest management.[215]

Shifting from biomass to biogas (and other clean sources) for cooking and heating could also contribute significantly to Ethiopia's objectives of reducing forest degradation.[216]

Agriculture

Agriculture is the backbone of Ethiopia's economy, with 80 to 85 per cent of the population working in this sector, contributing 46% of total GDP in 2013. Smallholders and herders are at the core of this. 95% of cropped land is cultivated by smallholders working in subsistence agriculture.[217]

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[206] See project level spreadsheets at OECD (2017) Climate-related development finance at the activity level, http://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/climate-change.htm

[207] Weikmans, R. J. Timmons Roberts et al. (2017); Michaelowa, A., and K. Michaelowa (2011); Junghans, L., and S. Harmeling (2012)

[208] FDRE (2015), p.3

[209] FDRE (2011), p.34

[210] Wang-Helmreich, H. and F. Mersmann (2018), p.22

[211] FDRE (2015), p.5

[212] FDRE (2019)

[213] See The Economist (2017) How climate change might affect the Nile, https://www.economist.com/middle-east-and-africa/2017/08/03/how-climate-change-might-affect-the-nile ; International Rivers (2018) 10 things you should know about Africa's Largest Dam, https://www.internationalrivers.org/blogs/433/10-things-you-should-know-about-africa%E2%80%99s-largest-dam

[214] Wang-Helmreich, H. and F. Mersmann (2018), p.40

[215] Evans, M. (2018) Ethiopia's new forestry law: A win for landscapes and livelihoods? https://forestsnews.cifor.org/57465/ethiopias-new-forestry-law-a-win-for-landscapes-and-livelihoods?fnl=en

[216] Herold, M. et al. (2014) Stoves cook up relief for Ethiopia's forests, climate, https://forestsnews.cifor.org/25166/improved-cooking-stoves-ethiopia-kafa-forests?fnl=en

[217] Wang-Helmreich, H. and F. Mersmann (2018) p.18

Agriculture also accounts for the largest share of Ethiopia's greenhouse gas emissions – most of which relates consists of methane emitted in manure management, enteric fermentation and rice cultivation, and nitrous oxide emissions from soils.[218] This would continue under a BAU scenario, which would see agriculture sector emissions reach 95 $MtCO_2e$ in 2030.[219] Ethiopia's NDC proposes to cut this by almost half (aiming for a 90 $MtCO_2e$ cut in greenhouse gas emissions from agriculture compared to BAU in 2030).

Agriculture is also at the core of the adaptation challenges faced by the country: 10 of the 18 options outlined in the country's National Adaptation Plan are directly relevant to the agricultural sector.

Despite this focus, agriculture is significantly under-represented in the balance of climate finance that is provided to Ethiopia, receiving less funding than the energy sector. Agriculture, forestry and fishing combined receive just 20 per cent of international climate finance to Ethiopia. While this is considerably above the global average (reportedly 5 per cent), it falls way short of reflecting the prioritization identified in Ethiopia's NDC.[220]

Conclusion and Recommendations

Accessing climate finance is part and parcel of the efforts to combat climate change, and progress on finance will help deliver the required climate action in Africa. But the analysis presented in this paper confirms that Africa has a long way to go to access the required climate finance to support the implementation of its pledged climate actions. To advance access to effective climate finance, support should be provided to African countries to enhance their capacity including setting up climate finance systems that can help them attract the required financing and also incorporate tracking climate finance, reporting, leveraging on possible financial instruments available i.e. within the GCF to finance climate actions and developing bankable climate interventions. The following recommendations are offered to policy makers to consider:

- Africa represents a very small share of global emissions – and this remains the case, even with increases in Africa's emissions through to 2030.
- Developing countries are already taking far closer to their fair share of mitigation responsibility than developed countries.
- Greater mitigation opportunities still exist in Africa – but these are conditional on international climate finance. The record of delivery so far is poor.
- To meet a 1.5 degree target it is vital that all bilateral and multilateral development finance – not just climate finance – is completely redirected away from fossil fuels.[221]
- National-level climate governance systems that incorporate finance are needed to support African countries in coordinating climate finance matters, identifying their climate finance needs and priorities in a country-driven manner and translating climate finance needs into actions.
- Addressing Africa's climate change challenges and leveraging on opportunities will require that climate finance is provided in-line with their needs and priorities within their country-driven strategies.
- Transparency in finance provided and tracking climate finance flows in African countries is imperative to provide countries an opportunity to evaluate progress towards realising their climate objectives.
- African countries should comprehensively identify their financial needs within climate commitments such as the nationally determined contributions to effectively articulate their climate finance gap. 2020 is the first year that countries are to submit new or revised NDCs to the UNFCCC Secretariat. Revised NDCs should include clear investment targets for mitigation and adaptation needs and be informed by available science.
- NDC targets should be met in ways that ensure that benefits come to local populations, in terms of job opportunities, reduced inequality, and land access. Greater accountability to local stakeholders and country ownership is needed, given the poor track record of MDBs.
- Direct Public finance can fund what the private sector won't - demonstration effects and

[218] Wang-Helmreich, H. and F. Mersmann (2018) p.36
[219] Wang-Helmreich, H. and F. Mersmann (2018) p.34
[220] The 5% figure is drawn from Ajayi, O. (2018) Mobilising funds and political will to prompt climate action, https://www.cta.int/en/climate/all/article/mobilising-funds-and-political-will-to-prompt-climate-action-sid0774a35bb-9bfc-4a9c-bc78-e38aef95ea4d
[221] Oil Change International et al (2016) The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production, http://priceofoil.org/2016/09/22/the-skys-limit-report/

market creation, rather than “leverage” (as co-financing) are crucial

- Adaptation needs are growing and adaptation is significantly underfunded by multilateral and bilateral climate finance. There is also need to have financing mitigation actions that provide adaptation benefits as well as we address the urgent need for adaptation in Africa. Bilateral funding is often tied to developed country exports, rather than driven by recipient country needs
- The Climate Investment Funds should “sunset” and the GCF should be recapitalized with at least double its current amount of financing. While far from perfect, it has already become the most significant adaptation funder. Now it needs to ramp up “direct access” finance.