Public Disclosure Authorized

Public Disclosure Authorized

ure Authorized

Overview Report

Ethiopia's Climate Resilient Green Economy (CRGE) Strategy (2011-2019) – Implementation Progress Assessment Report

20 May 2020

EXECUTIVE SUMMARY

Project overview

This report is a review of progress in implementing Ethiopia's national Climate Resilience and Green Economy (CRGE) strategy. The 2011 strategy sets out a vision for becoming a middle-income country by 2025 through a green economy. This report examines the efforts made to implement the priorities in the CRGE strategy, between 2011 and 2019. It describes progress in terms of mitigation, adaptation, financing, institutions, and policy development.

The strategy articulated Ethiopia's commitment to continued economic growth while keeping its total greenhouse gas (GHG) emissions at roughly the level when the strategy was formalised (145-150 Mt CO_2e). **Specifically, the CRGE strategy set target to reduce emissions by 64%below Ethiopia's projected emissions in 2030 (400** Mt CO_2e) **on a Business-as-Usual trajectory through structural transformation and increase in efficiency across sectors**. The CRGE strategy is a guidance document on how Ethiopia could avoid the difference, i.e. the 255 Mt CO_2e of additional emissions that would arise from strong economic growth to 2030 in the absence of climate change mitigation.

It is axiomatic that a Least Developed Country (LDC) like Ethiopia, which faces daunting human development challenges and is highly vulnerable to damaging impacts from climate change, must invest its attention and resources in climate change adaptation, over mitigation. Given Ethiopia's level of development, its minor contribution to global GHG emissions, and the source of its GHG emissions, the emphasis of its climate change response should not be on mitigation – it must be on adaptation. This is important to reaffirm for CRGE efforts moving forward, and to acknowledge as a principle that was recognised by the CRGE strategy's implementation progress assessment, even though the review had to track progress on the CRGE strategy's heavily mitigation-focused tenets.

The review of Ethiopia's efforts in implementing the CRGE strategy took place in a context where Ethiopia was still only accountable for 0.04% of the world's GHG emissions, and is 93rd in the ranking of nations contributing to global GHG emissions.[1] With a population of just under 110 million people (2018), Ethiopia is the second most populous nation in Africa after Nigeria, and the fastest growing economy in the region. Despite such growth, it remains one of the poorest nations on the continent, with a per capita income of $790 annually.[2]

Ethiopia aims to reach lower-middle-income status by 2025. To move towards this goal, it requires growth in all its major sectors (services, industry, and agriculture each contribute approximately a third of the country's GDP). It also requires increases in productivity and revenue in agriculture and livestock framing, where an estimated 65% of Ethiopians are employed.[3] Similarly, it needs the benefits of growth to reach rural areas, where nearly 80% of Ethiopians reside.[4] This context is relevant in evaluating the level of effort Ethiopia has invested in the realisation of the CRGE Strategy's vision of low-emissions growth, even as it pursues broader development goals under its second Growth and Transformation Plan (GTP-II).

[1] European Commission, EDGAR, Fossil CO2 and GHG emissions of all world countries (2019). Available at https://edgar.jrc.ec.europa.eu/overview.php?v=booklet2019&sort=des8
[2] The World Bank, Ethiopia: Overview. Available at https://www.worldbank.org/en/country/ethiopia/overview (last updated September 2019).
[3] The World Bank, Data: Employment in Agriculture - % of Total Employment. Available at https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS (last updated September 2019).
[4] The World Bank, Data: Rural Population - % of Total Population. Available at https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS (last updated September 2019).

National context

In 2010 (the baseline year for the CRGE strategy), 50% of Ethiopia's emissions arose from the agriculture sector, the overwhelming majority of which were from livestock (approximately 40% of national GHG emissions). To reduce GHG emissions from this sector, the CRGE strategy identified significant abatement interventions from improved soil management, watershed management, crop and nutrient management, avoided deforestation, livestock value-chain efficiency, livestock diversification, amongst others. The second largest contributor of GHG emissions was the forestry sector; nearly half of all forestry emissions were tied to deforestation to expand agricultural land, and the other half to deforestation due to fuelwood collection. In response, the CRGE strategy targeted significant abatement through fuel-efficient cookstoves, electric cookstoves, and afforestation and reforestation. The contribution of the transport, water and energy, industry, and buildings sectors to Ethiopia's national GHG emissions was 3% each, i.e. a relatively minor role (although both industry and transport emissions are projected to increase through 2030 and account for larger shares than in 2010). For the transport sector, where most emissions were tied to road transport by passenger and freight vehicles, the strategy prioritized light rail and fuel efficiency. In the buildings and urban sector, the CRGE strategy has prioritized efficient lighting to date and in the industrial and manufacturing sector, where the cement industry was the most significant source of emissions (accounting for 50% of industry emissions), the CRGE strategy pointed to abatement from clinker substitution and usage of biomass and energy efficiency techniques.

Ethiopia has been a leader on climate change action in Africa and amongst developing nations across the world. Ahead of many of its peers, it committed itself to tackling climate change through a transformative economic development approach that focuses on low-carbon growth and a 'green economy' driven by sustainability. **In 2011, well before countries undertook obligations to reduce greenhouse gas (GHG) emissions and enhance climate resilience under the Paris Agreement, Ethiopia released an ambitious national blueprint towards reducing its emissions 64% from a business-as-usual trajectory, by 2030**. Since doing so, the country has implemented a host of significant climate change-linked initiatives with major mitigation and adaptation potential. Simultaneously, the country worked to safeguard its development gains from climate change threats by building adaptive capacity amongst communities through large-scale initiatives such as the Productive Safety Net Programme (PSNP), the Agricultural Growth Programme (AGP), the Sustainable Land Management Programme (SLMP) and the ONE-Wash programme.

It is especially notable that **Ethiopia's focus on climate change and green growth are not limited to certain sectors alone, with interventions in the agricultural, forestry, transport, energy sectors as well as cross cutting areas such as media coverage, education, women, youth and children's affairs, labor affairs, wildlife management, meteorology, disaster risk management, science and innovation, and research and development.** The commitment transcends the traditional climate-linked sectors and is economy-wide, with all major areas of the economy having engaged in climate change response. This is particularly the case after climate change was mainstreamed into the country's overarching development planning architecture through the second Growth and Transformation Plan (GTP-II). In effect, Ethiopia has done, and continues to do, a great deal on climate change.

Progress on adaptation

The CRGE strategy did not address climate change adaptation or resilience. This gap was rectified in some sectors through the development of sectoral climate resilience strategies – for the agriculture and forestry sectors, the water and energy sectors, and the transport sector.[5] However, even without a specific mention of increasing resilience, Ethiopia has made great strides in development and improving resilience through development actives since 2011,

[5] Adaptation in other sectors is guided, from 2019 onwards, by Ethiopia's National Adaptation Plan (NAP), adopted in March 2019, and by the Nationally Determined Contributions (NDC) submitted to the UNFCCC, which become effective in 2020.

such as increasing food security, decreasing unemployment and increasing agricultural output, all of which contribute to greater adaptive capacity and increased resilience.

Between 2011 and 2019, a large proportion of adaptation activities in Ethiopia took place in the agriculture sector, focused on soil and crops, as well as in the livestock and water sectors. These included large flagship resilience projects such as the Productive Safety Net Programme (PSNP), the Agricultural Growth Programme (AGP), the Sustainable Land Management Programme (SLMP), and the Participatory Small-scale Irrigation Development Project (PASIDP), amongst others (several of these are likely to have mitigation co-benefits through landscape restoration, but have not been measured and reported). Several other noteworthy adaptation projects have focused on improving efficiency in the livestock value chain and improving food security and nutrition. In the forestry sector, large REDD+ initiatives have contributed to adaptation, even as they are predominantly designed to have mitigation impacts through sequestration. Areas which need more focus include: pest and disease control for livestock and crops and strengthening drought, livestock and crop insurance mechanisms in the agricultural sector; improvement of rangeland and pasture management in the livestock sector; increasing urban areas with land use plans that integrate adaptation and expanding urban agriculture in the green cities and buildings sector; as well as the adoption of vulnerability and adaptation assessments at decentralised levels, climate proofing health infrastructure and updating building codes incorporating baseline, mid-term and end-term evaluations in health sector adaptation interventions, promotion of community health insurance schemes, capacity building and training for programme evaluation and reporting in the health sector.

With the inclusion of adaptation in the NDC and with the adoption of the NAP, climate change adaptation is likely to be elevated as a priority for climate action in Ethiopia, which is consistent with the country's level of vulnerability and the imperative as an LDC to safeguard its development from climatic shocks and stressors in key sectors.

Progress on mitigation

In 2010, Ethiopia's national emissions stood at 150 Mt CO_2e.[6] Since 2011, when the CRGE strategy came into effect, Ethiopia's subsequent emissions inventories have not been able to provide a clear picture of the trend in absolute total emissions, since the 2013 inventory suggested that aggregate emissions fell to 146 Mt CO_2e in 2013[7] whereas the 2016 inventory indicates that aggregate emissions – *without any forestry and land use emissions accounted for* – reached 132.8 Mt CO_2e in 2016[8] (with the implication that once forestry and land use emissions would be calculated, total emissions would significantly exceed the 2010 CRGE baseline). It is problematic to compare these numbers because of methodological differences in the calculations of the different years' inventories (particularly in terms of the emissions factors relied on). Based on these inventories, **there is no indication that emissions have decreased in the period since the CRGE strategy came into effect.**

Furthermore, in the context of a progress assessment on the implementation of the CRGE strategy and achievement of CRGE targets, there is no method to attribute the potential decrease in emissions to the CRGE strategy or the initiatives driven specifically by the CRGE strategy. In other words, even if Ethiopia's national GHG emissions could have reliably been assessed as decreasing since 2010, there are no grounds for suggesting that this decrease would have been due to CRGE implementation. The principal challenge in drawing a causal linkage are that there is no identification mechanism in place in Ethiopia to denote programmes or projects that align with or are in pursuance of the CRGE strategy (or even climate change mitigation). This prevents disaggregation of CRGE-linked efforts (i.e. implementation of activities that are driven by and would be unlikely to have taken place in the absence of the CRGE strategy) from ambient economic factors that could lead to emissions reductions (for instance, a decrease in economic growth rate, or – as the world is witnessing in 2020 – decreased emissions due to restricted economic

[6] Federal Democratic Republic of Ethiopia, Ethiopia's Climate-Resilient Green Economy: Green Economy Strategy (2011)
[7] Federal Democratic Republic of Ethiopia, Ethiopia's Second National Communication to the UNFCCC (2015).
[8] Ministry of Environment, Forests, and Climate Change, Ethiopia's Three-Years Greenhouse Gas Inventory 2007-2009 Ethiopian Calendar (2018).

activity as a result of COVID-19 response measures by governments, which cannot be credited to national climate change strategies).

Mainstreaming of the CRGE strategy since 2015 into Ethiopia's national development programme, i.e. the second Growth and Transformation Plan (GTP-II) has further deepened this complexity, because under the GTP-II mainstreaming paradigm there presently appears to be no means to identify and track CRGE-related or explicitly climate change focused interventions in Ethiopia. Put simply, **the way Ethiopia has approached CRGE mainstreaming has resulted in the lack of meaningful and effective tracking of CRGE-driven or CRGE-linked climate change activities.** This is a shortcoming in Ethiopia's CRGE mainstreaming approach and curtails measurable assessment of whether GTP-II implementation has also boosted CRGE goals and targets. While there has certainly been progress on the implementation of GTP-II, it is problematic to conflate all progress on a national development plan with progress on a climate change strategy since a national development plan also contains several elements that counteract or negate mitigation efforts (e.g. investment in roads and highways, or oil and gas). In other words, a national development plan such as the GTP-II is not a climate change action plan, and progress on the former cannot be interpreted as progress on the latter, despite what several in Ethiopia have suggested (i.e. suggestions to treat progress on GTP II as progress on CRGE implementation, based on the assumption that CRGE is deeply embedded in GTP-II and implementation of GTP-II automatically spurs progress on CRGE). **In the future this conflation can be rectified and measured by using identifiers (budget codes or tags) for CRGE-linked projects and programmes that take place within the broader umbrella of GTP-II.** Fortunately, Ethiopia has developed several CRGE indicators that will likely be used moving forward to track progress on CRGE-related objectives and targets. Additionally, Ethiopia has initiated planning for its next ten-year perspective plan (its forthcoming national development plan) and has prioritised mainstreaming of CRGE into this pivotal ten-year perspective plan. Decision-makers driving the ten-year perspective plan have affirmed that CRGE is one of the main pillars under the plan and will be mainstreamed. **Lessons from the sub-optimal CRGE mainstreaming into GTP-II (where CRGE was mainstreamed in some instances through verbiage and text, but not in practice and without any mechanisms for measuring, tracking, and reporting of what elements of CRGE were implemented) will hopefully ensure that CRGE mainstreaming into the ten-year perspective plan comes with more accountability and explicit guidance about what activities, projects, or programmes – and their corresponding targets and indicators – constitute mainstreaming of the CRGE.**

Even the question of whether Ethiopia has made progress on mitigation (without the need to link to the CRGE) is fraught because of questions regarding the accuracy of the 2010 GHG baseline calculation. These challenges could be overcome to some degree with robust, reliable, internationally reportable GHG reduction results from projects and programmes in Ethiopia (by adding up the GHG reductions measured and reported by hundreds of such activities). However, such **calculations are not tracked and recorded in Ethiopia at present by the government in a centralised, accessible, consolidated manner**.

Based on the broad characteristics of Ethiopia's climate change projects and programmes in the AFOLU sector between 2011 and 2019, it is estimated that the majority of AFOLU mitigation efforts were related to capturing existing atmospheric GHGs (activities such as afforestation), rather than preventing new emissions (reducing degradation and avoided deforestation), although there have been initiatives related to Participatory Forest Management (PFM) and clean cookstoves (whose impact cannot be estimated based on available data). This is sub-optimal, given that in Ethiopia deforestation accounts for 50% of all forestry-related emissions and forest degradation due to firewood consumption accounts for 46% of forestry emissions.[9] Another feature of the AFOLU initiatives studied during the assessment period is that in the absence of clear and explicit design elements to measurably reduce GHGs, they could potentially even lead to an increase in land-use related emissions (for example through increased livestock numbers). **Without detailed Measurement, Reporting, and Verification (MRV) of projects and programmes expected to have mitigation impacts or co-benefits, it is not feasible to ascertain the balance between activities that could be a carbon source or a carbon sink.** As a nation with a negligible

[9] Ministry of Environment, Forests, and Climate Change, UNEP, The Contribution of Forests to National Income in Ethiopia and Linkages with REDD (no date).

contribution to global GHG emissions, it is not incumbent on Ethiopia to aggressively reduce AFOLU emissions, especially given the socio-economic context of subsistence agriculture and wood fuel dependency (over 80% of Ethiopians are engaged in agriculture,[10] over 70% keep livestock,[11] and over 80% of Ethiopia's household energy needs are met by biomass, particularly in rural areas).[12] Beyond wood fuel, forests support livelihoods in Ethiopia through timber products and a host of valuable non-timber products, including livestock fodder, coffee and honey. Nevertheless, since the CRGE strategy established a national target and commitment to abating 130 Mt CO_2e from the forestry sector by 2030, and abating 90 Mt CO_2e from the agriculture sector by 2030, an assessment of progress on the CRGE strategy's implementation would have been more robust if AFOLU projects in Ethiopia since 2011 were designed so measurable GHG changes could be ascertained.

Similarly, for mitigation in the industry, energy, or transport sectors, there is also insufficient data available to estimate emissions avoided or reduced. Several projects in these sectors were small-scale pilots unlikely to yield large GHG reductions, and in some cases the baseline emissions were already low (for instance, in the power sector, given Ethiopia's low-carbon electricity mix). Amongst these sectors, transport is the most likely source of measurable GHG reductions, due to large emissions savings from the Addis LRT, the Ethiopia-Djibouti railway line, and the national railway network.

At present, the Government of Ethiopia does not have a readily a consolidated database which is accessible, where detailed MRV data is tracked or recorded. This is an important gap to fill, so that in the future Ethiopia can meet its MRV obligations under the Paris Agreement and report progress on its NDC by deploying a comprehensive information and knowledge management system for GHG emissions. It is also critical that all future MRV be methodologically consistent and comparable.

Progress on climate finance

Ethiopia estimates that the full implementation of the CRGE strategy will require US $ 150 billion until 2030 (an average of US $ 7.5 billion annually). The CRGE sector climate resilience strategy for water and energy is costed at US $ 895 million to 2030,[13] and the sector climate resilience strategy for agriculture and forestry will require estimated finance of US $ 600 million to 2030.[14] In contrast to these numbers, the recently developed and costed sectoral CRGE roadmaps suggest a far greater budgetary requirement to achieve CRGE-linked objectives and implement CRGE-related activities through 2030: the activities and interventions identified in the Roadmaps together require finance of US $ 209,583,632,397.00 (if they were all to be implemented in full).

Calculation of finance spent by Ethiopia on CRGE implementation (adaptation and mitigation) between 2011 and 2019 is subject to the same challenges noted above. **In the absence of a governmental budget tracking or coding system that identifies spending linked to CRGE, or to climate change mitigation and climate change adaptation, there is currently no mechanism available to unpack activities funded under GTP-II to determine climate-change linked expenditure.** The closest proxy would be to break down the national budget by "budget vote" number 219 (linked to Environment, Forests, and Climate Change), but this would lead to overinclusion of initiatives that have no climate change linkage whatsoever (such as plastics, or conventional air and water pollution, hazardous chemicals, or environmental safety related activities).

One approach is to aggregate the total budgets of the hundreds of projects and programmes implemented between 2011 and 2019 that may be viewed as having a direct or indirect climate change impact. This may lead to an over-

[10] Farm Africa, Ethiopia. Available at https://www.farmafrica.org/ethiopia/ethiopia (last accessed March 2020).
[11] FAO, The Future of Livestock in Ethiopia: Opportunities and Challenges in the Face of Uncertainty (2019).
[12] Ministry of Environment, Forests, and Climate Change, UNEP, The Contribution of Forests to National Income in Ethiopia and Linkages with REDD (no date).
[13] Federal Democratic Republic of Ethiopia, Ethiopia's Climate Resilient Green Economy – Climate Resilience Strategy: Water and Energy (2015)
[14] Federal Democratic Republic of Ethiopia, Ethiopia's Climate Resilient Green Economy – Climate Resilience Strategy: Agriculture and Forestry (2015)

estimation of climate finance, since several of these large projects have multiple components, with the likelihood that only a portion of their overall budgets may be eligible to be classified as climate finance. However, this assessment adopted a more flexible approach to identification of climate change adaptation or mitigation projects[15] and was guided by the World Bank's categorization of activities with adaptation and mitigation co-benefits. Since the CRGE's original estimate of US $ 150 billion was for mitigation only, projections of the remaining climate finance needed to accomplish the CRGE's objectives would be compared to this baseline estimate. Using the project/programme budget aggregation approach, and adding up total budgets of all such identified projects[16] **it was found that approximately US $ 82 billion has been spent on the identified projects that have a direct or indirect link to CRGE, with plausible mitigation impacts, US $ 68 billion is still required between 2020 and 2030 (or US $ 6.8 billion per year) to achieve Ethiopia's CRGE mitigation targets**.[17] The vast majority of finance spent on these identified climate change-related projects during the study period came from Ethiopian public funds, with the second largest source being international aid, and private sector finance playing almost no role.

Climate finance tracking in Ethiopia will benefit from the establishment of an accessible, and consolidated data and information management system that adopts climate finance classifications used globally and records climate change-linked expenditure by the public sector, as well as donor and DFI climate change-linked expenditure. Such a system would ideally record not only total budgets, but characterise the funding by several other key features (e.g. project preparation expenditure, capital expenditure, operating expenditure; grant, loan, or equity; yearly breakdown; geographical breakdown; breakdown by source etc.) to enable a more sophisticated analysis of climate finance in the future.

Progress on institutional arrangements

To implement the CRGE strategy, Ethiopia has put in place multifaceted institutional architecture. A CRGE Facility was established, comprising of the Ministry of Finance, responsible for financial aspects of CRGE implementation as well as M&E, and the Environment, Forests, and Climate Change Commission (EFCCC) responsible for technical elements and day-to-day administration, as well as developing guidance and rules for CRGE implementation. **The institutional arrangements reflect a cross-sectoral, multi-disciplinary approach, through bodies like the inter-ministerial committee and steering committee and allow for regional and local level engagement as well, through regional bureaus and other non-federal bodies.** Most relevant line ministries have in-house CRGE directorates, units, or bureaus.

A great deal of attention has been invested in developing institutional rules, procedures, operating manuals, guidelines, tools, and protocols to help give effect to the CRGE. Capacity building initiatives such as the National Capacity Building Programme (NCDP) have also received attention. However, **gaps remain in actual implementation.** The action plan of proposed measures under the National Capacity Building Programme has not been completely implemented, and an important first step would be to give effect to the complete range of recommended actions in the NCDP proposal so that it becomes a foundation to build on. However, even the NCDP has a slightly skewed emphasis on trainings, preparation of guidelines, and dissemination of guidelines or documentation. Less attention has been paid to the actual operationalisation, management, and periodic performance evaluations of the systems and knowledge platforms (e.g. databases and filing methods). **Ethiopia has demonstrated that it is adept at developing manuals and guidelines and system design documents, but it needs to invest resources in actual roll-out, operationalisation, and maintenance of such systems**. Similarly, on the capacity-development front, Ethiopia has placed significant emphasis on trainings, but should now

[15] Deviating from best practice in classification of climate change mitigation and adaptation finance, as represented by the MDBs-IDFC common principles, and the OECD DAC's Rio Markers.
[16] For more details on calculation methodology please refer to section 5.1 of this report.
[17] Notwithstanding that Ethiopia may no longer need to target the same range of CRGE activities for mitigation through 2030, since its 2030 emissions may be lower than projected, as is suggested by the lower than projected emissions for 2013 and 2016 in the national inventories for those years.

consider more long-term and sustained approaches to capacity development such as sending high-performing officials for relevant degree programmes abroad to bring back deep-seeded skills and competencies.

Overall, the focus needs to shift to implementation and measurable, trackable operationalisation of institutional guidelines and protocols. This is particularly so in terms of human resources (staff numbers and technical capacity, as well as staff retention to maintain institutional memory), and information and knowledge management resources (databases and searchable archives). **Most critical is the need for stronger MRV systems at all levels.**

It would also be advisable to re-examine certain structural elements of the CRGE Facility that appear to contribute to fragmentation and increased transaction costs in the coordination of activities – the bifurcation between the Ministry of Finance and the EFCCC. **This need for devising a refined institutional architecture is particularly pressing given that the role of the CRGE Facility has shifted from channelling funds to discrete climate change projects (and providing oversight for implementation) to supporting government departments in enhancing their capacity to mainstream climate change into their activities and programmes**. The lapses in the existing CRGE Facility's institutional arrangements in contributing to progress on the CRGE strategy are well articulated in a damning assessment by the EFCCC. Thus, the government is already aware that CRGE coordination is falling short of expectations.[18]

Progress on policy

The CRGE strategy has catalysed several subsequent policy developments, including three sectoral climate resilience policies (for agriculture and forestry; water and energy; and transport), and the recent 2019 sectoral implementation roadmaps. It was also mirrored in the mitigation section of the NDC. The 2013 proclamation creating the Ministry of Environment and Forestry was an important policy milestone to empowering the relevant authority to address climate change, The creation of the National Biogas Energy Programme and the enabling environment support under the Scaling up Renewable Energy Programme (SREP) has led to more mitigation-friendly policies in the energy sector. The health sector climate change adaptation plan is another illustration of a progressive climate-responsive policy in Ethiopia.

Such examples notwithstanding, the major finding is that **policy instruments enacted during the assessment period missed an opportunity to supplement and align with the CRGE strategy**. From a policy coherence perspective, more needs to be done to ensure that other sectoral policies, plans, frameworks, strategies, and regulatory instruments take cognizance of the CRGE strategy and align with its priorities as they relate to the sector. Multiple such instruments in key sectors developed since 2011 were found to not link to the CRGE or its focus areas. **Sectors such as agriculture and livestock have developed major policies since 2011 that could have had a bearing on climate change mitigation and adaptation, but were disconnected from any elements of the CRGE strategy's targets and priority areas for the sectors, and therefore not effective in supporting CRGE implementation**.

The CRGE strategy itself warrants an update to its policy framework, given that Ethiopia's emissions trajectory appears to be evolving differently than what the 2010 projections suggested. In the lead-up to the NDC coming into effect in 2020, and to plan ahead for the 2023 global stocktake and the 2025 revision of the NDC, Ethiopia would be well placed to undertake a fresh baseline-setting exercise. In conjunction with this, it should develop new national economic growth scenarios that would be integrated with regional and global climate models, and high-medium-low emissions scenarios, to produce new emissions projections nationally and sectorally through 2030. This would also be an opportunity to update the CRGE strategy, refining certain sectoral priority areas to ensure stronger selection of mitigation interventions that can measurably result in GHG reductions and sequestration.

[18] EFCCC, 'Preliminary Assessment Report on the Institutional Structure and Coordination of the Climate Resilient Green Economy (CRGE) Implementation at the Federal Level,' January 2019.

Role of the private sector

In 2016, the CRGE Facility developed a private sector strategy as a first step towards engaging the private sector more in achievement of the CRGE strategy. However, the private sector strategy is more of an explanation of the CRGE Facility's organizational structure, an articulation of GTP-II pillars, a discourse on types of finance available in Ethiopia, and an overview of Ethiopia's financial sector. It sets out objectives for what the CRGE Facility's private sector strategy must address but provides no strategic guidance or direction on what needs to be done and how. As such, this is an ineffective instrument to enhance private sector engagement in climate change related activities in Ethiopia.

Given that the private sector is slowly and steadily emerging in Ethiopia's changing political economy, and could be an important source of both technical expertise and finance for climate change interventions, **an effort needs to be made by the CRGE Facility as well as sector CRGE Directorates to establish concrete dialogue with companies**. This is particularly crucial for the industrial sector, where cement industries could be pivotal to emissions reductions, and in transportation, where freight companies could be instrumental in driving more efficiency. The role of the private sector is also significant in the forest and livestock sectors (such as through commercial forest industry development involving outgrowers, or poultry businesses). In these sectors too there is a need for clearer policy guidance that addresses enabling conditions for the private sector to engage and contribute to the objectives of the CRGE.

Key takeaways

Ethiopia's CRGE Strategy is an ambitious and exceptional national guiding document that has steered the country towards a great deal of action on climate change mitigation and adaptation since 2011. **The specific quantifiable impacts of climate change interventions (in terms of greenhouse gases reduced or avoided, and in terms of adaptive capacity built and vulnerable households or individuals reduced) in the country are less discernible due to the absence of necessary tracking mechanisms (M&E systems, MRV protocols, consistent indicators, and lack of documentation).** It is this aspect of measuring what is being done that must change in the future as Ethiopia continues to maintain its leadership on climate change and progresses further towards its CRGE/NDC goals.

Recommendations on the way forward

Each of the sets of recommendations in the categories below apply to climate change mitigation, adaptation, and cross-cutting activities in Ethiopia.

Recommendations on policy formulation and strategy approaches

The Government of Ethiopia should conduct a fresh national and sectoral GHG inventory, adhering to 2006 IPCC guidelines, to establish accurate baselines for the years 2010 and 2020. The CRGE Facility's technical unit (within the EFCCC)should be accountable for implementing this. This comprehensive exercise should be initiated by 2021 and completed and verified by 2023. The CRGE Inter-Ministerial Steering Committee should verify that this will be done.

The Government of Ethiopia should commission fresh GHG growth projections (nationally and by sector) between 2020 and 2030, to establish a more accurate trajectory and recalibrate the level of ambition. The CRGE Facility's technical unit (within the EFCCC) should be accountable for ensuring this. The projections should be initiated by 2021 and completed and verified by 2023. The CRGE Inter-Ministerial Steering Committee should verify that this will be done.

The CRGE Facility's technical unit (within the EFCCC) should lead the setting of fresh GHG reduction targets based on the updated calculations and opt for relevant best practice in terms of mitigation interventions recognized (globally and regionally) as having climate change mitigation outcomes. The CRGE Inter-Ministerial Steering Committee should oversee this and ensure new targets are set by 2025.

The EFCCC should conduct detailed sectoral climate change risk and vulnerability assessments to establish accurate baselines for vulnerability, and to identify high-priority areas for intervention to build adaptive capacity and reduce vulnerability, as well as measurable targets. The CRGE Facility's technical unit (within the EFCCC) should be accountable for implementing this. Assessments should be initiated by 2021 and completed by 2023. The CRGE Inter-Ministerial Steering Committee should verify that this will be done.

The Government of Ethiopia (through the technical unit of the CRGE Facility at the EFCCC and the financial wing of the CRGE Unit at the Ministry of Finance) should revise the CRGE strategy and the NDC to reflect the new baseline, new 2030 targets, updated mitigation and adaptation priorities and interventions, with a special emphasis on revised approaches for high mitigation potential and high adaptation potential sectors. The CRGE Inter-Ministerial Steering Committee should oversee this by 2023, verify this, and publish the revised CRGE strategy by 2025, before the next NDC update.

Recommendations on project design and structuring

The PDC, EFCCC, and MoF should ensure that future climate change interventions (with direct climate change related benefits or outcomes) as well as all other interventions with climate change co-benefits (indirect climate change outcomes) are explicitly conceptualised, designed, and structured to respond to an established climate change-linked baseline, and to intentionally target climate related outcomes, to avoid the loss of future opportunities to reduce GHG emissions or vulnerability. The technical wing of the CRGE Facility (within the EFCCC) should issue guidelines to ensure this by 2023, updating them regularly. The CRGE Inter-Ministerial Steering Committee responsible for verifying this is done, and for measuring results.

Both units of the CRGE Facility, i.e. the technical wing at the EFCCC and the financial wing at the Ministry of Finance, and the PDC, should ensure that during project origination and development, all project developers and champions incorporate global best practice on climate change mitigation and adaptation activities in sectors sector (e.g. IPCC reports and special reports; OECD's DAC Rio Markers; MDBs-IDFC Common Principles on Mitigation and Adaptation Finance etc.). This will ensure that interventions intended to have climate benefits or co-benefits are informed by science and technical understanding on what constitutes climate change mitigation and climate change adaptation outcomes. The government of Ethiopia should issue guidelines to ensure this by 2021, updating them regularly. The CRGE Inter-Ministerial Steering Committee responsible for verifying this is done, and for measuring results.

Recommendations on MRV and M&E

The Government of Ethiopia should rapidly operationalize Ethiopia's existing MRV frameworks (developed in 2016 for major sectors) by translating theoretical guidance into operational systems, investments, staffing, and other resources. In doing so, it should update the frameworks and guidance as necessary to ensure consistency with UNFCCC's MRV guidelines, international best practice, and (for future refinement of national MRV systems beyond 2020) the Modalities, Procedures, and Guidelines (MPGs) under the Enhanced Transparency Framework (ETF) adopted under the Katowice Package. The technical unit of the CRGE Facility (at the EFCCC) and the financial unit of the CRGE Facility (at the Ministry of Finance) should jointly establish a task force to achieve this by 2021 and publish annual MRV reports thereafter. The CRGE Inter-Ministerial Steering Committee should oversee this and ensure the MRV mechanisms are in place and effective.

The EFCCC, MoF, plus the Planning and Development Commission should ensure t use of a consistent set of indicators related to climate change, with a final selection an official notification of indicators (sector level, programme level, project level, and activity level – both output indicators and outcome indics). Mandate the use of the same core set of indicators by all institutions, including the Planning and Development Commission, the EFCCC, the Ministry of Finance, all Ministries, donors, and implementation partners (with the freedom for all to additionally adopt, track, and report on further non-core indicators as may be contextually relevant). This should be monitored through a consultative review process by 2021 onwards, with the EFCCC and Ministry of Finance (together, the technical and financial arms of theCRGE Facility), and PDC responsible for adopting and using consistent indicators. The CRGE Inter-Ministerial Steering Committee should verify that this will take place.

The CRGE Inter-Ministerial Steering Committee should require all Ministries to develop climate change mainstreaming plans for the development plan that succeeds GTP II, as well for the ten year perspective plan, using the chosen core indicators, and thereafter prepare and submit to the CRGE Facility's technical unit (within the EFCCC) annual climate change mainstreaming reports using the same consistent set of core indicators (as well as additional sector-specific climate change indicators finalized for each sector under the next plan, as relevant to its own planned priorities and activities, to be reported on for the entire duration of the next national plan period). The Government of Ethiopia should issue guidelines for this by 2021, and the Planning and Development Commission should oversee this, verify this, and monitor reporting on indicators.

Recommendations on climate finance budgeting and tracking

The Ministry of Finance should design and put in place a public expenditure review framework at the Ministry of Finance, the Planning and Development Commission, and across all government institutions (at the Federal, Regional, and Woreda level) that enables disaggregation of distinct budgetary flows and allocations. Institute a "coding" system for (a) climate change mitigation, (b) climate change adaptation, and (c) cross-cutting climate change to enable isolating public revenue and expenditure linked to climate change. These budget codes should be adopted and published by 2021, and maintained, applied, and tracked consistently thereafter. The CRGE Inter-Ministerial Steering Committee should oversee this and ensure codes are operationalised.

The CRGE Inter-Ministerial Steering Committee should direct the Ministry of Finance and the Resource Mobilization Directorate at the EFCCC to prepare annual reports on climate change finance budgeting and tracking, at the national and sectoral level, to be published in Amharic and English. The Ministry of Finance should start publishing annual public expenditure reports on CRGE finance by 2021 and making them publicly available. The CRGE Facility's financial wing (at the Ministry of Finance) and the EFCCC's Resource Mobilization Directorate should be accountable to ensure this is implemented, and the CRGE Inter-Ministerial Steering Committee should verify this will be done.

Recommendations on knowledge and information management

The CRGE Facility's technical unit should establish a user-friendly, reliable, well-designed and organized centralised information and knowledge management system (dual platform – server-based and cloud based) at the EFCCC. This searchable database and archive will capture and store all climate change related data and information in an easily classifiable, retrievable manner. The EFCCC should convene a task force by 2021 to design and bring into effect this new information and knowledge management system by 2023, and the CRGE Inter-Ministerial Steering Committee should verify this is done.

The CRGE Inter-Ministerial Steering Committee should require all sectors to maintain an online, dual-platform (server-based and cloud-based) information and knowledge management system, to serve as searchable archive to trace and retrieve relevant documents and data, as well as to enable sharing and real-time dissemination of climate change related information and activities documented within the sector (at the national, regional, and woreda level). These Ministry systems should be completely integrated with the national centralised system at the CRGE Facility's technical wing (at the EFCCC). The EFCCC should convene a task force by 2021 to design and bring into effect this new information and knowledge management system by 2023, and the CRGE Inter-Ministerial Steering Committee should verify this is done.

Recommendations on institutional arrangements

The Government of Ethiopia should strengthen the CRGE Facility's mandate to guide, advise, monitor, seek reporting from, evaluate, and assess all interventions in Ethiopia with a climate change linkage (mitigation or adaptation). The strengthened mandate and functions should be given legal effect through a proposed Ethiopian Climate Change law by 2021, to be driven and overseen by the CRGE Inter-Ministerial Steering Committee.

The CRGE Inter-Ministerial Steering Committee should require non-governmental institutions implementing climate change related activities in Ethiopia (even those operating completely independently, i.e. not receiving any public funds directly or any pass-through funds) to submit project design documents, project monitoring and evaluation reports, project closure reports, and project financial reports to the CRGE Facility's technical wing (at the EFCCC) for all climate change initiatives. This requirement should be captured in a proposed Ethiopian Climate Change Law by 2021. EFCCC should be responsible for implementing this receipt, recording, and storage of reports, and the CRGE Inter-Ministerial Steering Committee should verify periodically that such submissions are occurring.

The Government of Ethiopia should conduct an options analysis (by an external service provider) for exploring restructuring of the CRGE Facility to end the bifurcation of responsibilities and activities between the EFCCC and Ministry of Finance, and – *if needed* -- to create a unified, integrated single institutional hub for all climate change related activities in Ethiopia (in particular, for NDC coordination). The options analysis should evaluate the stakeholder-suggested option of a semi-autonomous body independent of Ministries. The Options analysis should be completed in 2020 and its recommendations fully operationalised by 2021.

The CRGE Facility's technical unit (at the EFCCC) should create a private sector liaison office (or officer) to engage with the private sector on climate change activities, including the NDC (for enhanced private sector engagement on both resource mobilization as well as for technical partnership in implementation). This position, including its functions and mandate, should be created and brought into effect by 2021, and the EFCCC should be accountable for monitoring the results of the office. The CRGE Inter-Ministerial Steering Committee should verify that this will be done.

ACKNOWLEDGEMENTS

This report was prepared by a World Bank team led by Dereje Agonafir Habtewold, Pablo Cesar Benitez, and Dawit W. Mulatu, in collaboration with the Pegasys Group and the Ethio Resource Group (ERG), with support from the World Bank's assistance to Ethiopia's Climate Resilience and Green Economy strategy implementation programme.

This report and the assessment that underpins it were made possible, in particular, by the Government of Norway, and the NDC Support Facility Trust Fund that provided finance for this effort.

The CRGE Implementation Progress Assessment Report received strategic guidance and input from the Hon'ble Commissioner of the Environment, Forests, and Climate Change Commission (EFCCC), staff experts at the CRGE Facility, the Ministry of Finance, and officials in charge of CRGE Directorates, Units, and Bureaus within all line Ministries in Ethiopia.

Special thanks are given to the oversight and guidance by all members of the Technical Working Group (TWG) constituted to steer and inform the CRGE Implementation Progress Assessment: Bemnet Teshome, Gebru Jember Endalew, Asrat Yirgu Senato, Zerihun Getu, Yitebitu Moges (PhD), Asaye Ketema, Fantahun Gezie, Mohammed Andoshe, Tilaye Nigussie, Adefires Worku (PhD) and Daniel Fikreyesus (PhD).

This work is a product of the staff of the World Bank with external contributions. The findings, interpretations, and conclusions expressed do not necessarily reflect the views of the Bank, its Board of Executive Directors, or the governments they represent.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

ACKNOWLEDGEMENTS 1

1 Introduction 4

1.1 Overview of the Report 4
1.2 Methodology Adopted for this Report 4

2 Climate Change in Ethiopia 5

2.1 Climate and climate change in Ethiopia: a snapshot 5

3 Adaptation and Resilience 9

3.1 Increased Resilience and Adaptive Capacity 9
3.2 Understanding Adaptation co-benefits. 10
3.3 Adaptation Progress Assessment reporting Methodology 10
3.4 Overview of Adaptation Activities 2011-2019 10
3.5 Progress in Adaptation 2011-2019 13
3.6 Adaptation Activities in Key Sectors 15

4 Mitigation 25

4.1 Mitigation Overview 2011-2019 25
4.2 Assessment of the BAU AFOLU Component 28
4.3 Mitigation: Industry, Energy and Transport 30
4.4 Summary and potential for contribution of mitigation projects to future national emissions 37

5 Financial Assessment 38

5.1 Methodology 38
5.2 Ethiopia Climate Investment Overview 39
5.3 Future Climate Expenditure Projections 44

6 Policy 47

6.1 Agriculture and Livestock 47
6.2 Forestry 48
6.3 Water and Energy 49
6.4 Industry 50
6.5 Transport 51
6.6 Green Cities and Buildings 53
6.7 Health 54

7 Institutional 56

7.1 CRGE Facility and associated institutional architecture 56
7.2 Progress Under GTP-II 57
7.3 Institutional Capacity Challenges and Gaps 58
7.4 Institutional Arrangements Recommendations Moving Forward 60

8 The Private Sector 61

9 Recommendations on the Way Forward 63

Bibliography 66

APPENDIX A Report Methodology 76

APPENDIX B Projects included in the scan. 78

APPENDIX C Emissions categories as per the IPCC 2006 GHG inventory guidelines 80

APPENDIX D Project Database Overview 82

APPENDIX E Roles and Responsibilities of CRGE Implementation Bodies 84

FIGURES

Figure 1 Effect of Climate Change on Venerable Sectors, adapted from (CAARIA , 2016, p. 12) 6
Figure 2 Ethiopia NDC Projections (CAT, 2018) 6
Figure 3 NDC Targets, (Federal Democratic Republic of Ethiopia, 2015) 8
Figure 4 Household 'Capitals', Pegasys, 2019 9
Figure 5 Initiatives by Focus Area, Pegasys, 2019 15
Figure 6 The number of projects per CRGE category: Forestry, Livestock and Soil. 26
Figure 7 Project Development Objective Indicators OFLP (World Bank , 2017, p. 58) 27
Figure 8 Number of Climate Projects by Sector 2011 – 2019 (incl. overlapping) 40
Figure 9 Total Climate Project Value (in ETB) by Sector 2011-2019 (incl. overlapping) 41
Figure 10 Number of Projects (left) and Total Value (in ETB) of Projects by Climate Impact 2011-2019 (incl. overlapping) 42
Figure 11 Annual Breakdown of Project Expenditure (in ETB) by Sector 2011-2019 43
Figure 12 Annual Breakdown of Project Expenditure (in ETB) by Climate Impact 2011-20 43
Figure 13 Reorganized structure of CRGE Implementation Arrangements 57

TABLES

Table 1 The number of projects per CRGE category: Forestry, Livestock and Soil. 26
Table 2 The number of projects per CRGE category: Forestry, Livestock and Soil. 26
Table 3. Ethiopia CRGE sectors and corresponding IPCC categories 29
Table 4. Recent AFOLU sector GHG emissions compared to the 2010 base year and 2020 BAU, reported in mtCO2e. 29
Table 5: Summary of available information on emissions savings from mitigation projects 32
Table 6 Projects contributing to reducing emissions from the manufacturing industries and construction sub-sector (1.A.2) 33
Table 7: Projects contributing to reducing emissions from the transport sub-sector (1.A.3) 34
Table 8: Projects contributing to reducing emissions from the other sectors (1.A.4) 37
Table 9: Summary of available information on emissions savings from mitigation projects 37
Table 10 Estimated Future Climate Mitigation Investment Required to 2030 Based on 'National Costing' Methodology 45
Table 11 Policy Development relevant to the CRGE: Agriculture and Livestock 47
Table 12 Policy Development relevant to the CRGE: Forestry 49
Table 13 Policy Development relevant to the CRGE: Water and Energy 50
Table 14 Policy Development relevant to the CRGE: Industry 51
Table 15 Policy Development relevant to the CRGE: Transport 52
Table 16 Policy Development relevant to the CRGE: Green Cities and Buildings 53
Table 17 Policy Development relevant to the CRGE: Health 54

LIST OF ABBREVIATIONS

AFOLU	Agriculture, Forestry and Other Land Use
BAU	Business as Usual
CRGE	Climate Resilient Green Economy Strategy
EFCCC	Environment, Forestry and Climate Change Commission
GHG	Greenhouse Gasses
GoE	Government of Ethiopia
MoA	Ministry of Agriculture
MoF	Ministry of Finance
MoT	Ministry of Transport
MoWIE	Ministry of Water, Irrigation and Energy
NAP	National Adaptation Plan
NDC	Nationally Determined Contributions
REDD+	Reducing Emissions from Deforestation and Forest Degradation
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

1.1 OVERVIEW OF THE REPORT

This report presents and overview of the findings of the 'Assessing the Progress in Implementing Ethiopia's Climate Resilient Green Economy (CRGE) - Nationally Determined Contributions (NDC) in the Priority Sectors' project. It is accompanied by a more detailed, 'Sectoral Appendix Report' which outlines key activities in the sectors investigated. Several sectors were focused upon for the study, including:

Agriculture (Crops and Soil)
Livestock
Forestry
Water and Energy
Green Cities and Buildings
Industry
Health, and
Transport.

The project was funded by the World Bank and overseen by the CRGE facility. The project was undertaken in 2019 and included the mapping, organising and reporting on all CRGE related activities in Ethiopia during the period of 2011-2019. The report is split into the following sections:

An overview of adaptation activities in Ethiopia between 2011-2019
An overview of mitigation activities in Ethiopia between 2011-2019
A financial analysis of climate change spending during the period of 2011-2019
A policy review, and
An institutional review of the CRGE facility.

1.2 METHODOLOGY ADOPTED FOR THIS REPORT

1.2.1 ABOUT THIS REPORT

This report provides an overview of the on the implementation of the CRGE in Ethiopia. The detailed assessment is captured in a draft "CRGE/NDC Implementation Report," which covers Ethiopia's achievements on climate change mitigation, adaptation, climate change related policies, climate change related institutional arrangements, and climate finance, all within the framework of the CRGE strategy and three sectoral climate resilience strategies. The detailed report, appended hereto as an Annex, also offers insights – sector by sector - into areas for strengthening CRGE-related efforts on adaptation, mitigation, policy, institutional arrangements, and finance. This overview report encapsulates the same findings and recommendations but is organized by theme for Ethiopia as a whole on CRGE-driven or CRGE-linked adaptation, mitigation, policy, institutional arrangements, and finance.

It is important to note that the assessment conducted was designed to be a review of the progress made by Ethiopia on the implementation of the CRGE strategy (and, due to the replication of the CRGE strategy's priorities in the mitigation section of Ethiopia's NDC, it is also useful as a review of Ethiopia's progress on the mitigation aspects of it's NDC). It was not designed to be an economy-wide assessment of all climate change trends in Ethiopia unrelated to the CRGE (a task that would require a national and sectoral greenhouse gas inventory and climate modelling projections of future GHG trajectories), and also it is not intended to be an assessment of all development activities in Ethiopia since 2011 (even though all development activities have at least some indirect climate change implications). The assessment that underpins this report and the detailed sectoral report is an assessment of what Ethiopia has done, and not done, in furtherance of the CRGE strategy and its prescriptions for climate change priority interventions.

A brief note on methodology is provided within each section of this report, and a lengthier methodology description is appended to this report in Appendix A.

2 Climate Change in Ethiopia

2.1 CLIMATE AND CLIMATE CHANGE IN ETHIOPIA: A SNAPSHOT

Ethiopia has a varying climate that is highly influenced by its topography, ranging from warm and semi-arid to cold and moist (CAARIA , 2016). The climate is typically tropical in the south-eastern and north-eastern lowland regions, but much cooler in the large central highland regions of the country.

2.1.1 EXTREME EVENTS

Ethiopia has experienced both very dry and very wet periods over the past four decades; this strong inter-annual and inter-decadal variability in the country's rainfall makes it difficult to detect long-term trends (McSweeney et al, 2010), especially those that can be attributed to climate change rather than natural influences (CAARIA , 2016). Extreme events are common in Ethiopia, especially droughts; Ethiopia has been ranked 5th out of 184 countries in terms of its risk of drought – ranging from extreme events that often result in famine, to dozens of localised droughts with equally devastating effects. Currently, Ethiopia is in the midst of its worst drought in 50 years, exacerbated by a particularly strong El Nino. At the same time, flood and landslide events are also becoming more common; with Ethiopia ranking 34th out of 162 countries in terms of flooding risk, and 5th out of 162 in terms of landslide risk (Ministry of Foreign Affairs of the Netherlands, 2018).

2.1.2 TEMPERATURE TRENDS

Ethiopia has seen an increase of 1.3°C between 1960 and 2006, representing an average change of 0.28°C per decade and during this same period of observation, the increase in temperature was most rapid in July, August and September. The number of hot days has increased by 20% from 1960 to 2003 while the number of both cold days and cold nights has decreased[19] (CAARIA , 2016).

2.1.3 CLIMATE PROJECTIONS

Climate models are consistent in that there will be an increased in temperature over time. However, the degree and rate of this increase vary; some projections indicate an increase of 1.1 to 3.1°C by the 2060s, and 1.5 to 5.1°C by the 2090s, while more recent projections see temperature increases that range from less than 2.5°C to greater than 3°C by the 2040s (Daron, 2014). All projections suggest an increase in the frequency of hot days and nights[20] (Irish Aid, 2016). These such increases in temperature can lead to a rise in the frequency of heat waves and higher evapotranspiration rates (CAARIA , 2016).

In terms of rainfall, projections are more complex due to the lack of historical data as well as the large number of factors influencing rainfall (ENSO, sea surface temperatures, moisture sources, and land cover change) (Irish Aid, 2016). There is large local variability in rainfall projections, with some projections stating an increase in rainfall during the Bega rains in Southern Ethiopia during the months of October to December and decreases of rainfall in the northeast during April to June and July to September (CAARIA , 2016).

[19] With the exception of December to February
[20] Hot' day or 'hot' night is defined by the temperature exceeded on 10% of days or nights in current climate of that region and season.

2.1.4 CLIMATE IMPACTS

The figure below highlights the effects of climate change on vulnerable sectors in Ethiopia, as reflected in the 2016 CAARIA Working Paper (CAARIA , 2016).

Agriculture
Increased incidence of fires, droughts and floods.
Decreased water availability.
Loss of crop and livestock production.
Increased soil erosion.
Increased incidence of pests and diseases for crops and livestock.
Degradation in rangelands due to soil erosion, droughts, and floods

Health
Increased incidences of water, air and vector borne diseases.
Increased healthcare expenditures.
Damage to healthcare infrastructure.
Interruption in health services.

Water
Decrease in water flow.
Increased incidence of flooding and drought.

Energy
Interruption and reduction in hydropower generation.
Damages to energy infrastructure.
Loss in biomass due to increased soil erosion and extreme weather events.

Roads
Washing out of roads.
Higher maintenance and recovery costs.
Disruption of transportation services.

Figure 1 Effect of Climate Change on Venerable Sectors, adapted from (CAARIA , 2016, p. 12)

2.1.5 ETHIOPIA CRGE AND NDC

Ethiopia's 2015 NDC is seen as an example of good practice and among the more ambitious NDCs in Africa, in terms of its specific and measurable targets and goals (CDKN, 2016) . In the NDC, Ethiopia made the commitment to limit its net greenhouse gas (GHG) emissions in 2030 to 145 Mt CO_2e or lower (Federal Democratic Republic of Ethiopia, 2015). However, under current projections, emissions are expected to be in the range of 185–257 Mt CO_2e in 2030 (excluding LULUCF), depicted in Figure 2 below (CAT, 2019). Thus, the NDC commitment represents a significant and meaningful reduction from a Business as Usual (BAU) trajectory.

Importantly the NDC makes it clear, that in order to fully implement its proposed actions, there needs to be adequate technology transfer, capacity building support as well as external finance (CAT, 2019).

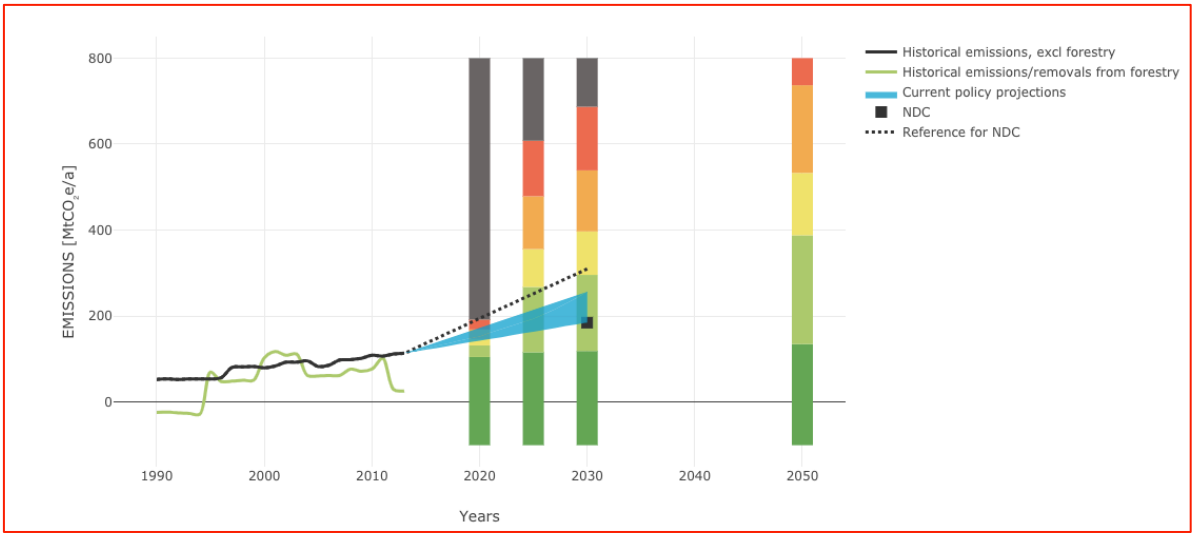

Figure 2 Ethiopia NDC Projections (CAT, 2018)

2.1.6 CRGE OVERVIEW

The 2011 CRGE provides the basis of the 2015 INDC as well as all subsequent climate related planning for the country. The CRGE is an in depth and detailed document which aims to 'to protect the country from the adverse effects of climate change and to build a green economy that will help realise its ambition of reaching middle income status before 2025' (Federal Democratic Repbilc of Ethiopia, 2011, p. v) The strategy has three complementary objectives

- Fostering economic development and growth
- Ensuring abatement and avoidance of future emissions, i.e., transition to a green economy
- Improving resilience to climate change.

It has over 60 initiatives based around 4 pillars:

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

The strategy goes on to state that the initiatives outlined in the document will help curb emissions from a BAU baseline, stating that:

'While contributing to reaching economic and social development targets, we have the domestic potential to contribute to the global effort by abating around 250 Mt CO2e in 2030 as compared to conventional development practices – this equals a decrease in GHG emissions of up to 64% compared to BAU in 2030.4 Given the projected population growth, emissions on a per capita basis will decrease from 1.8 t of CO2e to 1.1 – a decrease of around 35% – while multiplying GDP per capita from USD 380 to more than USD 1,800' (Federal Democratic Repbilc of Ethiopia, 2011, p. 38)

The CRGE not only provides a strategy for green development, economic growth and lowering GHG emission, but outlines the financial resources required in order to meet its goals and serves as a globally leading green economy strategy and plan. Since the formulation of the CRGE in 2011, there have been several sector specific CRGE strategies published and developed including the: Agriculture and Forest Sector CRGE (2015), the Water and Energy Sector CRGE (2015), and the Transport Sector CRGE.

2.1.7 NDC OVERVIEW

Noting the importance and direct relevance of the 2015 Intended Nationally Determined Contribution (INDC) to this project, this section provides a summary of its aim and objectives.

The 2015 NDC has the specific aims to:

'...limit its net greenhouse gas (GHG) emissions in 2030 to 145 Mt CO2e or lower. This will constitute a 255 MtCO2e reduction from the projected 'business-as usual' (BAU) emissions in 2030 or a 64% reduction from the BAU scenario in 2030. Ethiopia also intends to undertake adaptation initiatives to reduce the vulnerability of its population, environment and economy to the adverse effects of climate change, based on its Climate Resilient Green Economy Strategy (CRGE).The CRGE is Ethiopia's strategy for addressing both climate change adaptation and mitigation objectives. The implementation of the CRGE will ensure a resilient economic development pathway while decreasing per capita emissions by 64% or more. (Federal Democratic Republic of Ethiopia, 2015)

Figure 3 below highlights emissions reductions targeted in the NDC.

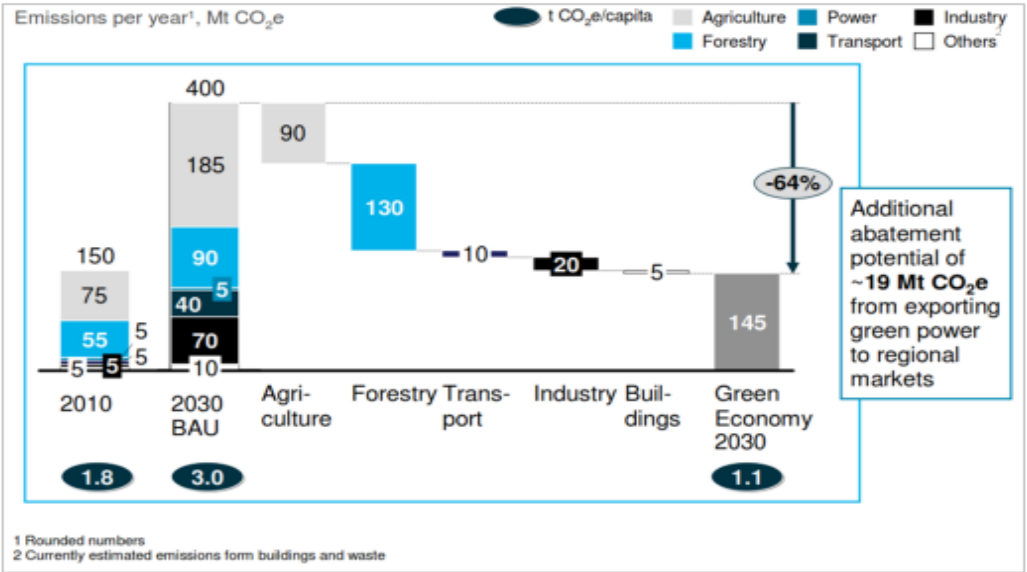

Figure 3 NDC Targets, (Federal Democratic Republic of Ethiopia, 2015)

Under **Mitigation** The NDC covers Carbon Dioxide (CO2), Methane (CH4) and Nitrous Oxide (N2O). The sectors included in the plan are Agriculture (livestock and soil), Forestry, Transport, Electric Power, Industry (including mining) and Buildings (including Waste and Green Cities).

The plan is built on the following four pillars:

1) Improving crop and livestock production practices for greater food security and higher farmer incomes while reducing emissions;
2) Protecting and re-establishing forests for their economic and ecosystem services, while sequestering significant amounts of carbon dioxide and increasing the carbon stocks in landscapes;
3) Expanding electric power generation from renewable energy;
4) Leapfrogging to modern and energy efficient technologies in transport, industry and building sectors.

The total GHG emissions of Ethiopia in 2010 were 150 Mt CO2 e. The sectoral GHG emission sources and their quantities were the following:

a) Livestock emitted methane and nitrous oxide totalling 65 Mt CO2e, i.e. 42% of the total;
b) Crop cultivation emitted nitrous oxide totalling 12 Mt CO2e, i.e. 9% of the total;
c) Deforestation and forest degradation due to cutting and burning fuel wood and due to logging totalling 55 Mt CO2e, i.e. 37% of the total;
d) Electric power generation totalling 5 Mt CO2e, i.e.3% of the total;
e) Transport sector emissions totalling 5 MtCO2e, i.e. 3% of the total;
f) Industrial sector emissions totalling 4 Mt CO2e, i.e. 3% of the total;
g) Building sector emissions totalling 5 Mt CO2e, i.e. 3% of the total.

3 Adaptation and Resilience

Ethiopia has undertaken a host of important, high-potential, large-scale initiatives focused on building resilience throughout the country. As a least developed country (LDC) in Africa, and as a nation that has emerged from the ravages of famine, drought, and malnutrition, it has invested heavily in strengthening the adaptive capacity of its most vulnerable populations. There has been a lot of activity that is linked to climate resilience, and in all sectors. In particular, strong adaptation efforts are in evidence related to livestock, amongst herders; crop cultivation, amongst dryland farmers; and in relation to water supply, sanitation, and access to basic services, amongst both rural and urban households.

This section of the report outlines the progress made by Ethiopia in enabling greater adaptation towards climate change and increasing the resilience of the Ethiopian populace between 2011-2019.

While the CRGE strategy was solely focused on mitigation (with later additions on adaptation emerging in the form of sector climate resilience strategies for a select few sectors), the NDC did have certain qualitative adaptation components, therefore this section will provide a largely qualitative overview of all activities undertaken during the time period with direct and indirect positive effects in adaptation, and link them to the goals of the CRGE as well as the goals of the recently published National Adaptation Plan (Federal Democratic Republic of Ethiopia, 2019).

3.1 INCREASED RESILIENCE AND ADAPTIVE CAPACITY

The initiatives highlighted in this section are included because they have had a positive effect on increasing resilience and adaptive capacity in the Ethiopian context. Adaptative capacity is defined by the Intergovernmental Panel on Climate Change as:

'The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences' (IPCC, 2018, p. 3).

While resilience is defined as:

'The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganising in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation' (IPCC, 2018, p. 44).

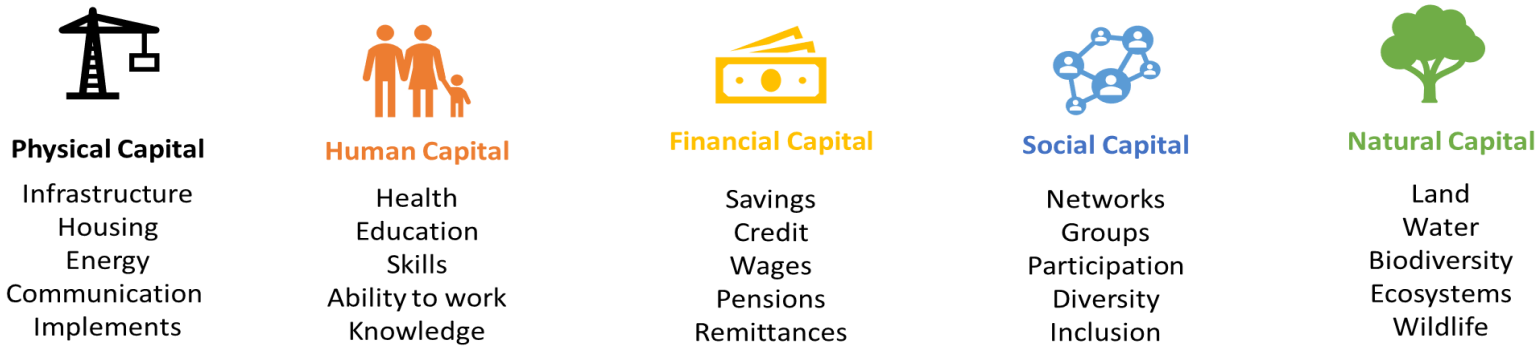

Figure 4 Household 'Capitals', Pegasys, 2019

The initiatives included increased adaptive capacity through a variety of means, often through increasing one or more 'capitals'. Figure 4highlights these capitals. Through increased 'capitals', adaptive capacity is improved as

individuals have a larger variety of resources to draw upon and options available to utilise in response to the negative effects of climate change. Other projects focus on the larger policy, institutional and legal environment, to create more efficient and robust processes at a local and national level, with which to respond to the ever-changing effects of climate change.

3.2 UNDERSTANDING ADAPTATION CO-BENEFITS.

For the purposes of the progress implementation inquiry, it was necessary to understand progress in real terms (the actual on-the-ground 'lived' experience of Ethiopians) during the time period. Therefore, the research included projects which, while not designed specifically as climate projects, still held adaptation co -benefits. The study utilised the typology of activities with climate co-benefits developed by the World Bank (World Bank, 2015). The World Bank understand a development activity to provide co – benefits if it:

- 'Promotes efforts to reduce or limit greenhouse gas (GHG) emissions or enhance GHG sequestration., and
- Reduces the vulnerability of people or natural systems to the impacts of climate change and risks related to climate variability by maintaining or increasing adaptive capacity and resilience'. (World Bank, 2015, p. 3)

Accordingly, projects in this section contribute towards adaptation even if their primary objective was not explicitly adaptation focused[21].

3.3 ADAPTATION PROGRESS ASSESSMENT REPORTING METHODOLOGY

The methodology used to understand progress in increasing adaptive capacity and resilience for the projects and programmes identified was to:

1. Understand and identify the adaptation outcomes aimed for in the 2011 CRGE strategy, Sectoral CRGE strategies the 2015 NDC, the 2015 National Adaptation Plan and the 2018 Sector-wise GTP II Implementation Monitoring Checklist;
2. Group the projects under each outcome to understand where the majority of activity occurred;
3. Focus on the impacts of the projects in terms of scale (both geographic and in number of beneficiaries);
4. Group the projects under the relevant CRGE/NDC/NAP aims (which make up the sub-headings in the sectoral overview appendix), and
5. Utilising this grouping process, it becomes apparent which areas have fewer projects/activities in, which are then put forward as suggestions for future focus.

3.4 OVERVIEW OF ADAPTATION ACTIVITIES 2011-2019

Overall, the main activities in the adaptation sector took place in agriculture (crops and soil sector), followed by activities in the livestock and water and energy sectors.

In line with the developmental needs of the country the majority of large-scale projects (with a budget of over 100,000,000 million USD) have been nationally managed large-scale projects which have a primary focus on improved food and nutrition as well as poverty alleviation. Important **national large-scale programmes** include the Productive Safety Net Programme (PNSP) (World Bank, 2015), the Agricultural Growth Programme (AGP) (World Bank, 2017), Participatory Small-scale Irrigation Development Project (PASIDP) 1 and 2 (IFAD, 2014; IFAD, 2017) and the Sustainable Land Management Programme (SLMP) 1 and 2 (World Bank, 2014). These programmes had large adaptation impacts including:

[21] A more detailed list of what constitutes an adaptation co-benefit for each sector is available online here: https://www.worldbank.org/content/dam/Worldbank/document/Typology.pdf

- PSNP III (2010-2014/15) supported over 7.8 million chronically poor and food insecure households, including 4 million in the highland areas and 1.2 million in the lowland areas, and enabled 1.2 million to graduate out of the program by 2015, Through the public works component of the PNSP, 16.1 million people in project areas had access to improved water sources, with 130,751 community water points, 10,045 springs, 120,706 wells, 88,699 ponds, and over 24,684 small-scale irrigation canals constructed or rehabilitated. The program also rehabilitated 901,654 ha of land through improving land and water management, constructing 528,754 km of embankments, and supporting the production of 1.3 million seedlings as well as planting of 1,162 billion seedlings and 3,200 tree nurseries (World Bank, 2015, pp. 6-13);
- Under the AGP, the agricultural yield index for the average beneficiary was 56% higher than for the average household that did not benefit from the project. In total, 44,150 hectares of land was provided with irrigation, benefiting 148, 357 farmers. Approximately 537,335 farmers adopted best practice technologies for crop, livestock and natural resource management (World Bank, 2017, pp. 17-24);
- PASIDP 1 and 2 (2016-2024) saw an increase in small scale irrigation schemes and land under irrigation, with the following outcomes: 121 Irrigation schemes constructed; 12,000 Hectares of irrigated land covered; 62,000 Beneficiary households, and a total of 311,000 beneficiaries (IFAD, 2019, p. 2), and
- The SLMP 1 and 2, created 45 participatory Watershed Management Plans, issuing land certificates to 59,999 households and supporting 36,450 households on 95,000 ha of farmland with improved soil and water management systems (World Bank, 2014, pp. 10-13).

The **forestry sector** is a major focus of the CRGE due to its powerful mitigation potential. The major forestry projects with a strong adaptation component include through the REDD+ initiatives and several CRGE FTI projects and have a strong focus on diversifying income streams through reforestation and afforestation, creation of land forestry management systems and training, and capacity building. The development and launch of the National Forest Sector Development Plan (NFSDP) is an important step towards reaching the goals of the CRGE/NDC and NAP. An area of future focus could in the creation and implementation of a regulatory system to protect wetlands.

The majority of activities undertaken in the **livestock sector** fall under the focus areas of on improving efficiency in the livestock value chain as well as improving food and security nutrition. Secondary initiatives were in the fields of strengthening and expansion of animal health services and prevention and control of diseases, knowledge production and Research for Development (R4D). Areas of future focus could be in strengthening drought, livestock and crop insurance mechanisms, and improvement of rangeland and pasture management.

The main projects in the areas of **water and energy** focused on power generation, energy access, irrigated and commercial agriculture, access to WASH, and cross-cutting priorities. Areas of future focus include securing the funds to implement initiatives at scale, as well as ensuring the long-term sustainability of interventions. The **industry sector** has the least adaptation activity and is a traditionally mitigation focused sector. The key project in this sector was an CRGE FTI project: Greening of Bole Lemi Industry Park which developed 32.9ha of green space, which directly benefitted 740 jobless youth through employment opportunities and upskilling.

The majority of activities in the **green buildings and cities** area was centred around mitigation. Nationally, the Second Urban Local Government Development Programme included aspects of greening and public parks as adaptation measures. This is further bolstered by the URBAN Greenery Infrastructure Development Program, which promotes green infrastructure and sustainable urbanisation. Other key initiatives in this area include the 2014 Municipal Solid Waste Strategy and the Housing Development programme, which have numerous adaptation co-benefits. Areas of future focus could be increasing urban areas with land use plans that integrate adaptation and expanding urban agriculture.

Ethiopia has a health specific National Adaptation plan which outlines its adaptation goals and priorities in the health sector. Major projects in the **health sector** include national scale projects such as the Ethiopia National Nutrition Programme, the Ethiopia Sanitation and Hygiene Improvement Programme and the ONE Wash program which have numerous adaptation co-benefits. Areas of future focus could be vulnerability and adaptation assessments at decentralised levels, climate proofing health infrastructure and updating building codes incorporating baseline, mid-term and end-term evaluations in health sector adaptation interventions, promotion of community health insurance schemes, capacity building and training for programme evaluation and reporting.

Almost all the initiatives featured in the report included an element of **capacity building**, however there were also standalone projects which focused on cross-sectoral capacity building at a national level. Certain innovative projects have components which cut across several activities, in a creative response to climate change. There have been several DRR projects in the agricultural and water sectors. The major standalone DRR project was the Strengthening Climate Information Systems and Early Warning Systems to Support Climate Resilience Development and Adaptation to Climate Change project delivered by UNDP.

3.5 PROGRESS IN ADAPTATION 2011-2019

Some measurable progress	Limited progress	No progress	Lack of adequate information

Category of Adaptation	Objectives	Number of projects	Comment on Effectiveness
Agriculture crops and soil	• Majority of climate actions in CRGE reside in this sector - so it has been broken down into 8 subsections		• Overall progress but much more action required
Agriculture crops and soil *Improved food security and nutrition*	• Major national projects effective in this area. • Organising savings and loans organization • Focus on gender • Soil characterization and mapping • 70 projects to increase food security	**18%** of agriculture and crop projects 13 initiatives	• Projects implemented and results recorded • More needs to be done
Agriculture crops and soil *Droughts, floods, DRR*	• Livelihood resilience infrastructure provision • Agro pastoralists affected by drought • Weather insurance index pilot projects	**18%** of Agriculture crops and soil initiatives 13 initiatives	• Projects implemented and results recorded • More needs to be done
Agriculture crops and soil *Value chain efficiency and increased incomes*	• Major national projects effective in this area. • Improved productivity through CSA • Agricultural intensification • Downstream value chain interventions (post-harvest loss minimization) • Weather station installation • Farmer training facilities • Ground water mapping	**16%** of Agriculture and crops initiatives	
Agriculture crops and soil *Climate Smart Agriculture*	• Training experts • Farmers and households trained • Number of hectares of land now under CSA	**9%** of Agriculture and crops initiatives	• Many projects not specifically designed specifically for CSA but may include a CSA component.
Agriculture crops and soil *Capacity building*	• Capacity building at ministerial level • Partnership and resource mobilization • Upstream strategic and programmatic support • Capacity building farmers and female farmers • Training facilities	**12%** of Agriculture and crops initiatives	
Agriculture crops and soil *Improved Ecosystem services and biodiversity conservation*	• Production of seedlings • Planning in rehabilitation areas	**9%** of Agriculture and crops initiatives	
Agriculture crops and soil *Land management systems and insurance systems*	• Promotion of sustainable land practices • Increased productivity • Transforming land tenure ad certification t increase investment	**11%** of Agriculture and crops initiatives	

Category of Adaptation	Objectives	Number of projects	Comment on Effectiveness
Agriculture crops and soil *Water and irrigation*	• Increased food security • Increased productivity • Micro irrigation	**7%** of Agriculture and crops initiatives	
Forestry	• Strong mitigation focus REDD+ • Diversifying income streams • Land and forestry management systems • Training and capacity building • Develop national forest plan • Improved stoves to households • Afforestation • Establishing nurseries raising and distributing seedlings		
Livestock	• Improve efficiency in the livestock value chain • Improve food security and nutrition • Expand animal health services • Research and development • Emission reductions		• Good progress but interventions are small
Water and energy	• Focus of energy projects was on mitigation • Energy access • Irrigated and commercial agriculture • Access to WAH		• Based improved safe water, energy access small scale and not directly relevant to adaptation
Green cities and buildings	• Focus on mitigation • Greening public parks • Urban green infrastructure • Solid waste management • Housing		
Industry	• Mitigation focused • Included the least adaptation activity of all sectors		• Limited progress but perhaps other sectors offer better value for money and more potential for adaptation impact.
Health	• Improved nutrition • WASH		
Cross cutting	• Capacity building • Disaster risk reduction		

3.6 ADAPTATION ACTIVITIES IN KEY SECTORS

3.6.1 AGRICULTURE (CROPS AND SOIL)

- The majority of all climate change related activity has been in the agricultural sector, and in adaptation efforts. This is aligned with the developmental needs of the country as a whole and the reliance on agriculture by the majority of the population.
- Several large-scale food security and agricultural productivity programmes have seen impressive results in increasing adaptive capacities and resilience for smallholders and pastoral communities.
- Projects are largely focused on food security, value chain efficiency and raised incomes, as well as Droughts, Floods and Disaster Risk Reduction.
- Areas which could be developed further include pest and disease control for livestock and crops.

The heavy focus on adaptation in the agricultural sector in the NDC reflects the needs of country as a whole, with the majority of its populace dependent on land or crops for their livelihoods. Reflecting this, is the amount and type of activity undertaken in the sector. The agricultural sector is the sector with the most climate related activity in the period of 2011-2019, and the majority of this activity has rightfully had an adaptation focus (although there have been mitigation activities at a Ministry level such as integrated watershed management and rehabilitation).

Figure 5 Initiatives by Focus Area, Pegasys, 2019

Activities in the sector can be broadly organised under the following groupings, and are depicted in Figure 5, which outlines the breakdown of initiatives by focus area:

- Improved Eco-Systems and Biodiversity Conservation;
- Improved Food Security and N*u*trition;
- Value Chain Efficiency and Increased Incomes;
- Water and Irrigation;
- Land Management and Insurance Systems;
- Droughts, Flood and Disaster Risk Reduction;
- Climate Smart Agriculture, and
- Capacity Building and Training.

There has been a large focus on **improving food security and nutrition**, with over 13 initiatives in the period since 2011. Key projects include the 'Food Security for Farmers' project, which increased household income for 67,874 farmers through enabling the organisation of savings and loans associations, it was particularly beneficial to female farmers, 93% of which had improved engagement in value chains after accessing finance made available through participation in associations. (Path Development Consulting, 2018). Another successful project is the 'Capacity

building and Scaling up of evidence-based best Practices in Ethiopia' (CASCAPE) project which focused on utilising soil characterisation and mapping studies to inform the best interventions for project areas to improve soil fertility and water management (ISRIC, 2019). The project saw a 30% increase in agricultural productivity for participating farmers during the project period of three years through adoption of evidence informed techniques (Wageningen, 2019). Another notable project in the food and nutrition area is the ongoing USAID Feed The Future programme of projects, which supports over 70 projects and organisation is various activities towards increasing food security. To date the programme has seen the following results:

- A 12% reduction in poverty in areas covered by the programme;
- Over 1 million producers have adopted new technologies and practices through FTF assistance;
- Over $40 million USD annual agricultural sales generated by the programme in 2017;
- Over $5.5 million USD private investment leveraged, and
- Over 100,000 children under 5 reached with nutrition assistance (USAID, 2019).

There has also been over 13 projects in the area of **droughts, floods and disaster risk reduction (DRR)** in Ethiopia since 2011. Major programmes in this area include the World Bank funded Regional Pastoral Livelihoods Resilience Project (RPLRP) which has seen positive outcomes with the establishment of 81 water infrastructure schemes, as well as the 'Drought Resilience and Sustainable Livelihoods Program in the Horn of Africa' (DRSLP) which is now going into its second phase and hopes to reach 20 million agro-pastoralists affected by drought and land degradation in the horn of Africa (World Bank , 2019; AFDB, 2014). A further programme with this focus is the JICA funded Rural Resilience Enhancement Project which aimed to improve resilience in the lowland areas through a series of Weather Index Insurance (WII) pilot projects which saw a 20% uptake by farmers in 45 kebeles (JICA, 2016).

Programmes in the area of **value chain efficiency and increased incomes,** focused on improving productivity through adoption of CSA techniques, agricultural intensification, and other downstream value chain interventions such as better management of post-harvest losses. Notable projects included the Greening Agricultural Transformation in Ethiopia (GATE) DANIDA programme (in partnership with the Agricultural Transformation Agency and CRGE Facility, the FAO led 'Reducing Food Losses through Postharvest Management' project focused solely on improving post-harvest losses (PHL). The GATE project saw the: installation of weather stations and farmer training facilities, ground water mapping which enable 90,000 smallholders access to irrigation, 1.5 million smallholders contacted with SMS/interactive voice messages containing agricultural content and 92,000 ha of forested area protected and rehabilitated (DANIDA , 2019). While the PHL project resulted in the creation and endorsement of the Ethiopia Postharvest Management Strategy as well as several key policy briefs on the topic. The project reached 7,746 smallholder farmers, cooperatives, artisans, experts and extension workers and adoption of new technologies amongst beneficiaries which improved the longevity and quality of grans and therefore their market value (FAO, 2018).

Interestingly, as many of the projects included in this review were not designed specifically in response to climate change, and while agriculture features heavily in the adaptation profile of Ethiopia, **Climate Smart Agriculture (CSA)**, as an approach, is only present in a certain number of projects; 36% of the overall agricultural projects include CSA as an explicit component. The promotion of CSA is often a component in a larger project, hence not being included in this section of the report. Therefore, CSA is prevalent as an approach, but does not dominate the landscape as a singular stand-alone measure being promoted. Several of the CSA focused projects were implemented by the CRGE facility, which saw positive results through a number of experts trained at all levels, farmers and households trained in CSA, and a number of hectares of land now under CSA usage (further details can be found in the agriculture sectoral appendix) (MoFEC, 2017).

In terms of **capacity building,** USAIDS' Feed The Future campaign of projects includes a trio of capacity building projects in differing spheres and levels of operation (USAID, 2011). The UNDP'S 'Strengthening National Capacity through Sustainable Increases in Agricultural Production and Productivity' programme which ran from 2011-2016 and the focused on institutional capacity development at a Ministry level, partnership and resource and mobilisation and upstream strategic and programmatic support and had also had large-scale 'on the ground' successes; 2.2 million farmers (33% of teff growers in Ethiopia) are estimated to have accessed the 'Teff Improved Seed Variety, Row Planting, and Reduced Seed Rate (TIRR) technology package', accounting for 36% of teff cultivated land in

the country (1.1 million hectares). Between 2011 and 2015 (UNDP, 2016). The Global Climate Change Alliance Plus Initiative (GCCA+) undertook the 'Building the national capacity and knowledge on climate change resilient actions in Ethiopia' which delivered training to 706 government development agents and 1,439 female farmers on climate-smart and energy-saving (GCCA+, 2019). Lastly, the Agricultural Transformation Through Stronger Vocational Education' programme was designed to contribute towards the national TVET strategy through the creation and ongoing operation of four Agricultural TVET colleges in Ethiopia (ATTSVE, 2019a; ATTSVE, 2019b).

Under **improved eco-systems and biodiversity conservation** were the aforementioned CBINReMP IFAD programme, and the 'Trilateral Resilience Enhancement in the Ethiopian Lowlands' (TREE) and 'Environmental Conservation And Economic Empowerment For Poverty Alleviation' projects which produced over 42,000 multi-purpose tree seedlings and 16,000 Elephant grass cutting which were planted in valleys under rehabilitation, over 80 government staff, nursery staff and agro -pastoralists (GIZ, 2019).

Notable projects in the **land management and insurance systems included the** Improving Livelihoods, Agriculture and National Development in Ethiopia' (LAND) project which created sustainable land management practices for 95,551ha of land which saw agricultural productivity increase by 92% in project areas (Global Affairs Canada, 2019), as well as the 'Land Investment for Transformation' (LIFT) Programme which focuses on transforming land tenure regularisation and runs from the period of 2013 - 2030. The programme supports the GoE in rural land certification in order to increase investment and productive land use and promotes a market systems approach. To date the programme has demarcated over 7 million parcels of land; issued almost 4 million certificates to farmers and delivered over 4,000 bespoke loans worth over 3 million GBP through 60 MFI branches nationally (DAI, 2018, p. 3).

Many of the projects in the agriculture sector **include water and irrigation** as a component of a broader project, however the ongoing Small Scale and Micro Irrigation Support Project (SMIP) has a key focus on irrigation and aims to increase food security and agricultural growth through the promotion of SSI and micro irrigation (SMIP, 2019).

3.6.2 FORESTRY

- The forestry sector is a major focus of the CRGE due to its powerful mitigation potential.
- The major forestry projects with a strong adaptation component include the REDD+ initiatives and several CRGE/FTI projects which have a strong focus on diversifying income streams through reforestation and afforestation, creation of land forestry management systems and training, and capacity building.
- The development and launch of the national forest sector development plan (NFSDP) is an important step towards reaching the goals of the CRGE/NDC and NAP.
- An area of future focus could in the creation and implementation of a regulatory system to protect wetlands.

Since the Climate-Resilient Green Economy started in 2011, the Government of Ethiopia has taken significant action regarding forests through its national strategy and policy, often with a focus on mitigation but also accruing many adaptation co-benefits. REDD+ is being implemented in all regions and sectors. Community mobilization has been taking part in Sustainable Land Management Program (SLMP). Every year millions of hectares of degraded lands are converted into area closure, undergo afforestation, reforestation and physical conservation by constructing different site preparations for tree planting. Every year, over a billion tree seedlings are distributed to the local communities. The main forestry activities over the period were in: REDD+, diversifying income streams through reforestation and afforestation, creation of land forestry management systems and capacity building and training.

In terms of **REDD+ activities**, the following (adaptation) outcomes were seen: A number of cooperatives engaged in Participatory Forest Management (PFM), a large number of hectares restored and under joint forest management plans, promotion of improved stoves to households, extensive afforestation and reforestation activities, establishment of new nurseries, raising and distribution of seedlings, land identified and delineated for Assisted

Natural Regeneration (ANR) and coffee value chain activities (the REDD desk, 2019; MEFCC, 2018) (further details can be found in the Forestry chapter of the sectoral appendix).

Several projects focused on **diversifying income streams through reforestation and afforestation** fell under the CRGE facility through Fast Track Investment (FTI) programme, which ran for the period of 2014-2017 and had positive results in the areas of re-afforestation, post plantain management training, training and capacitation in, as well as strengthening of the bamboo value chain and watershed rehabilitation projects in the Amhara region (MoFEC, 2017). Further projects focused on the **creation of land forestry management systems** such as the Community-Based Integrated Natural Resources Management Project (CBINReMP) project, which aimed to reduce poverty for about 312,000 households in the Lake Tana Watersheds, through combating land degradation and the promote of 'Sustainable Land Management' (SLM) to increase agricultural productivity, household food security and incomes (IFAD, 2017) and was successful, covering 650 watersheds. Another notable project is the Kafu Bio-Sphere Reserve Project, Hosted by the Nature and Biodiversity Conservation Union (NABU), which enabled the transfer of 11,000 ha of forest area to Participative Forest Management (PFM) and organising 1,500 community members into forest management groups who received training and were incorporated into the management of six forest areas, covering a total of almost 4,000 hectares (NABU , 2015; IKI, 2019).

Lastly, many of the programmes that introduced new forestry or agro-forestry had large, multi-dimensional **capacity building** components (individual, household, community and at the institutional level) such as the 'Institutional Strengthening for the Forest Sector Development Program of Ethiopia (ISFSD)', which ran for a duration of five years and was a key programme of the CRGE. The project has been referred to as a 'showcase project' and is a good example of how capacity building programmes can be integral to further policy and sectoral development (MEFCC, 2017) and included the:

- 'Training of 157 beneficiaries (60 female) on beekeeping, 153 solar lantern, 1893 improved stoves distributed, and 6 biogas plant locally built;
- 46,688 people (21,272 female) gained temporal job opportunities through the program;
- In the rehabilitation effort alone, about 176,656 (59,677 female participants) participated in the free community participation and the monetary value of this amounted to 8,723,075 ETB (as of 2017);
- 242 field experts and extension agents participated on TOT on sustainable forest management and establishment and management of forest business enterprises;
- Trained trainers provided similar training at woreda level for a total of 13,174 participants;
- Procurement of key laboratory facilities is on-going by the project support, and
- Key knowledge gaps in the research system identified and postgraduate training, academic exchanges and joint research initiated' (MoFEC, 2017, pp. 9-18).

3.6.3 LIVESTOCK

- The majority of activities undertaken in the livestock sector fall under the focus areas of on improving efficiency in the livestock value chain as well as improving food and security nutrition.
- Secondary initiatives were in the fields of strengthening and expansion of animal health services and prevention and control of diseases, knowledge production and Research for Development (R4D)
- Areas of future focus could be in strengthening drought, livestock and crop insurance mechanisms, and improvement of rangeland and pasture management.

Livestock and agricultural systems around livestock rearing and dairy, plays a large role not only in emissions reduction planning for the country, but also in terms of improving resilience for the millions of people who rely on livestock for their livelihoods. Activities in this sector were mostly focused on the following adaptation outcomes: improving efficiency in the livestock value chain, food security, strengthening and expansion of animal health services and prevention and control of diseases and knowledge production and R4D.

Most activities (over 50%) fell under the **improving efficiency in the livestock value chain** grouping, partly owing to projects that fell under the Agricultural Growth Programme - a five year programme which ran from 2011-2016, and aimed to 'increase agricultural productivity and market access for key crop and livestock products in targeted woredas with increased participation of women and youth' (EDRI, 2013, p. 48). The Livestock Market Development component had a large reach in enabling market lead growth in livestock value chains. Over its course, it facilitated $106.3 million in livestock export sales, leveraged $33.2 million in new private investment leveraged in the livestock sector, and trained 37,879 individuals on agricultural-sector productivity (CNFA, 2019). Other notable projects include several projects supported by the International Livestock Research Institute (ILRI) focusing on improving gains in the dairy and chicken value chains, such as the African Chicken Genetic Gains (ACCG) (ILRI, 2017), African Dairy Genetic Gains (ADDG), and Public-Private Partnership for Artificial Insemination Delivery and 'Livestock and Irrigation Value chain for Ethiopian Smallholders' (LIVES) (ILRI, 2015). These programmes had impacts through the registration of farmers into improved genetic programmes, resulting in larger and heavier livestock and poultry.

In terms of **food security,** two large scale projects were especially impactful; The Empowering the New Generation to Improve Nutrition and Economic opportunities project (ENGINE) and the GRADuating Families Out of Poverty project (GRAD). The ENGINE programme reached 15,070 most vulnerable households (MVHHs) and 5.7 million children under five years of age, and provided these households with both livestock and training in animal husbandry and resulted in 13% of households using income derived from farming and livestock activities to purchase additional food, and the sale of livestock and vegetables was linked to increased dietary diversity in children (USAID, 2016). The GRAD programme benefited 63,000 food insecure households and utilised interventions including training and demonstration of improved livestock rearing techniques such as fattening in enclosures. The project had strong results, with 80% of beneficiaries being able to move off of PSNP support, household incomes almost doubling, access to credit improved, and improved national outcomes for children (USAID, 2016).

A key project in the area of **strengthening and expansion of animal health services and prevention and control of diseases**, was the 'Pastoralist Areas Resilience Improvement and Market Expansion (PRIME)' project, which implemented two vaccination campaigns which covered 811,000 animals and benefited over 12,000 households and in strengthening animal health surveillance and reporting. Further project outcomes included: 17,330 households receiving seasonal climate advisories and the rehabilitation of 16 water points - supporting 22,910 households improved access to water (Global Waters, 2019). Lastly, in terms of **knowledge production and R4D**, the USAID funded 'Feed the Future' (FTF) Programme, included two knowledge production programmes, Africa Rising and the Agriculture Knowledge, Learning, Documentation and Policy (AKLDP) programmes. The still ongoing Africa Rising project undertakes specific interventions in research sites such as integrating tree lucerne in the crop-livestock farming systems for multiple products and services, and has set up innovation Platforms (IP) at the sites to create linkages between farmers, the Africa RISING teams and private and public actors, results from interventions are fed back into farming system to optimise systems and create new practices (Africa Rising, 2015).

3.6.4 WATER AND ENERGY

- As with most energy projects, the main focus in the sector is on mitigation.
- The main projects in the areas of water and energy focused on power generation, energy access, irrigated and commercial agriculture, access to WASH, and cross-cutting priorities.
- Areas of future focus include securing the funds to implement initiatives at scale, as well as ensuring the long-term sustainability of interventions.

In the water and energy sectors, the main activities with adaptation outcomes were in the areas of: Power Generation; Energy Access; Irrigated and Industrial agriculture; Access to WASH, and Cross-Cutting responses.

In terms of **power generation**, The 2019 'Environment, Forest and Climate Change Commission Performance Contract in Ethiopia' report of the CRGE presents an overview of the nature and scale of electricity expansion in recent years (CRGE, 2019):

- An additional 2,124MW of hydropower has been developed (Gilgel Gibe III, Genale Dawa III), with a further 2,800MW at planning and construction stages (Genale Dawa IV, Koysha and Geba) (Salini Impregilo, 2019) (Hydro Review, 2014);
- 273MW of wind power has been developed (Ashegoda and Adama Wind Farms I & II) (The Wind Power, 2017), and
- 100MW Metahara Solar PV Plant is at the final design stages (MultiConsult, 2019).

This diversification of the energy mix decreases the risks involved in energy supplies solely reliant on one energy source which is affected by clime change (such as hydropower), thus increasing adaptive capacity and resilience of the economy as a whole. In terms of **energy access**, main areas of activity were in improving efficiency of biomass and accelerating non grid access. In this area, the following progress was made:

- 10,134 biogas plants were built nationwide, enabling the equivalent number of households shifting from firewood burning to biogas, and
- 11,488 solar home systems were distributed, with over 4,000 home systems and 24 institutional systems installed (for schools and health stations) (CRGE, 2019).

Under **Irrigated and Industrial agriculture**, progress was made in increasing irrigated and arable land, with over 1million ha of rehabilitated land, and an increase in coverage of basin and hydrological information systems, from 25% to 63% between 2015-2019. From an irrigation perspective, almost 165,000ha of land, across eight medium-to-large-scale schemes, were prepared for irrigation – directly contributing to increased food security and reduced reliance on rainfed agriculture practices (CRGE, 2019). Whilst operating on a relatively smaller scale, the *CRGE Energy Plus Program* also developed 17 boreholes for irrigation as well as, developing over 100,000ha of damaged land to support sustainable land management, including rainfed agriculture (ERG).

Access to WASH has been greatly improved, partly due to the One WASH National Program (Federal Democratic Republic of Ethiopia, 2015) as well as several other projects at a national and regional scale, resulting in the provision of safe drinking water to 18.5 million people in urban and rural settlements (CRGE, 2019). Lastly several **cross - cutting responses** were identified, including the capacity building of 550 woreda CRGE experts in the water, irrigation and energy sector, to technological advancements around climate information services through improved daily, weekly, monthly, quarterly and seasonal weather forecasts. (CRGE, 2019) as well as the project in upgrading the connection capability of MoWIE's hydrological telemetry data transmissions, developing a strategic programme for upgrading data systems, and providing training on the use of telemetry equipment (including actual installation and database management) (Ministry of Finance and Economic Cooperation, 2017).

3.6.5 GREEN CITIES AND BUILDINGS

- The majority of activities in the Green Building and cities area was centred around mitigation. Nationally, the Second Urban Local Government Development Programme included aspects of greening and public parks as adaptation measures.
- This is further bolstered by the URBAN Greenery Infrastructure Development Program, which promotes green infrastructure and sustainable urbanisation.
- Other key initiatives in this area include the 2014 Municipal Solid Waste Strategy and the Housing Development programme, which have numerous adaptation co-benefits.
- Areas of future focus could be increasing urban areas with land use plans that integrate adaptation and expanding urban agriculture.

Within the Green Cities and Buildings component of the CRGE's monitoring framework, the adaption indicators relate to i) environmental and social impact assessments (ESIA); and ii) development of green infrastructure[22].

Three programmes/proposals/plans with green cities adaptation components have been identified, including:

- The Second Urban Local Government Development Programme (ULGDP II) (2014 - 2019), which included *greenery and public parks* target within the infrastructure and maintenance workstream;
- The Strategic Climate Institutions Programme in Hawassa (SCIP-Hawassa) (2014), which primarily aimed to develop a *protected green zone* along the Lake shore, and
- The Climate Resilient Green Growth Strategy and Integrated Climate Change Response Investment Plan for Addis Ababa (CCRIP) (2015), which was a UNDP-funded study that analysed, identified and prioritised adaptation measures for the country's capital (Worku, 2015). The CCRIP's four priority adaptation intervention areas included: integrated water resource management, integrated urban land use planning and implementation, green infrastructure and ecosystem resilience, and strengthened climate related health programmes. These interventions comprise costed activities, indicators and timeframes (up to 2025).

The 2019 'Environment, Forest and Climate Change Commission Performance Contract in Ethiopia' report of the CRGE (CRGE, 2019) states that the following interventions have been successful in the last 3 year period:

- The development of the 2014 Solid Waste Management Strategy, developed in 2014 by the Ministry of Urban Development and Construction (MUDC);
- The Urban Greenery Infrastructure Development Program was designed to support 'sustainable urbanization, health and mental well-being, social cohesion (e.g., sport parks) and the preservation of the natural environment and ecology' (CRGE, 2019, p. 18), and has numerous important design features that improve adaptive capacity and resilience of urban areas to extreme weather events. Several strategies, manuals and policies have been developed through the UGI programme, and
- The Housing Development Program is an ambitious programme which constructed 140,000 units and is planning to construct 430,000 more GTP II. The programme will enable affordable housing to those living in urban areas in Ethiopia (CRGE, 2019).

3.6.6 INDUSTRY

- The Industry sector has the least adaptation activity and is a traditionally mitigation focused sector.
- They key project in this sector was an CRGE FTI project: Greening of Bole Lemi Industry Park.
- The project developed 32.9ha of green space, which directly benefitted 740 jobless youth through employment opportunities and upskilling.

Given organised industrial activities currently comprise a relatively small share of Ethiopia's economy, industry only accounts for 3% of national GHG emissions (CGIAR, 2018). However, the country considers industrialisation as a primary driver of social transformation and modernization – meaning the sector's GHG emissions contribution is likely to scale up significantly, unless mitigative approaches are factored into industrial planning and implementation processes. The CRGE's 2011 Strategy and 2018 Monitoring Framework therefore predominantly focus on the promotion of energy- and waste-efficient technologies – targeting the largest five industrial sub-sectors with primarily mitigation actions. To understand adaptation outcomes, A broader lens was therefore adopted in reviewing the adaptation components of several projects, which relate to the NAP adaptation option on 'adaptive industry systems' (Federal Democratic Republic of Ethiopia, 2019).

[22] Area of land development through improved soil and crop management; Area of land developed through integrated watershed management; Number of households benefitting from the extension of agroforestry.

The FTI project – Greening of Bole Lemi Industry Park (2015-2016) – directly contributed to two of the NAP indicators[23], through the development of 32.9ha of green space, which: directly benefitted 740 jobless youth[24] through employment opportunities and upskilling during the implementation period, reduced air and noise pollution; and contributed to moderating the park's microclimate. Indirect, on-going health and aesthetic benefits are also accrued by the park's 8000 employees, investors and customers. The greenbelt design includes storm water drainage and water point infrastructure that has enhanced the park's resilience to events such a flooding and fires (Industrial Parks Development Corporation, 2016).

Given one of the ISDP's five primary strategic options is the development and operation of industrial zones, the 'Greening of Bole Lemi Industry Park' project should serve as a pilot for the development of 12 future industrial zone green spaces (six of which are understood to already be at construction stage) (Industrial Parks Development Corporation, 2016). One of the key challenges noted during the project was the lack of 'best practice' landscaping experience in green zone development. This should be noted as an area of capacity development that Government and international cooperating partners should seek to support as part of broader efforts to green Ethiopia's industrial sector[25].

3.6.7 HEALTH

- Ethiopia has a health specific National Adaptation plan which outlines its adaptation goals and priorities in the health sector.
- Major projects in the health sector include national scale projects such as the Ethiopia National Nutrition Programme, the Ethiopia Sanitation and Hygiene Improvement Programme and the ONE Wash program which have numerous adaptation co-benefits.
- Areas of future focus could be vulnerability and adaptation assessments at decentralised levels, climate proofing health infrastructure and updating building codes incorporating baseline, mid-term and end-term evaluations in health sector adaptation interventions, promotion of community health insurance schemes, capacity building and training for programme evaluation and reporting.

As well as the NAP, the health sector has its own National Health Adaptation Plan to Climate Change (Federal Ministry of Health, 2018), which provides a plan through which to situate the projects in the health sector. The Ethiopia National Nutrition Programme - Phase II (NNP II) being implemented between 2016-2020 directly contributes to the NDC's health targets[26] through improvement of the nutritional status of children from birth up to 10 years; improvement of delivery of nutrition services for communicable and non-communicable/lifestyle related diseases; strengthening the implementation of nutrition-sensitive interventions across sectors; and improving multi-sector coordination and capacity to implement the national nutrition programme (Federal Democratic Republic of Ethiopia, 2016). The NNP II programme also directly contributes to the H-NAP targets[27] by improving delivery of nutrition services for communicable and non-communicable/lifestyle related diseases and strengthening the implementation of nutrition-sensitive interventions across sectors.

The Water, Sanitation and Hygiene (WASH) Program implemented by World Vision between 2011-2018 contributed to two of the H-NAP priority intervention areas of promoting climate resilient sanitation facilities and promoting climate resilient water safety plans. This was achieved through the program's activities in improved water supply,

[23] hectares of land in industrial parks/zones protected from environmental impact, and the number of people benefitting from socially responsible industries
[24] 450 females and 290 males
[25] It has been reported that the World Bank intends to launch a project that supports the greening of Ethiopia's textile industry (Intrinsic Consultancy, 2018); based on the learnings from Bole Lemi Industrial Park, this project should include capacity building components based on a skills gaps and needs assessment.
[26] Strengthening capacity to deal with the expansion and emergence of human, animal, crop and plant diseases in Ethiopia and providing respective medicines in adequate quantities
[27] 754 health facilities' infrastructures will be renovated, and 65.6 million people sensitised about climate change and health

improved sanitation services and improved hygiene practices. As a result, 2.9 million people have access to safe drinking water, more than 2.4 million people have access to dignified sanitation and 2.45 million people are practicing healthy hygiene behaviour in rural and urban WASH and emergency WASH response (World Vision Ethiopia, 2019).

The Water, Sanitation, and Hygiene Transformation for Enhanced Resiliency Project (WaTER) implemented by the International Rescue Committee (IRC) and Care Ethiopia between 2011-2014 directly contributed to priority intervention areas and targets for both the H-NAP[28] and NDC's health targets[29] through construction of 22 new boreholes and rehabilitated 19 existing borehole-based systems with corresponding distribution networks. This resulted in 221,504 beneficiaries having year-round access to an improved water source. Installation of new and rehabilitated water systems was complemented with hygiene promotion activities in target areas (SaafConsult B.V, 2014).

Lastly, the Ethiopia Sanitation and Hygiene Improvement Programme (ESHIP) implemented between 2012-2017 under the leadership of the Federal Ministry of Health has directly contributed to attainment of the CRGE's monitoring framework's indicators of number of households using toilets in rural & urban as well as number of households with modern toilets. This was achieved through ESHIP's activities that resulted in 1.6 million people living in open defecation free environment and more than 3,600 villages triggered through behaviour change activities. A further 1.7 million people gained access to handwashing facilities (Global Sanitation Fund, 2015)

3.6.8 CROSS CUTTING

- Almost all the initiatives featured in the report included an element of capacity building, however there were also standalone projects which focused on cross-sectoral capacity building at a national level.
- Certain innovative projects have components which cut across several activities, in a creative response to climate change.
- There have been several DRR projects in the agricultural and water sectors.
- The major standalone DRR project was the Strengthening Climate Information Systems and Early Warning Systems to Support Climate Resilience Development and Adaptation to Climate Change project delivered by UNDP.

Cross-cutting projects included project in Capacity Building, Floods, Drought and Disaster Risk Reduction (DRR), although many projects included aspects of these activities in their design. Project were therefore designated as cross-cutting due to their sole or explicit focus on Capacity Building, Floods, Drought or Disaster Risk Reduction (DRR). The 2019 'Environment, Forest and Climate Change Commission Performance Contract in Ethiopia' report of the CRGE (CRGE, 2019) states that the following interventions have been successful in the last 3 year period:

More than 10,000 experts trained each year over the time period on climate change impacts, climate change strategies and the tools developed to implement the strategies.

Creation of a planning guideline with five National Technical Institutions (NTIs), to be used by Woredas to assist them in mainstreaming the CRGE within their integrated sectoral development plans (CRGE, 2019).

Capacity Building

Two programmes/proposals/plans with capacity building components were identified, including the CRGE Registry Project (2013-2014) which developed a web-based CRGE Registry to build the capacity of Environmental Protection Authority (EPA) when managing climate change projects, and a second project introducing Capacity Building

[28] 1,126 health posts and 90 health centres will have self-supply of water
[29] Strengthening capacity to deal with the expansion and emergence of human, animal, crop and plant diseases in Ethiopia and providing respective medicines in adequate quantities

interventions to the EPA in order to implement *Mechanisms to Motivate, Support and Reward Results* (mMSR) (2012 -2013) (ERG, 2019). At the time of writing, the CRGE registry[30] and the Measurement, Reporting and Verification (MRV) database were not operational; as such, it was difficult to assess the usefulness and effectiveness of the web-based platform. However, in 2017 the Global Green Growth Institute (GGGI) launched its MRV program to support partner countries in their efforts to track progress and reporting of greenhouse gases emissions (Global Green Growth Institute, 2019). Since its inception, the GGGI has hosted intensive capacity building trainings and produced teaching materials to further support proper management of Ethiopia's MRV system. In 2017, the GGGI reported that capacity building for tracking GHG emission at national and sub-national levels was on track and operating effectively (Global Green Growth Institute, 2017).

This was confirmed by Irish Aid who, in 2018, positively reported that the CRGE's Steering and Technical committees were convening regularly and capacity building was improving at all levels. The report also confirmed that the MRV system for the Agriculture and Industry sectors had been established and appropriate technology selection was ongoing (Irish Aid, 2018).

Cross Cutting

Notable cross-cutting projects include the "Enhancing the public awareness on climate change through broadcasting in TV and radio programmes" (2012-2015), and the Climate Resilient Green Zone alongside Akaki River" project (2013-2015). The "Enhancing the Public Awareness on Climate Change through Broadcasting in TV and Radio Programmes" has been relatively successful. According to a report by the International Institute for Environment and Development's entitled "Climate Diplomacy: Understanding Ethiopia's National Engagement" (International Institute for Environment and Development, 2016), both print and electronic media have been used in disseminating climate related events. There are currently regular education and awareness creation programmes undertaken by the Forum of Environment. Coupled with print and electronic media are environmental advocacy activities including capacity building, training, network building, communicating information, policy level discussions, public meetings, commissioning research, publications, and incentive and acknowledgement schemes. Examples include the 'Akirma' Magazine, radio programmes like EBC FM 97.1 Radio Programme, and the 'Akirma' TV programme supported by the Strategic Climate Institutions Programme (SCIP).

Disaster Risk Reduction (DRR)

In terms of DRR, the UNDP executed a project between 2013-2015, named "Strengthening Climate Information Systems and Early Warning Systems to Support Climate Resilience Development and Adaptation to Climate Change" (UNDP, 2012). The programme operates in several flood and drought prone regions to reduce vulnerability to climate change risks and impacts by strengthening the capacity of the Government of Ethiopia to observe, analyse and forecast climate information. Additionally, the programme should enhance Ethiopia's early warning systems and inform climate resilient development and adaptation to climate change.

According to an Irish Aid report drafted in 2018, the Government of Ethiopia focused on combating recurrent droughts and food insecurity. To do so, the government created the Disaster Management and Food Security Agency, drafted a National Policy and Strategy on Disaster Management, and designed a DRM Strategic Program and Investment Framework for government and donor interventions. Yet, some challenges still remain, including insufficient capacity to carry out analysis and advocacy for: (1) enhanced understanding of risks and impacts, (2) development and strengthening of building codes, (3) land-use and urban planning, and (4) contingency planning, among others (Irish Aid, 2018).

[30] The web-based platform can be located at this address: http://www.ethcrge.info/#

4 Mitigation

4.1 MITIGATION OVERVIEW 2011-2019

Ethiopia, despite its negligible contribution to global greenhouse gas levels and its status as an African Least Developed Country (LDC), has undertaken ambitious and commendable commitments on mitigation. As a country experiencing rapid economic growth as well as population expansion, and as a society that shares the vision of becoming a middle-income nation by 2030, Ethiopia has chosen to demonstrate that economic growth does not have to come at the expense of climate stability. Ethiopia's efforts on climate change mitigation have been conceptualized to serve as proof-of-concept that emissions growth can, in fact, be decoupled from GDP growth. As a result of this commitment to a low-carbon economic trajectory, Ethiopia has done a lot on mitigation – including several large projects and programmes related to forestry and transportation that other similarly situated countries can emulate.

4.1.1 MITIGATION OVERVIEW: AFOLU

Ethiopia has implemented a wide range of climate change response activities, including both mitigation activities aimed at reducing Greenhouse Gas (GHG) emissions and sequestrating atmospheric carbon, as well as programs aimed at enhancing resilience and adapting to the adverse impacts of predicted climate change. This includes both the development of *policies, strategies* and further *guidance*, as well as the implementation of on-the-ground activities.

This scope of work focuses on the GHG emission reductions and carbon sequestration that have been achieved through on-the-ground projects as well as guiding documents where a specific emissions savings benefit can be causally estimated between 2011 and 2019.

In order to determine the impact of individual projects on the national GHG emission profile of Ethiopia, complete, robust and consistent data is required which reflects:

- The context prior to implementation (a reference case);
- What might have occurred in the absence of mitigation (would there have been growth in emissions from a particular activity, would emissions have remained constant – a reference scenario), and
- The change in GHG emissions and carbon sequestration due to the mitigation action (a with-project scenario).

Since the compilation of the CRGE, approximately **117 AFOLU sector projects have been implemented** in Ethiopia **to either adapt or mitigate climate change**, many of them overlapping in purpose. Unfortunately, a lack of availability of required data, does not allow the direct GHG reductions due to individual projects to be estimated over the period 2011-2019. Furthermore, understanding their impact on the national GHG emissions profile is further limited by the complexities of comparing the base year with the last inventory year of 2018. Potential contribution of projects to climate change mitigation and Adaptation.

A set of 117 projects were reviewed ranging from large scale regional collaborations and watershed scale rehabilitation programmes, to smaller scale initiatives focussed on a particular community or commodity, for example, sustainable coffee production. In addition to on-the-ground activities that either mitigation climate change or increase resilience to predicted climate change, are further initiatives that improve and enhance institutional capacity, supply chains, policy, monitoring and reporting, as well as other necessary supporting elements.

Whereas there are approximately 22 projects principally focussed on either forests or livestock (Table 5), there are over 70 initiatives that focus on the sustainable management of landscapes. These generally fall within the ambit of "sustainable land management" and may have a particular emphasis in the form of, for example, integrated water management or community ecosystem-based adaptation, among others.

Type of project (CRGE category)	Number of projects
Disaster risk reduction	2
Forests	22
Livestock	22
Soil	71
Total	117

Table 1 The number of projects per CRGE category: Forestry, Livestock and Soil.

Out of the set of 117 projects, only two provide an estimate of the reduction in GHG emissions or additional carbon sequestration per year. Namely the Humbo and Soddo CDM Afforestation / Reforestation Project and the Bale Mountain REDD+ Project, which either sequestrate 29,343 tCO2e or reduce GHG emissions by 1,288,821 tCO2e per year respectively. Based on available information in project documents and web-portals, attempts were therefore made to at least assess if a project will broadly lead to an increase in GHG emissions or a decrease in atmospheric GHGs through a reduction in GHG emissions or the additional sequestration of carbon in biomass and *soil (Table 2, Figure 9*).

In general, projects focused on halting, reducing and reversing the degradation of forests and open landscapes were assumed to lead to a net reduction in atmospheric GHGs. This included REDD+, afforestation / reforestation and many watershed restoration programs. Alternatively, programs aimed at increasing the number of livestock, were assumed to lead to a net increase in GHG emissions generated through enteric fermentation and manure. The reason for the large fraction of programs where it was "*not possible to estimate"* the climatic impact (Table 2, Figure 6) is that most landscape management programs include both the avoided degradation or enhancement of terrestrial carbon stocks as well as an improvement in livestock production. Without detailed information on the particular number of livestock or area of land, it is not possible to estimate the balance between the two and the net climatic impact. In addition, to allow a full assessment of the GHG emission impact, further information on changes in emissions from fire, agrochemical and liquid fuel use would be required as well.

Atmospheric GHG impact	Number of projects
Potential decrease in atmospheric GHGs	41
Not possible to estimate	63
Potential increase in GHG emissions	13
Total	117

Table 2 The number of projects per CRGE category: Forestry, Livestock and Soil.

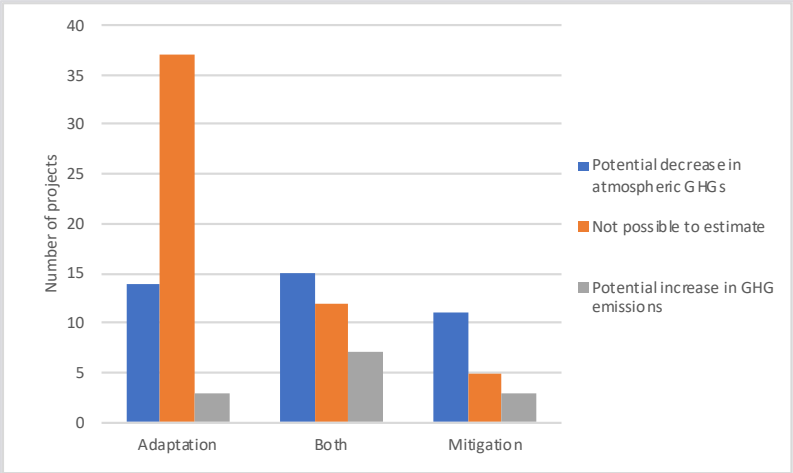

Figure 6 The number of projects per CRGE category: Forestry, Livestock and Soil.

Key Programmes in the Forestry Sector 2011-2019

In the AFOLU sector, the main programmes with mitigation effects and potential are the REDD+ and related forestry programmes.

The REDD+ Programme in Ethiopia

Several important and large-scale projects have been undertaken as part of the REDD+ programme in Ethiopia. The REDD+ program has been in development since 2009 and is co-ordinated by the National REDD+ Secretariat accountable to the Forest Sector of the EFCCC. The National REDD+ Strategy (2018-2030) was published in 2018 (MEFCC, 2018) and aligns with and will contribute to the targets of the CRGE/NDC and is fully aligned with the National Forest Sector Development Program (MEFCC, 2018). Under the REDD+ program, a number of projects have been undertaken and are currently in progress, including the Oromia's Forested Landscape Program (OFLP), the Project for Supporting Sustainable Forest Management through REDD+ and Certified Forest Coffee Production and Promotion (REDD+FCCP), the REDD+ Investment Program, Responding to the increasing risk of drought: building gender-responsive resilience of the most vulnerable communities, the Ethiopia REDD+ Readiness Package (R-Package) as well as several other pilot projects (including the pilot REDD+ and CDM projects in the country include the Bale Mountain Eco-region REDD+ Project in Oromia, Nono Sele Participatory Forest Management REDD+ project includes Oromia location, Yayu REDD+ Project includes Oromia location, the Ethio-wetlands REDD+ and forest related CDM Projects).

The Bale Mountain Eco-Region REDD+ project

The Bale Mountain Eco-Region REDD+ project was one of the first large scale REDD+ initiatives in Ethiopia, starting in 2010 and is expected to run for 20 years (the REDD desk, 2019). The project area covers 500,000ha and it is estimated to reduce emissions by 18 million tonnes of CO2e over this period (the REDD desk, 2019). The 2017 VCS/CCBA Verification Report states that 'Having started on January 01, 2012 the Bale Mountains Eco-Region REDD+ project activities generated over the period of 2012 and 2015 the cumulative carbon emission reduction of 5,532,367 tCO2e.' (VCS/CCBA, 2017, p. 2).

The Oromia's Forested Landscape Program (OFLP)

The OFLP runs from 2017-2022, now in its implementation stage, it has been in development since 2013 and focuses on how forested landscapes are managed to have the following positive impacts: poverty reduction and resilient livelihoods, climate change mitigation, biodiversity conservation, and water provisioning. The project covers approximately 8.7 million ha in total and is 'Oromia Regional State's strategic programmatic umbrella and coordination platform for multi-sector, multi-partner intervention on all forested landscapes in Oromia' (MEFCC, 2017, p. 37) . It is also a world first REDD+ programme as it is jurisdictional rather than project level (MEFCC, 2018). Figure 7 below highlights the expected reductions in emissions year on year as a result of the OFLP.

Figure 7 Project Development Objective Indicators OFLP (World Bank , 2017, p. 58)

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10	End Target
1. Emission Reductions in the OFLP accounting area ($MtCO_2e$)	0	0	0	1.25	2.5	3.75	5.0	6.25	7.50	8.75	10	10
2. Gross deforestation reduction in the OFLP accounting area (ha)	0	0	0	8,367	17,483	26,412	35,341	44,269	53,198	62,127	71,056	71,056

As of the most recent appraisal report published in 2018, the OLFP is still in the process of developing certain composite indicators for emissions reductions, however, has achieved the following under reforestation indicators '…the expected reforested area is 1800 ha. Of the planned 1800 ha, 762 ha. of lands were planted in the first year of the program implementation' (Oromia Environment, Forest and Climate Change Authority, 2018, p. 7).

The REDD+ Investment Program (RIP)

The RIP runs from 2017-2020 in five regions and focuses on providing opportunities for emission reductions through reduced deforestation and forest degradation by sustainable forest management and afforestation and reforestation initiatives. As of 2018, the project had achieved the following results (GHG emissions as a result of the following are yet to be tracked/published):

- Afforestation and Reforestation (AR) activities started in 36 woredas for the first year;
- 25 new nurseries established;
- 78 existing nurseries supported and strengthened;
- 17,718,819 seedlings raised;
- 3,160 ha of land identified and delineated for AR;
- 86,919 ha of land identified and delineated for Assisted Natural Regeneration (ANR);
- Physical conservation activities commenced in SNNPR, Tigray and Amhara regions;
- 3,686.96 ha of PFM sites identified in Amhara region, and
- Capacity building trainings and meetings held for 1,500 participants in the regions (MEFCC, 2018).

Supporting Sustainable Forest Management through REDD+ and Certified Forest Coffee Production and Promotion

The 'Supporting Sustainable Forest Management through REDD+ and Certified Forest Coffee Production and Promotion project' funded by JICA and running from 2014-2020 is another notable REDD+ project and aims to balance forest conservation with improved livelihoods in order to contribute to sustainable rural development. The project consists of a Forest Coffee Certification Program (FCCP), Farmers Field Schools and the establishment sub-village-based PFM authorities in order to build capacity (JICA, 2019). To date the project has seen a reduction in deforestation, with rates of change of deforestation declining from 1.16% a year to 0.46% a year, resulting in 10,000ha of deforestation suppressed (JICA, 2018).

4.2 ASSESSMENT OF THE BAU AFOLU COMPONENT

4.2.1 ALIGNMENT OF AFOLU SECTORS WITH IPCC CATEGORIES

It is important to note that the BAU from the CRGE does not follow IPCC categories, thus making comparing recent inventories with the BAU difficult. An attempt has therefore been made to align the sectors in the BAU with the IPCC categories and sub-categories (Table 3).

CRGE Sector	CRGE Sub-sector	IPCC 2006 Sub-Category	IPCC 2006 Category
Forestry	Deforestation	3.B.2.b.i Forest land converted to cropland and 3.B.3.b.i Forest land converted to grassland	3.B Land
	Degradation	3.B.1a Forest land remaining forest land	
Livestock	N_2O from Manure left on pasture and range	3.C.4 - Direct N_2O Emissions from managed soils	3.C -Aggregate sources and non-CO_2 emissions sources on land
	CH_4 from enteric fermentation and manure	3.A.1 - Enteric Fermentation and 3.A.2 - Manure Management	3.A Livestock
Soil	N_2O from crops residue	3.C.4 - Direct N_2O Emissions from managed soils	3.C -Aggregate sources and non-CO_2 emissions sources on land
	N2O from synthetic fertilisers	3.C.4 - Direct N_2O Emissions from managed soils	
	N2O from manure used as fertiliser	3.C.4 - Direct N_2O Emissions from managed soils	

Table 3. Ethiopia CRGE sectors and corresponding IPCC categories

Emissions associated with Livestock in the CRGE align with emissions from *3.C -Aggregate sources and non-CO2 emissions sources on land*, the category dealing mainly with emissions from crops and soils. The result of this misalignment is that the BAU base year overestimates livestock emissions by 7% and it has been carried forward to the 2030 emissions projections. Subsequent inventories have been based on IPCC guidelines and using these inventories to assess the impact of mitigation activities must therefore be treated with caution.

4.2.2 POTENTIAL IMPORTANT IPCC CATEGORIES OMITTED IN THE BAU

Ethiopia is a heterogenous country with diversity and wealth of biomes ranging from tall forests to wetlands and shrublands. The BAU does not cover this full range of vegetation and land-cover types, potentially not considering important emissions sources from land management as listed per IPCC category below:

- 3C1 Emissions from biomass burning;
- 3C2 Liming CO_2 emissions;
- 3C3 Urea application CO_2 emissions;
- 3C5 Indirect N_2O Emissions from managed soils;
- 3C6 Indirect N_2O Emissions from manure management;
- 3B2 Cropland;
- 3B3 Grassland;
- 3B4 Wetlands;
- 3B6 Other land, and
- 3D1 Harvested wood products.

It is important to take note of these omissions when comparing the BAU with more recent inventories. Comparing the BAU to current GHG emissions

Due to the misalignment between the CRGE sectors and subsequent inventories, it is not possible to compare sub-categories of more recent inventories to the BAU model, hence a higher level comparison is summarized in Table 4.

BAU 2010	BAU 2020	2nd Communication 2013	3-year Inventory 2018	3.B Land Emissions from 2017 FRL per yr.
133.5	162.1	115.2	109.6	17.9

Table 4. Recent AFOLU sector GHG emissions compared to the 2010 base year and 2020 BAU, reported in mtCO2e.

It is notable that the base year of the CRGE reports higher emissions than subsequent inventories (Table 4), including 2018. When annual emissions from the FRL are included (127.5 mtCO2e), it still does not exceed the 2010 base year. It is important to note that the CRGE estimated that emissions from Forestry will increase from 53 Mt CO2e in 2010 to 88 Mt CO2e in 2030 and that this does not align with the estimated average emissions from the FREL of 17.9Mt CO2e/yr.

It is possible that the CRGE and subsequent inventories used different forest classifications and emissions factors for forest classes to calculate annual GHG emissions. When comparing forest area lost, a different result emerges, the CRGE base year 2010 estimates a loss of 279 546 ha of forest, a country specific FAO report estimates 140 800 ha lost and a global database (Global Forest Watch set to 20% forest cover) estimates a 22,572ha loss for the base year.

There is therefore substantial variation between datasets regarding a major GHG source and perhaps the largest climate change mitigation opportunity in Ethiopia. As Ethiopia consists largely of dry woodland and shrubland, vegetation types that are difficult to quantify with current remote sensing technology, changes in these dryland systems are generally underestimated and often poorly understood, thus making the tracking of emissions over time difficult. It must be noted that it is possible, but unlikely that mitigation activities could explain the total perceived decrease in the AFOLU sector emissions between 2010 and 2018 (using the total 3 years inventory 2018 AFOLU

emissions combined with the average FRL annual emissions). Especially considering that the BAU did not consider several IPCC categories and that the FRL estimated forest gain at only 20% of forest loss during the reference period 2000-2013. It is possible that there are combined discrepancies between land use change/activity data and emissions factors between the CRGE and other inventories.

4.2.3 FUTURE CONSIDERATIONS

A lack of project scale data has inhibited the opportunity to evaluate progression towards targets identified in the CRGE. As the need for this type of evaluation is likely to increase in future as countries are required to report on progression towards climate change goals, it would be prudent to at least start a basic form of project reporting as soon as is reasonably possible.

Short of requiring a full in-depth MRV process, even a basic set of metrics will assist in tracking the climatic impact of individual additional on-the-ground activities:

Restoration activities:

- Location and spatial extent - a GIS .shp file illustrating the location and boundaries of the activity;
- Number of hectares on which the restoration activities have been implemented;
- The level of degradation, particular of carbon stocks at the start of the project;
- The type and nature of restoration activities;
- Project start date and project period;
- Predicted changes in terrestrial carbon stocks and GHG emissions due to the project activity, and
- Level of success as a fraction of total initial project goals - Activity-based monitoring would occur on an annual basis.

Halting and reducing degradation activities:

- A similar set of metrics to that listed above. In addition, the development of spatially explicit reference and with-project scenarios at a project scale is required.

Livestock activities:

- In addition to location and spatial extent, the change in the type and number of livestock over time.

The reason for the particular emphasis on the location and spatial extent and the need for submission of a GIS .shp file is mainly understand potential overlap and double accounting between projects, but in addition, to facilitate the use of remote sensing to validate changes in land-use and fire regimes. The submission of .shp files also allows the distribution of projects to be better understood and to allow for future strategic positioning of programs in areas where there may be a shortage of interventions.

4.3 MITIGATION: INDUSTRY, ENERGY AND TRANSPORT

In order to quantify the impacts of mitigation projects on national GHG emissions, emissions in a baseline year need to be established (which is typically presented in the greenhouse gas inventory), and then a projection made on how those emissions might have changed over time in the absence of the mitigation action. The projection is often called a business as usual or BAU scenario. So, for example, under a BAU scenario people might travel to work in private cars, whereas building a rail line could mitigate emissions from private cars, as rail has lower per trip emissions than cars. Or building renewable electricity generation infrastructure for supply to households could offset burning of kerosene for lighting and cooking.

To determine the actual benefit of mitigation actions that have been implemented, compare them to each other and determine their impact on the overall emissions trajectory, the first step is to ensure that the BAU scenarios are consistent. Ideally, they should start from the same starting year (e.g. 2011), and use the same assumptions for example about population growth, economic growth, transport demand, cooking and lighting fuel demand etc. Furthermore, it needs to be ensured that the projects are not double counting emissions. An example here is that

planning for a railway line, attracting climate finance for the line and constructing the line are not separate – they all target the same emissions. A related point is that a study, strategy or energy audit cannot achieve emissions savings in and of itself – the emissions savings occur when the actions recommended are implemented.

Once the projects are being implemented on the ground, a comprehensive monitoring and evaluation (M&E) system is required to gather data on actual roll out of the project. The key data here is the activity data which can then be used to calculate emissions savings from the project.

An analysis of the available information suggests that a number of the projects identified do not have all of these requirements in place. Some projects present a baseline and projected emissions savings, although underlying data used to calculate the projections is not always available to be checked. For a number of other projects there is no clear information available on the extent to which the projects have been implemented. And so, although projects are already being successfully rolled out, contributing to the mitigation of emissions in the country, a detailed and consistent analysis of emissions savings from individual projects is not possible at this stage.

As such, this document provides a qualitative description of the projects and a comment on how they achieve emissions savings, presenting quantitative data where possible.

The document first provides an overview of the GHG inventory data, broken down to third level IPCC sub-category as per the 2006 IPCC Guidelines for GHG inventories (see Appendix A), to demonstrate the magnitude of contribution of each of the emissions sub-categories to national emissions. It then provides a mapping of the projects to emissions sub-categories and provides a comment on the emissions savings achieved. The final section presents a reflection on the potential future contribution to mitigation in the country, based on the overall inventory.

Table 5 lists the data that is available in the public domain on emissions savings from individual projects. **It is important to note that this data has not been confirmed through own analysis, nor are the numbers necessarily comparable.** They do, however, serve to show the **relative** contribution of projects and a sense of scale relative to the emissions from each sub-category in 2011.

Table 5 shows that no single project will have provided material emissions savings in the 2011-2019 period. Although insufficient data is available to provide a detailed quantification of the savings for many of the projects, it is likely that the contribution of each project to reducing emissions in the emissions sub-categories is less than 0.5%. This is as a result of a combination of factors: some of the projects started late in the analysis period, some were pilot projects, and some targeted a small emissions subset (e.g. an energy efficiency audit at a single plant). This does not suggest that mitigation projects are not targeting the “right” emissions. The analysis of the inventory suggested that (after the AFOLU sector), the energy sector is the next biggest contributor of emissions, and within that the “other sectors” (mostly commercial and residential) and transport sub-sectors. A large proportion of the projects focus on reducing these emissions, which is thus appropriate. Scale up and replication of these projects has the potential to lead to more extensive savings.

Project	Indication of emissions savings
1.A.3: Transport	**Emissions from sub-category in 2011: 3,769,000 tonnes**
Addis LRT	9,000 tonnes in 2017
Ethiopia-Djibouti Railway	639 tonnes of emissions from passenger transport and 790 tonnes in 2017
National Rail Network	5,560 and 4,320 tonnes in 2017 (G.C) from the East-West and North-South lines respectively
1.A.5 Other Sectors	**Emissions from sub-category in 2011: 16,958,000 tonnes**
NBPE	Target was 66,500 tons CO_2 equivalent GHG emission reduced per year by 2020
Lighting Ethiopia	Between 2013 and 2018 lighting Africa claimed an emissions avoidance of 490.5 thousand tonnes CO_2
RETs	By November 2018 the project was estimated to have saved about 101,210.34 tons of CO_2e/a
FTI Solar Water	Project target was to reduce greenhouse gas emission by 1,233t CO_2e per annum

Table 5: Summary of available information on emissions savings from mitigation projects

4.3.1 POTENTIAL CONTRIBUTION OF PAST ACTIONS TO MITIGATION

The majority of the mitigation projects outside of the AFOLU sector target emissions in the Energy sector, apart from three composting projects that impact on the waste sector. This might be argued to be appropriate given that AFOLU and Energy are by far the overwhelming the greatest sources of emissions, with waste and IPPU jointly contributing less than 5% to the total emissions. The following sections present an analysis of the potential contribution of these projects to national emissions, based on third level IPCC emissions categories.

4.3.2 MANUFACTURING INDUSTRIES AND CONSTRUCTION (1.A.2)

Five projects were identified where energy efficiency audits were conducted in different manufacturing plants. While these projects will have some savings in terms of electricity demand, electricity in Ethiopia is largely supplied through renewable sources and so saving electricity will result in limited emissions savings. The energy efficiency audit findings could, however, result in savings in other energy carriers used on site such as gas or coal. The emissions from onsite energy usage, and any hence any savings, are accounted for in 1.A.2. Total emissions in 1.A.2 were 1,331 ktonnes in 2011, representing 6% of energy sector emissions, or approximately 0.7% of the total national inventory.

Although very little information is available on the findings from these audits, or the extent to which the recommendations have been implemented, some generic observations can be made (Table 7). As noted previously, savings are not achieved by the audits alone; implementation of the findings is required to realise savings.

Project Name	Overview of contribution to mitigation in the emissions sub-category
EE Textile	Textiles are not a very high user of energy relative to other industries in 1.A.2. As such, potential savings associated with implementation of the audit findings at one textile mill are likely to be low relative to the sub-category's emissions.
EE Steel	Steel can be a higher user of energy than some of the other industries for which audits were done, and so implementation of these audit findings could result in greater savings in this emissions category than in some of the other industries. This steel mill is one of 12 in the country, and roll-out to other mills could have the potential to lead to further savings.
EE Brewery	Given that this audit was conducted at one of 9 breweries, and breweries being just one relatively smaller contributor to 1.A.2, the overall contribution to emissions savings in the sub-category and the country as a whole would be negligible.

Project Name	Overview of contribution to mitigation in the emissions sub-category
EE Leather	Tanneries are not a very high user of energy relative to other industries in 1.A.2, and so the savings achieved may not be significant.
EE Cement	Although cement production gives rise to high process emissions, energy audits would possibly not have addressed these emissions. Having said this, if the audit recommendations have all been taken on board then some savings would have been achieved, however being just one of 16 cement plants, and cement being just one contributor to 1.A.2, the overall contribution to emissions savings would be negligible.

Table 6 Projects contributing to reducing emissions from the manufacturing industries and construction sub-sector (1.A.2)

4.3.3 TRANSPORT (1.A.3)

Ten projects were identified that potentially contribute to mitigation of emissions from the transport sector, as *shown in Table 9. In 2011, emissions from this sector were reported to be 3,769 ktonnes (Second National Communication).*

The individual contribution of each of these projects to the total emissions from 1.A.3 emissions has been estimated to be very small, with each individual project likely contributing far less than 0.5% to a reduction in the total emissions from this sub-sector in each year. Furthermore, when looking at cumulative savings over the 2011 to 2019 analysis period, it is important to note that some of the projects only started later in the period, as indicated in Table 6.

Of the projects presented, it is suggested that the rail-related interventions (the LRT, Ethiopia-Djibouti railway link, and the other national rail network projects) will be the biggest contributors to reducing emissions in the future: the infrastructure has a long service life and, if run on renewable energy which already makes up a large proportion of the grid mix in the country, will have low emissions. The remaining interventions will require ongoing support to remain effective in reducing emissions, as well as large scale roll-out in some cases, and thus potentially have a lower potential to achieve long-term emissions reductions.

Project Name	Overview of contribution to mitigation in the emissions sub-category
FTI Monitoring Petroleum	Without further detail, it is suggested that this project largely contributes to local air pollution benefits, although the efficiency with which appliances will run on cleaner burning fuels could result in small emissions savings. No details on emissions savings could, however, be found. Note that this project could also result in some mitigation in 1.A.4, which includes stationary burning of liquid fuels.
Anbessa Bus Expansion	This project appears to still largely be in the planning rather than implementation phase by 2019 and so no emissions savings reported.
Fuel Efficient Taxis	Insufficient detail is available to provide comment on the potential savings from this roll-out.
Addis LRT	The Addis Light Rail Transport project is reported to have already been a big success, since its opening in September 2015. Various figures exist in the public domain about the emissions savings from this project. The Department of Transport's 2017 (G.C) M&E document suggests 9,000 tonnes savings in one year. Another report suggests emissions reductions from the project are estimated to grow from 55,000 tons of CO_2 per year in 2015 to 170,000 tons CO2 per year by 2030, which is higher than the Department's estimate.
Ethiopia-Djibouti Railway	According to the Ministry of Transport's M&E report in 2017 (G.C) the Ethiopia-Djibouti railway saved 639 tonnes of emissions from passenger transport and 790 tonnes of emissions in freight transport in that year, a total of 1,429 tonnes. The freight line opened in November 2015 and passenger line in October 2016, and so total emissions savings will only be counted from these dates, rather than over the whole 2011-2019 assessment period.

Project Name	Overview of contribution to mitigation in the emissions sub-category
National Rail Network	The Ministry of Transport's M&E report in 2017 (G.C) identifies three components of rail upgrade, being North-South, East-West and the Ethiopia-Djibouti line, which this project is assumed to refer to. The Ethiopia-Djibouti upgrade is covered in the previous point. The M&E document suggests savings of 5,560 and 4,320 tonnes in 2017 (G.C) from the East-West and North-South lines respectively.
CFP Railways	This Climate Financing Project appears to refer to the previous three projects and so is not analysed further here to avoid double counting.
PTSETSE Buses	The project relates to a new bus fleet to provide free public transportation to public servants, supporting them in using public transportation to commute to their work and back. This occurred after a merger with Walia intercity bus service. There is insufficient information available to know how many passengers being transported, what the project is replacing etc, to be able to assess the greenhouse gas mitigation potential.
FTI Share the Road	The project, which seeks to support non-motorised transport, cycling and public transport, was a pilot project run between 2014 and 2016. As such it would have had a very small mitigation impact during the analysis period.
FTI Smart Parking	This project targets improving traffic flows through smart parking systems. As with the previous project, however, it appears to have been largely an analysis and pilot project, and so would have had limited emissions savings over the period.

Table 7: Projects contributing to reducing emissions from the transport sub-sector (1.A.3)

4.3.4 ENERGY AND RENEWABLE ENERGY

Several key projects and programmes have been undertaken in the Energy Sector, most notably (and largest), the National Electrification program 1 and 2. The NEP is supported by the Ethiopia Electrification Program (ELEAP), which has 3 pillars, Pillar 2 of which is 'Public programs supporting stand-alone solar systems and mini-grids' To date, the following has been achieved under this pillar:

- 12 pilot solar mini grids contract signed and under implementation,
- 25 additional solar mini grids (financed by AfDB and GoE) under design and bid preparation stage
- 250 solar mini grids solar under feasibility study stage (EEU, 2019).

NEP 1 and 2 are supported and complemented by other notable renewable energy projects such as the:

Electricity Network Rehabilitation and Enhancement Project (ENREP)

The ENREP Project started in 2013 and ended in 2019. The project was of sought to enable further delivery of electricity services in the country through expanding access in on and off grid areas. The project had 4 components, of which, component 3 was 'Market development for renewable energy and energy efficient product.' The project was highly successful and saw the following results (GHG emissions reductions results were not calculated for the project):

- More than one million households were positively affected by increasing access to modern energy services.
- The credit line is now fully subscribed, and 1,051,691 solar lanterns and solar home systems were procured.
- The sale of cookstoves, however, was lacklustre as micro finance institutions were not interested in providing loans due to high transaction costs (World Bank , 2019, pp. 9-10).

The project also included a Carbon Finance Programme of Activities, approved in 2015 which had the objective reducing emissions as measured by 'Certified emission reductions (CERs) issuance' with a target of 1,908,000.00 by 2019 (World Bank, 2019).

The 2018 review found that the project ad achieved a certified amount of 38,913 tCO2e for a total of 417,615 solar lamps distributed over the time of monitoring and a certified amount of 35,465 tCO2e for a total of 4,812 domestic biogas plants installed under National Biogas Program in 2015 and 2016. As such the recommendation was made to reduce the target number of PDO indicator related to "Certified emission reductions (CERs) issuance" from 1,908,000 tCO2e to 101,000 tCO2e for the project period of 2018-2020 (World Bank , 2019).

Renewable Energy Guarantee Programme (REGREP)

In 2019 the World Bank approved $200 million Renewable Energy Guarantees Program (REGREP) to mobilize International Development Association (IDA) guarantees to Ethiopia. While the program has not yet been utilised, it is worth mentioning in this report due to its potential for future growth in the renewable energy sector.

The project's objective is to 'Increase renewable energy generation capacity through private sector participation in Ethiopia through increased renewable energy generation capacity under the IPP program that has reached commercial operation from 0 MW in 2018 to 100 MW and increase in the amount of private capital mobilized under the IPP program from US$0 million in 2018 to US$35 million by 2022' (Wold Bank, 2019, p. 15). REGREP Phase 1 consists of IDA guarantee support to the Metehara Solar IPP (100 MW), which is expected to mitigate about 22,548 tons of CO2 over its lifetime at an average of about 1,074 tons per year (Wold Bank, 2019, p. 74),

4.3.5 OTHER SECTORS (1.A.4)

As indicated previously, other sectors include energy usage (diesel, kerosene, LPG etc) for cooking, lighting and heating in the commercial, institutional, residential, agriculture, forestry and fishing sectors. The Second National Communication indicates commercial and residential energy to be the primary sources of these emissions. Emissions from this sector in 2011, the base year of this analysis, were 16,958 ktonnes. Note that *wood burning is not included in the inventory.*

Table 8 lists the thirteen projects that can contribute to emissions reductions in this sub-category. The list includes projects focusing on grid connected power supply, such as those related to geothermal energy and wind. While emissions from grid-connected power are included in 1.A.1, the function that the expansion of the grid will have is to increase electrification to households that might not have had electricity before. As such it displaces the alternative fuels typically used in such households (which is considered to be the baseline), rather than displacing other more emissions intensive grid electricity options. Hence its inclusion in this sub-category.

As with 1.A.3, the contribution of each individual project to savings in 1.A.4 is negligible (again, likely to be less than 0.5% or even lower). However, given that 1.A.4 contributes to the order of 72% of energy emissions, the emissions savings potential with scaling of projects is likely to be substantial.

Project Name	Overview of contribution to mitigation in the emissions sub-category
FTI Monitoring Petroleum	Without further detail, it is suggested that this project largely contributes to local air pollution benefits, although the efficiency with which appliances will run on cleaner burning fuels could result in small emissions savings. No details on emissions savings could, however, be found. As stated previously, this project could also result in some mitigation in 1.A.3, which covers transport emissions.
FTI Biogas	This programme focuses on substitution of conventional domestic energy sources like fuel wood, charcoal and kerosene for cooking and lighting with biogas from biodigesters. Emissions savings will only come from fossil fuel substitution and possibly charcoal depending on its source, as fuel wood/biomass is considered "carbon neutral". The pilot phase focused on roll out of 40 demonstration digesters, so this project will have very minimal impact on the sector's emissions. Biodigesters may also impact on traditional manure management practice, and substitution of chemical fertilizer, and so this project could result in emissions savings in 3.A.2 and 3.C.4.

Project Name	Overview of contribution to mitigation in the emissions sub-category
NBPE	The aim of this project was to provide 210,000 rural persons in 8 regions with clean renewable energy from 35,000 bio-digesters for cooking and lighting. The target savings, achieved via the same mechanism as the FTI biogas project in the previous line, was 66,500 tons CO_2 equivalent GHG emission reduced per year by 2020. NBPE+ is now in operation.
FTI Solar Energy	The main project outcomes are the supply of CRGE fast track investments Solar Home Systems (SHS) to 4,000 households in all the four Regions and the Supply of Solar Lanterns of 8,000 units in all the four Regions and 24 institutional photovoltaic systems units and building capacity of implementers. The solar lighting provides lighting services where none were available and/or replaces kerosene, fuel wood and charcoal for lighting. Although many recipients will have benefited from this project, the number of households targeted represents a very small percentage of the total and so the impacts on this sub-category or on national emissions would have been relatively small.
Energy + Project	This project includes both AFOLU and non-AFOLU interventions. The non-AFOLU mitigation benefits of this project include replacing diesel in pumping with solar PV, biogas rollout and solar PV system roll out. Emissions savings will be from diesel, kerosene and possibly wood and charcoal. Once again while the project will be beneficial to recipients their impacts on overall emissions in this sub-category will be small given the small percentage of households targeted.
Geothermal Sector Development (GSD) Project	According to documentation found, work to date under this project appears to have been largely feasibility and contracting to date, so no emissions savings during the analysis period.
Geothermal Sector Strategy (GSS)	No information on the strategy and its implementation has been found. Furthermore, a strategy does not result in savings unless it is implemented.
Lighting Ethiopia	Between 2013 and 2018 lighting Africa claimed an emissions avoidance of 490.5 thousand tonnes CO_2 in Ethiopia. As with other projects in this sector this would be attributed to savings largely in kerosene and other fuels used in lighting.
CRGE Carbon Sinks	Although this is largely a rural project, it does include energy components (solar power, biogas and ICS utilization) for 750 rural HHs, with emissions savings being through similar mechanisms to the other projects described thus far. The small number of households resulted in negligible savings relative to overall emissions from the sector.
Off-grid Renewable Energy programme	Limited detail was found on this programme. It is assumed to be provision of renewable electricity for lighting and cooking, which will offer similar routes for savings as the other projects. The scale of the programme is unknown.
RETs	The Mid Term Review on this project states "the project aims to reduce Ethiopia's energy-related CO_2 emissions by approximately 2 million tonnes CO2e. This is to be achieved through promoting renewable energy and low greenhouse gas GHG-producing technologies as a substitute for fossil fuels and non-sustainable biomass utilisation in the country, with a focus on rural household appliances for cooking, lighting, and heating" By November 2018 the project was estimated to have saved about 101,210.34 tons of CO_2e/a. There had been delays in starting implementation which lead to savings being lower than planned.
FTI Solar Water	The project focuses on using solar power for water supply and irrigation, assumed to mitigation emissions through reducing diesel demand. The project was expected to improve sustainability and supply of water to

Project Name	Overview of contribution to mitigation in the emissions sub-category
	increase the sustainability and supply of water to 147,000 people and reduce greenhouse gas emission by 1,233t CO_2e per annum as well as contribute to improvements in local air quality.
Solar for companies	Various private companies have installed solar power and have started generating and using solar power for industrial processes (including to run a boiler). These include a soap factory and a tannery. It is assumed to replace grid electricity which is largely renewable at this point. Insufficient detail is available to determine emissions savings from this project.

Table 8: Projects contributing to reducing emissions from the other sectors (1.A.4)

4.4 SUMMARY AND POTENTIAL FOR CONTRIBUTION OF MITIGATION PROJECTS TO FUTURE NATIONAL EMISSIONS

Table 11 lists the data that is available in the public domain on emissions savings from individual projects. **It is important to note that this data has not been confirmed through own analysis, nor are the numbers necessarily comparable.** They do, however, show the relative contribution of projects and a sense of scale relative to the emissions from each sub-category in 2011.

Project	Indication of emissions savings
1.A.3: Transport	**Emissions from sub-category in 2011: 3,769,000 tonnes**
Addis LRT	9,000 tonnes in 2017
Ethiopia-Djibouti Railway	639 tonnes of emissions from passenger transport and 790 tonnes in 2017
National Rail Network	5,560 and 4,320 tonnes in 2017 (G.C) from the East-West and North-South lines respectively
1.A.5 Other Sectors	**Emissions from sub-category in 2011: 16,958,000 tonnes**
NBPE	Target was 66,500 tons CO_2 equivalent GHG emission reduced per year by 2020
Lighting Ethiopia	Between 2013 and 2018 lighting Africa claimed an emissions avoidance of 490.5 thousand tonnes CO_2
RETs	By November 2018, the project was estimated to have saved about 101,210.34 tons of CO_2e/a
FTI Solar Water	Project target was to reduce greenhouse gas emission by 1,233t CO_2e per annum

Table 9: Summary of available information on emissions savings from mitigation projects

Table 11 shows that no single project will have provided material emissions savings in the 2011-2019 period. Although insufficient data is available to provide a detailed quantification of the savings for many of the projects, it is likely that the contribution of each project to reducing emissions in the emissions sub-categories is less than 0.5%. This is as a result of a combination of factors: some of the projects started late in the analysis period, some were pilot projects, and some targeted a small emissions subset (e.g. an energy efficiency audit at a single plant). This does not suggest that mitigation projects are not targeting the “right” emissions. The analysis of the inventory suggested that (after the AFOLU sector), the energy sector is the next biggest contributor of emissions, and within that the “other sectors” (mostly commercial and residential) and transport sub-sectors. A large proportion of the projects focus on reducing these emissions, which is thus appropriate. Scale up and replication of these projects has the potential to lead to more extensive savings.

5 Financial Assessment

The goal of the following financial assessment is to provide a high-level and broad fiscal measurement, evaluation, and extrapolation of progress made towards Ethiopia's climate goals, specifically its Climate Resilient Green Economy (CRGE) Strategy 2011-2019.

The assessment has two main objectives:

1. **A review of all historical investment into climate-related initiatives from 2011 to 2019, the period of the CRGE Strategy.**
2. **A projection of required future expenditure for Ethiopia to meet its NDC and CRGE climate objectives by 2030.**

5.1 METHODOLOGY

5.1.1 OVERVIEW OF APPROACH

As a first step, a comprehensive long-list of projects and initiatives was identified that were implemented in Ethiopia during the study period of 2011 to 2019 (either partially or fully). This long-list was then sorted and screened to assess the climate impact of each project, culminating in a short-list of 224 distinct interventions with substantive climate credentials.

With the short-list of climate projects in hand, a process was initiated to collect the necessary financial data for each initiative. Guided by Ethiopia's Climate Finance Tracking and Projection Approach and Methodology, and the supporting data collection template, a project database was developed to capture the necessary project financial metrics.

With an extensive research process, and assistance from numerous Ethiopian officials, key data was collated for each shortlisted project. Importantly from a financial perspective, this included the total cost of each project, it's climate impact (adaptation, mitigation, or both), and its start and end date.

Following the data collation exercise, the financial analysis was conducted, with over-arching findings articulated in the following sections of this chapter. This includes a review of total climate investment over all identified projects, broken down by sector and impact. *More detailed sector-specific analyses are included in the Sectoral Appendix Report accompanying this document.*

Finally, a high-level projection of future expenditure still required is estimated off the back of the historical investment recorded. More detail on this is provided in chapter 5.3.

5.1.2 A COMPREHENSIVE APPROACH FOR FUTURE ITERATIONS

Before considering the results, it should be noted that several compromises had to be made in this financial assessment. Initially, it was envisaged that additional project detail could be captured to allow for a more in-depth and nuanced analysis. To this end, the project database (*guidance developed for this database can be found in the Sectoral Overview Appendix*) reflects numerous additional data fields. In addition to various qualitative descriptors, these included:

1. Total project cost and expenditure to date;
2. A breakdown of cost/expenditure on an annual basis;
3. A breakdown of cost/expenditure by core project stage – preparation, implementation, and operations;
4. A breakdown of cost/expenditure by type of financing – grant/transfer, (concessional) loan, equity, etc., and
5. A breakdown of cost/expenditure by source of the financing - the identity of each funder/financier.

With this data in hand, a detailed audit and analysis would have been conducted to produce valuable insights on past climate expenditure and impact, and lessons to inform future planning, including:

- Year-on-year climate expenditure and commitments;
- Trends in expenditure by sector and impact (adaptation, mitigation);
- The major sources of funding and financing in Ethiopia's climate sector
    - Is Ethiopia over-reliant on certain financiers, are there opportunities to mobilise under-tapped finance?
- The types of climate financing, including split between grants, debt, equity etc, and
    - Are projects being designed to optimally attract available finance types and do unrealised blending opportunities. exist?
- The climate expenditure splits between project preparation, implementation, and operations;
    - Is enough being spent on ensuring projects are properly prepared, to ensure bankability and long-term success?
- The utilisation of different climate financing modalities, such as public-private partnerships, and private-sourced, and
    - Are there opportunities to attract more private participation in climate projects?

In addition, it was anticipated that a detailed quantification of historical climate impact and GHG reductions would allow for impact-per-dollar metrics to be developed. These metrics would provide insight into where and how the best 'bang for buck' is achieved and inform a more thorough and robust estimation of future investment requirements by Ethiopia to meet its climate goals.

Despite extensive efforts within the study constraints, it was not possible to collect a consistent level of data which would have allowed for this depth of analysis. However, the frameworks set up for data capture and collation under this assignment do provide useful tools for Ethiopian officials going forward, and the findings a valuable foundation for a (originally envisaged) more comprehensive assessment of historical and future investment.

5.1.3 ASSESSMENT ASSUMPTIONS

The following key assumptions should be noted in the assessment that follows:

- All projects considered in this assessment have been judged to have some substantive level of climate impact, be it adaptation, mitigation, or both (direct and through co-benefits);
- All projects considered intersect with this study's period of 2011 to 2019. This means projects either fall entirely within this cycle or have some earlier or later overlap;
    - This manifests as a difference between the total value or cost of identified projects, and total expenditure within or commitment allocated to the 2011 to 2019 period;
- With actual project annual expenditure figures unavailable, the analysis estimated the per year breakdown by averaging each project's overall value on a per annum basis and spreading this across its duration;
- All cost and expenditure figures have been converted into Ethiopian Birr (where necessary), using the mid-market exchange rate at the time of this analysis;
- Despite extensive efforts, it was not possible to source all necessary data for all projects, hence in some cases:
    - The lack of project cost/expenditure figures means indicated total costs/expenditures may be less than actual,
    - The lack of dates precluded the ability to estimate expenditure over the 2011 - 2019 study period for all projects, and
- In addition, it is possible that some projects have not been considered at all, either due to a total lack of data, or they were not identified to the project team.

5.2 ETHIOPIA CLIMATE INVESTMENT OVERVIEW

Overall, this financial study assessed 224 projects or initiatives with substantive climate impact, across eight sectors, as well as cross-cutting and capacity building areas, over the 2011-2019 period.

5.2.1 NUMBER OF INITIATIVES BY SECTOR

Most projects assessed (83) fall within the agriculture sector, followed by water & energy (48), forestry (27), and livestock (22). Pure capacity building projects numbered the least (2), although it must be noted that many other projects in other sectors include a significant capacity building element.

As per the assessment assumptions, note that Figure 8 below includes all projects with timelines fully within, or partially overlapping with, the 2011-2019 period under assessment. Where indicated in the figure title, this applies to following graphics too.

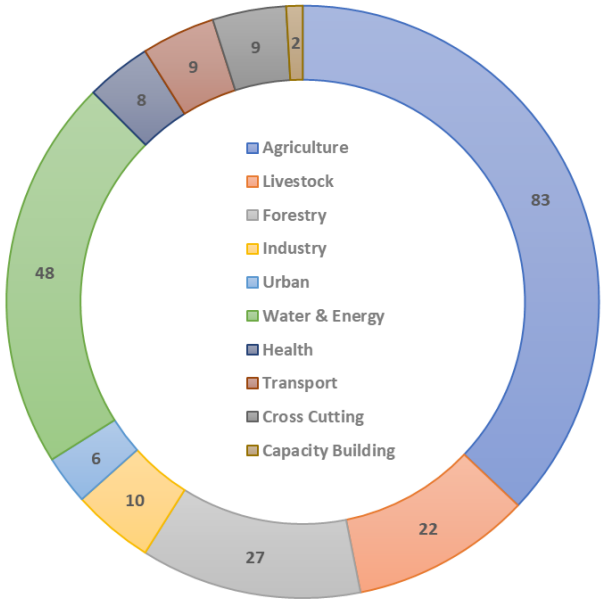

Figure 8 Number of Climate Projects by Sector 2011 – 2019 (incl. overlapping)

5.2.2 VALUE OF INITIATIVES BY SECTOR

The total investment value across these projects is estimated at ETB 598.1 billion, of which almost half is accounted for by the agriculture sector (ETB 284.9 billion). The next largest contributor is transport (ETB 140.7 billion). Pure capacity building projects have had the least invested in them, although again, it must be emphasised this is not indicative of the total invested in capacity building across all sectors.

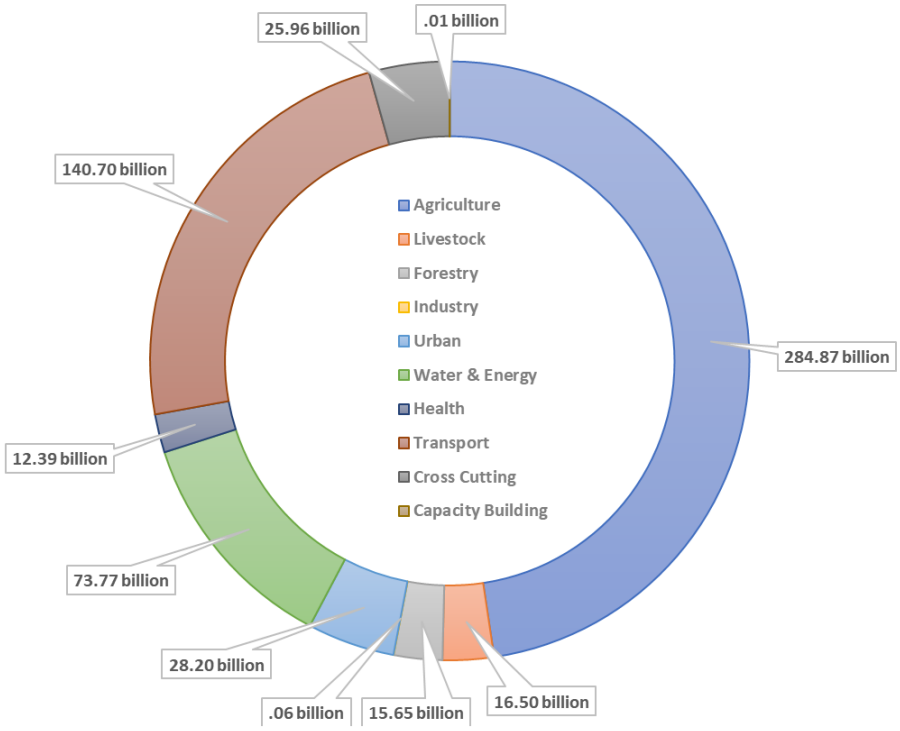

Figure 9 Total Climate Project Value (in ETB) by Sector 2011-2019 (incl. overlapping)

5.2.3 BREAKDOWN BY CLIMATE IMPACT

When considering the type of climate impact across these 224 projects, valued at ETB 598.1 billion, we see the number of adaptation projects (97) slightly ahead of mitigation (74). There are 53 projects judged to have approximately equal adaptive and mitigative impact.

However, from a project value perspective, mitigation projects have seen the largest total commitment, at ETB 219.7 billion. Initiatives with both adaptation and mitigation aspects follow with total value of ETB 205.1 billion, while adaptation projects total ETB 171.8 billion.

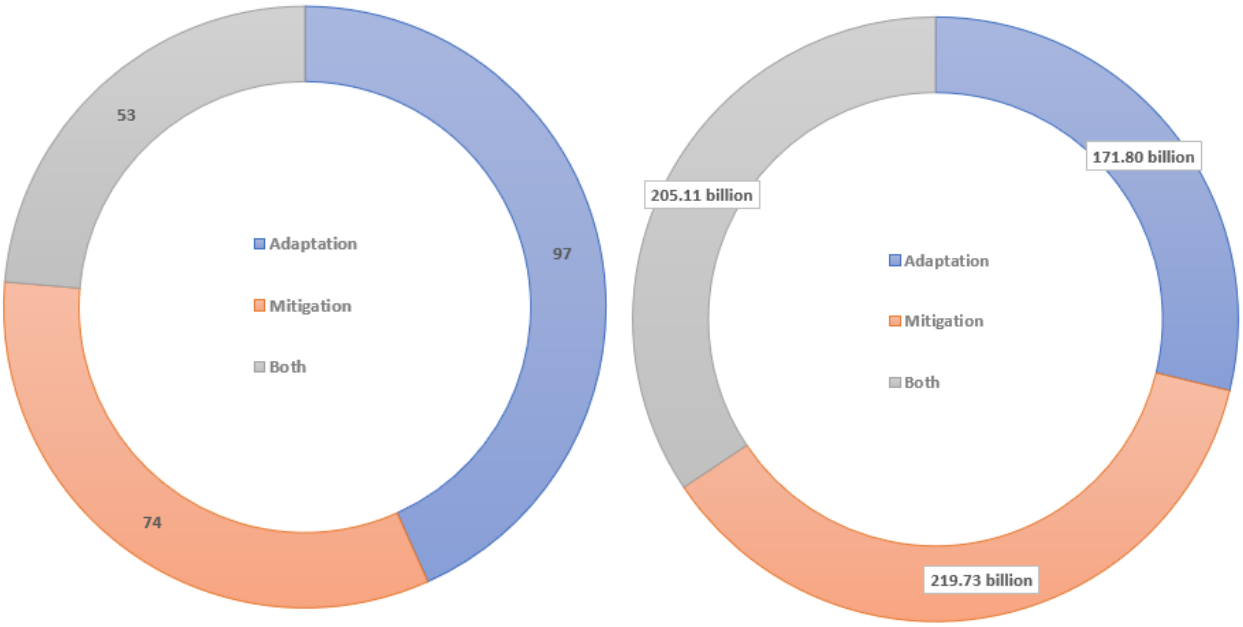

Figure 10 Number of Projects (left) and Total Value (in ETB) of Projects by Climate Impact 2011-2019 (incl. overlapping)

- ***Adaptation Initiatives*** – The agricultural sector has, by some distance, the largest number of climate projects with an adaptation focus – a total of 63. These equate to cumulative investment of approximately ETB 104 billion. The sector with the next largest number of adaptation initiatives is water and energy, with 14 at ETB 6.6 billion. However, the urban space, with only 3 adaptation projects, accounts for the second largest investment in adaption at just under ETB 27 billion (the prominent contributor being the Urban Productive Safety Net Program at ETB 14.2 billion).

- ***Mitigation Initiatives*** – The water and energy sector dominate the mitigation space in terms of number of projects, with 30 at a total value of ETB 67 billion. This is followed by the forestry sector, with 15 projects at around ETB 8 billion. However, the transport sector accounts for the largest total mitigation initiative cost, at just under ETB 141 billion spread across 9 projects. By far the largest transport initiative considered was the National Railway Network from Awash (Three Zones) project, at almost ETB 100 billion.

- ***'Both' Initiatives*** - The agricultural sector also has the largest number of projects, 19, with joint mitigation and adaptive impact, followed by livestock with 13 and forestry with 11. Further, the agricultural sector accounts for a substantial majority of investment into these broader impact projects, at almost ETB 181 million (88% of the overall total). The largest contributors to this total are the Productive Safety Net Programs 3 and 4.

5.2.4 ANNUAL BREAKDOWN OF CLIMATE INVESTMENT

The following graphs provide a more detailed look at Ethiopia's climate project investment (expenditure) on an annual basis over the 2011 to 2019 period specifically, broken down by sector and by impact type.

In total over this period, it is estimated that Ethiopia invested ETB 440.7 billion in projects with substantive climate impact. This figure is lower than the total value of the 224 identified projects highlighted previously (ETB 598.1 billion) because some of this value falls in expenditure either side of the 2011-2019 cycle.

Annual expenditure figures show an increasing trend from 2011, peaking at around ETB 68.7 billion in 2015 and plateauing through to 2017. In 2018 and 2019, expenditure figures fell to their lowest since 2011, highlighting a downwards trend in climate expenditure that may be of concern.

From a climate impact perspective, per Figure 11, expenditure on mitigation activities has dominated since 2011, although substantially reduced in 2018 and 2019 (likely due to the reduced transport investment). Interestingly, since 2015 expenditure on projects with both significant adaptation and mitigation aspects has increased substantially. This may be a function of Ethiopia designing and implementing more sophisticated and multi-faceted climate projects.

Unsurprising, agriculture and transport projects contribute most of the expenditure from 2011 to 2017, as highlighted in Figure 12. Captured expenditure on transport projects in 2018 and 2019 is negligible and would explain the observed drop-off. Encouragingly, expenditure in sectors aside from agriculture and transport have picked up since 2011, albeit still reducing slightly in 2018 and 2019.

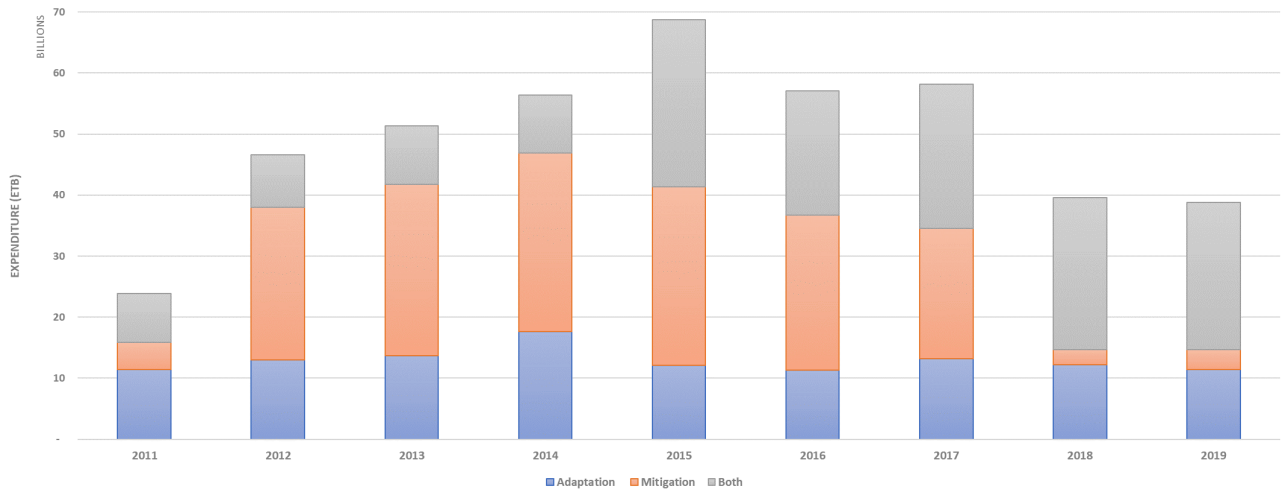

Figure 11 Annual Breakdown of Project Expenditure (in ETB) by Sector 2011-2019

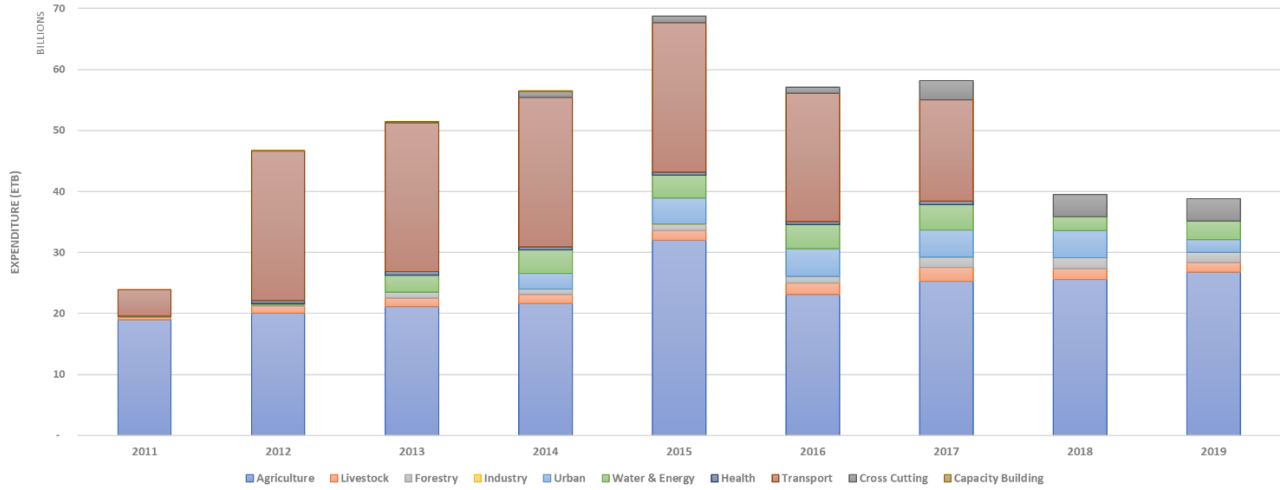

Figure 12 Annual Breakdown of Project Expenditure (in ETB) by Climate Impact 2011-20

5.3 FUTURE CLIMATE EXPENDITURE PROJECTIONS

5.3.1 CLIMATE MITIGATION

Three possible approaches to estimating Ethiopia's future climate change mitigation expenditure to 2030 have been considered as part of this analysis:

1. ***Project Level Abatement Estimation***

   This methodology would utilise greenhouse gas emissions abatement calculations at a project-level (across all the mitigation projects identified in this study). Comparing these figures with the project-level implementation costs captured in this report, detailed sector and sub-sector costs per unit emissions abated could be computed. These unit abatement cost metrics could then be employed to project future climate investment requirements to meet 2030 targets, based on estimated 2019 greenhouse gas inventory levels and the gap still to be bridged.

   As indicated in previous sections of this chapter, an inability to get consistent access to certain project-level data to date has inhibited the ability to estimate project-level abatement. Without these abatement figures, it is impossible to calculate cost-per-unit abatement figures, and the remaining emissions reductions still to be achieved through to 2030. This has therefore not allowed for a comprehensive and robust estimation of Ethiopia's climate investment needs up to 2030 using this methodology.

2. ***Sector Level Abatement Estimation***

   As a more high-level analysis compared to option (1), Ethiopia's recent inventory assessments provide a breakdown of national greenhouse gas inventory by sector from 2010 to 2016. By cross-referencing the climate-related expenditure captured in this report with the change in inventory levels from 2010 to 2016 (against a business-as-usual baseline), it would be possible to estimate an average sector cost per emission unit abated. These average sector-specific abatement cost metrics, based on historical trends, could then be utilised to project (from 2020) further climate investment requirements to meet sector-specific emission targets by 2030.

   The efficacy of this approach is dependent on the precision of the sector inventory numbers, the continued accuracy of proposed business-as-usual scenario, and the re-based (from 2017) 2030 target levels. Although some of this data was not immediately available at the time this report was compiled (precluding the ability to utilise this approach at this stage), it is possible that it could be collated in a less resource-intensive manner than that required for methodology option (1). With this data in hand, the future investment calculation would provide an indicative but insightful look at further expenditure required to 2030 on a sector-by-sector basis.

3. ***National Costing Estimation***

   This methodology is a significantly higher-level approach than options (1) and (2), based on the historical and future expenditure analysis of this report, and estimates of Ethiopia's total required climate investment from other sources.

   The logic and process pursued is as follows:

   - At the time of its establishment, the CRGE Strategy estimated that Ethiopia required USD 7.5 billion of annual investment (or USD 150 billion in total) to realise its NDC vision;
   - This equates to approximately ETB 220 billion per annum, or a total of ETB 4.4 trillion over the 2011 to 2030 horizon;
   - Of this amount, around USD 80 billion (or ETB 2.4 trillion) was estimated to be required for capital expenditure, which is the focus for this report;

- This report's analysis of initiatives falling over 2011-2019, estimates a total of ETB 440.7 billion has been expended on implementation in the period, with a further ETB 157.5 billion committed beyond 2019 to 2030, for a total of ETB 598.1 billion;
- Of this, a total of ETB 424.8 billion can be attributed to projects with some substantive level of mitigation impact (those projects flagged as 'mitigation' or 'both' initiatives in this report);
- Subtracting the ETB 424.8 billion from the total of ETB 2.4 trillion CRGE Strategy estimate, would suggest that to reach its 2030 targets, Ethiopia would need to invest another approximately ETB 1.9 trillion in capital costs, and
- This equates to approximately USD 66 billion, or USD 6.0 billion per year, over the next 10 years from 2020 through to beginning of 2030.

These calculations are summarised in the table below, highlighting the process flow from the original CRGE Strategy estimate in 2010, through to the balance required for the 2020-2020 period.

Total estimated requirement	USD	150,000,000,000
Capital	*USD*	*80,000,000,000*
Operating	*USD*	*70,000,000,000*
ETB:USD Exchange Rate		29.6
Total estimated requirement	ETB	4,440,000,000,000
Capital	ETB	2,368,000,000,000
Operating	ETB	2,072,000,000,000
Total committed capital expenditure	ETB	424,839,799,619
Mitigation	*ETB*	*219,731,509,237*
Both	*ETB*	*205,108,290,382*
Capital expenditure balance required	ETB	1,943,160,200,381
Per year 2020-2030	*ETB*	*176,650,927,307*
Capital expenditure balance required	USD	65,647,304,067
Per year 2020-2030	USD	5,967,936,733

Table 10 Estimated Future Climate Mitigation Investment Required to 2030 Based on 'National Costing' Methodology

In the future, subject to sufficient data availability, it would be valuable to compile estimations through methodologies (1) and (2), and triage with (3)'s results to ensure more robust and confident results.

5.3.2 CLIMATE ADAPTATION

Quantifying the impact of climate adaptation initiatives is a much more resource-intensive, and – due to the absence of any CRGE baseline for adaptation indicators in Ethiopia to compare with - beyond the remit of this study. Adaptation quantification has therefore not been considered in detail.

However, the mitigation future projection methodology described above in part (3) of section 5.3.1 can be utilised for adaptation projections, where initial investment estimates are available.

To date, no total, national-level expenditure estimate for Ethiopia's adaptation targets could be sourced, and nor was data consistently available across all sectors. However, estimates were available for the Water & Energy, Health, and the combined Agriculture and Forestry sectors. The results for these sectors are provided below.

- ***Water and Energy***
  - CRGE Sector Strategy adaptation expenditure estimate to 2030 – USD 895 million (ETB 26.5 billion)
  - Total adaptation expenditure committed to date – ETB 6.8 billion
  - Adaptation investment still required to 2030 – ETB 19.7 billion

- ***Agriculture and Forestry***
  - CRGE Sector Strategy adaptation expenditure estimate to 2030 – USD 600 million (ETB 17.8 billion)
  - Total adaptation expenditure committed to date – ETB 291.5 billion
  - Adaptation investment still required to 2030 – nil

- ***Health***
  - National Health Adaptation Plan expenditure estimate to 2020 – USD 540 million (ETB 1.7 billion)
  - Total expenditure committed to date – ETB 12.4 billion
  - Investment still required from 2018 to 2020 – nil

The findings suggest that while significant investment into adaptation is still required in the Water & Energy sector over the next 10 years, Ethiopia has already invested more than originally envisaged into adaptation of the Agriculture, Forestry, and Health Sectors.

From a ***Transport*** perspective, Ethiopia's Climate Resilient Transport Sector Strategy document fails to indicate the total expenditure estimate for all planned activities, which are geared at achieving the strategies targets and objectives.

The National Adaptation Plan (NAP-ETH) under Ethiopia's Climate Resilient Green Economy is estimated to cost approximately US$ 6 billion per year for implementation over fifteen years (2016 – 2030). In sum, US$ 90 billion is divided proportionately across a number of sectors, namely Agriculture, Forestry, Health, Transport, Power, Industry, and Water. However, the National Adaption Plan does not indicate how much has been spent to date but does indicate spend on certain individual projects within the varied sectors.

Finance Successes

Feedback from Stakeholder Workshop

- Mobilisation of CRGE and climate change resources from public funds in Ethiopia
- Clear quantification of scale of financial resources needed for CRGE implementation
- Climate funding thus far obtained from development partners
- Bargaining power with donors and development partners due to the clarity of CRGE strategy (and NDC) needing financial support

Finance Challenges

Feedback from Stakeholder Workshop

- Lack of financial data and budget tracking and management systems for CRGE, leading to difficulty in estimating what has been spent
- Inadequate resources mobilised thus far
- Insufficient role of and support from the private sector
- Lack of technical financial capacity to seek and secure climate finance
- Donor coordination has been poor

Finance Next Steps

Feedback from Stakeholder Workshop

- Strengthen climate finance tracking capacity in MoF as well as in sector ministries
- Step up resource mobilisation to seek more funding support
- Seek more coordination amongst donors and development partners
- Identify and develop more optimal / bankable opportunities to attract funding
- Explore carbon markets

6 Policy

Ethiopia's principal achievements on climate change related policy since 2011 are the CRGE Strategy, the three supplementary sector climate resilience strategies, its National Adaptation Plan (NAP), and its NDC – which reflects policy ambition on both climate change mitigation and adaptation. Several sectors have referenced climate change in sectoral policy documents (particularly in the forestry sector, with REDD+), but this is an area where there is potential for more sectoral climate mainstreaming so that all significant sectoral policies contribute to – or at least stay in lock-step with – the CRGE Strategy's (and the NDC's) targets on climate change.

This chapter provides an overview of key policy developments in each sector since 2011 that have helped support progress on the CRGE strategy and sector CR strategies. Contained herein are observations on the relevance of the CRGE strategy's priority focus areas in each sector (in terms of whether the focus areas strategically position Ethiopia to achieve its climate change goals or not), other policies that contribute to an enabling environment for the CRGE objectives and targets, gaps that either have been or still need to be addressed, and considerations for the future.

6.1 AGRICULTURE AND LIVESTOCK

The CRGE strategy's priority areas for mitigation in the **agriculture and livestock** sector include the reduction of emissions from livestock through increasing the efficiency of the cattle value chains (for meat and milk), raising the off-take rate (decreasing the age at which livestock are sold), enhancing productivity of livestock, shifting dietary patterns towards lower-emitting livestock, mechanisation of draft power, and improving the quality of pastureland. In the context of crop cultivation, the CRGE strategy focuses on the introduction of lower-emitting techniques in crop cultivation such as conservation agriculture (low or no-till methods), watershed management, nutrient and crop management, agricultural intensification, capture of new agricultural land in arid areas through irrigation, and crop production techniques that increase yields. Furthermore, avoided deforestation is also identified as a priority (Federal Democratic Republic of Ethiopia, 2012). Considering what the biggest source of agricultural emissions and emissions growth is, i.e. livestock, the CRGE strategy's focus on reducing livestock related GHGs was both strategic and optimal.

In the context of assessing the progress of *implementation of the CRGE Strategy* (as opposed to assessing overall progress in the agriculture and livestock sector's development in Ethiopia), two main policy developments since 2011 in the agriculture and livestock sector are relevant to gauging progress on the CRGE strategy (depicted in Table 11 Policy Development relevant to the CRGE: Agriculture and Livestock below).

Policy Instrument	Year	Focus and Objective	Originator / Developer	Institutional Responsibility
Ethiopia's Climate Resilient Green Economy: Climate Resilience Strategy – Agriculture and Forestry Sector	2015	The strategy's objective is to ensure that economic growth in the agriculture and forestry sectors is climate resilient. The strategy identifies the impacts of climate variability and climate change on Ethiopia; highlights options for building climate resilience; and provides guidance on how these options can be financed and implemented.	GGGI	Ministry of Agriculture; EFCCC
Ethiopia's Livestock Master Plan – Roadmaps for Growth and Transformation	2015	To inform the development of GTP-II's provisions on agriculture and livestock, the Ethiopian Livestock Master Plan prepared detailed roadmaps (2015-2020) for cow dairy development; red meat can cattle feedlot systems development; poultry development; livestock feed, production, and extension; livestock health; improving animal genetics; and provisions on enabling environment and institutions.	ILRI	Ministry of Agriculture

Table 11 Policy Development relevant to the CRGE: Agriculture and Livestock

In terms of adaptation, the agriculture and forestry sector CR strategy underscores the need to build adaptive capacity through: capacity-building and institutional coordination; information and awareness; on-farm crop and water management; livestock management; value chain and market development; sustainable agriculture and land management; natural resources conservation and management; disaster risk reduction; and social protection for high-priority groups including women and children. Further, in 2019, Ethiopia developed a comprehensive National Adaptation Plan (NAP) (Federal Democratic Republic of Ethiopia, 2019). The NAP prioritizes 18 adaptation options across the most vulnerable sectors, including agriculture and livestock. Adaptation option number 1 in the NAP emphasizes enhancing food security by improving agricultural productivity; and adaptation option 3 speaks of strengthening sustainable natural resource management through safeguarding landscapes and watersheds. Ethiopia now also has GE and NAP roadmaps to 2030, including for this sector.

The central role of livestock in Ethiopia is mirrored strategically in Ethiopia's livestock master plan as well, although it does not take climate change mitigation or adaptation into consideration, which is a missed opportunity.

Where the CRGE strategy falls short is in the identification of interventions to achieve emissions reduction. Many of the interventions prioritized do not, unfortunately, yield the definitive emissions reductions that are required for Ethiopia to meet its 2030 CRGE targets because they drive efficiency and agricultural productivity, rather than abatement and sequestration. Globally, there is a wealth of literature on best practice in agriculture and livestock emissions reduction, despite the complex nature of land-use emissions (and the ability of land-use sectors to be both carbon sinks and sources of emissions). Most interventions prioritized by the CRGE Strategy for the agriculture and livestock sectors are not reflective of such global best practice on mitigation, i.e. on measurable emissions reductions. It would be advisable for future revisions and updates of the CRGE Strategy to re-examine the priority interventions under the agriculture and livestock sectors, and pivot towards measures such as those recognized by the World Bank as having mitigation co-benefits.

Moving forward, the CRGE strategy's mitigation options in this sector should be revised in favour of high-potential mitigation options with more direct mitigation outcomes. On adaptation, future focus areas should be the implementation of the NAP and conducting climate change vulnerability assessments for major breeds and crops.

6.2 FORESTRY

In the **forestry sector** the CRGE strategy's mitigation focus is on afforestation, reforestation, and forest management. The strategy also emphasizes on reducing pressure from agriculture on forests, by agriculture intensification on existing land, and by restoring degraded agricultural land into cultivable land. It underscores interventions that reduce demand for fuelwood, such as efficient stoves, and other advanced cooking and baking technologies that reduce reliance on primary energy or biomass (electric, biogas, and LPG stoves). Considering where the biggest sources of forestry emissions and emissions growth are, i.e. deforestation due to agricultural expansion, and degradation due to biomass collection, the CRGE strategy's focus on reducing these two categories of GHGs was both strategic and optimal.

In the context of assessing the progress of *implementation of the CRGE Strategy* (as opposed to assessing overall progress in the forestry sector's development in Ethiopia), five main policy developments since 2011 in the forestry sector are relevant to gauging progress on the CRGE strategy (depicted in Table 12 Policy Development relevant to the CRGE: Forestry below).

Policy Instrument	Year	Focus and Objective	Originator / Developer	Institutional Responsibility
Ethiopia's Climate Resilient Green Economy: Climate Resilience Strategy – Agriculture and Forestry Sector	2015	The strategy's objective is to ensure that economic growth in the agriculture and forestry sectors is climate resilient. The strategy identifies the impacts of climate variability and climate change on Ethiopia; highlights options for building climate resilience; and provides guidance on how these options can be financed and implemented.	GGGI	Ministry of Agriculture; EFCCC

Policy Instrument	Year	Focus and Objective	Originator / Developer	Institutional Responsibility
Biomass Energy Strategy of Ethiopia	2013	In recognition of the dominant role of biomass in meeting Ethiopia's energy needs, as well as the degradation caused by biomass harvesting, the strategy's overall aim is to ensure the sustainable use of biomass for the socio-economic and environmental benefit of Ethiopians – i.e. access to affordable and sustainable biomass for all by 2030.	EUEI	Ministry of Water and Energy, Ethiopia; EFCCC
Ethiopia's REDD++ Strategy	2018	A national strategy for reducing emissions from deforestation and forest degradation, in adherence with the UN-REDD programme.		EFCCC
Forest Law (revised)	2018	Law that recognizes the rights of communities and acknowledges their role in managing natural forests and establishing plantations, without unduly compromising ecological services or biodiversity. Includes references to climate change adaptation.		EFCCC
Ten-Year Forest Sector Development Programme	2018	Guiding document for coordinating strategic policy interventions so as to increase the national forest coverage and its contribution to national green growth	UNDP, Governments of Norway and Sweden	EFCCC

Table 12 Policy Development relevant to the CRGE: Forestry

On adaptation, the agriculture and forestry sector CR strategy highlights the role of land use planning, forest monitoring, pest and disease control, payment for ecosystem services. The NAP also includes forestry as a key sector for adaptation. Adaptation option number 3 in the NAP speaks of strengthening sustainable natural resource management through safeguarding landscapes and watersheds, and adaptation option 6 affirms improving ecosystem resilience through conserving biodiversity (which implicates forest conservation). Crucially, adaptation option number 7 emphasizes enhancing sustainable forest management. Ethiopia now also has GE and NAP roadmaps to 2030, including for this sector.

Other policy documents that provide guidance for Ethiopia's climate change mitigation and adaptation actions in this sector are the REDD++ strategy, and the Biomass Energy Strategy.

Moving forward, the optimal approach towards mitigation in the sector would be the effective implementation of the REDD+ strategy. In terms of adaptation, future focus areas should be the implementation of the NAP and conducting climate change vulnerability assessments for major tree species of commercial or ecological importance.

6.3 WATER AND ENERGY

The CRGE strategy recognized no domestic abatement potential from the **water and energy** sector (due to the already low-carbon character of the sector and the absence of projected GHG increases from this area). In other words, Ethiopia's targeted 64% reduction of GHGs from the 2030 BAU to the 2030 CRGE target does not involve any reductions from the water and energy sector. Even so, climate change mitigation in the sector is still important as even without an abatement target, the sector has to ensure that growing energy demand will continue to be met by renewable, low-carbon energy, to keep emissions growth in 2030 to zero. To this end, the CRGE strategy emphasizes exploiting the potential for renewable energy from hydropower, geothermal, wind, and solar power; and utility-scale energy efficiency measures and consumer-oriented demand-side-management.

In the context of assessing the progress of *implementation of the CRGE Strategy* (as opposed to assessing overall progress in the water and energy sector's development in Ethiopia), three policy developments since 2011 in the energy sector are relevant to gauging progress on the CRGE strategy (depicted in Table 13 Policy Development relevant to the CRGE: Water and Energy below).

Policy Instrument	Year	Focus and Objective	Originator / Developer	Institutional Responsibility
Ethiopia's Climate Resilient Green Economy: Climate Resilience Strategy – Water and Energy Sector	2015	The strategy's objective is to identify the economic and social impacts of climate variability and climate change on water and energy in Ethiopia; to identify priority options through which the water and energy sectors can build climate resilience and reduce the impacts of climate variability and climate change, and to provide guidance on possible means to finance and implement such climate resilience measures.	GGGI	Ministry of Water and Energy, Ethiopia
Biomass Energy Strategy of Ethiopia	2013	In recognition of the dominant role of biomass in meeting Ethiopia's energy needs, as well as the degradation caused by biomass harvesting, the strategy's overall aim is to ensure the sustainable use of biomass for the socio-economic and environmental benefit Ethiopians – i.e. access to affordable and sustainable biomass for all by 2030.	EUEI	Ministry of Water and Energy, Ethiopia
Ethiopia's National Energy Policy	2013	The policy provides updated guidance for the energy sector, including for the promotion and development of renewable energy. In the context of climate change adaptation, the main approach under the policy is to caution against the impacts of climate change on Ethiopia's hydropower systems and the potential power supply disruptions this can cause.		Ministry of Water and Energy, Ethiopia

Table 13 Policy Development relevant to the CRGE: Water and Energy

For adaptation, the water and energy sector CR strategy prioritizes diversifying the energy mix; increasing energy efficiency; enhancing biomass efficiency; expanding off-grid energy; accelerating irrigation plans; strengthening rainfed agriculture; balancing water demands; accelerating access to WASH; and enhancing energy and water self-supply. The NAP also discussed adaptation in the water and energy sectors: adaptation option number 2 in the NAP underscores improving access to potable water; adaptation option 4 lends support to water harvesting; and adaptation option number 9 affirms enhancing alternative and renewable power generation and management. Ethiopia now also has GE and NAP roadmaps to 2030, including for this sector.

Other policy documents that provide guidance for Ethiopia's climate change mitigation and adaptation actions in the water and energy sectors are the National Energy Policy, and the Biomass Energy Strategy.

Moving forward, the optimal approach towards mitigation in the sector would be the effective implementation of the National Energy Policy and integrating the National Energy Policy's targets in the successor planning instrument to GTP II. On adaptation, future focus areas should be the implementation of the NAP and conducting climate change vulnerability assessments for major water and energy infrastructure and systems of national importance.

6.4 INDUSTRY

In the **industries and manufacturing** sector, the CRGE strategy recognized that the most important sub-sector for mitigation is the cement industry. The CRGE strategy directed attention to interventions that focus on the cement industry: improving energy efficiency (altering the type of kilns used, the type of coolers used, introducing computerised energy management systems, and other energy demand management measures); substituting input material (reducing clinker by increasing pumice content or fly-ash); adopting alternate combustion materials (fuel-switching by increasing the share of biomass in energy production for cement plants); and waste heat recovery (capturing some of the waste heat lost). Of all the options, the CRGE strategy pointed to clinker substitution as the

most crucial abatement lever. Considering where industrial emissions in Ethiopia arise from, the CRGE strategy's focus on the cement industry and clinker substitution was strategic and most relevant.

In the context of assessing the progress of *implementation of the CRGE Strategy* (as opposed to assessing overall progress in industrial development in Ethiopia), two policy developments in the industry sector stand out as relevant to progress on the CRGE strategy (depicted in Table 14 Policy Development relevant to the CRGE: Industry below).

Policy Instrument	Year	Focus and Objective	Originator / Developer	Institutional Responsibility
Ethiopia's Green Manufacturing Strategy	2018 (Draft for Validation)	The strategy's focus is on improving energy management and waste management in Ethiopia's industries, reducing energy consumption and waste, and promoting low-carbon production. The strategy provides a national-level set of priority actions for green manufacturing. It also identified international best practice applicable to major industrial sub-sectors in Ethiopia, including cement.	Funded by USAID and the US Forest Service International Programme (developed by Global Development Solutions)	Ministry of Industry, Ethiopia
Roadmap for Greening Ethiopian Industrial Parks	Under Development (2019)	The proposed roadmap's focus is on identifying and recommending a set of practical policy interventions that will lead to dramatic reduction in GHG emissions from industrial production processes, whilst also addressing other environmental, economic, social, and management problems, to enable a transition to low-carbon industrial development.	Funded by GIZ (developed by GGGI)	Ministry of Industry, Ethiopia; Industrial Parks Development Corporation (IPDC)

Table 14 Policy Development relevant to the CRGE: Industry

A major gap in the CRGE strategy is the lack of attention to adaptation in any sector. This also includes industries and manufacturing. However, this imbalance has been rectified through the NAP. Adaptation option number 12 in the NAP underscores "Developing Adaptive Industrial Systems." Under the NAP, the industrial sector is both a subject for enhanced adaptive capacity, as well as a driver or source of stronger economy-wide adaptive capacity (through infrastructure growth etc.). Ethiopia now also has GE and NAP roadmaps to 2030, including for this sector.

Other policy documents that provide guidance for Ethiopia's climate change mitigation and adaptation actions in the industry and manufacturing sector are Ethiopia's Green Manufacturing Strategy, and the Roadmap for Greening Ethiopian Industrial Parks (still under development).

Moving forward, the optimal approach towards mitigation in the sector would be the effective implementation of the Ethiopia's Green Manufacturing Strategy, integrating the Green Manufacturing Strategy's targets into the successor planning instrument to GTP II, and co-developing a Cement Industry Emissions Reduction Plan with private sector cement manufacturers. On adaptation, future focus areas should be the implementation of the NAP and conducting climate change vulnerability assessments for major industries of national importance or strategically critical industrial sites and plants.

6.5 TRANSPORT

The CRGE strategy's approach to the **transport** sector recognized that the largest contributor to Ethiopia's transport sector emissions was road transport – both passenger and freight vehicles. In response to this, the strategy's chosen abatement options included: (i) fuel efficiency and fleet modification: introducing stricter fuel efficiency standards for passenger and cargo transportation and promoting the purchase of hybrid and electric vehicles to counter the low efficiency of the existing vehicle fleet; (ii) electric rail development for freight: constructing an electric rail network powered by renewable energy to substitute road freight transport; (iii) electric integrated public transport networks for urban passengers: improving urban transport in Addis Ababa by introducing urban electric rail and enabling fast

and efficient bus transit; and (iv) Fuel-switching: substituting imported fossil fuels with domestically produced biodiesel and bioethanol. Of the range of options, the CRGE strategy prioritized fuel efficiency and fuel switching (from conventional fuels to renewables) which are appropriate choices given the major sources of transport sector GHG emissions. Beyond the CRGE strategy, the crucial role of fuel switching and fuel efficiency, as well as public transport, has also been captured in the Transport Policy of Addis Ababa (which predates the CRGE strategy).

In the context of assessing the progress of *implementation of the CRGE Strategy* (as opposed to assessing overall progress in transport sector development in Ethiopia), two policy developments in the transport sector are noteworthy for their relevance to progress on the CRGE strategy (depicted in Table 15 Policy Development relevant to the CRGE: Transport below).

Policy Instrument	Year	Focus and Objective	Originator / Developer	Institutional Responsibility
Ethiopia's Climate Resilient Transport Sector Strategy	Indeterminate	The strategy's objective is to support the creation of an affordable, integrated, safe, responsive and sustainable transport system that enhances the environmental, economic, social and cultural wellbeing of Ethiopia's population. The strategy's focus is on reducing exposure of human health, safety, and the environment to the negative impacts of transport pollution; and reducing GHGs from the country's transport network.		Ministry of Transport, Ethiopia
Transport Policy of Addis Ababa	2011	The strategy seeks to address and reduce the challenges of urban transport in Addis Ababa. Specifically, it aims to: provide safe, efficient, comfortable, affordable, reliable and accessible transport service for urban dwellers; to enable the transport sector to provide for the socio-economic development, good governance, livelihoods, and environmental protection; and to enable seamless traffic flow through a modern traffic management system.		Ministry of Transport, Ethiopia

Table 15 Policy Development relevant to the CRGE: Transport

In terms of adaptation, the transport sector CR strategy provides guidance on strengthening transport sector resilience by improving overall system planning, implementation, coordination, and efficacy, making the sector more robust and adaptive in the face of climate risks and vulnerabilities. Furthermore, it recognizes the role of a well-functioning transport sector in facilitating population-resilience, whereby people are able to use reliable transport systems as resources to improve their own socio-economic well-being, and as support systems in times of climatic shocks and stresses. The transport sector's approach to adaptation is also reflected in the NAP. Adaptation option number 11 in the NAP emphasizes "Building Sustainable Transport Systems." Under the NAP, the transport sector is both a subject for enhanced adaptive capacity, as well as a driver or source of stronger economy-wide adaptive capacity (through transport infrastructure growth etc.). For the transport sector, the NAP underscores protecting and improving the lifespan of transport infrastructure; reviewing and updating transportation design and safety standards; implementing adaptation-oriented asset management systems; and creating a transport system adequate enough to facilitate the movement of aid and support to climate change-affected communities in times of need. Ethiopia now also has GE and NAP roadmaps to 2030, including for this sector.

In the future, the CRGE strategy's mitigation objectives for the transport sector can be met by fully and effectively operationalizing the Climate Resilient Transport Strategy and the Addis Ababa Transport Policy. The key targets and indicators from both these documents should be embedded within the national planning document that succeeds GTP-II. The transport sector should also invest in co-developing a Freight and Construction Transport Emissions Reduction Plan with private sector fleet managers and transport operators.

On adaptation, future priorities should be the implementation of the NAP, and conducting climate change vulnerability assessments for major transport systems of national importance, or strategically critical transportation assets.

6.6 GREEN CITIES AND BUILDINGS

In the **urban (buildings and cities)** sector, the CRGE strategy opted for mitigation options such as accelerating the transition to high-efficiency light bulbs for residential, commercial, and institutional buildings; adopting and enhancing landfill gas management technologies (e.g., flaring) to reduce emissions from solid waste; and reducing methane production and emissions from liquid waste. The greatest emphasis was placed on the deployment of energy efficient lightbulbs, even though energy efficiency was one of the least relevant sources of abatement. The largest contributor to the urban sector's GHG emissions was the generation and disposal of solid and liquid waste, followed using off-grid power generators (run on diesel and kerosene). Given that solid and liquid waste were the largest sources of urban emissions and emissions growth, the CRGE strategy should have focused more on reducing waste related GHGs. It opted for greater abatement from more cost-effective interventions, but in the process neglected opportunities for GHG reduction from waste.

In the context of assessing the progress of *implementation of the CRGE Strategy* (as opposed to assessing overall progress in urban sector development in Ethiopia), two policy developments in key sub-sectors stand out as relevant to progress on the CRGE strategy (depicted in Table 16 Policy Development relevant to the CRGE: Green Cities and Buildings below).

Policy Instrument	Year	Focus and Objective	Originator / Developer	Institutional Responsibility
Ethiopia's Urban Wastewater Management Strategy	2017	The strategy's objective is to ensure a sustainable, resilient, safer, and healthier urban environment in Ethiopian cities and towns through improved wastewater management devoid of human contact by 2026 and beyond. The strategy notes that undertaking activities linked to the CRGE strategy may enable greater access to international finance.		Ministry of Water and Energy, Ethiopia
Ethiopia's National Energy Policy	2013	The policy provides updated guidance for the energy sector, but in the context of the CRGE Strategy's urban (cities, buildings, and waste) priorities, the policy lends strong support to energy efficiency technologies. The policy articulates the need to reduce reliance on kerosene for lighting, and for more efficient street lighting.		Ministry of Water and Energy, Ethiopia

Table 16 Policy Development relevant to the CRGE: Green Cities and Buildings

As noted before, a major gap in the CRGE strategy is failure to address adaptation needs in sectors. This includes the urban sector. Fortunately, this oversight has been rectified through the NAP. Adaptation option number 10 in the NAP underscores "Increasing Resilience of Urban Systems." Under the NAP, the urban sector is both a target-area for enhanced adaptive capacity, as well as a driver or source of stronger economy-wide adaptive capacity (through more reliable and resource-efficient infrastructure and services etc.). The NAP suggests that for the urban sector, adaptive capacity should be strengthened by improving housing conditions; expanding urban greenery; and enhancing urban infrastructure. It also emphasizes on more integrated urban land use planning and management, and the promotion of efficient household/urban waste management systems. Ethiopia now also has GE and NAP roadmaps to 2030, including for this sector.

Other policy documents that provide guidance to the cities and buildings space are Ethiopia's Urban Wastewater Management Strategy and the National Energy Policy. Neither takes climate change mitigation or adaptation into consideration, and both represent lost opportunities to mainstream or promote CRGE priorities for the urban sector.

Moving forward, the CRGE strategy's mitigation options in this sector should be updated and enhanced to include more interventions on urban solid and liquid waste management. The government should also ensure that when the urban wastewater management strategy is developed, climate change considerations - especially GHG reduction potential – are explicitly considered. For adaptation, future focus areas should be the implementation of the NAP, and conducting climate change vulnerability assessments at the woreda and city level (building on and integrating the Woreda Disaster Risk Profiles already developed for several woredas in the country by the National Disaster Risk Management Commission).

6.7 HEALTH

The CRGE Strategy's focus on climate change mitigation manifested in certain key sectors of the country being excluded from the strategy, despite the pressing need for climate resilience in such sectors. The **health sector** is the most significant of these omissions, given wide-ranging climate change impacts on public health and the need, therefore, for adaptation in the sector. It was not included in the CRGE Strategy since it is not a source of GHG emissions (other than through energy use, like any end-user). Future revisions and updates of the CRGE Strategy are likely to take a holistic approach to a green and climate-compatible economy, and integrate both low-carbon development (mitigation) and climate resilience (adaptation). Thus, it is expected that the health sector will be clearly featured in any future iteration of the CRGE Strategy.

In 2018, Ethiopia released a National Health Adaptation Plan to Climate Change, a two-year plan with short-term strategic interventions to make the health sector climate resilient, and to help mainstream climate change into Ethiopia's health services and health delivery systems. It is often referred to as the H-NAP (depicted in Table 17 Policy Development relevant to the CRGE: Health below).

Policy Instrument	Year	Focus and Objective	Originator / Developer	Institutional Responsibility
National Health Adaptation Plan to Climate Change, 2018-2020[31]	2018 (Draft)	The NHAPCC's objectives entail: enhancing early warning systems and surveillance in the context of climate change health emergency risk management; building the capacity of health sector for the realization of a climate resilient health system; enhancing the climate resilience of the health system in provision universal health coverage; and creating an enabling environment for health adaption to climate change. The plan comprises of ten key intervention areas.	DFID/WHO	Ministry of Health, Ethiopia

Table 17 Policy Development relevant to the CRGE: Health

A key guiding document for climate change adaptation in the health sector is the National Health Adaptation Plan to Climate Change, or H-NAP. The H-NAP (Federal Ministry of Health, Ethiopia, 2018) is a compelling example of a governance instrument that explicitly and intentionally creates policy guidance on climate change in a sector (in contrast to sectoral growth and development strategies that may contain mentions of climate change, but contain traditional socio-economic strategies that indirectly build resilience and adaptive capacity by supporting a better-resourced workforce).

[31] This document superseded (and built on) the precursor 2014 National Framework for a Climate Resilient Health Sector, by the Ministry of Health (https://www.who.int/globalchange/resources/wash-toolkit/national-framework-of-climate-resilient-health-sector.pdf?ua=1).

More recently, adaptation in the health sector was also covered in the NAP. Adaptation option number 5 in the NAP emphasizes that Ethiopia must improve human health systems through the implementation of changes based on an integrated health and environmental surveillance protocol. This approach is underpinned by the intent to strengthen disease surveillance related to climate change and health, and promote evidence-based policy decisions. The NAP's focus, in this measure, is on strengthening health systems to prepare them to better deal with gradual changes and sudden shocks, including those linked to climate change. Ethiopia now also has GE and NAP roadmaps to 2030, including for this sector.

While the NAP prioritizes disease surveillance protocols and systems related to climate change and health, as well as awareness-building within health sector workers and healthcare practitioners, the H-NAP provides an even more comprehensive approach, whilst still making improved surveillance and awareness central tenets. Given that the H-NAP was developed in a more granular manner, it is recommended that in the immediate-term (2019-2020), resources be dedicated to the full implementation of the H-NAP, which will automatically translate into implementation of the health sector elements of the NAP. Full implementation of the H-NAP will also drive some mitigation measures in the health sector, as this is an element included in the H-NAP as well.

Policy Successes

Feedback from Stakeholder Workshop

- Integration of socio-economic and livelihoods considerations with climate change
- Balancing increase in agricultural productivity with climate change mitigation
- Ambitious GHG reduction commitment

Policy Challenges

Feedback from Stakeholder Workshop

- Absence of adaptation and resilience from CRGE strategy
- More focus needed on early warning systems
- Need for more community participation and stakeholder involvement in CRGE
- Integration of sectors

Suggested Next Steps

Feedback from Stakeholder Workshop

- Improving ability to measure policy's impacts
- Strengthen manpower and capacity
- Enhance documentation and reliable data
- Prioritise greater policy coordination
- Scale up solutions

7 Institutional

7.1 CRGE FACILITY AND ASSOCIATED INSTITUTIONAL ARCHITECTURE

The Climate Resilient Green Economy Facility (CRGE Facility) is Ethiopia's primary institution mandated to give effect to the CRGE Strategy and to manage Ethiopia's efforts towards its 2030 CRGE targets.

Following the development of the CRGE strategy, CRGE facility was established to address financial and technical issues. The Facility's functions are bifurcated between the Environment, Forests, and Climate Change Commission (EFCCC) and the Ministry of Finance. Programmatic and technical aspects of CRGE implementation are vested with the former, and financial and budgetary aspects of CRGE implementation are vested with the latter.

CRGE directorates/units or case teams have been established in almost all relevant line Ministries.

At the national level the CRGE strategy is coordinated by Inter-Ministerial Steering Committee answerable to the Prime Minister's office. All ministers of sectoral institutions are members of the steering committee. Under the Inter-Ministerial Committee there is also a CRGE management committee, co-chaired by EFCCC and Ministry of Finance, where the sectoral Ministries are represented by their state ministers or assigned representatives. Another body – the sub steering committee – is responsible for the management of the CRGE within the sectoral institutions.

The overall coordination of the CRGE is the role of the inter-ministerial committee which meets every six months (although, in practice, the committee has not been able to meet as regularly as stipulated). The management committee makes decisions on the budget allocation for CRGE implementation, based on the proposals submitted to the facility, and also monitors day-to-day aspects of the CRGE implementation. The CRGE facility is composed of the technical and financial wing which resides in the EFCCC and MoF. The sub steering committee within each ministry is chaired by the minister in charge, and members include directors of the directorates under the ministry. Currently only a few ministries have established their sub-steering committees.

EFCCC's efforts in coordinating the implementation of CRGE are focused on putting in place technical systems and procedures needed. Recently the EFCCC reorganized its structure and put in place CRGE planning, implementation and verification coordination, technology transfer, resource mobilization, negotiation and other relevant directorates for the overall coordination of CRGE in the country. Each such directorate has its own role to play in the implementation of CRGE. To this end, the following overall CRGE governance structure has been established at the federal, regional and local level. However, significant staffing gaps remain at the regional and local levels.

Regional level CRGE institutions are expected to be set up and operationalised soon in the different sectors' regional offices or regional bureaus.

A more detailed discussion of institutional structures and roles at the national level is provided in Annex D.

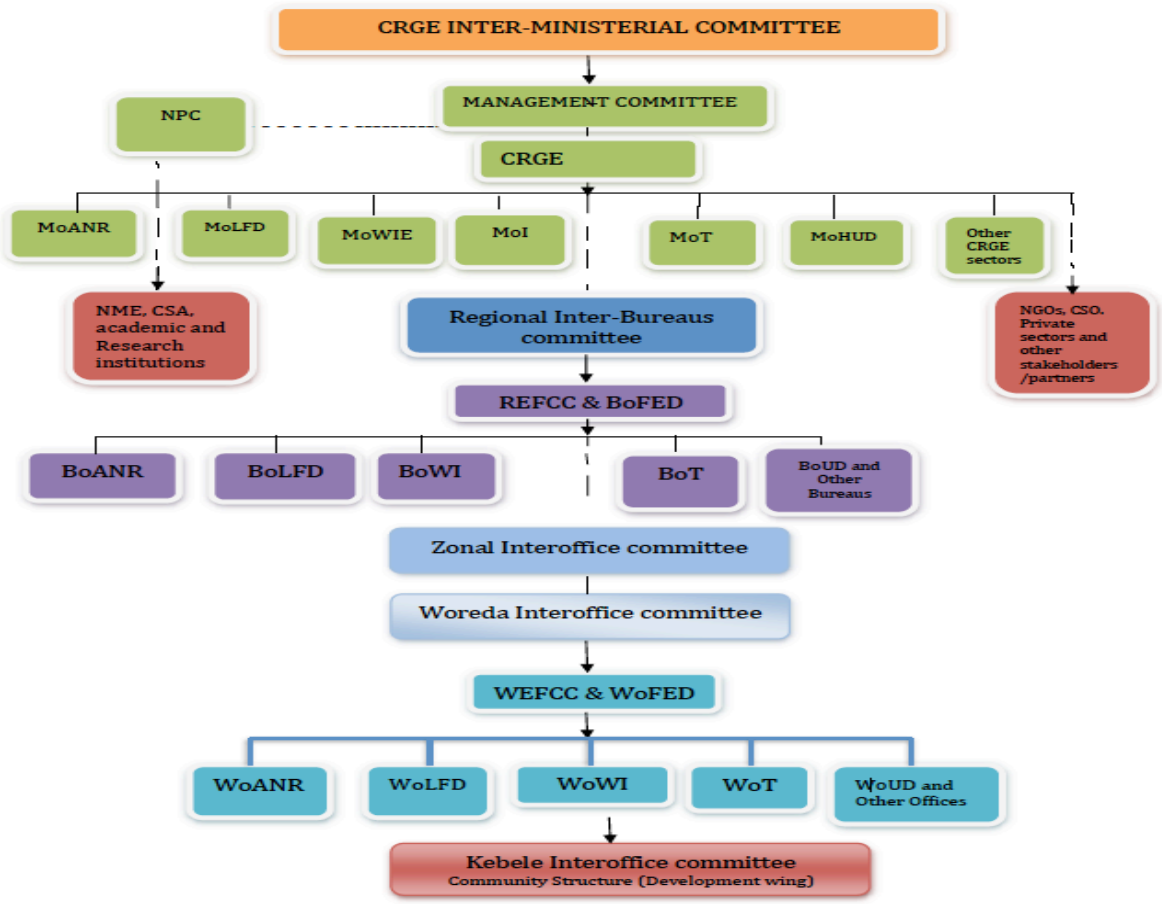

Figure 13 Reorganized structure of CRGE Implementation Arrangements

The CRGE Facility has developed a wealth of documentation that provides institutional guidance and sets up frameworks for effective operations. These include the CRGE Facility Operations Manual; the CRGE Registry; the CRGE Monitoring and Evaluation System Manual; the Environmental and Social Safeguards Framework; the project/programme concept note and proposal preparation guidelines and templates; project/programme appraisal guidelines and templates; the CRGE National Capacity Development Programme; a gender integration framework; and various other policies.

While the CRGE Facility has achieved important milestones in terms of the development of key policies and guidelines, which provide predictability and consistency to its activities, it appears that several of these guidance documents have yet to be fully translated into implementation.

For instance, the CRGE Registry (http://www.ethcrge.info/home.php) is non-functional, and thus unable to fulfil the data and information management role envisioned.

7.2 PROGRESS UNDER GTP-II

According to the GTP-II Mid Term Review, the EFCCC undertook several important actions during the first half of GTP-II, which supported progress on the CRGE strategy.

- Enhancing the contribution of development partners: Ten concept notes and twelve programs and project proposals were evaluated and forwarded to development partners, and previously forwarded proposals were followed up on. As a result, over USD 67.17 million was secured for local projects and USD 6.8 million for projects underway in Ethiopia, Kenya and Uganda;

- Increasing public awareness and participation on the green economy: awareness generation campaigns were planned for 14.6 million people and efforts were made to create awareness for 14.9 million people on the green economy via training, seminars, electronic and print media channels;
- Coordinating and supporting cross sector green economy activities: A survey was conducted with seven sector ministries based on a checklist of national greenhouse gas emissions measurement, registration and certification frameworks. Based on survey findings, an action plan was developed, and
- Building greenhouse gas emission measurement, reporting and verification system - in the 2013/14 fiscal year, a draft report was prepared on estimation of greenhouse gas emissions from land use and sewage of energy, industry, agriculture, forestry and other sectors had been prepared. Similarly, a report was developed on the amount of greenhouse gas emissions caused by deforestation and the amount of greenhouse gas removed from the air due to afforestation has been identified and reported to the UNFCCC.

Despite these achievements, the review of progress on CRGE implementation found that CRGE mainstreaming under GTP-II suffered from the challenge of getting "lost" within GTP-II implementation. In terms of verbiage and text, CRGE was mainstreamed in several places (it is mentioned numerous times in GTP-II documents). However, in terms of giving effect to discrete, measurable, identifiable elements of CRGE during implementation of GTP-II, the government's inability to specifically identify and point to CRGE-linked activities, projects, and programmes during the GTP-II period creates a constraint in determining whether CRGE principles and priorities really resulted in any outputs and outcomes during GTP-II that would not have otherwise occurred anyway in due course of GTP-II, irrespective of CRGE mainstreaming. An effective mainstreaming paradigm is one where an issue becomes manifest in a cross-cutting way, and elements of it – in this case CRGE – are embedded throughout. However, to translate this mainstreaming into practice, there also needs to be evidence of how the embedded elements yielded specific results. In Ethiopia's case, the lack of a mechanism to pinpoint CRGE implementation within the wider GTP-II rubric has resulted in a lack of clarity about whether GTP-II did, in any way, accelerate tangible results on CRGE or not. This will be rectified in the CRGE mainstreaming effort under the country's new ten-year perspective plan, for which CRGE has already been identified as a key pillar.

7.3 INSTITUTIONAL CAPACITY CHALLENGES AND GAPS

A recent review of institutional structures and coordination of CRGE implementation at all levels revealed cause for concern. The assessment[32] found that gaps both in procedure (such as frequency of committee meetings) and in efficacy, and that CRGE actions were driven increasingly through externally funded initiatives rather than be driven through mainstreamed processes within the Ethiopian government. The report noted (emphasis added):

> "At the national level, the coordination of the CRGE is found to be weak, which is manifested by various ways such as not following the time schedules of the steering committee meetings as per the operational manual. Although the manual suggests quarterly meetings, the inter-ministerial steering committee meeting minutes show that the committee was able to meet only four times during the past four years. It is also found that, the steering committee meeting was often attended by representatives of the ministers, not the minister him/herself, which has its consequence on the re-enforcing of decisions. It is also found that, most decisions which were passed during the inter-ministerial committee meeting are not fully implemented for various reasons, but also since regional presidents are not members of the national inter-ministerial committee. Similarly, the CRGE management committee is not regularly meeting as per the schedule among others due to reshuffling of higher officials and institutional re-arrangements. In summary, the assessment revealed that, ***there is declining ownership of the CRGE among the responsible officials and experts, and increasing intention of associating the CRGE to external projects, manifested by active engagement of sectoral institutions when there is externally funded project and diminishing interest otherwise***."[33]

[32] EFCCC, 'Preliminary Assessment Report on the Institutional Structure and Coordination of the Climate Resilient Green Economy (CRGE) Implementation at the Federal Level,' January 2019.
[33] EFCCC, ibid.

The review also articulated what this current assessment found, i.e. the CRGE Directorates (or Units and Bureaus) within various line ministries have only marginal influence. They are not well integrated into the workings of the broader Ministry, and do not have much ability to mainstream CRGE considerations into the Ministry as a whole.

Another critical shortcoming of CRGE institutional structures and implementation flagged in the review, and also evidenced during the current assessment, is the fact that the existing CRGE operational manual and M&E manual was designed for use with facility-funded projects, but now are no longer appropriate for the CRGE's institutional architecture since CRGE has been mainstreamed into GTP-II. And it also does not consider the current structure of the organizations involved in the CRGE implementation.

Literature review as well as direct engagement with several key CRGE and sectoral stakeholders point to some key areas for strengthening:

- **Knowledge management systems**: The CRGE Facility does not appear to have a functional, integrated, searchable electronic archive of its documents and materials. This leads to the challenges of loss of institutional memory (since not all staff necessarily have access to the same content and guidance), as well as transaction costs in terms of repetitive effort to identify, track down, retrieve, and disseminate information and data when required;
- **M&E systems:** there is a lack of clarity and potential duplication in M&E. The M&E function sits with the Ministry of Finance, yet the programmatic element of CRGE efforts lie with the EFCCC. M&E is less effective when fragmented. This has been overcome in the past through joint field missions and joint evaluation activities, but a more holistic, unified, comprehensive M&E approach would be beneficial;
- **Proliferation of indicators:** another challenge is the multiplicity of performance indicators, which has hindered streamlined M&E. Indicators have been developed by the CRGE Facility itself, as well as by the ECRC at EDRI. In addition, the National Planning Commission has its own set of GTP indicators, and there is also a detailed indicator framework provided within the CRGE's own M&E manual. At present, there is no finality about which sets of indicators are final and official, which prevents resources from being directed at setting up the corresponding M&E systems and processes, and
- **Need for re-structured mandate**: prior to 2015, the CRGE Facility was responsible for resource mobilization, project and programme solicitation, selection, funding, and M&E of interventions in Ethiopia that supported the goals of the CRGE Strategy. This provided a clear institutional focus and resource-allocation. Since the mainstreaming of CRGE into GTP-II, there appears to be a more diluted sense of the CRGE Facility's precise role, beyond the development of guidance documents and building of capacity. There is room for re-envisioning the role of the CRGE Facility under GTP-II and moving forward, not only for resource mobilization but also as a centralised hub for the conceptualization, tracking, M&E, MRV, and assessment of all climate change related activities in the country, across different sectors.

Responses to Questionnaire on CRGE Institutional Capacity and Functions

(the perspectives below were shared by respondents who filled the questionnaire)

What's Worked Well

- Training workshops for sectoral experts from different ministries for CRGE mainstreaming into GTP-II
- Creation of CRGE mainstreaming checklist for sector experts to refer to, as a decision support tool

What's Not Worked as Well

- Regular use of and reference to the mainstreaming checklist
- Coordination between CRGE Facility and sectoral CRGE institutions
- Engagement with the private sector in any form
- Application of CRGE facility guidelines for projects that have climate change or CRGE linkages but are not Facility-funded (M&E manual, Gender framework, ESS framework are not useful for mainstreamed projects)
- Knowledge management and data and information-sharing systems, including tracking of financial data
- CRGE registry (is defunct and no longer exists)

- Consultations and communication at the regional and woreda level on CRGE operations manual
- Division of roles in the CRGE Facility between technical wing (EFCCC) and financial wing (MoF)
- Lack of harmonization in the structures and responsibilities of CRGE staff between different ministries
- Regional-level technical or administrative capacity to grasp climate change and implement CRGE functions
- MRV of greenhouse gas reductions and tracking of other project key performance indicators
- Accountability for results, which is key for mobilizing climate finance

7.4 INSTITUTIONAL ARRANGEMENTS RECOMMENDATIONS MOVING FORWARD

1. Develop a centralised user-friendly, interactive, ICT platform for knowledge and data management that allows for document archiving and record-keeping;
2. Unify all M&E (programmatic and technical outputs as well as financial tracking and recording) in a single M&E unit within the Facility;
3. Adopt a single set of indicators and adhere to this one set moving forward, and
4. Reduce fragmentation in the institutional set up and re-structure the CRGE Facility to play a more proactive role in guiding and overseeing and tracking all climate related actions in the country. This redefinition could focus on the implementation and reporting of NDC progress. Consider making the CRGE Facility a semi-autonomous structure that works in collaboration with but independently of the EFCCC and MoF.

Institutional Successes

Feedback from Stakeholder Workshop

- Strong commitment articulated in CRGE Strategy
- Positive image of Ethiopia in front of the international community, as a leader on climate change
- Establishment of CRGE Facility and directorates in major sectors
- Operationalisation of CRGE institutional architecture
- Increasing awareness of climate change issues in development work
- Development of the climate finance tracking tool at MoF

Institutional Challenges

Feedback from Stakeholder Workshop

- Inadequate and ineffective coordination between CRGE Facility and sector CRGE institutions
- Lack of coordination between EFCCC and MoF
- Technical capacity on various aspects of climate change and CRGE implementation
- Lack of information and data management systems and archives
- Institutional structures not operating as designed
- Lack of a robust M&E tracking system

Suggested Next Steps

Feedback from Stakeholder Workshop

- Centralise CRGE functions in one entity, not split between EFCCC and MoF
- Give PM's Office more direct oversight
- Increase technical capacity and project management capacity at the CRGE Facility
- Create regional level CRGE capacity and include in governance
- Design and structure programmes with specific mitigation and adaptation impacts
- Design bankable projects and mobilise more resources

8 The Private Sector

The CRGE's 'Private Sector Strategy For Ethiopia's Climate Resilient Green Economy (CRGE) Facility' (CRGE, 2016) provides a useful blueprint for financing the private sector in order to enable the realisation of the targets of the CRGE as this is not clearly outlined in the original CRGE strategy or the NDC. Little to nothing has been published on the topic of the private sector in relation to climate change in Ethiopia, and this study also found that little was known or reported around private sector involvement[34]. However, private sector partners have been key in delivering many of the projects in all sectors, and in the case of the livestock and agriculture sector, project and programme beneficiaries themselves can be seen to be private sector actors, as they are producers or processers along the agricultural value chain. There are key opportunities for new or further private sector involvement in key sectors to contribute towards the attainment of the goals set out in the CRGE/NDC.

In relation to the **agriculture** sector, a review of Ethiopia's Agriculture Sector Policy and Investment Framework (2010–2020) (Chipeta et al, 2015), found that one of the outcomes of GTP2 is the advent of an 'indigenous' private sector, which is more formal and stable than prior 'micro-enterprises', which, when teamed with public sector investments in public goods, will enable the private sector more opportunities to act in agricultural value chains (Chipeta et al, 2015). In the **livestock** sector, The Livestock Master Plan (ILRI, 2015) identifies the following opportunities for private sector inclusion in livestock production:

- 'The introduction of policy measures to rationalize public and private sector roles in veterinary service provision, leading to the transition to the private provision of clinical services wherever feasible and public oversight and quality regulations;
- The promotion of the establishment of more private-sector flour and oil mills to encourage the production of additional feeds from agro-industrial by-products by introducing protective policies against flour and cooking oil imports, and
- Promotion of the importation and dissemination of improved semi-scavenging poultry breeds by the private sector and/or through public-private partnerships, combined with the improved capacity of private animal health services to provide critical vaccines, in tandem with the continued promotion by the GoE extension services of improved feeding' (ILRI, 2015, pp. 3-4).

This can be made possible through better engagement with the Ethiopian Leather Industries Association (ELIA) Leather Industry Development Institute (LIDI), the Agricultural Transformation Agency (ATA), Regional Trade and Transport Bureaus and Regional Cooperative Bureaus (USAID , 2013).

The **industry** sector is broad and covers cement and textile production as well as manufacturing and mining. While there has been real progress made in industry MRV and industry adoption of CRGE MRV frameworks (Ministry of Industry, 2016), there is still little private sector involvement in climate related activities. The cement industry is well monitored and reported on, and certain initiatives (such as increasing share of biomass in the energy mix as well as several others).

In terms of **forestry**, the private sector is currently a key driver of deforestation in Ethiopia; however, it also holds good opportunities to support possible solutions to deforestation and land degradation. The 2017 Ethiopia Forestry Sector Overview (MEFCC, 2017) highlights the construction, furniture and utility (electricity infrastructure) sectors as the prime sectors to absorb forestry products. However, as the CRGE focuses on reducing emissions from deforestation and forest degradation, this will have to be enabled through the private sector support in the establishment of establishment of properly managed plantations. Furthermore, private sector support towards increased domestic production of wood, would not only create green jobs, but also lower emissions through lowered imports. Furthermore, more domestic production of cookstoves can move reliance away from wood burning for cooking purposes (MEFCC, 2017).

[34] Experts and stakeholders were questioned around private sector involvement in their relative sectors and reported little to no active involvement.

In the **transport** sector, the expansion of public transport systems such as railways, light train and BRT creates opportunity for private sector involvement in resource manufacturing as well as operation function (provided that the methods utilised in production and operationalisation were themselves green/emissions conscious) (AfDB , 2017).

There are several opportunities for enhanced private sector involvement in the **green cities** sector, particularly in the areas of green infrastructure and provision as well as solid waste management. This can be enabled though the creation of an enabling policy and legal environment. This can be done through:

- 'Mainstreaming green infrastructure into planning processes and documents;
- Updating codes to include green infrastructure and enforce new regulations;
- Developing incentives to promote green infrastructure;
- Communicating and demonstrating the benefits of green infrastructure, and
- Providing technical assistance and coordination for green infrastructure implementation' (USAID, 2018, pp. 2-5).

The **energy** sector in Ethiopia is highly reliant on hydropower, which is highly susceptible to climate change, as such, Ethiopia is experimenting with a range of other power production projects which could all bolster private sector involvement, such as:

- Waste-to-energy projects in secondary cities;
- Improved cook stoves for households;
- Energy efficiency for industries;
- Small and medium-scale renewable power plants, ranging from biomass to sugarcane bagasse to small hydropower;
- Alternative fuels for industries (such as improved biomass for cement industries);
- Solar thermal for heating services (particularly water heating), and
- Ethanol for cooking to replace non-sustainable biomass and petroleum fuels (Cities Alliance, 2017, pp. xii-xiii).

More interaction is required between the state and the private sector to create targeted private sector goals for each sector. A possible enabler of more integrated state/private sector co-ordination in response to Climate Change could be the creation of a private sector liaison office (or officer) within the CRGE Facility to engage with the private sector on climate change activities, including the NDC (for enhanced private sector engagement on both resource mobilization as well as for technical partnership in implementation).

9 Recommendations on the Way Forward

The CRGE/NDC implementation progress assessment has identified several areas wherein Ethiopia can strengthen its climate change actions. These have been grouped into recommendations on: (i) policy and strategy; (ii) project design and structuring; (iii) MRV of mitigation and M&E of adaptation; (iv) climate finance budgeting and tracking; (v) knowledge and information management; and (vi) institutional arrangements.

Further details on these recommendations, such as phasing and indicators, can be found in Section 3 of the 'Follow-Up Note to the CRGE Implementation Progress Assessment: Actions for the NDC Update – 2020-2030,' a companion document developed to supplement this assessment report.

9.1.1 POLICY AND STRATEGY REVISIONS

- The Government of Ethiopia should conduct a fresh national and sectoral GHG inventory, adhering to 2006 IPCC guidelines, to establish accurate baselines for the years 2010 and 2020. The CRGE Facility's technical wing (at the EFCCC) should be accountable for implementing this. This comprehensive exercise should be initiated by 2021, and completed and verified by 2023 *(findings in the CRGE implementation progress assessment suggest that the 2010 baseline was potentially an underestimate nationally and in key sectors).* The CRGE Inter-Ministerial Steering Committee should verify that this will be done.
- The Government of Ethiopia should commission fresh GHG growth projections (nationally and by sector) between 2020 and 2030, to establish a more accurate trajectory and recalibrate the level of ambition. The CRGE Facility's technical wing (at the EFCCC) should be accountable for implementing this. The projections should be initiated by 2021, and completed and verified by 2023 (*findings in the CRGE implementation progress assessment suggest that the 2030 BAU emissions projection was potentially an overestimate nationally and in key sectors, chiefly due to assumptions of economic growth).* The CRGE Inter-Ministerial Steering Committee should verify that this will be done.
- The CRGE Facility's technical wing (at the EFCCC) should lead the setting of fresh GHG reduction targets based on the updated calculations, and opt for relevant best practice in terms of mitigation interventions recognized (globally and regionally) as having climate change mitigation outcomes. The Inter-Ministerial Steering Committee should oversee this and ensure new targets are set by 2025.
- The EFCCC should conduct detailed sectoral climate change risk and vulnerability assessments to establish accurate baselines for vulnerability, and to identify high-priority areas for intervention to build adaptive capacity and reduce vulnerability, as well as measurable targets. The CRGE Facility's technical unit (at the EFCCC) should be accountable for ensuring this. Assessments should be initiated by 2021, and completed by 2023. The CRGE Inter-Ministerial Steering Committee should verify that this will be done.
- The Government of Ethiopia (through the technical unit of the CRGE Facility at the EFCCC and the financial unit of the CRGE Facility at the Ministry of Finance) should revise the CRGE strategy and the NDC to reflect the new baseline, new 2030 targets, updated mitigation and adaptation priorities and interventions, with a special emphasis on revised approaches for high mitigation potential and high adaptation potential sectors. The Inter-Ministerial Steering Committee should oversee this by 2023, verify this, and publish the revised CRGE strategy by 2025, before the next NDC update. This effort should reflect a special emphasis on a revised approach for mitigation in high-emitting sectors (AFOLU, industry, and transport) and a more targeted approach, sector-specific for adaptation in high-vulnerability sectors (AFOLU, health, water, and energy).

9.1.2 PROJECT DESIGN AND STRUCTURING

- The PDC, EFCCC, and MoF should ensure that future climate change interventions (with direct climate change related benefits or outcomes) as well as all other interventions with climate change co-benefits (indirect climate change outcomes) are explicitly conceptualised, designed, and structured to respond to an established climate change-linked baseline, and to intentionally target climate related outcomes, to avoid the loss of future opportunities to reduce GHG emissions or vulnerability. The technical wing of the CRGE

Facility (within the EFCCC) should issue guidelines to ensure this by 2023, updating them regularly. The CRGE Inter-Ministerial Steering Committee should be responsible for verifying this is done, and for measuring results.

- Both units of the CRGE Facility, i.e the technical wing at the EFCCC and the financial wing at the Ministry of Finance), and the PDC, should ensure that during project origination and development, all project developers and champions incorporate global best practice on climate change mitigation and adaptation activities in sectors sector (e.g. IPCC reports and special reports; OECD's DAC Rio Markers; MDBs-IDFC Common Principles on Mitigation and Adaptation Finance etc.). This will ensure that interventions intended to have climate benefits or co-benefits are informed by science and technical understanding on what constitutes climate change mitigation and climate change adaptation outcomes. The Government of Ethiopia should issue guidelines to ensure this by 2021, updating them regularly. The CRGE Inter-Ministerial Steering Committee should be accountable for ensuring this is done, and measuring results.

9.1.3 MRV OF CLIMATE MITIGATION AND M&E OF ADAPTATION IMPACTS

- The Government of Ethiopia should rapidly operationalize Ethiopia's existing MRV frameworks (developed in 2016 for major sectors) by translating theoretical guidance into operational systems, investments, staffing, and other resources. In doing so, it should update the frameworks and guidance as necessary to ensure consistency with UNFCCC's MRV guidelines, international best practice (GIZ, n.d.), and (for future refinement of national MRV systems beyond 2020) the Modalities, Procedures, and Guidelines (MPGs) under the Enhanced Transparency Framework (ETF) adopted under the Katowice Package (UNFCCC, 2018). The technical unit of the CRGE Facility (at the EFCCC) and the financial unit of the CRGE Facility (at the Ministry of Finance) should jointly establish a task force to achieve this by 2021, and publish annual MRV reports thereafter. The CRGE Inter-Ministerial Steering Committee should oversee this and ensure the MRV mechanisms are in place and effective.
- The EFCCC, MoF, plus the Planning and Development Commission should ensure the use of a consistent set of indicators related to climate change, with a final selection and official notification of indicators (sector level, programme level, project level, and activity level – both output indicators and outcome indices). Mandate the use of the same core set of indicators by all institutions, including the Planning and Development Commission, the EFCCC, the Ministry of Finance, all Ministries, donors, and implementation partners (with the freedom for all to additionally adopt, track, and report on further non-core indicators as may be contextually relevant). This should be monitored through a consultative review process by 2021 onwards, with the EFCCC and the Ministry of Finance (together, the technical and financial wings of the CRGE Facility), and PDC responsible for adopting and using consistent indicators. The CRGE Inter-Ministerial Steering Committee should verify that this will take place.
- The CRGE Inter-Ministerial Steering Committee should require all Ministries to develop climate change mainstreaming plans for the development plan that succeeds GTP II, as well for the ten year perspective plan, using the chosen core indicators, and thereafter prepare and submit to the CRGE Facility's technical wing (at the EFCCC) annual climate change mainstreaming reports using the same consistent set of core indicators (as well as additional sector-specific climate change indicators finalized for each sector under the next plan, as relevant to its own planned priorities and activities, to be reported on for the entire duration of the next national plan period). The Government of Ethiopia should issue guidelines for this by 2021, and the PDC should oversee this, verify this, and monitor reporting on indicators.

9.1.4 CLIMATE FINANCE BUDGETING AND TRACKING

- The Ministry of Finance should design and put in place a public expenditure review framework at the Ministry of Finance, the Planning and Development Commission, and across all government institutions (at the Federal, Regional, and Woreda level) that enables disaggregation of distinct budgetary flows and allocations. Institute a "coding" system for (a) climate change mitigation, (b) climate change adaptation, and (c) cross-cutting climate change to enable isolating public revenue and expenditure linked to climate change. These budget codes should be adopted and published by 2021, and maintained, applied, and tracked consistently thereafter. The CRGE Inter-Ministerial Steering Committee should oversee this and ensure codes are operationalised.

- The CRGE Inter-Ministerial Steering Committee should direct the Ministry of Finance and the Resource Mobilization Directorate at the EFCCC to prepare annual reports on climate change finance budgeting and tracking, at the national and sectoral level, to be published in Amharic and English. The Ministry of Finance should start publishing annual public expenditure reports on CRGE finance by 2021, and making them publicly available. The CRGE Facility's financial wing (at the Ministry of Finance) and the EFCCC's Resource Mobilization Directorate should be accountable to ensure this is implemented, and the CRGE Inter-Ministerial Steering Committee should verify this will be done.

9.1.5 KNOWLEDGE AND INFORMATION MANAGEMENT

- The CRGE Facility's technical unit should establish a user-friendly, reliable, well-designed and organized centralised information and knowledge management system (dual platform – server based and cloud based) at the EFCCC. This searchable database and archive will capture and store all climate change related data and information in an easily classifiable, retrievable manner. The EFCCC should convene a task force by 2021 to design and bring into effect this new information and knowledge management system by 2023, and the CRGE Inter-Ministerial Steering Committee should verify this will be done.
- The CRGE Inter-Ministerial Steering Committee should require all sectors to maintain an online, dual-platform (server-based and cloud-based) information and knowledge management system, to serve as searchable archive to trace and retrieve relevant documents and data, as well as to enable sharing and real-time dissemination of climate change related information and activities documented within the sector (at the national, regional, and woreda level). These Ministry systems should be completely integrated with the national centralised system at the CRGE Facility's technical wing (at the EFCCC). The EFCCC should convene a task force by 2021 to design and implement this new information and knowledge management system by 2023, and the CRGE Inter-Ministerial Steering Committee should verify this will be done.

9.1.6 INSTITUTIONAL ARRANGEMENTS (CRGE FACILITY OPTIMIZATION)

- The Government of Ethiopia should strengthen the CRGE Facility's mandate to guide, advise, monitor, seek reporting from, evaluate, and assess all interventions in Ethiopia with a climate change linkage (mitigation or adaptation). The strengthened mandate and functions should be given legal effect through a proposed Ethiopian Climate Change law by 2021, to be driven and overseen by the CRGE Inter-Ministerial Steering Committee.
- The CRGE Inter-Ministerial Steering Committee should require non-governmental institutions implementing climate change related activities in Ethiopia (even those operating completely independently, i.e. not receiving any public funds directly or any pass-through funds) to submit project design documents, project monitoring and evaluation reports, project closure reports, and project financial reports to the CRGE Facility's technical wing (at the EFCCC) for all climate change initiatives. This requirement should be captured in a proposed Ethiopian Climate Change Law by 2021. The EFCCC should be responsible for implementing the receipt, recording, and storage of reports, and the CRGE Inter-Ministerial Steering Committee should verify periodically that such submissions are occurring.
- The Government of Ethiopia should conduct an options analysis (by an external service provider) for exploring restructuring of the CRGE Facility to end the bifurcation of responsibilities and activities between the EFCCC and Ministry of Finance, and – *if needed* -- to create a unified, integrated single institutional hub for all climate change related activities in Ethiopia (in particular, for NDC coordination). The options analysis should evaluate the stakeholder-suggested option of a semi-autonomous body independent of Ministries. The Options analysis should be completed in 2020 and its recommendations fully operationalised by 2021.
- The CRGE Facility's technical unit (at the EFCCC) should create a private sector liaison office (or officer) within the CRGE Facility to engage with the private sector on climate change activities, including the NDC (for enhanced private sector engagement on both resource mobilization as well as for technical partnership in implementation). This position, including its functions and mandate, should be created and brought into effect by 2021, and the EFCCC should be accountable for monitoring the results of the office. The CRGE Inter-Ministerial Steering Committee should verify that this will be done.

Bibliography

Adem, K. D., 2019. *CRGE/NDC review – 31 May – 23 August 2019,* Addis Ababa : Pegasys.

AfDB , 2017. *Enhancing Sustainable Development in Ethiopia through Climate Change Mitigation and Adaptation. Opportunities, challenges, and requirements for Ethiopia's participation in mechanisms under Article 6 of the Paris Agreement1,* Abidjan: AfDB .

AFDB, 2014. *Project Appraisal Report. Drought Resilience and Sustainable Livelihoods Program in the Horn of Africa (DRSLP) Project II,* Abidjan: The African Development Bank .

Africa Rising, 2015. *Africa RISING Ethiopia project in Southern Nations, Nationalities and Peoples, The Tigray, The Oromia and the Amhrara regions. ,* Addis Ababa: Africa Rising.

Africa RISING, 2019. *Africa RISING In the Ethiopian Highlands: An Overview.* Addis Ababa , Africa RISING.

Africa RISING, 2019. *Early Win Projects.* [Online]
Available at: https://africa-rising.net/early-win-projects/
[Accessed 27 10 2019].

African Development Bank Group, 2013. *Harar Water Supply and Sanitation Project: Improving Livelihoods and Enhancing Water Security in Ethiopia.* [Online]
Available at: https://www.afdb.org/en/projects-and-operations/selected-projects/harar-water-supply-and-sanitation-project-improving-livelihoods-and-enhancing-water-security-in-ethiopia-86

ALINE, 2018. *EDGET Project Final Evaluation,* Addis Ababa : ALINE.

ASARECA, 2015. *Reducing greenhouse emissions from the livestock sector: The case of Ethiopia,* Entebbe: ASARECA.

ATTSVE, 2019a. *ATVETs.* [Online]
[Accessed 31 10 2019].

ATTSVE, 2019b. *Brochure: Working Towards a Market-Based Economy ,* Addis Ababa: ATTSVE.

C. Okereke, A. C. M. G. T. G. J. W. Y. M., 2019. Governing green industrialisation in Africa: Assessing key parameters for a sustainable socio-technical transition in the context of Ethiopia. *World Development,* pp. 279-290.

CAARIA , 2016. *Working Paper no.8 Review of current and planned adaptation action in Ethiopia ,* s.l.: s.n.

CAT, 2019. *Climate Action Tracker Current Policy Projections.* [Online]
Available at: https://climateactiontracker.org/countries/ethiopia/current-policy-projections/
[Accessed 11 10 2019].

CDKN, 2016. *Aligning energy development and climate objectives in Nationally Determined Contributions ,* London: CDKN.

CDKN, 2017. *Mapping of Energy Institutions and Initiatives in Ethiopia,* s.l.: DFID.

CDP, n.d. *Building pressure: Which cement companies are prepared for the low carbon transition?.* [Online]
Available at: https://www.cdp.net/en/investor/sector-research/cement-report

CGIAR, 2018. *Climate Resilient Green Economy Strategy 'Sector-wise GTP II Implementation Monitoring Checklist' ,* Copenhagen: CGIAR.

CGIAR, 2018. *Climate Resilient Green Economy Strategy: Sector-wise GTP II Implementation Monitoring Checklist,* s.l.: s.n.

CGIAR, 2019. *New project launched to strengthen veterinary service delivery in Ethiopia.* [Online]
Available at: https://livestock.cgiar.org/2019/04/26/heard-ethiopia/
[Accessed 11 10 2019].

Chipeta et al, 2015. *Ethiopia's Agriculture Sector Policy and Investment Frameowrk (2010-202). External Mid-term Review ,* Addis Ababa : AKLDP.

Cities Alliance, 2017. *The Climate Change and Energy Debate in Ethiopia,* Brussels : Cities Alliance.

CNFA, 2019. *Agriculture Growth Program - Livetcok Market Development.* [Online]
Available at: https://www.cnfa.org/program/agricultural-growth-program-livestock-market-development-2/
[Accessed 23 10 2019].

Cornell University, Bahir Dar University, 2012. *Evaluation Report on World Vision EthiopiaWASH Projects,* Addis Ababa: s.n.

CRGE, 2014. *CRGE Fast Track Investments 2014-2016,* Adds Ababa : Climate Green Resilient Economy Facility .

CRGE, 2015. *Ethiopia's Climate Resilient Transport Sector Strategy ,* Addis Ababa : CRGE .

CRGE, 2016. *Private Sector Strategy for Ethiopia's Climate Resilient Green (CRGE) Economy Strategy ,* Addis Ababa: CRGE.

CRGE, 2016. *The Private Sector Strategy for Ethiopia's Climate Resilient Green Economy Facility ,* Addis Ababa : CRGE.

CRGE, 2019. *Environment, Forest and Climate Change Commission Performance Contract in Ethiopia,* Addis Ababa : CRGE .

CRGE, 2019. *Environment, Forest and Climate Change Commission Performance Contract in Ethiopia,* Addis Ababa: CRGE.

Dagne, T. & Dereje, M., 2017. Current Status of Climate Change Impact on Production and Reproductive Performance of Beef Cattle in Ethiopia.. *Advances in Life Science and Technology,* Volume 59, pp. 1-11.

DAI, 2018. *Ethiopia: Land Investment for Transformation (LIFT) Programme,* Hapsley: DAI Europe.

DANIDA , 2019. *DANIDA Open Aid. Project : Greening Agricultural Transformation in Ethiopia (GATE) Thematic Programme.* [Online]
Available at: https://openaid.um.dk/en/projects/dk-1-219227?Y=2016
[Accessed 22 10 2019].

Daron, J. D., 2014. *Regional climate messages: East Africa ,* s.l.: s.n.

DIE, 2017. *Policy Options for Improving Drought Resilience and its Implication for Food Security. The Cases of Ethiopia and Kenya,* Bonn: The German Development Institute .

EDRI, 2013. *Agricultural Growth Program (AGP) of Ethiopia (Baseline Report 2011) ESSP II - EDRI Report ,* Addis Ababa : EDRI.

EEU, 2019. *Ethiopian power sector Progress briefing.* Adddis Ababa : Ethiopian Electric Utiity .

ERG, 2019. *CRGE Project Lists ,* Addis Ababa : ERG.

ESSP II, 2013. *Evaluation of Ethiopia's Food Security Program: Documenting Progress on the Implementation of the Productive Safety Nets Programme and the Household Asset Building Programme.,* Washington : IFPRI.

Ethiopia, F. D. R. o., 2011. *Ethiopia's Climate-Resilient Green Economy – Green Economy Strategy,* Addis Ababa: Federal Democratic Repbilc of Ethiopia.

EU, 2019. *Project Summary: Beekeepers Economic Empowerment through long-Term Investments in Enter,* Brussels: Eurpoean Union External Action.

FACASI, 2019a. *Goals and Objectives.* [Online]
Available at: http://facasi.act-africa.org/content.php?com=2&com2=9&com3=
[Accessed 27 10 2019].

FACASI, 2019b. *Dashboard.* [Online]
Available at: https://docs.google.com/spreadsheets/d/19Qj2dfLytMK2-1gJy4wPK4wS1gE0ayjwWEmlTwDSOX0/pubhtml?gid=391617725&single=true
[Accessed 27 10 2019].

FAO, 2015. *Supporting Low Emissions Development in the Ethiopian Dairy Cattle Sector Reducing enteric methane for food security and livelihoods ,* Rome: FAO.

FAO, 2018. *Reducing Post Harvest Losses through Postharvest Management ,* Rome : Food and Agriculture Organisation of the United Nations.

Farm Africa, 2019. *New project launched to help Ethiopian farmers cope with climate change.* [Online]
Available at: https://www.farmafrica.org/latest/news/post/893-new-project-launched-to-help-ethiopian-farmers-cope-with-climate-change-
[Accessed 31 10 2019].

Federal Democratic Repbilc of Ethiopia, 2011. *Ethiopia's Climate-Resilient Green Economy – Green Economy Strategy,* Addis Ababa: Federal Democratic Repbilc of Ethiopia.

Federal Democratic Republic of Ethiopia, 2011. *Ethiopia's Climate-Resilient Green Economy: Green Economy Strategy,* Addis Ababa: s.n.

Federal Democratic Republic of Ethiopia, 2012. *Ethiopia's Climate Resilient Green Economy - Green Economy Strategy,* s.l.: s.n.

Federal Democratic Republic of Ethiopia, 2015. *Climate Resilient Green Economy - Climate Resilience Strategy: Agriculture and Forestry,* s.l.: s.n.

Federal Democratic Republic of Ethiopia, 2015. *Climate Resilient Green Economy - Climate Resilience Strategy: Water and Energy,* s.l.: s.n.

Federal Democratic Republic of Ethiopia, 2015. *Climate Resilient Green Economy - National Capacity Development Program Gap Assessments and Findings,* Addis Ababa: s.n.

Federal Democratic Republic of Ethiopia, 2015. *Ethiopia's Climate-Resilient Green Economy - Climate Resilience Strategy: Water and Energy,* s.l.: s.n.

Federal Democratic Republic of Ethiopia, 2015. *Nationally Determined Contribution (INDC) of the Federal Democratic Republic of Ethiopia,* Addis Ababa: Federal Democratic Republic of Ethiopia.

Federal Democratic Republic of Ethiopia, 2015. *Nationally Determined Contrivution (NDC) of the Federal Democratic Republic of Ethiopia.,* Addis Ababa: Federal Republic of Ethiopia.

Federal Democratic Republic of Ethiopia, 2016. *National Nutrition Programme (2016-2020),* Addis Ababa: s.n.

Federal Democratic Republic of Ethiopia, 2018. *Climate Resilient Green Economy Strategy Sector Wise II GT Implementation Monitoring Checklist ,* s.l.: CGIAR Research Program on Climate Change, Agriculture and Food Security.

Federal Democratic Republic of Ethiopia, 2019. *Ethiopia's Climate Resilient Green Economy - National Adaptation Plan,* Addis Ababa: Federal Democratic Republic of Ethiopia.

Federal Democratic Republic of Ethiopia, 2019. *Ethiopia's Climate Resilient Green Economy: National Adaptation Plan,* Addis Ababa: s.n.

Federal Ministry of Health, Ethiopia, 2018. *National Health Adaptation Plan to Climate Change 2018-2020,* s.l.: s.n.

Federal Ministry of Health, 2018. *National Health Adapattaion Plan to Climate Change,* Addis Ababa: s.n.

Federal Ministry of Health, 2018. *National Health Adaptation Plan to Climate Change,* Addis Ababa : Federal Ministry of Health.

GCCA+, 2019. *Building the national capacity and knowledge on climate change resilient actions in Ethiopia.* [Online]
Available at: http://gcca.eu/programmes/building-national-capacity-and-knowledge-climate-change-resilient-actions-ethiopia
[Accessed 31 10 2019].

GIZ, 2019. *Measures to fight drought in the lowlands of Ethiopia.* [Online]
Available at: https://www.giz.de/en/worldwide/23119.html
[Accessed 31 10 2019].

GIZ, 2019. *Trilateral Resilience Enhancement in the Ethiopian Lowlands (TREE).* [Online]
Available at: https://www.giz.de/en/worldwide/63284.html
[Accessed 31 10 2019].

GIZ, n.d. *MRV Tool: How to Set Up National MRV Systems,* s.l.: s.n.

Global Affairs Canada, 2019. *Project profile — Improving Livelihoods, Agriculture and National Development in Ethiopia.* [Online]
Available at: https://w05.international.gc.ca/projectbrowser-banqueprojets/project-projet/details/a034855001
[Accessed 30 10 2019].

Global Green Growth Institute, 2017. *Ethiopia: Accelerating Green Growth,* s.l.: Global Green Growth Institute.

Global Green Growth Institute, 2019. *Consultative Workshop on the Development of a Road-map for Greening Ethiopian Industrial Parks.* [Online]
Available at: https://gggi.org/consultative-workshop-on-the-development-of-a-road-map-for-greening-ethiopian-industrial-parks/

Global Green Growth Institute, 2019. *Strengthening Measurement, Reporting and Verification Systems ,* Seoul: GGGI Thought Leadership.

Global Sanitation Fund, 2015. *Ethiopia Sanitation and Hygiene Improvement Programme, E-SHIP,* s.l.: s.n.

Global Waters, 2019. *Pastoralist Resiliency Improvement & Market Expansion (PRIME).* [Online]
Available at: https://www.globalwaters.org/HowWeWork/Activities/pastoralist-resiliency-improvement-market-expansion
[Accessed 07 09 2019].

Hydro Review, 2014. *Ethiopia-China consortium to construct 385-MW Geba 1,2 hydro project in Ethiopia.* [Online]
Available at: https://www.hydroreview.com/2014/09/12/ethiopia-china-consortium-to-construct-385-mw-geba-1-2-hydro-project-in-ethiopia/#gref

IFAD, 2014. *Participatory Small-scale Irrigation Development Project (PASIDP) Supervision Report ,* Rome: IFAD.

IFAD, 2016. *Federal Democratic Republic of Ethiopia. Pastoral Community Development Project II. Project Perfroance Assessment,* Rome: IFAD.

IFAD, 2017. *Community-Based Integrated Natural Resources Management Project (CBINReMP) Supervision Report Main Report and Appendices,* Rome: International Fund for Agircultural Development .

IFAD, 2017. *Community-Based Integrated Natural Resources Management Project Supervision Report (CBINReMP),* Rome: International Fund for Agricultural Development.

IFAD, 2017. *Participatory Small-scale Irrigation Development Supervision Report ,* Rome: IFAD.

IFAD, 2017. *Request from the Government of Ethiopia for Project Funding from the Adaptation Fund. Final Draft,* Rome: IFAD.

IFAD, 2019. *Impact Brief. Ethiopia. Participatory Small-Scale Irrigation Development Programme I (PASIDP II),* Rome: IFAD.

IKI, 2019. *Climate Protection and Preservation of Primary Forests - A Management Model using the Wild Coffee Forests in Ethiopia as an example.* [Online]
Available at: https://www.international-climate-initiative.com/en/nc/details/project/climate-protection-and-preservation-of-primary-forests-a-management-model-using-the-wild-coffee-forests-in-ethiopia-as-an-example-09_II_066-73/
[Accessed 28 10 2019].

ILRI, 2015. *Ethiopia Livestock Master Plan Brief 1 July 2015,* Addis Ababa : ILRI.

ILRI, 2015. *Livestock and Irrigation Value chain for Ethiopian Smallholders (LIVES) Project 5th Progress Report,* Addis Ababa: ILRI.

ILRI, 2017. *Progress Narrative: African Chicken Genetic Gains Narrative,* Addis Ababa: ILRI.

ILRI, 2018. *African Chicken Genetic Gains Building the Business Case,* Addis Ababa: ILRI.

ILRI, 2018. *African Dairy Genetic Gains: Building the Business Case,* Addis Ababa: ILRI.

ILRI, 2019. *Program to support climate-smart livestock systems launched in Ethiopia.* [Online]
Available at: https://www.ilri.org/news/program-support-climate-smart-livestock-systems-launched-ethiopia
[Accessed 10 10 2019].

Industrial Parks Development Corporation, 2016. *Fast Track Investment Projects (Greening of Bole Lemi Industry Park),* s.l.: s.n.

Intergovernmental Panel on Climate Change, 2014. *Chapter 10 - Industry, Report of Working Group 3 on Mitigation, Fifth Assessment Report (AR5),* s.l.: IPCC.

Intergovernmental Panel on Climate Change, 2014. *Chapter 11 - AFOLU - Working Group 3, Fifth Assessment Report (AR5),* s.l.: s.n.

Intergovernmental Panel on Climate Change, 2014. *Chapter 8 - Transport - Working Group 3, Fifth Assessment Report (AR5),* https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter8.pdf: s.n.

Intergovernmental Panel on Climate Change, 2014. *Report of Working Group Three on Mitigation, Fifth Assessment Report (AR5),* s.l.: s.n.

International Institute for Environment and Development, 2016. *Climate diplomacy: Understanding Ethiopia's,* London: International Institute for Environment and Development.

IPCC, 2018. *SR 15 Glossary ,* Geneva: IPCC.

Irish Aid , 2018. *Ethiopia Country Climate Risk Assessment Report,* Limerick: Irish Aid.

Irish Aid, 2015. *Ethiopia Climate Action Report,* Limerick : Irish Aid.

Irish Aid, 2016. *Ethiopia Climate Action Report For 2016 ,* s.l.: s.n.

ISRIC, 2019. *Capacity building for scaling up of evidence-based best practices in agricultural production in Ethiopia (CASCAPE).* [Online]
Available at: https://www.isric.org/projects/capacity-building-scaling-evidence-based-best-practices-agricultural-production-ethiopia
[Accessed 28 10 2019].

JICA, 2016. *Rural Resilience Enhancement Project in the Federal Democratic Republic of Ehtiopia ,* Tokyo: JICA.

JICA, 2017. *Combatting desertification,* Tokyo: JICA.

JICA, 2018. *Cooperation on Coffee.* [Online]
Available at: http://www.ico.org/documents/cy2017-18/Presentations/Cooperation_on_coffee_Masaki_Wakai_JICA.pdf
[Accessed 05 12 2019].

JICA, 2018. *Internal Ex-Post Evaluation for Development Planning Project: Jerer Valley and Shebele Sub-basin Water Supply Development Plan, and Emergency Water Supply,* s.l.: s.n.

JICA, 2019. *Project for Supporting Sustainable Forest Management through REDD+ and Certified Forest Coffee Production and Promotion: Outline of the Project.* [Online]
Available at: https://www.jica.go.jp/project/english/ethiopia/006/outline/index.html
[Accessed 05 12 2019].

K. Gashu, T. G.-E., 2019. Barriers to green infrastructure development and planning in two Ethiopian cities: Bahir Dar and Hawassa. *Urban Ecosystems.*

Lighting Africa, 2018. *Ethiopia: Reaching Rural End Users.* [Online]
Available at: https://www.lightingafrica.org/country/ethiopia/

LTS International, 2015. *Lessons Learned from CRGE support to the Fast Track Investment Process,* s.l.: CRGE Facility.

McSweeney et al, 2010. *Improving the Accessibility of Observed and Projected Climate Information for Studies of Climate Change in Developing Countries, Bulletin of the American Meteorological Society,* s.l.: s.n.

MDBs and IDFC, 2015. *Common Principles for Climate Change Mitigation Finance Tracking,* s.l.: s.n.

MEFCC, 2017. *Report on: Institutional Strengthening for the Forest Sector Development in Ethiopia ,* Addis Ababa : Ministry of Environment Forest and Climate Change .

MEFCC, 2017. *Strategic Environmental and Social Assessment (SESA) For the Implementation of REDD+ in Ethiopia including the Oromia Forested Landscape Program (OFLP) Social Assesment,* Addis Ababa: MEFCC.

MEFCC, 2017. *Technical Report: Ethiopia Forest Sector Overview. Focus on commercial forestry and industrialisation,* Addis Ababa: MEFCC.

MEFCC, 2018. *National Forest Sector Development Program Ethiopia. Volume 3: Synthesis Report ,* Addis Ababa : Ministry of Environment, Forest and Climate Change.

MEFCC, 2018. *National REDD+ Strategy (2018-2030),* Addis Ababa : MEFCC.

MEFCC, 2018. *Progress on Ethiopia's REDD+ Program.* [Online]
Available at: https://www.uneca.org/sites/default/files/images/progress_on_ethiopias_redd_program_-_yitebitu_moges.pdf
[Accessed 05 12 2019].

MEFCC, 2018. *REDD+ Investment Program Program Progress July 2017-July 2018 ,* Addis Ababa : MEFCC.

Ministry of Agriculture , 2015. *Ethiopia livestock master plan - roadmaps for growth and transformation,* s.l.: s.n.

Ministry of Environment, Forests, and Climate Change , 2015. *RCBP Accomplishment Report ,* Addis Ababa: s.n.

Ministry of Finance and Economic Cooperation, 2017. *CRGE Facility Progress Report to DFID: Reporting Period July 2016 - June 2017,* Addis Ababa: s.n.

Ministry of Foreign Affairs of the Netherlands, 2018. *Climate Change Profile Ethiopia ,* s.l.: s.n.

Ministry of Industry, Ethiopia, 2016. *Industry Sector MRV System: REPORT ON INTERNATIONAL BEST PRACTICES OVERVIEW, MRV INSTITUTIONAL ARRANGEMENT & MRV IT DATABASE ,* s.l.: s.n.

Ministry of Industry, 2013. *Ethiopian Industrial Development Strategic Plan (2013-2025),* Addis Ababa: s.n.

Ministry of Industry, 2016. *Industry Sector MRV System. Report on International Best Practices, Overview, MRV Institutional Arrangemnts and MRV IT Database.,* Addis Ababa: Federal Democratic Republic of Ethiopia Ministry of Industry.

Ministry of Transport, Ethiopia, 2011. *Transport Policy of Addis Ababa,* s.l.: s.n.

Ministry of Transport, Ethiopia, n.d. *Ethiopia's Climate Resilient Transport Sector Strategy,* Addis Ababa: s.n.

Ministry of Water and Energy, 2013. *Biomass Energy Strategy of Ethiopia,* s.l.: s.n.

Ministry of Water and Energy, 2013. *National Energy Policy,* Addis Ababa: s.n.

Ministry of Water, Irrigation, and Energy, 2017. *Urban Wastewater Management Strategy,* Addis Ababa: Water Supply and Sanitation Directorate.

MoFEC, 2017. *CRGE Facility Annual report for the Fiscal Year 2017,* Addis Ababa: MoFEC.

MoFEC, 2017. *CRGE Facility Annual Report for the Fiscal Year 2017,* Addis Ababa: Ministry of Finance and Economic Cooperation .

MoFEC, 2017. *CRGE Facility Progress Report to DFID ,* Addis Ababa: MoFEC.

MultiConsult, 2019. *Metehara Solar Power PV Plant: Environmental and Social Impact Assessment - Final Report,* s.l.: s.n.

NABU , 2015. *NABU‘s work at Kafa Biosphere Reserve: Introduction and Highlights,* Berlin: Nature and Biodiversity Conservation Union.

Organization of Economic Cooperation and Development, 2017. *OECD DAC Rio Markers for Climate - Handbook,* s.l.: s.n.

Oromia Environment, Forest and Climate Change Authority, 2018. *Oromia National regional State Forested Landscape Program: Program Implementation Progress Status Report Second Year first bi-annual [July 8 - Dec 31, 2018],* Addis Ababa : Oromia Environment, Forest and Climate Change Authority.

Path Development Consulting, 2018. *Smmative Evaluation Food Sufficiency for Farmers,* Addis Ababa: Path Development Consulting.

PHEEC, 2014. *Project progress and Achievement Evaluaion Report 'Building Institutional Capacity and Participatory Leadership in Awaseh and Simien Mountains National Parks for Resilience, Mitigation and Adaptation to Climate Chane.,* Addis Ababa : Population, Health and Environment Ethiopia Consortium .

ReliefWeb, 2019. *ivestock Stakeholders Discuss 15-Million Euro HEARD Project.* [Online]
Available at: https://reliefweb.int/report/ethiopia/livestock-stakeholders-discuss-15-million-euro-heard-project
[Accessed 11 10 2019].

Republic of Ethiopia, 2015. *Intended Nationally Determined Contribution (INDC) of the Federal Democratic Republic of Ethiopia,* Addis Ababa: Republic of Ethiopia.

Resilience, 2019. *ENTAG Ethiopia - Netherlands Trade for Agricultural Growth.* [Online]
Available at: https://resiliencebv.com/projects/entag-ethiopia-netherlands-trade-for-agricultural-growth/
[Accessed 19 10 2019].

SaafConsult B.V, 2014. *Final Performance Evaluation of Water, Sanitation and Hygiene Transformation for Enhanced Resiliency (WaTER) Project,* s.l.: USAID.

Salini Impregilo, 2019. *Koysha Hydroelectric Project.* [Online]
Available at: https://www.salini-impregilo.com/en/projects/dams-hydroelectric-plants/koysha-hydroelectric-project

SMIP, 2019. *Goals, Objectives & Output.* [Online]
Available at: http://smis-ethiopia.org/index.php/2017/02/15/goals-objectives-output/
[Accessed 25 10 2019].

Tamiru, Y. & Cochrane, L., 2016. Ethiopia's Productive Safety Net Program: Power, Politics and Practice. *Journal of International Development,* 28(5), pp. 649-665.

Tenake Bena, 2014. *Urban Agriculture and Farming - training session at Tesefa Birhan Primary & Secondary school.* [Online]
Available at: http://www.tenakebena.org/project/report%20farmers%20training%20session.pdf

the REDD desk, 2019. *https://theredddesk.org/countries/initiatives/bale-mountains-eco-region-redd-project.* [Online]
Available at: https://theredddesk.org/countries/initiatives/bale-mountains-eco-region-redd-project
[Accessed 12 05 2019].

The Wind Power, 2017. *Adama II Ethiopia.* [Online]
Available at: https://www.thewindpower.net/windfarm_en_21985_adama-ii.php

Tsunekawa, A. & Hargeweyn, N., 2017. Development of Next-Generation Sustainable Land Management (SLM) Framework to Combat Desertification. *Impact,* 2017(7), pp. 26-28.

UN Environment , 2019. *Ethiopia enhances environmental protections through waste management.* [Online]
Available at: https://www.unenvironment.org/news-and-stories/story/ethiopia-enhances-environmental-protections-through-waste-management

UNDP, 2012. *Strengthening Climate Information and Early Warning Systems in Africa for Climate Resilient Development and Adaptation to Climate Change ,* New York: UNDP.

UNDP, 2014. *AGP Fatc Sheet Strengthening National Capacity through Sustainable Increases in Agricultural Production and Productivity,* New York : United Nations Development Program .

UNDP, 2016. *AGP Fact Sheet; Strengthening national capacities to enhance agricultural production and productivity,* New York: United Nations Development Program.

UNDP, 2016. *Integrated Landscape Management to Enhance Food Security and Ecosystem Resilience in Ethiopia,* New York: UNDP.

UNDP, 2019. *Integrated Landscape Management to Enhance Food Security and Ecosystem Resilience in Ethiopia.* [Online]
Available at: https://www.et.undp.org/content/ethiopia/en/home/projects/integrated-landscape-management-to-enhance-food-security-and-eco.html
[Accessed 28 10 2019].

UNFCCC, 2014. *Handbook on Measurement, Reporting, and Verification for Developing Country Parties,* s.l.: s.n.

UNFCCC, 2018. *Report of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement on the third part of its first session, held in Katowice from 2 to 15 December 2018.* [Online]
Available at: https://unfccc.int/documents/193408

UN-REDD Proramme, 2019. *Scoping Private Sector Opportunities in Ethiopia: How to stimulate both economic development and REDD+ implementation?,* Addis Ababa: MEFCC.

USAID , 2013. *Agricultural Growth Project - Livestock Market Development Value Chain Analysis for Ethiopia: Meat and Live Animals Hides, Skins and Leather DairyExpanding Livestock Markets for the Small-holder Producers,* Washington : USAID .

USAID , 2018. *Five Year Final Report January 2014-December 2018. The Agriculture, Knowledge, Learning, Documentaton and Policy Project,* Washington: USAID .

USAID, 2011. *Feed The Future Ethiopia Multi- Year Strategy (2011-2015),* Washington: USAID .

USAID, 2014. *Final Performance Evaluation of Water Sanitation and Hygiene Transformation for Enhanced Resiliency (WaTER) Project,* s.l.: s.n.

USAID, 2015. *Pastoralist Areas Resilience Improvement Through Market Expansion (PRME) Ethiopia. Mid-Term Evaluation Report ,* Washington: USAID.

USAID, 2016. *Graduating Out of Social Assistance and into Long-Term Food Security ,* Washington: USAID.

USAID, 2016. *Improving Nutrition through Multi-sectoral support: The ENGINE Experience: ENGINE Final Report 2011–2016,* Washington : USAID.

USAID, 2017. *Climate-Smart Agriculture in Ethiopia,* Washington: USAID.

USAID, 2018. *Engaging the Private Sector in Green Infrastructure Development and Financing:A Pathway Toward Building Urban Climate Resilience,* Washington : USAID.

USAID, 2019. *Ethiopia.* [Online]
Available at: https://www.feedthefuture.gov/country/ethiopia/
[Accessed 27 10 2019].

USAID, 2019. *Lowland Water, Sanitation and Hygiene WASH Activity: Briefing Note - January 2019,* s.l.: s.n.

VCS/CCBA, 2017. *VCS/CCBA Verification Report Bale Mountain Eco-Region REDD+ Project ,* Pune: VCS/CCBA.

Wageningen, 2019. *CASCAPE: An evidence-based approach to agricultural innovation.* [Online]
Available at: http://www.food-security.nl/group/embassy-support-portal/resource/cascape-evidence-based-approach-agricultural-innovation
[Accessed 28 10 2019].

Wold Bank, 2019. *IDA Program Apraisal Document on Porposed IDA Guarantees for the REGREP Phase 1 as part of a multiphase programmatic approach for the Ethiopia Renewable Energy Guarantees Program,* Washington: Wold Bank.

Worku, H., 2015. *Climate Resilient Green Growth Strategy and Integrated Climate Change Response Investment Plan Development for Addis Ababa,* Addis Ababa: s.n.

World Bank , 2015. *Project Appraisal Document,* Washington : World Bank .

World Bank , 2017. *Project Appraisal Doucment Oromia National Regional State Forested Landscape Project ,* Washington : World Bank .

World Bank , 2018. *Project Information Document/Integrated Safeguards Data Sheet (PID/ISDS)Ethiopia Resilient Landscapes and Livelihoods Project (P163383),* Washington: World Bank .

World Bank , 2019. *Livestock and Fisheries Sector Development Project.* [Online]
Available at: https://projects.worldbank.org/en/projects-operations/project-detail/P159382
[Accessed 01 10 2019].

World Bank , 2019. *Restructuring Paper on a propsed Project restructuring of ENREP Carvbon Finance Programme of Activities. ,* Addis Ababa: World Bank .

World Bank , 2019. *Restructuring Paper on a prposed project restructuring of Electrcity Network Reinforcement and Expansion Project (ENREP) ,* Washington : World Bank .

World Bank , 2019. *Restructuring Paper on the RI-Regional Pastoral Livelihoods Resilience Project (P129408),* Washington: World Bank .

World Bank, 2014. *Implementation Completion and Results Report. Sustainable Land Mangement Project,* Washington: World Bank.

World Bank, 2015. *Finance for Climate Action A Snaphot of the World Bank Group's Climate Work ,* Washington : World Bank.

World Bank, 2015. *Implementation Completion Report (ICR) Review ET Productive Safety Nets (APL III),* Washington: World Bank.

World Bank, 2015. *Typology of Activities with Climate Co-benefits by World Bank Sector. ,* Washington : World Bank.

World Bank, 2017. *Implementation Completion and Results Report: ET: AGricultural Growth Project,* Washington : World Bank.

World Bank, 2018. *Project Information Document/Integrated Safeguards Data Sheet (PID/ISDS)Ethiopia Resilient Landscapes and Livelihoods Project (P163383),* Washington: World Bank.

World Bank, 2019. *ENREP- Carbon Finance Programme of Activities,* Washington: World Bank.

World Bank, 2019. *Program Appraisal Document ,* Washington : World Bank.

World Business Council on Sustainable Development, n.d. *Cement Sustainability Initiative.* [Online]
Available at: https://www.wbcsd.org/Sector-Projects/Cement-Sustainability-Initiative/Cement-Sustainability-Initiative-CSI

World Vision Ethiopia, 2019. *Water, Sanitation and Hygiene (WASH).* [Online]
Available at: https://www.wvi.org/ethiopia/water-sanitation-and-hygiene-wash

Y. Girma, H. T. S. P. M. K., 2019. Urban green infrastructure planning in Ethiopia: The case of emerging towns of Oromoia special zone surrounding Finfinne. *Elsevier - Journal of Urban Management,* Volume 8, pp. 75-88.

APPENDIX A Report Methodology

Data and Information Collection

This draft assessment report is the outcome of six (June – November 2019) of data and information gathering. While the project was scoped and conceptualized as one that would focus only on secondary sources (i.e. previously published or prepared documents, reports, analyses, materials available to review and extract information from), and while the project was not expected to (either in the terms of reference or in the approved methodology proposed in the technical proposal) entail primary research and data-gathering, the project team has undertaken the level of primary data-gathering feasible within existing temporal and budgetary constraints.

Across all sectors and for the national level, the team engaged in targeted literature collection and review. A complete list of experts and stakeholders contacted as well as a list of reference documents is included in the Sectoral Overview Report Appendices.

The team engaged in purposive sampling with a snowball approach for the selection of stakeholders and experts to engage in-person, in the form of key informant interviews. These were semi-structured interviews with individuals principally at the national/federal level.

Data and Information Analysis

The team adopted a mixed-methods approach to analysis, integrating both quantitative and qualitative research where available. Each major thematic area of the report required a differentiated approach to data and information analysis. These are summarily as follows:

Adaptation and Mitigation

For the years 2011 – 2019, the project team identified interventions (projects and programmes) undertaken in Ethiopia in each sector that addressed climate change adaptation or mitigation directly or indirectly or had climate change adaptation or mitigation co-benefits. To inform this screening, the team relied on the Intergovernmental Panel on Climate Change's (IPCC's) definitions of adaptation (including adaptive capacity and resilience) and mitigation (including sequestration, abatement, and avoided emissions), and also used the World Bank's criteria for classification of climate change adaptation and mitigation co-benefits by sector. This screening was further refined by reviewing project and programme documents to determine a direct or indirect linkage to any adaptation or mitigation priorities identified in the CRGE Strategy, in any of the CRGE climate resilience sector strategies (agriculture and forestry; water and energy; transport; and the national health adaptation plan), or in Ethiopia's Nationally Determined Contributions (NDC).

Thereafter, for the analysis on adaptation, the team collected and reviewed publicly available documentation related to the projects and programmes and undertook a qualitative assessment of the adaptation strategic priorities addressed, the balance of activity, gaps, and future areas of focus.

For mitigation, the team also engaged in literature review, and additionally undertook a high-level estimation of the range of greenhouse gas emissions reduction that are plausible to attribute to such interventions (where projects and programmes were characterized with sufficient features), to gauge the potential reductions if the projects and programmes were implemented completely and effectively. The scope of this project does not permit an on-the-ground, project-by-project, third-party evaluation based on collection and validation of output data. Thus, project and programme results and parameters described in published documentation was used as the basis of estimations.

In addition to the conservative project-by-project approach, the team also examined the extent to which CRGE had been mainstreamed in the implementation of Ethiopia's second Growth and Transformation Plan (GTP-II), and progress on CRGE under GTP-II. This was done by reviewing annual GTP-II progress and performance reports by sector (translated from Amharic), examining the reports for progress reported against each sector's GTP-II Policy Matrix and targets under the Policy Matrix, and identifying actions listed in each sector's policy matrix that either (a)

directly mentioned the CRGE; or (b) pertained to strategic priorities and themes focused on by CRGE for the specific sector, with a linkage to climate change (e.g. activities that related to adaptation, adaptive capacity, resilience, reducing vulnerability, mitigation, low-carbon development, decarbonizing growth, sequestration, abatement etc.); or (c) linked to Sustainable Development Goal (SDG) 13, i.e. climate change action. Upon review of the translated GTP-II progress reports, the team found insufficient reporting on the policy matrices' elements with climate change linkages to be the subject of analysis for this assessment.

Finance

The finance workstream undertook a quantitative assessment of budgets attributed to the projects selected (screened as noted above, under adaptation and mitigation categories). The team engaged in primary data-collection and information gathering through a customised survey tool developed for this purpose. The tool (in excel format) was structured in alignment with a similar data-gathering tool used by the CRGE Facility for an earlier assessment of climate finance tracked in the transport, urban, and forestry sectors. This tool, designed to solicit and record project budgetary information, was disseminated to all sector CRGE Focal Points, along-with a guidance document that provided direction on the types of financial data sought and how to enter the data in the tool. For each sector, the data-gathering tool included all identified climate change adaptation and mitigation projects and required sectors to indicate or confirm the total budget of each such intervention.

Wherever the datasheets were not populated by the sector CRGE Focal Point, the team populated the projects' total budget based on publicly available online data.

This data was then analysed through the tool to provide a breakdown of budgets (funds allocated, even if not spent) to climate change mitigation and adaptation projects by sector.

The team also compared the total amount spent thus far (an aggregate of all budgets linked to identified adaptation and mitigation projects) to the total investment needs for CRGE and NDC implementation, identified by the CRGE Strategy (and consequently the NDC), the three sector CR strategies, as well as the sectoral CRGE roadmaps, and estimated the balance of finance yet to be mobilized to meet CRGE targets for 2030.

Institutional Arrangements

In addition to targeted literature review, the team engaged in purposive sampling, with a snowball approach, for the selection of stakeholders and experts for key informant interviews. Principally, the interview subjects were CRGE focal points for each sector (Directorates, Units, and Bureaus). Semi-structured interviews were conducted, with questions focused on institutional architecture, capacity, and institutional needs and gaps. This input was qualitatively analysed, blended with takeaways from secondary literature reviewed, and documented in narrative format. The analysis yielded recommendations that the report has put forward.

Policy

The principal methodology adopted for this qualitative analysis was document review of primary literature, i.e. the government-issued policies, strategies, and regulatory frameworks in each sector that have a direct linkage to and focus on climate change adaptation or mitigation, or on any of the strategic priorities of the CRGE Strategy. The structured review was conducted through a lens of the policy's relevance to and consistency with the CRGE Strategy, and its ability to complement or fill gaps left by the CRGE Strategy. The report presents recommendations that emerged from this policy analysis.

APPENDIX B Projects included in the scan.

112		Forestry	Climate Protection Forests	Climate Protection and Preservation of Primary Forests Project	Both	2,466,696,000	Ongoing	2013	2019
113		Forestry	FTI Urban Parks	FTI: Urban greening and solid waste management across Ethiopia	Mitigation	43,830,000	Ongoing	2016	2021
114	54	Agriculture	ATTSVE	Agricultural Transformation through Stronger Vocational Education	Adaptation	450,518,374	Ongoing	2014	2019
115	55	Agriculture	CIAPS	Capacity to Improve Agriculture and Food Security	Adaptation	561,687,500	Completed	2011	2016
116	56	Agriculture	FSF	Food Sufficiency for Farmers	Adaptation	297,816,107	Complete	2013	2018
117	57	Agriculture	IFSMC	Increased Food Security for Mothers and Children	Adaptation	0	0	0	0
118	58	Agriculture	SAGI	Sustainable Agricultural Growth through Irrigation	Both	0	0	0	0
119	59	Agriculture	LAND	Livelihoods, Agriculture and National Development Project	Adaptation	565,590,666	Completed	2012	2016
120	60	Agriculture	RLPHM	Reducing Food Losses through Improved Post Harvest Management in Ethiopia	Adaptation	96,125,572	Completed	2013	2018
121	61	Agriculture	QSPPSF	Quality Seed Promotion Project for Smallholder Farmers	Adaptation	132,150,760	Completed	2010	2014
122	62	Agriculture	RREP	Rural Resilience Enhancement Project	Adaptation	0	Completed	2012	2016
123	63	Agriculture	IBCIP	INDEX-BASED CROP INSURANCE PROMOTION PROJECT FOR RURAL RESILIENCE ENHANCEMENT	Adaptation	195,472,999	Ongoing	2018	2020
	64	Agriculture	OVOP	One Village - One Product Promotion	Adaptation	0	Completed	2010	2014
124	65	Agriculture	SLMCD	THE PROJECT FOR DEVELOPMENT OF NEXT-GENERATION SUSTAINABLE LAND MANAGEMENT (SLM) FRAMEWORK TO COMBAT DESERTIFICATION	Adaptation	0	Ongoing	2017	2022
	66	Agriculture	SAMD	Support for Agricultural Marketing Development in Ethiopia	Both	0	0	0	0
125	67	Agriculture	SRPASAL	Strengthening Resilience of Pastoral and Agro-pastoral Livelihoods in Ethiopia's Arid and Semi-arid Lands	Adaptation	2,235,000,000	Ongoing	2015	2019
	68	Agriculture	IAFIP	Innovative Approaches to Food Insecurity Project	Adaptation	0	0	0	0
126									
127	69	Agriculture	SDRPAP Afar	Capacity Development for Strengthening Drought Resilience of the Pastoral and Agro-Pastoral Population in the Lowlands of Ethiopia - Afar Region	Adaptation	5,215,000,000	Completed	2012	2018
128	70	Agriculture	EHPP II	Ethiopian-Netherlands Horticulture Partnership Program.	Adaptation	0	Completed	2013	2016
129	71	Agriculture	EHPP III	Ethiopian-Netherlands Horticulture Partnership Program.	Adaptation	0	Ongoing	2017	2021
	72	Agriculture	FSREP	Food Security and Rural Entrepreneurship Fund	Both	0	Completed	2012	2016
130	73	Agriculture	PCDP II	Pastoral Community Development Project II	Adaptation	41,055,200,000	Completed	2010	2014
131	74	Agriculture	CBINRMP	Community Based Integrated Natural Resource Management Project	Both	799,200,000	Complete	2008	2017
132	75	Agriculture	Agri-Export Ethiopia	Climate resilient strategy for major agricultural export commodities in Ethiopia	Adaptation	4,623,510	Completed	2013	2015
	76	Agriculture	FTI	Agriculture Fast Track Investment Project	Adaptation	675,561,980	Completed	2013	2017
133	77	Agriculture	CSA PSNP	Ethiopia—Technical Assistance to Support GCCA+/Mainstreaming Climate-Smart Approaches into the Productive Safety Net Programme (Climate-Smart PSNP)	Both	256,270,881	Ongoing	2019	2022
134									
135	78	Agriculture	BNCCR	Building the national capacity and knowledge on climate change resilient actions in Ethiopia	Both	327,000,000	Completed	2012	2016
	79	Agriculture	ACSA	Accelerating the Uptake of Climate-Smart Agriculture in Ethiopia	Adaptation	0	Ongoing	2018	2020
	80	Agriculture	CALM	Climate Action through Landscape Management Program for results	Adaptation	14,700,000,000	Ongoing	2019	2024
136									
137	81	Agriculture	ACREI	Agricultural Climate Resilience Enhancement Initiative (ACREI) (Ethiopia, Kenya, Uganda)	Adaptation	66,738,000	Ongoing	2018	2021
138									
139	82	Agriculture	MFDLE	Capacity development for strengthening the drought resilience of the pastoral and agro-pastoral population in the lowlands of Ethiopia	Adaptation	0	Completed	2013	2018
140	83	Agriculture	TREE	Trilateral Resilience Enhancement in the Ethiopian Lowlands (TREE)	Adaptation	0	Ongoing	2016	2021
141	84	Livestock	ACGG	African Chicken Genetic Gains	Adaptation	325,600,000	Ongoing	2015	2019
	85	Livestock	ADGG	African Dairy Genetic Gains program	Mitigation	266,837,943	Ongoing	2015	2020
142									
143	86	Livestock	LIVES	Livestock and Irrigation Value Chains for Ethiopian Smallholders	Both	562,843,937	Complete	2012	2018
	87	Livestock	GTN	Growth Through Nutrition) Project	Both	2,126,565,900	Ongoing	2016	2021
144	88	Livestock	PRIME	Ethiopia Pastoralist Areas Resilience Improvement and Market Expansion Project	Both	1,523,310,800	Complete	2012	2016
145	89	Livestock	EDGET	Enhancing Dairy Sector Growth in Ethiopia	Mitigation	330,563,858	Complete	2012	2017
146	90	Livestock	ASPIRE	Apiculture Scaleup Program for Income and Rural Employment	Mitigation	215,691,475	Complete	2013	2017
	91	Livestock	LMD	Livestock Market Development - Agricultural Growth Program	Mitigation	1,112,412,000	Complete	2012	2017
	92	Livestock	FEED II	Feed Enhancement for Ethiopian Development	Both	818,118,000	Complete	2013	2017
147	93	Livestock	SIMLESA II	Sustainable Intensification of maize-legume cropping systems for food security in eastern and southern Africa-Phase II	Both	20,540,605	Complete	2015	2018
148	94	Livestock	Africa Rising	Africa rising	Both	672,934,000	Complete	2011	2015
149	95	Livestock	CASCAPE	Capacity building for scaling up of evidence-based best practices in agricultural production in Ethiopia	Both	328,260,471	Complete	2012	2018
150									
151	96	Livestock	ENTAG	Ethiopian Netherlands Trade for Agricultural Growth	Mitigation	163,123,937	Ongoing	2016	2021
152	97	Livestock	LFSDP	Livestock and Fisheries Sector Development Project	Both	5,149,709,300	Ongoing	2017	2021
153	98	Livestock	AKLDP	Agriculture Knowledge, Learning, Documentation and Policy Project	Both	270,900,500	Complete	2014	2018
154	99	Livestock	PAID	Public-Private Partnership for Artificial Insemination Delivery	Both	295,900,000	Complete	2016	2020
155	100	Livestock	ENGINE	Empowering the New Generation to Improve Nutrition and Economic opportunities	Both	1,627,450,000	Complete	2011	2016
	101	Livestock	GRAD	Graduation with Resilience to Achieve Sustainable Development	Mitigation	686,790,000	Complete	2012	2016
156	102	Livestock	AGP - LGP	Livestock Growth Program	Adaptation	0	Completed	2012	2018
	103	Livestock	Honey VCD	New Business Model for Honey Value Chain Development	Both	0	0	0	0
157	104	Livestock	BEE - LIEVE	Beekeepers Economic Empowerment through Long-term Investments in Entrepreneurship and Value chain in Ethiopia	Adaptation	0	Ongoing	2017	2022
158	105	Livestock	PCSL	Programme for climate-smart livestock systems (PCSL)	Both	0	Ongoing	2018	2022
	106	Forestry	REDD Readiness	Ethiopia REDD+ Readiness Package (R-Package)	Mitigation	399,462,736	Completed	2012	2016
159	107	Forestry	OFLP	Oromia's Forested Landscape Program (OFLP)	Mitigation	2,012,800,000	Ongoing	0	0
	108	Forestry	Humbo and Soddo	Humbo and Soddo CDM project	Mitigation	37,986,000	Completed	2007	2018
160	109	Forestry	National Forest Development	National Forest Sector Development Program	Both	457,599,310	Ongoing	2013	0
161	110	Forestry	Bale Mountain REDD	Bale Mountain Eco-Region	Mitigation	48,287,248	Ongoing	2013	2033
	111	Forestry	GGW Ethiopia	Great Green Wall	Mitigation	2,960,723,808	Ongoing	2013	2019

162	Water & Energy	RPs for Drinking Water	The Project for Rural Water Supply, Sanitation and Livelihood Improvement through Dissemination of Rope Pumps (RPs) for Drinking Water	Adaptation	0	Completed	2014	2018
163	Water & Energy	Water Supply Amhara	Small towns water supply in southern part of Amhara Region	Adaptation	0	0	0	0
164	Water & Energy	Water Supply SNNPR	Water Supply development for Small Towns in Rift Valley Basin in SNNPR	Adaptation	3,867,000	Completed	2015	2017
165	Water & Energy	WSP Bahir	Bahir Dar Water Supply Project (new)	Adaptation	392,259,511	Ongoing	2017	2020
166	Water & Energy	GSS	Geothermal Sector Strategy	Mitigation	44,298,000	Ongoing	2014	2020
167	Water & Energy	Lighting Ethiopia	Lighting Ethiopia	Mitigation	55,992,672	Completed	2014	2016
168	Water & Energy	GSD Project	Geothermal Sector Development Project	Mitigation	6,412,990,295	Completed	2014	2020
169	Water & Energy	RETs	Promoting Sustainable Rural Energy Technologies (RETs) for House-hold and Productive Uses	Mitigation	2,149,531,034	Completed	2013	2015
170	Water & Energy	OG Energy	Off-grid renewable energy program	Mitigation	176,100,420	Completed	2016	2017
171	Water & Energy	Pastoral SNNPR	Building climate resilience through the promotion of green enterprises in pastoral and agro-pastoral zones of SNNPR and Gambella	Adaptation	11,916,214	Completed	2013	2015
172	Water & Energy	EERF	Energy Efficiency Regulatory framework development and implementation.	Mitigation	19,086,158	Completed	2013	2014
173	Water & Energy	CRGE Carbon Sink	Local Level Initiative for Climate Resilient Green Economy (CRGE): Creati n g Carbon Sink while Promotin g Clean and Efficient Energy Utilization in Muhirna Aklil Woreda	Mitigation	8,259,079	Completed	2014	2015
174	Water & Energy	EMDs	Holistic Feasibility Study of a National Scale-up Program for Ethanol Cook Stoves and Ethanol Micro Distilleries (EMDs) in Ethiopia	Mitigation	5,442,338	Completed	2014	2015
175	Water & Energy	SE4ALL	Sustainable Energy for All (Africa Hub)	Mitigation	0	Ongoing	2013	0
176	Water & Energy	EnDev	Energising Development Partnership	Mitigation	1,127,671,027	Ongoing	2005	2020
177	Water & Energy	GRM Facility	Geothermal Risk Mitigation Facility	Mitigation	1,736,857,690	Ongoing	2012	0
178	Water & Energy	SEFA IPP	Hydro IPP procurement framework :SEFA -Ethiopia	Mitigation	29,601,250	Ongoing	2019	0
179	Water & Energy	ECCEPP	Ethiopia Clean Cooking Energy Program Project	Mitigation	241,272,500	Ongoing	2016	0
180	Water & Energy	ENREP	Ethiopia Electricity Network Reinforcement and Expansion Project	Mitigation	7,378,000,000	Ongoing	2016	0
181	Water & Energy	ECIC	Ethiopia Climate Innovation Center	Both	148,750,000	Completed	2013	2018
182	Water & Energy	Assela	Assela Wind Farm – Scaling-Up Renewable Energy Program (SREP)	Mitigation	38,620,855	Ongoing	2018	0
183	Water & Energy	Transform WASH	USAID Transform WASH	Adaptation	712,800,000	Ongoing	2017	2021
184	Water & Energy	LAWD	Lowland Water, Sanitation, and Hygiene Project in Ethiopia	Adaptation	703,890,000	Ongoing	2016	2020
185	Water & Energy	REGREP	Renewable Energy Guarantees Program (REGREP) Ethiopia	Mitigation	5,940,000,000	Ongoing	2019	2025
186	Water & Energy	Scaling Solar 2	Scaling Solar 2	Mitigation	0	Ongoing	2019	2024
187	Water & Energy	EITI	Ethiopia EITI (Grant II)	Mitigation	11,261,098	Ongoing	2016	2019
188	Water & Energy	ET CCEP	ET Clean Cooking Energy Program	Mitigation	240,335,551	Ongoing	2016	0
189	Water & Energy	WPG	Monitoring water productivity by remote sensing as a tool to assess possibilities to reduce water productivity gaps	Mitigation	115,109,764	Ongoing	2018	2020
190	Water & Energy	LDHRV	Support to Livelihoods of Drought Affected Households and Resilience Building of Vulnerable Groups in Warder and Kebredehar Woredas of Ethiopia's Somali Region	Mitigation	115,752,736	Ongoing	2018	2020
191	Capacity Building	CRGE Registry	CRGE Registry	Both	2,280,622	Complete	2013	2014
192	Capacity Building	mMSR	Capacity Building to EPA to implement Mechanism to Motivate, Support and Reward Results (mMSR)	Both	5,550,703	Complete	2012	2013
193	Cross Cutting	PACC TRP	Enhancing the public awareness on climate change through broadcasting in TV and Radio programs	Adaptation	10,743,296	Complete	2012	2015
194	Cross Cutting	CRGZ Akaki	Climate Resilient Green Zone alongside Akaki River	Adaptation	15,523,132	Complete	2013	2015
195	Cross Cutting	ESACCAP	Environmental Service and Climate Change Analyses Programme (ESACCAP)	Both.	32,226,448	Complete	2013	2015
196	Cross Cutting	RCSP	Regional Capacity Support Programme (RCSP)	Both	23,126,560	Complete	2014	2016
197	Cross Cutting	ERLLP	Ethiopia Resilient Landscapes and Livelihoods Project	Both	3,822,846,630	Ongoing	2018	2024
198	Cross Cutting	WSS Hygiene I	Ethiopia Water Supply, Sanitation and Hygiene Project	Adaptation	6,928,539,086	Ongoing	2014	2020
199	Cross Cutting	WSS II	Second Ethiopia Urban Water Supply and Sanitation Project	Adaptation	14,963,407,350	Ongoing	2017	2023
200	Cross Cutting	BCT RDCL	Meeting Ethiopia's Bonn Challenge Target: Restoring Degraded Coffee Landscapes	Adaptation	24,410,169	Ongoing	2018	2021
201	Cross Cutting	EWS Climate Change	Strengthening Climate Information and Early Warning Systems in Africa for Climate Resilient Development and Adaptation to Climate Change	Adaptation	133,353,113	Complete	2013	2017
202	Health	E-SHIP	Ethiopia Sanitation and Hygiene Improvement Program	Adaptation	3,121,848,000	Completed	2012	2017
203	Health	WSHTER	Water, Sanitation, and Hygiene Transformation for Enhanced Resiliency Project	Adaptation	327,344,060	0	0	0
204	Health	ICBN	Integrated Community Based Nutrition Project	Adaptation	0	0	0	0
205	Health	CRWASH	Delivering Climate Resilient Water and Sanitation in Ethiopia	Adaptation	0	0	0	0
206	Health	CRWS	Climate Resilient Water Safety in Ethiopia	Adaptation	0	0	0	0
207	Health	WCCH - Rift Valley	Water, Climate Change, and Health in the Rift Valley, Ethiopia	Adaptation	0	0	0	0
208	Health	OneWASH I	One WASH National Program - Phase I	Adaptation	0	0	0	0
209	Health	OneWASH II	One WASH National Program - Phase II	Adaptation	8,940,000,000	0	0	0
210	Transport	FTI Smart Parking	Smart Parking as an Instrument to Improve Traffic Flow and Emissions Reduction	Mitigation	22,791,600	Complete	2014	2016
211	Transport	FTI Share the Road	Share the Road: Development of Walking and Cycling Facilities for Urban Transportation of Addis Ababa	Mitigation	20,892,300	Complete	2014	2016
212	Transport	Eth-Djibouti Railway	Ethiopia - Djibouti Railway Project	Mitigation	25,816,712,000	Complete	2011	2016
213	Transport	Addis LRT	Addis Ababa Light Rail Transport	Mitigation	14,000,625,000	Complete	2012	2015
214	Transport	National Rail Network	National Railway Network from Awash (Three Zones)	Mitigation	99,973,600,000	Complete	2012	2017
215	Transport	Anbessa	Anbessa Bus Expansion	Mitigation	854,775,000	Ongoing	2016	0
216	Transport	PTSETSE buses	Public Servants' Bus Service in Addis Ababa	Mitigation	0	Ongoing	2014	0
217	Transport	Fuel Efficient Taxis	Bajaj Fuel Efficient Taxi Fleet	Mitigation	0	Ongoing	0	0
218	Transport	CFP - Railways	Ethiopian Railways Climate Financing Project.	Mitigation	13,456,706	Completed	2013	2015

APPENDIX C Emissions categories as per the IPCC 2006 GHG inventory guidelines

1 - Energy
1.A - Fuel Combustion Activities
1.A.1 - Energy Industries
1.A.2 - Manufacturing Industries and Construction
1.A.3 - Transport
1.A.4 - Other Sectors (incl. Commercial, Institutional, Residential, Agriculture, Forestry, Fishing)
1.A.5 - Non-Specified
1.B - Fugitive emissions from fuels
1.B.1 - Solid Fuels
1.B.2 - Oil and Natural Gas
1.B.3 - Other emissions from Energy Production
1.C - Carbon dioxide Transport and Storage
1.C.1 - Transport of CO2
1.C.2 - Injection and Storage
1.C.3 - Other
2 - Industrial Processes and Product Use
2.A - Mineral Industry
2.B - Chemical Industry
2.C - Metal Industry
2.D - Non-Energy Products from Fuels and Solvent Use
2.E - Electronics Industry
2.F - Product Uses as Substitutes for Ozone Depleting Substances
2.G - Other Product Manufacture and Use
2.H - Other
3 - Agriculture, Forestry, and Other Land Use
3.A - Livestock
3.A.1 - Enteric Fermentation
3.A.2 - Manure Management
3.B - Land
3.B.1 - Forest land
3.B.2 - Cropland
3.B.3 - Grassland
3.B.4 - Wetlands
3.B.5 - Settlements
3.B.6 - Other Land
3.C - Aggregate sources and non-CO2 emissions sources on land
3.C.1 - Emissions from biomass burning
3.C.2 - Liming

3.C.3 - Urea application
3.C.4 - Direct N2O Emissions from managed soils
3.C.5 - Indirect N2O Emissions from managed soils
3.C.6 - Indirect N2O Emissions from manure management
3.C.7 - Rice cultivations
3.C.8 - Other (please specify)
3.D - Other
3.D.1 - Harvested Wood Products
3.D.2 - Other (please specify)
4 - Waste
4.A - Solid Waste Disposal
4.B - Biological Treatment of Solid Waste
4.C - Incineration and Open Burning of Waste
4.D - Wastewater Treatment and Discharge
4.E - Other
5 - Other
5.A - Indirect N2O emissions from the atmospheric deposition of nitrogen in NOx and NH3
5.B - Other

APPENDIX D Project Database Overview

The following description and guidance were provided to numerous individuals and entities in Ethiopia to assist with gathering the necessary project information to allow for comprehensive financial assessment.

ASSESSING THE PROGRESS IN IMPLEMENTING EHTIOPIA'S CRGE/NDC 2011 – 2018

PROJECT FINANCIAL DATA SHEET GUIDANCE

Numerous project financial data metrics are required, as part of the CRGE Strategy 2011-2018 Implementation Assessment. This will allow an audit and assessment of expenditure on climate projects in Ethiopia during the 2011-18 period, and generation of impact metrics to inform effectiveness and future resource requirements.

An Excel template has been provided to input all relevant data for each project. This is broken up into two main parts:

1) **High-Level Project Information**

The first section of the Data-Sheet (one of which is to be completed for each identified project) provides an overview of all important information on each project.

Inputs are required, where possible and applicable, in all of the following categories:

- **Project Name**
  - The official name of the project (or programme/initiative/business, etc.)
- **Project Code**
  - The official code of the project (if none, leave blank)

- **Project Lead/Proponent**
  - The Ministry, Department, Coordination Unit, Company, or other organisation who is leading the project
- **Lead Contact Person**
  - The main contact person within the Project Lead entity
  - Their name, position, address, telephone number, and email address

- **Project Status**
  - Choose from drop-down menu
    - Ongoing
    - Incomplete
- **Project Start Date**
  - Start date (month and year)
- **Project Completion Date**
  - Completion date (month and year)
  - If project is indicated as still 'Ongoing', include planned completion date

- **Project Type**
  - Choose from drop-down menu:
    - Public (including development organisations)
    - Private
    - Public-Private Partnership
- **Sector**
  - Choose from drop-down menu:
    - Energy (electricity)
    - Water
    - Transport
    - Agriculture
    - Cities/Buildings
    - Industry (including mining)
    - Other (describe in Project General Description)
- **General Description**
  - A brief overview and description of the project

- **Climate Impact**
  - Choose from drop-down:
    - Adaptation
    - Mitigation
    - Both
- **Climate Objectives**
  - Choose from drop-down
    - Primary objective(s) to improve adaptation/resilience or contribute to mitigation
    - Secondary objective(s) related to building climate adaptation/resilience or contributing to mitigation
    - Indirect climate adaptation/resilience or mitigation benefits
    - Limited or no climate impact
- **Other Notes**
  - Any other important details or notes (if none, leave blank)

- **Total Project Cost**
  - Broken down by preparation, implementation (capital), and operations & maintenance (O&M) costs
  - To be inputted in Ethiopian Birr
- **Total Expenditure To-Date**
  - If project is indicated as Ongoing, input the total expenditure to date
  - Broken down by preparation, implementation (capital), and operations & maintenance (O&M) costs
  - To be inputted in Ethiopian Birr

- **Project Funder**
  - Name of entity funding or financing the project
  - If more than one funder, indicate each funder separately
- **Financial Contact Person**
  - Details of the contact person within each entity funding/financing the project
  - Their name, position, address, telephone number, and email address

- **Financial Documents Sourced**
  - Name of documents or other sources of the financial data and information inputted into these data sheet

2) Detailed Funding Breakdown

The 2nd part of the Datasheet provides tables for a detailed breakdown of project funding received and expended year-on-year, sorted by the following categories:

- By project stage
  - Project Preparation, Project Implementation (Capital), and Project O&M
- By year
  - 2011 to 2018
- By type of funding
  - Grant/transfer, loan, or other (to be specified)
  - 'Other' may include types such as equity, guarantees, etc
- By amount expended
  - Per year and type of funding
- By funding purpose
  - Choose from drop-down menu
    - 100% climate finance
    - Partial climate finance
    - Other
- By source
  - Where the portion of funding in question has come from (the name of the project funder)

The template tables provided for the detailed funding breakdown provide scope to input one or several types and sources of finance, across one or several years. Values can be inputted where appropriate, with excess table elements ignored. Conversely, it is possible in some cases (e.g. large projects receiving funding from numerous sources) that the tables will need to be expanded where necessary

APPENDIX E Roles and Responsibilities of CRGE Implementation Bodies

The Inter-Ministerial Steering Committee

The CRGE is governed by the CRGE Inter-Ministerial Steering Committee, which is chaired by the Prime Minister's Office, and comprises ministers of the CRGE implementing Ministries. The Steering Committee is responsible for setting overall policy direction and guidance on CRGE implementation, criteria and scope for funding, and for approving proposals.

The CRGE Management Committee

MOF and EFCCC co-chair and supervise the activities of the CRGE Management Committee. All sector ministries involved in the CRGE strategy are represented at state minister level. Overall, the Management Committee provides oversight on CRGE implementation, in accordance with the CRGE Inter-Ministerial Committee's guidance. and It also reviews and make fund allocation decisions of all Facility activities appraised by the technical team (which sits within the CRGE Facility secretariat), and oversees effective monitoring and evaluation of all CRGE activities

The National Planning Commission (NPC)

The roles played by NPC are oversight and follow up of the implementing entities, in close collaboration with EFCCC from the federal level down to the regions and Woredas, to plan and implement the CRGE strategies. The NPC makes sure that all CRGE-related plans and reports are updated based on the comments given by EFCCC and the updated plans are also incorporated in the national plan submitted to planning commission. Another responsibility of the NPC is M&E of reports of implementing entities in collaboration with EFCCC.

The Environment, Forest & Climate Change Commission (EFCCC)

EFCCC's role in the achievement of CRGE goals is to develop different strategies and tools in collaboration with stakeholders that will facilitate its planning and implementation, providing technical support during the planning process in collaboration with NPC and reviewing of their plan and giving timely review comments. The EFCCC also helps mobilize resources though its resource mobilization general directorate in collaboration with MOF. As such, the EFCCC's role covers coordinating and follow up of the overall implementation of CRGE/NAP at the federal and regional level; facilitating and organizing the inter - ministerial and management committee meetings, and building capacity of implementing entities at the federal and regional level.

CRGE Facility

The facility is established under EFCCC and MoF to coordinate and support implementation of the CRGE strategy; mobilize resources for the implementation of CRGE/NAP; build the capacity of implementing and coordinating entities; and conduct M&E of implementation of CRGE/NAP funded by the Facility

Federal Sectorial Implementing Entities

The federal sectorial implementing entities roles focus on preparing their CRGE/NAP mainstreaming development plan. They are expected to cascade their plans and its implementation to their regional counterparts; to establish their respective CRGE directorates or/and strengthen if already established; and coordinate, monitor and evaluate the implementation of CRGE/NAP-mainstreamed development plan by their regional counterparts.

Regional and City Administration Environment, Forest and Climate Change Bureaus (EFCCs)

The regional EFCCCs follow the same approach at the regional level. Their primary role is to incorporate climate change into the regional and Woreda development plans and to coordinate regional implementation of the strategy. The regional bureaus establish the necessary CRGE structures in their respective regions, facilitate and organize the regional CRGE steering committee meetings, build the capacities of the regional and Woreda implementing entities, undertake M&E of the region's implementation performance through periodic evaluation of the regional implementing plan, and manage reporting of CRGE implementation in their respective regions and Woredas to the federal coordinating entities.