

Sectoral implementation of nationally determined contributions (NDCs)

May 2017

FORESTRY AND LAND-USE CHANGE

This publication forms part of a series of NDC sectoral overviews, which provide information about current sectoral contributions to global greenhouse gas emissions and prospects for implementing NDCs in these sectors.

Each briefing paper presents concrete options for integrating sectoral measures in future NDCs, as well as more general cross-sectoral recommendations for moving forward with emissions-reductions measures.

Written primarily from the perspective of climate change experts, with input and suggestions from sector colleagues, the briefing series' intended target audience is twofold: first sectoral experts, who are facing the challenge of implementing the NDCs and related climate policies in their respective sectors; and second climate change experts, highlighting the relevance of the sector for NDC implementation.

This briefing paper focuses on forestry but also covers issues related to land-use change, as the two issues are oftentimes inextricably linked. Agriculture is included to the extent that it affects deforestation and / or overlaps with land-use change policies and measures. All other aspects regarding agriculture are covered in a separate briefing paper.

Forestry, land-use change and climate change

Forestry, land use and land-use change contributed to around 10% of global greenhouse gas (GHG) emissions in 2010 (IPCC 2014)^{1, 2}, most of which were caused by deforestation in developing countries in the tropics. Deforestation has resulted in an increase in GHG emissions by 4 GtCO₂e annually from 2001-10, and 2.9 GtCO₂e per year in the period 2011-15 (Federici et al. 2015).

Deforestation is largely driven by agriculture — specifically by agricultural commodities such as soy, beef, and palm oil — but is also driven by timber production. According to the FAO, large-scale commercial agriculture accounts for around 40% of deforestation in the tropics and subtropics, and local subsistence agriculture for another 33% (FAO 2016a), with considerable regional differences. Whereas commercial agriculture accounts for almost 70% of deforestation in Latin America, it only accounts for one-third in Africa, where small-scale agriculture is a more

1 CO₂ emissions from forestry, land use and land-use change are highly uncertain, in the order of +/- 50% (IPCC 2014).

2 This figure accounts for emissions from the forestry, land use and land-use change (LULUCF) sector. No separate figure is available for forestry and land-use change alone.

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significant driver. Stress on forest stocks and land worldwide is exacerbated by population growth, increasing per capita food consumption and urban expansion (Ibid).

Illegal land conversion and illegal logging is another huge challenge for the sector, and between 2000 – 2012 accounted for about 50% of deforestation in the tropics. Nearly one-quarter of the illegally converted land was used for agriculture destined for export markets (Lawson et al. 2014). Many of the aforementioned commodities, which are traded internationally, originate on lands that have been illegally deforested (Lawson et al. 2010).

Forests represent the world’s most significant terrestrial carbon sink, containing an estimated 77% of all carbon stored in vegetation and 39% of all carbon stored in soils (Eliasch Review 2008). Forests remove a significant amount of CO₂ from the atmosphere: 2.2 GtCO₂e from 2001-10 and 2.1 GtCO₂e from 2011 – 15 (Federici et al. 2015). Forested areas continue to decrease each year;

however, the annual rate of decrease has slowed by 18% since the 1990s (Eliasch Review 2008).

The formal forestry sector is a significant source of global wealth. As such, in the period from 2000 – 2011 the sector provided paid employment for around 13 million people, generated USD 66 billion in value added and exported products worth USD 421 billion. While the employment number is slowly decreasing, global value added slightly increases (Lebedys & Li 2014). Its role was also recognised in the Paris Agreement, where forestry was the only sector explicitly included in the final text. Indeed, Article 5 of the Agreement explicitly encourages Parties to conserve and enhance forests, including through REDD+ (UNFCCC 2015).

The table below details what needs to be achieved in the sector to hold global temperature increase to “well below 2°C” and to pursue “efforts to limit the temperature increase to 1.5°C”.

TABLE 1: Selected implications of the Paris Agreement targets for the forestry and land-use change sectors

| INDICATOR / SUBSECTOR | SELECTED IMPLICATIONS OF PARIS AGREEMENT FOR REQUIRED PATHWAYS |
|------------------------------------|--|
| Emissions (whole sector) | <p>1.5°C: Reduce emissions from forestry and other land use by 95% (range 40 to 145%) by 2030, compared to 2010 (Climate Action Tracker 2016).</p> <p>Impact of current Nationally Determined Contributions (NDCs) on emissions from forestry, land use and land-use change: While considering uncertainties, it is estimated that the full implementation of unconditional NDCs could lead to a GHG reduction of 1.6 GtCO₂e, which would increase to 1.9 GtCO₂e if conditional NDCs are implemented (UNEP 2015a).</p> |
| Deforestation | <p>2°C: For a 2°C-compatible pathway, countries would need to stop net deforestation by 2030 (SBT 2015).</p> <p>1.5°C: For a 1.5°C-compatible pathway, countries would need to stop net deforestation already by the 2020s, 10 years earlier than for a 2°C scenario, or reverse the trend, i.e. global forest area would have to increase again (Climate Action Tracker 2016).</p> |

Approaches and opportunities for mitigation in the forestry sector

The technical potential of forestry-related mitigation activities is huge. The mitigation potential from reduced deforestation in developing countries in the tropics is estimated to be 3.5 GtCO₂e/year by 2030, while reduced degradation and sustainable forest management could further reduce GHG emissions by 1.7 GtCO₂e/year.

Afforestation and reforestation in non-Annex I countries could achieve an additional reduction of 3.8 GtCO₂e through enhanced carbon sequestration. The potential for reducing deforestation is most significant in Latin America and the Caribbean, while the potential for sustainable forest management, afforestation and reforestation is significant in many regions. The real GHG emission reduction potential may be lower, as economic, land-use and other relevant constraints were not considered in this scenario (UNEP 2015a).

Forested lands continue to be converted for agriculture because that is often the most profitable option (Eliasch Review 2008) and is also a response to the challenge of food security (UNEP 2015a). In order to combat such trends, forests need to be accurately valued as providers of ecosystem services and preservers of biodiversity, and the services they provide should be reflected in the price of agricultural commodities. By stressing the significant co-benefits of forest conservation, which are described in the recommendations section below, gains can be made that result in increased food security without uncontrolled land conversion. Such win-win outcomes are also sought by the Sustainable Development Goals (SDGs). SDG 15 (sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss) and SDG 13 (combat climate change and its impact) anchor forestry and land management into the agenda 2030.

Reducing emissions from deforestation and forest degradation in developing countries (otherwise known as REDD+), which emphasizes the role of conservation, sustainable forestry management, and enhancement of forest carbon stocks, can be a key instrument and cost-effective land-use option that also addresses some of the challenges mentioned above (UNEP 2015b). REDD+ is a results-based finance mechanism that requires countries to prove that their forest conservation programmes have reduced emissions before they receive funds (UNFCCC 2013).

A series of challenges have impeded the full operationalization of REDD+ programmes. REDD+ is designed to operate at multiple levels of government and requires the coordination of different policies at the subnational and national levels. However, a lack of cross-sectoral approaches has resulted in ineffective implementation. In addition, uncertain tenure rights for those entrusted with protecting and restoring forests are another major challenge. Forest tenure arrangements at the landscape level have tended historically to favour the interest of actors that convert forests to non-forest uses. Other REDD+ challenges include gaps in capacity for carbon monitoring, the setting of realistic benchmarks for actual emis-



Deforestation, for example through slash-and-burn land clearing, significantly contributes to climate change.

sions reductions, and uncertainty over payments from (voluntary) markets for carbon offsets (CIFOR 2014). An additional bottleneck is finance. While sufficient short-term finance is available, slow disbursement, lack of private finance, insufficient investment opportunities and the absence of a long-term strategy remain problematic (Angelsen et al. 2012).

The role of forests as carbon sinks could be strengthened through reforestation or afforestation, or through enhancing sequestration in existing forests. However, the (limited) ability of forests to act as carbon sinks should not be seen as an alternative to reducing CO₂ emissions in other sectors but rather as a complementary action to protect the natural storage reservoirs of carbon (Climate Action Tracker 2016).

The private sector has been acting on its interest in promoting emissions reductions in the sector. The Carbon Disclosure Project's (CDP) non-state initiative, which engages supply chains of large businesses that have an impact on deforestation, was estimated to be able to reduce annual emissions by an additional 500 – 1200 GtCO₂e in 2030 (CDP 2016). The New York Declaration on Forests and the Tropical Forestry Alliance are estimated to contribute to additional emissions reductions of 331 MtCO₂e and 100 MtCO₂e respectively in 2020 (UNEP 2015a). Other initiatives, such as the Bonn Challenge on forest landscape restoration, target the restoration of 150 million ha of forests by 2020.

Forestry and land-use change sectors in NDCs

Coverage of the forestry and land-use change sectors in NDCs

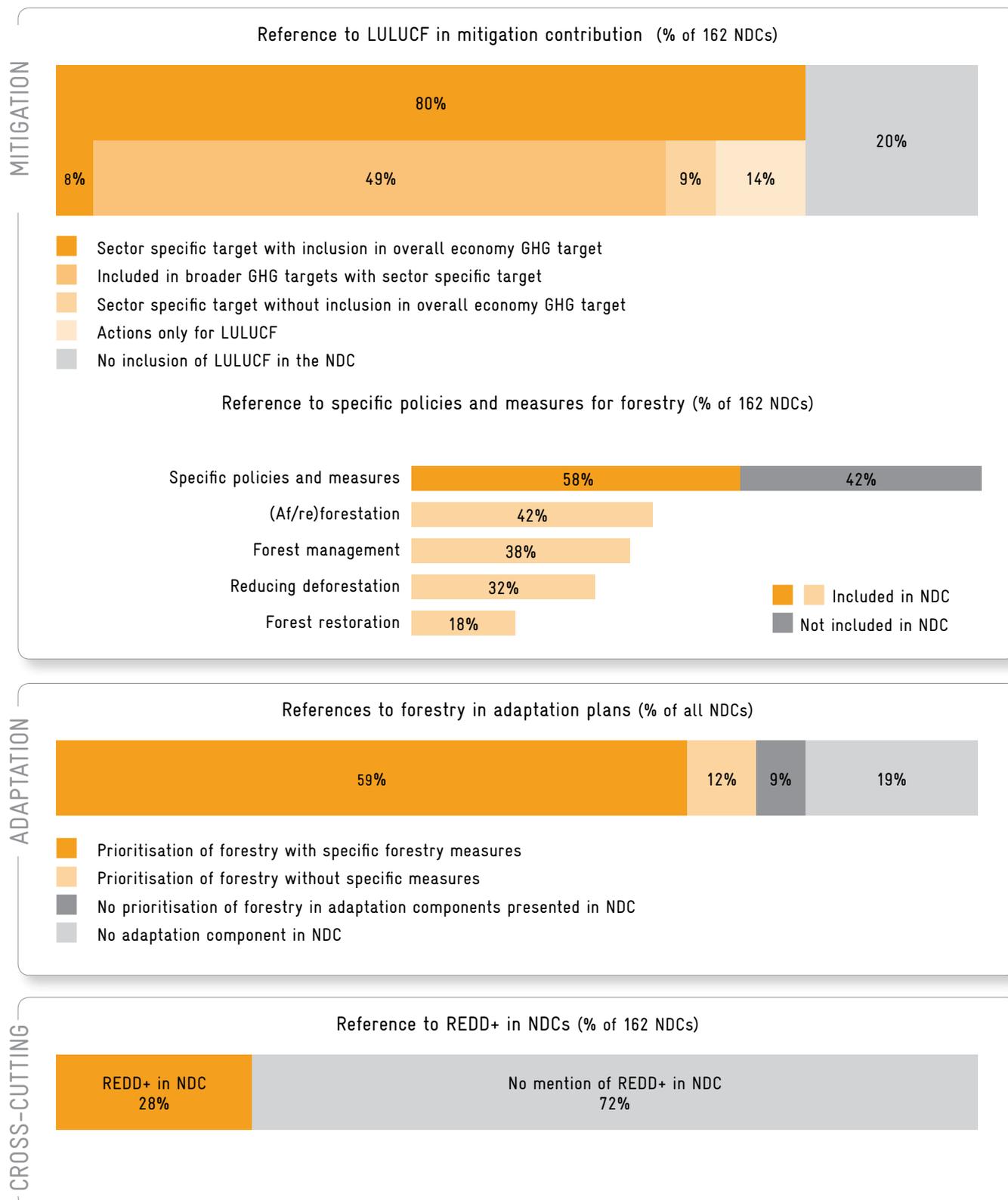


FIGURE 1: Overview of forestry, land use and land use change sector coverage in NDCs. Authors' own elaboration, based on FAO (2016).

The forestry and land-use change sectors were generally afforded high importance in the NDCs. 80% of NDCs reference LULUCF in mitigation contributions and 58% reference specific policies and measures for forestry. However, a lack of concrete information in NDCs on approaches and methods for accounting emissions and removals from land-use categories makes it difficult to compare efforts and also leads to uncertainty regarding the global mitigation impact of the NDCs in the forestry and land-use sectors. Only a small number (17%) detail a concrete, measurable forestry, land-use change and land-use sector-specific target (FAO 2016b). The most frequently referenced policies and measures are afforestation/reforestation (referenced in 42% of NDCs), forest management (38%) and a reduction of deforestation (32%).

The synergies between adaptation and mitigation were commonly highlighted throughout the NDCs. 59% of NDCs refer to forestry in adaptation plans and 12% included specific adaptation measures for the forestry sector. Adaptation targets focus mostly on sustainable forest and land management (World Bank 2016).

REDD+ activities are usually included within sectoral policies and measures, as a means to achieve mitigation and adaptation targets. 45 countries made an explicit reference to REDD+ in their NDCs. A handful of countries specifically mention the development of NAMAs within the forestry sector in their NDCs (FAO 2016b).

Most countries with conditional forest targets do not provide sufficient detail on financial requirements. At least eight countries do have specific, conditional forestry targets, with estimates of the international finance needed to achieve them³ (SV IWP/ GIZ 2016).

Key steps for moving towards sector-driven implementation and ambition raising

Many of the key steps for moving ahead with NDC implementation and ambition raising are relevant for all sectors. They are summarised in this box. Further details on the individual steps can be found in the overview briefing paper of this briefing series.

Establishment of institutional bodies for oversight of implementation and monitoring of progress: Alignment of institutions based on optimisation of existing mandates, to include broader levels of governance in strategy making including finance and planning ministries, and devolvment of responsibilities to line ministries and agencies with most sector influence. Approaches developed should be resilient to government staff turnover.

Development and dissemination of knowledge on climate requirements and benefits: Enhancing understanding on the implications of the Paris Agreement for the sector, and the social and economic benefits of climate change mitigation and adaptation measures.

Plans for achievement of sector targets, and review of potential for increasing ambition in specific sub-sectors: Stock-take and integration of sub-national, national and non-state action, translation to subsector targets, determination of long-term full decarbonisation targets for the sector, and collation of this information into a target-based roadmap. Potential for ambition raising can be analysed based on regional best practice policies and consideration of targets for sub-sectors not covered in climate strategy.

Planning and implementation of instruments to leverage investments: Evaluation of investment requirements and the role of private and public finance for leveraging those investments. Analysis of persisting barriers and development of concepts for projects/programmes that can address those barriers through unilateral action or international support (e.g. NAMAs).

Revision of NDC: Update content of NDC for greater transparency, clarity and in line with aligned national strategy and identified ambition raising potential.

Introduction of policy packages and programmes to kick-start action: Introduction of new policies and strengthening of existing policies, in accordance with sector planning process, and development and submission of proposals for internationally supported programmes (e.g. NAMAs).

³ Angola, Democratic Republic of the Congo, Fiji, Guinea, India, Laos, Mongolia and Suriname.

Moving ahead with implementation and raising ambition

Actions can be taken within the forestry and land-use change sectors in the immediate- to short-term to support the implementation of the NDC targets and actions, and for raising ambition. Specific considerations for these sectors are presented in the following.

Key priorities for effective NDC implementation must consist of **strengthening institutional arrangements and processes**, and revising NDCs accordingly. Specific recommendations include:

- » *As a sector that is highly relevant for both climate change and sustainable development, the integration of forestry and climate change planning should be strengthened and better reflected in NDC revisions.* Revisions should identify and reflect synergies and trade-offs between forestry and other national objectives and should have clarity regarding sector and sub-sector targets. Greater transparency with regard to forestry targets and their potential overlap with emissions from agriculture and carbon sinks should also be included.
- » *The standardisation of approaches for estimating and reporting GHG emissions and removals from the sector, such as applying the 2006 IPCC Good Practice Guidelines for LULUCF⁴, would help to clarify contributions.* Currently, a wide range of emissions estimates from deforestation and forest degradation exist. The range reflects uncertainty in data sources, the use of different methodologies to estimate emissions, differences in the land-use change processes included, differences in the emissions sources included, and variations in the definition of “land cover”.
- » *The improvement of data collection and reporting would also be beneficial.* Several countries refer to difficulties in establishing measurable emissions reductions from the LULUCF sector due to data gaps or the inability to collect information (Petersen & Varela 2015).

On the **policy side**, mitigation options will need to address the main drivers of deforestation, including inefficient land-use management and trade-offs with other sectors.

⁴ For more details on the guidance, please see: <http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html>



Afforestation and reforestation can lead to considerable emission reductions through enhanced carbon sequestration. Here, seedlings are grown in a village tree nursery in Madagascar.

Specific recommendations include:

- » *To reduce deforestation, where there are good national land-use monitoring systems in place, land-use management planning and policies must be strengthened at the national and local levels.* The resolution of land tenure issues is essential to generate incentives for longer-term investments in sustainable management (Eliasch Review 2008; FAO 2016a).
- » *Policy in the next decade should focus on community awareness raising and community forest management*, including the transfer of land tenure to local communities. It is important to support local communities in their efforts to address illegal logging activities (Agrawal & Angelsen 2009).
- » *To overcome land-use competition issues, nationally coordinated cross-sectoral strategies are required.* Effective land management should involve all relevant line ministries and be based on an analysis of the drivers of deforestation and forest degradation, as well as on the barriers to sustainable forest management and the enhancement of forest carbon stocks. National and often subnational institutions need to be mandated, given resources and the capacity to implement these strategies (FAO 2015).
- » *Policies not directly related to forest-land management can help reduce deforestation.* The modernisation and intensification of agricultural practices and investment in their resilience against natural disasters and climate change can reduce the demand for land conversion.

Moving ahead with NDC implementation will also require the **involvement of key stakeholders**, the availability of human and financial **resources** and a clear **communication** of the broader benefits of mitigation measures. Specific recommendations include:

- » *A better understanding and exploitation of overlaps with other sectors, in particular agriculture and energy, is needed to optimise synergies and mitigate negative effects.* Certification schemes for forest-risk commodities (soy, timber, beef, palm oil) could be strengthened by importing countries. Export regulation and enforcement could also be improved via international private tracking and certification systems (Climate Action Tracker 2016). Agroforestry also offers opportunities to address conflicting interests, while simultaneously increasing crop yields and the diversity of products grown (Mbow et al. 2014).
- » *It is important to fully understand and communicate the broader benefits of forestry related mitigation measures.* If properly designed and implemented, forestry mitigation approaches will have substantial economic, social, environmental and adaptation co-benefits in terms of employment and income generation opportunities, biodiversity and watershed conservation, provision of timber and fibre, as well as decreased soil erosion (FAO 2015; IPCC 2014).
- » *The REDD+ initiative needs to be operationalised at a large scale, to support countries' efforts to raise the ambition of their NDC targets and actions.* While public sources are likely to provide the majority of REDD+ funding in the short term, indirect market mechanisms, such as green or sustainably sourced commodities, could become sources of REDD+ financing. Consideration could also be given to allow REDD+ credits to be traded in the global compliance-based carbon market (Angelsen et al. 2012).
- » *Human rights safeguards need to be promoted and supported to respect the knowledge and rights of indigenous peoples and local communities, and to enable their full and effective participation in the protection of forests (FAO 2015).* Indigenous peoples and local communities provide essential contributions as the rights holders of over 500 million hectares of tropical forests - and the managers of an

even larger area (UNFCCC 2016). Civil society plays an important role in building capacities, tracking progress, and disseminating information to this end.

- » *Strengthen the involvement and impact of the private sector.* Over the last few years, more than 300 private sector companies have announced their intent to eliminate deforestation from their supply chains (UNFCCC 2016). Voluntary action by companies can be accelerated when governments provide enabling policy environments that create incentives at both ends of the supply chain, engage in public-private partnerships and target development assistance. This in turn enables governments to set more ambitious timeframes for reducing deforestation (CDP 2016).

FURTHER READING

Further details on the topics discussed in this briefing paper may be found in the following sources, amongst others:

Emission scenarios for the forest sector

- UNEP, 2015 → [Emissions Gap Report 2015](#) (mitigation potential from forest-related activities and incentives for enhanced action in developing countries).
- IPCC, 2014 → [Fifth Assessment Report – Summary for policymakers](#).

Long term implications of 2°C and 1.5°C for the sector

Reflecting uncertainty in the long-term technical options for reducing and/or removing GHG emissions in the forestry sector, the availability of information related to 2°C and 1.5°C pathways for the sector remains highly limited. The following sources summarise some of the available information.

- Climate Action Tracker, 2016 → [10 most important steps to limit warming to 1.5°C](#) (Chapter 8: requirements and feasibility of options for 1.5°C compatibility in the land use, land-use change and forestry sectors).
- UNEP, 2012 → [Emissions Gap Report 2012](#) (detailing best practice policies to curb deforestation and achieve a sustainable forestry sector).

Integration of forest sector in NDCs

- FAO, 2016 → [The agriculture sector in the Intended Nationally Determined Contributions](#) (overview of the inclusion of the forestry sector in INDCs, including statistical information on sector inclusion and target types for mitigation and adaptation).
- World Bank, 2016 → [NDC Platform](#) (searchable database of sector and sub-sector specific details in all INDCs).

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