



WORLD
RESOURCES
INSTITUTE

EXECUTIVE SUMMARY

Traceability and transparency in supply chains for agricultural and forest commodities

A review of success factors and enabling conditions
to improve resource use and reduce forest loss

Emily Fripp, Jonathan Gorman, Tina Schneider, Sharon Smith, Joe Paul, Till Neeff, Francesca Marietti, Laura Vary, Ashleigh Zosel-Harper



**FOREST DATA
Partnership**

With the technical support of:



Food and Agriculture
Organization of the
United Nations



AUTHORS

EMILY FRIPP

is the founder and director of Efeca.
Contact: emily.fripp@efeca.com

JONATHAN GORMAN

is a technical director at Efeca.
Contact: info@efeca.com

TINA SCHNEIDER

is director of forest governance and policy at WRI.
Contact: tina.schneider@wri.org

SHARON SMITH

is the founder of Kanopi Consulting.
Contact: sharon@kanopiconsulting.com

JOE PAUL

is a consultant at Efeca.
Contact: info@efeca.com

TILL NEEFF

is a consultant at the FAO.
Contact: till.neeff@fao.org

FRANCESCA MARIETTI

is a consultant at Efeca.
Contact: info@efeca.com

LAURA VARY

is the Chief of Party for the Forest Data Partnership.
Contact: laura.vary@wri.org

ASHLEIGH ZOSEL-HARPER

is the monitoring, evaluation, and learning specialist for the Forest Data Partnership.
Contact: ashleigh.zoselharper@wri.org

DESIGN AND LAYOUT

SHANNON COLLINS

shannon.collins@wri.org

SARA STAEDICKE

sara.staedicke@wri.org

ACKNOWLEDGMENTS

This report was prepared by World Resources Institute, Efeca, and Kanopi Consulting with the technical support of the Food and Agriculture Organization of the United Nations (FAO).

The authors would like to thank everyone who supported this work, including the following people who were interviewed and provided information used in the report or served as reviewers:

Jean Bakouma, Mairon Bastos-Lima, Leandro Baumgarten, Helen Bellfield, Grace Blackham, Ethan Budiansky, Pedro Burnier, Andre Campos, Caroline Duhesme, Luca Fischer, Toby Gardner, David Gehl, Adrian Gires, Adrian Hagitas, Maddie Harris, Alastair Herd, Lisandro Inakake de Souza, Vincent Istace, Simon Kartar, Marcel Koubemba, Godwin Limberg, Daniela Mariuzzo, Rob Maslin, Serge Moukouri, Sengbee Ng, Saskia Ozinga, Naven Pankhania, Gary Paoli, Oswaldo Pereira, Elizabeth Petykowski, Florian Reimer, Luke Ryder, Anna Sands, Jade Saunders, Daniel Silva, Jack Simpson, Lucie Smith, Tim Steinweg, Olivier Tichit, Nanne Tolsma, Sebastiaan van der Hoek, Laura Waisbich, Jon Walker, Nathalie Walker, Victoria Wiafe, Mark Wong, a number of contributors who wish to remain anonymous, and FACT Dialogue members of the Traceability and Transparency Action Group.

Thank you also to the following FAO colleagues for their support: Bruno Cammaert, Rémi D'Annunzio, Serena Fortuna, Julian Fox, Buyung Hadi, Tomislav Ivančić, Thaís Linhares-Juvenal, Caroline Merle, Anne Mottet, Cristiana Orlandi, Tiina Vähänen, and Erik van Ingen.

Finally, the authors would like to thank the following current and former WRI staff and consultants for serving as reviewers, for providing technical inputs, for guiding the publication and peer review process, for supporting the dissemination of the findings, and for designing and copyediting the report: Ruth Nogueron, Wan Jian, Zhe Liu, Achille Djeagou, Bukti Bagja, Hidayah Hamzah, Mikaela Weisse, Luiz Calado, Caroline Winchester, Fred Stolle, Sarah Carter, Charles Barber, Marie Vallée, Elizabeth Goldman, Anne Rosenbarger, Bo Li, Tobias Stäuble, Chloe Shauck, Jun Geng, Stephanie Tan, Ekin Birol, Laura Malaguzzi Valeri, Gregory Taff, Renee Pineda, Emilia Suarez, Romain Warnault, Sarah DeLucia, Sara Staedicke, Shannon Collins, and Emily Vail.

Funding for this independent piece of research was provided by the UK Department for Environment, Food and Rural Affairs. Funding for the Forest Data Partnership was provided by the United States Agency for International Development (USAID).

SUGGESTED CITATION

Fripp, E., J. Gorman, T. Schneider, S. Smith, J. Paul, T. Neeff, F. Marietti, L. Vary, A. Zosel-Harper. 2023. "Traceability and transparency in supply chains for agricultural and forest commodities: A review of success factors and enabling conditions to improve resource use and reduce forest loss." Report. Washington, DC: World Resources Institute. Available online at doi.org/10.46830/wrirpt.22.00156.

VERSION 1

October 2023

HIGHLIGHTS

- Decoupling production and consumption of commodities such as soy, palm oil, cattle, cocoa, timber, coffee, and rubber from forest loss is imperative for meeting climate targets. Although the causal link between forest loss and traceability and transparency is complex, forest loss cannot be addressed without understanding where and how commodities are produced and how sustainability of agricultural value chains could be strengthened.
- This report assesses traceability and transparency tools and initiatives based on a literature review and interviews. It draws out enabling conditions and success factors that inform priority actions for expanding traceability and transparency.
- Independent verification is necessary for systems to be credible. Definitions need to be applied consistently.
- Traceability and transparency in commodity supply chains are achievable, though additional investment is required.
- Governments should provide an adequately resourced policy environment that facilitates traceability and transparency within the challenges of complex supply chains. Investments are rarely one-off since continued funding is usually needed. Approaches to traceability and transparency must consider the needs of smallholders to be effective.
- Data gaps remain, especially where there is a large smallholder component, but equally important is ensuring that data are accessible and usable. Investments are needed to help close these gaps.

BACKGROUND

Traceability and transparency are increasingly called on to help halt and reverse forest loss. In November 2021, 145 countries restated their commitments to conserve, protect, sustainably manage, and restore forests and to work toward halting forest loss and land degradation in the Glasgow Leaders' Declaration on Forests and Land Use (COP26 2021). Close to 90 percent of forest loss is associated with expansion of agriculture, resulting in increasing calls for better solutions to identify and help manage the risk of forest loss associated with commodity supply chains. The role of traceability and transparency has been widely recognized in the application and enforcement of laws that underpin sustainable production, efforts by companies to ensure sustainable sourcing of agricultural commodities, and efforts by stakeholders and civil society to enhance accountability. There is growing momentum of government commitments at the national, regional, and international levels; private sector commitments and pledges; and requirements for disclosure, monitoring, and reporting. Delivering on these commitments requires robust traceability and transparency systems.

OBJECTIVE AND METHODS

This independent research project, undertaken by World Resources Institute with technical support of the Food and Agriculture Organization of the United Nations (FAO) and a team of consultants on behalf of the Forest Data Partnership, seeks to provide an updated evidence base on traceability and transparency in commodity value chains. The report aims to inform collaborative action among governments, the private sector, and civil society organizations that are working toward enhancing traceability and transparency. It focuses on seven commodities: cattle, palm oil, soy, cocoa, timber, coffee, and rubber, but also offers insights applicable to other commodities.

Traceability and transparency can have different meanings to different stakeholders in different circumstances. This report uses the following working definitions:

- *Traceability* refers to the ability of an actor to link a product or unit of material with information about its history of locations, owners, and transformations between points in the supply chain, such as from production site

to end user. The information associated with commodities also includes sustainability aspects at the production site, notably forest loss.

- *Transparency* refers to the making available of information by any stakeholder. The information that is made available will often relate to the traceability of commodities, but can include broader information that is relevant and useful in the context of halting and reversing forest loss such as sustainability policies and practices, commitments, land use information, monitoring, or outstanding grievances. There can be different levels of transparency, ranging from information sharing within an organization or peer companies, to sharing with specific stakeholders, to sharing publicly.

Traceability and transparency tools and initiatives, while providing much needed information, do not alone lead to reduced forest loss. Traceability and transparency are not solutions in themselves but are necessary to support decisions by supply chain actors that affect forest cover. While the causal link between traceability and transparency on one side and forest conversion on the other is complex, increased access to information is a precondition for producing commodities without inducing forest loss.

This report's research draws on three sources of information collected and analyzed between October and December 2022. First, we surveyed 94 tools and initiatives that generate, collect, process, and distribute relevant information about agricultural and forest commodities through a global mapping exercise. Second, we conducted over 70 interviews with representatives from government, the private sector, civil society, and academia. Third, we undertook case studies to delve into more detail, covering regions and commodities of global importance. The case studies are on palm oil in Southeast Asia, cocoa and timber in West and Central Africa, soy in Brazil, and cattle in Latin America.

Traceability and transparency are not solutions in themselves but are necessary to support decisions by supply chain actors that affect forest cover.

CONCLUSIONS

This report draws out three categories of findings based on these information sources:

- An overview of enabling conditions and success factors for traceability and transparency
- An assessment of how traceability and transparency can underpin the ambitious objectives to address forest loss in the public and private sectors and identify key gaps
- Priority actions to improve traceability and transparency

ENABLING CONDITIONS AND SUCCESS FACTORS

Enabling conditions can be critical for the success of traceability and transparency.

- **Public funding and civil society involvement in design and management** lead to higher levels of disclosure in traceability and transparency tools and initiatives, highlighting the importance of ownership structure and funding sources.
- The **regulatory environment** requires transparency on commodity production (e.g., including due diligence requirements and mandatory national or jurisdictional standards, reporting standards, or assurance mechanisms) and governance structures set up to successfully implement and enforce legal frameworks.
- **Reporting standards, definitions, and methodologies** are consistently applied across a whole sector and within initiatives.
- Governments make **data available and accessible**, supporting traceability and transparency within supply chains and facilitating agreement on standards for data disclosure and publication.

- **Shared goals and trust** among actors enable data sharing and avoid duplication of efforts, building on and expanding the reach of individual supply chain solutions.
- **Collective action relies on agreement among companies, governments, financial institutions, and civil society** on the demands for data.
- **Equitable cost sharing** to set up and maintain data collection and traceability systems enables broad participation.
- **Continued investment in technical innovation** creates the conditions for better data quality and usability, which are important for tools and initiatives to be effective.

In addition to the enabling conditions, there are also common success factors associated with specific tools and initiatives, which the report lays out with examples.

- **Clear scope and corresponding metrics of success** enable targeted initiatives that can be evaluated.
- **Internal or external verification and audit processes** assess the validity of reported data and build data credibility.
- **Aligned or consistent** definitions, metrics, scopes, and reporting mechanisms and alignment on what constitutes credible evidence make it possible to compare disclosed results from several sources. Safeguards for sharing data effectively are needed to protect sensitive information, reduce duplication of efforts, and enhance transparency.
- **Clear frameworks and rules** for consistent data collection and reporting across sectors, commodities, and geographies enable broad uptake and reduce cost.
- **When datasets are user-friendly and well-documented, and data and methods are accessible** (published and easy to find) **and interoperable** (different datasets can be used together), target audiences are able to act upon information.

Existing and future traceability and transparency tools and initiatives can support policy objectives to halt and reverse forest loss by building on existing efforts and closing gaps.

Current traceability and transparency tools and initiatives have developed rapidly to meet evolving needs. This report lays out a list of successful examples across several geographies and commodities that illustrate that enhancing

traceability and transparency is achievable and can be part of efforts to address forest loss. In many cases, changing voluntary and regulatory requirements have encouraged innovation and the development of solutions to meet these requirements. Governments should continue to raise the level of ambition reflected in systems, requirements, and pledges, while providing the necessary guidance and support to help private sector actors navigate these changes.

Despite the rapid progress seen to date in developing traceability and transparency solutions, more concerted and aligned action from all groups is necessary in the near term to address forest loss in agricultural and forest supply chains. Individual companies and collaboration platforms have adopted pledges to remove deforestation from supply chains, but to date only 36 percent of the largest companies have commitments and many of these companies are not systematically monitoring their progress toward meeting them. Much of the effort to date has been focused on individual supply chains and small pilots. Similarly, governments have signed commitments to halt and reverse forest loss, but in many cases more funding and staff are needed to meet these commitments, and to expand government-owned traceability and transparency tools and initiatives. There needs to be a shift both in the pace and scope of action taken to apply traceability and transparency to achieve sector-wide transformation.

The ability to achieve full traceability back to the point of origin depends on various factors, including geographic complexity, the number of tiers of a supply chain, whether the supply is from only direct or also indirect sources, and the proportion of smallholders in the supply chain. There are examples where full traceability has been achieved, but traceability of indirect supply and for smallholder producers remains challenging, requiring investments of time, financial resources, and effort. For some commodities, individual units of products are easier to trace, but for others (e.g., soy, coffee, cocoa, palm oil), raw materials and derived products are blended in the supply chains.

Governments play a key role in collecting and sharing data and should make more data available to help fill remaining gaps. Traceability and transparency tools and initiatives in many cases rely on public sector information, such as farm legality and licensing data, as well as forest monitoring systems. Traceability and transparency can be advanced more rapidly when private sector traceability data can be

integrated with data from government forest monitoring systems and sources of information on land tenure, including on legality and other contextual information. Further improvements can also be made in terms of the accessibility and usability of public sector data. For example, even when government data are available, systems could be further improved to allow integration of relevant datasets and information flows across state and federal agencies. Government action is needed at the jurisdictional, country, and international levels to expand the data and information available for use, which is a key component of a conducive enabling environment for achieving transparency and traceability on commodity production. However, in many cases, providing additional data will depend on the provision of adequate capacity development support.

While gaps remain, in most instances enough data and information exist for supply chain actors to take meaningful steps toward assessing the risk of forest loss in supply chains, and to prioritize areas for action. Data gaps remain such as in data availability for individual commodities (some commodities have been prioritized, and interest in others is now rising), for certain producer groups (primarily related to smallholder farmers), and for specific types of data (some kinds of geospatial data are difficult or expensive to obtain, and a lot of contextual data, such as around land tenure, are often not available). While continued investments are needed to improve data availability, quality, usability, and interoperability, data gaps should not be used to delay action. Solutions should start from the problem, not the available technology, to avoid limiting ambition to what is already common practice and avoid bias in selecting tools and resources.

Individual supply chain projects and pilot approaches have been a useful source of experimentation and learning, but to address forest loss in supply chains, a sector-wide transformation is needed. Solutions developed by individual actors or small consortia remain limited in reach in part because data remain siloed or are not shared across actors, or because of a lack of adoption by peer companies. Private sector-led approaches will cover only a portion of markets, typically the activities of the largest enterprises, which are subject to international investor and buyer pressure. The largest private sector actors engaged in the “visible” economy, such as major meatpackers, soy traders, and palm oil traders, have taken voluntary measures to set up traceability systems. However, in all these cases their market shares,

while meaningful, do not cover all production. More emphasis can be placed on recruiting more private sector actors, including small and midsize enterprises, to join collaborative efforts aimed at sector transformation. Enhanced collaboration within and among supply chains, collective action approaches, and scaling up successful strategies are all essential building blocks. However, these approaches all rely on funding and time to build trust among actors and align on definitions and can be harder to fund than new tools and initiatives. Rather than creating new systems, a necessary focus is on strengthening the linkages of existing systems, protocols, and datasets, and the certifications across both the public and private sectors.

For a sector-wide transformation, governments in producing and consuming countries need to continue raising the bar with respect to traceability, reporting, and disclosure requirements as well as supporting information flows across public and private sectors. Relying on private sector financing and innovation limits the ability of traceability systems to reach full market saturation. Even if these systems are strong and fully implemented in these supply chains, private sector efforts cannot on their own fully transform sectors. The lack of efficient information flows and exchange across multiple private sector actors limits effective policy design and interventions. Government efforts, regulations, and systems, in collaboration with private sector efforts, are necessary to ensure that traceability systems cover the entire marketplace. Furthermore, the public sector can help facilitate information flows and accessibility by and for market actors.

Producing countries need support in developing, implementing, and maintaining sector-wide traceability and transparency tools and initiatives. Government approaches to achieving market-wide uptake of tools and initiatives through required standards, certification, or disclosure mechanisms are needed to “raise the floor.” However, this may not occur unless there is investment from consuming countries, philanthropies, and private sector sources to accompany changing market requirements. Such investments enable producing countries to pursue traceability and transparency tools and initiatives—both for public sector purposes, such as improving governance, enhancing revenue collection, and meeting national-level commitments and climate targets, and to improve market access for producers. Improved market access is particularly important in supporting vulnerable

actors that may otherwise be excluded from markets and supply chains. The interests and needs of vulnerable actors such as smallholders need to be considered in traceability and transparency tools and initiatives starting in the design phase.

Broad uptake of transparency and traceability initiatives rests on collaborative approaches that manage to ensure that all supply chain actors participate and that collected information is of a high quality. The credibility of tools and initiatives will derive from their broad uptake, as long as strong mechanisms are in place for systematic quality control and data verification. Such quality management is essential to achieving public trust in systems that self-reported data will not always enjoy.

International dialogue can advance traceability and transparency by setting expectations and creating guidance. International fora such as the Forest, Agriculture and Commodity Trade (FACT) Dialogue; the Amsterdam Declarations Partnership; and the Forest and Climate Leaders' Partnership can advance discussions around topics that require government participation or support. This includes finding an equitable cost-sharing mechanism to avoid the burden of traceability and transparency being placed on smallholders or other upstream actors. International alignment would also be useful in agreeing on best practices for data gathering undertaken in an inclusive manner, considering current power imbalances in supply chains, and safeguarding privacy concerns and ownership of data collected, especially when it concerns data collected about individual producers. These fora could agree on best practices for funding traceability and transparency tools and initiatives, which should include a requirement for robust impact evaluation and a mandate to learn from and build on existing experiences. Government dialogue could also serve as a useful avenue for sharing lessons about efforts to implement traceability and transparency at the national or jurisdictional level. Further, governments can assess existing and planned initiatives in-country based on the key elements and success factors identified in this report and apply the lessons from collaborative approaches presented in this report. Government dialogue can help align on methods for data gathering and reporting, and on what constitutes credible evidence based on existing initiatives such as the Accountability Framework initiative and the Science-Based Targets Network.

Government, the private sector, and civil society need to expand the ambition and scale of action now to improve and increase traceability and transparency while engagement and dialogue continue. Making progress on some issues, such as definitions and specific data requirements, may take time and should not distract from the urgency of the forest loss crisis. There needs to be a dual approach to simultaneously pursuing better alignment on standards, reporting requirements, and datasets, while putting into place traceability systems. Today's existing solutions can be used more fully while work progresses in parallel to define and establish tomorrow's approach to traceability and transparency among the public and private sectors and civil society.

This report draws out the following priority actions by category of actor to improve traceability and transparency.

Private sector actors in supply chains should make the necessary effort to collect information, build up traceability systems, and disclose information where appropriate. Private sector actors should, jointly with other stakeholders, pursue an equitable solution to the additional costs created by increasing demands for traceability and transparency; collaborate with other actors to find ways to ensure that cost does



not cut out vulnerable upstream producers from markets; and put in place safeguards to protect privacy. They should, jointly with other stakeholders, work toward aligned standards for data disclosure and publication. They should support greater consistency within the objectives and reporting standards set in policy measures. They should work toward coherent and aligned commitments and take measures to address specific challenges facing smallholders and small and medium-sized enterprises in supply chains.

Governments of consuming countries should closely work together with those of producing countries. This will often include a range of activities, from providing technical and financial support to setting up and rolling out approaches to traceability and transparency. They should prioritize funding coordinated and integrated approaches and initiatives that build on and expand existing successful projects. They should carefully work with producers and supply-chain actors toward meeting consistent objectives and reporting standards.

Governments of producing countries should “raise the floor” by setting up assurance systems for commodity production and create market signals by setting national

standards for traceability and transparency. They should provide the necessary data to create effective traceability and transparency systems. They should, jointly with other stakeholders, work toward consistent objectives and reporting standards set in policy measures. Where they provide tools and platforms, governments should ensure that cost does not limit access to tools and platforms, especially among vulnerable upstream producers, and put in place safeguards to protect privacy. They should also set up support mechanisms to prevent smallholders from being excluded from markets.

Civil society organizations should continue developing technical solutions to integrating datasets, tools, and systems. They should ensure that cost does not limit access to tools and platforms, especially among vulnerable upstream producers, and put in place safeguards to protect privacy. They should leverage innovation and learn from other sectors to facilitate data sharing. They should support consistent objectives and reporting standards set in policy measures. They should bolster efforts to collaborate with existing initiatives, and support smallholders and other vulnerable actors in targeted projects.



REFERENCE

COP26 (Twenty-Sixth United Nations Climate Change Conference–United Kingdom). 2021. "Glasgow Leaders' Declaration on Forests and Land Use." Glasgow, UK: United Nations Climate Change Conference. <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>.

Photo Credits

Cover, Axel Fassio/CIFOR; p. ii, Craig Morey; p. 2, Dhruv Mehra; p. 7, Tom Coady.

Each World Resources Institute report represents a timely, scholarly treatment of a subject of public concern. WRI takes responsibility for choosing the study topics and guaranteeing its authors and researchers freedom of inquiry. It also solicits and responds to the guidance of advisory panels and expert reviewers. Unless otherwise stated, however, all the interpretation and findings set forth in WRI publications are those of the authors.

Maps are for illustrative purposes and do not imply the expression of any opinion on the part of WRI, concerning the legal status of any country or territory or concerning the delimitation of frontiers or boundaries.

ABOUT WRI

World Resources Institute is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity, and human well-being.

OUR CHALLENGE

Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

OUR VISION

We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

ABOUT FAO

The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger.

Our goal is to achieve food security for all and make sure that people have regular access to enough high-quality food to lead active, healthy lives. With 195 members—194 countries and the European Union—FAO works in over 130 countries worldwide.

Join us in creating a world without hunger and poverty.

ABOUT EFECA

Efeca provides independent technical advice and support on the sustainable and legal sourcing of natural resources, with a focus on agricultural and forest commodities including palm oil, soy, timber, cocoa, coffee and rubber. Working across the public and private sectors, research and civil society, our focus is primarily on national and international policies, regulations and private sector commitments. Efeca provides specialized advice on responsible sourcing, traceability, transparency, monitoring and reporting, and sustainable trade.

Efeca has a strong reputation for solution-oriented, cross-sector and industry-wide facilitation, along with high quality research and report writing. Efeca is impact driven, highly collaborative and focused on quality of execution.

Efeca is a Tropical Forest Alliance (TFA) partner, a World Economic Forum (WEF) preferred supplier, a UN Global Compact signatory, a Race to Zero committed business and an Accountability Framework initiative (AFi) coalition member. In 2023 Efeca became BCorp certified and is proud to be an accredited UK Living Wage Employer.

ABOUT KANOPI CONSULTING

Kanopi Consulting accelerates transformative change within corporate supply chains, driven by a dedication to reducing deforestation and safeguarding natural ecosystems. We collaborate with companies and NGOs to accelerate the widespread adoption of responsible sourcing and production practices, both at the individual company and sector levels. Through rigorous analysis and targeted advocacy, we identify and champion impactful sustainable land-use interventions for businesses operating in the food, consumer goods, and agricultural commodity sectors.

ABOUT THE FOREST DATA PARTNERSHIP

Initiated in October 2021, this five-year partnership, coordinated by the World Resources Institute (WRI) with support from USAID and the U.S. Department of State, brings together leading organizations, governments and private sector partners to collectively address the challenge of improving land use data. WRI lead the development of the data ecosystem by convening public and private sector stakeholders, providing governance and facilitation, and maintaining technical facilities for implementation. SERVIR, a joint initiative of NASA, USAID and leading geospatial organizations, builds capacity to use geospatial data at national and regional levels through its network of hubs in Asia, Africa and Latin America. Google supports the initiative as the key technology partner and platform provider. Unilever serves as the private sector lead for launching the ecosystem and coordinating private sector involvement.



WORLD
RESOURCES
INSTITUTE

10 G Street, NE
Washington, DC 20002
WRI.ORG



Copyright 2023 World Resources Institute. This work is licensed under the Creative Commons Attribution 4.0 International License.
To view a copy of the license, visit <http://creativecommons.org/licenses/by/4.0/>