Subnational mitigation actions for forest regeneration and the implementation of planned grazing

ICAT Technical Review Report

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PREPARED UNDER

Initiative for Climate Action Transparency (ICAT) project supported by the German Federal Ministry

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1. Introduction to the policy reviewed

Name of the policy evaluated

The name of the evaluated policy is '**Subnational mitigation actions for forest regeneration and the implementation of planned grazing'**. This Nationally Appropriate Mitigation Action (NAMA) promotes the establishment of state financing mechanisms to incentivize the replication of successful actions for the restoration of degraded forests and planned grazing. It also aims to influence public policy to encourage these activities and achieve a transformational change in the forestry and livestock sectors. In this way, the NAMA seeks to strengthen and make more ambitious the mitigation goals of the Nationally Determined Contributions (NDC) of Mexico under the Paris Agreement.

This NAMA is registered under a previous name, Carbon Credits with Local Protocols from Forest Regeneration and Agricultural Holistic Management, dated 20 November 2015 in the Voluntary Register of Nationally Appropriate Mitigation Actions (RNV-NAMA) of the Ministry of the Environment and Natural Resources (SEMARNAT), with registration number NAMA-MX-28. It was also registered in the NAMA Registry of the United Nations Framework Convention on Climate Change (UNFCCC) in January 2018 with identification number NS-272.

Implementers of the ICAT assessment

The policy is coordinated by the Grupo Ecológico Sierra Gorda (GESG) with the participation of multiple actors at the national and state levels. Team members who participated in the assessment of impacts include the following:

- David Patrick Ross, Advisor, Grupo Ecológico Sierra Gorda, IAP
- Martha Isabel Ruiz Corzo, General Director, Grupo Ecológico Sierra Gorda, IAP ● César Tijerina González, CZE Cesar Augusto Tijerina González, Regenerative Ranching Advisor ● Gilberto Emmanuel Lepe Pérez, Monitoring Coordinator, Grupo Ecológico Sierra Gorda, IAP ● Pedro Ángel Calderón Domínguez, Field Technician
- Ricardo Montiel, Monitoring Coordinator, Grupo Ecológico Sierra Gorda, IAP ● Berenice López Reséndiz, Technical and Administrative Assistant, Grupo Ecológico Sierra Gorda, IAP

and Bosque Sustentable, A.C.

Assessment statement

GESG and the NAMA were selected by the international Initiative for Climate Action Transparency (ICAT) for piloting of selected ICAT guidance documents and received technical and financial assistance from ICAT during the assessment process. The ICAT guidance documents applied by the assessors were:

● Introductory Guide: Overview of the ICAT Series of Guidance. v. May 2018 ● Agriculture Guidance: Guidance for Assessing the Greenhouse Gas Impacts of Agriculture Policies. v. May 2018

- Forest Guidance: Guidance for Assessing the Greenhouse Gas Impacts of Forest Policies. v. May 2018
- Transformational Change Guidance: Guidance for assessing the transformational impacts of policies and actions. v. May 2018
- Elements of Non-State and Subnational Action Guidance: Guidance for integrating the impact of non-state and subnational mitigation actions into national greenhouse gas projections, targets and planning. v. July 2018 were incorporated into the assessment reports as well.
- Technical Review Guidance: Guidance to support the review of impacts of actions and policies. v. May 2018

This was not an update on a previous assessment. The technical review of the assessment reports was conducted in conjunction with the final evaluation of the project of "Mechanism for the Compensation of Agricultural Producers for Carbon Capture in Soils," a project implemented by GESG with financing of the Multilateral Investment Fund of the InterAmerican Development Bank in which the planned grazing pilot activities of the NAMA were implemented. The project's final evaluation is presented in a separate report.

Assessment reports used for this technical review

The assessment reports used for this technical review were:

● Report on the evaluation of GHG impacts of subnational actions for planned grazing ● Report on the evaluation of GHG impacts of subnational actions for forest regeneration ● Transformational change impact evaluation report

Evaluation dates

January-March 2019.

2. Objectives

GESG objectives for this technical review of the Assessment reports are the following:

- Review and provide recommendations for improvement of assessment reports of the GHG and transformational change impacts of the NAMA.
- Externally validate NAMA GHG removals as a contribution to Mexico's NDCs ● Validate the potential of subnational actions for the regeneration of forests to improve the mitigation goal of the AFOLU (USCUSS) sector in Mexico
- Validate the potential of subnational planned grazing actions to improve the mitigation goal of the agricultural sector of Mexico
- Increase transparency and reliability of the impacts reported by each participating state and the NAMA as a whole
- Strengthen support for NAMA activities among the governments of the participating states and the owners of participating forests and ranches

- Attract new funding by demonstrating how the NAMA facilitates a paradigm shift towards low carbon development.

3. Scope and Criteria

The criteria used for evaluating the assessments were drawn from the Key Recommendations of the ICAT guidance documents listed above. The specific recommendations are also included in the tables in Annex 1 which provides an assessment of each of them.

Key recommendations from the Agriculture and Forestry ICAT guidance

- Determine the objectives of the assessment at the beginning of the impact assessment process
- Base the assessment on the principles of relevance, completeness, consistency, transparency and accuracy
- Clearly describe the policy (or package of policies) that is being assessed
- Identify all stakeholders affected by, or with influence on, the policy
- Identify the inputs and activities that go into implementing the policy
- Identify all intermediate effects of the policy
- Identify all potential GHG impacts of the policy
- Develop a causal chain
- Include all significant GHG impacts in the GHG assessment boundary
- Define the assessment period

For forests:

- Stratify land by land-use category
- Estimate the area of land in each stratum
- Estimate the carbon stock change (e.g., emission factor) for each carbon pool in each land stratum
- Calculate the cumulative GHG emissions and removals for the baseline scenario over the assessment period

For enteric fermentation:

- Determine livestock categories and feed characterization

- Estimate the baseline average annual population for the species mix
- Choose or derive emission factors
- Calculate the cumulative GHG emissions for the baseline scenario over the assessment period

For soil carbon sequestration:

- Stratify land by IPCC land-use category and soil management practices
- Estimate the area of land in each stratum
- Determine the soil carbon stock for each stratum
- Calculate the net change in soil carbon stock over the assessment period
- Calculate the cumulative GHG emissions and removals for the baseline scenario over the assessment period

- Determine the maximum implementation potential of the policy

● Analyze policy design characteristics and national circumstances that may reduce the effectiveness of the policy, and account for their effect on the maximum implementation potential ● Analyze the financial feasibility of the policy for each stakeholder group, and account for the effect on the implementation potential of the policy

- Analyze other barriers that could reduce the effectiveness of the policy and account for their effect on the implementation potential
- Estimate the GHG impacts of the policy
- Estimate or update baseline emissions using observed values for parameters that are not affected by the policy and estimated values for the parameters that are affected by the policy ● Ascertain whether the inputs, activities and intermediate effects that were expected to occur according to the causal chain, actually occurred (if relevant)
- Estimate the GHG impacts of the policy over the assessment period for each GHG source and carbon pool included in the GHG assessment boundary
- Identify the key performance indicators that will be used to track performance of the policy over time and define the parameters necessary to estimate GHG emissions ex-post
- Create a plan for monitoring key performance indicators and parameters

Key recommendations from the subnational guidance included in the forest and agriculture reports ● Check for potential overlaps between various non-state and subnational actions in the same sector, across sectors and between non-state/subnational actions and national policies to avoid double counting

- Harmonize the target year with the non-state and subnational target years when comparing ambition
- Use the results for decision making

Key recommendations from the Transformational change guidance

- Determine the objectives of the assessment at the beginning of the impact assessment process
- Base the assessment on the principles of relevance, completeness, consistency, transparency, accuracy and reflection on ambition
- Clearly describe the policy or action (or package of policies or actions) that is being assessed

● Describe the transformational vision of the policy or action, through consultation with key stakeholders
● Define the assessment boundary in terms of geographical and sectoral coverage of transformational characteristics selected for assessment
● Define the assessment period
● Choose characteristics to be assessed based on their relevance to a policy or action and the society in which it is implemented
● Identify the phase of transformation to understand the context in which the policy or action is being planned or implemented
● Identify barriers for transformational change specific to the phase of transformation ● Describe the starting situation of characteristics impacted by the policy or action ● Assess and qualitatively score how barriers modify the extent of transformation expected for each characteristic
● Assess and qualitatively score each characteristic using the scale provided in Table 8.3 and explain the underlying assessment

● Aggregate the results for all characteristics and barriers to the process and outcome level ● Report information about the assessment process and the transformational impacts resulting from the policy (including information listed in Section 11.1)
● Describe insights gained from the assessment, and how results are used to revise objectives, design, planning, and implementation of ongoing or future policies and actions.

Materials

GESG provided substantial additional material beyond the assessment report, for consideration in the review.

Type of review

3rd party review

Level of assurance

This technical review provides a *Reasonable* level of assurance.

Materiality threshold

There is a materiality threshold of 10%.

4. Summary Tables of Compliance with Recommendations

See Annexes 1 and 2 for a complete review of the extent to which the ICAT recommendations were

followed in the GESG assessments.

5. Review team qualifications

This project was implemented by a highly qualified team from EcoAgriculture Partners. The team leader was Mr. Seth Shames, Director of Markets and Policy. Ms. Elizabeth Sweitzer, Analyst, assisted with detailed analytical review. Sara J. Scherr, President and CEO, provided strategic guidance to the team, co designed the methodology, and undertook the field trip. Below are brief bios of the team members.

Seth Shames leads EcoAgriculture's program on policies and financial mechanisms to support integrated agricultural landscape management. His work at EcoAgriculture Partners over the past 12 years has touched on a wide range of enabling environment elements within landscapes, with a focus on finance for integrated landscape management, climate-smart agriculture, payments for ecosystem services, and integrated policy development. He led a 5-year CCAFS (a CGIAR research program) project in which he studied and supported the development of smallholder agricultural projects. He has also worked on

assessing agricultural greenhouse gas measurement methods, national climate policies related to land use as well as global policy related to climate and agriculture. He holds a Master's degree in Environmental Science from Yale University and Bachelor's degree from Columbia University.

Elizabeth Sweitzer is an Analyst with EcoAgriculture Partners. Prior to EcoAg she worked as a consultant for Federación Campesino de Cauca in Colombia (2016) and WWF (2018) on projects related to climate smart agriculture. In addition she has helped develop coursework at the Division for Nutritional Sciences, InterAmerican Development Bank (BID), and at CIMMYT regarding project management, in particular means for conducting monitoring, learning and evaluation of programs. At EcoAgriculture Partners, she contributed to curriculum on climate-smart agriculture and landscape finance, and evaluation of CARE WWF Alliance field projects. She holds a Master's in Public Administration from Cornell University, and an Honors Bachelor of Arts from University of Toronto in Political Science and Spanish.

Sara J. Scherr is an agricultural and natural resource economist specializing in land management policy in tropical developing countries. She founded EcoAgriculture Partners in 2002 and is President/CEO. She has been a prominent voice globally in promoting the restoration of degraded agricultural lands for food security and rural livelihoods, and conservation of forest and other ecosystems and is a leading innovator in integrated landscape management. She is an expert in the economics of sustainable agriculture and agroforestry, the dynamics of agricultural and forest land degradation and restoration, and the design of payments to farmers and communities for ecosystem stewardship. Dr. Scherr has been involved in research and program/project field design for climate mitigation in agriculture, forestry and land use since the 1990s, and contributed foundational analyses and strategies internationally for climate-smart agricultural landscapes including methods for monitoring GHG emissions and sequestration. She has provided advisory input on agricultural and land use mitigation to FAO, UNFCCC SBSTA, UN Environment, USAID, USDA, WWF, CARE, CATIE, ICRAF and others, and to specific field programs in Brazil, Central America, East Africa and Indonesia.

6. Conflicts of interest

EcoAgriculture Partners has no conflicts of interest in implementing this Technical Review.

7. Technical review process

The technical review was a cooperative and iterative process that provides feedback and encourages improvements in impact assessment practices and reporting practices. The review process was conducted in a manner intended to be non-intrusive, non-punitive and respectful of the independence of state governments and civil society organizations participating in the NAMA.

EcoAg participated in multiple remote meetings with GESG staff and the long-term consultant responsible for the reports to clarify information on documents provided and to plan the field visit. Before the field visit was undertaken, EcoAg developed a table that included each of the relevant ICAT key recommendations from the assessment reports that had been produced by GESG. Based on the documents

provided and remote consultations, EcoAg assessed the extent to which the assessment followed the key recommendations. For areas in which additional questions needed to be answered, a note was made to follow up during the field visit. The field visit was used to validate the desk review and to follow up on unanswered questions.

Main documents reviewed. The assessment reports reviewed were:

- Report on the evaluation of GHG impacts of subnational actions for planned grazing
- Report on the evaluation of GHG impacts of subnational actions for forest regeneration
- Transformational change impact evaluation report

Additional documents reviewed. Other materials were provided to the technical reviewers to further explain the contents of the main documents. These included:

Report on the evaluation of GHG impacts of subnational actions for planned grazing

Annex 1. Protocolo local para acciones subnacionales de pastoreo planificado
Annex 2. Capítulo 2 del Informe de la situación del medio ambiente en México SEMARNAT 2012 Annex 3. INEGI 2009
Annex 4. Nota de apoyo Sector Agropecuario con metas CND
Annex 5. Test of significance of excrement emissions
Annex 6. Reporte censo nacional bovino 2007 a 2016 y escenarios
Annex 7. Proyección de emisiones de fermentación entérica
Annex 8. Sexta comunicación e INEGYCEI 1990-2015
Annex 9. Reporte de carbono en suelos proyecto BID-FOMIN
Annex 10. Práctica común y adoptadores tempranos

Annex 11. Evaluación de impactos GEI carbono en suelos
Annex 12. Proyección financiera
Annex 13. NDC de México
Annex 14. NDC del sector agropecuario
Annex 15. Sexta comunicación nacional

Report on the evaluation of GHG impacts of subnational actions for forest regeneration

Annex 1. Protocolo Local para Acciones Subnacionales para la Regeneración de Bosques Degradados Annex 2. Inventarios estatales forestales y de suelos
Annex 3. Proyección de impactos de GEI de regeneración forestal
Annex 4. INEGYCEI 1990-2015
Annex 5. Estudio Ciénega, Cedros, Parada de Cerro, Caleras
Annex 6. Estudio El Pilón, Las Mesas y San Francisco
Annex 7. Captura de carbono en sotobosque
Annex 8. Información sobre el mecanismo de Querétaro
Annex 9. NDC de México

Annex 10. NDC del sector USCUSS
Annex 11. Sexta comunicación nacional

Transformational change impact evaluation report

Annex 1. Carpeta de los análisis del retorno social de la inversión

PowerPoint prepared by David Ross summarizing process and results of the NAMA review.

Field visit. Dr. Sara Scherr of the Technical Review team at EcoAgriculture spent four days in Mexico from February 26-March 1 to follow-up on questions arising from the document review. On Day 1 she met with the Sierra Gorda project lead; on Day 2 with the Ministry of Environment and Natural Resources (SEMARNAT) staff person responsible for the National Emissions Registry (RENE), staff of the Ministry of Agriculture and Rural Development (SADER) office of Territorial Development; participants in an interagency meeting regarding a NAMA Facility proposal, with participation of UNDP Mexico, SEMARNAT, SADER and CONAFOR; on Day 3 with the Queretaro State Secretary of Sustainable Development; the state Sub-secretary of Environment; the Director of Environmental Planning; a state official from CONAFOR; and GESG staff. On Day 4, she met in Jalpan de Serra with a group of ~50 producers involved in planned grazing, forest restoration, and carbon management in agricultural production and home gardens, as well as some municipal-level agriculture officers; visited the Sierra Gorda training farm; and met with the team of lead promoters in the planned grazing and other soil carbon extension activities of Sierra Gorda.

Her meetings included:

- Grupo Ecológico Sierra Gorda - to clarify questions about the report
    - David Ross, Long-term consultant to GESG
    - Martha Isabel (Pati) Ruiz Corzo, General Director
    - Laura Pérez Arce Burke, Coordinator of Public Relations and Fund Raising,
    - Roberto Pedraza Ruiz, Assistant to the Director
- Grupo Ecológico Sierra Gorda field project personnel - to understand how the project worked in the field, barriers and opportunities; to understand monitoring protocols and assess impact adjustments
    - Berenice López Reséndiz, Technical and Administrative Assistant
    - Mario Pedraza Ruiz, Operations Coordinator, Soil Regeneration Program
    - Ricardo Montiel, Monitoring Coordinator
    - Lucio Baldelamar Chávez, Promoter
    - Cesar Augusto Tijerina González, Livestock Promoter
    - Bernardo Flores, Promoter,
    - Marta Hernández Galvan, Home garden and healthy nutrition promoter
    - Manuel Sorio, Agriculture and Home garden promoter
- Ministry of Environment and Natural Resources (SEMARNAT) in order to understand national NAMA policy staff response to the technical evaluation of the NAMA
    - Diana Guzman, Director of Climate Change Mitigation Policy
    - Paula Macias, Sub-Director, responsible for National Emissions Registry (RENE)
    - Erick Rodríguez, National Forestry Commission (CONAFOR)

    - Juan Martín Aguilar Hernández, Climate Change
- Ministry of Agriculture and Rural Development (SADER) - to understand national agriculture and rural development policy and implications for NAMA transformation
    - Salvador Fernández Riva, Deputy Secretary of Rural Development
    - Manuel García, Program Officer for Rural Development
    - Isabel Cueva, Technical Assistant to the Deputy Secretary
    - Felipe Legorreta Padilla, Rural Development
    - Luis Ortega Reyes, Livestock Coordinator
- UNDP-Mexico - to understand international support for the NAMA and implications for transformation
    - Edgar González, Director, Sustainable Development Program
    - Gerardo Arroyo, Director, Sustainable Development Program
- Secretariat of Sustainable Development (SEDESU), Queretaro State - to understand potential for NAMA transformation at state level; to assess the technical analysis in the report
    - Marco del Prete, Secretary of Sustainable Development
    - Ricardo Torres, Sub-secretary of Environment
    - Alejandro Jiménez Gallegos, Director, Environmental Planning
- CONAFOR-Queretaro [to understand potential for NAMA transformation, and assess the technical analysis in the report]
    - Susana Madrigal
- Meeting with ~50 farmers, ranchers, home garden managers, municipal agriculture officers, et al from Sierra Gorda region involved in BID-FOMIN project and NAMA - to understand local barriers and

opportunities for the NAMA, and transformation strategy

8. Review findings

These findings are organized by technical report. Additional information is included in the table in **Annex 1** where each key recommendation is treated separately.

Subnational Mitigation Actions for Planned Grazing (ex-ante and ex-post) After detailed review along with government and field interviews, we determined that the carbon calculations made were as precise as possible given the limitation faced by the designers of the NAMA. A detailed review of the calculations is included in **Annex 2**. The table in this annex identifies each of the assumptions made in the carbon estimates for both the planned grazing and forest regeneration elements of the NAMA. We checked the sources given for each of the carbon estimate parameters. The mitigation potential calculated seems high and probable, as reported. The report uses conservative assumptions for several variables. Many of the numbers were national factors; it should be possible to use more detailed local information in the next phase of analysis.

The Social Rate of Returns (SROI) methodology developed and used by GESG was appropriate to assess sustainable development benefits. In future development of the NAMA, state government, producer and agribusiness stakeholder participation could be expanded to refine estimates (and ideally calculate sensitivity analysis) for soil carbon and enteric fermentation. The risk evaluation which helped to

determine the projections for emission reductions was not systematically reviewed with key stakeholders for the draft report but was incorporated during the Technical Review process. More detailed financial feasibility analysis is underway with partners and should be adjusted by socioeconomic context. GESG is confident that with training, the state-level partners in the NAMA will be capable of the needed long-term monitoring

Subnational Mitigation Actions for Forest Regeneration (ex-ante and ex-post) After detailed review and government interviews, we determined that the carbon calculations made were as precise as possible with existing data given the limitation faced by the designers of the NAMA. A detailed review of the calculations is included in **Annex 2.** The table in this annex identifies each of the assumptions made in the carbon estimates for both the planned grazing and forest regeneration elements of the NAMA. We checked the sources given for each of the carbon estimate parameters. The mitigation potential calculated seems high and probable, as reported. The report uses conservative assumptions for several variables. Many of the numbers were national factors; it should be possible to use more detailed local information in the next phase of analysis.

The SROI methodology was appropriate to assess benefits. While there was close collaboration with stakeholders in the design of extension process and carbon payments, the evaluation process was less collaborative. In future, local data and stakeholder consultations should provide more accurate estimates of soil carbon and enteric fermentation, and of risk adjustments to projections for emission reductions. The monitoring protocol for pilot activities was not developed until after the pilots began, so this created an additional challenge for extrapolating future results based on the pilot. The state government of

Queretaro is committed to continue to co-funding the program with CONAFOR (assuming latter funding continues); we could not confirm commitments of other states, nor their capacities for long-term monitoring.

Transformational Change Impacts (ex-ante)
The Technical Review included assessment of the Transformation Change Report and interviews with federal agriculture, environment and climate agencies; Queretaro State government sustainable development and environment departments and the state-level CONAFOR office; with municipal agriculture officers and with diverse agricultural producers in the Sierra Gorda. There is growing pride in the state's high biodiversity, surprising given its urban and industrial nature, and high concern about water scarcity. Queretaro State has put in place a strong enabling environment and complementary policies to support the NAMA, though not fully implemented. These include controls on vegetation removal, protected area management plans, local ecological management programs, ecoregional guidelines for land use planning, closing of wells to reduce groundwater extraction, and climate change mitigation and adaptation strategies identified. Many of these could have lasting effects, even with changes in government administration, such as the legal foundation through environment and climate legislation, the establishment of the state Fund (hard to de-fund), and environmental education in the schools. This could be further strengthened by explicitly linking terrestrial carbon regeneration to watershed health.

Non-governmental and sub-national impact evaluation (ex-post and ex-ante)

The Technical Review included assessment that compared the projected impacts of the NAMA with Mexico's NDCs. We considered the estimates of potential contribution of the NAMA on meeting Mexico's national commitments on mitigation through land use to be quite conservative, and the proportion of total land area involved relatively small.

Potential for the models for grazing land regeneration and degraded forest restoration to be included in mitigation strategies in 12 states as part of the NAMA (ex-post and ex-ante). Based on the above evaluations, the Technical Reviews concur with the Report's assessment that this NAMA would have a potentially high impact on GHG mitigation, with probable implementation success. GESG already has established links at a high political level in five of the states, and has existing networks with agencies, producer organizations and trained extensionists in the other states. The State of Querétaro and GESG are also closely linked with the international initiative "Under 2". There is potential for the NAMA criteria of cattle exclusion for degraded forest restoration to be incorporated into CONAFOR forest ecosystem service payments.

9. Recommendations for improvement of future assessment reports

Stakeholder participation. There was limited participation of stakeholders in the preparation of the ICAT Reports for the NAMA; most of the analysis was done by Sierra Gorda staff, drawing on collaborators for any missing data sources. The field component of the Technical Review provided an

opportunity for Sierra Gorda to solicit feedback during four small-group presentations to national and state government agency representatives, and one large-group presentation to producers and municipal government representatives. These provided significant technical feedback on quality of carbon estimates, and the context for transformation.

Mitigation potential. The mitigation potentials in the reports were calculated using national factors for several variables, and it should be possible to use more detailed local information in the next phase of analysis.

Risk evaluation. The risk evaluation which helped to determine the projections for emission reductions was not systematically reviewed with key stakeholders for the draft report but was incorporated during the Technical Review process. This risk evaluation should be more widely discussed in the next assessment.

Financial feasibility analysis. The next assessment should include more detailed financial feasibility analysis which should take into account socioeconomic context in all the areas in which the NAMA operates.

10. Technical review statement

We have evaluated the user's assessment of greenhouse gas and transformational impacts of the policy. GESG has followed the ICAT key recommendations and its assessment is consistent with the key

recommendations set out in the forestry, agriculture and transformational change ICAT guidance documents as well as selected portions of the Non-state and subnational action guidance.

11. Recommendations for NAMA design and implementation

The Reviewers were also asked by GESG to generate recommendations for the further design and implementation of the NAMA. The principal recommendation is to use a ***landscape regeneration framing*** for the NAMA. GESG's broad extension approach is to develop a "Soil Culture" in producer communities, and GESG already has extensive experience, methodology and impact in soil regeneration in staple crop, vegetable gardens, fruit orchards and agroforestry, as well as rangelands and forests. Some of these land uses do not yet have approved carbon monitoring methods, but the NAMA could contribute to developing these. Even if soil sequestration and storage in these uses are not eligible to be counted against national commitments under the Paris Agreement, their inclusion could contribute significantly to the broader transformation agenda. Clustering interventions geographically in high-priority landscapes in each state could also generate significant synergies (co-benefits) with programs for watershed health, biodiversity, food security, forest landscape restoration, territorial development and other sustainable development goals, contributing further to transformation. A second recommendation is to use and generate local factors in ex-ante analyses and planning, rather than national factors, including utilizing geographic information systems and new ***remote sensing*** methods to track changes at scale in biomass

across land uses in the landscapes, along with field monitoring systems.