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Interconnecting Forests, Science and People

INNOVATIONS TO ENABLE, INVEST AND MONITOR LANDSCAPE RESTORATION IMPLEMENTATION: PUBLIC AND PRIVATE FINANCE TO RESTORE 350 MILLION HECTARES OF DEGRADED LANDSCAPES GLOBALLY

Dr. René Zamora Cristales

Initiative 20x20

RESTORE OUR FUTURE BONN CHALLENGE

afr100

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Initiative 20x20

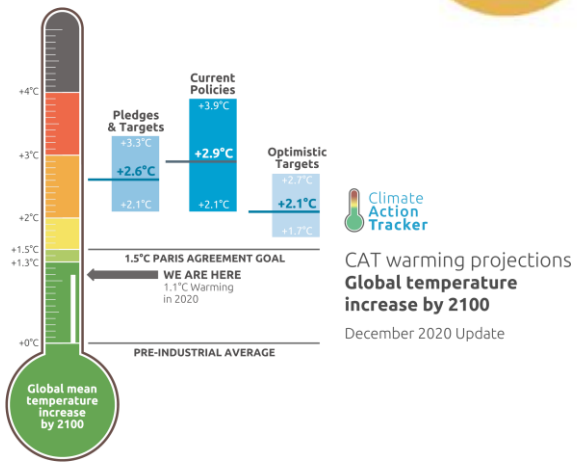
UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

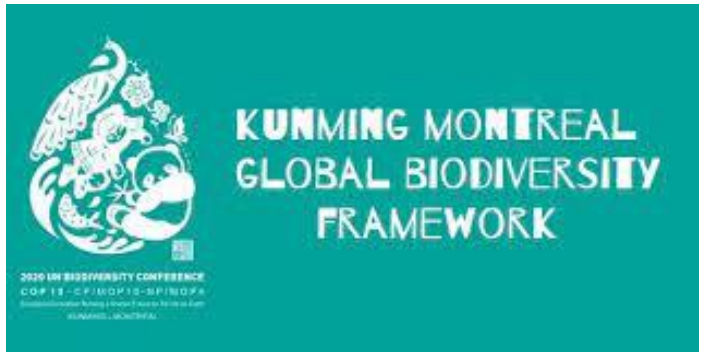
Oregon State University College of Forestry

IUFRO FOREST ENVIRONMENT DIV 8 CONFERENCE 2023

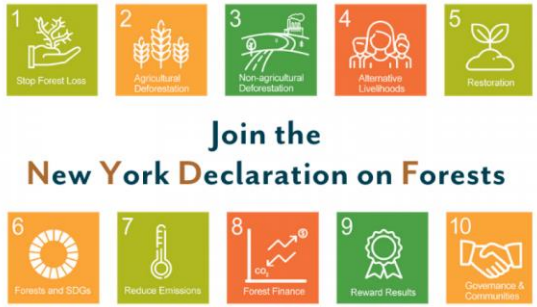
GOVERNANCE AND SYNERGIES

UNITED NATIONS DECADE ON
ECOSYSTEM
RESTORATION
2021-2030





RESTORE OUR FUTURE
BONN CHALLENGE



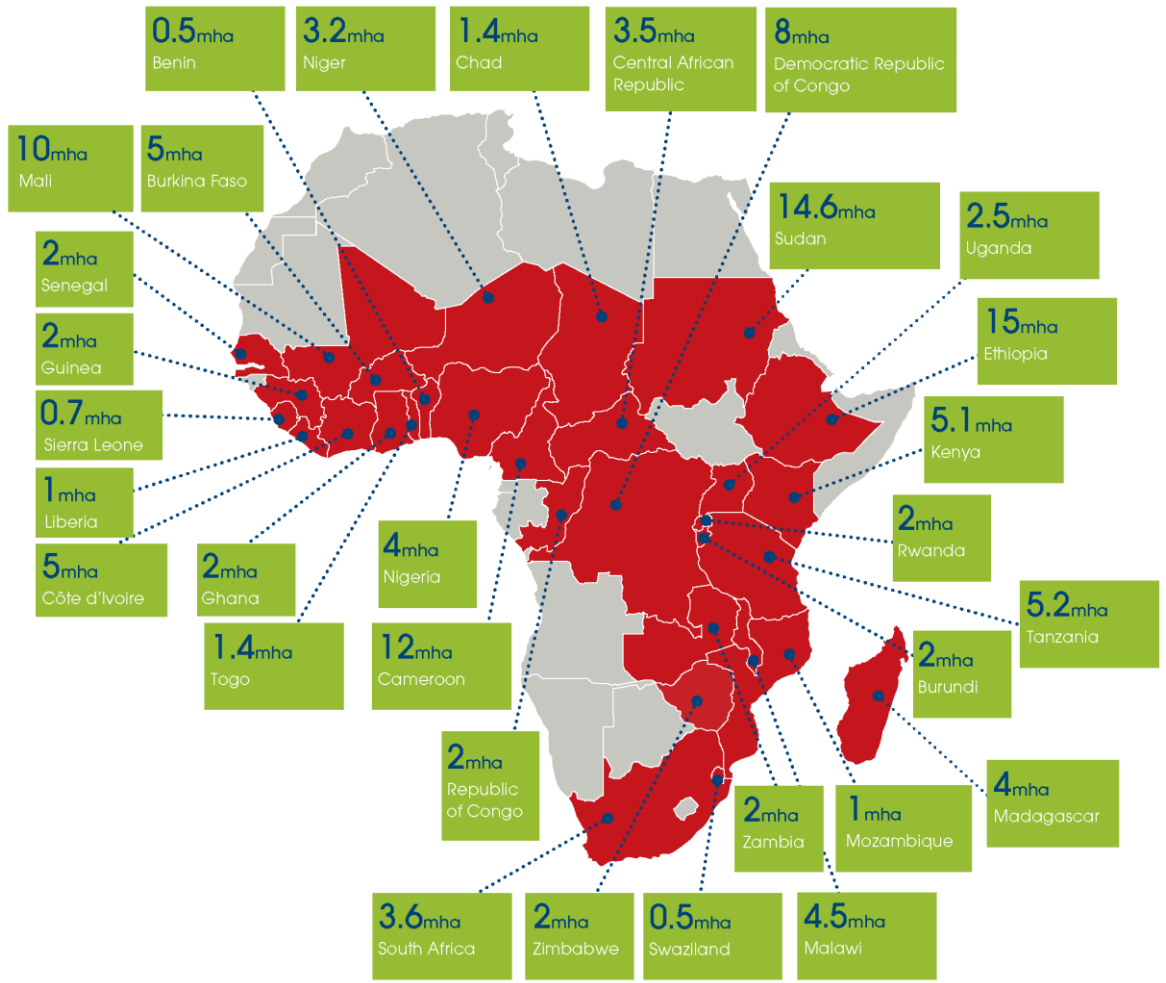
Africa 100

afr100

Africa restoring
100 million hectares
of deforested
and degraded land
by 2030

31 countries have committed
to restore **128 million hectares**

$1B in development finance
$481M private sector
commitment



Initiative 20x20

Beginning to protect and restore **50 million** hectares of land in Latin America & the Caribbean by **2030**.

COMMITMENTS

52.6 M ha by governments

$2.5 B of private sector capital

Notes:
*Goals to be accomplished by 2030
**Commitment to define a national restoration strategy

GOVERNANCE AT REGIONAL LEVEL

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

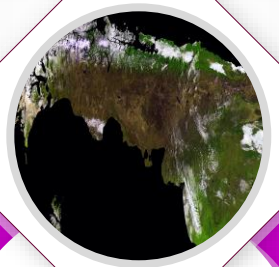
RESTORE OUR FUTURE
BONN CHALLENGE

Initiative 20x20

ALIANZA MEXICANA POR LA RESTAURACIÓN DE ECOSISTEMAS

RED TRINACIONAL DE RESTAURACIÓN DEL BOSQUE ATLÁNTICO

Partnership Status



Countries

18

National governments, regions and programs spanning more than one country, who commit to restore and conserve hectares of land, as well as to implement any policy and strategy in support of restoration and conservation..

Policy

Technical Partners

136

Organizations and institutions providing expertise and research supporting the implementation of restoration and conservation across the region..

Support

Financial Partners

32

Private sector groups who earmark investment for restoration, including impact investors and companies financing restoration projects.

Finance

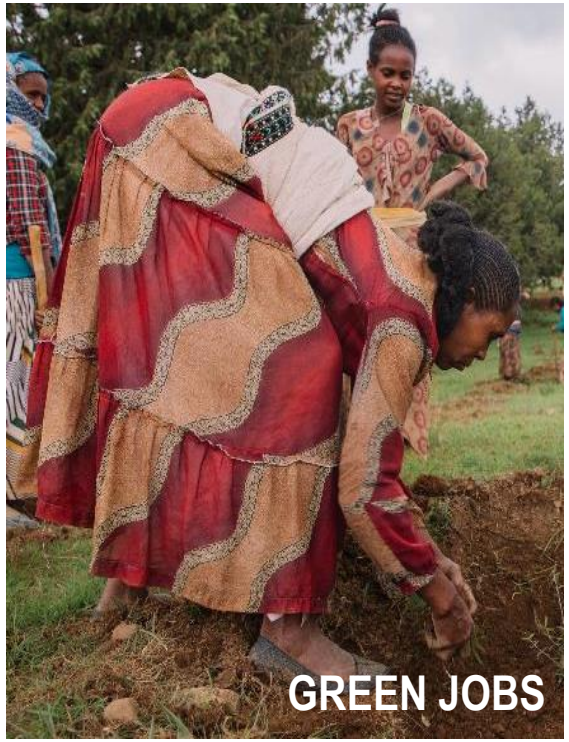
Task Forces

7

Initiative 20x20's task forces are groups of representatives from across the initiative's technical partners. The members of each task force convene to discuss a key theme of restoration. Each task force works to address a key theme for restoration.

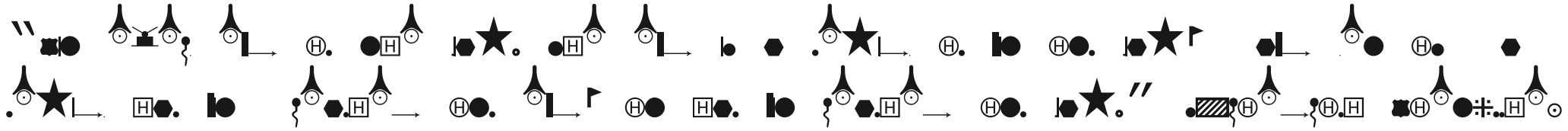
Knowledge

WHY DO PEOPLE RESTORE?



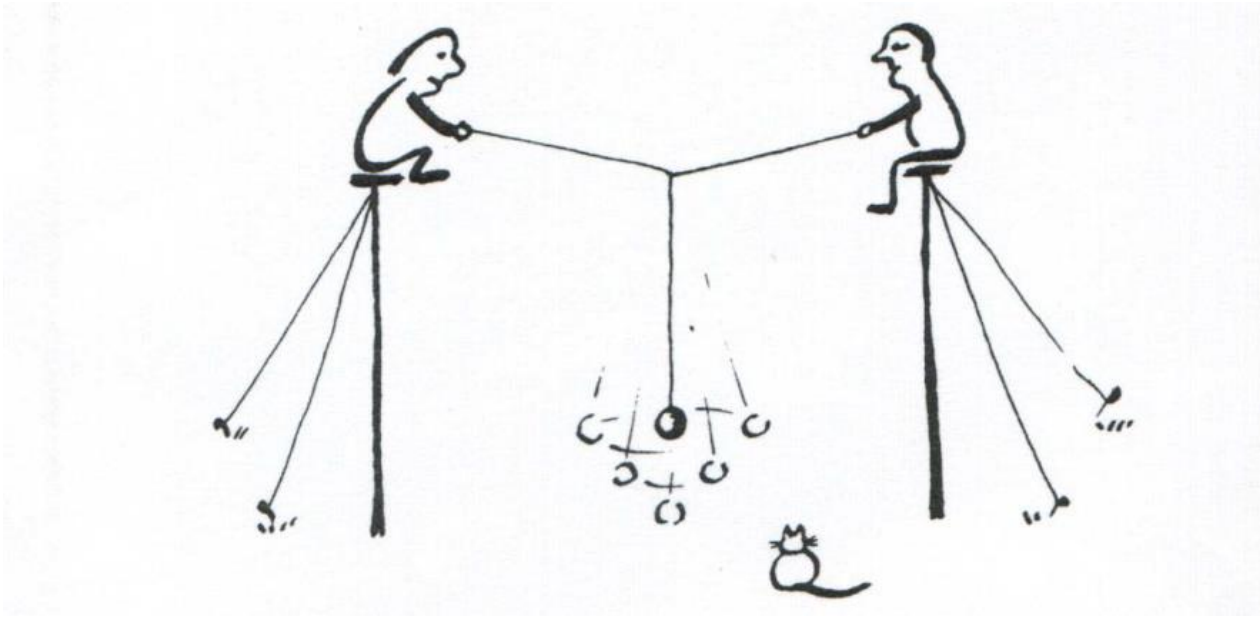
Restore into what?

Enable: Challenges

- 

Governance in Landscape Restoration

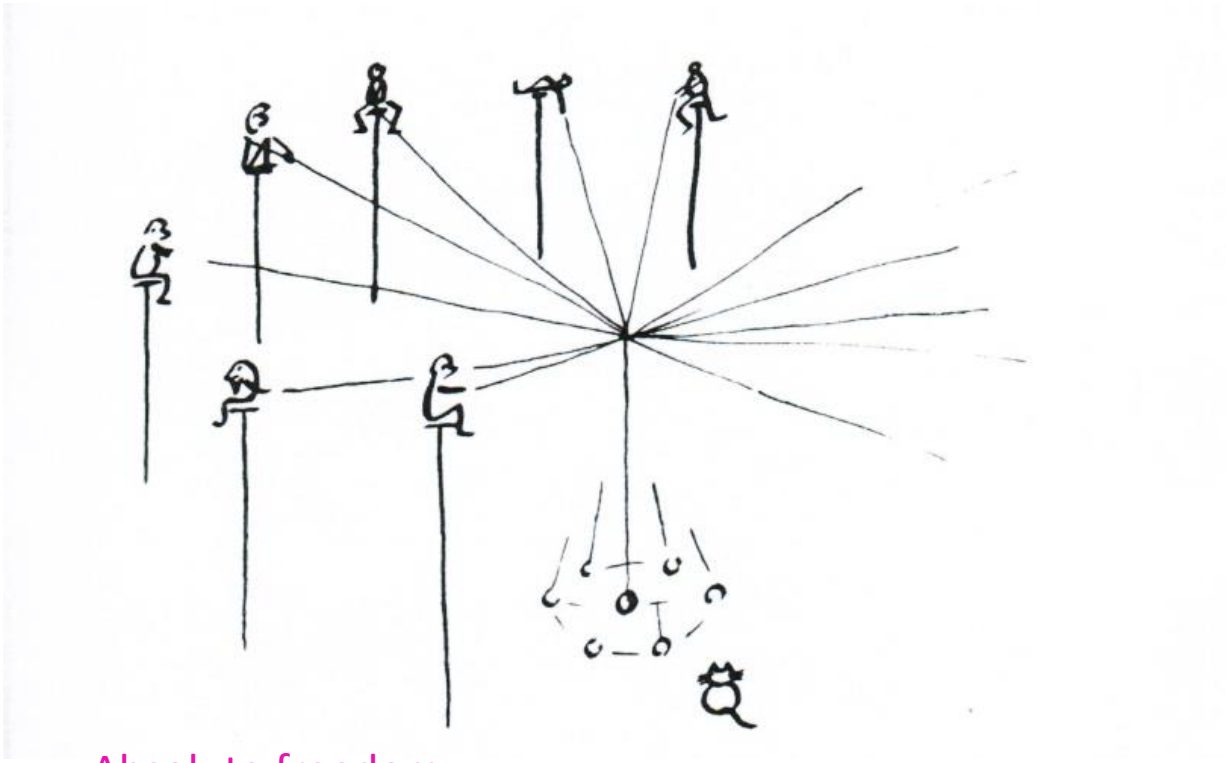
Stakeholders around restoration: Government, Private sector, civil society, academia



Source: Designing Freedom, Stafford Beer, 1973

Performance
Time to achieve equilibrium

Our institutions



Absolute freedom:
All communicate with all= n(n-1) channels of communication

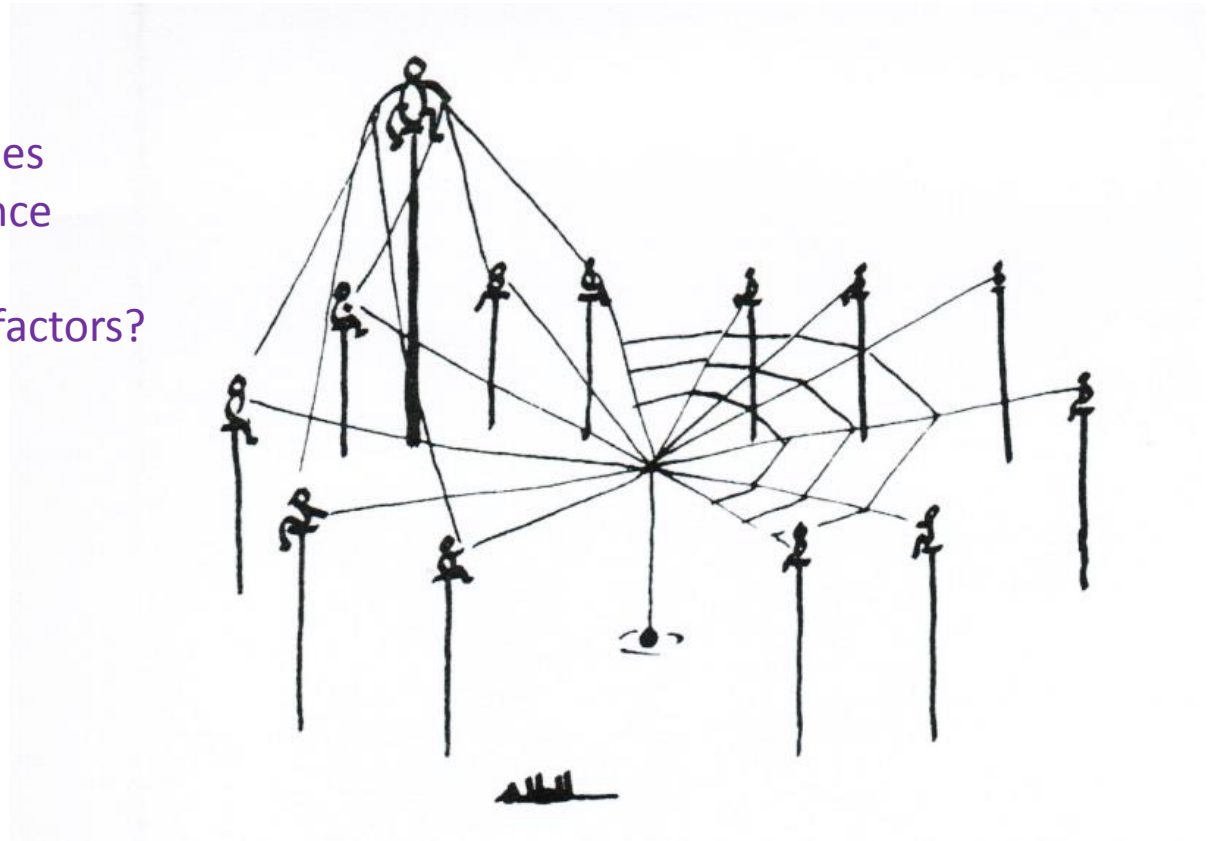
If n=40 the n(n-1) = 40 x 39 =1560

Source: Designing Freedom, Stafford Beer, 1973

Good Governance

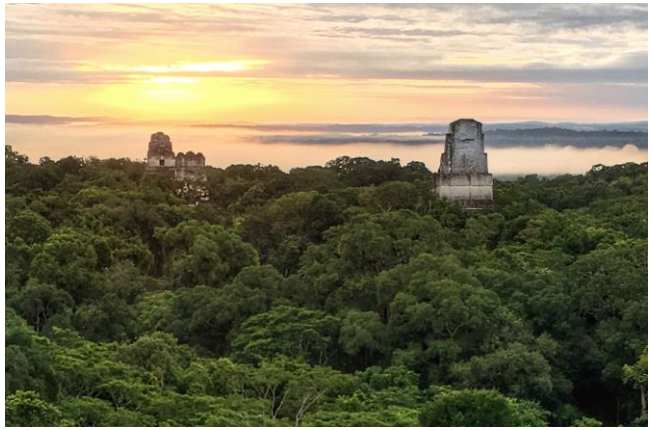
Reduce la variedad :

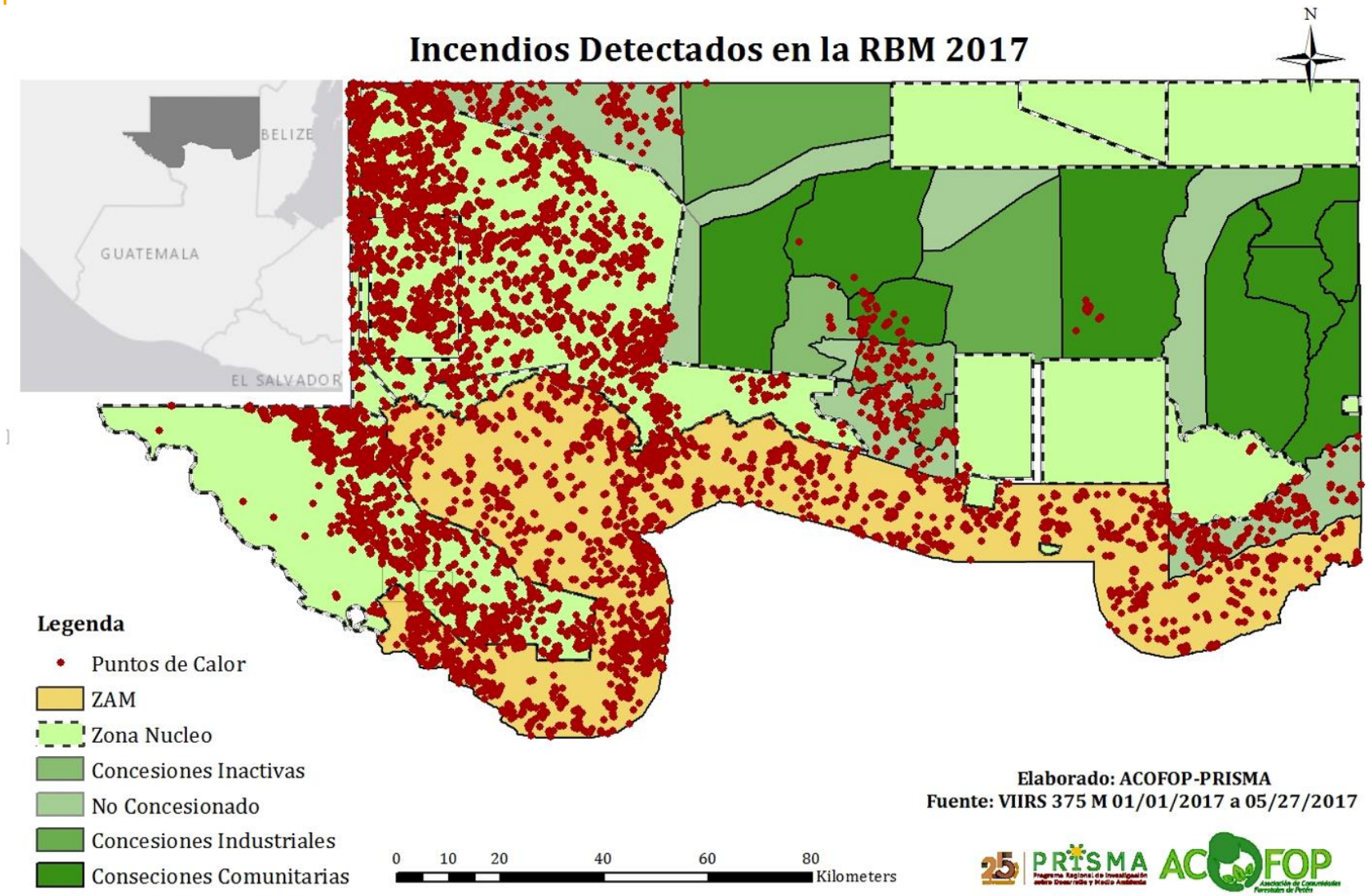
1. Clear objectives
2. Plans and Strategies
3. Internal Governance
4. Good leaders
5. Address external factors?



Source: Designing Freedom, Stafford Beer, 1973

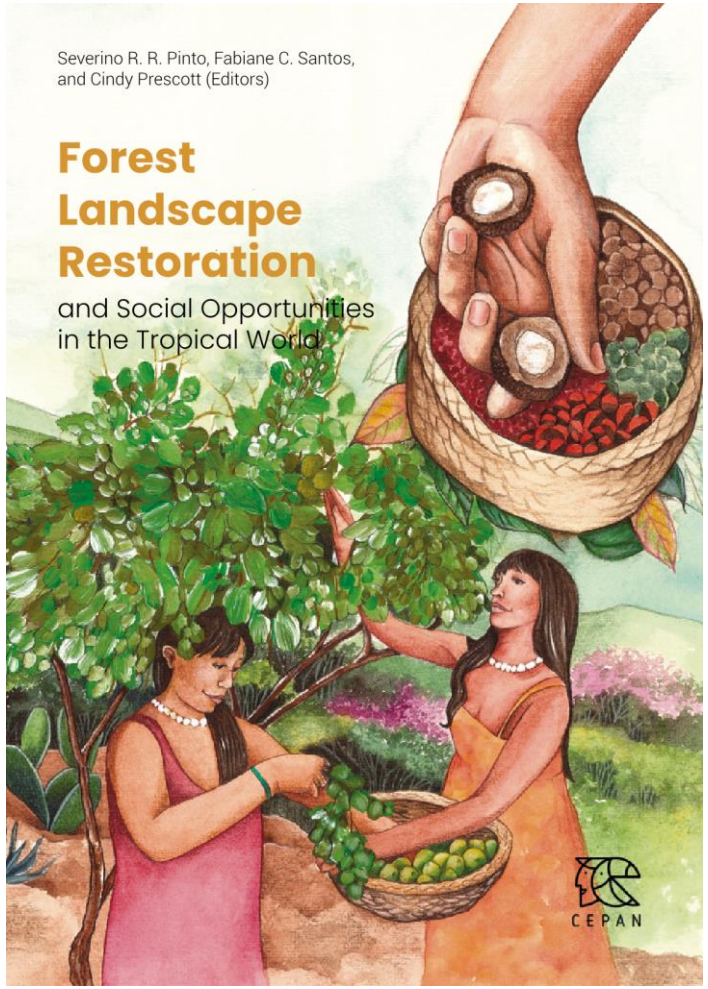
Heat points and forest fires in the Mayan Reserve

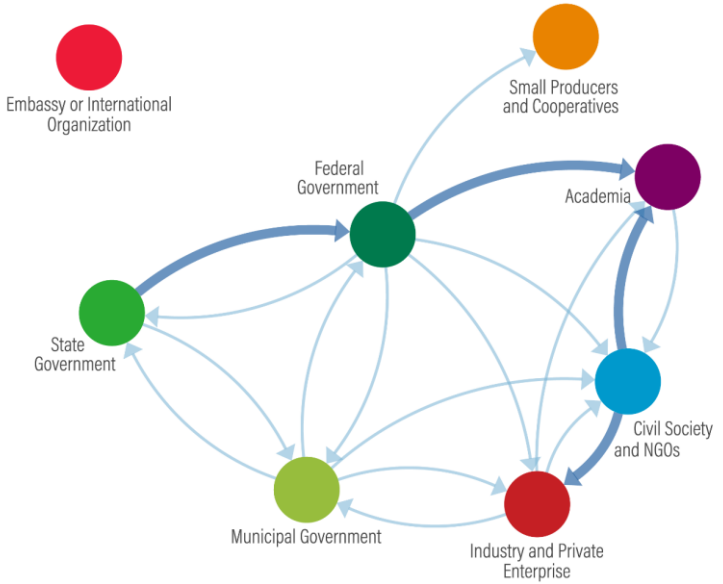




Track Record on Restoration Policies by 20x20

Mapping Social Landscapes: A Guide to Identifying the Networks, Priorities, and Values of Restoration Actors

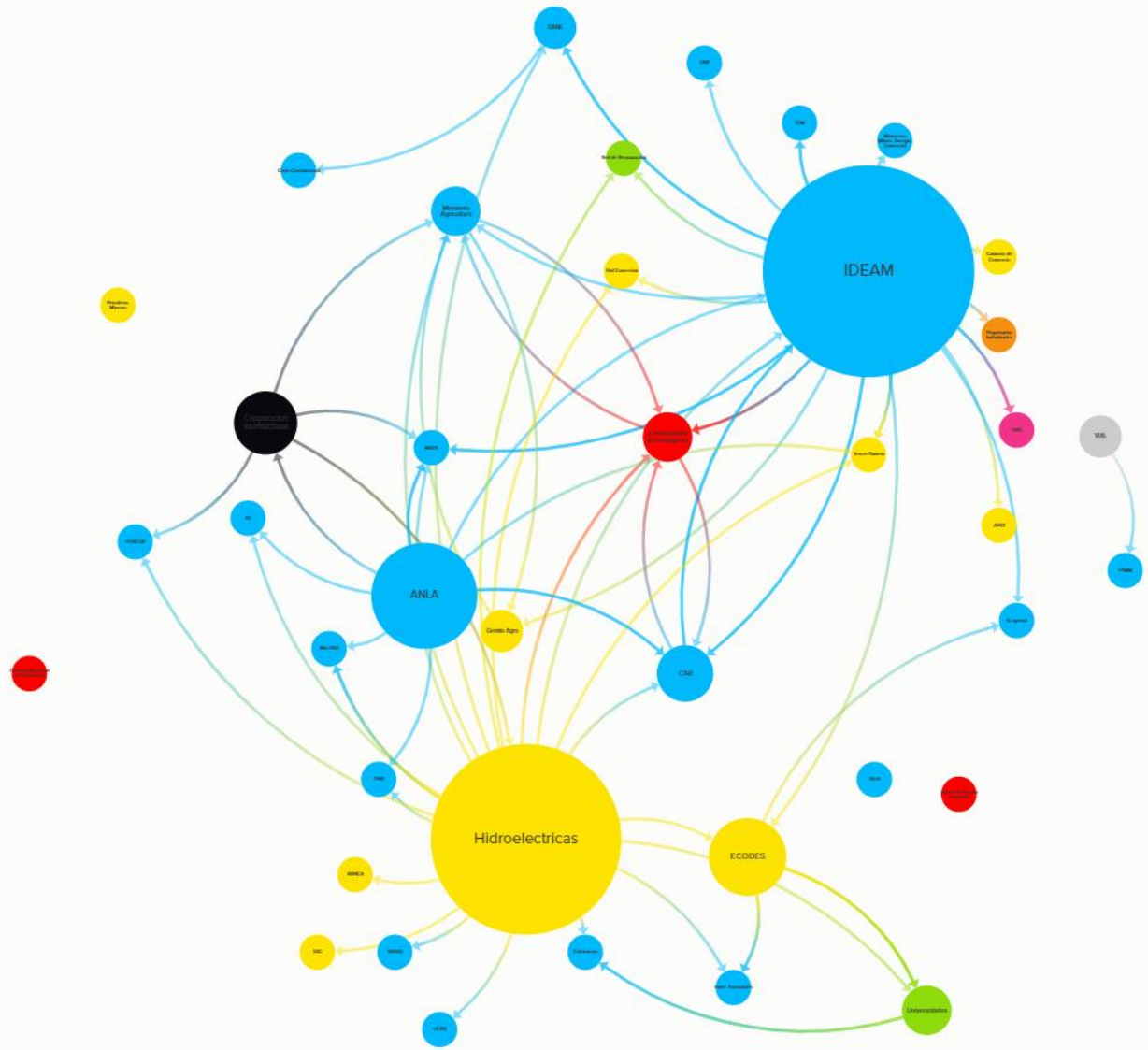




https://www.wri.org/research/mapping-social-landscapes-guide-identifying-networks-priorities-and-values-restoration

COLOMBIA_MONITOREO COLOMBIA_20X20 Default view RENEZAM

Search



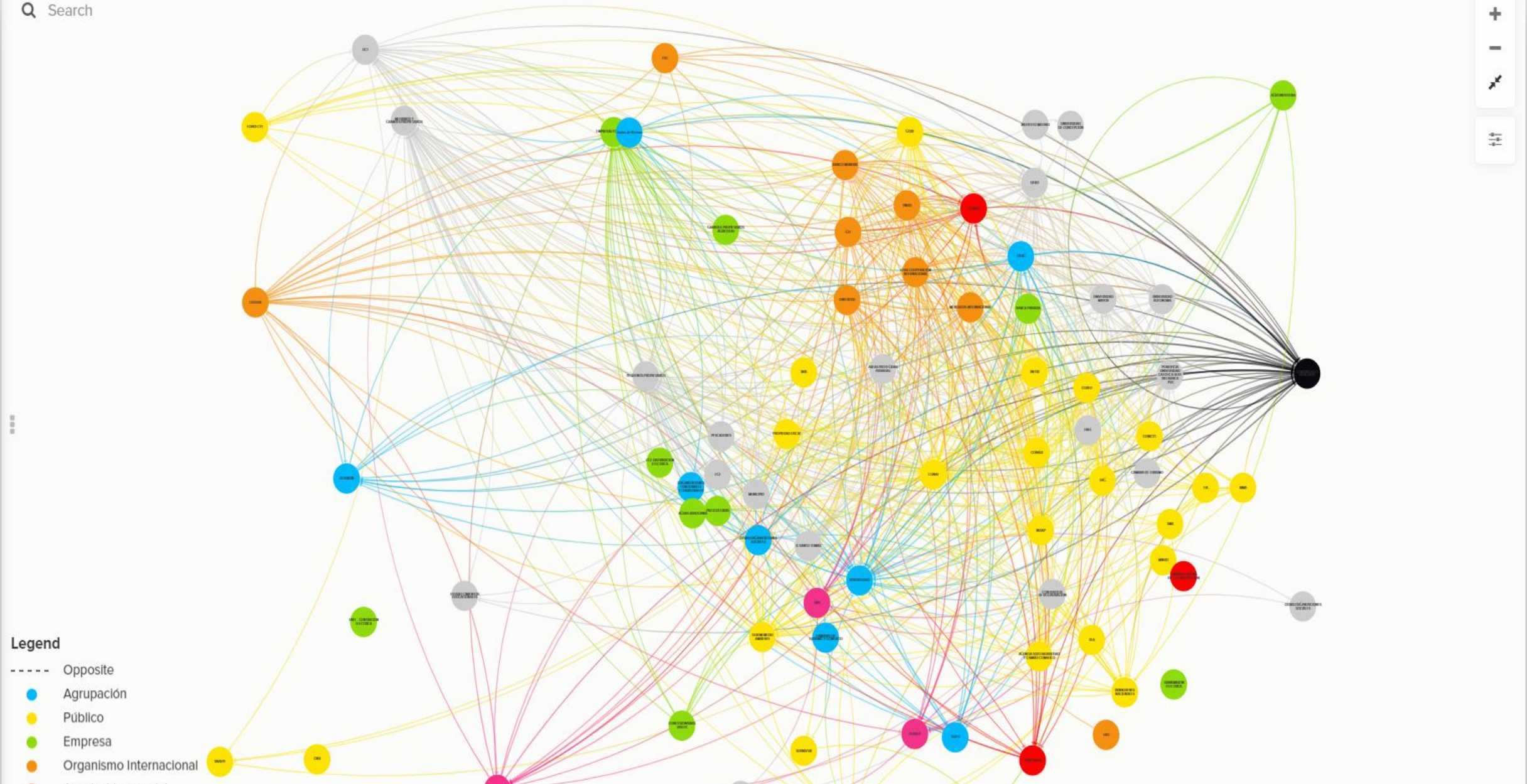
Legend

- Opposite
- Gobierno
- Privados
- Academia
- Propietarios Individuales
- Comunidades
- ONG
- Cooperacion

You edited map **COLOMBIA_20X20**

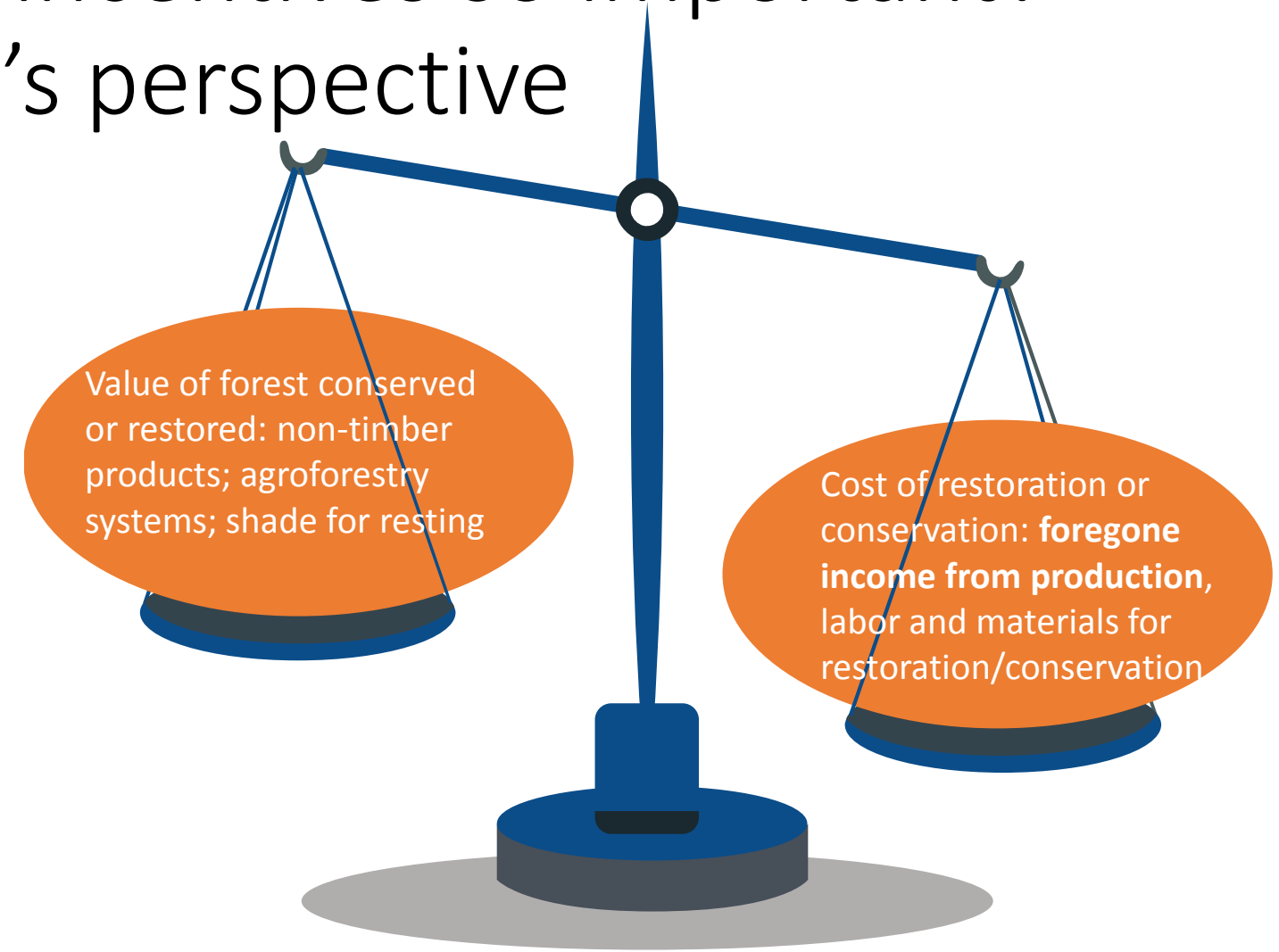
Araucanía Filtered Araucanía, Mapa de Actores para la Restuaración Escala Paisaje Default view RENEZAM

Search

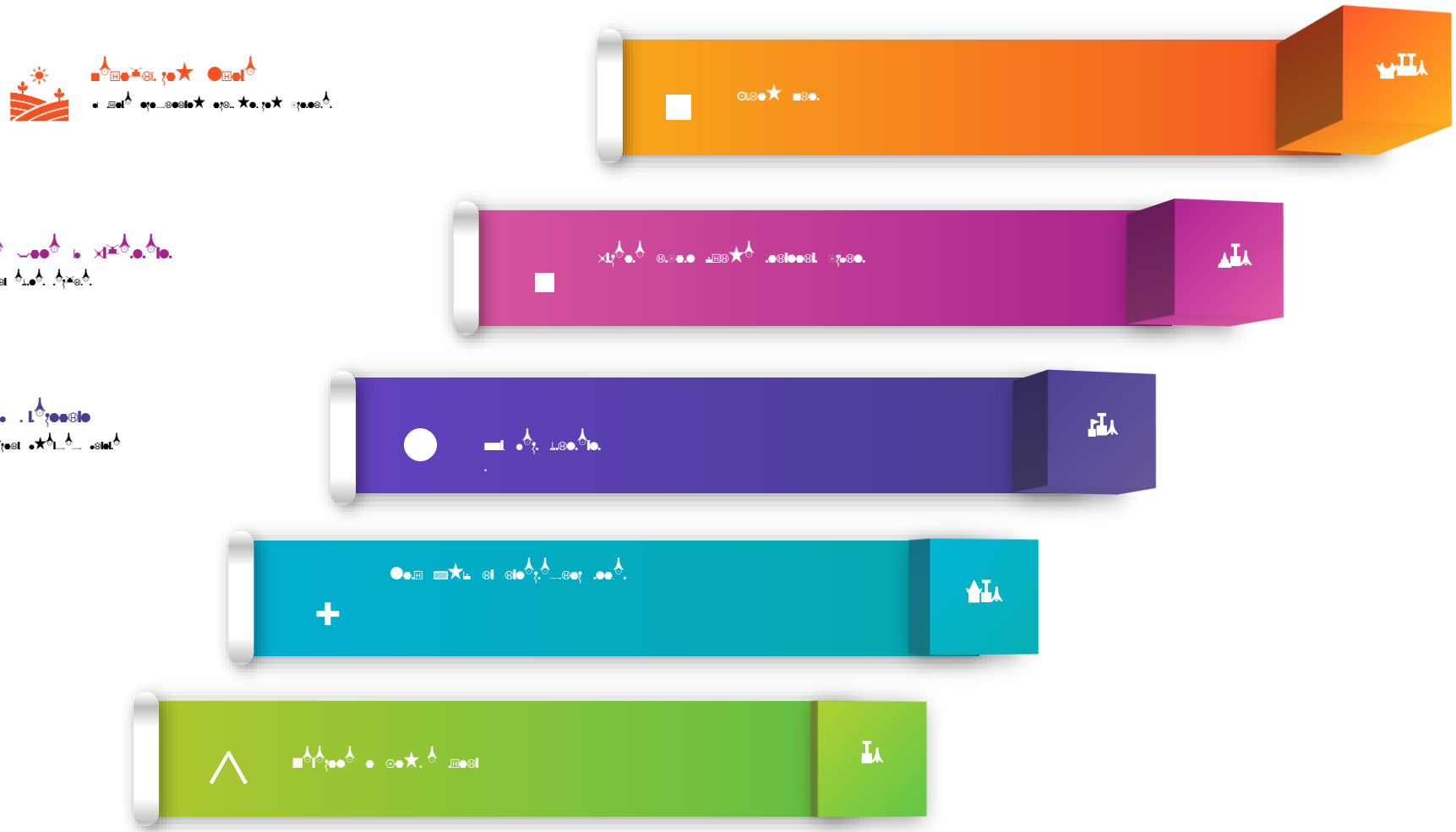


Why are public incentives so important? The landholder's perspective

- There is a market failure:
  - The owner of the land doesn't reap all the benefits, but without incentives, they pay all the costs
  - If you do nothing, there will not be magical conservation and restoration



How Policies can help to leverage private finance?



Landscape Policy Lab/accelerator

Policy Accelerators

-Registry with bottlenecks and challenges at the landscape level

-Subnational Governments involved in co-creating solutions

-Regulations of incentives improved to consider Ecosystem restoration principles

-Ag and Restoration Incentives aligned and complementing each other

-Foster blended finance (public/private/philanthropy

Restoration Knowledge-hub on incentives based on country needs

Restoration knowledge hub on incentives exist and present the key Restoration incentive policies for governments. Systematize the most relevant information from WRI and key actors.

-Describes Public incentives
-Propose transformative actions
-Invites partners to address some of the challenges

Network of leading government officials & public entrepreneurs

-Build a trusted relationship to identify real needs among governments though Policy and Monitoring Accelerators

-Scaling through AFR100

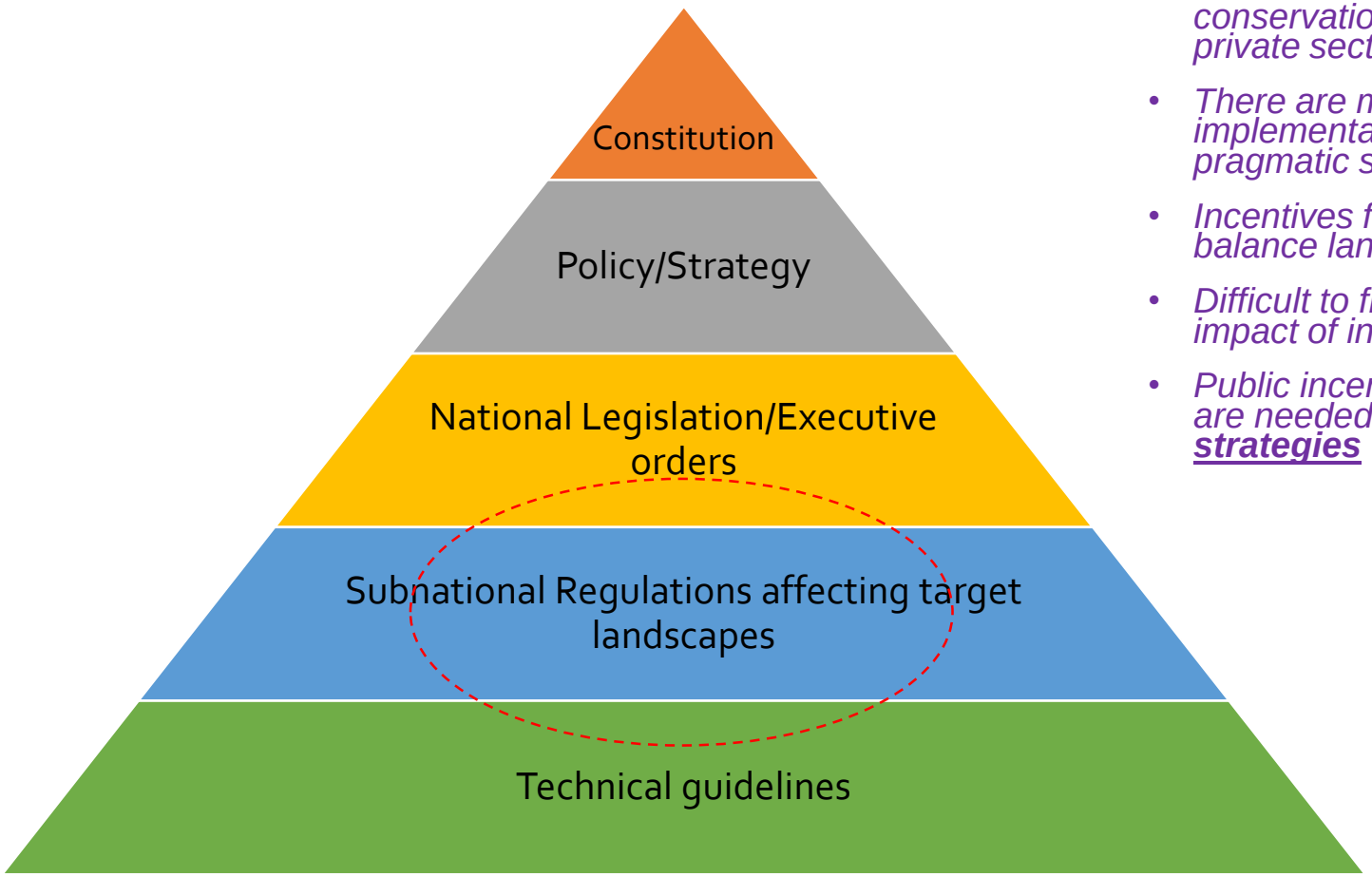
Monitoring Acceleration

Monitor Policy Incentives Effectiveness including Impacts and performance

Quantify impacts beyond the hectares

Brings GRI Monitoring data and methods to the international agenda

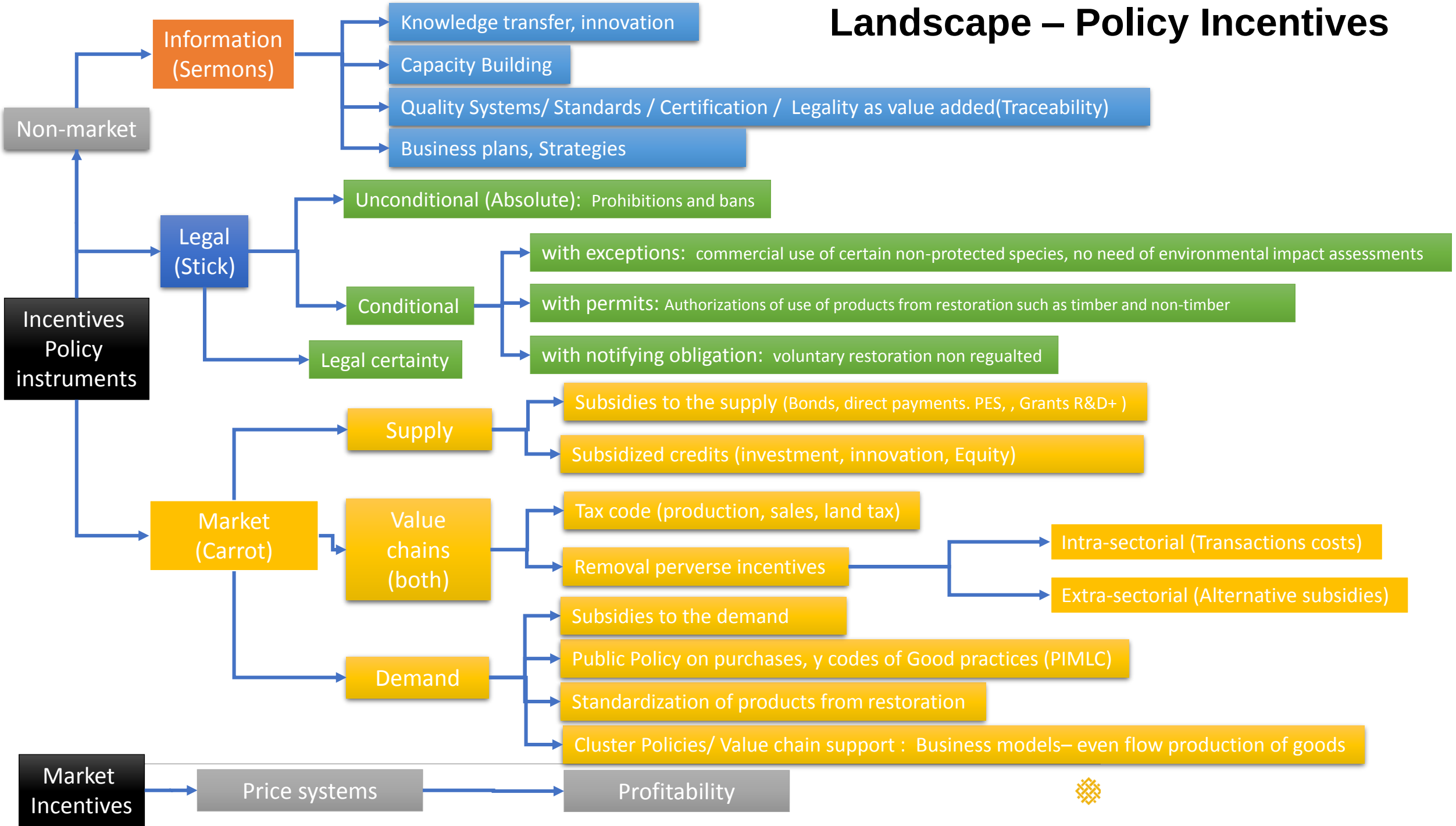
Landscape - Policy



- *The landholders/landowners doesn't reap all the benefits, but without incentives, **they pay all the costs***
- *If subnational governments do nothing, there will not be magical conservation and restoration as non-market values are not accounted by private sector investments therefore public finance/incentives are needed/*
- *There are many policies on incentives, but regulations are limited, and implementation is difficult as good intentions does not translate on pragmatic solutions*
- *Incentives for agricultural intensification may increase demand: how to balance land use Efficiency vs demand: Jevons Paradox*
- *Difficult to find policy effectiveness **monitoring systems**, then the real impact of incentives polices is not known*
- *Public incentives cause dependance on the farmers and exit strategies are needed to foster private sector involvement through **blended finance strategies***

Public incentives are needed to either lower the cost or increase the benefits of restoration. Regulations exists but some are ineffective due to weak regulations, others are effective but limited due to changes in opportunity costs that of agricultural incentives provide and very few have exit strategies and promote private sector investments and value creation.

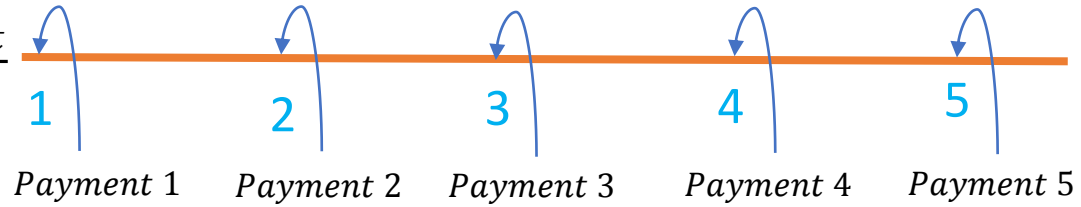
Landscape – Policy Incentives



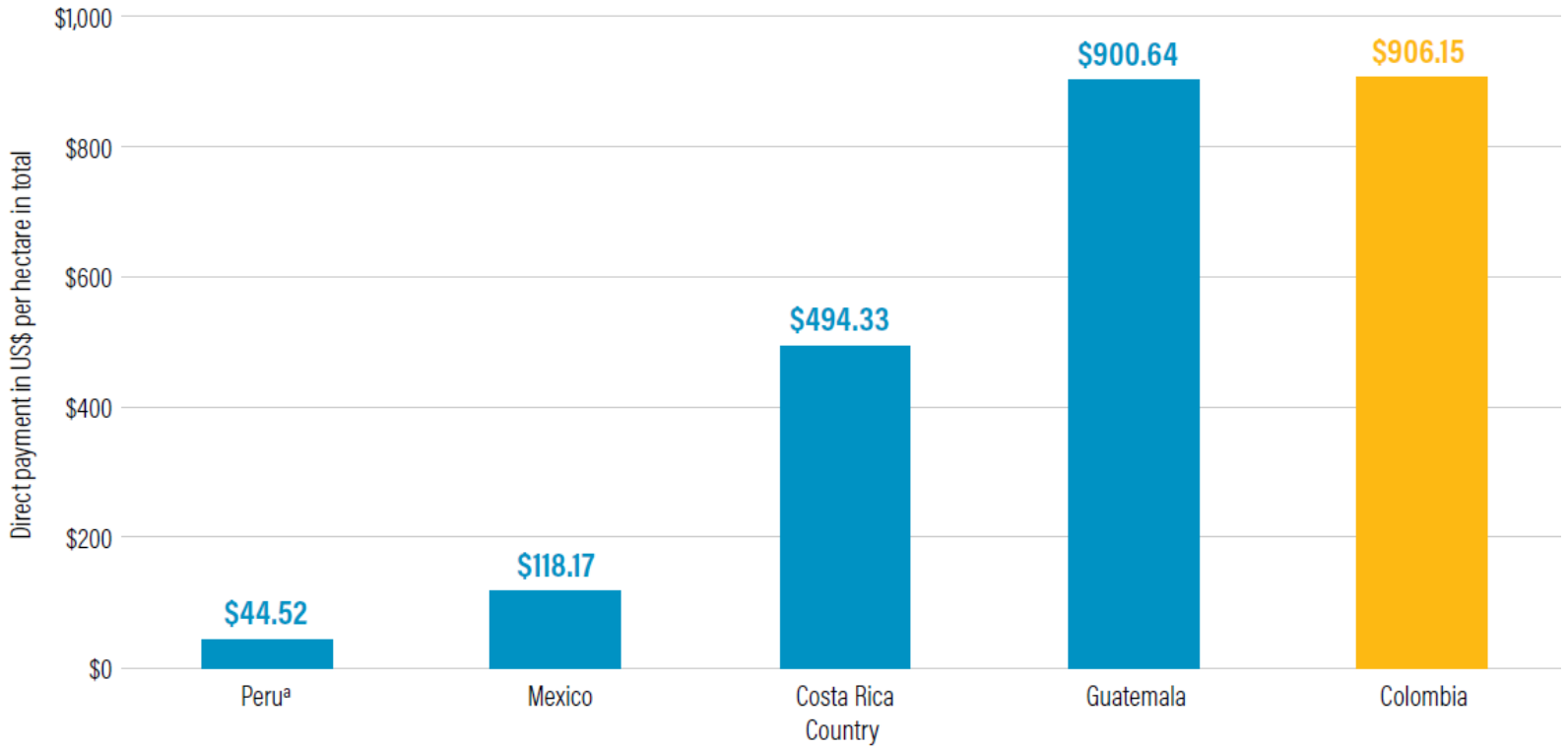
A simple approach to estimate the payments

Countries/ Strategies	Reforestation (Total US$/Tree)	Agroforestry (Total US$/Tree)
Chile[a] Incentives for Native Forest	1.98	1.16
Colombia[c] Forest Incentive Certificate	0.74	0.44
Costa Rica[b] Payment for Environmental Services	1.94	1.55
Guatemala[d] PROBOSQUE incentives	2.45	1.92
Mexico[e] Support Program for Sustainable Forestry Development	0.48	0.70

$$PV = \sum_{k=0}^{n} \frac{Payment_t}{(1+r)^t}$$



PRESENT VALUE OF DIRECT PAYMENTS FOR CONSERVATION IN MEXICO (PSA, CONAFOR); COSTA RICA (PSA, FONAFIFO); COLOMBIA (PSA, DNP, MADS); GUATEMALA (PROBOSQUE, INAB); AND PERU (TDC)



Notes: The Colombian program is not in operation, although there are several programs at the watershed and local levels.
a. US$1 = 3.63 Peruvian soles.
Source: Calculated by the authors with information from CONAF 2020; CONAFOR 2019; DNP 2017; FONAFIFO n.d.; INAB 2020; MINAM 2019.

Healing the Wounded Land: The Role of Public Economic Incentives in Scaling Up Restoration Efforts in Six Latin American Countries

Recommendations for Strong Restoration Incentive Policies

- Prioritize areas under intervention to maximize impacts
- Diversify tree-based restoration activities with native species
- Improve monitoring and transparency
- Attach programs to laws and robust institutions
- Create value for long-term sustainability
- Promote policy coherence in the land-use sector
- Revise mechanisms and payments to landowners

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DOI: https://doi.org/10.46830/wriib.20.00072

ELSEVIER

Forest Policy and Economics

Volume 134, January 2022, 102624

Using machine learning to identify incentives in forestry policy: Towards a new paradigm in policy analysis

Daniel Firebanks-Quevedo [a], Jordi Planas [b], Kathleen Buckingham [c], Cristina Taylor [d], David Silva [a], Galina Naydenova [b], René Zamora-Cristales [d]

Policy Data Mining

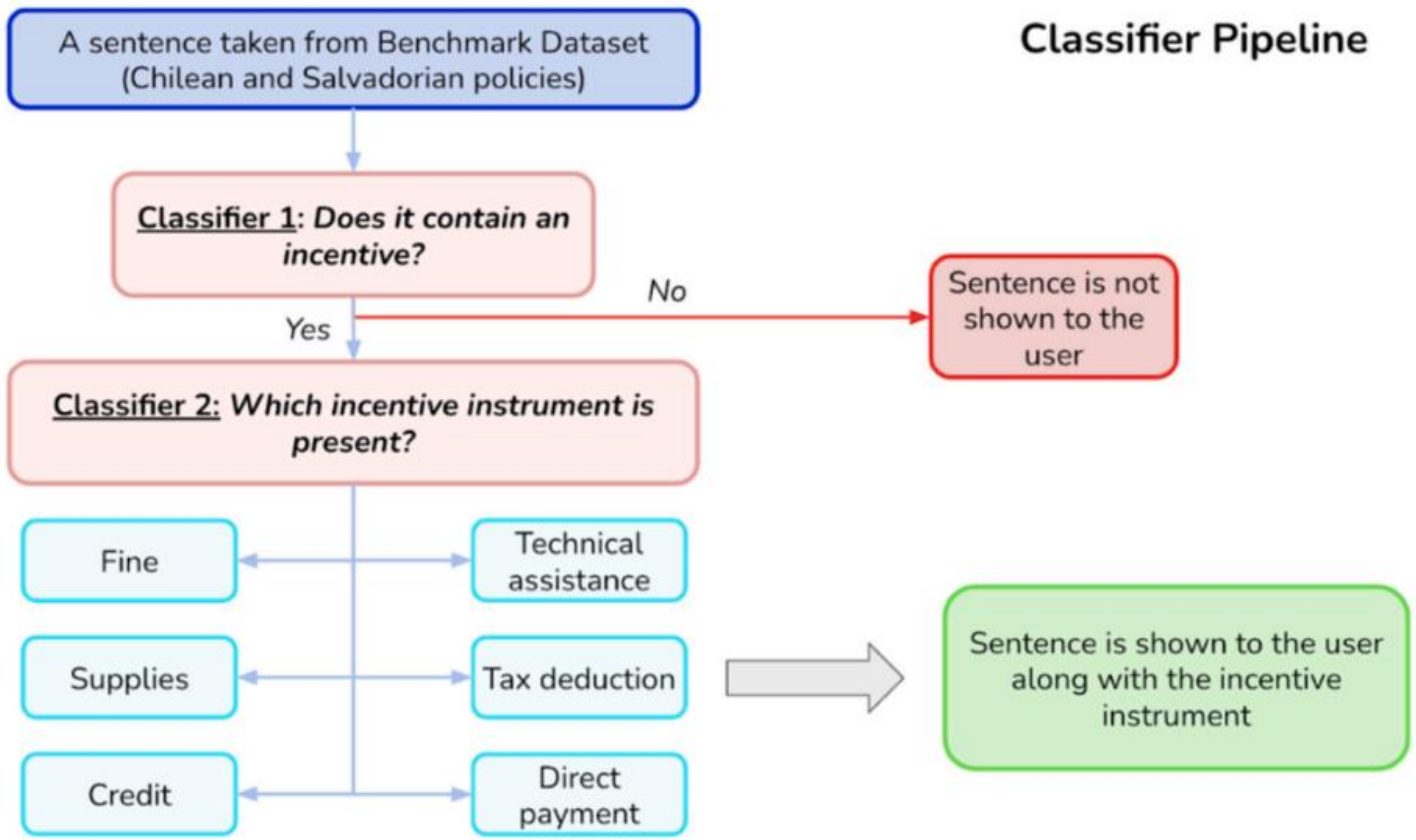

Fig. 3. Classification pipeline for 1 policy sentence that every filtered sentence from a document goes through.

Riparian Forest are key in highly fragmented agricultural landscapes

Source: Planet

Economic Optimization of Public Incentives for riparian forest

Priorización y optimización económica de los incentivos públicos para la restauración de bosques riparios

René Zamora-Cristales[1], Marie Andrée Liere[2], Ebal Abdiel Sales Hernández[3]

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[2] South Pole, Urbanstrasse 71, 10967 Berlin, Germany. Email: liere.ma@gmail.com
[3] Departamento de Análisis y Planificación Sectorial, Dirección de Coordinación y Cooperación Sectorial, Instituto Nacional de Bosques, ebal.sales@inab.gob.gt

Cita: Zamora-Cristales, R., Liere, M. A. y Sales Hernández, E. A. (2020). Priorización y optimización económica de los incentivos públicos para la restauración de bosques riparios. *Revista Mesoamericana de Biodiversidad y Cambio Climático–Yu'am,* 4(2): 23-43.

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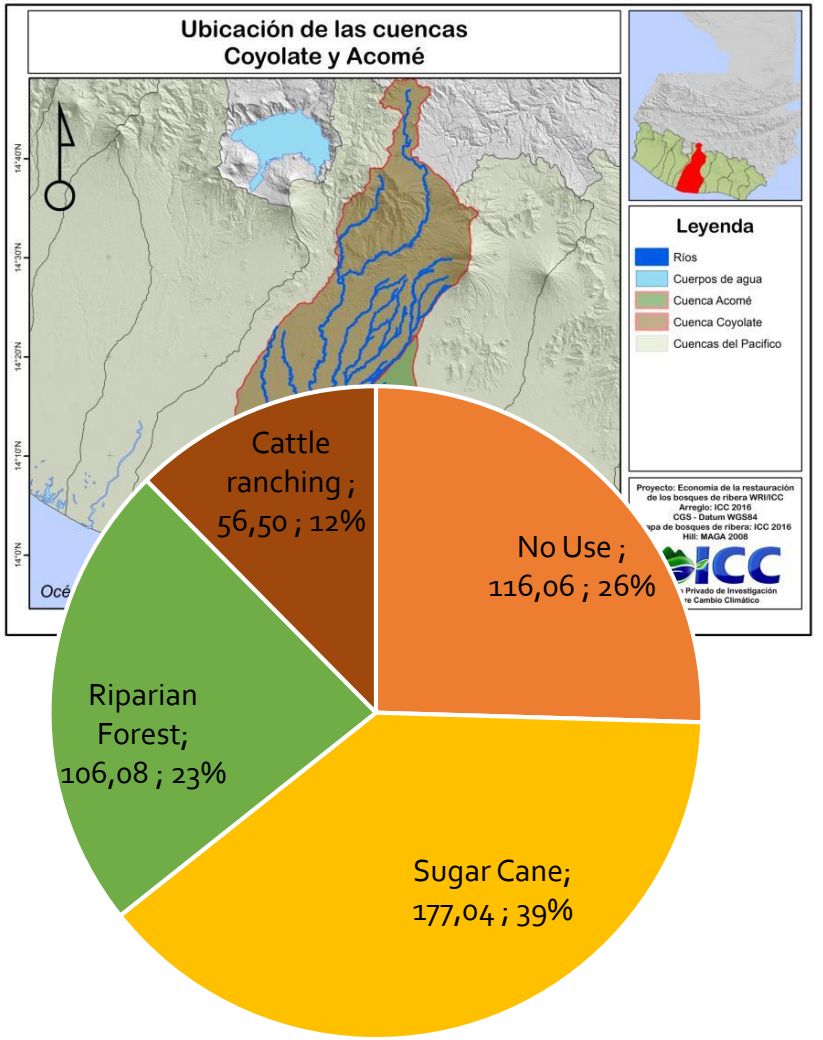


Maximizing Public Investment in Restoration

Objective Function

$$max \sum_{i=1}^{5} \sum_{j=1}^{4} c_{ij} X_{ij} \quad (1)$$

$$\sum_{j=1}^{4} X_{ij} = h_i \quad (2)$$

$$\sum_{i=1}^{5} X_{ij} \leq d_j \quad (3)$$

Where:

X_{ij}	Area to restore in landuse j on period *i*, *ha*
c_{ij}	Net present value of restoration with current land use *j* in period *i*, *USD/ha*
h_i	Available area in current landuse *j*
d_j	Maximum area to incentivize per year for riparian zone restoration

$$c_{ij} = NPV_{ij}$$

Benefits

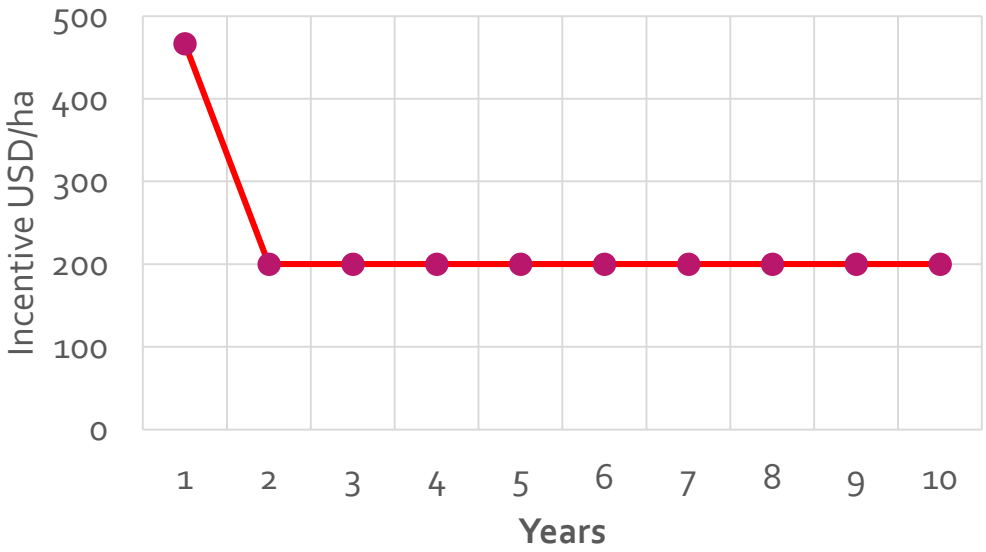
$$A_p = A_t * \%A_c * 10\%$$

$$P(x) = Random(\quad) \leq 0.5$$

Protection zone 25 m of the border

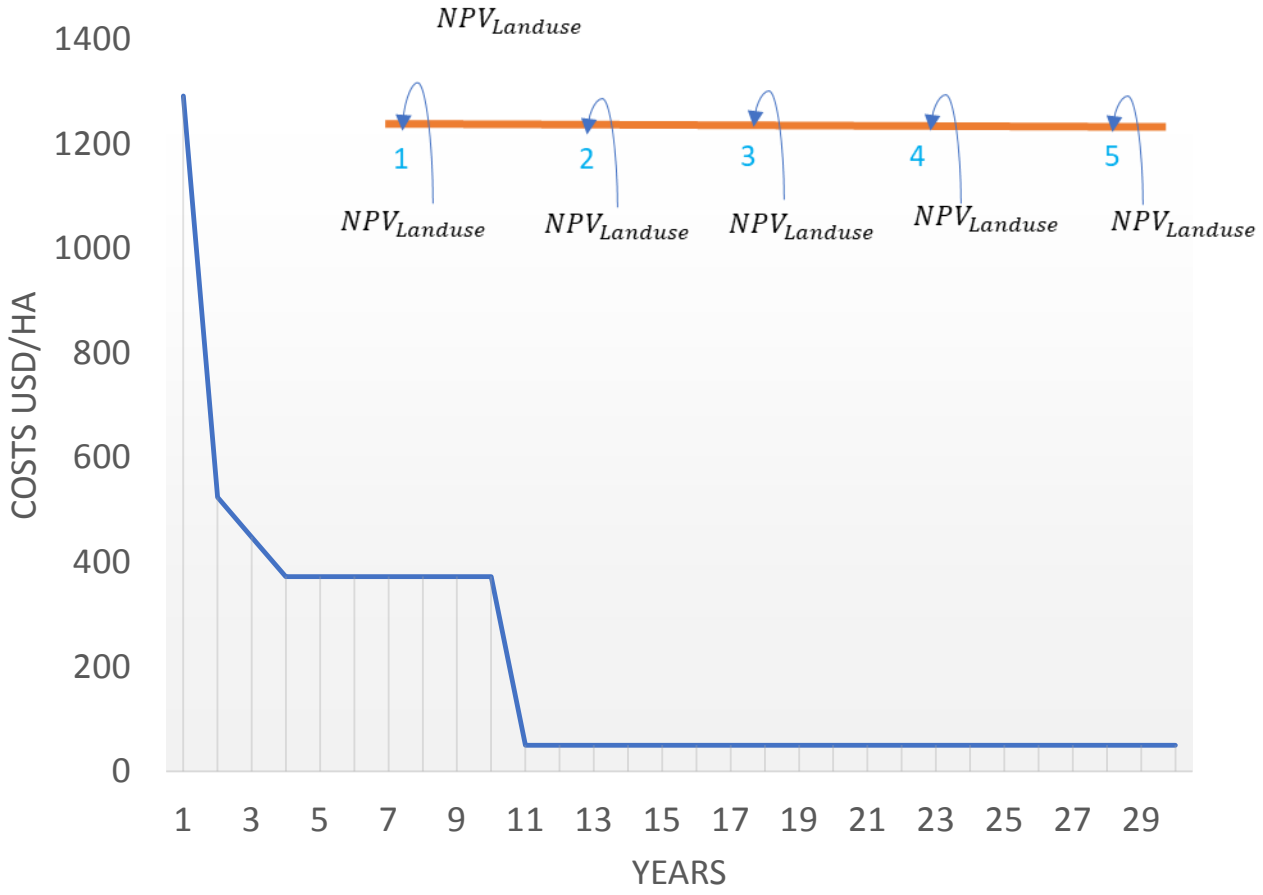
Return Period (years)	Acome (ha)	Coyolate (ha)
2	2,038	7,587
10	6,043	2,856
30	13,913	3,326

PROBOSQUE Incentive:



USD 2267/ha/10 years

Costs and Results



The landowner leases land to the Sugar Company

Productivity = 85 t/ha

Field price of sugar cane= 25 USD/t

Cost of harvesting and piling= 13 USD/t

Net benefit= USD 1003/ha/year

800 lb/cow

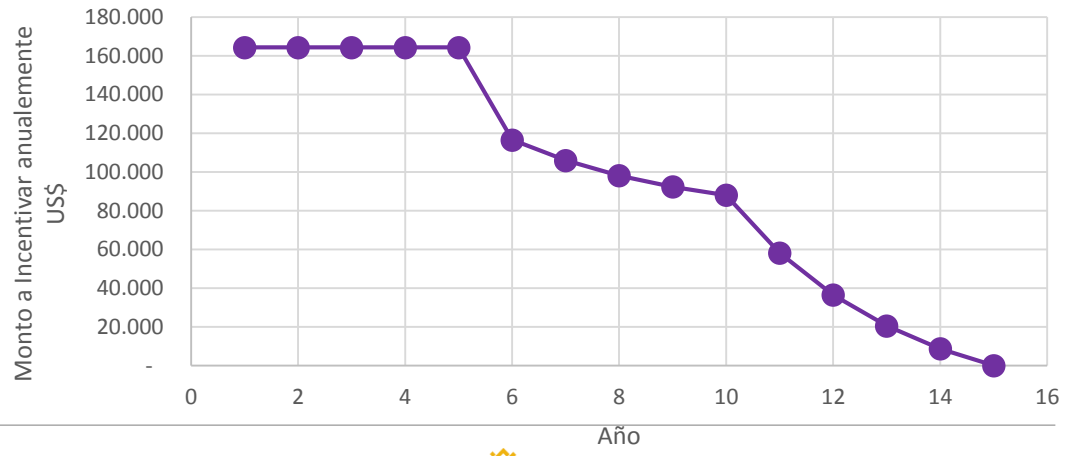
1 cow per ha

Price USD 0.8/lb

Benefit: USD 640/ year

Cost: USD 440/year

Net benefit= USD 200/ha/year



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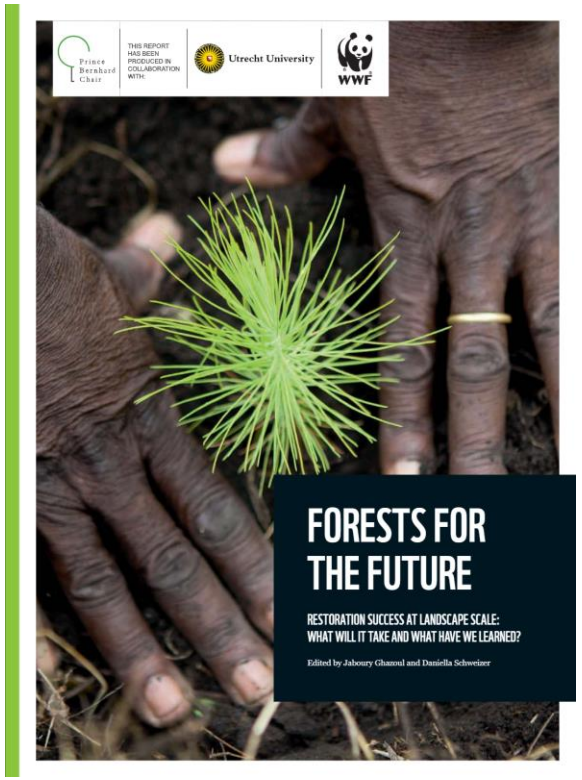
FINANCIAL STRATEGIES FOR FOREST AND LANDSCAPE RESTORATION

Figure ES-1 | **Barriers to Investment in Restoration**

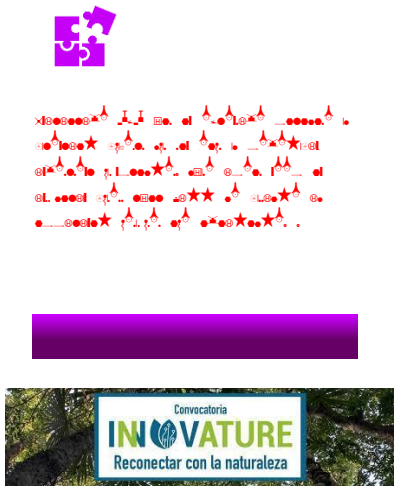
SYSTEMIC BARRIERS	BARRIERS TO PUBLIC FINANCE	BARRIERS TO PRIVATE FINANCE
Environmental and social benefits often have no market value	Difficult to access climate finance	Many restoration projects are too small in size to attract private finance
Incentives to degrade land outweigh incentives to restore land	Restoration funding is often confined to small environmental budgets	Restoration often requires a long investment time horizon (e.g. 10–20 years)
		Restoration is considered to be a risky investment

Source: WRI authors.



In book: Ghazoul J. and Schweizer D. (eds) (2021) Forests for the future: Restoration success at landscape scale - what will it take and what have we learned? Prince Bernhard Chair Reports (issue 1). Series editors Almond, R.E.A., Grooten, M. and Van Kuijk, M., WWF-Netherlands, Zeist and Utrecht University, Netherlands.Publisher: WWF Nederland & Prince Bernhard Chair for International Nature Conservation, Utrecht University

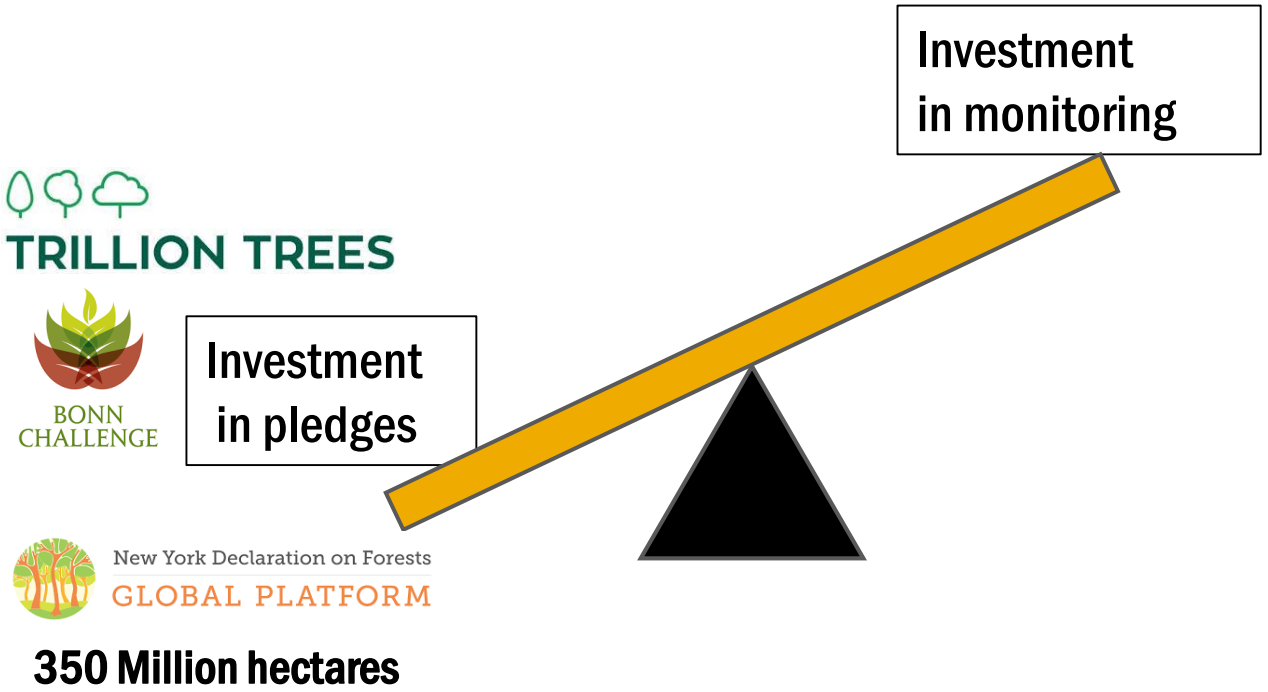
Priority 2: Catalyze private finance into restoration and a common language



MONITORING AND TRANSPARENCY

"We see what we fear and often what we think we see is not there at all" (Jonathan Sacks)

Restoration Monitoring: The Problem



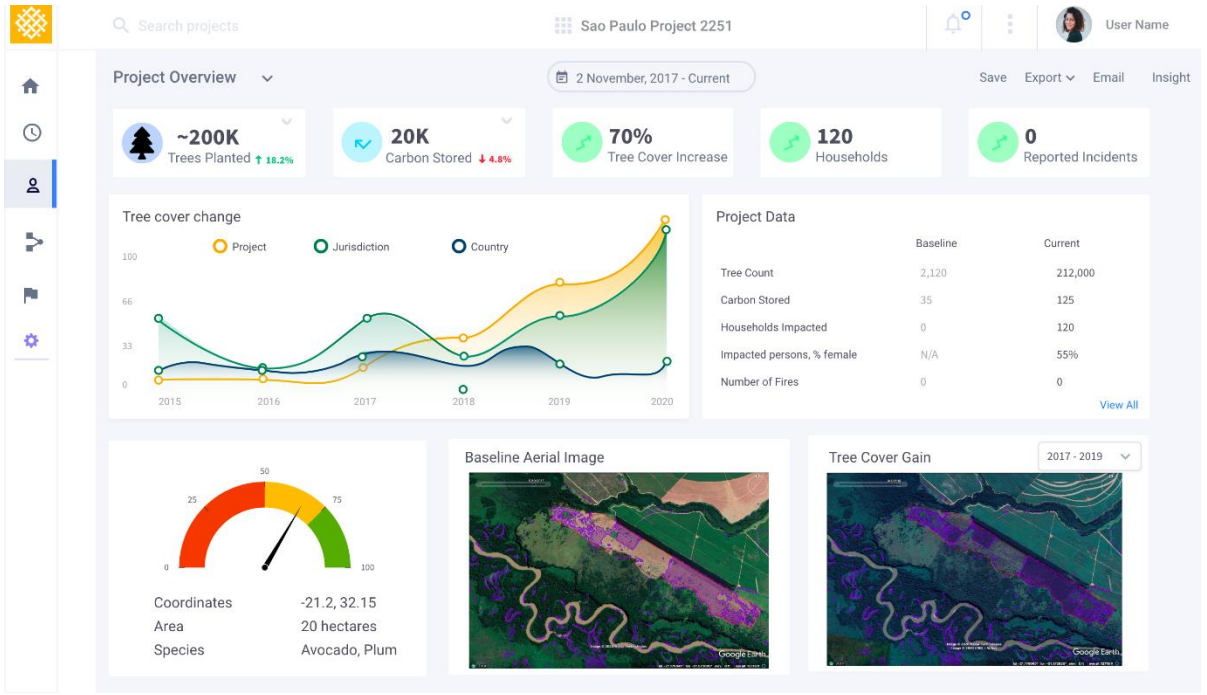
Monitoring restoration is HARD!

- Tree growth is slow & often sparse
- "Restored" means different things to different people
- Restoration can take many forms
- No globally-consistent methods/protocols

WRI's Approach: Three Scales, One Vision

Project Monitoring

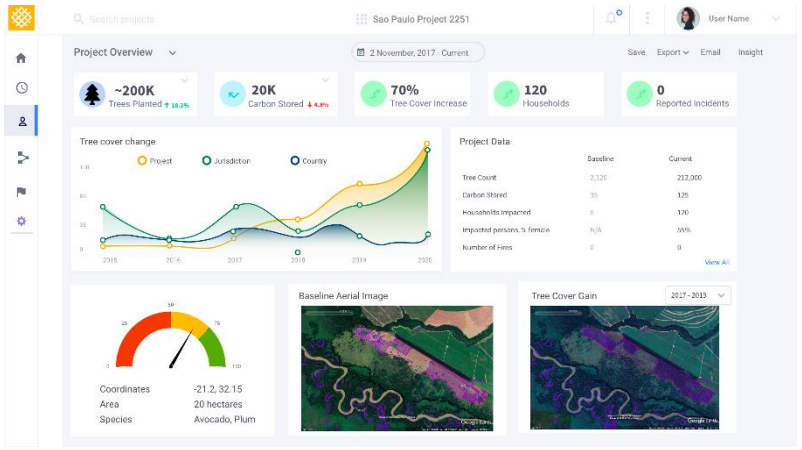
- Track progress of specific restoration sites
- Measure additionality and leakage
- Estimate carbon sequestration



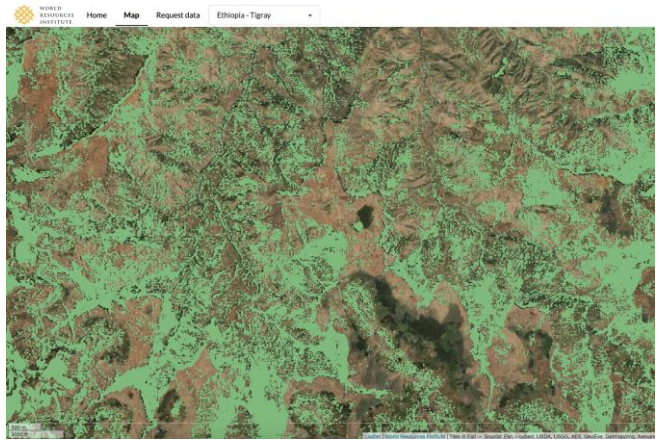
Project (and landscape) Baselines

Project Monitoring

PROJECT MONITORING

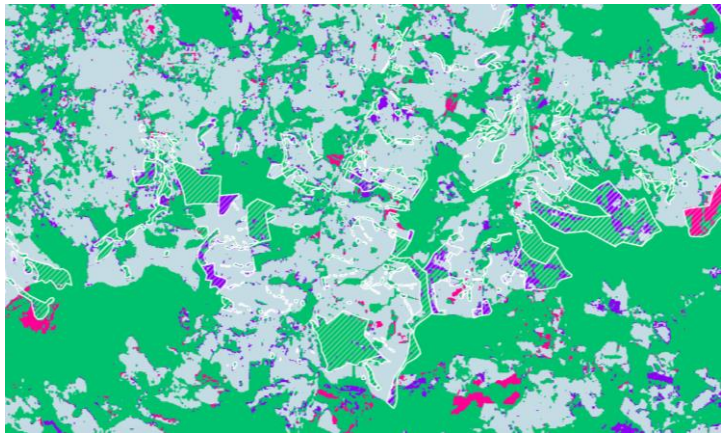


PROJECT/LANDSCAPE BASELINE DATA

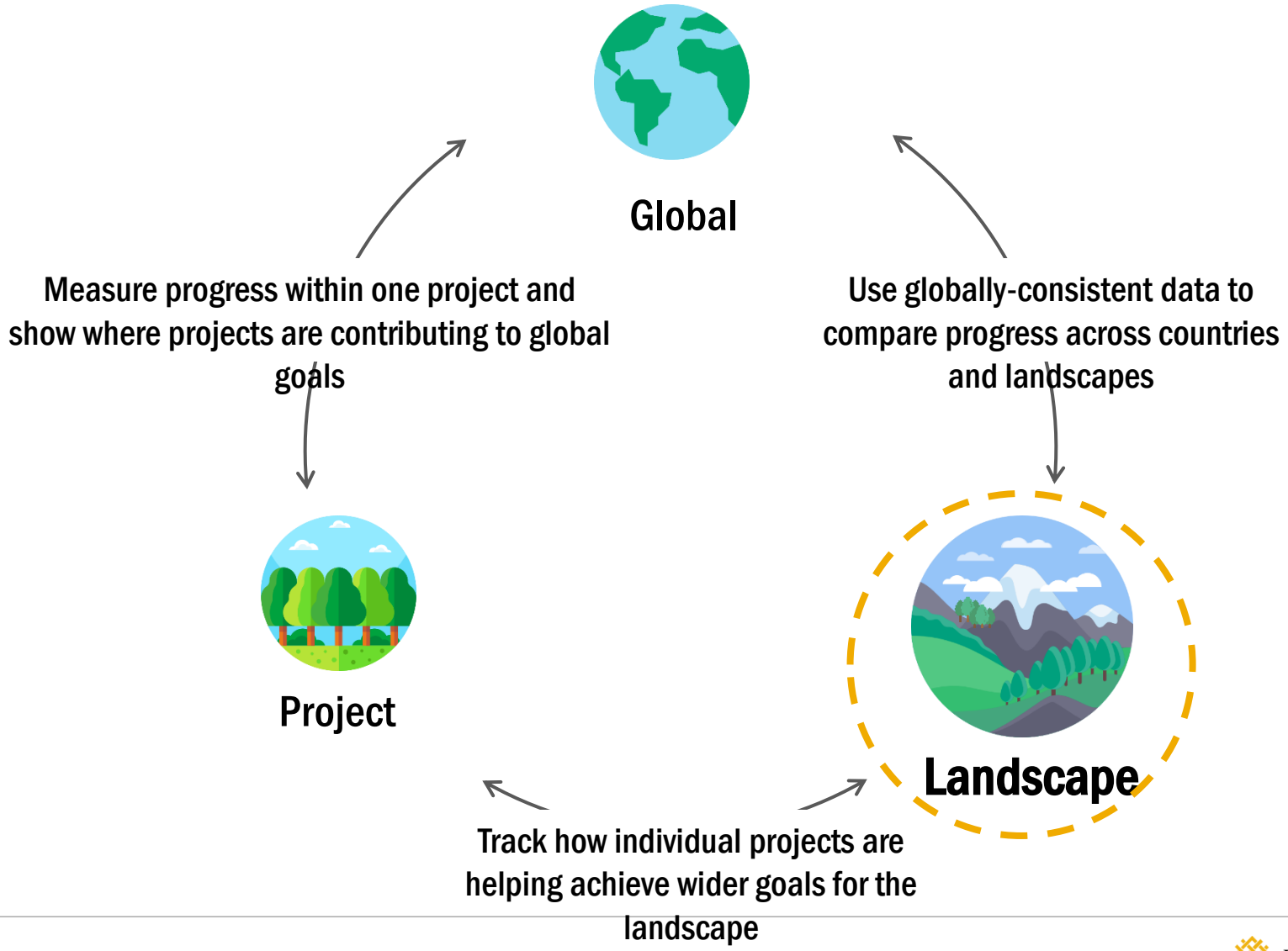


CHANGE DETECTION

(Forthcoming in 2024)



Three Scales, One Vision



Collaborative Monitoring for Landscape Restoration

RESTORATION ECOLOGY
The Journal of the Society for Ecological Restoration
SER SOCIETY FOR ECOLOGICAL RESTORATION

PRACTICE AND TECHNICAL ARTICLE

Drivers of success in collaborative monitoring in forest landscape restoration: an indicative assessment from Latin America

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Author contributions: MRG, KAE conceptualized the research and designed the diagnostic tool; KAE collected and analyzed the data; KAE, MRG, PM led the writing; all authors provided substantial inputs to all phases of the research and edited and revised the manuscript.

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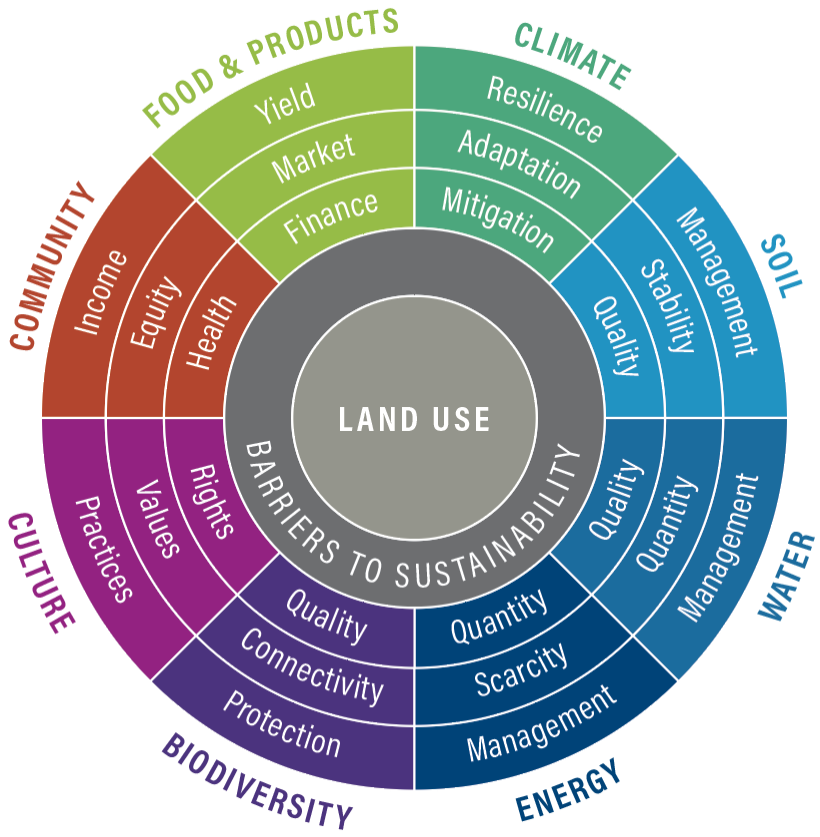
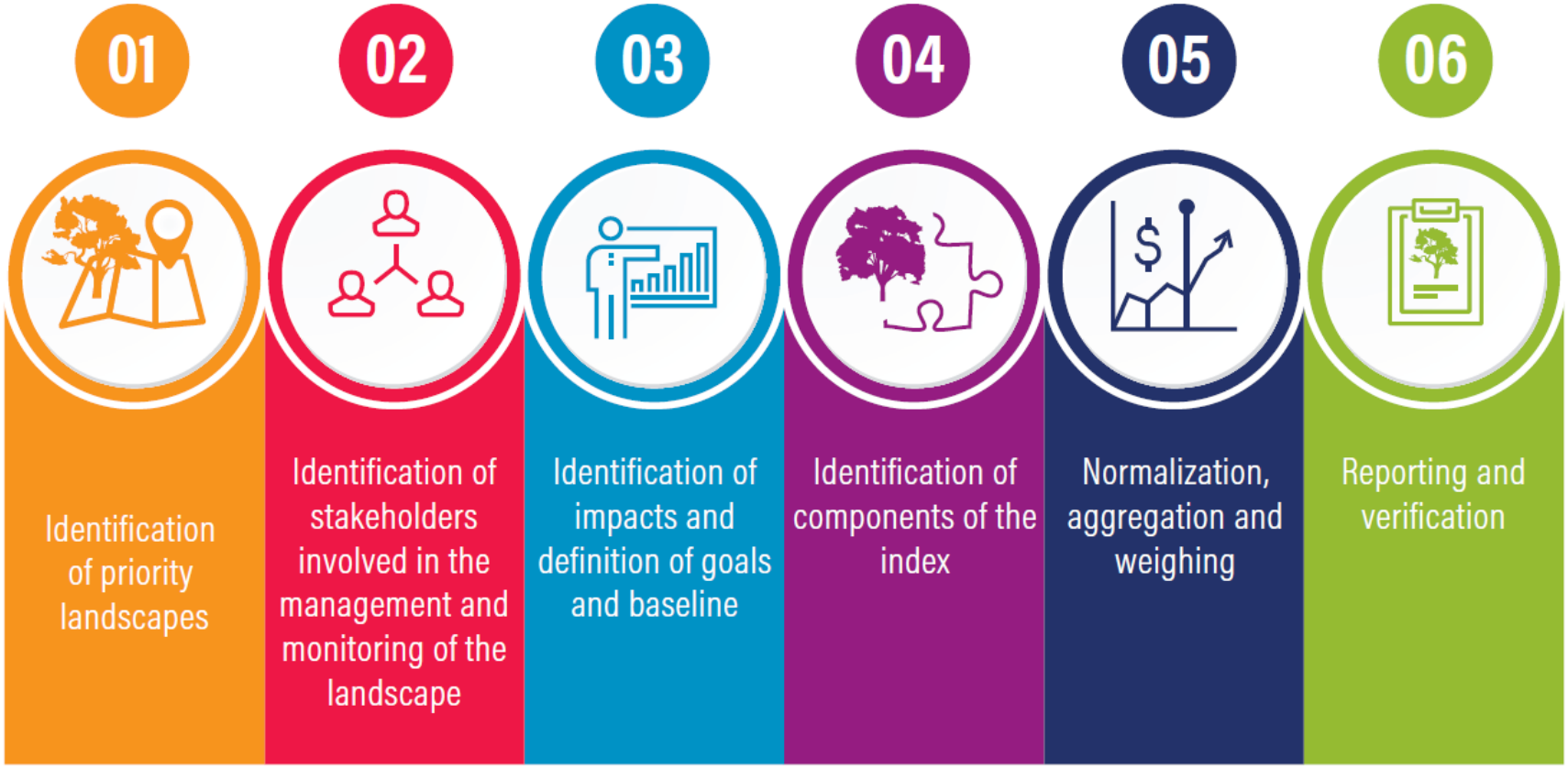
The Road to Restoration and AURORA



Sustainability Index for Landscape Restoration

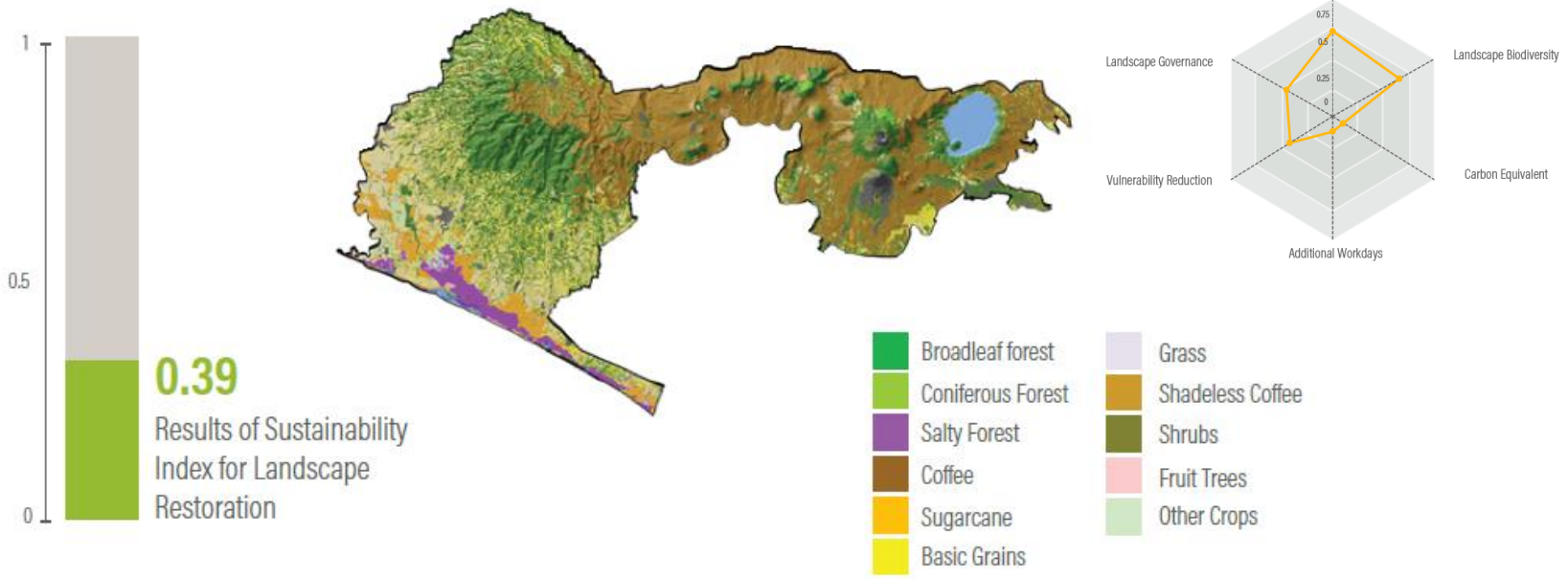
Initiative 20x20

Index Design and Development



Source: WRI and PRISMA, 2019.

Sustainability Index for Landscape Restoration



0.73 Water Quality Index (WQI)

0.68 Landscape Biodiversity Index (LBI)

0.08 Carbon Equivalent Index (CO_2el)

0.05 Additional Workday Index (AWI)

0.36 Vulnerability Reduction Index (VRI)

0.44 Landscape Governance Index (LGI)

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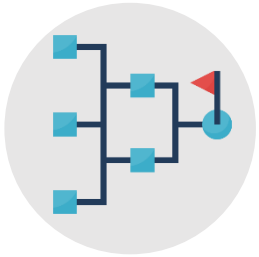
Three Scales, One Vision

Global Monitoring

What is it?



- Creating a globally-consistent way of tracking restoration progress

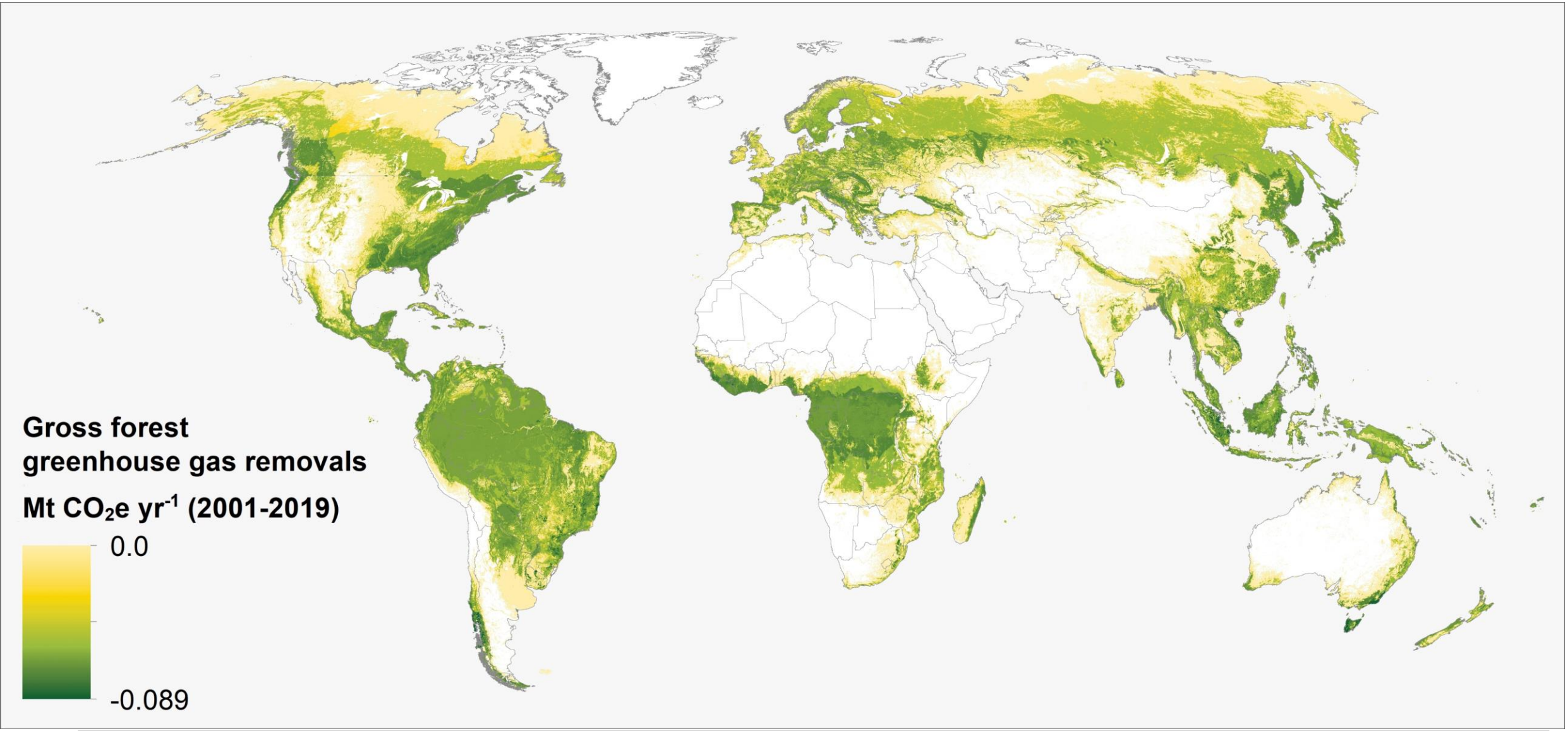
Why do we need it?

- Bonn Challenge, New York Declaration on Forests, Trillion Trees platform and others have inspired commitments
- Lack of a systematic way to track progress

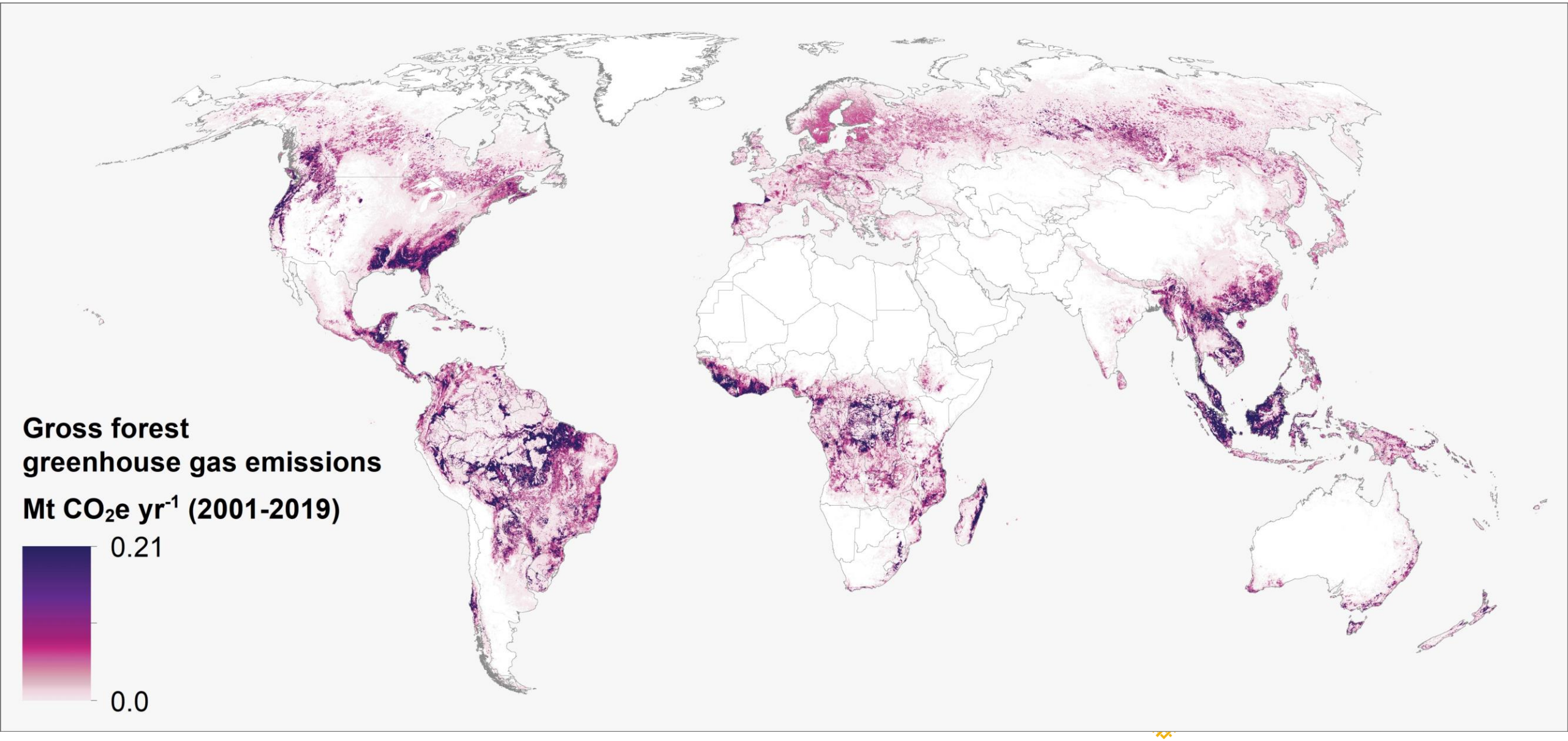
Who is it for?

- Bilateral and multilateral donors
- International NGOs
- National governments
- The general public

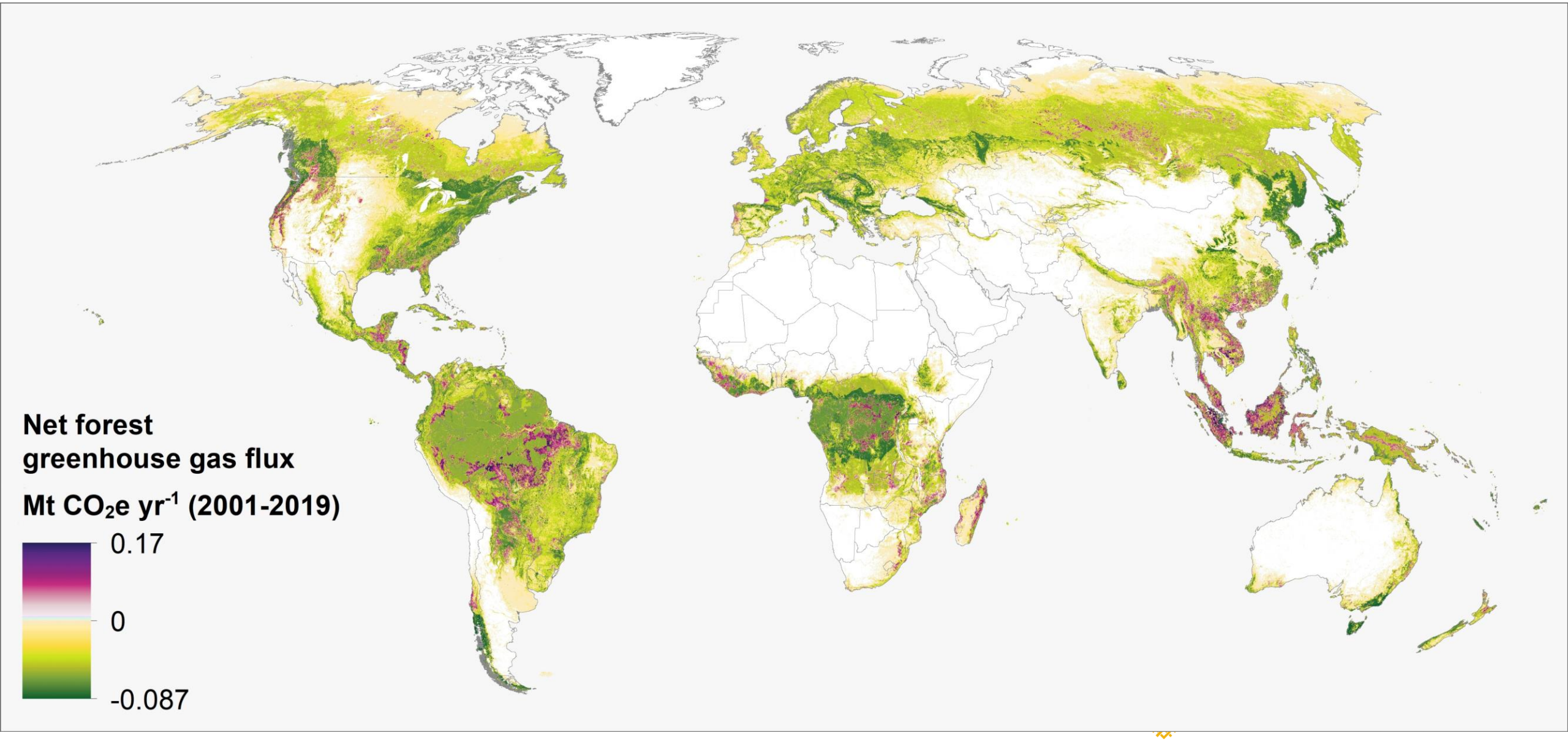
Carbon capture



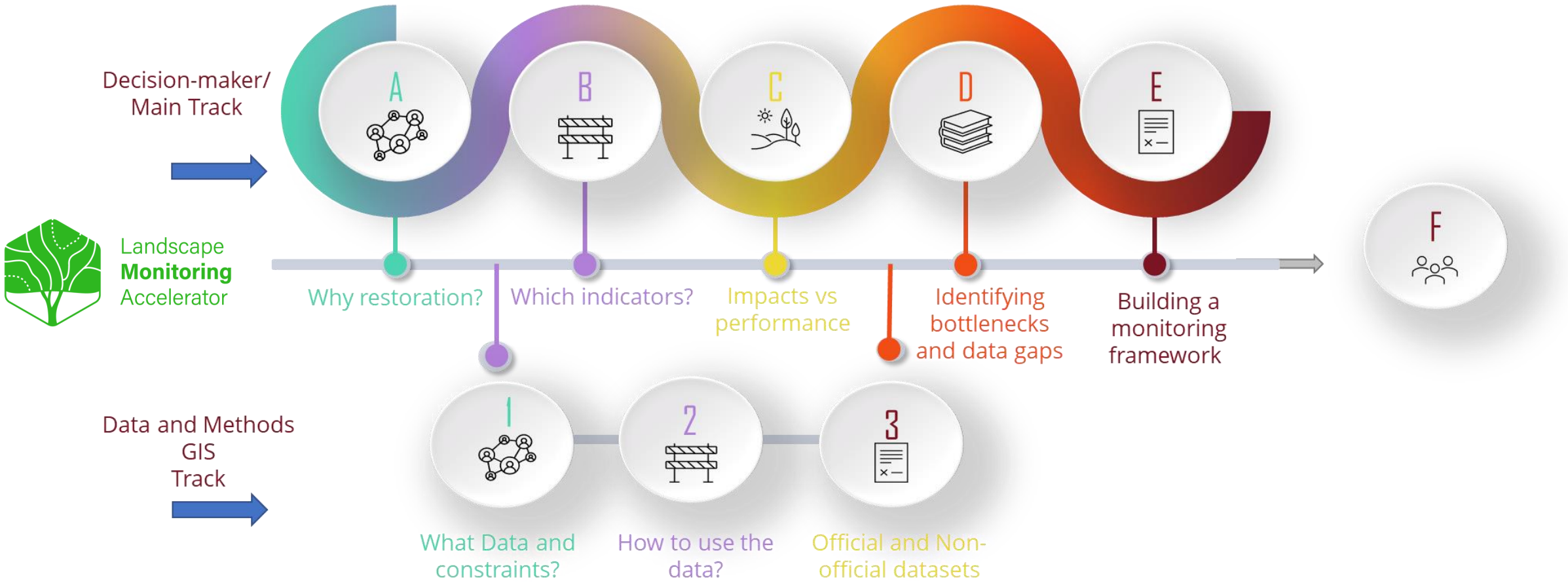
Carbon loss


Gross forest
greenhouse gas emissions
Mt CO_2e yr^{-1} (2001-2019)
0.21
0.0

NET GHG's Flux



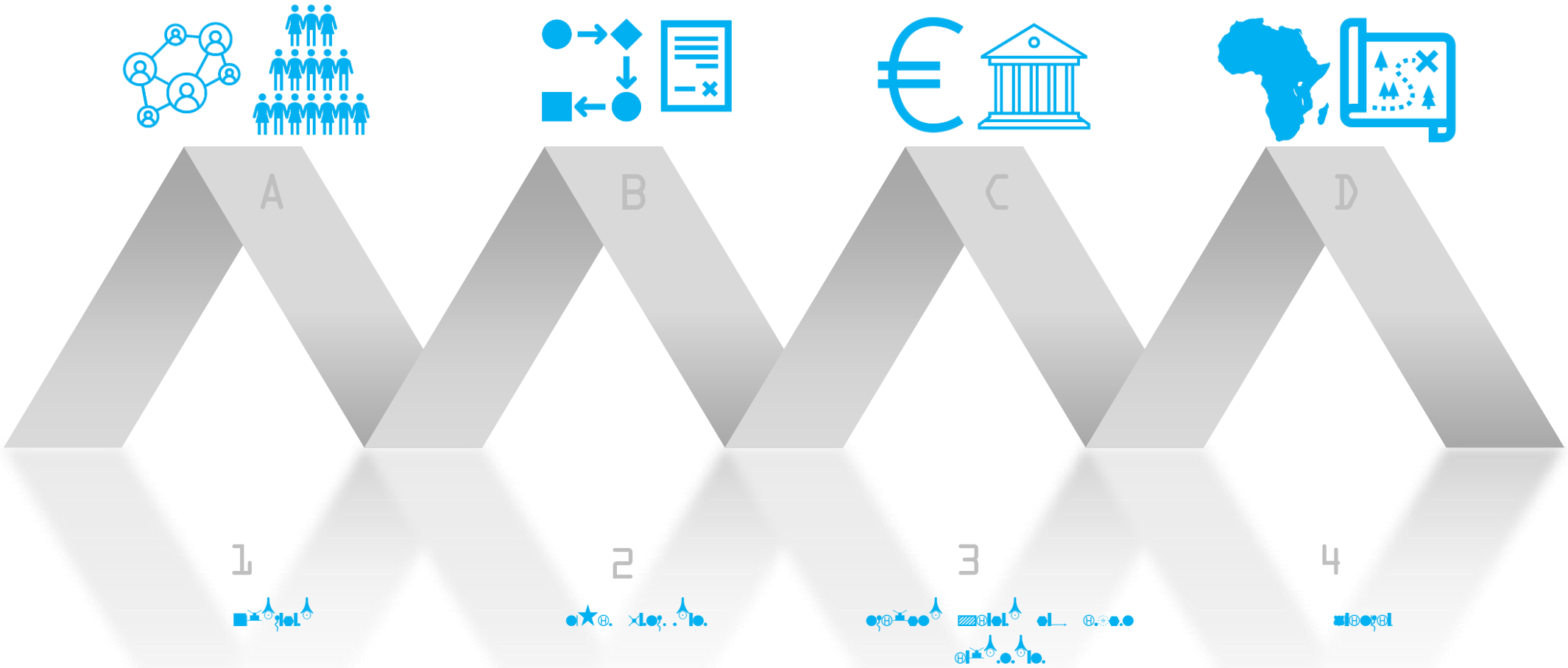
Cross-sectional Monitoring/reporting Transparency



World class Program supporting landscape policy and monitoring

Packaging offers to reduce variety of requests by countries
Connecting research with technical assistance/Engagement

Wrapping up key messages



Initiative 20x20

Dr. René Zamora Cristales
Research Group Coordinator 3.09 Sustainable forest operations for Landscape Restoration

Courtesy faculty Oregon State University

Director of Iniative 20x20 and Restoration Policy, WRI

Landscape Monitoring Accelerator

Landscape Policy Accelerator

IUFRO Interconnecting Forests, Science and People

Oregon State University

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Images and figures from adapted from Creative Venus and European Space Agency