# Leading and lagging indicators of progress for forest and landscape restoration

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The Bonn Challenge is a global effort to bring 150 million hectares of deforested and degraded land into restoration by 2020 and 350 million hectares by 2030.
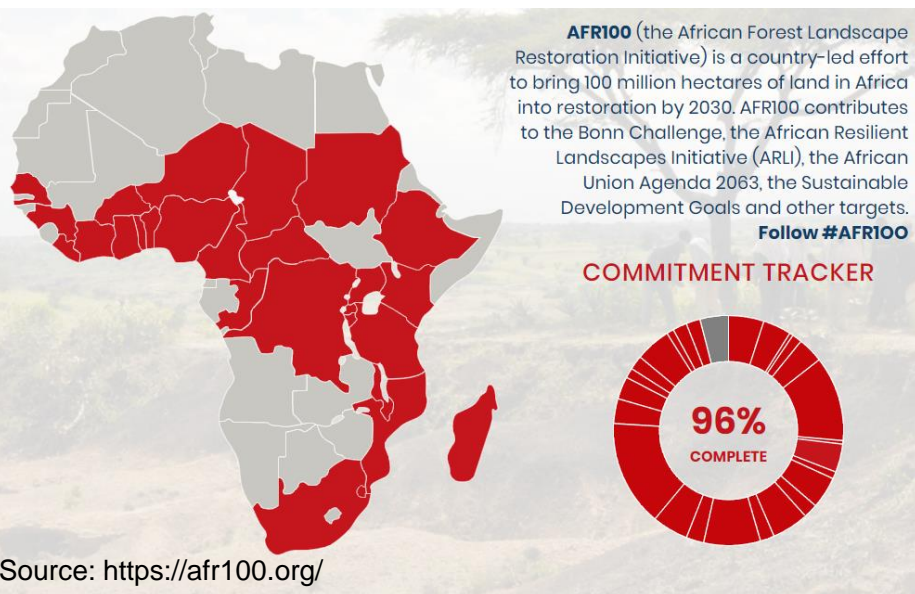
168.43 million hectares pledged

	2020 goal		2030 goal
94	74		

0   150   350

Million hectares

Commitments

56
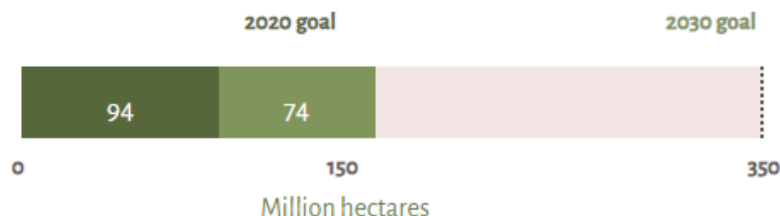
Potential

Climate benefit:
15.66 GtCO2 sequestered

Economic activity:
48,424 million USD

AFR100 (the African Forest Landscape Restoration Initiative) is a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030. AFR100 contributes to the Bonn Challenge, the African Resilient Landscapes Initiative (ARLI), the African Union Agenda 2063, the Sustainable Development Goals and other targets.
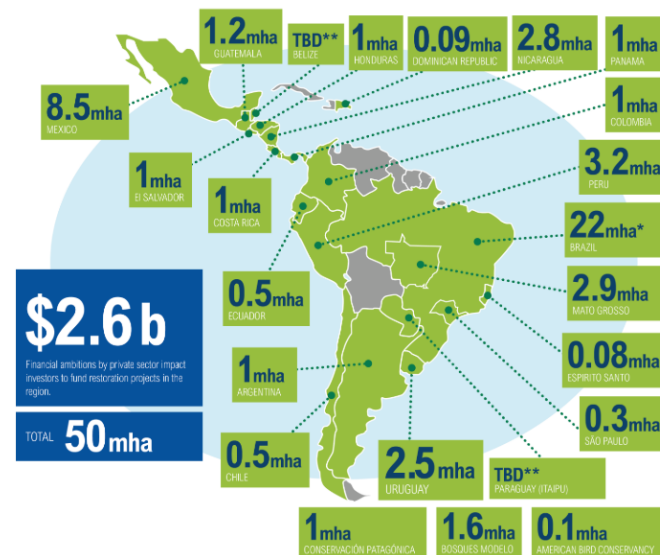**Follow #AFR100**

COMMITMENT TRACKER

96% COMPLETE

Initiative 20x20

Bringing **20 million** hectares of degraded land in Latin American & the Caribbean into restoration by **2020**.

COMMITMENTS
50 M ha by governments
$2.6 B of private sector capital

$2.6 b
Financial ambitions by private sector impact investors to fund restoration projects in the region.

TOTAL **50 mha**

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

1.2 mha GUATEMALA	**TBD** BELIZE	**1 mha** HONDURAS	**0.09 mha** DOMINICAN REPUBLIC
2.8 mha NICARAGUA	**1 mha** PANAMA		
8.5 mha MEXICO			**1 mha** COLOMBIA
1 mha EL SALVADOR	**1 mha** COSTA RICA		**3.2 mha** PERU
			22 mha* BRAZIL
0.5 mha ECUADOR			**2.9 mha** MATO GROSSO
1 mha ARGENTINA			**0.08 mha** ESPIRITO SANTO
			0.3 mha SÃO PAULO
0.5 mha CHILE	**2.5 mha** URUGUAY	**TBD** PARAGUAY (ITAIPU)	
1 mha CONSERVACIÓN PATAGÓNICA	**1.6 mha** BOSQUES MODELO	**0.1 mha** AMERICAN BIRD CONSERVANCY	

FIGURE 4 **PRINCIPLES OF FOREST AND LANDSCAPE RESTORATION (FLR)**

FLR is defined as a process that aims to regain ecological functionality and enhance human well-being in deforested or degraded landscapes. FLR is not an end in itself, but a means of regaining, improving, and maintaining vital ecological and social functions, in the long-term leading to more resilient and sustainable landscapes.

MAINTAIN AND ENHANCE NATURAL ECOSYSTEMS WITHIN LANDSCAPES

FLR does not lead to the conversion or destruction of natural forests or other ecosystems. It enhances the conservation, recovery, and sustainable management of forests and other ecosystems.

FOCUS ON LANDSCAPES

FLR takes place within and across entire landscapes, not individual sites, representing mosaics of interacting land uses and management practices under various tenure and governance systems. It is at this scale that ecological, social and economic priorities can be balanced.

FLR uses a variety of approaches that are adapted to the local social, cultural, economic and ecological values, needs, and landscape history. It draws on latest science and best practice, and traditional and indigenous knowledge, and applies that information in the context of local capacities and existing or new governance structures.

TAILOR TO THE LOCAL CONTEXT USING A VARIETY OF APPROACHES

FLR actively engages stakeholders at different scales, including vulnerable groups, in planning and decision making regarding land-use, restoration goals and strategies, implementation methods, benefit sharing, monitoring and review processes.

ENGAGE STAKEHOLDERS AND SUPPORT PARTICIPATORY GOVERNANCE

MANAGE ADAPTIVELY FOR LONG-TERM RESILIENCE

FLR seeks to enhance the resilience of the landscape and its stakeholders over the medium and long-term. Restoration approaches should enhance species and genetic diversity and be adjusted over time to reflect changes in climate and other environmental conditions, knowledge, capacities, stakeholder needs, and societal values. As restoration progresses, information from monitoring activities, research, and stakeholder guidance should be integrated into management plans.

RESTORE MULTIPLE FUNCTIONS FOR MULTIPLE BENEFITS

FLR interventions aim to restore multiple ecological, social and economic functions across a landscape and generate a range of ecosystem goods and services that benefit multiple stakeholder groups.

Besseau, P., Graham, S. and Christophersen, T. (eds.), 2018. Restoring forests and landscapes: the key to a sustainable future. Global Partnership on Forest and Landscape Restoration, Vienna,

Main objective

To propose the use of leading and lagging indicators to assess **progress** in forest restoration

The origins of leading and lagging indicators

- Tool to detect a coming recession, measure its impacts and guide reactive actions (Moore, 1983)

- Terminology adopted by occupational H&S literature and practice

MOORE, G. H. 1983. The forty-second anniversary of the leading indicators. Business Cycles, Inflation, and Forecasting, 2nd edition. Ballinger.

Common simple progress assessment system using only
one/few short-term lagging indicators of progress

What we measure affects what we do

Joseph Stiglitz, Economist and Nobel Prize winner

seedling
survival rate

3   Years

ACCOMPLISHMENTS

Measures of effort

Short-term measures of progress

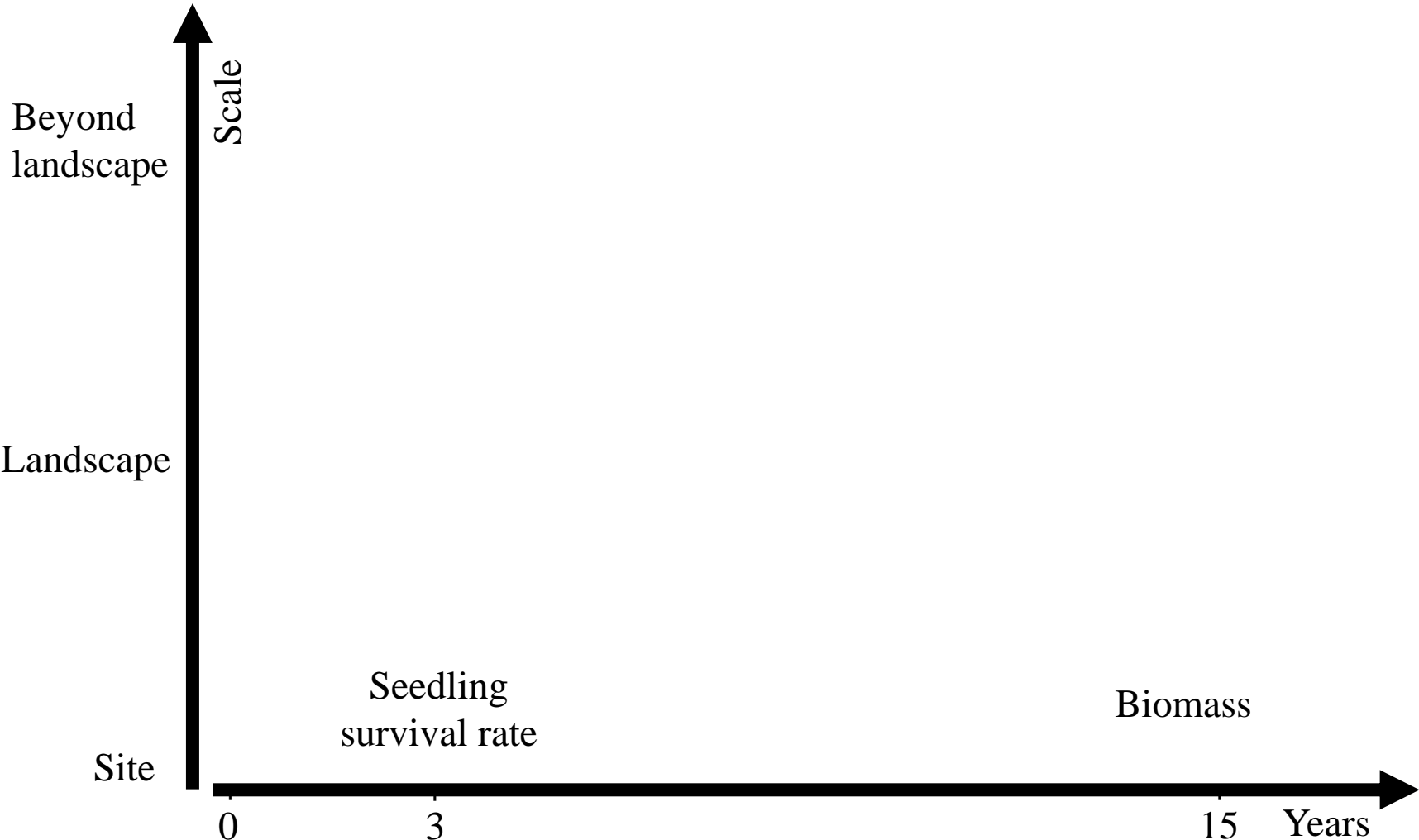| YEAR	TARGET AREA	AREA PLANTED	% Accomp	SEEDLINGS PLANTED	JOBS GENERATED	PERSONS EMPLOYED
2011	100,000	128,558	129%	89,624,121	335,078	47,868
2012	200,000	221,763	111%	125,596,730	380,696	55,146
2013	300,000	333,160	111%	182,548,862	466,990	65,198
2014	300,000	334,302	111%	205,414,639	1,079,792	152,008
2015	350,000	360,357	103%	351,014,239	915,729	123,519
2016	247,683	284,089	115%	415,564,211	842,792	114,584
2017	193,803	202,488	104%	178,142,764	582,070	84,315
2018	136,466	132,741	97%	121,067,668	133,048	27,851
TOTAL	1,827,952	1,997,457	109%	1,668,973,234	4,736,195	670,489

as of December 28, 2018
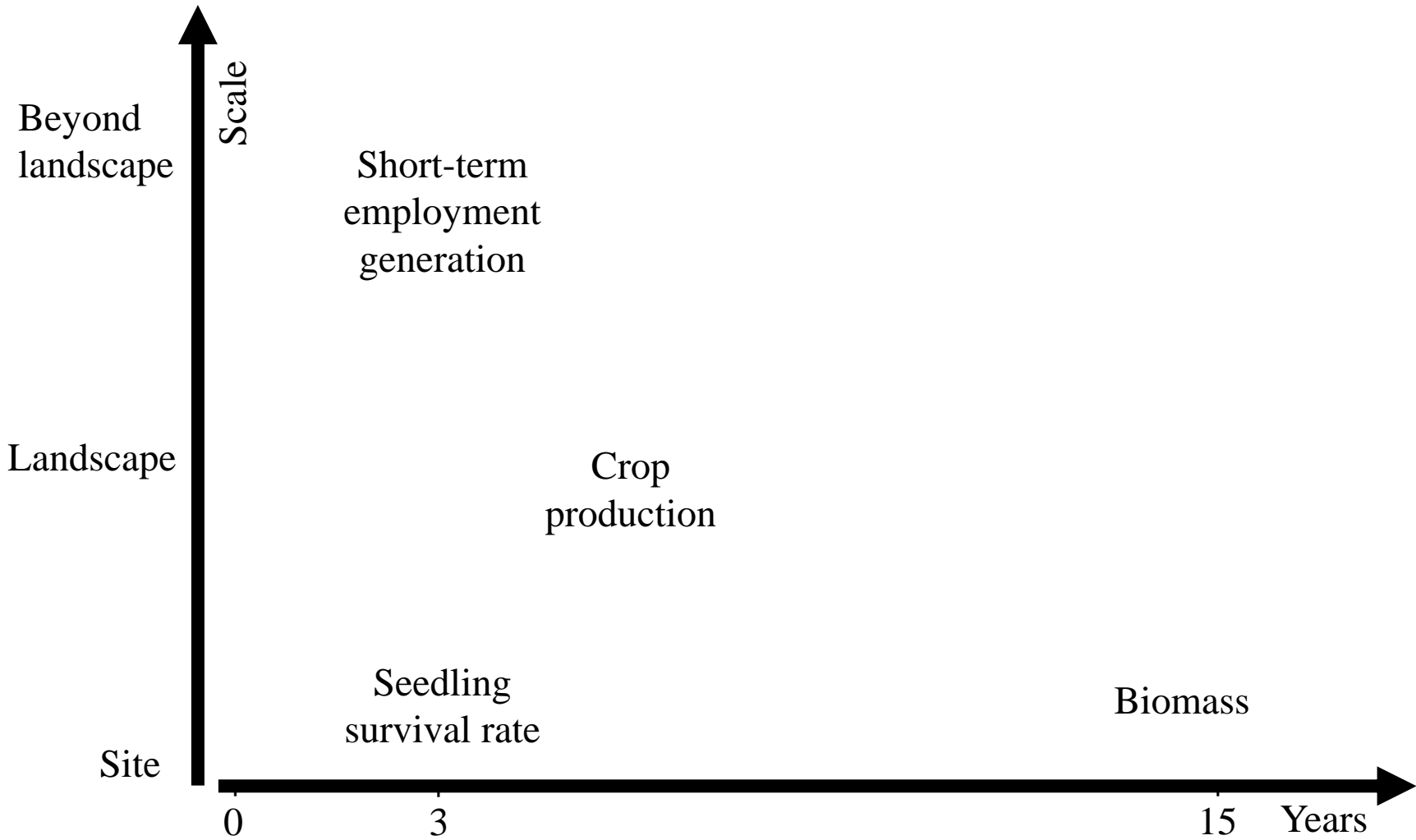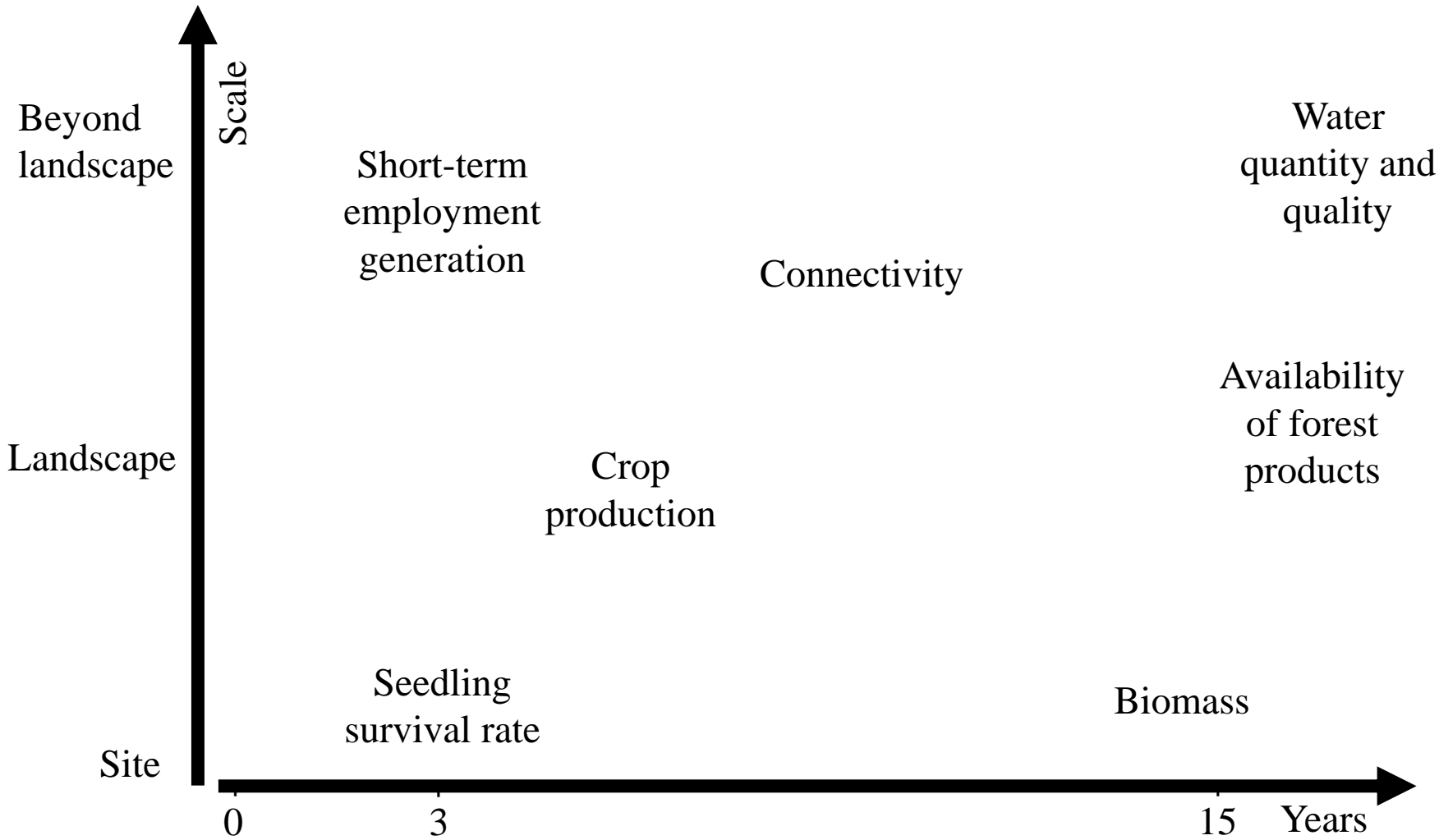
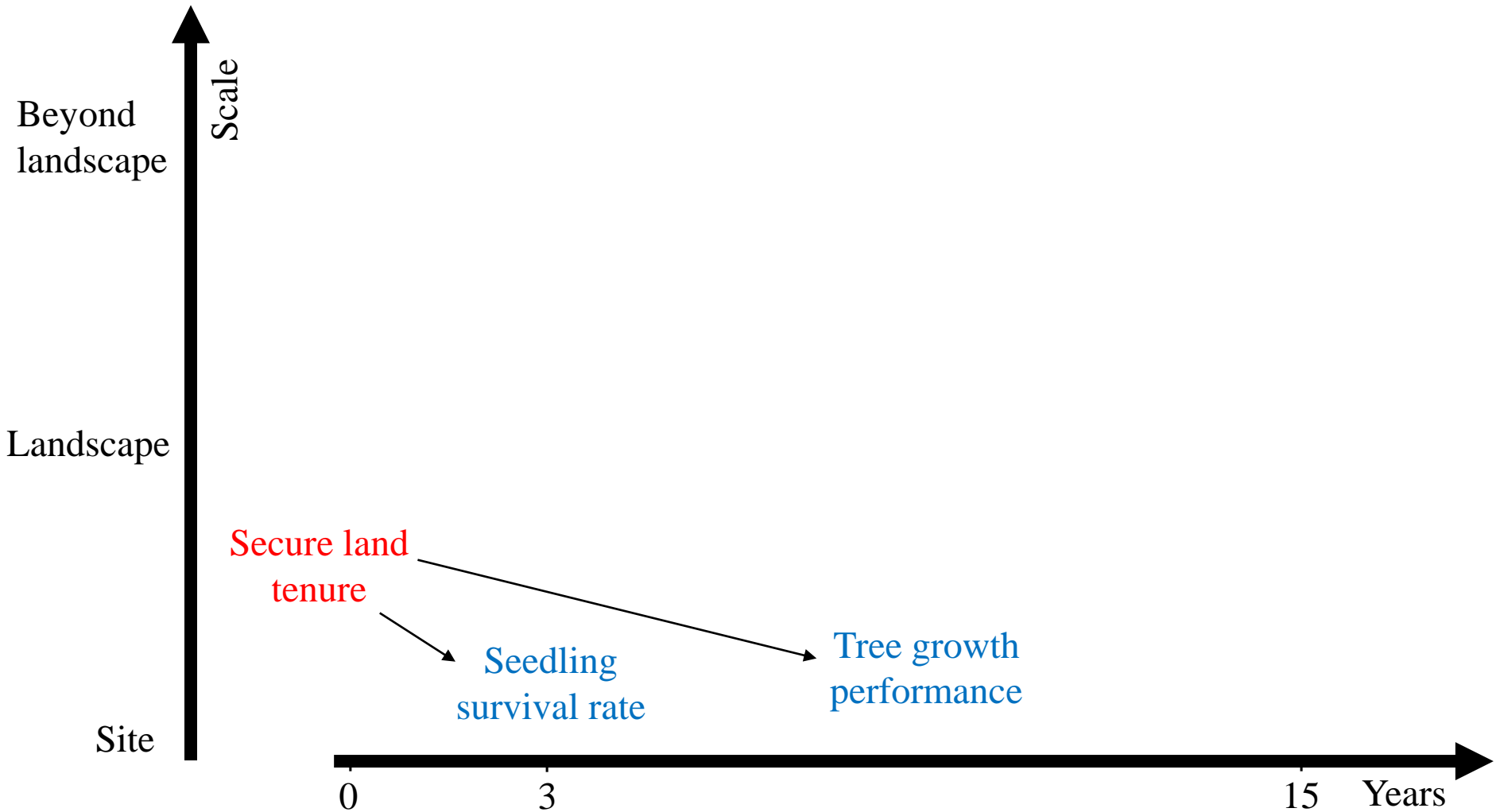Source: ngp.denr.gov.ph/index.php/accomplishments

Assessment system with lagging indicators of
progress over time and across scales

Assessment system with lagging indicators of
progress over time and across scales

Scale

Beyond
landscape

Landscape

Site

Seedling
survival rate

Biomass

0   3   15   Years

Assessment system with lagging indicators of progress over time and across scales

Assessment system with lagging indicators of
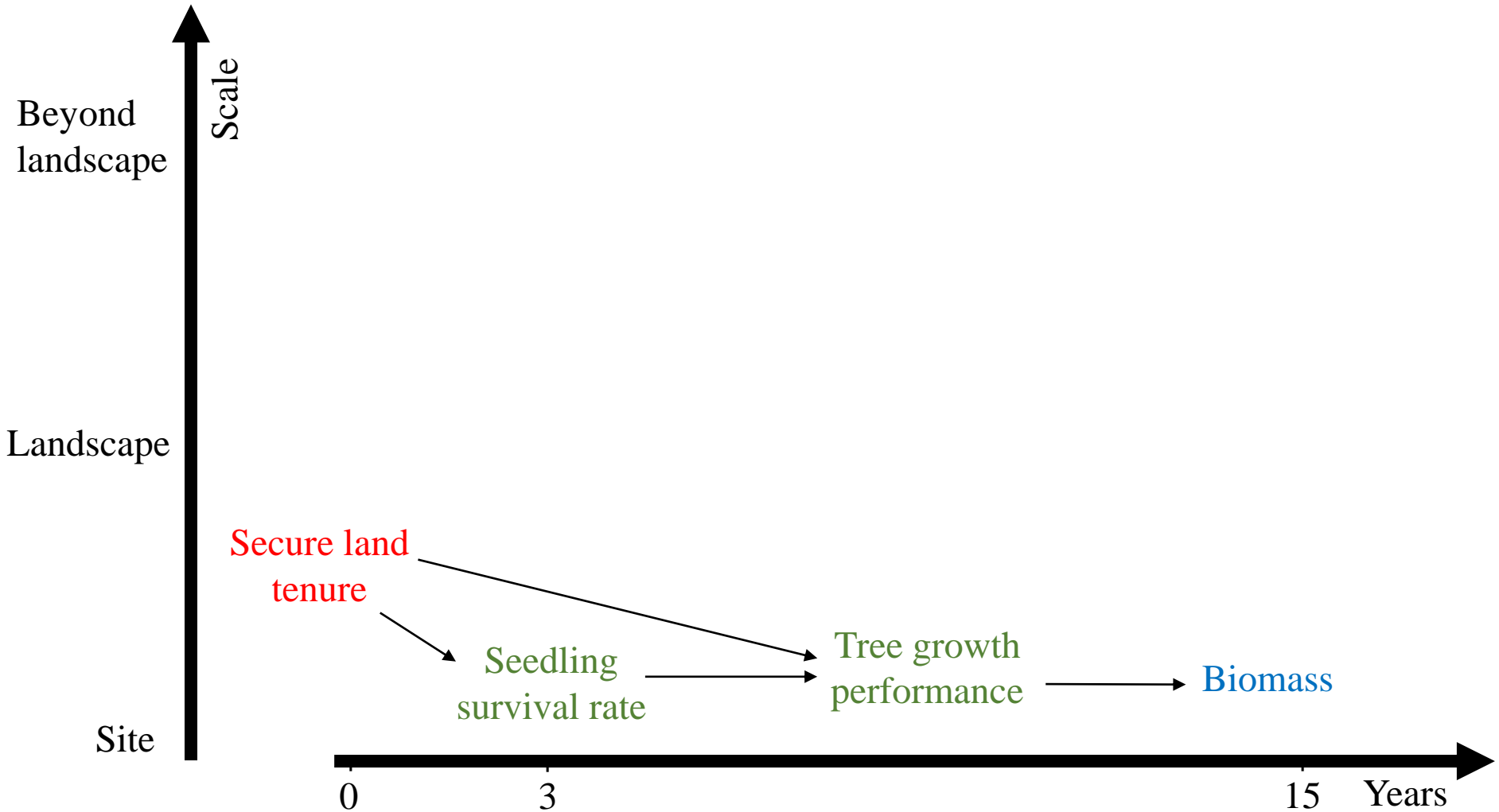progress over time and across scales

Assessment system with multiple leading, lagging and both leading and lagging indicators of impact of forest restoration at different scales and time and their connections

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Not only for M&E
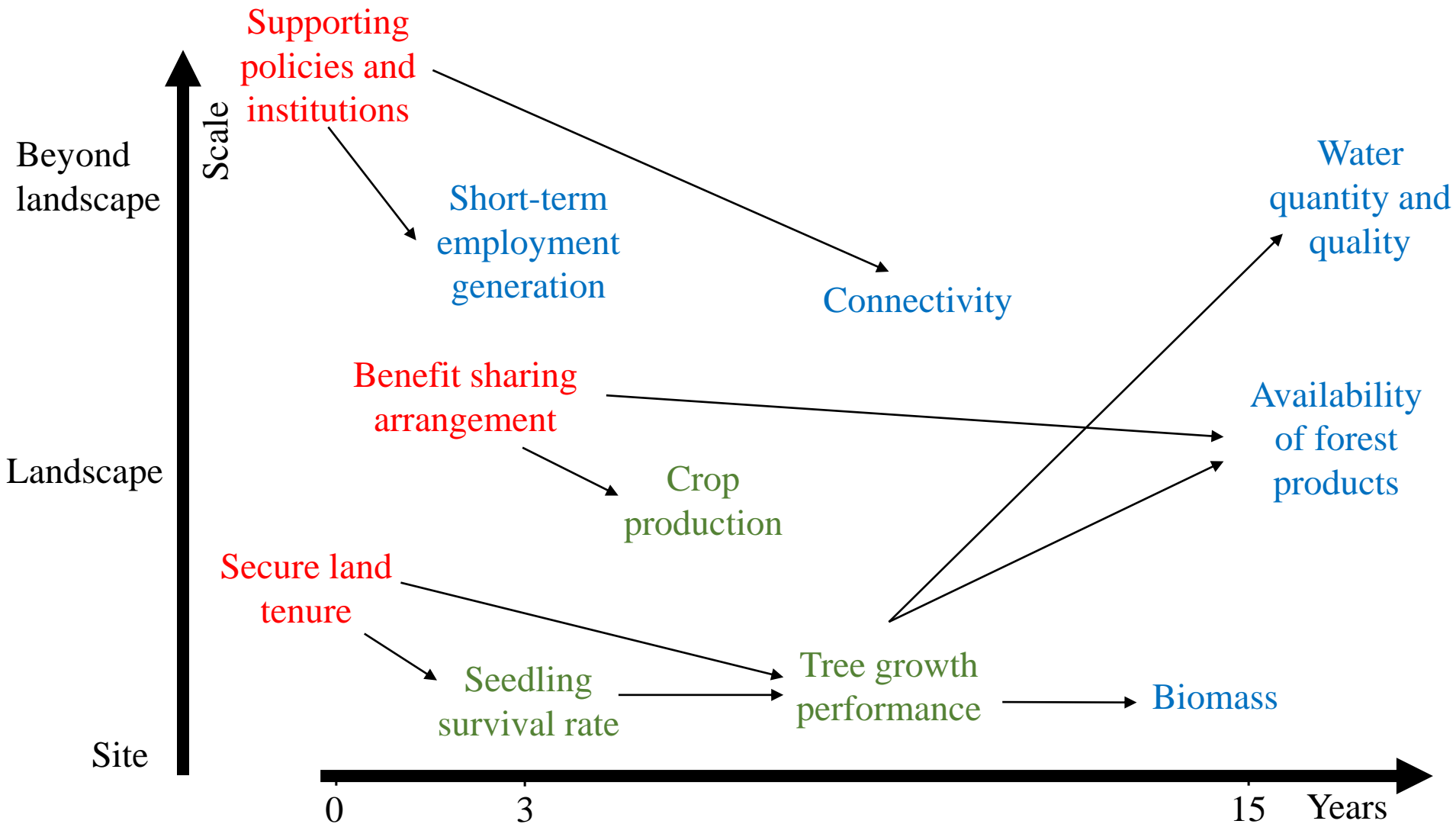
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Planning, designing, managing adaptively, M&E, reporting

Assessment system with multiple leading, lagging and both leading and lagging indicators of impact of forest restoration at different scales and time and their connections

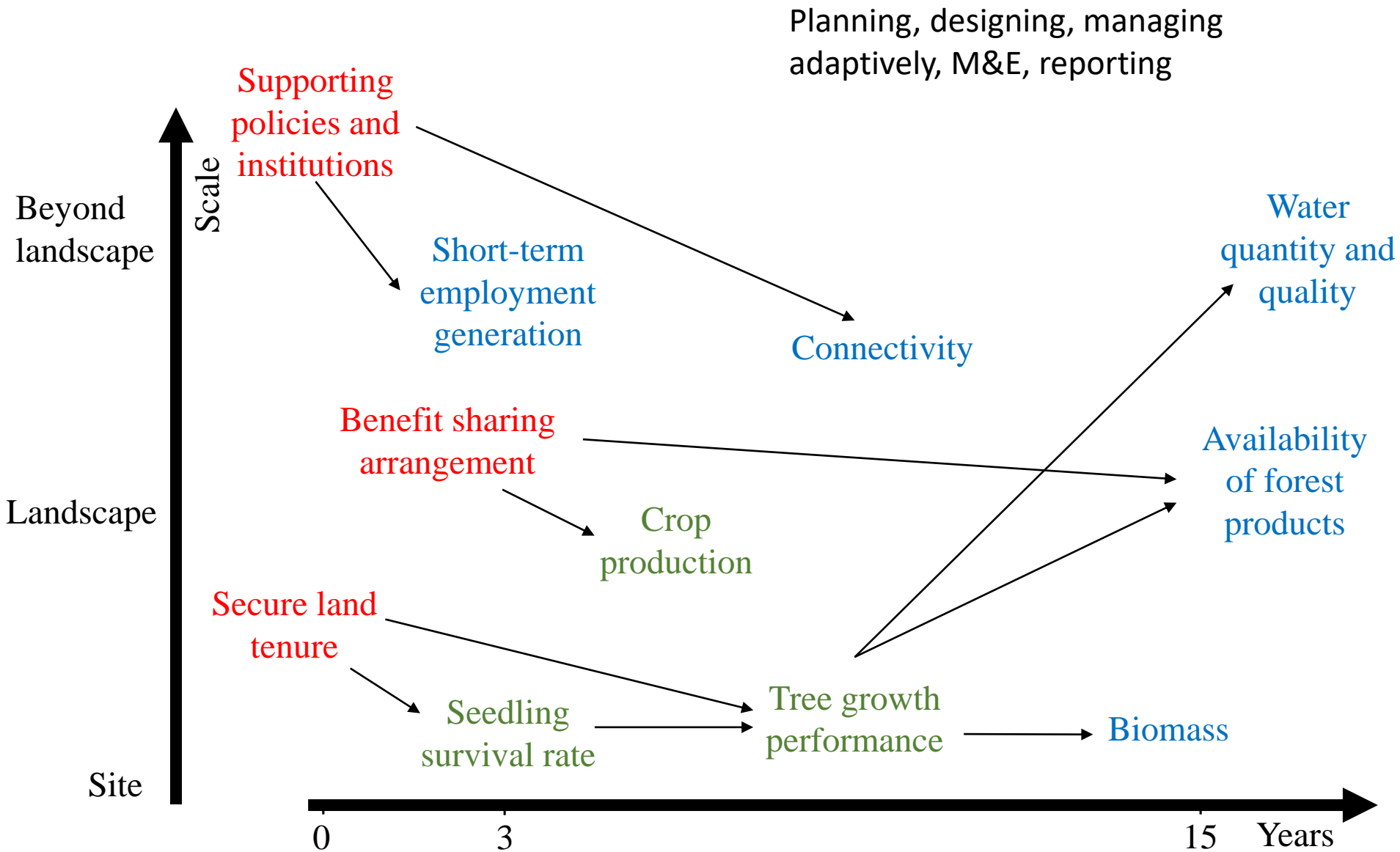Example: Selecting communities with minimum level of capacity or elevating community capacity

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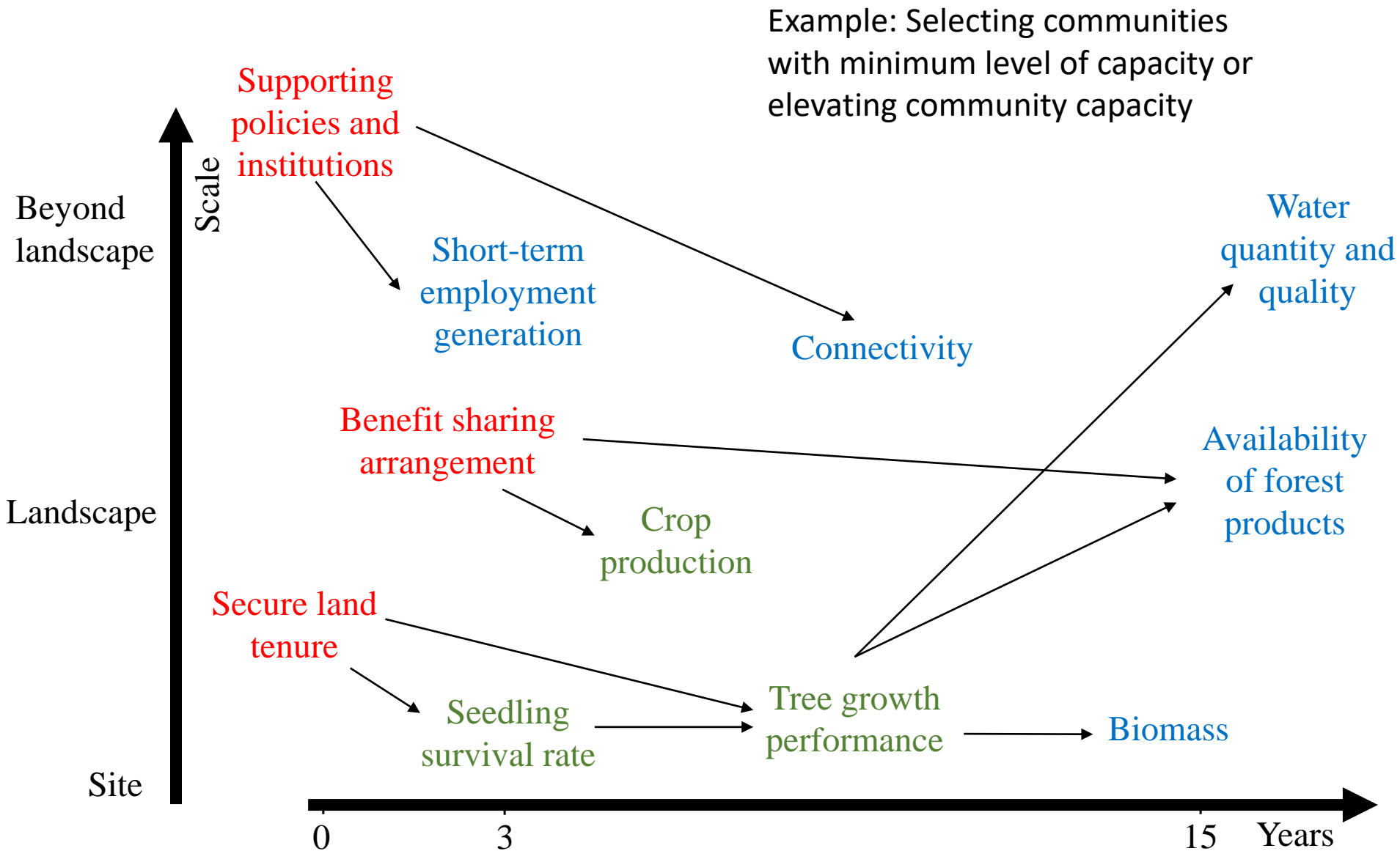
Example: Identifying factors that may limit outcomes and addressing them in a timely manner
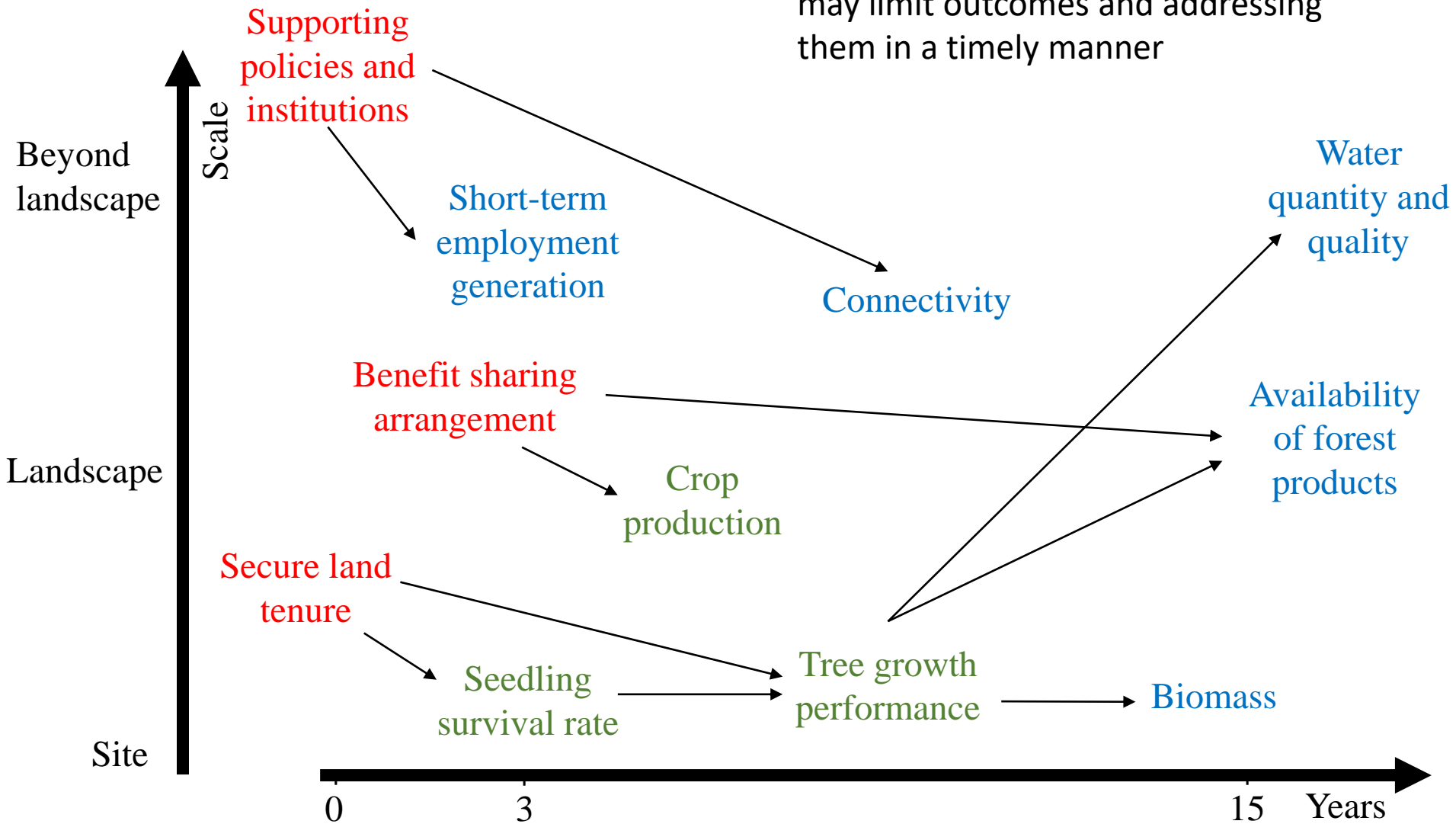
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Example: Reporting: maybe not all principles/objectives have been met but demonstrate there are structures/actions in place to increase their likelihood

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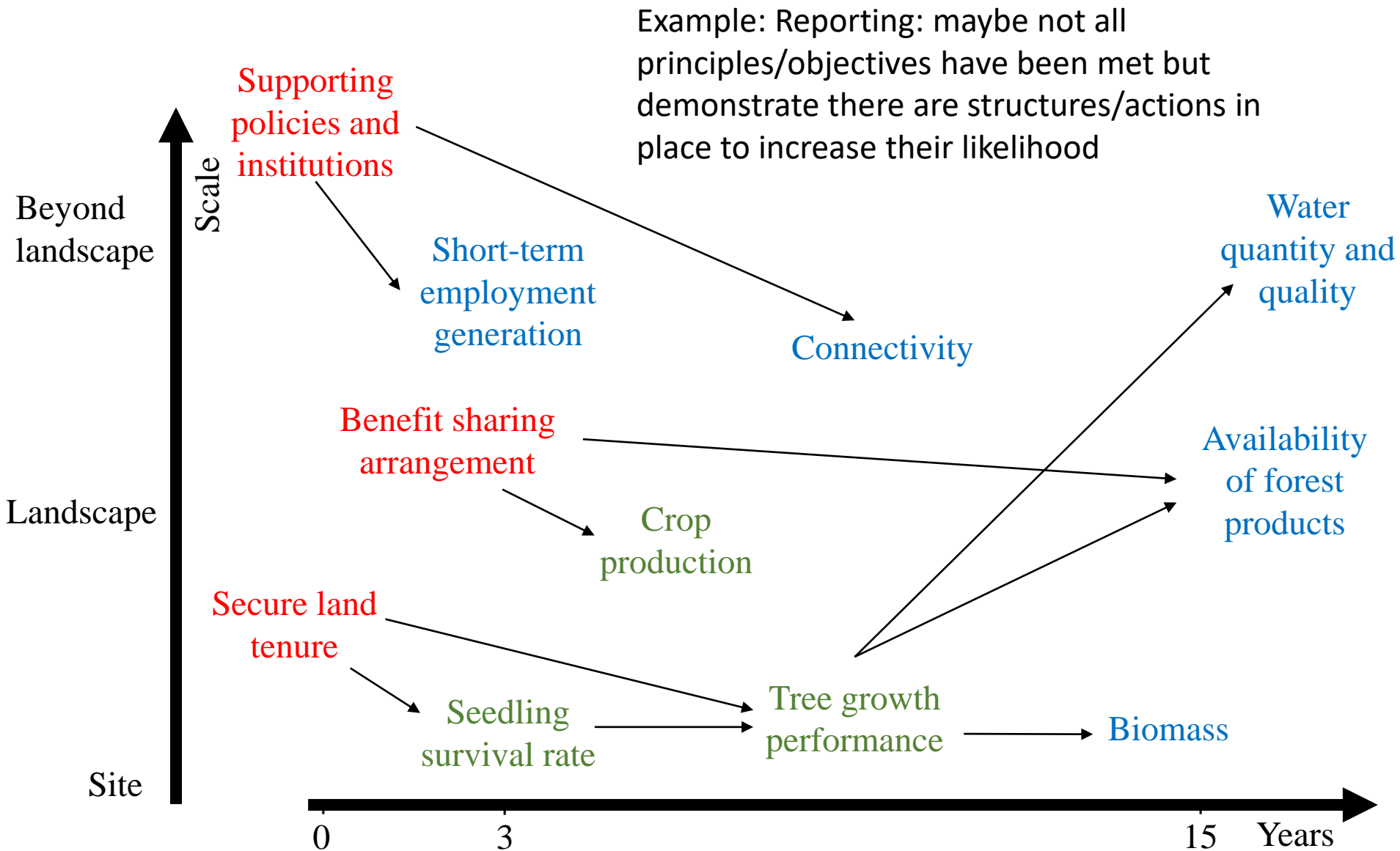
Concept integrates project/program into processes, allows for different starting points of the process, is synergetic with theories of change (Sayer et al. 2017)

SAYER et al 2017. Measuring the effectiveness of landscape approaches to conservation and development. *Sustainability Science,* 12**,** 465-476.
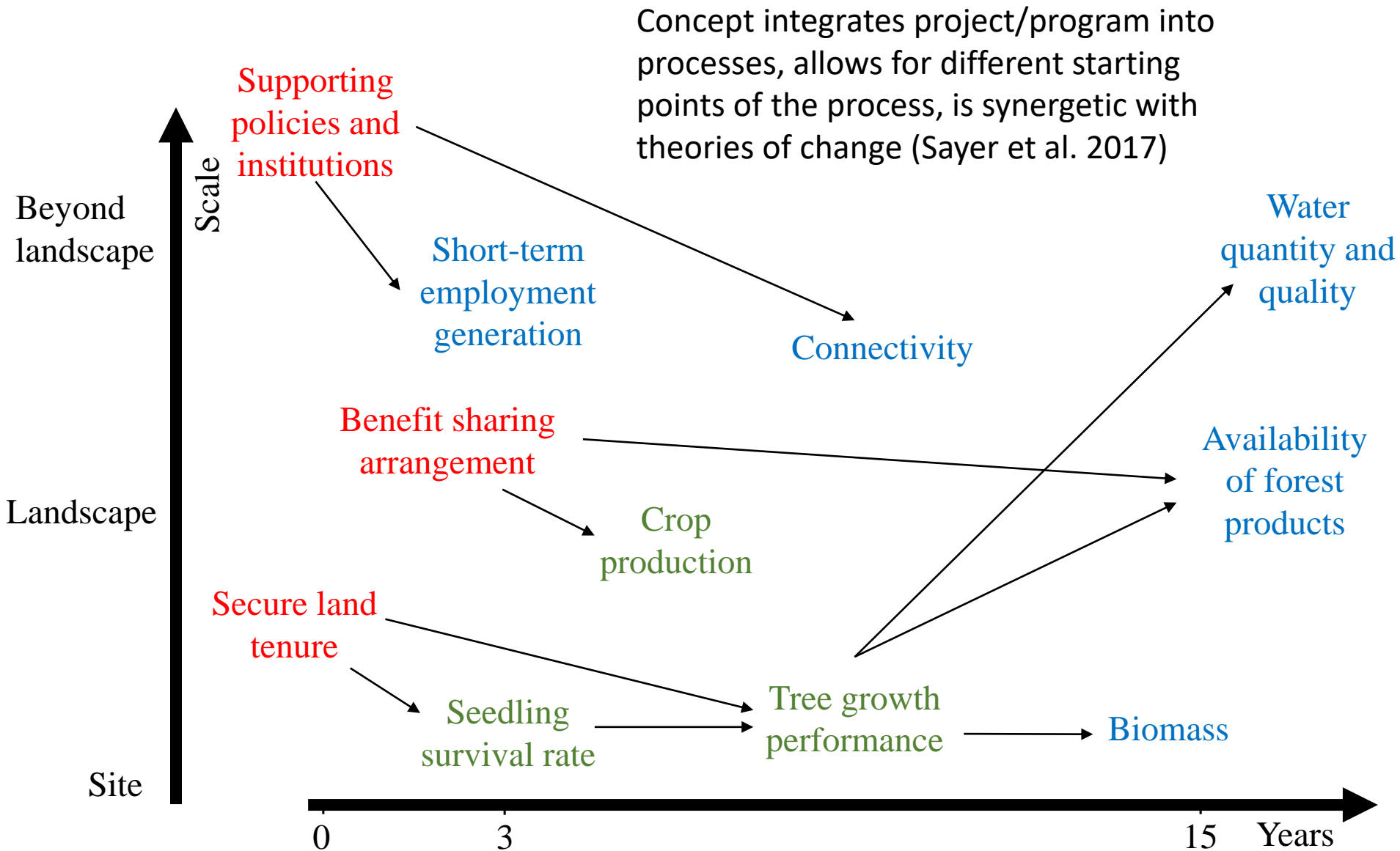
ACCOMPLISHMENTS

Measures of effort

Short-term measures of impact

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as of December 28, 2018

JUST AS AN EXAMPLE:

YEAR	% of communities with benefit sharing arrangement	% of communities implementing new technologies	% projects with road access	% of women involved in NGP	Value of products and services obtained from NGP projects	Change canopy cover
2011						
2012						
2013						
2014						
2015						
2016						
2017						
2018						

Testing the concept

Define list of leading and lagging indicators based on literature and workshops with different groups of stakeholders

Draw paths connecting leading and lagging indicators

Collect data from Regions 6, 7 and 8 in the Philippines

Validate paths with Structural Equation Models and stakeholders

Select best leading and lagging indicators

Subsets of indicators to be proposed to different groups of stakeholders

Thank you

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Topics
Energy source
House infrastructure
Road access
Water access
Household appliances
Vehicle
Forestry nursery
Soil
Trees on the landscape
Biodiversity
Biomass
Area of intervention
Land-use system
Climate
Seedling and seeds
Planting site
Community organisation
Natural resources ownership and use rights
Governance
Employment
Education
Knowledge
Health
Income
Commercial products from FLR
Subsistence products from FLR
Funding and incentives
Livelihoods
Savings
FLR intervention
External support
Policies and regulations
Institutional arrangements
Market structures
Municipality wealth
Vulnerability to natural disasters
Population trends

EXAMPLES

Topic
Indicator
Metrics

Wealth
Housing material
Scale

Road access

Type of road community-town
Categories

Distance community-town
Categories

Ease access planting site
Hours to planting site

Energy source
Use of fuelwood by community members
% of community/PO members using fuelwood

Forest restoration intervention

Intervention lifecycle
Years

Monitoring system
Frequency

Information campaign
% PO members who are aware/understand intervention

Soil

Soil organic carbon
%

Litter cover
% cover

Bedrock type
Categories