

LANDING CHANGE: TOP-DOWN POLICY- MAKING USING BOTTOM-UP SCIENCE

**Carter Brandon
Senior Fellow
World Resources Institute (WRI)**

**GLASSNET
April 8, 2016**

Four stories about what motivates change, building on good technical analysis

1. India
2. China
3. Madagascar
4. The Triple Dividends

Change: getting somebody to do something different.

But first, some priors:

In many countries, decision-making is highly centralized – through economic policies and budgets.

Given their public goods nature, environmental and climate change objectives need government action

Environmental and climate change objectives are inherently cross-sectoral – and therefore require comparative analysis and often aggregation

Who looks across sectors? Presidents/PM's; Ministries of Finance and Planning; Governors; and Mayors

1. India - pollution

In the late 1990s, we showed that the health impact of air and water pollution was greater than any disease burden other than malnutrition.

The economic losses due to pollution were over 5% of GDP.

The high-level government response:
“Who has EVER seen an economist at the table when we make decisions around here?”

Today: India has the most polluted cities in the world, overtaking China about 5 years ago.

CAUSALITY???

2. China – grow to high income status

In 2008, we produced even more dire numbers for China. Over a million people were dying a year from air pollution.

The high-level government response: “You can’t publish that.”

It challenged what the Communist Party stood for.

We did. And started convening annual conferences with China’s 100 most polluted cities.

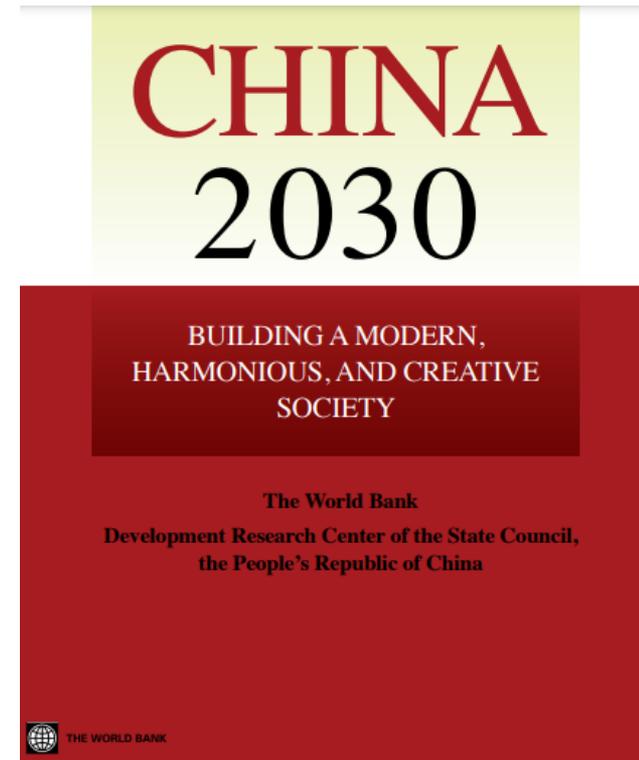
And staged theater productions of Ibsen’s **Enemy of the People**

China – grow to high income status

In 2012, the World Bank, working with the think tank to the national cabinet, agreed on five requirements for China to grow to high income status:

- Financial reforms
- Social reforms
- Green growth
- Innovation Policies
- Relations with the rest of the world

This put environmental issues in a different context.



Environmental and Natural Resource Degradation and Depletion as % of Gross National Income

10.0%
9.0%

China's Prime Minister announced *"A war against pollution, equal to the war against poverty"* (2014).

6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%

China

India

Brazil

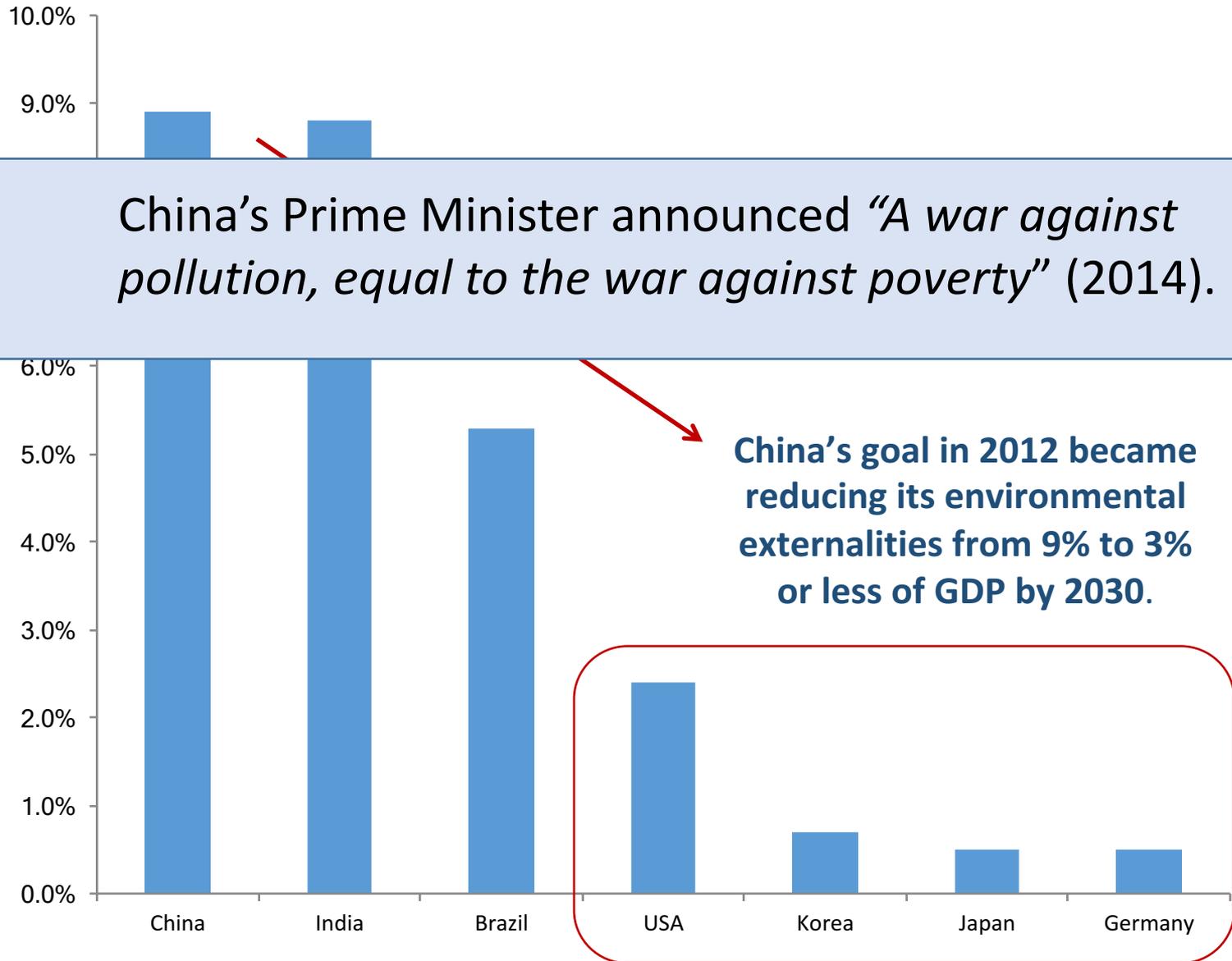
USA

Korea

Japan

Germany

China's goal in 2012 became reducing its environmental externalities from 9% to 3% or less of GDP by 2030.



3. Madagascar – the IMF wants to know:

Does the country understand its “macro-critical” climate risks, and are they being managed?

The IMF has access to government officials in the Ministry of Finance and Central Bank that others dream of.

The environment and climate communities need to speak their language in terms of:

- Fiscal imbalances
- Trade imbalances
- Financial sector vulnerability
- Budgeting and PFM (public financial management)
- Debt sustainability

But they say: “Just give us the numbers...”

What is the economic impact of climate change?

What are the strategies to address climate risks?
-- divided into risk reduction and risk management

What is the cost of those priorities?

What are the benefits of implementing those priorities?

All measured in terms of macroeconomic variables.

Just give us the numbers

Madagascar faces a "poverty - environment - climate change trap"

- High poverty
- Heavily degraded natural resources (land, forests, water), upon which 80% of the population depends
- High vulnerability from degraded landscapes and worsening extreme climate events
- Reduced resilience to those events, both in situ and downstream (e.g., flooding)
- Threatened globally important biodiversity and loss of tourism
- Major governance and corruption issues in land management and deforestation

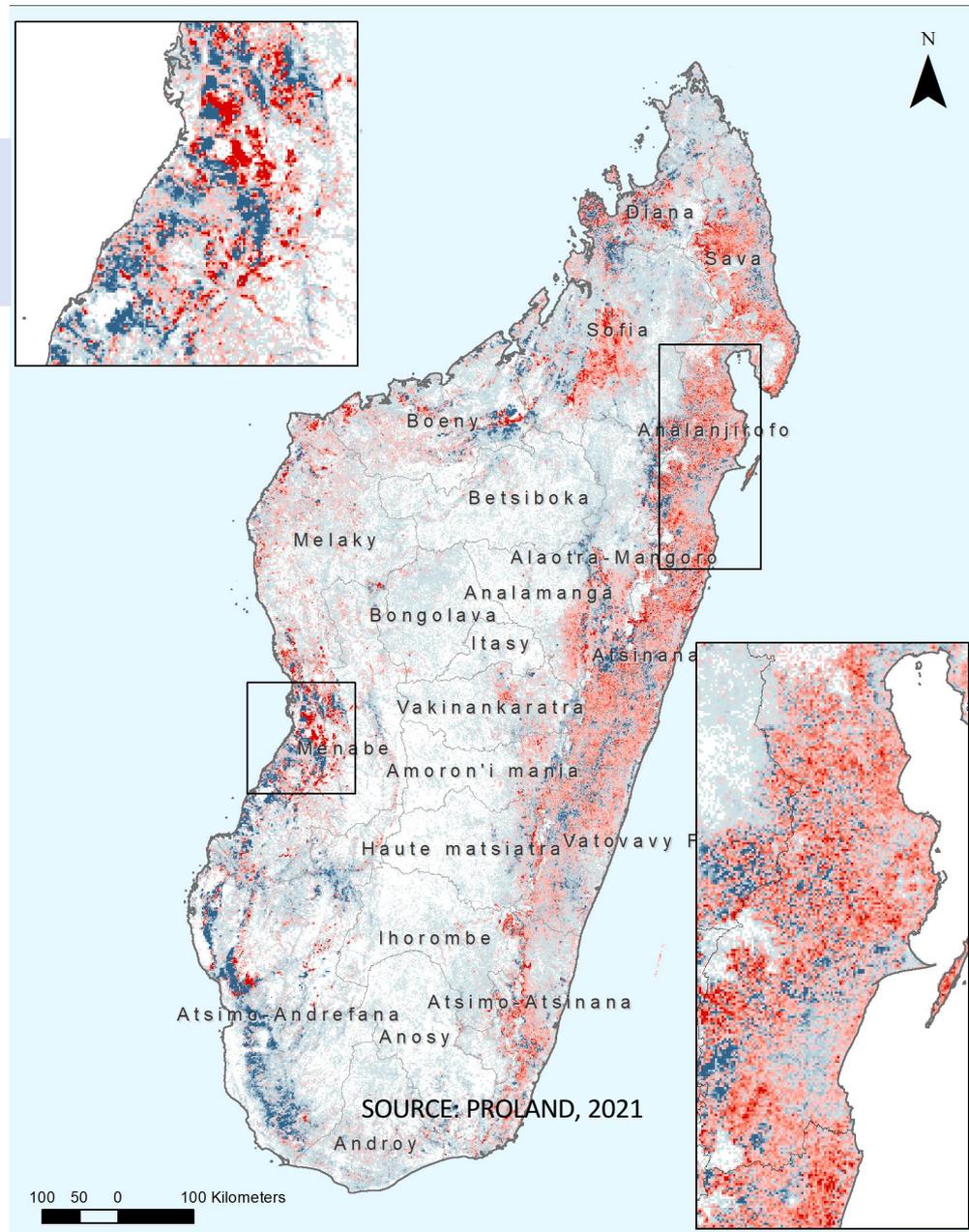
DEFORESTATION FROM 2000 TO 2020

RED shows where deforestation was higher from 2018-2020 than it was from 2001-2017.

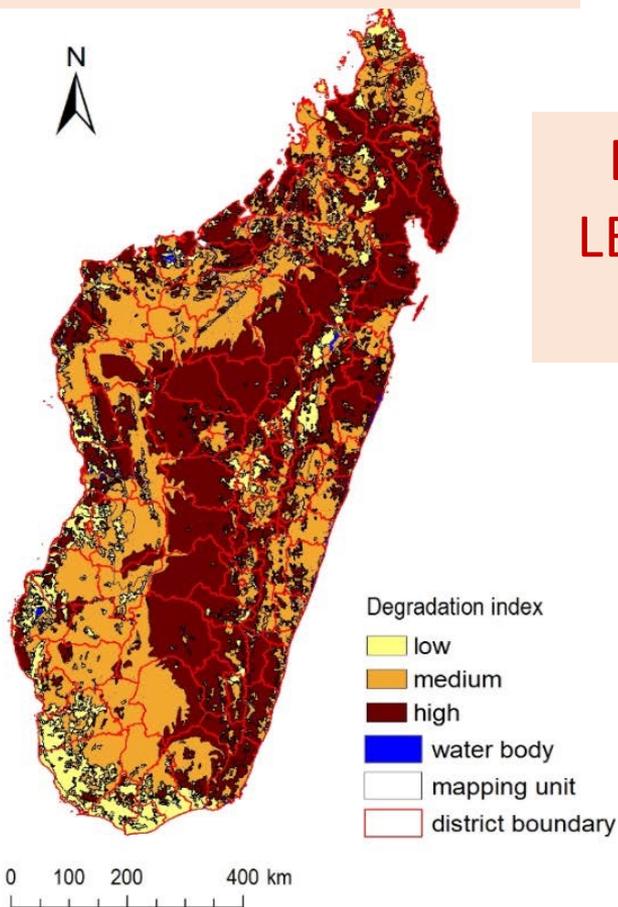
BLUE shows where deforestation was lower in the last 3 years.

TOGETHER, THEY SHOW THAT

**DEFORESTATION HAS
INCREASED DRAMATICALLY IN
THE LAST 3 YEARS**

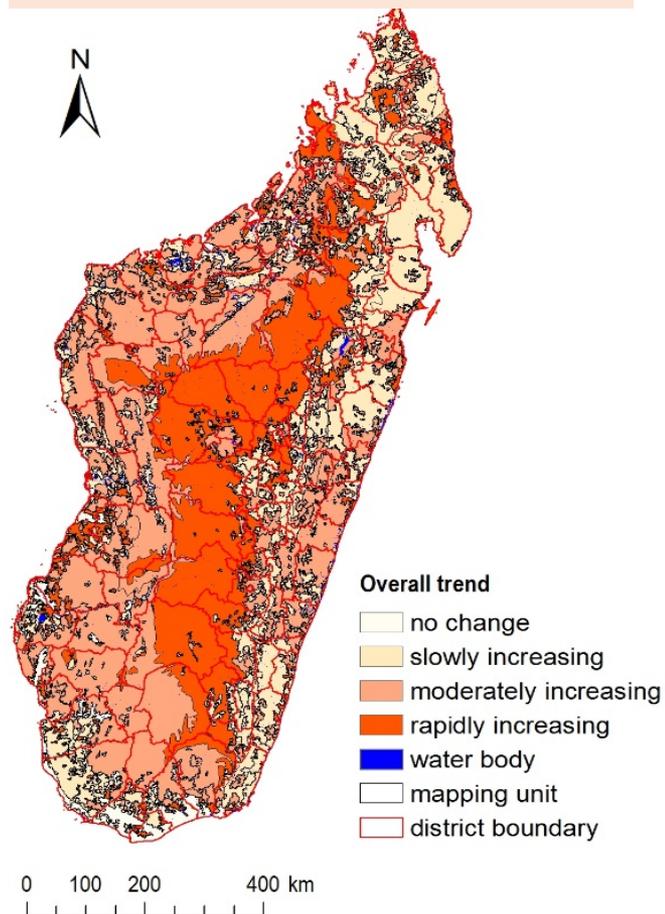


HOW BAD IS DEGRADATION?



**DEFORESTATION
LEADS TO SERIOUS
EROSION**

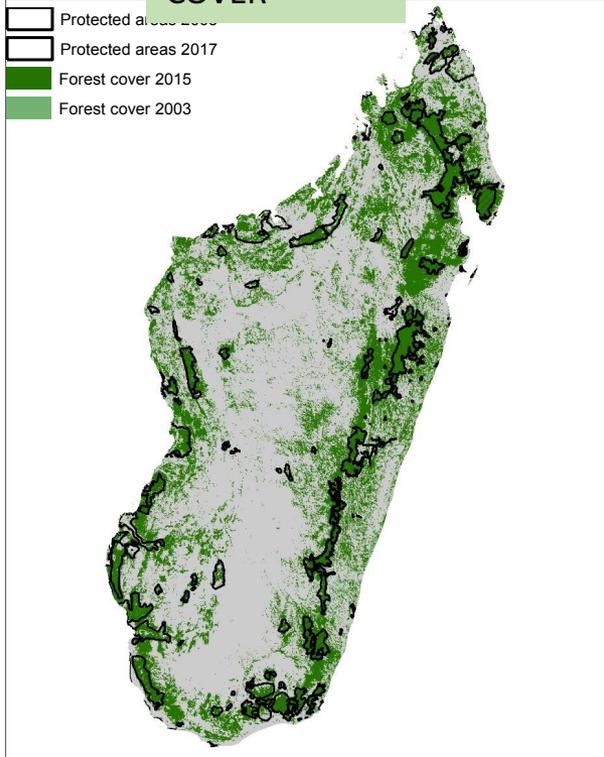
WHAT IS THE TREND?



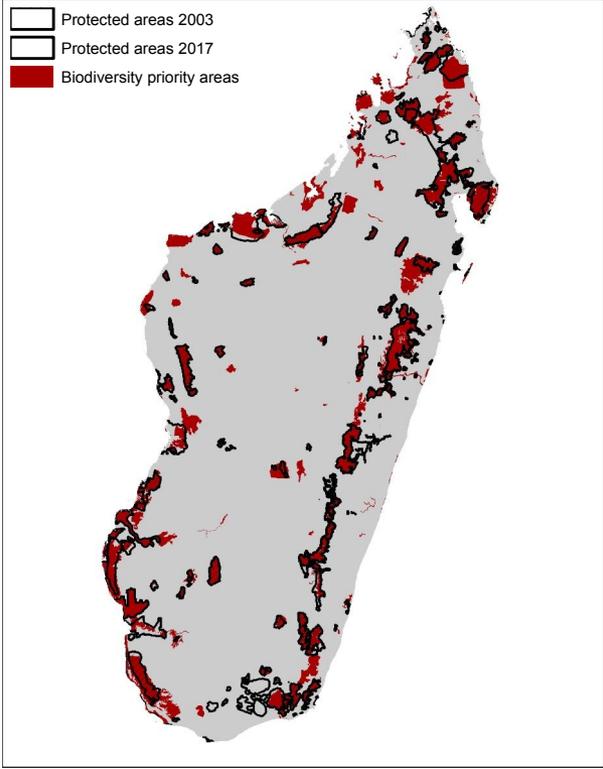
SOURCE: PROLAND, 2021

NATURAL CAPITAL OVERLAYS

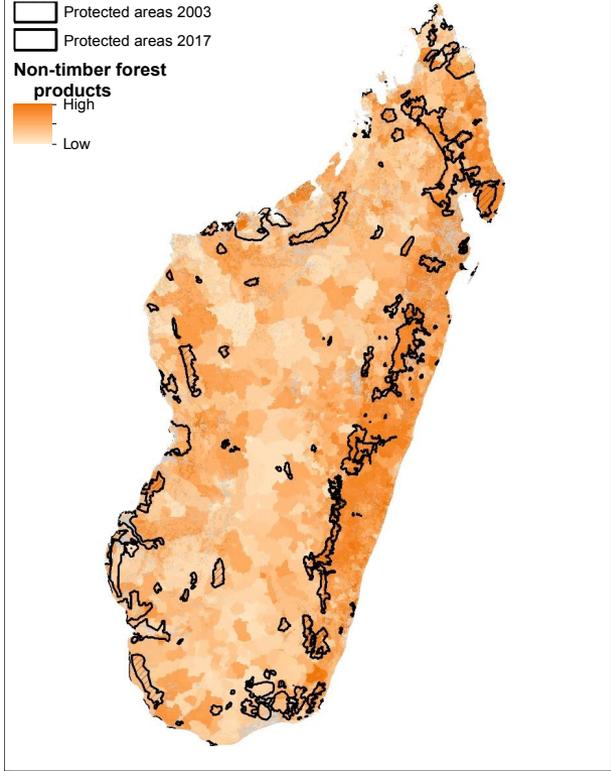
FOREST COVER



BIODIVERSITY

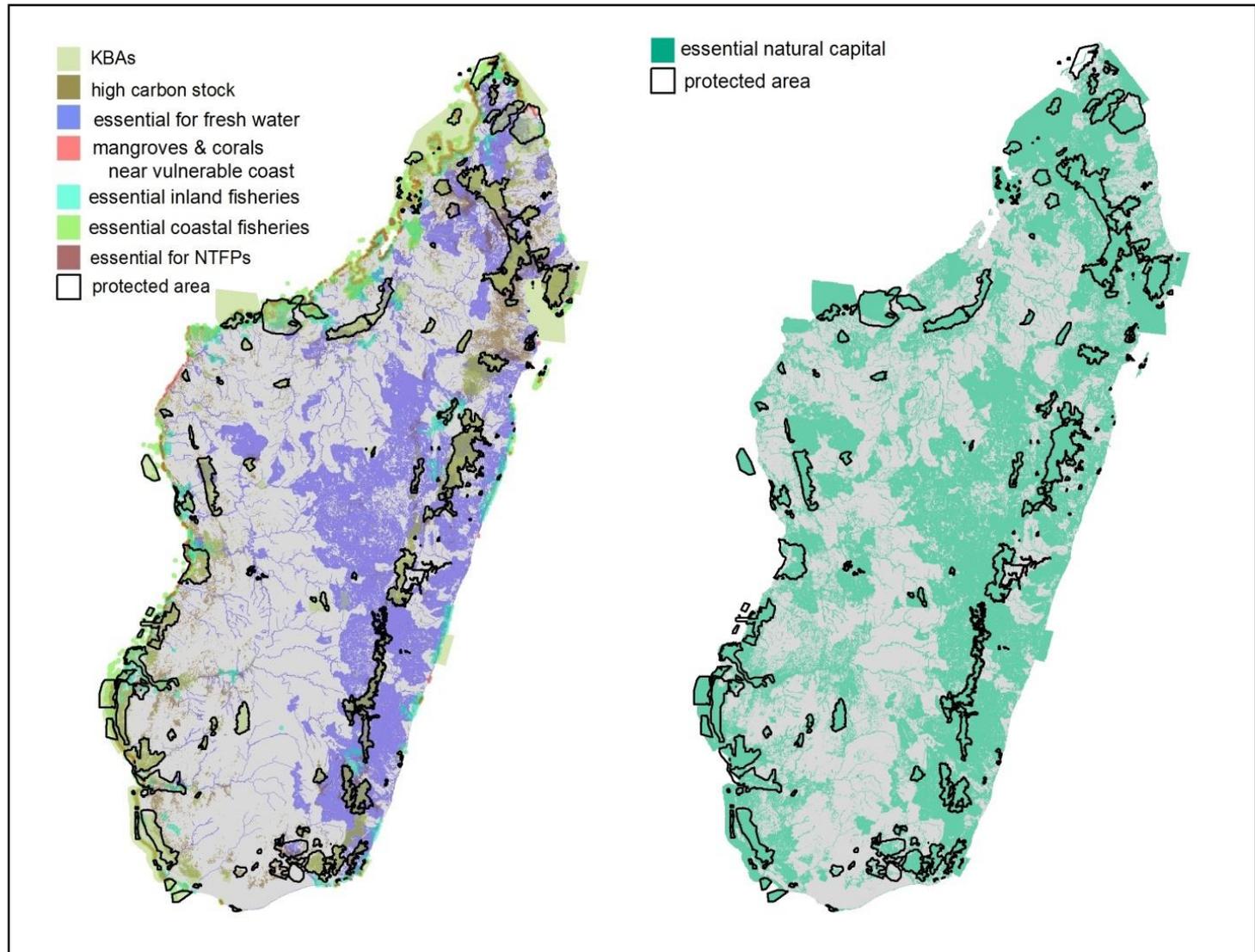


NON-TIMBER FOREST PRODUCTS



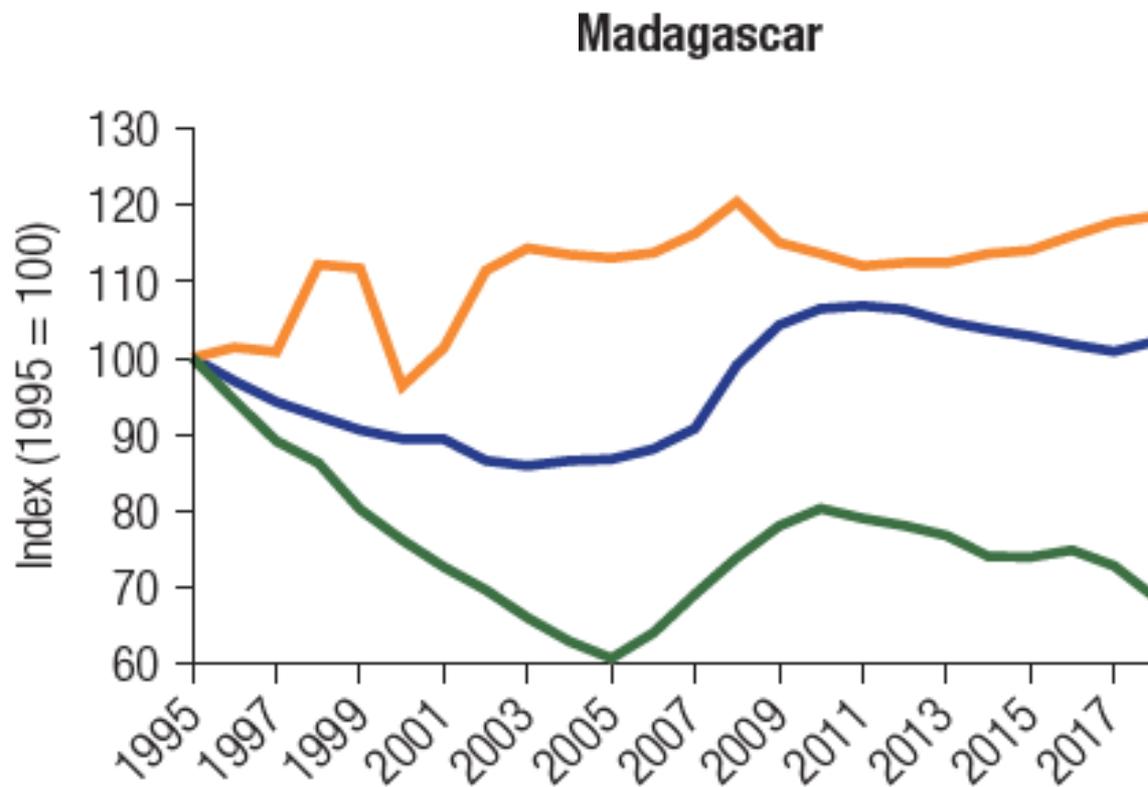
SOURCE: Neugarten et al. 2020

Overlays tell us the essential natural capital in terms of key biodiversity areas, ecosystem services (water, carbon, NTFP's, fisheries), and protected areas currently threatened



How to convert that incredible wealth of nuanced spatial analysis into the macroeconomic variables?

Annual Indexed Per Capita Wealth, 1995-2018



— Produced capital per capita — Human capital per capita — Renewable natural capital per capita

Source: The Changing Wealth of Nations, World Bank, 2021

The fiscal elements of a strategy to protect and restore Madagascar's natural capital:

- a. Manage existing forest areas, spanning both formally protected areas and areas under community management
- b. Restore degraded forest areas
- c. Restore degraded agricultural land
- d. Create new terrestrial protected areas
- e. Create new marine protected areas.

Combined with lots of non-fiscal policy measures:

- f. Spatial landscape planning to support better measurement of the returns on ecosystem protection and/or restoration investments;
- g. Strengthened laws and enforcement of environmental crimes, especially as involve illegal slash and burn agriculture;
- h. Land tenure security, to better incentivize agricultural intensification in situ, to reduce clearing of marginal lands and forests;
- i. Policies for payment for ecosystem services (PES) schemes to funnel financial benefits from downstream beneficiaries to upstream watershed custodians;
- j. Energy action plans to reduce household dependence on woodfuels and charcoal, which is a strong driver of deforestation in marginal lands;
- k. National tourism planning and regulations that promote development while protecting wildlife and coastal resources;
- l. Scaled up environmental education and training of local populations.

The costs and benefits of restoring Madagascar's natural capital

The estimated ten-year cost to 2030: \$2.1 – 9.7 billion (*)

Benefits = the value of natural capital lost since 2010

The ratio is a high range of benefit-costs: 1.4 to 6.6

Putting nature's value in a macro framework deflected details about how benefits may specifically benefit each sector (forestry, water, agriculture, energy, and tourism).

Discussions turn to the "how" (financing) not just the "what".

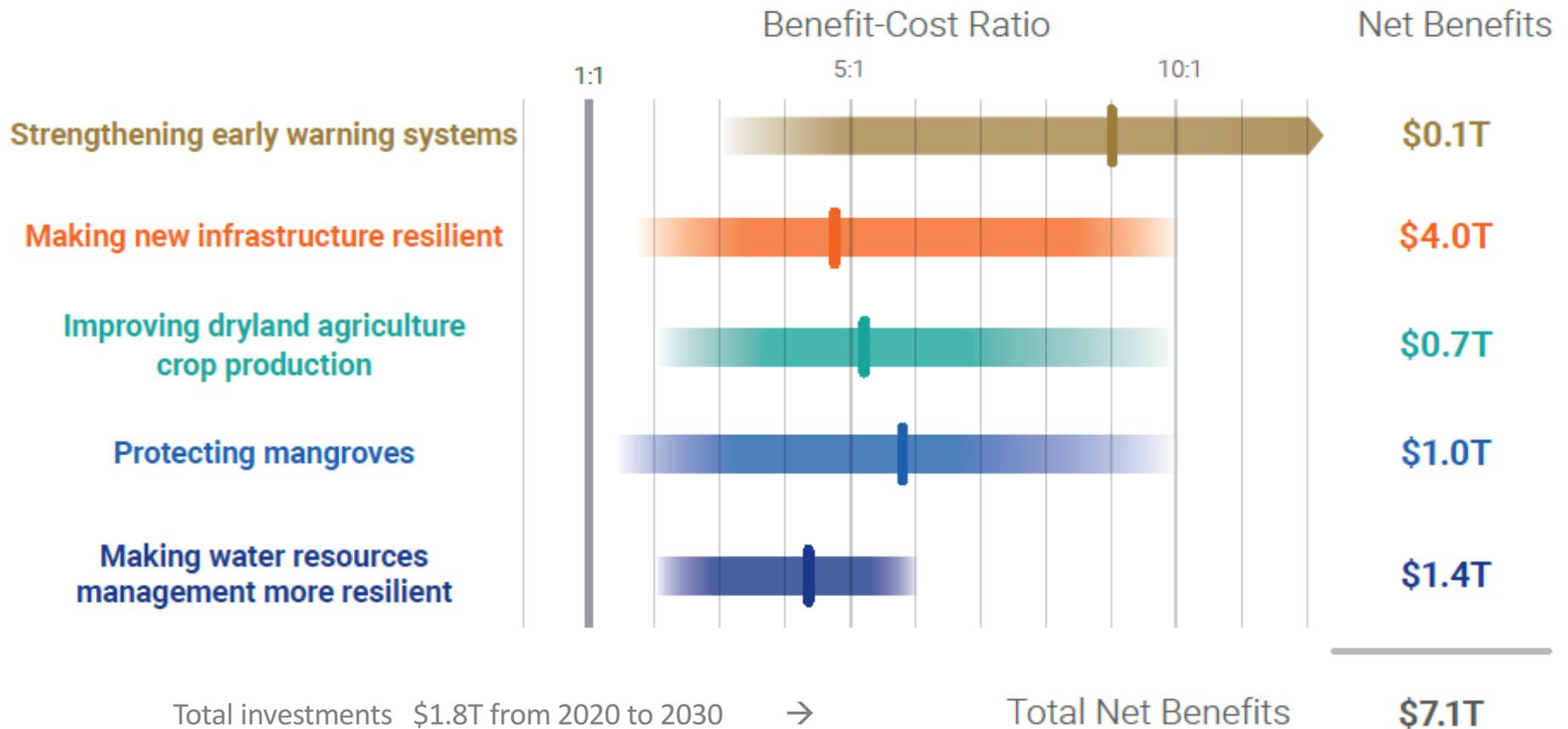
(*) Based on extensive literature review on land management and restoration.

4. The Triple Dividends – estimating the full economic return on adaptation investments

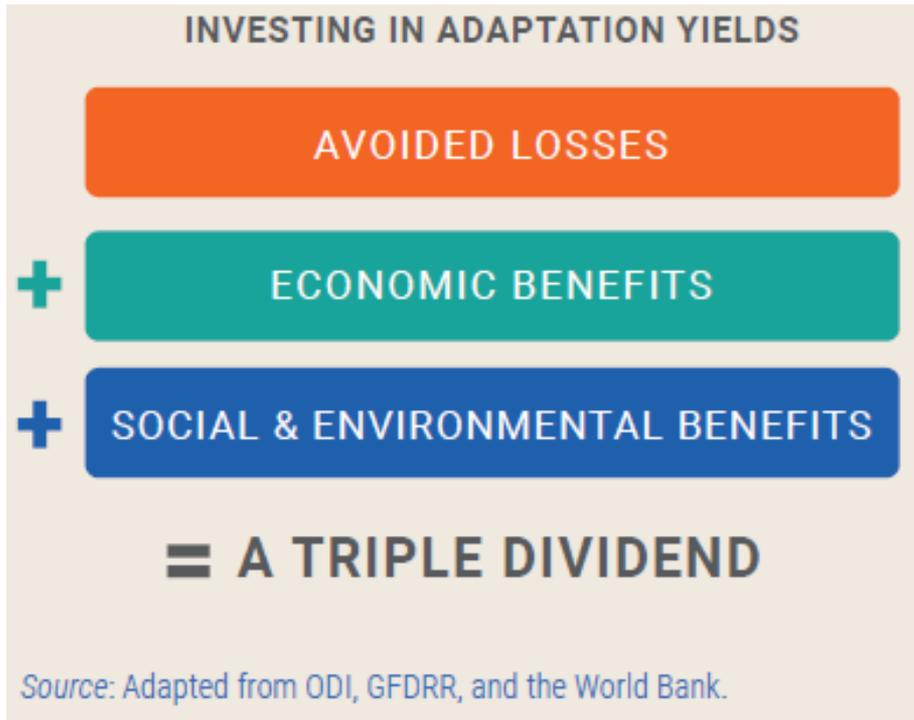
There is under-investment in climate change adaptation, partly because of under-valuation of benefits.

This is particularly true in the case of nature-based solutions – including water provision, water quality, flood control, coastal protection, and urban heat.

Benefits and Costs of Illustrative Investments in Adaptation



Climate adaptation offers a triple dividend



Saving lives and avoiding economic losses

Induced development benefits due to reduced risk

Additional on-market benefits

Estimating the full return on adaptation investments

Category	Forests and wildfires	Urban flooding and drainage	Storm-water management	Coastal flooding	Urban heat islands (two US cities in one study)		Drought
	Tahoe National Forest, USA	Kunshan, China	Princes Park, Australia	Felixstowe, UK	Washington DC, USA	Philadelphia, USA	Ningxia, China
Benefit-cost ratio: first dividend only	4.5	5.7	0.6	15.1	3.7	2.0	0.06
Benefit-cost ratio: second and third dividends only	1.2	43.8	1.3	16.7	1.8	2.5	5.6
Benefit-cost ratio: all three dividends	5.7	49.5	1.9	31.8	5.5	4.5	5.6

The Triple Dividends – estimating the full economic return on adaptation investments

The best message isn't that the second and third dividends are significant.

It's that significant benefits accrue regardless of whether the climate risk materializes.

Motivating change -- Four takeaways

1. We need to understand THEIR context, their objectives, their knowledge, their partners, their resources. (India)

They have a revolving door as soon as we walk out – from different sectors, agencies, regions, political interests, the private sector...

Four takeaways:

2. Bench-marking is powerful (China).

Indices work – they invite questions

They also offer easy messaging, but best with
“Find-a-friend” (good analytical pairings)

Four takeaways:

3. National scale decision-making is the sweet spot for many decisions, reforms, allocations... leading to a lot of national-local-national. (Madagascar)

Four takeaways:

4. For almost everything we do, there's a missing institutional middle. (Madagascar and Triple Dividends)

There are traditional sectoral skills (silos), and traditional management skills (finance). But few multi-disciplinary, comparative, aggregative skills.

Capacity-building in universities and in governments is key.

WE ALL have a hard time aggregating across complexity and uncertainty. How are most governments going to do it?

Four take-aways

1. If you want somebody to do something differently, know who that somebody is
2. Bench-marking is powerful
3. The national level is the sweet spot for change in most countries
4. Look out for the missing institutional middle – the missing mindset and capacity to analyze, aggregate, and prioritize

Annex – the institutional complexity of climate change

A Framework for Climate Impacts and Responses (1)

Physical climate risks	Impact on the economy and on human welfare	Economic sectors	Responsible Agencies
Higher air temperatures			
Higher ocean water temperatures			
Sea level rise			
More intensive storms			
Changing rainfall patterns			

A Framework for Climate Impacts and Responses (2)

Physical climate risks	Impact on the economy and on human welfare	Economic sectors	Responsible Agencies
Higher air temperatures	Diseases spreading, heat stress, reduced agricultural yields		
Higher ocean water temperatures	Coral reef die-off; changes in fisheries productivity		
Sea level rise	Coastal flooding; coastal degradation		
More intensive storms	Flooding, asset damage, income loss, reduced nutrition		
Changing rainfall patterns	Changing ecosystems and land use (often loss of forests and agriculture land); reduced yields; change in freshwater reserves		

A Framework for Climate Impacts and Responses (3)

Physical climate risks	Impact on the economy and on human welfare	Economic sectors	Responsible Agencies
Higher air temperatures	Diseases spreading, heat stress, reduced agricultural yields and changing cropping patterns	Health; construction; infrastructure; agriculture; water	
Higher ocean water temperatures	Coral reef die-off; changes in fisheries productivity	Fisheries, coastal communities; tourism	
Sea level rise	Coastal flooding	Coastal communities, cities, infrastructure, disaster risk management	
More intensive storms	Flooding, asset damage, income loss, reduced nutrition	Agriculture, cities, infrastructure, disaster risk management, tourism	
Changing rainfall patterns	Changing ecosystems and land use (often loss of forests and agriculture land); reduced yields; change in freshwater reserves	Agriculture; land use; forestry; nutrition; infrastructure (e.g., water, hydro, transport, cities); social safety nets	

A Framework for Climate Impacts and Responses (4)

Physical climate risks	Impact on the economy and on human welfare	Economic sectors	Responsible Agencies
Higher air temperatures	Diseases spreading, heat stress, reduced agricultural yields	Health; construction; infrastructure; agriculture; water	<p><u>Global, Federal, State and Local agencies are all involved:</u></p> <ul style="list-style-type: none"> Planning Finance Agriculture, Livestock, Fisheries Energy Transport Water Supply, Sanitation Environment Forestry and Parks Health Education Urban Development Commerce and Tourism National Meteorological Agency (NOAA in the US)
Higher ocean water temperatures	Coral reef die-off; changes in fisheries productivity	Fisheries, coastal communities; tourism	
Sea level rise	Coastal flooding	Coastal communities, cities, infrastructure, disaster risk management	
More intensive storms	Flooding, asset damage, income loss, reduced nutrition	Agriculture, cities, infrastructure, disaster risk management, tourism	
Changing rainfall patterns	Changing ecosystems and land use (often loss of forests and agriculture land); reduced yields; change in freshwater reserves	Agriculture: land use; forestry, nutrition; infrastructure (e.g., water, hydro, transport, cities); social safety nets	

High complexity both ways...
between risks and agencies,
and agencies and risks

