

## **Summary of Cluster Group Meeting Water in the Landscape, SIWI, 2017-10-06**

The SIWI/SWH coordinator of the Cluster Group, Anna Tengberg, opened the meeting and presented the workplan of the network and expected outputs. The workplan includes five thematic meetings on various aspects of water and landscape management that will lead to the development of a popular science report and a policy brief. Other potential outputs include Sida proposals on e.g. International Training Programmes (ITP), information on website, social media, a scientific article, and an event at the next World Water Week. The introduction was followed by three keynote speeches:

### **Lars Laestadius, SLU - Forest and Landscape Restoration: The new REDD**

Restoration is necessary, the question is how and where to do it, and at what scale. An example from Niger highlighted the importance of changes to governance and that restoration can improve livelihoods, provide food, and affect security issues. Another example from Costa Rica demonstrated the role of payment for ecosystem services schemes and introduction of an ecosystem service fee for stopping expansion of harmful land use, in this case cattle ranching. Restoration has also been conducted in Southern Sweden, involving agroforestry where the trees keep nitrogen in the soil, which can decrease the use of fertilizers, which in turn can change agricultural management. Restoration can change the landscape and we need to see the opportunities in a positive way and the potential of what we can do together. Restoration is when one generation leaves the landscape in a better shape to the next generation. Restoration takes decades and there are no such thing as perfect projects, only the need to manage adaptively.

In terms of policy frameworks for restoration, the REDD policy is too weak. By increasing forest in some areas, the decrease of forest in other areas can be balanced out (as for example logging in Brazil). We can create political coalitions and alliances of states in green zones. There are many different forms of restoration and overlapping approaches, such as sustainable land management, ecological restoration, forest landscape restoration, integrated land management, etc. However, the guiding principles of Forest and Landscape restoration entail the following:

- Adapt to context
- Involve all stakeholders
- Allow for multiple benefits
- Learn as you go
- Restore eco-functionality
- Focus on landscapes
- Avoid interfering with natural grasslands
- Create a mosaic type of restoration (which might be difficult/challenging from administrative perspective).

Most of the restorations follows the mosaic method (74%) as there are people living in most landscapes.

There are ambitious targets for land under restoration, such as the Bonn challenge: 150 million ha under restoration by 2020. It was followed by the New York declaration with a goal of 350 million ha under restoration by 2030. These are voluntary commitments and by 2017, there are 156 ha committed to restoration (i.e. statements of political engagement), mostly by countries from the South that are so far leading the process. There should be more countries committing from the North as well. However, the question is how to move from commitment to action. Every country need to think about this, as contexts vary, and there is a need to find context specific solutions.

Question: How do you see food and agriculture in landscape restoration? Land can be used for several purposes at the same time that do not need to contradict and be in competition with each other. We need to find ways to bring them together.

### **Kevin Bishop, SLU - Need for capacity building in hydrology**

It is very hard to know how and where water is moving, but it is really important as it differs in different contexts. Forests + Flow regime = complexity. Hydrology is fundamental for restoration of productive landscapes.

An example: If you pour water over a flower, how will it move? Where will it go? Some of the water will go to the soil, roots of the plant, but the roots will eventually die, what happens then? We build dams to control the water, but we need to understand the way of the water to avoid making mistakes.

Hydrological cycles can be different, depending on what components are considered, such as people, industries, agriculture, etc. A lot of times those aspects are not included when the hydrological cycle is described. We need to understand that, to understand the watershed balance and where the water comes from. And the question is, where does the water actually come from, as water knows no boundaries. For example, rainforest loss in one country/area can decrease rainfall in other regions (Line Gordon at SRC does research on this).

Evapotranspiration is a very important component. In Sweden we have calculations and data on runoff and water flows, but not everyone has that (for example not Finland). There are different systems to measure those things, for example, in Ethiopia they have standard automated rain gauges, which can improve local weather predictions.

In conclusion, more resources are needed to improve the basic understanding of how water moves in landscapes. More capacity in the field is required as well as more trained hydrologists, especially in the South.

### **Jennie Barron, SLU – The hydrological challenges in the landscape, with a focus on Africa**

Big and rapid changes in how we use water are taking place due to:

- Climate
- Changing diets and increased population.

There is a need to regulate and manage our use of water much more than we are doing today, especially when it comes to agriculture. Water management is critical for tipping points and a threat to people's wellbeing in several places. The climate is changing, for example in Africa there is an increase or decrease in rainfall in many places, and changes in seasons.

People will eat more and different food due to increased wealth. People want to eat more nutritious food, which is often more water demanding, and therefore we need improved management of water, between food (nutrition) security and other purposes, including environmental. More nutritious food requires more water, which also includes fodder, fiber and other biomass. A lot of investments are needed in infrastructure for water use in sustained /increased agriculture.

There is a need for supplementary irrigation or dry-season irrigation in agriculture, but also for ways how to handle too much water and flooding (especially in urban areas). Areas that are cultivated are cultivated more intensively, and provide higher yields per ha (as in South Asia). We need to meet the agricultural water demand, to be able to intensify sustainably especially in Africa. For example, small scale dams that are decentralized, provide better opportunities for irrigation (based on an example from Burkina Faso) and can have little impact on downstream flows. However, there is a lack of data on water flows in productive landscapes. Data on existing irrigation is also very poor and need to be improved. How do we invest in storage of water? We need to make data/information available and undertake analysis of needs.

### **Elin Weyler, SIWI/SWH – The cluster group on food and water**

The cluster group on water and food included a private partnership, working with different companies. They look at certifications and systems used by food companies, and how water is included. It is very difficult and complex to know what works and not. Therefore, on demand from the participants in the cluster group, they are now screening different tools. The group has developed a website - the Water journey, which is based on a stewardship and multi-stakeholder approach. What issues do the certifications pick up on, for example biodiversity, soil etc.? The screening has come down to two different useful tools/standards: SAI FSA and GLOBALG.A.P. Although they still need to develop the water aspect. It is always a challenge when working with self-assessment. Farmers are spending a lot of time on audits and paperwork and there is a need to improve the systems, both for small-scale and large-scale farmers.

The project included different crops and value chains: avocado in South Africa, rice in Cambodia, wine in Portugal, black pepper in India, and asparagus in Peru. A lesson was that not all producers have a background in farming, but rather are entrepreneurs or have a background in business. Some observations to date: Certifications are a lot of times just boxes to tick off, but this is easy for companies to use. Certifications are often used as a "magic bullet", but there is a tiredness of certifications from producers.

Can this cluster group take some inspiration from the food group regarding involvement and collaboration with the private sector, as we want to include them more?

## Discussion

Key points from the discussion include:

### Integration of water in landscape approaches

- **Forest versus agriculture** - is there a conflict? Not necessarily, just different entry points. Shift from watershed focus to nexus - need to understand different perspectives. And in most degraded landscapes with people, one cannot exclude agriculture and water demand
- **Context specific challenges** - most of the time water is not the primary focus but rather forestry or agriculture. Which approach or perspective should we use? Water is often the most pressing issue and a connecting issue. Suggestion to have an overarching, but context specific, problem formulation as starting point and then structure problems into different groups.
- **Competition for water** - see the landscape as the system boundary and that activities upstream affect water flows/access downstream. There are multiple links between for example water and gender and the effects are also integrated. The challenge is to make people aware that water is a manageable resource - you need to manage it and be aware of its importance.
- **Multifunctional and productive landscapes** are the goal, and sustainable water management is the means to achieve that. Water is a means to an end, as the goal is to feed people and/or ensure that people have access to safe drinking water. Put the problem as the actual starting point and then see how water is necessary to solve the problem. Look at the whole picture through for example a Theory of Change to see how governance, water and other issues are linked. Find ways to value water and see the relevance of it.

### Governance

- **Need to focus on governance** from a water perspective and to get forest and land owners interested in the way water moves, and to see the complexity and the whole landscape. There is a toolbox available for this to increase stakeholder engagement. Processes in Sweden could perhaps contribute to other contexts in terms of capacity building/resources, and building of bridges between academia and practitioners.
- **Governance strategies** to find ways to support “good” transformations should be inclusive. The risk is that water is not given top priority when it comes to landscape approaches. Governance many times mean control, but should provide support and incentives to focus on good factors to improve the situation. But positive incentives for stakeholders or management are not always well understood. Governance is cooperation and conflict. Water is one of the things that connect upstream and downstream activities and links goods and ecosystem services. Water is the key to make the connection, and it can also be connected to conflict and security, and transboundary conflict management.
- **Need to include the people who own the question**, such as LRF, Jordbruksverket (Swedish Board of Agriculture), Länsstyrelser (County Administrative board). Also companies, such as forest companies Stora Enso and Sveaskog should be encouraged to join the cluster group.

Capacity building

- **Educational systems** - do we have the capacity to educate in adaptive management, both for countries in the North and the South? We need to include not only technical expertise, but also tools for behavioral change and social aspects that are closely linked to landscape restoration.
- **There is a lot to learn from countries in the South**, where water issues and especially the lack of water has been given more attention than in Sweden. Working in Africa, the access as well as the need to conserve water. The situation may not be the same in Sweden, as water is considered more at a policy level here. We should focus more on authorities where the main focus is water, rather than where forest is the main focus. There is a need to create more local incentives so communities and local people maintain, for example, local dams, which is a more long-term and sustainable approach.
- **“A guide to the Restoration Opportunities Assessment Methodology (ROAM)”** - published by WRI and IUCN where the focus is on forests, and water is not included. There is a need to write something similar, but with the main focus on water.

**Conclusions - moderated by Anders Malmer, SLU, Global**

- Can this cluster group contribute to the Bonn challenge - with a focus on water as contribution to good restoration of landscapes? We should try to show how different parts of the landscape are linked - forests, agriculture land, water - and connect the dots.
- What mix of people should we have at our meetings? Today there are many with background in forestry and academia, invite more practitioners and private sector participants. Are there any case studies we could bring in from the industry? Any case studies on climate change and changes over a long time? For example TNC's examples of water funds for restoration, Skogsstyrelsen's Model Forest initiatives, etc.?
- As the lack of data has been discussed, maybe the group should pick that up? The need for better data, could that be included in all themes we will discuss?
- Include governance as a theme. Try to include practical examples and case studies. Prioritize private sector.

The next meeting will be held the first week of December and SIWI/SWH will send out information about the exact date as soon as possible.

# Klustergruppen Vatten i Landskapet - Verksamhetsplan

Anna Tengberg

SIWI



# Program

9.30-9.45	Välkommen – presentation av verksamhetsplan för klustergruppen "vatten i landskapet"	Anna Tengberg, SIWI SWH
9.45-11.00	Key Notes:	
	Vad är landskapsrestaurering?	Lars Laestadius, SLU
	Avrinningsbildning, ytvattenflöden och grundvattenflöden	Kevin Bishop, SLU
	Vilka är de hydrologiska utmaningarna i landskapet?	Jennie Barron, SLU & CGIAR – Water, Land & Ecosystems
11.00-11.15	Kaffe	
11.15-11.30	Kort presentation från SIWIs Klustergrupp "vatten och livsmedel"	Elin Weyler, SIWI
11.30-12.00	Gruppdiskussioner	
12.00-12.30	Presentation av gruppdiskussioner	Moderator, Anders Malmer, SLU Global
12.30-12.45	Sammanfattning, kommentarer på verksamhetsplanen, nästa möte	Anna Tengberg, SIWI



## Swedish Water House

Connects Swedish water stakeholders from different sectors with each other and with international processes and discussions. It provides meeting places for innovative thinking on emerging issues, knowledge dissemination and multidisciplinary policy development concerning the global water situation.

## From Water and Forest to Water and Landscapes

A photograph of a savanna landscape. In the foreground, there is a field of tall, golden-brown grass. Several acacia trees with flat, umbrella-like canopies are scattered across the middle ground. In the background, there are rolling hills or mountains under a clear, light blue sky. The overall scene is bright and open.

# Vatten i Landskapet

## Syfte

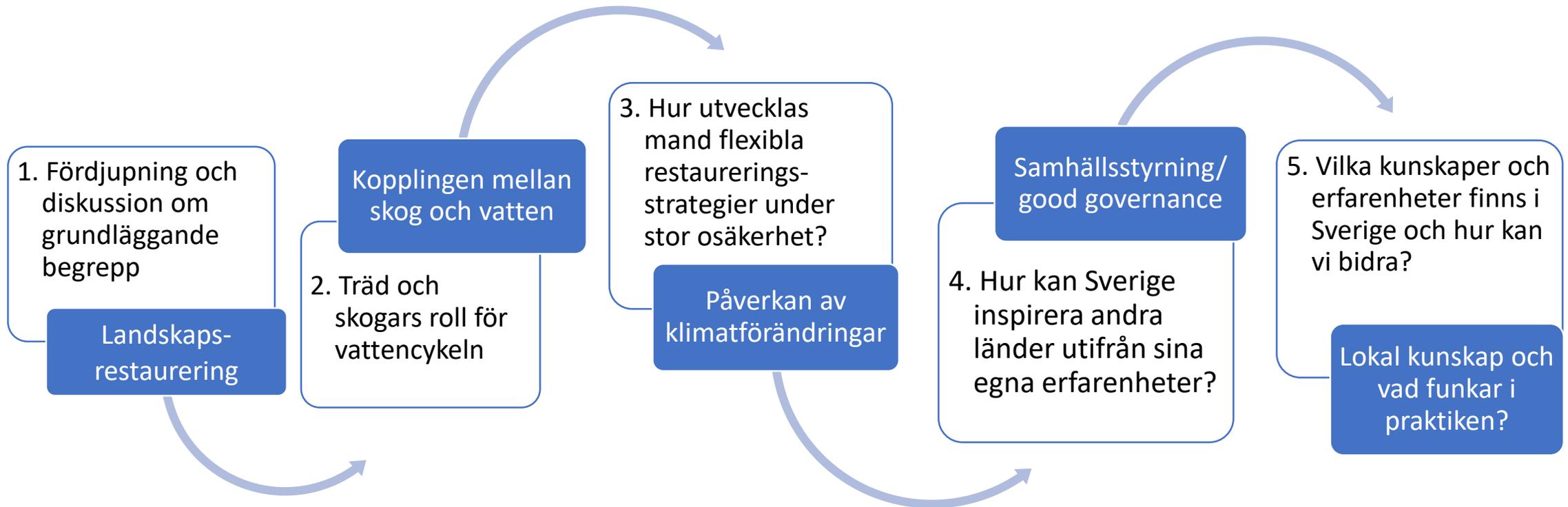
Arbetet syftar till att stärka svenska aktörers förståelse för och kompetens i hydrologiska aspekter av landskapsrestaurering, så att Sverige mer effektivt kan bidra till att uppfylla målsättningarna i Sveriges politik för global utveckling (PGU), Agenda 2030 och internationella restaureringsinitiativ

A photograph of a savanna landscape. In the foreground, there is a field of tall, dry, yellowish-brown grass. Several acacia trees with flat, umbrella-shaped canopies are scattered across the middle ground. In the background, there are rolling hills or mountains under a clear, light blue sky. The overall scene is bright and open.

# Sustainable use of water for productive and multifunctional landscapes

- To promote water in the international conversation on landscape approaches and restoration
- Strengthening / expanding Swedish and International networks on water-related natural resource management

# Temat hösten 2017/våren 2018



Okt-17

Nov-17

Feb-17

Mar-17

Apr-17

# Slutprodukt/output

- En pedagogisk och attraktiv rapport ska produceras som riktar sig till svenska och internationella restaureringsinitiativ.
- Kunskapen ska också användas och förmedlas till berörd lokalbefolkning, t.ex. genom ett SIDA International Training Program (ITP) eller andra utbildningsinsatser/online material.
- Relaterade produkter
  - Policy brief
  - Websida
  - Social media?
  - Vetenskaplig artikel?
- Seminarie/event vid World Water Week som har temat Water, Ecosystems and Human Development?

# Tidplan



# Questions for discussion



- How can water be better integrated into landscape restoration concepts and initiatives?
- What are the top hydrological challenges and what are the most important water-related ecosystem services in the landscape?
- How can these ecosystem services be enhanced?

# Water in the Landscape

@ swedishwaterhouse.se

*Tack!*



# Forest and Landscape Restoration: What is it?

**Lars Laestadius**  
**Swedish University of  
Agricultural Sciences**  
**6 October 2017**  
**[lars.laestadius@slu.se](mailto:lars.laestadius@slu.se)**



Restoration is necessary





But where and how?



# NIGER (ZINDER PROVINCE)

Before: Pre-1990s



After: Today

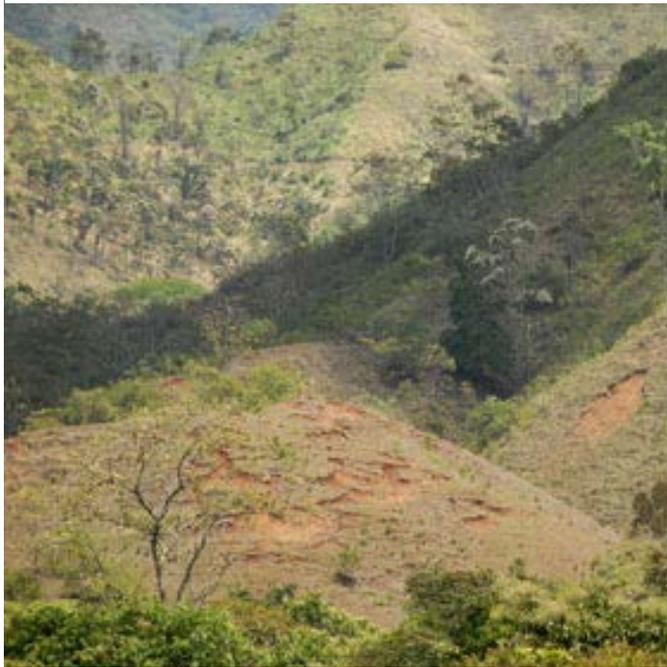


Source:  
WRI



# COSTA RICA

Before: 1969



Source:  
WRI



# COSTA RICA

Before: 1969



After: 2010



Source:  
WRI

# NEPAL

Before: 1975



After: Present



Source:  
WRI



# SOUTHERN SWEDEN

Before: 1880s

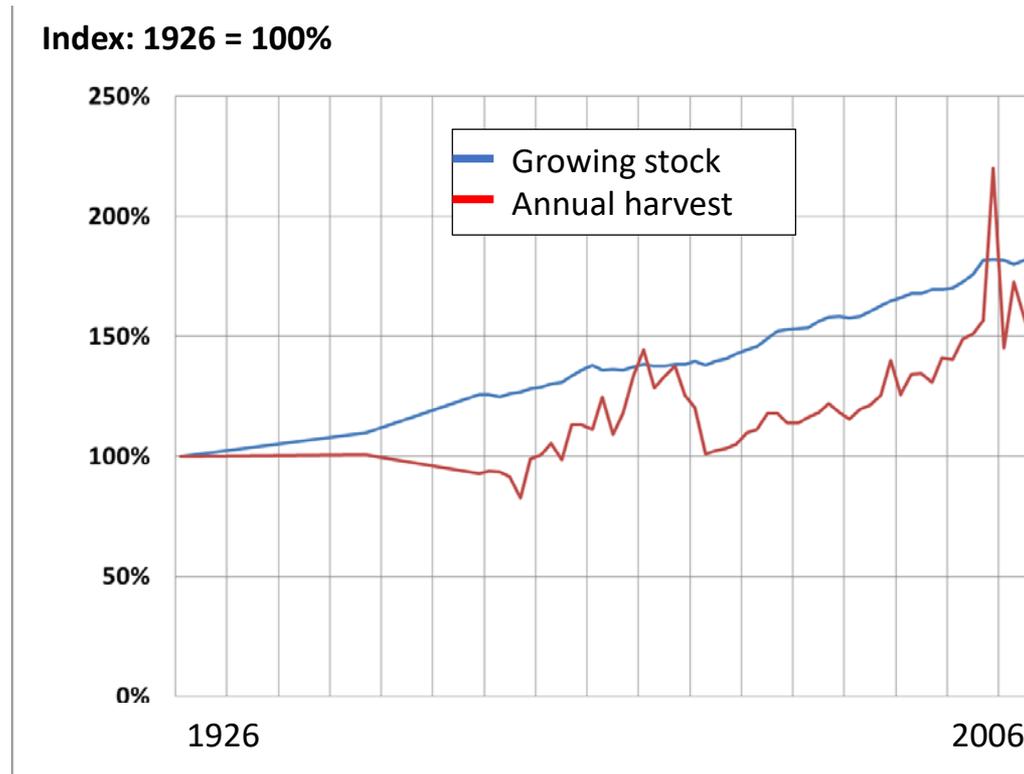


After: 2000s



Source:  
WRI

# Sweden since 1926: Growing stock and harvest



Sources: National Forest Survey, SLU; Thomas Thuresson

# Restoration is possible!



THIS IS THE FUTURE

Maize farming in a *Faidherbia* agroforest in Mbarali District, Southern Highlands, Tanzania. 2008

Photo: Saldi Mkomwa



**Few trees, low carbon, low biodiversity, low resilience.  
Poor source of livelihoods.**



**Indonesia**



**China**



**Gabon**



**India**



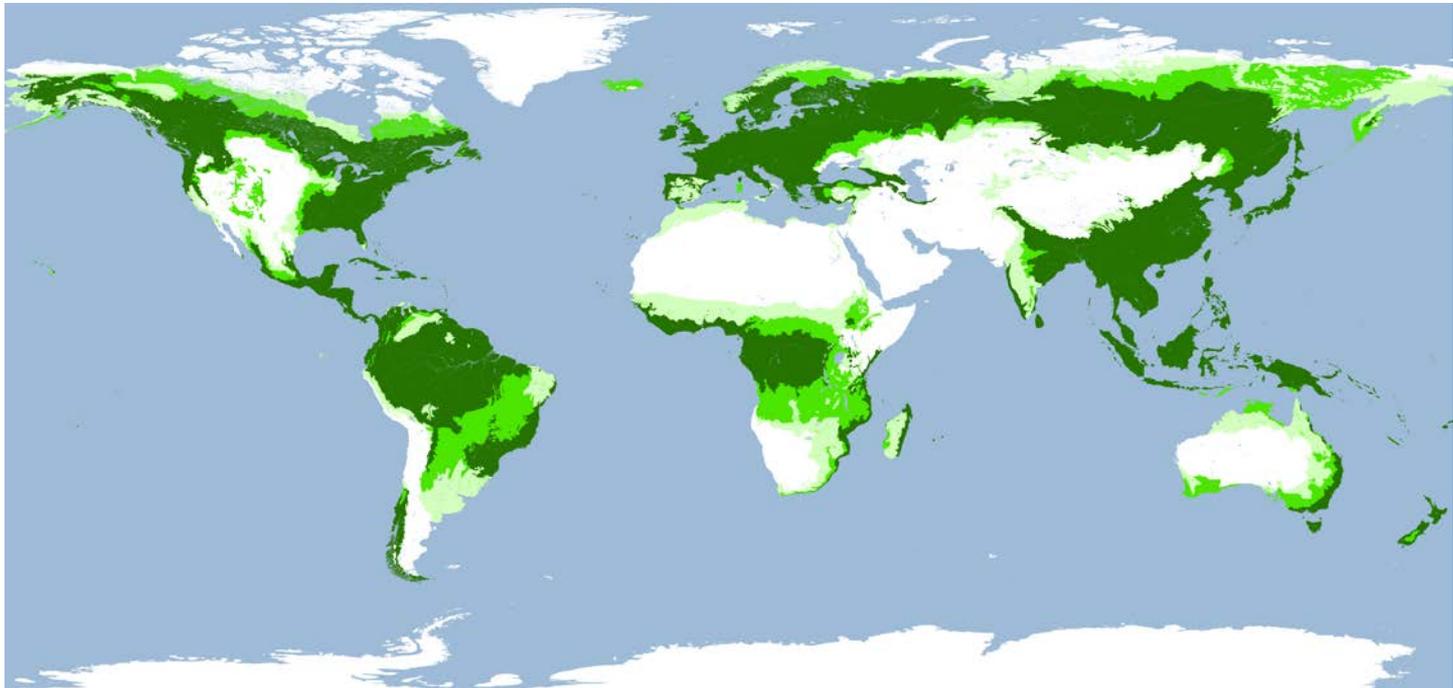
**Brazil**

**= Opportunities for restoration!**



# Potential Forest Extent

If climate and soils alone decided

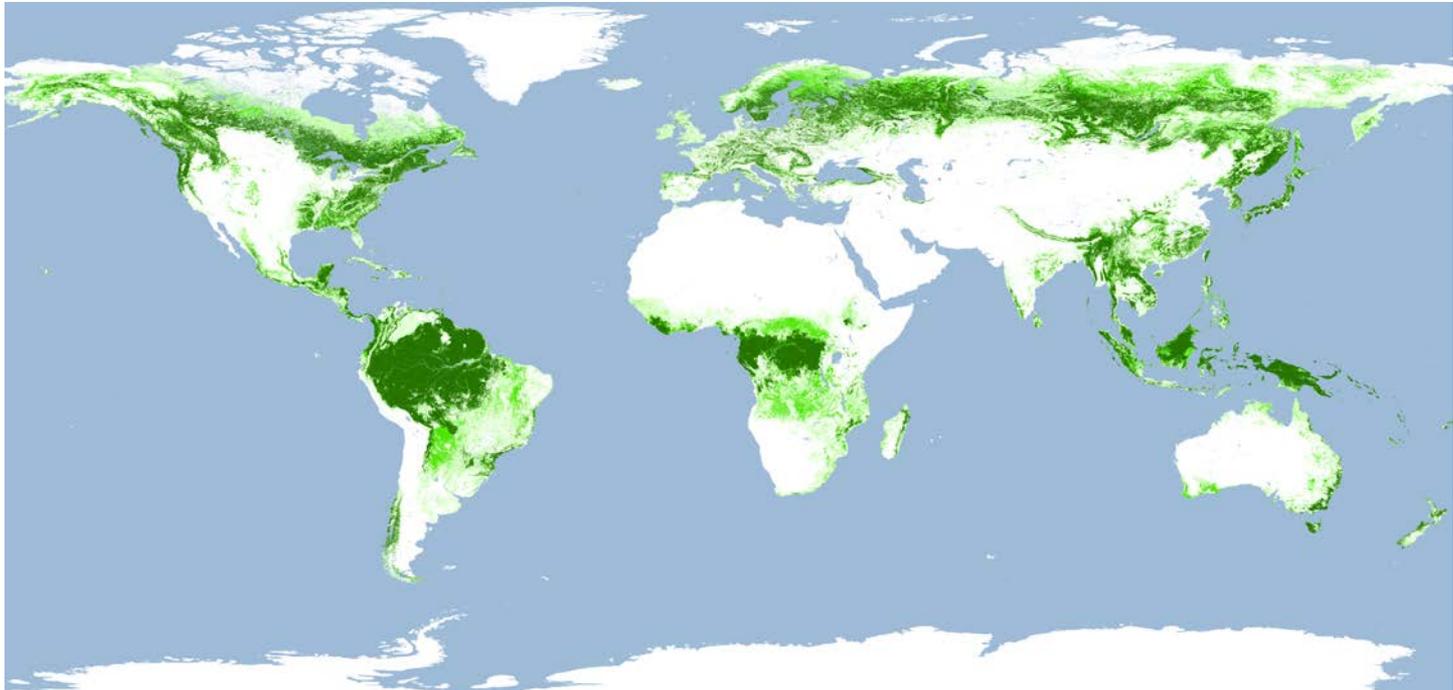


Dark green – canopy cover >45%; Medium green – 25-45%; Light green – 10-25%

Source:  
WRI

# Actual Forest Extent

Where forests and woodlands are today

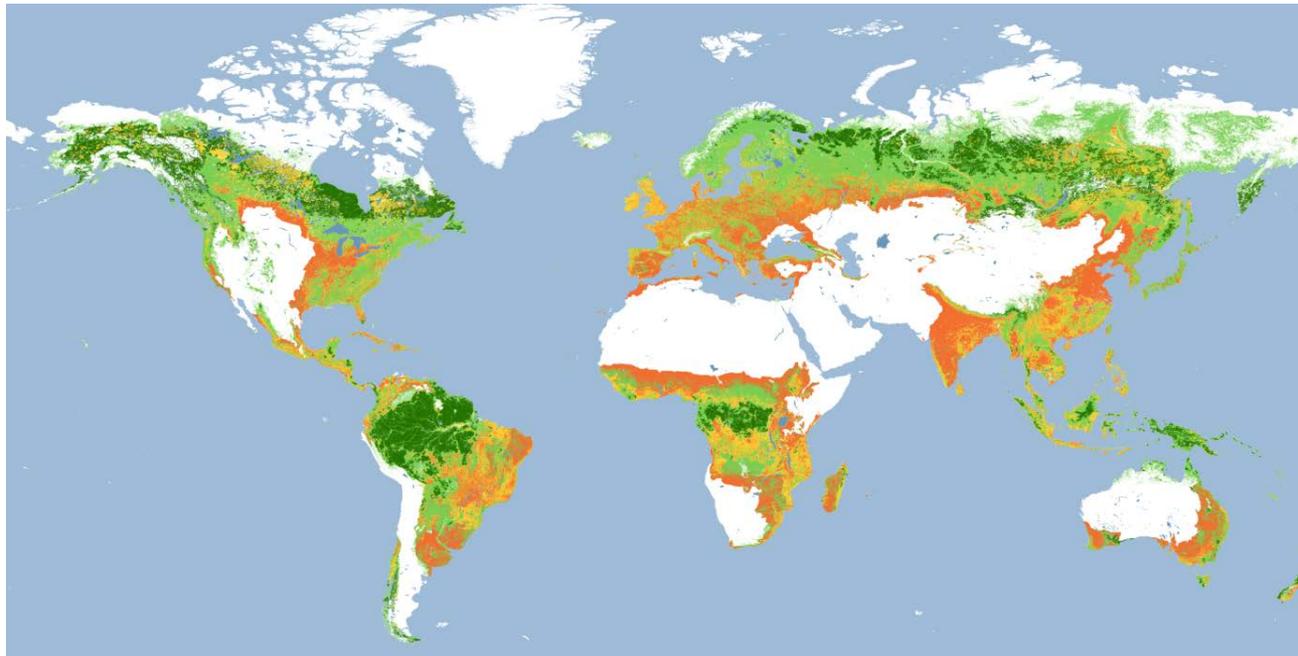


Dark green – canopy cover >45%; Medium green – 25-45%; Light green – 10-25%

Source:  
WRI

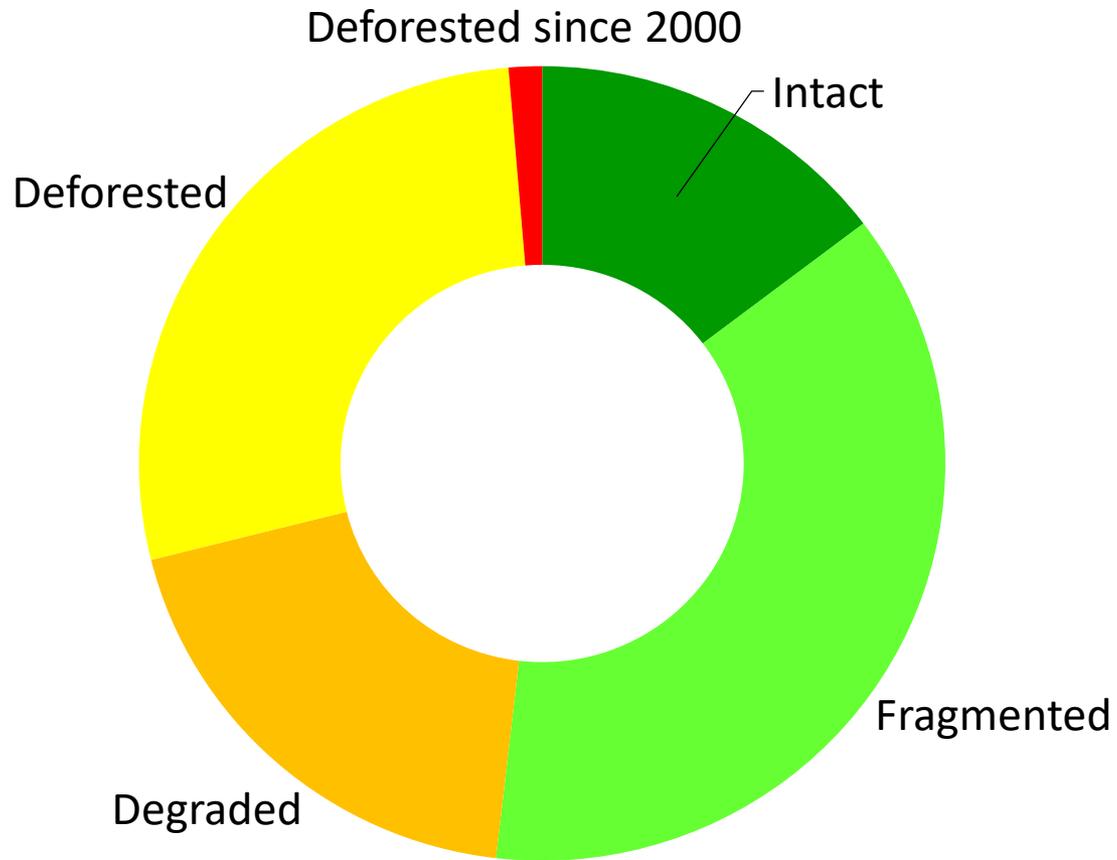
# The world's potential forest landscapes

Current status



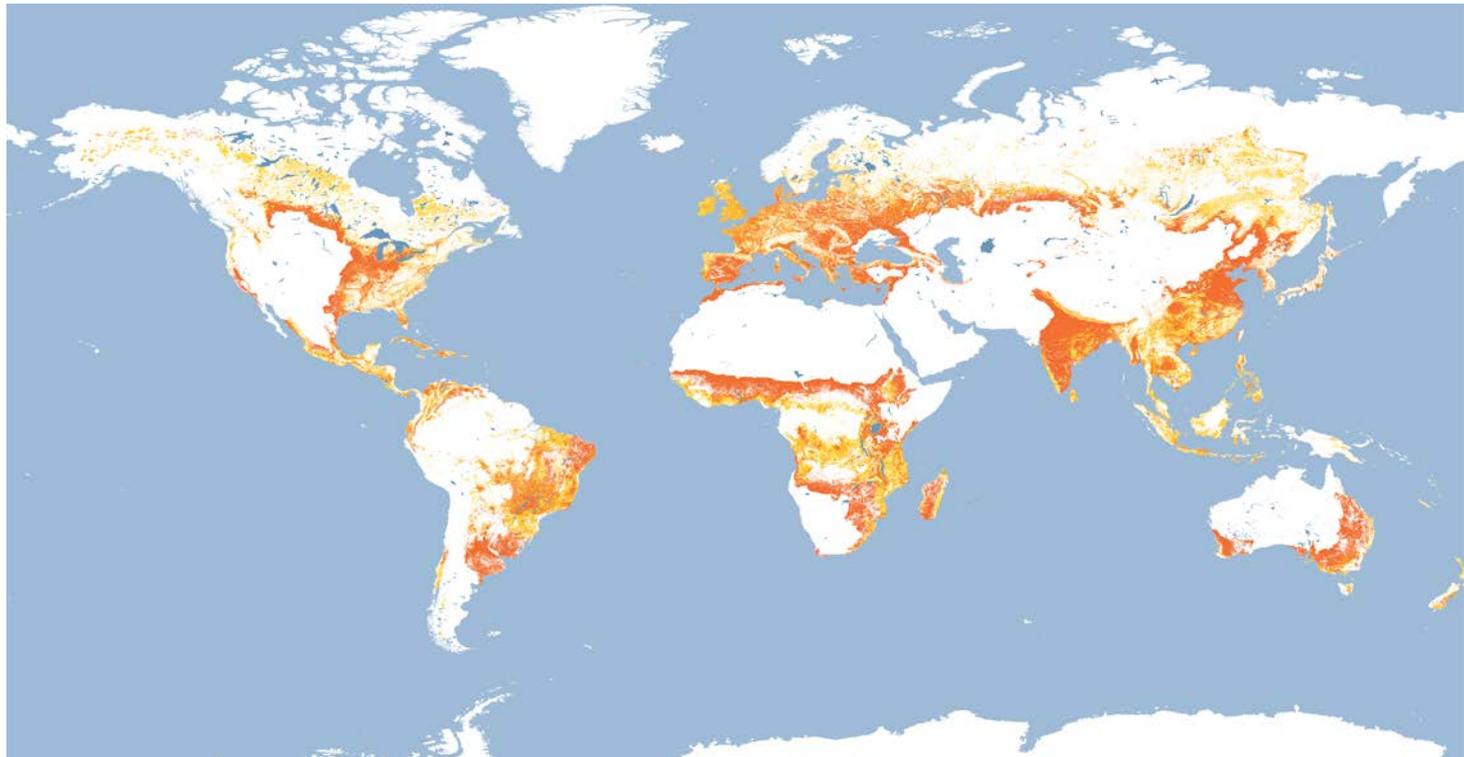
# Global Forest Status

Current status of lands where forests can grow



# Deforested or Degraded Forest Landsapes

Some of these lands can be restored



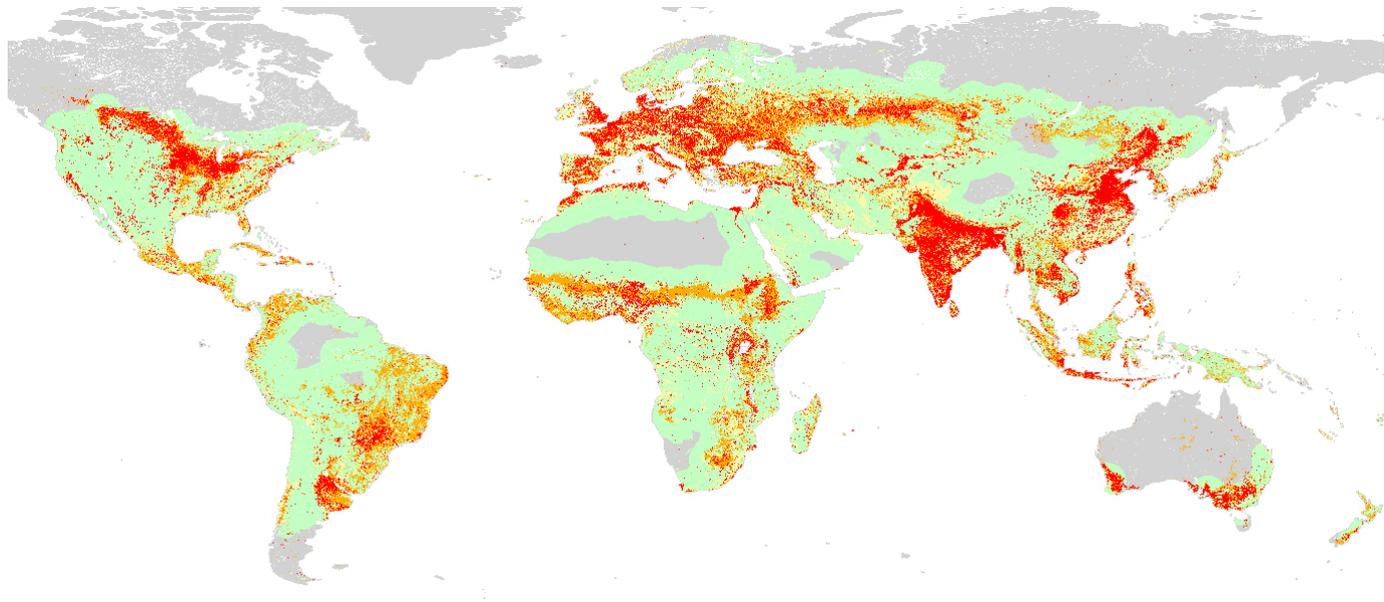
 Degraded  Deforested

Source:  
WRI



# High Population Density and Open Croplands

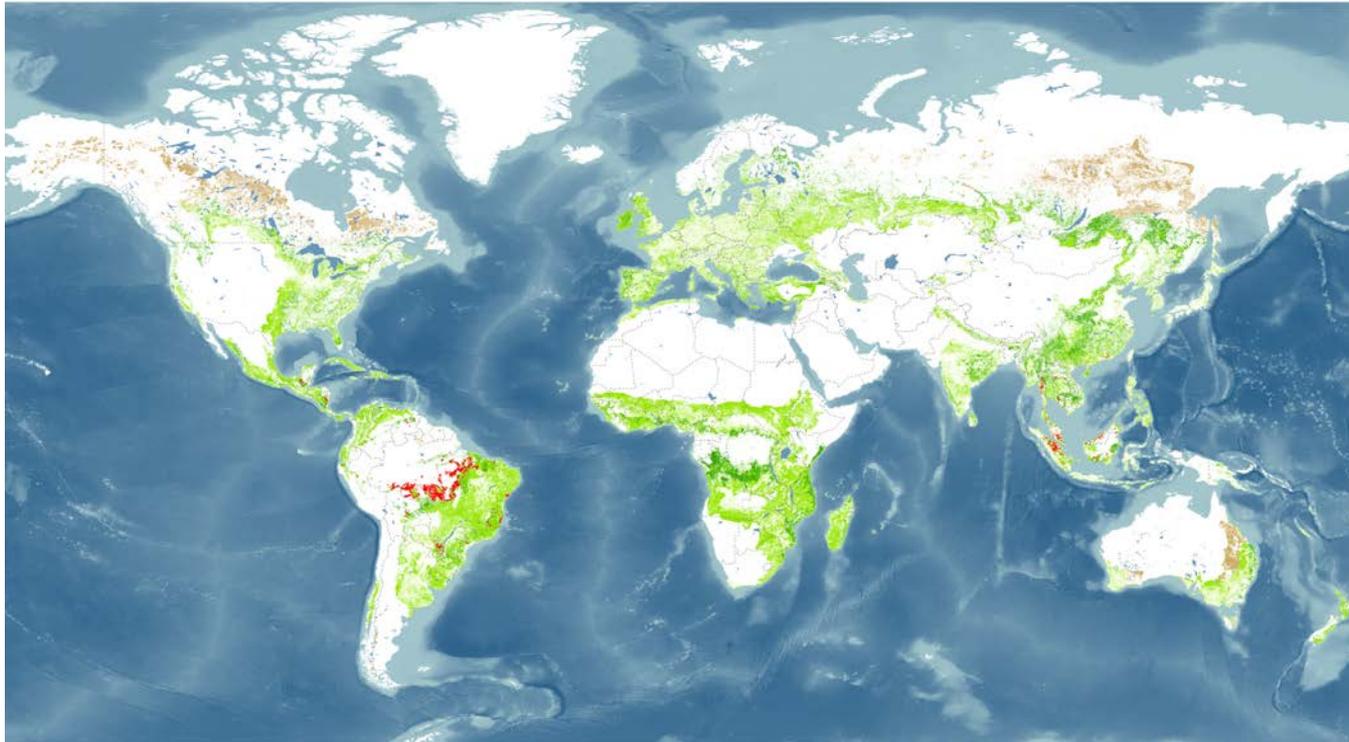
A major constraint on rectoration



Source:  
WRI



# Lands of Opportunity for Forest and Landscape Restoration



## FOREST AND LANDSCAPE RESTORATION OPPORTUNITIES

- Dark green square: Wide-scale restoration
- Light green square: Mosaic restoration
- Brown square: Remote restoration

## OTHER AREAS

- Red square: Recent tropical deforestation





# Lands of Opportunity for Forest and Landscape Restoration



### FOREST AND LANDSCAPE RESTORATION OPPORTUNITIES

- Wide-scale restoration
- Mosaic restoration
- Remote restoration

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# Restoration

## What is it?

# Forms of Restoration

FLR – Forest and Landscape Restoration

ILM – Integrated Land Management

SLM – Sustainable Land Management

ER – Ecological Restoration



# Sustainable Land Management (SLM)

*Long-term collaboration among different groups of land managers and stakeholders to achieve the multiple objectives required from the landscape*



# Ecological Restoration

*The process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed*



# Forest [and] Landscape Restoration (FLR)

*The process of regaining ecological functionality and enhancing human well-being across deforested or degraded forest landscapes*



# Integrated Land Management (ILM)

*The adoption of land use systems that, through appropriate management practices, enables land users to maximise the economic and social benefits from the land while maintaining or enhancing the ecological support functions of the land resources*



# Restoration

*Restoration is when one generation hands the landscape to the next generation in better shape than it was received.*





# Guiding Principles of Forest and Landscape Restoration

Based on Maginnis et al. (2005)

- *Focus on landscapes*
- *Restore ecological functionality*
- *Allow for multiple benefits*
- *Recognize that a suite of interventions are possible*
- *Involve stakeholders*
- *Tailor to local conditions*
- *Manage adaptively*
- *Avoid conversion of natural ecosystems*

# RESTORATION INTO WHAT?

## A Mosaic Of ...

**NATURAL  
FOREST**

**SUSTAINABLY  
MANAGED FOREST**

**AGROFORESTRY**

**CLIMATE-SMART  
AGRICULTURE**



- Water
- Air
- Biodiversity
- Carbon

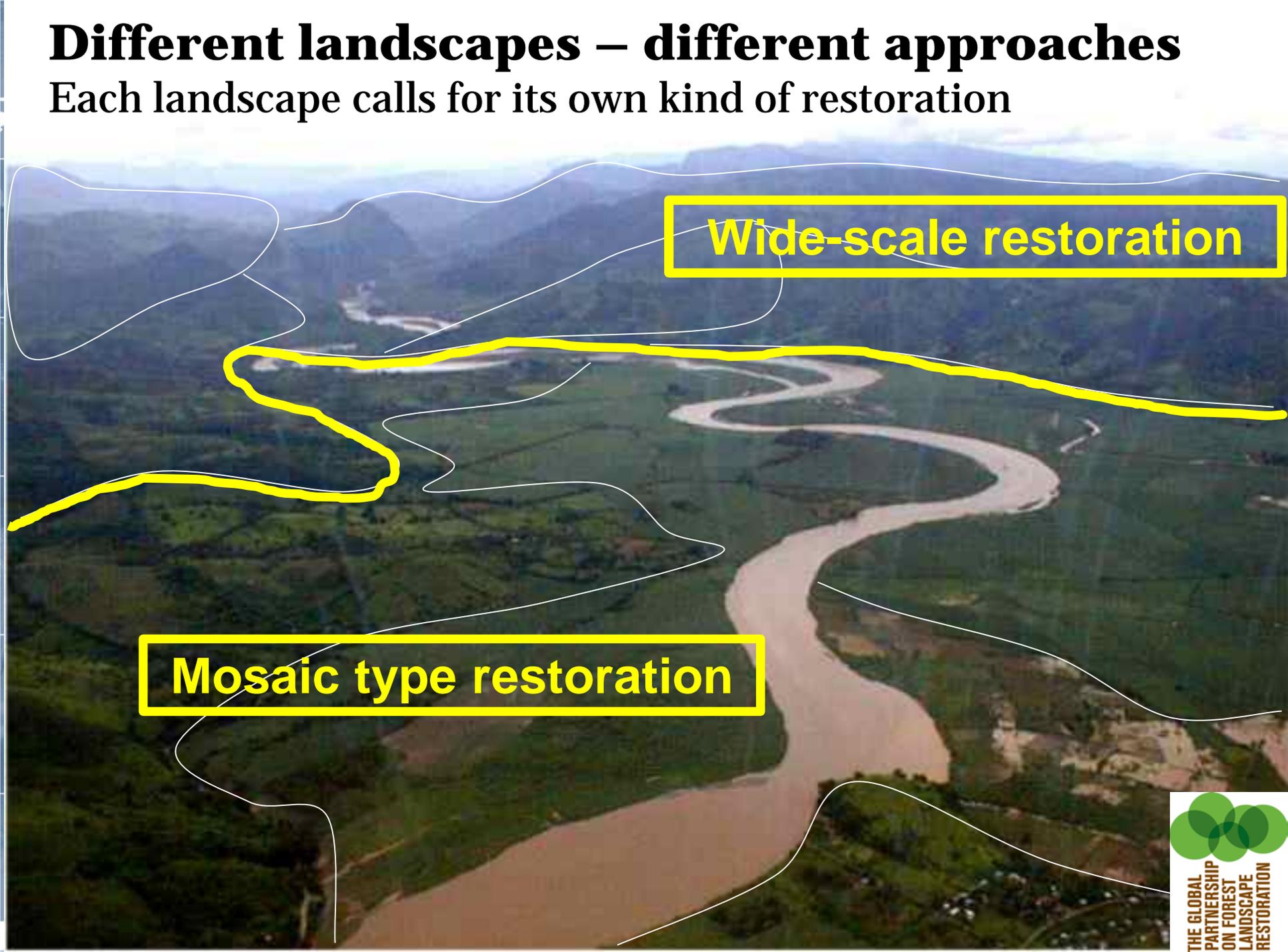
- Wood
- Livelihoods
- Forest products
- Biodiversity
- Carbon

- Food
- Livelihoods
- Soil fertility
- Biodiversity
- Carbon

- Food
- Livelihoods
- Soil fertility
- Biodiversity
- Carbon

# Different landscapes – different approaches

Each landscape calls for its own kind of restoration

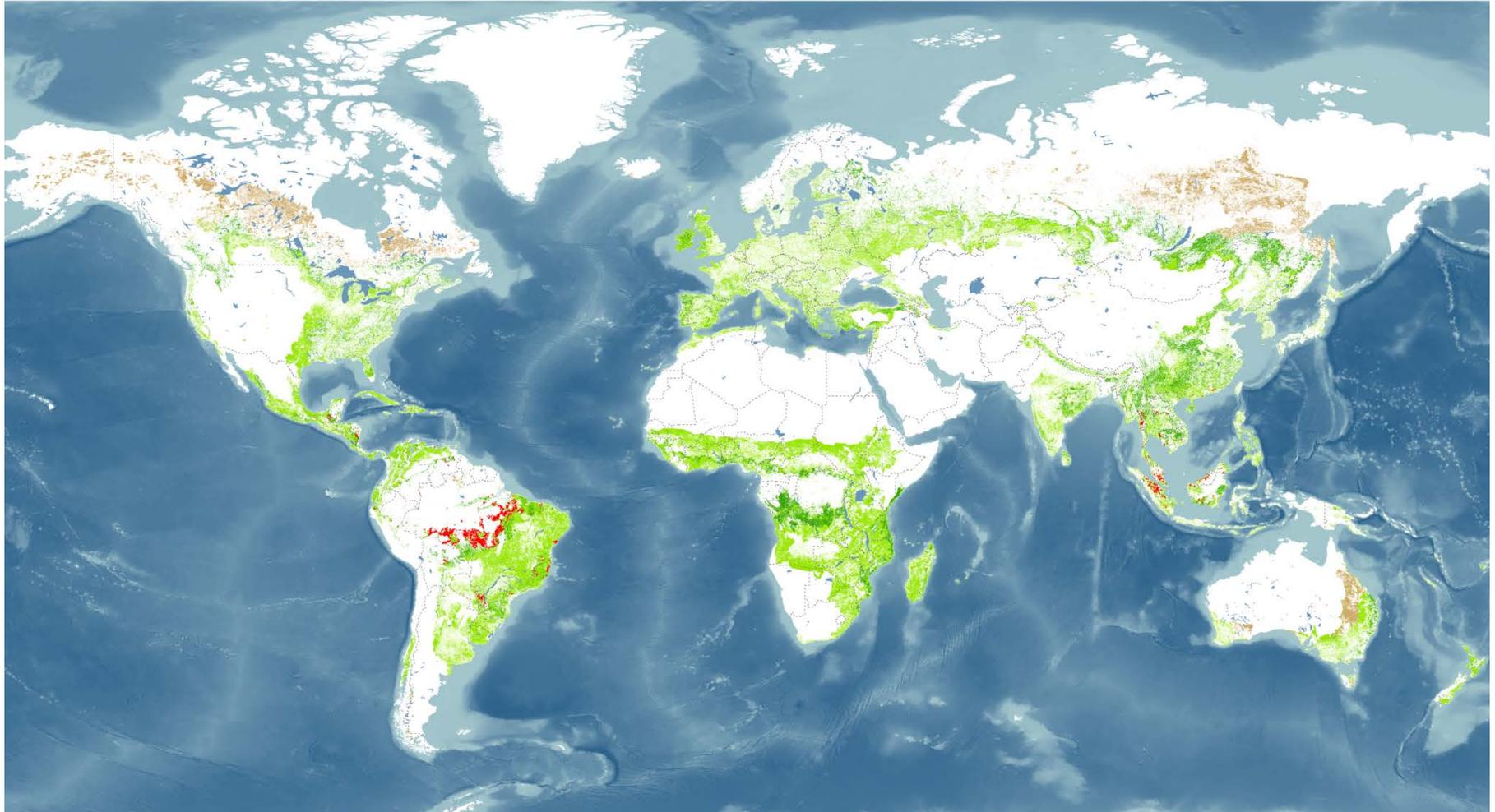
An aerial photograph of a wide river valley with a winding, muddy-brown river. The surrounding landscape is a mix of green fields and forested areas. A thick yellow line traces a path through the valley, and a yellow box highlights a specific area. White lines outline various regions of the landscape.

**Wide-scale restoration**

**Mosaic type restoration**

# Lands of Opportunity

## for Forest and Landscape Restoration



**FOREST AND LANDSCAPE RESTORATION OPPORTUNITIES**

- Wide-scale restoration
- Mosaic restoration
- Remote restoration

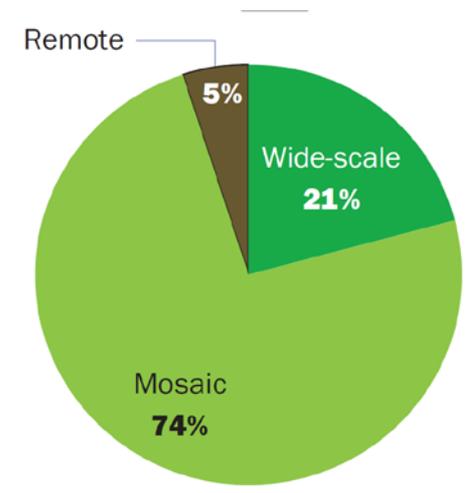
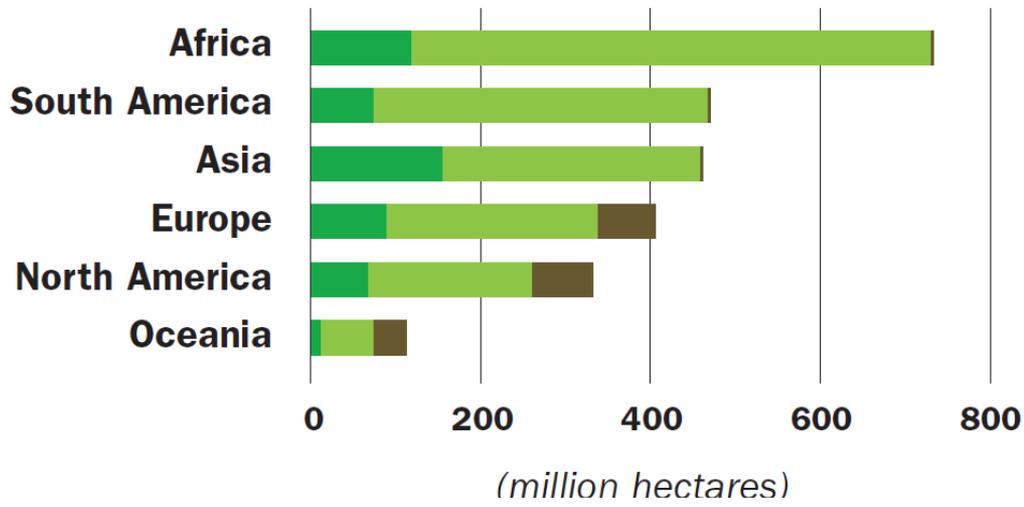
**OTHER AREAS**

- Recent tropical deforestation



# Opportunities on All Continents. By Area Mostly Mosaic

The total opportunity area is 2 billion hectares



Wide-scale restoration      Mosaic-type restoration      Remote, unpopulated areas

Source: WRI



# AMBITIOUS TARGETS EXIST

## The Bonn Challenge

**150m**

hectares under  
restoration by 2020

## New York Declaration

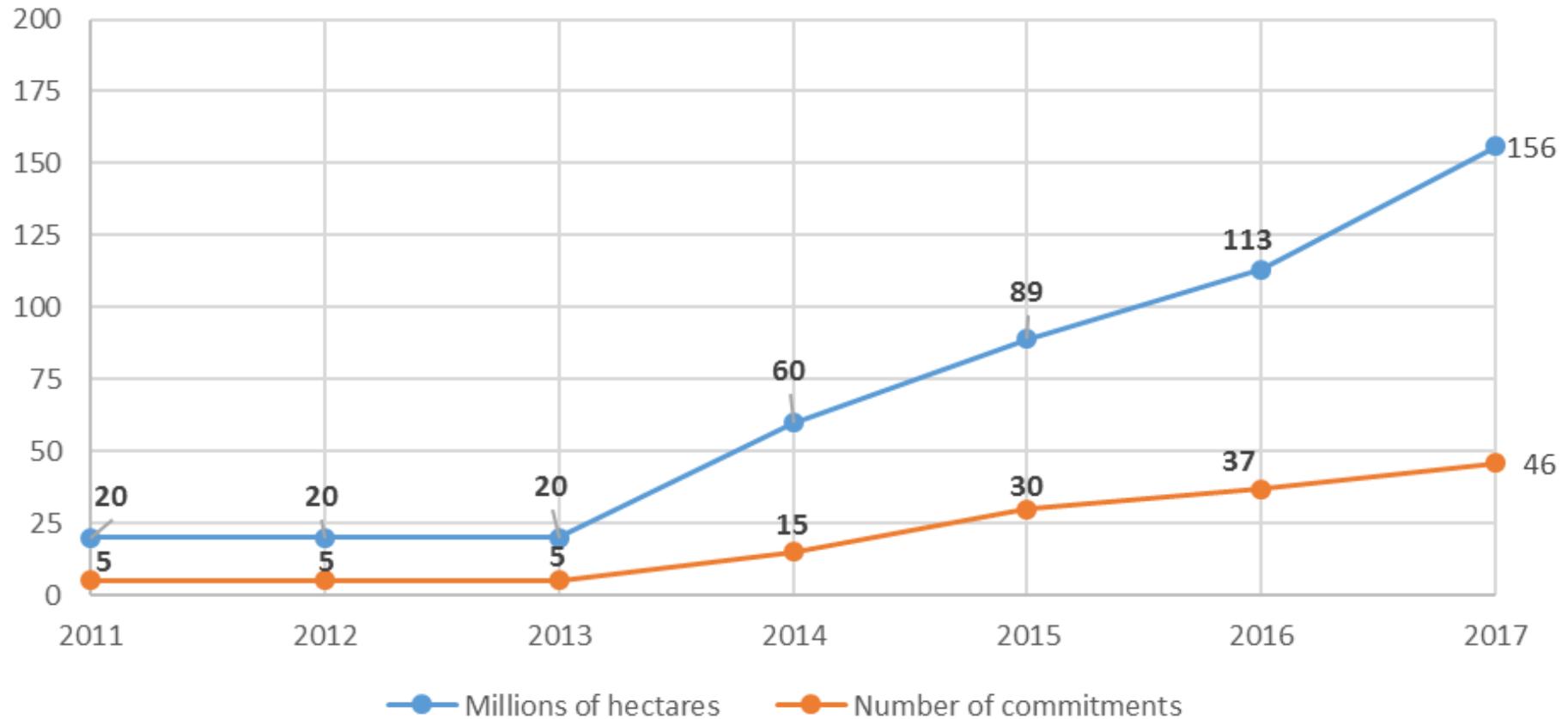
**350m**

hectares under  
restoration by 2030

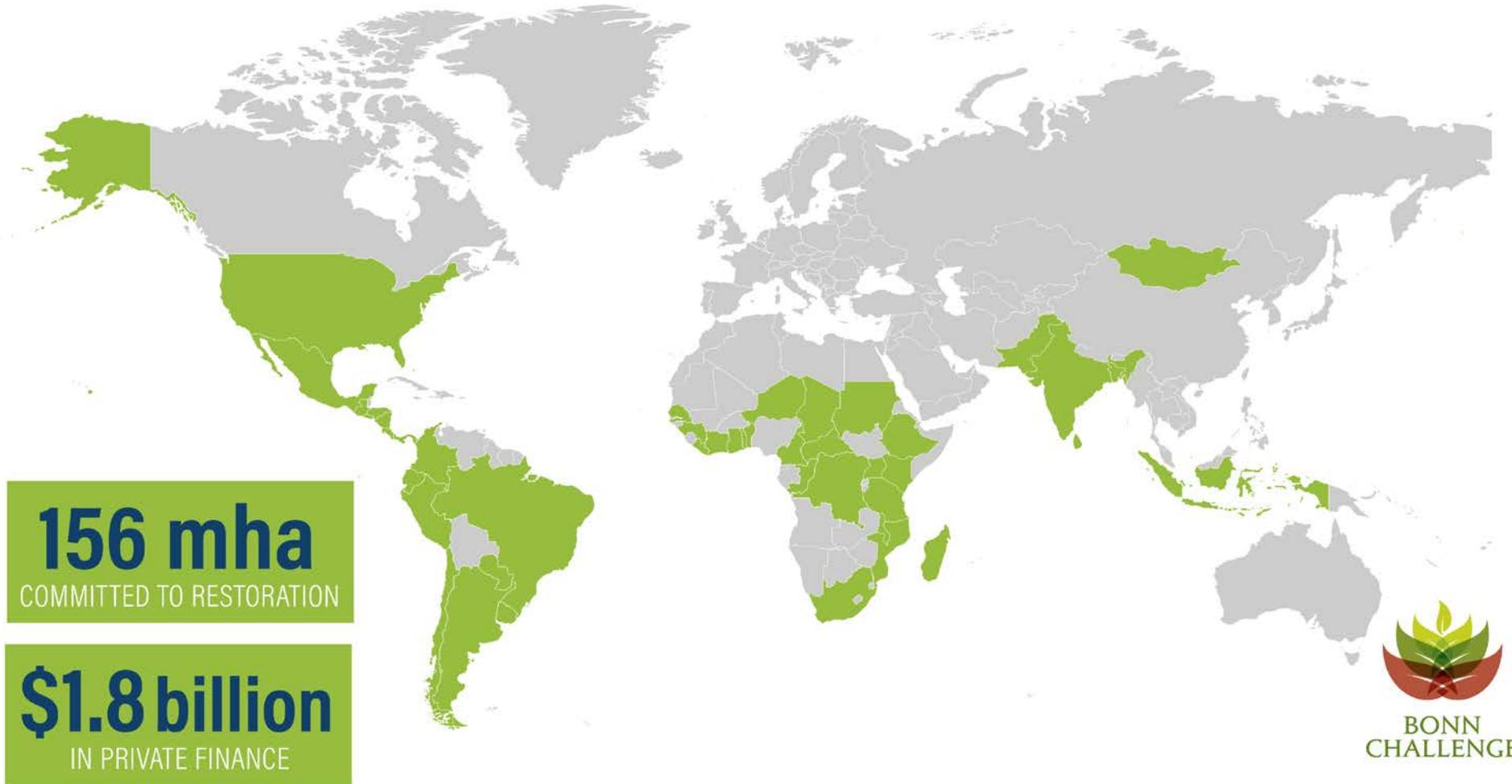
# 1. POLITICAL ENGAGEMENT



Commitments to the Bonn Challenge and  
New York Declaration on Forests



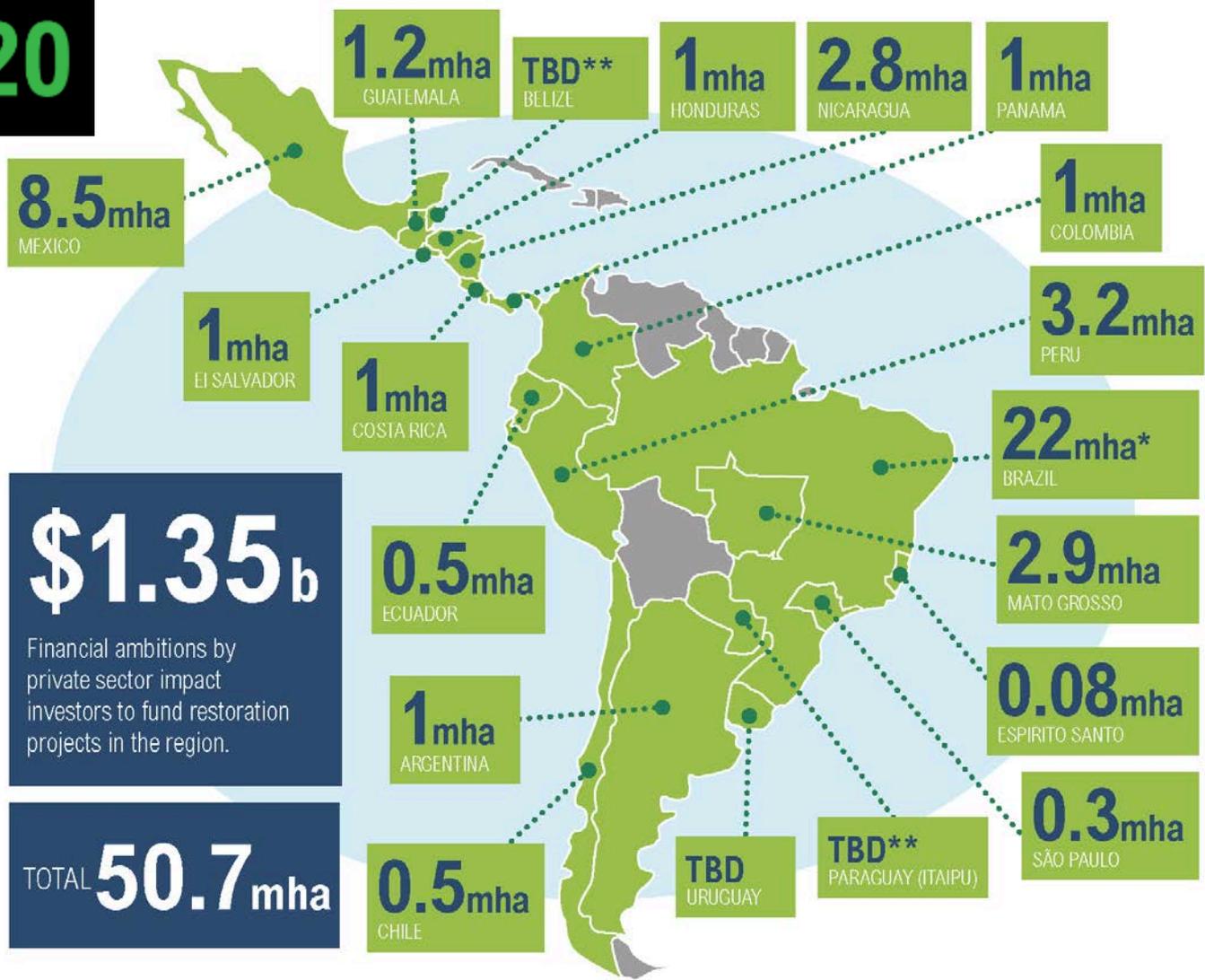
# 1. POLITICAL ENGAGEMENT





# 1. POLITICAL ENGAGEMENT

**Initiative**  
**20x20**



**\$1.35 b**

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

TOTAL **50.7 mha**

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

# 1. POLITICAL ENGAGEMENT

afr100



**\$1B** in development finance

**\$481M** private sector commitment

**24 countries** have committed to restore **80.3mha**

AS OF AUGUST 2017

\*formulating commitment

**Leadership  
& optimism**

**Courage &  
innovation**

**Execution &  
adaptive  
management**

### **Ambition to strategy**

- Map biophysical landscape
- Map social landscape
- Assess economic case
- Diagnose enabling factors
- Assess potential finance
- Cascade ambition
- Launch new strategies

### **Strategy to implementation**

- Find good practices
- Promote champions
- Tell good stories
- Build technical capacity
- Support entrepreneurs
- Setup baselines

### **Implementation to scale**

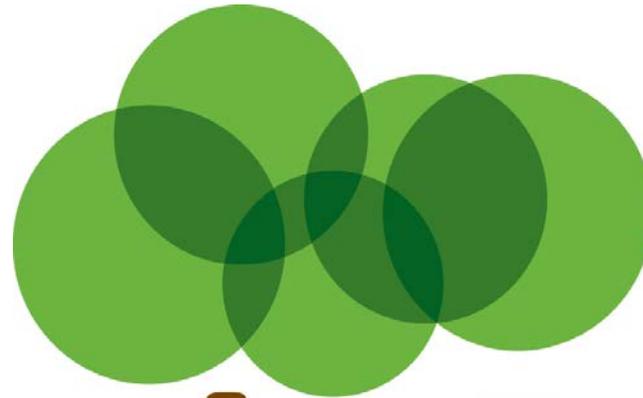
- Launch awareness campaigns
- Orchestrate peer exchanges
- Shift incentives
- Mobilize finance
- Develop markets
- Monitor progress & failure

# WHERE IS SLU?

# WHERE IS SWEDEN?



IUFRO



**THE GLOBAL  
PARTNERSHIP  
ON FOREST  
LANDSCAPE  
RESTORATION**

<http://www.forestlandscaperestoration.org/>

# Lands of Opportunity for Forest and Landscape Restoration



**FOREST AND LANDSCAPE RESTORATION OPPORTUNITIES**

-  Wide-scale restoration
-  Mosaic restoration
-  Remote restoration

**OTHER AREAS**

-  Recent tropical deforestation





Sveriges lantbruksuniversitet  
Swedish University of Agricultural Sciences

# Vilka är de hydrologiska utmaningarna i landskapet?

Med fokus på Afrika

Jennie BARRON

## Stora och snabba förändringar på vattenanvändning i (odlings)landskap

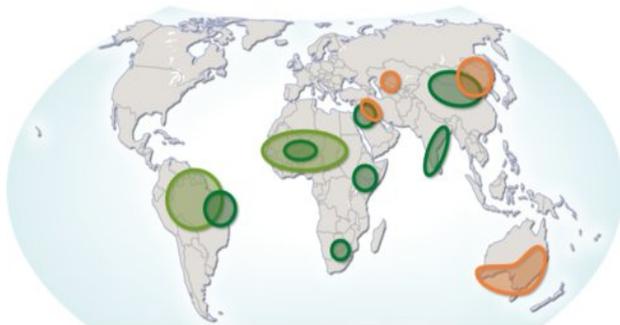
- I. Klimat
- II. Befolkning och ändrad diet

## Ökat behov av vattenreglering i landskap

- I. Intensifiering av odling styrs av vattentillgång
- II. Exempel Burkina Faso : utveckling av vatten och landskapsresurser och inverkan på hydrologi
- III. Osäkerhet i hydrologisk data (vattenresurser och användning)

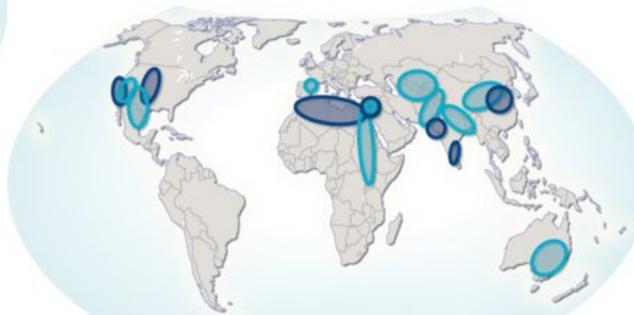
Ökat behov av vattenreglering i landskap: några förslag...

# Vatten – mark - klimat sammantaget ger kritiskt läge i viktiga produktionssystem och regioner



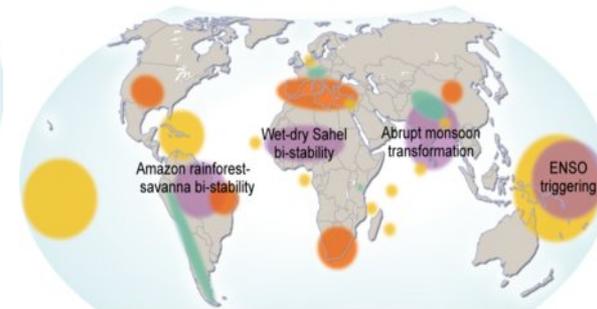
Tipping points, regional risks due to land management issues

- Deforestation moisture feedback
- Land mismanagement (e.g. soil loss, land degradation)
- Salinisation



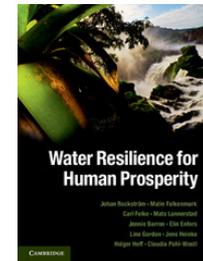
Tipping points, regional risks due to water overuse

- Groundwater collapse
- River basin closure/river depletion

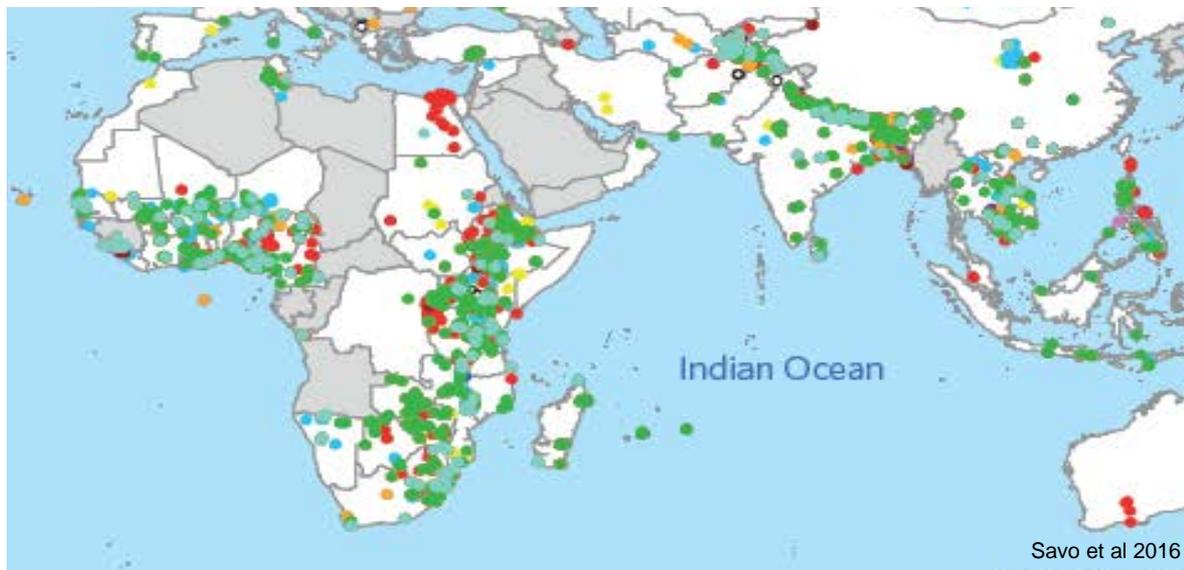


Tipping points, global change pressures

- Regional processes
- Sea level rise and salt water intrusion
- Drastic rainfall regime change
- Glacier melt

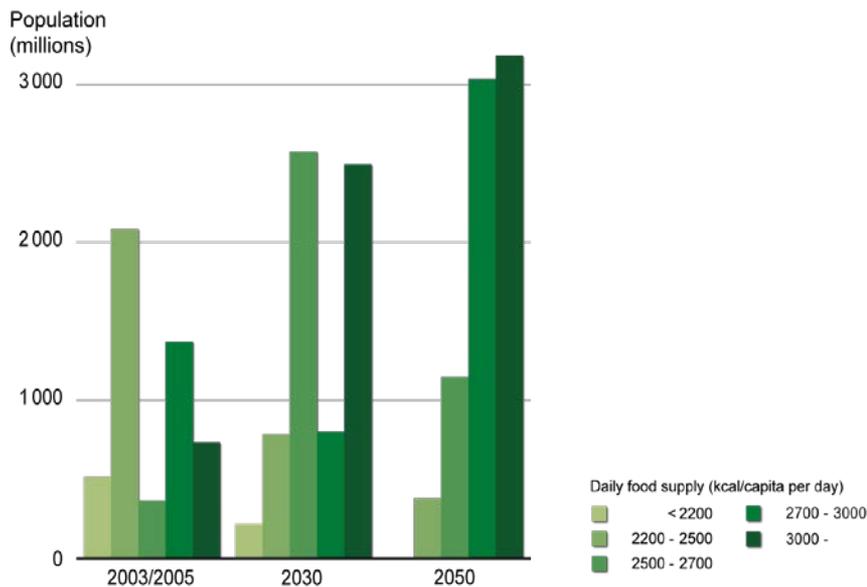


# Klimatförändring är redan här... men osäkerhet om hydrologiska förändringar på landskapsnivå

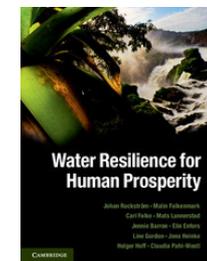


- |   |  |   |
|---|--|---|
| <b>Changes in weather and climate</b>           |  |   |
| • Rainfall — decrease and/or change in patterns | • Temperature (water) — increase                     | • Wind — changes in direction and intensity |
| • Rainfall — increase                           | • Weather — changes in patterns and seasonality      | • Fog — decrease                            |
| • Temperature (air) — increase                  | • Extreme weather events — increase                  | • Fog — increase                            |
| • Temperature (air) — increased heat of the Sun | • Droughts — increase                                | □ Country with no available data            |
| • Temperature (air) — increased anomalies       | • Snowfall, permafrost, glaciers, sea ice — decrease | □ Country with available data               |

# Växande befolkning vill äta mer näringsrik mat



- Mer näringsrik mat behöver ofta mer vatten
- Inte bara mat, utan också foder, fiber annan biomassa ...

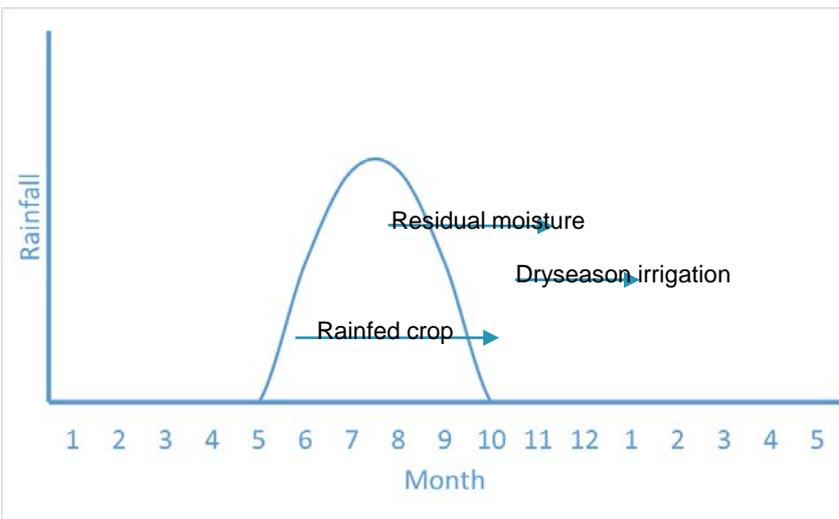


# Ökat behov av klimatsmart vattenreglering för säkra utveckling, och matförsörjning

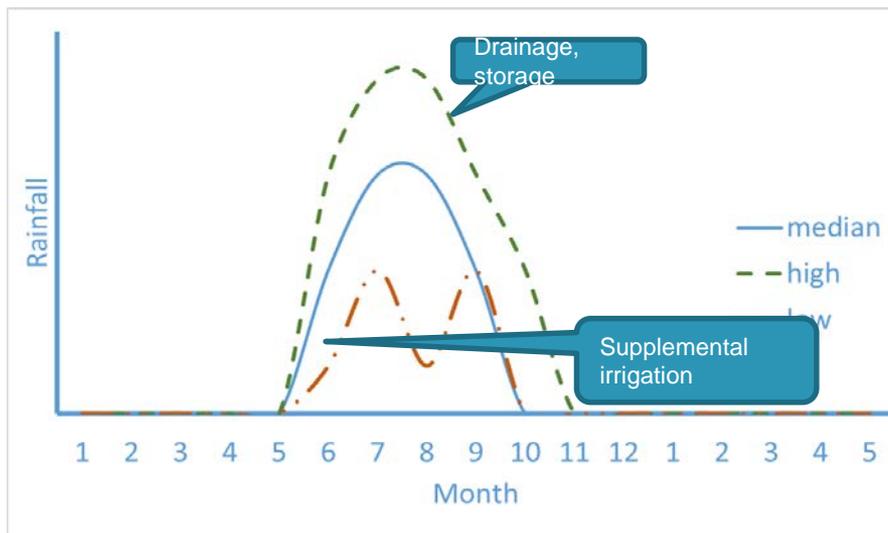
- Klimat, markanvändning och utveckling förändrar redan hydrologi i odlingslandskap
- Data om förändrad kvantitet och kvalitet av vattenresurser i (odlings)landskap är oförutsägbar och bristfällig
- Stort investeringsbehov i infrastruktur, -och institutioner så utveckling sker inom ramar för hållbart vatten uttag och i distribuerad form
- Kapacitet att analysera information och att implementera lösningar behöver stärkas



# Ökad produktion betyder ofta ökad och specifik vattenhantering inom och mellan odlings säsong



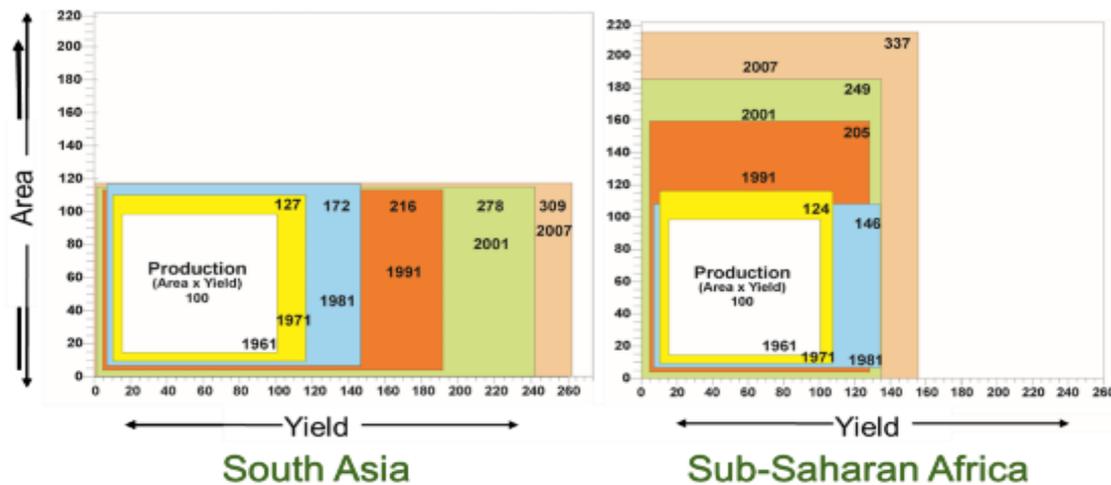
Exempel på vattenhantering i olika odlings system för intensifiering



Exempel på lösning för resilient odlings system med vattenhantering

# Intensifiering av odlingsystem möjliggörs genom förbättrad vattenhantering

- utveckling av produktiviteten och lönsamhet (tex Indien, Kina) genom ökad vatten hantering in odlingsystem
- Afrika söder om Sahara hittills ökad areal mer än odlingsintensitet

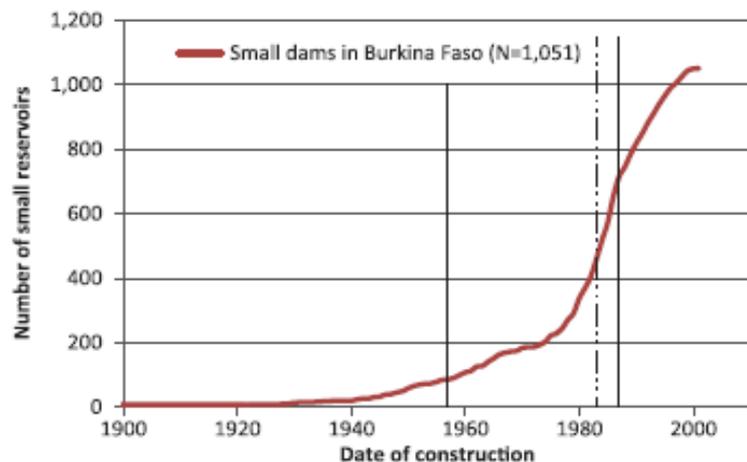


X and Y axis are dimensionless – 1961 = 100.

# Existerande vattenanvändning kritisk för klimatsmart lösning (exempel Västafrika/Burkina Faso)

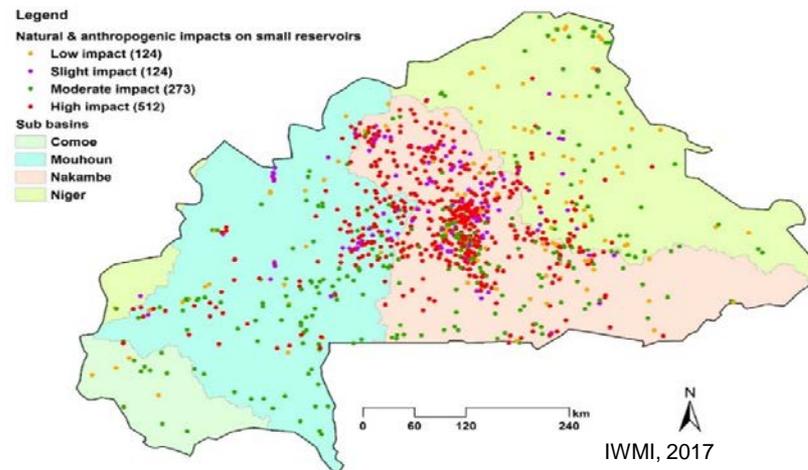
Många små dammar konstruerade under 80-90talet nu föråldrade

.. Trots ökat behov av vattenmagasin samtidigt som ökad variation i regnmängder



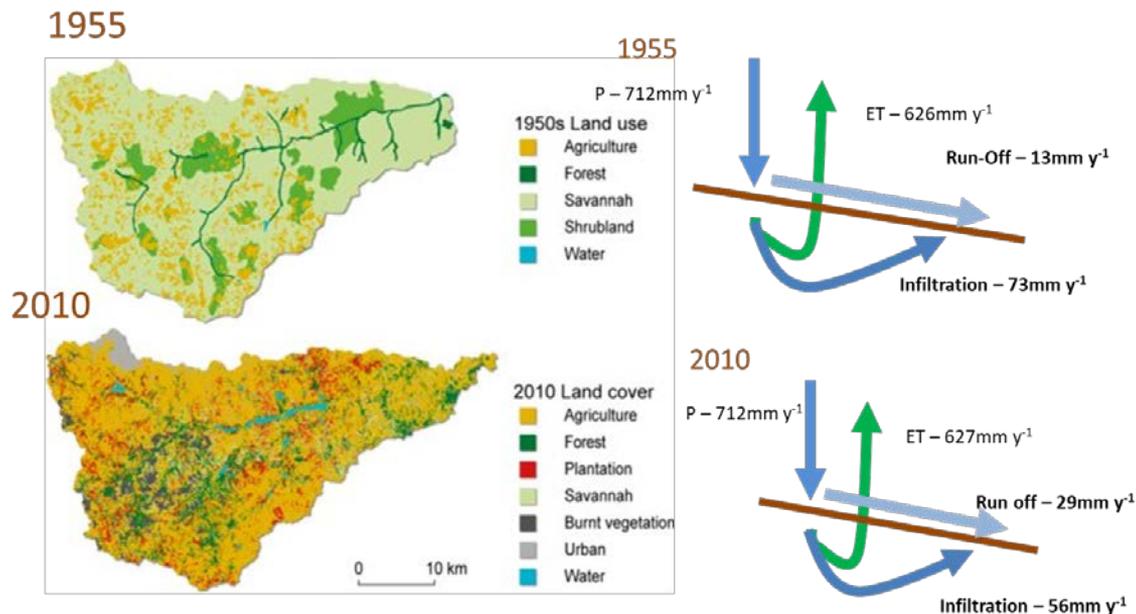
Source: DGRE database. Construction date is available for 1,051 out of 1,190 records (e.g., 90%).

Venot et al 2012



# Skaleffekter av vattenanvändning är oförutsägbara

- lokala hydrologiska förändringar fortfarande relativt små i förhållande till stora dammar nedströms

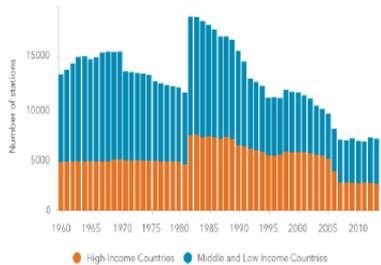


Småskaliga dammar från 1950 till 2010:  
 - volym från 0 till 2% av årlig regnmängd, skapar bevattning för 1% av avrinningsområde

# Data om förändrad kvantitet och kvalitet av vattenresurser i (odlings)landskap är bristfällig och/eller otillgänglig

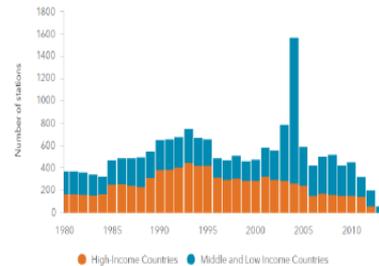
## Precipitation

Temporal distribution of global precipitation stations (NOAA's NCEP & NCD, 1960 - 2013)



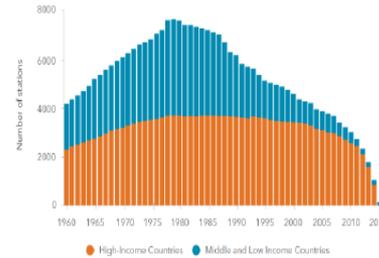
## Water Quality

Temporal distribution of global water quality stations (GEMS-Water 1980 - 2015)



## Streamflow

Temporal distribution of GRDC stations with river discharge data



Grundvatten?

## Data om utveckling av bevattning är osäker både för volymer och arealer

- .. Vilket skapar svårighet i vattenhantering och planering...

	AQUASTAT Total irrigation land (ha)	LSMS-ISA Total cultivated land under irrigation by smallholders (2010- 2012)(ha)	IWMI estimates AGWater Solutions (2012) : area under small scale irrigation (ha)	IWMI new map for single irrigation area (v. 1; 2016)
Ethiopia	-	163 187	312 000	<i>tbc</i>
Malawi	26 900	4090	-	<i>40 287</i>
Niger	65 610	136 383	-	<i>82 862</i>
Nigeria	218 000	274 681	-	<i>562 531</i>
Tanzania	-	239 493	150 000	<i>tbc</i>
Uganda	12 450	174 972	-	<i>tbc</i>

# Utrymme för investering i forskning för mer hållbar och klimat smarta lösningar för vattenhantering i landskap

- Klimat, markanvändning och utveckling förändrar redan hydrologi i odlingslandskap
  - *Ökad variation ställer krav på lagring av vatten samt uthållig markanvändning*
- Data om förändrad kvantitet och kvalitet av vattenresurser i (odlings)landskap är bristfällig
  - *Kvalitet , tillgänglighet och kontinuitet i hydro7meteorologiska data om vattentillgångar och användning*
- Investeringsbehov i infrastruktur, -och institutioner för att möta hydrologiska utmaningar
  - *Tekniska och institutionella innovationer för att möta multi sektoriella behov*
- Kapacitet att analysera information och att implementera lösningar behöver stärkas
  - *Behovsanalys?*



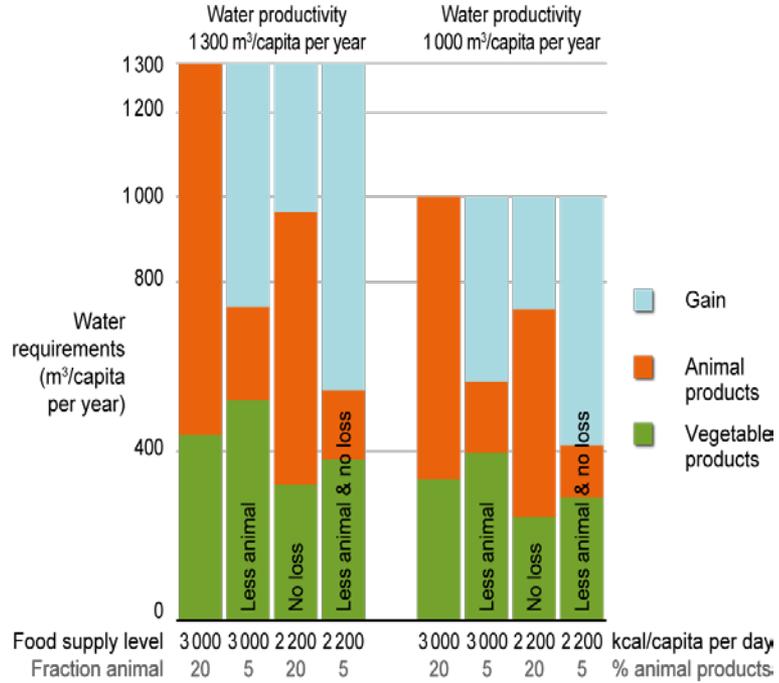
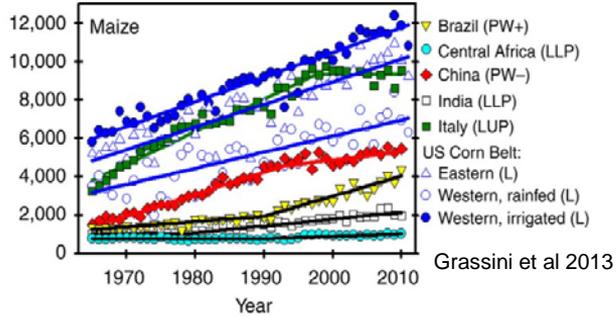
Frågor ?  
Synpunkter ?

Tack!

Jennie BARRON

Professor jordbrukets vattenhushållning, Inst f mark och miljö, SLU

CRP Water Land Ecosystems (WLE) Flagship leader 'Land and Water Solutions for Sustainable Intensification'



# Are existing water tools beneficial for small-scale farmers?

An evaluation together with the Swedish Food and Beverage sector  
October 6, 2017 | Stockholm





# Cluster group water for food



AXFOUNDATION

ANTONIA AX:SON JOHNSON FOUNDATION  
FOR SUSTAINABLE DEVELOPMENT



LIVSMEDELSFÖRETAGEN

The Swedish Food Federation



# Water Journey



[waterjourney.swedishwaterhouse.se](http://waterjourney.swedishwaterhouse.se)

# Water issues in food production



- Irrigation method
- Water source
- Soil management
- Biodiversity
- Fertilizers and pesticides
- Water runoff and wastewater
- WASH
- Energy and food waste
- Water for cleaning, cooling and heating
- Climate mitigation and adaptation

# Background and objectives

- Spin-off project from the water and food cluster group. Building on the results from the mapping of water tools and standards
- Testing the implementation potential and scaliability of SAI FSA and GLOBALG.A.P;
  - Do they help producers address water risks?
  - What are the benefits and limitations to a certification system compared with a volunatry self-assessment tool?
  - Can companies use the same "toolbox" and reduce number of audits?



# South Africa



# Cambodia



# Portugal



# India



# Some observations to date

- Companies view certifications as the “magic bullet”
- “Certifications don’t create more rain, or generate more investments”
- Tiredness of certifications among producers
- Producers have limited knowledge (and interest) of the local water context and local decision-making
- Producers in water-scarce areas already took measures to save water, before buyers made this a requirement

Thank you

