



Module 2: Objective



Learning level:

Students at high schools, training centres and universities.



Learning objective:

Present the FLR process as a long-term intervention into a socio-ecological system based on project cycle management as a tool to address complexity of land use, allow for adaptive management of natural resources and monitoring of progress/impact on the ground.

Module 2: Outline

- TOPIC 1: Underlying causes of degradation
- TOPIC 2: Enabling environment for restoration
- TOPIC 3: Designing an FLR project
- TOPIC 4: Innovative technical restoration approaches
- TOPIC 5: Monitoring short- and long-term restoration progress and impact
- Credits



Topic 1:

Underlying causes of degradation



Learning activities:

Class presentation, small group questions and student assignments.



Learning outcome:

By the end of Topic 1, students will have developed a basic understanding of landscape dynamics and the drivers of forest and land degradation representing a complex mix of interacting social, economic and ecological factors.



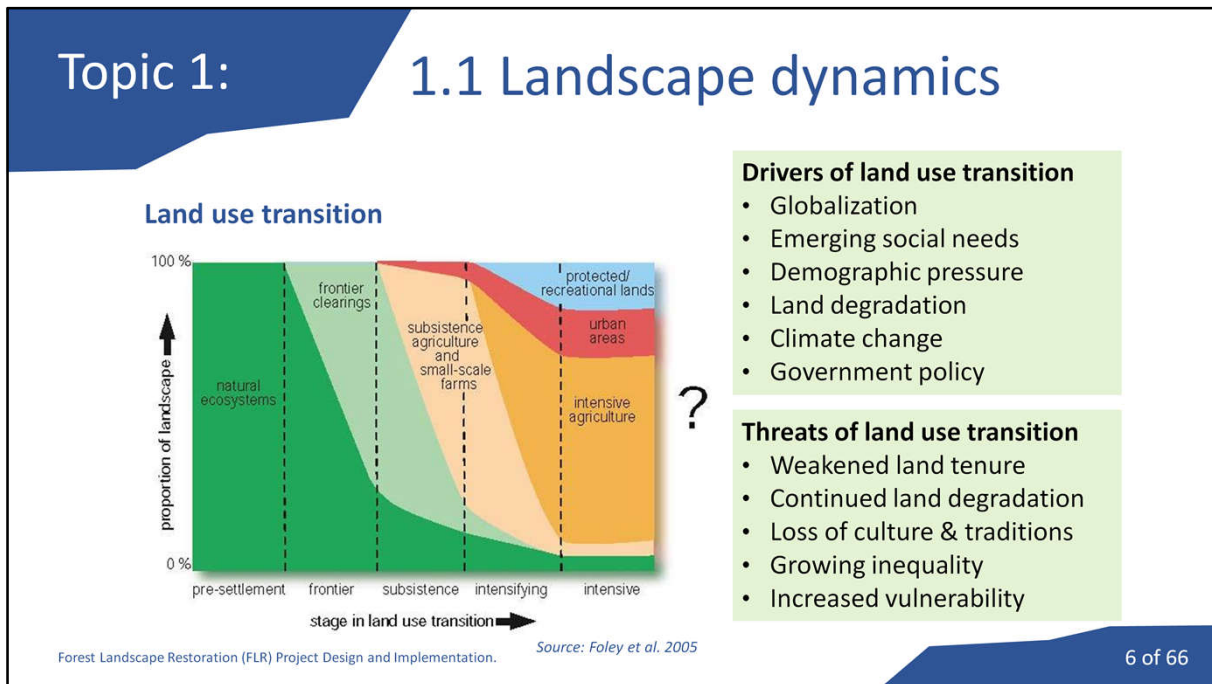
The proximate (immediate) drivers of deforestation and forest degradation are usually linked to unsustainable land use practices as well as large scale ecological disturbances. Drivers may include accelerated erosion due to the removal of vegetation, coupled with easily erodable soil conditions and increased precipitation extremes (such as the case of the southern edge of the Meghalaya Plateau, which experiences the World's largest amount of rain).

Unfavourable soil conditions can not only accelerate erosion, but also restrict vegetation growth, such as saline soils and acid sulphate soils.

Large scale disturbances operating at extended spatial scales as a result of climate change and anthropogenic impacts, such as altered fire regimes or large scale insect outbreaks can lead to widespread mortality and degradation of forests over vast areas.

Invasive species are a serious threat globally, but they particularly threaten islands.

Livestock grazing at high intensity effectively prevents regeneration of forests, particularly in sub-tropical and temperate regions.



The conceptualized process of land use transition includes five stages. It starts with the presettlement stage, where only natural ecosystems are present. In this stage humans form part of the ecosystem or are not present.

Next, the land transitions into the frontier stage as settlers arrive and start to clear land for agriculture. The proportion of natural ecosystems rapidly declines across the landscape.

The next stage is the subsistence stage, which is increasingly dominated by subsistence agriculture and small-scale farms. In this stage the proportion of both natural ecosystems and frontier clearings decline. At the same time urban areas appear as a new land use type, but they are restricted to land areas of negligible size.

Next, the intensifying stage arrives in which subsistence agriculture gives way to intensive agriculture. Frontier clearings and natural ecosystems decline simultaneously, while urban areas expand. At the same time, a new land use priority of protected and recreational areas arises, primarily to cater to the needs of the increasing urban population.

Finally, the intensive stage of land use transition arrives, which is dominated by intensive agriculture and in which urban areas and protected and recreational areas also take up substantial proportions of land. The areas covered by natural ecosystems and frontier clearings is negligible.

What drives land use transition?

These include underlying causes, such as globalization, emerging social needs, population

boom and the demographic pressure linked to it, land degradation, climate change and unfavourable government policies.

These trends can be exacerbated by weakened land tenure, particularly of communally-held land, continued land degradation due to unsustainable land use, loss of cultural and traditional attachment to the land, growing social and economic inequalities, and the increased vulnerability of communities and ecosystems to climate change.

Topic 1:

1.2 Characterise landscape: Landscape analysis

Driving forces

- Demography, incl. labour availability
- Historic development
- Economic factors – livelihood strategies
- Social change

Current situation

- Biodiversity
- Land parameters (productivity, erodibility, etc.)
- Land use types, incl. cover
- Associated problems

Projected situation

- Land use trajectory - likely land use scenario after 10 years

Internal driving forces

vs.

External driving forces

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A landscape analysis is a very useful tool to describe the driving forces, the current situation and the projected development under a common framework.

First, driving forces for changes across the landscape need to be described. These may include changes in demographic conditions, including the availability of labour, as well as historic land use trends. At the same time, economic factors, including the main livelihood strategies pursued by the local population are important drivers. Changes in social conditions, lifestyles, educational aspirations, family sizes should not be underestimated either.

Next, the landscape analysis needs to describe the current situation. This is best done in terms of characterizing the landscape's biodiversity, land parameters, including productivity and erodibility, as well as the current land cover and land use types. It is important to highlight all issues associated with certain land use types.

Finally, based on the driving forces and the current situation description, the landscape analysis arrives at the projected situation, which is described through the land use trajectory. This is a prediction according to best knowledge on what the landscape will look like in 10 years IN CASE NO FURTHER activities (no FLR interventions) are implemented.

Topic 1: 1.3 Addressing drivers of degradation

Trends, conditions & response options

Pressure

- Demographic change
- Social change
- Economic change
- Climate change

State

- Degraded land
- Reduced biodiversity
- Migration
- Insecure land tenure
- Reduced resilience
- Low carbon stocks

Response

- Stakeholder engagement
- Planning approaches
- Restoration options
- Landscape connectivity
- Conflict resolution

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Assessing the drivers of degradation can also help to identify response options. The pressure-state-response conceptual framework can be a useful tool for this. The pressure describes the driving forces as in case of the landscape analysis. In the presented situation this may include demographic, social, economic and climatic changes. Next, the state describes the present situation. Finally, the response describes the FLR actions necessary to address the pressures in the context of the given situation.

Topic 1:

References and resources

- DeFries, R.S., Rudel, T., Uriarte, M., Hansen, M., 2010. *Deforestation driven by urban population growth and agricultural trade in the twenty-first century*. *Nature Geoscience* 3, 178–181.
- Foley, J.A., et al. (2005) *Global Consequences of Land Use*. *Science*, 309, 570-574
- IPBES, 2018. *Summary for policymakers of the thematic assessment report on land degradation and restoration of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. In: Scholes, R., Montanarella, L., Brainich, A., Barger, N., Brink, B.t., Cantele, M., Erasmus, B., Fisher, J., Gardner, T., Holland, T.G., Kohler, F., Kotiaho, J.S., Maltitz, G.V., Nangendo, G., Pandit, R., Parrotta, J., Potts, M.D., Prince, S., Sankaran, M., Willemen, L. (Eds.). IPBES Secretariat, Bonn, Germany
- Robinson, B.E., Holland, M.B., Naughton-Treves, L., 2014. *Does secure land tenure save forests? A meta-analysis of the relationship between land tenure and tropical deforestation*. *Global Environmental Change* 29, 281–293.

Topic 1:

Small group questions

1. What other drivers of land degradation and deforestation are known to you?
2. In which stage of the land use transition is your landscape in?
3. What are the main drivers of land degradation in your landscape?
4. Analyse the current situation in your landscape!
5. What will your landscape look like in 10 years in case current trends do not change and no restoration takes place?



Topic 1:

Student assignments

Apply the landscape analysis for your landscape / a landscape well-known to you:

1. Analyse drivers responsible for changes at the landscape level, including degradation and deforestation.
2. Identify and describe the current status of land degradation.
3. Visualize expected future trends and possible trajectories of how your landscape will evolve.



Topic 2:

Enabling environment for restoration



Learning activities:

Class presentation, small group questions and student assignments.



Learning outcome:

By the end of Topic 2, students will be familiar with the various aspects of an enabling institutional, regulatory and policy environment for forest landscape restoration as well as behavioural characteristics such as motivation, shared visions and new ways of learning to initiate change.

Topic 2:

2.1 Synthesized list of enabling conditions for FLR

with reference to FLR Module 1: Principles 1 to 6

Engagement for common interests

1. Shared motivation & vision (Principle 3)
2. Stakeholder engagement (Principle 3)
3. Economic viability (Principle 5)

Clear rules

4. Enabling policy & regulatory framework (Principle 3 and 4)
5. Clear and secure tenure (Principle 3 and 4)
6. Effective governance (Principle 3)

Focus on landscapes

7. Landscape approach (Principle 1)
8. Landscape suitability for FLR (Principle 2)

Available knowledge and capacities

9. Accessible & efficient knowledge base (Principle 4)
10. Adequate capacities (Principle 4)

Change management

11. Negotiated change logic (Principle 6)
12. Flexible approach incorporating new learning (Principle 6)

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The enabling conditions of FLR have been synthesized from international reviews of implementing FLR.

The 12 enabling conditions cluster around five themes. They include:

Engagement for common interests

1. Shared motivation & vision
2. Stakeholder engagement
3. Economic viability

Clear rules

4. Enabling policy & regulatory framework
5. Clear and secure tenure
6. Effective governance

Focus on landscapes

7. Landscape approach
8. Landscape suitability for FLR

Available knowledge and capacities

9. Accessible & efficient knowledge base
10. Adequate capacities

Change management

11. Negotiated change logic
12. Flexible approach incorporating new learning

Topic 2:

2.2 Shared motivation & vision

with reference to FLR Module 1: Principle 3



Shared motivation for restored landscapes





Common understanding of FLR





Common vision of the restored landscape



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Shared motivation:

- Benefits: improved flow of ecosystem services at different scales expected by a wide range of stakeholders
 - economic: positive livelihood outcomes, market and non-market values should outweigh costs
 - social: preservation of cultural values, meeting of international commitments (e.g. NDC)
 - ecological benefits;
- Awareness: knowledge on the benefits of restoration known, potential areas for restoration identified and communicated
 - Legal trigger: restoration is made a legal requirement (e.g. Hungary after WWI turned from a country rich in forests to a poor one and made afforestation a legal requirement, which raised the forest cover from 9 to 24% within 100 years)
 - Crisis events: Korea afforestation

Understanding:

- Definition: FLR is not only tree planting, but restoration of landscape functions
- Approach: Not a top-down centrally planned approach, but a combination of top-down and bottom-up approaches
- Trans disciplinary: not only a foresters' subject

Common vision of restored landscape: result of a visioning exercise documenting the wishes of stakeholders

Topic 2:

2.3 Stakeholder engagement

with reference to FLR Module 1: Principle 3

Stakeholder	Involvement category	Role in project	Type of engagement	Frequency of engagement
Forest Department	Primary stakeholder	Technical implementer	Implementation, technical advisory	Monthly team meetings, capacity building
FLR facilitators	Primary stakeholder	Lead coordination	Coordination, facilitation, planning, monitoring	Intensive engagement full time
Local farmers	Primary stakeholder	Main beneficiaries	Implementation, labour	Quarterly coordination meetings, awareness programmes
Land owners	Primary stakeholder	Main enablers	Implementation	Awareness campaigns
Timber industry	Secondary stakeholder	Investors	Provide funding	Inform regularly, conduct advocacy

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Topic 2:

2.4 Economic viability

with reference to FLR Module 1: Principle 5

- FLR needs to be economically attractive
- Need to ensure early flow of benefits to communities
- Public funding will remain insufficient to achieve global restoration targets
- Need to increasingly engage private sector



IUCN PRIORITIZING INVESTMENTS IN FOREST LANDSCAPE RESTORATION

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The economic aspects of the project need to be tackled in the development phase. **financial analysis compares benefits and costs to the enterprise**, while the **economic analysis compares the benefits and costs to the whole economy**. Main Difference is the consideration of non-market values (externalities) in the economic analysis. Some activities will have costs, other will generate revenues. There should be a balance in costs and expected revenues on the overall scale of the project. Commercial restoration has the aim of creating a productive landscape, which can generate revenues and sustain itself and safeguard long-term environmental and social sustainability. develop financing mechanisms and build an enabling policy and regulatory environment for investors in FLR, which participants viewed as a priority. Also important, is local landscape coordination leading to more attractive economic returns. Today, there are already substantial annual investments into trees that could be partly shifted towards FLR. The seed capital assistance facility provides a risk-sharing mechanism for early-stage FLR development, thus addressing and ultimately overcoming early stage investment barriers.

All in all, embedding FLR in a broader development agenda and looking at FLR as a means to achieve a wide range of development objectives would attract more funding need to integrate forest landscape restoration into the whole value chain of products and services creating productive landscapes including agriculture, agroforestry, production

forests, and protection of native forests so as to achieve sustainability

Topic 2:

2.5 Enabling policy & regulatory framework

with reference to FLR Module 1: Principles 3 and 4

Regulatory instrument	Minimum contents to enable FLR
Policies	<ul style="list-style-type: none"> Specify FLR as a government priority, possibly linking it to international commitments Define the country's policy on FLR
Laws	<ul style="list-style-type: none"> Define & enable FLR Specify jurisdictional hierarchy responsible for FLR Establish tenure rights Enable benefit sharing and dispute resolution mechanisms Incentives for restoration
Regulations	<ul style="list-style-type: none"> Rules & regulations for implementing FLR Guidelines Additional administrative requirements

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The enabling policy and regulatory framework consists of three fundamental levels of regulatory instruments

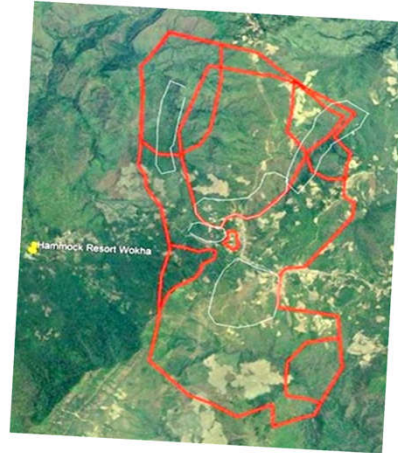
- 1) Policies (including strategies, strategic plans, etc.)
 - a) Specify FLR as a government priority, possibly linking it to international commitments
 - b) Define the country's policy on FLR
- 2) Laws
 - a) Define & enable FLR
 - b) Specify jurisdictional hierarchy responsible for FLR
 - c) Establish tenure rights
 - d) Enable benefit sharing and dispute resolution mechanisms
 - e) Incentives for restoration
- 3) Regulations
 - a) Rules & regulations for implementing FLR
 - b) Guidelines
 - c) Additional administrative requirements

Topic 2:

2.6 Clear and secure tenure

with reference to FLR Module 1: Principles 3 and 4

- **Basis for the sustainability of all land-based interventions, incl. FLR**
- **Unclear tenure:**
 - Governance challenge
 - Conflicts over benefit distribution
 - Long-term investments unlikely
- **Assess land-tenure and try to secure tenure, especially for local stakeholders, as a key issue to allow investments in FLR**



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Clear and secure tenure is a key enabling condition for FLR:
Basis for the sustainability of all land-based interventions, incl. FLR

- **Unclear tenure:**
 - Governance challenge
 - Conflicts over benefit distribution
 - Long-term investments unlikely
- **Assess land-tenure and try to secure tenure, especially for local stakeholders, as a key issue to allow investments in FLR**


Topic 2:

2.7 Effective (landscape) governance

with reference to FLR Module 1: Principle 3

Multiple actors


Source: shutterstock.com



Challenge engaging multiple diverse stakeholders

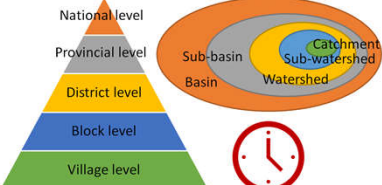
Multiple functions

Source: Echeopar, Global Comparative Study on REDD+, cijfor.org



Challenge of sectoral integration

Multiple scales



Challenge of crossing administrative boundaries

The concept of landscape governance tries to overcome these challenges by facilitating spatial and integrated decision-making which is multi-actor, multi-sector and multi-scale (GLF Landscape Academy).

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Multi-functionality of landscapes

Competing claims on the user rights of landscape functions between stakeholders

Range of overlapping claims across the landscape

Governance systems (administrative boundaries) do not match with socio-ecological systems boundaries

Partial/sectoral policies

Policy conflicts

Sectoral silos

Issues across the landscape are dealt with in isolation

Sectoral governance does not provide integrated & spatially explicit landscape solutions!

Spatial segregation

Traditional governance systems address parts/elements of the landscape and do not allow for recognizing interconnectedness

Topic 2:

2.8 Landscape suitability for FLR

with reference to FLR Module 1: Principle 2

Landscape suitable for restoration:

- Ecologically (climate, soils, hydrology, competing vegetation) suitable for restoration
- Indigenous planting material available
- Empowered local communities
- Market forces do not promote competing land use
- Existing markets for products from restored areas



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Landscapes need to have the following features to be suitable for restoration

- Ecologically (climate, soils, hydrology, competing vegetation) suitable for restoration
- Indigenous planting material available
- Empowered local communities
- Market forces do not promote competing land use
- Existing markets for products from restored areas

Topic 2:

2.9 Negotiated change logic

with reference to FLR Module 1: Principle 6

- **FLR needs to be tailored to local conditions**
- **Discuss trade-offs & compensation**
- **Refer international best practice guidelines** (e.g. IUFRO FLR Practitioner's Guide)
- **Landscape-level FLR planning** (e.g. through land use planning)
 - Determine availability of land for FLR
 - Zoning to define spatial location of FLR activities
 - Action planning to define roles and responsibilities, resources and timelines
 - By-laws to define rules



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Refer to multiple scales – national, regional, landscape

Negotiated planning for FLR needs to consider

- **Root causes** of forest degradation -> often governance failures.
- **Scaling up** – more actors = further complexity in governance matters.
- **Tenure and rights** – In landscapes, often a range of tenure and rights systems (or even unclear tenure)
- **Competing land use** – Allocating land for forest restoration signifies that land can't be used for other purposes (e.g. food production or mining) -> unclear or poor governance exacerbates conflicts.
- **New value is generated** - by returning trees and forests to the landscape -> potential for powerful actors taking over landscapes are complex and unique social constructs and as such, integrated landscape and forest landscape approaches require adequate planning and monitoring tools at the national and local levels. Past experience with broad-scale restoration has shown the importance of defining and reconciling multiple objectives, a process that begins with well-defined goals.

There are many available tools for project planning at different scales, but in many cases these may need to be adapted to support FLR implementation. Key messages on FLR

project planning and monitoring approaches include the need for local involvement and integration of national, sub-national and local planning with implementation in a flexible and adaptive manner in order to achieve long-term success

Topic 2:

References and resources

- Mansourian, S., 2017. *Governance and forest landscape restoration: A framework to support decision-making*. *Journal for Nature Conservation* 37, 21–30.
- Mansourian, S. (2021). *Disciplines, Sectors, Motivations and Power Relations in Forest Landscape Restoration*. *Ecological Restoration* 39(1), 16-26.
<https://www.muse.jhu.edu/article/793656>
- Stanturf J.A., Kleine M., Mansourian S. et al. (2017/2019/2020). *Implementing Forest Landscape Restoration: A Practitioner's Guide* (EN, FR, SP). Available at: <https://www.iufro.org/science/special/spdc/netw/flr/flr/pract-guide/>



Topic 2:

Small group questions

1. Which enabling conditions proved to be crucial in your FLR project / an FLR project known to you?
2. Do all enabling conditions need to be present for FLR to be successful?
3. Analyse your FLR situation in the context of the different enabling conditions!
4. Can you initiate FLR in case of insecure land tenure?



Topic 2:

Student assignments

Analyse your FLR project / an FLR project well-known to you in terms of the 12 enabling conditions:

1. To what extent do local conditions for each of the 12 categories enable / hamper the FLR intervention?
2. Are there any knock-out conditions which must be in place for your FLR intervention to be successful?
3. How can you overcome weaknesses in certain enabling conditions in your FLR project?



Topic 3: Designing an FLR project



Learning activities:

Class presentation, small group questions and student assignments.



Learning outcome:

By the end of Topic 3, students will be able to understand and design an FLR project applying the project cycle management approach involving phases such as visioning, conceptualising, acting and sustaining. In this way, FLR as an intervention into a social-ecological system becomes more transparent and manageable.

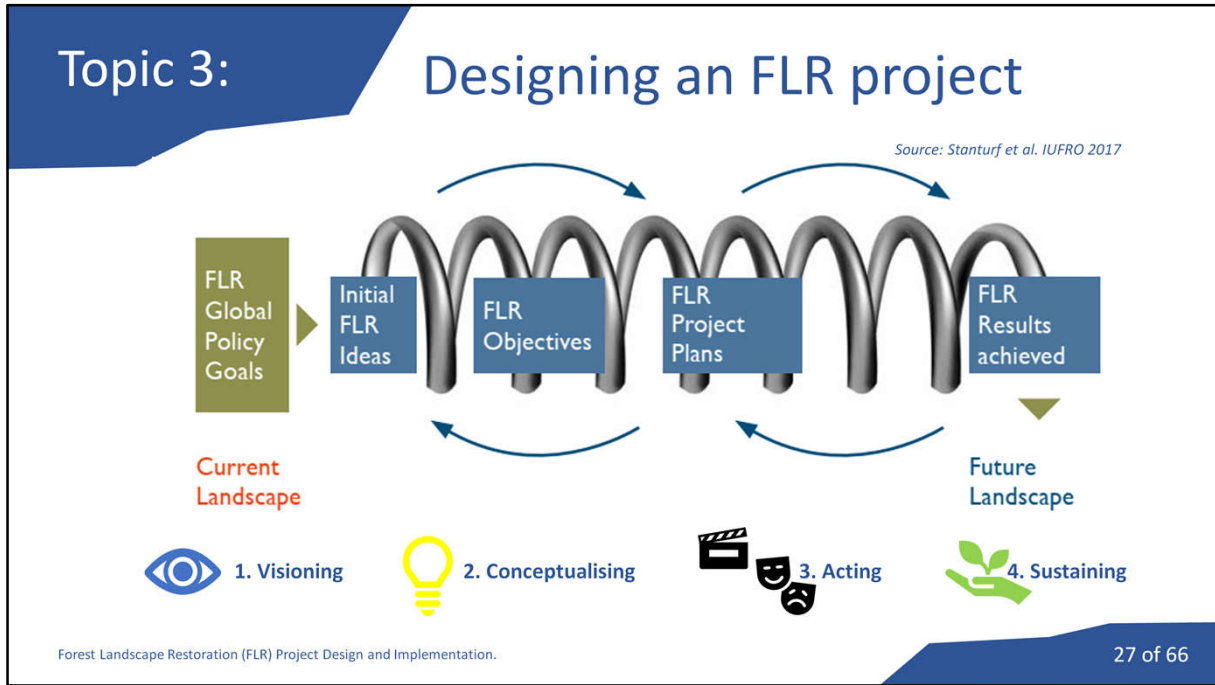
Topic 3:

Designing an FLR project

- **FLR is a cyclic process with constant feedback loops between:**
 - Conceptualization
 - Implementation and
 - Impact assessment of an FLR process
- **This cycle may be pursued at various scales**

FLR translates global policy goals into restoration achievements on the ground

- FLR is a cyclic process with constant feedback loops between conceptualization, implementation and impact assessment of an FLR process
- This cycle may be pursued at various scales
- FLR consists of four phases, which are visioning, conceptualizing, acting and sustaining

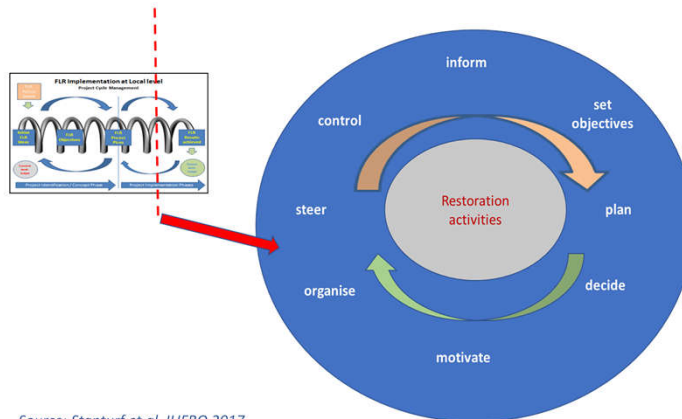


Topic 3:

Designing an FLR project

FLR and the project cycle management framework:

- The project cycle management approach provides a useful framework for FLR to account for a constantly evolving socio-economic, political and natural environment
- FLR requires constant stakeholder engagement for planning, coordination, and adaptive management



Source: Stanturf et al. IUFRO 2017

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- The project cycle management approach provides a useful framework for FLR to account for a constantly evolving socio-economic, political and natural environment
- FLR requires constant stakeholder engagement for planning, coordination, and adaptive management
- Monitoring, learning, and redefining targets is a continuous process throughout the FLR project cycle

Topic 3:

3.1 Visioning FLR

Key points to consider for an FLR vision:

- Scale - national or landscape
- National commitments - Bonn Challenge, LDN Targets, etc.
- Context - e.g. tenure
- Baseline conditions - landscape “suitability”
- Social & Ecological Goals - national or landscape

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There are Key points to consider for developing an FLR vision

- Scale is the vision at the national or the landscape scale?
- National commitments does the vision contribute to achieving Bonn Challenge, LDN Targets, etc.
- Context is the vision adequate for the context, e.g. tenure?
- Baseline conditions How is the landscape “suitability” for FLR?
- Social & Ecological Goals Does the vision contribute to national or landscape social and ecological goals?

Topic 3: 3.1 Visioning FLR

- Job Creation
- Alternative Livelihoods
- Ecosystem Services



Source: journals.openedition.org

- Tenure
- Governance



Source: Kelly Lacy, Pexels.com



Source: Binyamin Mellish, Pexels.com

- Free Prior Informed Consent
- Participatory Planning
- Co-Management



Source: FZS Peru

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In terms of the social context, the need to emphasize local community members is very important.

The FLR vision should ideally pursue livelihood development targets, such as job creation and alternative livelihoods emerging from the FLR process (e.g. new jobs in ecotourism, nurseries, NTFP processing. etc.)

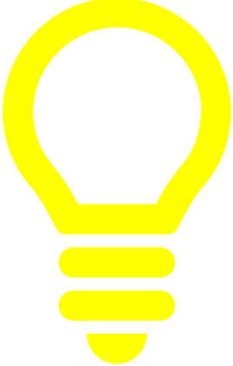
Engagement of local communities needs to follow the principle and procedures of Free, Prior, Informed Consent and the planning of FLR activities needs to engage local communities. In case of government dominated land tenure, comanagement arrangements with local communities are ideal.

The governance and tenure aspects of FLR are essential features. FLR needs to be responsive to local tenure and the setting up of multistakeholder governance arrangements early in the process is important.

Topic 3: 3.2 Conceptualising FLR

Key points to consider for conceptualizing FLR:

- Prioritize landscapes & units within landscapes
- Turn goals into objectives
- Connect starting point with the ending point
- Define the causal connection “how to get from point A to B”



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There are a few key points to consider for conceptualizing FLR

- Prioritize landscapes & units within landscapes - this needs to be done along a hierarchic set of criteria in a manner transparent to all stakeholders
- Turn goals into objectives - objectives need to be long-term, but measurable in terms of impacts
- Connect starting point with the ending point - this is to define the FLR project’s storyline from its starting point to its end point.
- Define the causal connection “how to get from point A to B”, also called “Theory of Change”, or “change logic”

Topic 3:

3.2 Conceptualising FLR

Defining objectives for FLR:

- What is the ecosystem baseline and what are the social characteristics?
- What needs to be repaired or improved?
- What needs to be maintained or preserved?
- What are feasible interventions?

Focus on two questions:

- Do we have the conditions we want?
- Do we want a given condition?

Do we have it?

NO

YES

Achieve	Avoid
Preserve	Eliminate

YES

NO

Do we want it?

Answering these two questions leads to four possible objectives of preserving or eliminating current conditions, or achieving or avoiding certain future conditions.

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When defining objectives, one needs to ask a few helpful questions. These include:
 What is the ecosystem baseline and what are the social characteristics?

- What needs to be repaired or improved?
- What needs to be maintained or preserved?
- What are feasible interventions?

It is particularly helpful to focus on two issues:

- Do we have the conditions we want?
- Do we want a given condition?

The answers to these two questions define the type of objective setting we need. For example, if we have invasive alien species, it is a condition we have, but probably don't want. This puts us into the category "eliminate" in the small matrix at the bottom right of the slide. So it is helpful to start your objective with the word "Eliminate".

Topic 3:

3.2 Conceptualising FLR



Example of defining project goals & objectives in the overall project context – South Pacific

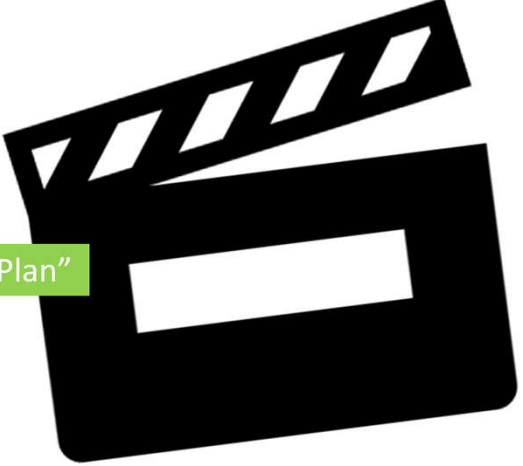
	Goal	Objective	Activity
Meaning	Purpose of FLR project	Accomplishment	Activities that result in accomplishment
Measure	Not measurable/tangible	Measurable	Sequenced list of what, where, when, by whom, at what cost
Timeframe	Long-term	Short to mid-term	Short to mid-term
FLR example	Secure the unique biodiversity of Gau Island, continued provision of ecosystem goods and services from forest ecosystems and build climate change resilience	Restore 20 ha of key riparian and coastal areas around Sawaieke and Navukailagi villages	Activity.1.1 Conduct feasibility study on sites for reforestation (with communities involving Conservation officers, Provincial Office and Ministry of Forestry)

Topic 3: 3.3 Acting FLR

Develop a detailed plan for FLR:

- What will be done
- Where will it be done?
- When will it be done?
- By whom will it be done?
- At what cost and from whose resources will it be done?

“Action Plan”



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Next, we get to the “Acting” stage of FLR. Here is where most of the action happens. **The helping questions for the “Acting” phase help you to Develop a detailed planning for FLR**

- What will be done?
- Where will it be done?
- When will it be done?
- By whom will it be done?
- At what cost and from whose resources will it be done?

Once you have the information together to answer all these questions related to one or more specific overarching objectives, you can easily put together an FLR action plan. This will be your blueprint for implementing activities on the ground.

Topic 3:

3.3 Acting FLR



Example of an action plan

Sl. No.	Action	Lead implementer	External assistance	Timeframe
1	Establish Multi Purpose Tree Nursery for 10000 seedlings	Local community	Forestry Department	December 2020
2	Carry out contour bunding on 20 ha against soil erosion	Local community	Department of Horticulture Department of Soil and Water Conservation	February 2021
3	Carry out afforestation on 150 ha	Forest Department Local community Land owners	Department of Soil and Water Conservation NGO	June 2021
4	Plant leguminous trees in shifting cultivation fallows on 15 ha	Land owners Department of Horticulture	Forest Department	June 2021
5	Establish horticulture plantation for income generation on 30 ha	Land owners Department of Horticulture	Private investors	June 2022
6	Avenue Plantation and Landscaping along 5 km of roads	Department of Roads	Forest Department Community Council	June 2021

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We have just spoken of the FLR action plan. On this slide you can see a simplified version of such an FLR action plan. This contains an overview of activities that need to be implemented, clarifies the area of interventions, responsibilities, collaboration and timeframe. In addition, it is useful to list the proposed budget and the source of funding to this table. Each activity, particularly the larger ones will require subordinate more detailed planning.

Topic 3:

3.3 Acting FLR




Example of defining project activities in the overall project context – South Pacific

	Goal	Objective	Activity
Meaning	Purpose of FLR project	Accomplishment	Activities that result in accomplishment
Measure	Not measurable/tangible	Measurable	Sequenced list of what, where, when, by whom, at what cost
Timeframe	Long-term	Short to mid-term	Short to mid-term
FLR example	Secure the unique biodiversity of Gau Island, continued provision of ecosystem goods and services from forest ecosystems and build climate change resilience	Restore 20 ha of key riparian and coastal areas around Sawaieke and Navukailagi villages	Activity.1.1 Conduct feasibility study on sites for reforestation (with communities involving Conservation officers, Provincial Office and Ministry of Forestry)

Topic 3: 3.4 Sustaining FLR

Key aspects of sustaining FLR:

- Monitoring
- Adaptive management
- Evaluation
- Knowledge management
- Capacity development



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Next, we get to the “Sustaining” phase of FLR. This phase has a temporal overlap with the Conceptualization and Acting phase, given that monitoring, adaptive management, capacity development and knowledge management are continuous processes that need to accompany implementation. It is not sufficient to think of monitoring once implementation has started or worse, once it has ended.

Topic 3:

3.4 Sustaining FLR

Example of sustaining in the overall project context – South Pacific

	Goal	Objective	Activity
Meaning	Purpose of FLR project	Accomplishment	Activities that result in accomplishment
Measure	Not measurable/tangible	Measurable	Sequenced list of what, where, when, by whom, at what cost
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FLR monitoring	Impact monitoring	Output monitoring	Process monitoring

Topic 3:

References and resources

- European Commission, 2004. *Project Cycle Management Guidelines*. Europe Aid Cooperation Office. 158 p. (available online at https://ec.europa.eu/international-partnerships/system/files/methodology-aid-delivery-methods-project-cycle-management-200403_en.pdf) [accessed on 27 June 2021]
- Stanturf J.A., Kleine M., Mansourian S. et al. (2017/2019/2020). *Implementing Forest Landscape Restoration: A Practitioner's Guide* (EN, FR, SP). Available at: <https://www.iufro.org/science/special/spdc/netw/flr/flr/pract-guide/>
- Stanturf J. A., Mansourian S., Darabant A. et al. (2020). Occasional Paper No. 33 - *Forest Landscape Restoration Implementation: Lessons learned from selected landscapes in Africa, Asia and Latin America*, pp 63. Available at: <https://www.iufro.org/publications/series/occasional-papers/article/2020/02/14/occasional-paper-no-33-forest-landscape-restoration-implementation-lessons-learned-from-selected/>

Topic 3:

References and resources

Example for **visioning** from Peru titled „Sustained water supply for Apurimac Region”

- <https://www.youtube.com/watch?v=T152nbRYGcM&feature=youtu.be>

• Example for **sustaining** from Ghana:

- <https://www.youtube.com/watch?v=1kcVIDEN31Q>



Topic 3:

Small group questions

1. What capacities / skills are needed for successful implementation of each of the four phases of designing and implementing FLR?
2. How would you develop an action plan for implementing your FLR project and what specifically would it contain?
3. At what stage and in which form do you need to design the monitoring component of your FLR project?
4. How can you use monitoring in adjusting the actions you implement in your FLR project?



Topic 3:

Student assignments

Design a hypothetical FLR project for your landscape along the four phases of FLR:

- Identify a vision for your restored landscape
- Define goals and objectives and think of the theory of change for your landscape
- Prepare an FLR action plan, taking into account the actions necessary to achieve the targeted objectives
- Define monitoring procedures to keep track of progress and impacts



Topic 4:

Innovative technical restoration approaches



Learning activities:

Class presentation, small group questions and student assignments.



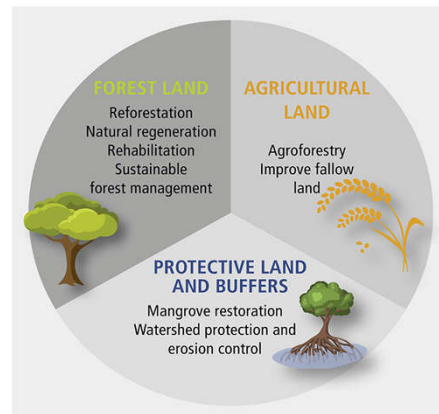
Learning outcome:

By the end of Topic 4, students will have obtained a good overview about the spectrum of technical approaches, methods and tools available to support forest landscape restoration in tropical regions.

Topic 4:

4.1 Context: *Alternative Future Land Use for Restoring Mosaic Landscapes*

- Productive agriculture
- Mixed agroforestry with woody perennials integrated into crop and livestock systems
- Actively managed, productive forests
- Passively managed, protected forests



Source: www.globalnpo.org

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We need to orient ourselves in the context of landscape mosaics to identify options for restored landscapes, which in turn inform viable FLR techniques. Fundamental distinction needs to be made between forest land, agricultural land and land fulfilling general protective and buffer functions.

Based on our location in the matrix landscape, our targeted restored land use types may include:

- Productive agriculture
- Mixed agroforestry with woody perennials integrated into crop and livestock systems
- Actively managed, productive forests
- Passively managed, protected forests, and others.

Topic 4:

4.2 Starting Point: *Where to Begin, What to Restore?*

- Soil/site degradation
- % cover
- Species composition
- Stand or landscape structure
- Function

Source: Stanturf et al. IUFRO 2017

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We need to identify what we want to restore or rehabilitate. Is our intention to bring back the original native vegetation or are we looking at restoring ecosystem functions, possibly through the use of non-native species assemblages?

An assessment of the level of land conditions and of the land use type we are operating in is particularly helpful in this context.

To get an understanding of where we are we may identify the following information:

- Soil/Site Degradation
- % cover
- Species composition
- Stand or Landscape Structure
- Function


This will help us to determine our starting point from where it is easier to define our target point.

We may for example be in a managed forest that is artificially regenerated and our target may be to transition to natural regeneration. Or we may be in a landscape of intensive swidden farming that we may want to restore through extended fallow periods into degraded forest.

Topic 4: 4.3 Passive vs. active techniques

Passive Approaches:

- Natural Regeneration
- Farmer Assisted Natural Regeneration



Source: Brian Lockhart, USDA Forest Service, Bugwood.org

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Active Approaches:

- Artificial Regeneration (planting)
- No forest cover
 - Agroforestation
 - Afforestation
- Degraded cover
 - Manipulate structure
 - Manipulate composition
- How much of the landscape to be treated
- Planting designs vary

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FLR technologies can be classified into passive and active approaches.

Options for passive approaches include:

- Natural Regeneration
- Farmer Assisted Natural Regeneration

Active approaches on the other hand include

- Artificial Regeneration (planting)
- No forest cover
 - Agroforestation
 - Afforestation
- Degraded cover
 - Manipulate structure
 - Manipulate composition
- How much of the landscape to be treated

- Planting designs vary

Topic 4:**4.4 Manipulating Vegetation**

- **Remove unwanted vegetation**
- **Add vegetation by passive means**
 - Natural regeneration/native recolonization
- **Add vegetation by active means**
 - Direct seeding
 - Planting
 - Combination



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Most FLR interventions will include manipulation of vegetation. There are several conceptual options for this that include techniques to:

- Remove unwanted vegetation
- Add vegetation by passive means
 - Natural regeneration/native recolonization
- Add vegetation by active means
 - Direct seeding
 - Planting
 - Combination



Topic 4: 4.5 Natural Regeneration

Positives:

- Minimizes restoration costs
- Secures locally adapted genotypes
- Promotes development of natural biodiversity

Negatives:

- Source of desired species has been eliminated or too far away
- Altered edaphic, hydrologic or climatic conditions can prevent natural establishment of regeneration
- Local genotypes may not be adapted to future climate
- Lack of activity may be misinterpreted

Source: Kenneth M. Gale, Bugwood.org

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Natural regeneration and other nature-based solutions should be given preference to other methods for reasons of cost efficiency, environmental sustainability, adaptiveness and resilience against external stressors.

The advantages of natural regeneration include:

- Minimizes restoration costs
- Secures locally adapted genotypes
- Promotes development of natural biodiversity

Natural regeneration also has disadvantages that include:

- Source of desired species has been eliminated or too far away
- Altered edaphic, hydrologic or climatic conditions can prevent natural establishment of regeneration
- Local genotypes may not be adapted to future climate
- Lack of activity may be misinterpreted

Topic 4:

References and resources

- Stanturf J.A., Kleine M., Mansourian S. (Eds.), (2017/2019/2020). *Implementing Forest Landscape Restoration: A Practitioner's Guide* (EN, FR, SP). Available at: <https://www.iufro.org/science/special/spdc/netw/flr/flr/pract-guide/>
- Stanturf, J.A., Kleine, M., Mansourian, S., Parrotta, J., Madsen, P., Kant, P., Burns, J., Bolte, A., 2019. *Implementing forest landscape restoration under the Bonn Challenge: A systematic approach*. *Annals of Forest Science* 76.



Topic 4:

Small group questions

1. What restoration techniques are you familiar with in your landscape context?
2. What land use / land cover types exist across your landscape and what restoration techniques can be applied on them?
3. Please analyse the financial and economic costs and benefits of natural versus artificial regeneration in your FLR context!
4. What ecosystem functions would you like to restore in your landscape and what technologies are most appropriate to achieve these?



Topic 4:

Student assignments

1. Building on the landscape analysis exercise conducted under Topic 1, and the hypothetical FLR implementation plan prepared under Topic 4, identify the best suited restoration approaches and tools for each landscape element in your landscape
2. For each restoration approach / tool, list opportunities and challenges
3. Identify how to overcome the challenges for successful implementation of each of the approaches



Topic 5:

Monitoring short- and long-term restoration progress and impact



Learning activities:

Class presentation, small group questions and student assignments.



Learning outcome:

By the end of Topic 5, students will understand the rationale for monitoring FLR and be familiar with the methods and tools of cost effective monitoring. In addition, the role of monitoring in adaptive management as a means to gradually shift to more sustainable land use has been clarified.

Topic 5:

5.1 Purpose of monitoring

- Need to keep track of progress to show success / failure
- To determine whether further action is needed
- Keep track of risks & negative impacts for mitigation
- Build on knowledge for upscaling
- Jointly generate information to build transparency & trust
- Report to investors
- Communicate results

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Purpose of monitoring:

1. Need to keep track of progress to show success / failure
2. To determine whether further action is needed
3. Keep track of risks & negative impacts for mitigation
4. Build on knowledge for upscaling
5. Jointly generate information to build transparency & trust
6. Report to investors
7. Communicate results

Topic 5:

5.2 Monitoring in FLR

Forest Landscape Restoration:

- Slow – long-term
- Dispersed – trees in pockets of landscape
- Diverse goals – complex social-ecological systems

}

Need innovative approaches for monitoring, conventional forest monitoring won't do

Source: Stanturf et al. 2019; WRI 2019

Forest Landscape Restoration (FLR) Project Design and Implementation.

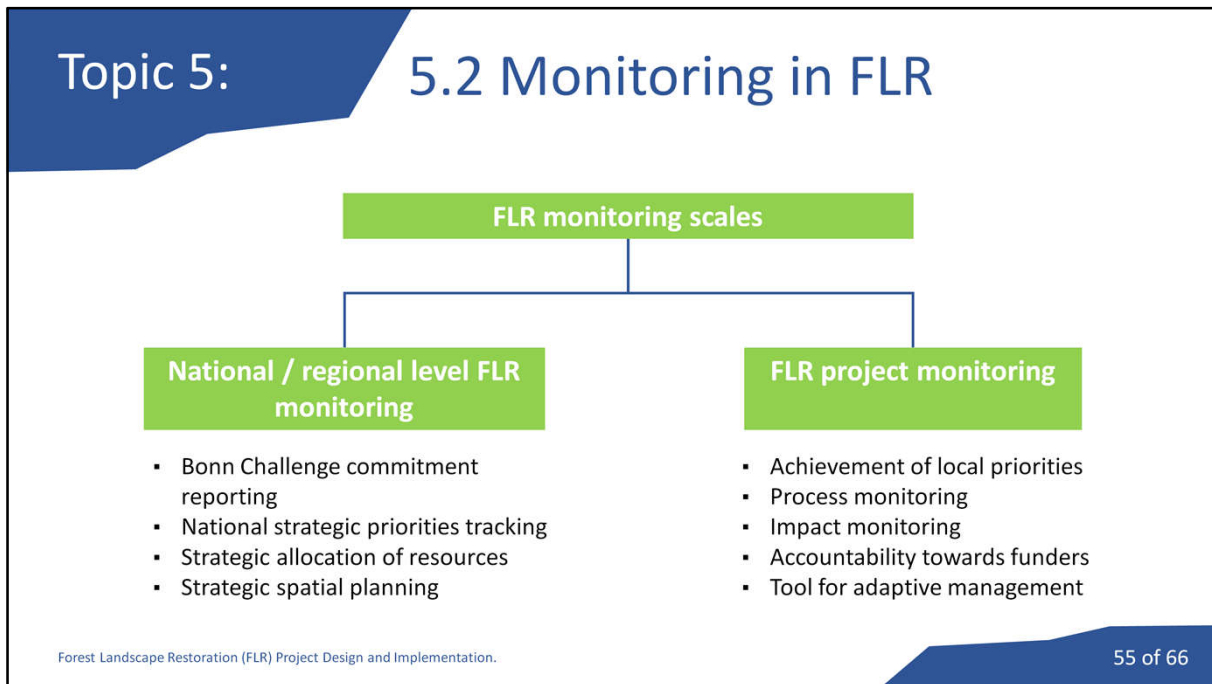
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Monitoring in FLR has few peculiarities that sets it apart from monitoring of other land-based interventions

FLR is

- Slow – which means we look at long time frames
- Dispersed – restoration activities are scattered across the landscape. For example, we may plant individual trees in pockets of landscape
- Diverse goals – FLR pursues goals that may be of social, environmental and economic nature. FLR deals with natural mosaic landscapes including all its actors- These are complex social-ecological systems

As a result, FLR needs innovative monitoring mechanisms and conventional forest monitoring systems alone are not adequate to answer all monitoring questions of FLR



There are two fundamental scales in FLR monitoring:

One deals with national or regional level monitoring of FLR and serves the following specific functions:

- Bonn Challenge commitment reporting
- National strategic priorities tracking
- Strategic allocation of resources
- Strategic spatial planning

The other deals with project level monitoring of FLR and we will devote substantially more attention to this latter aspect. This focuses on:

- Achievement of local priorities
- Process monitoring
- Impact monitoring
- Accountability towards funders
- Tool for adaptive management

Topic 5:

5.3 National level in FLR monitoring

Example: IUCN Bonn Challenge Barometer

Monitors progress in terms of:

- Policies & institutions
- Financial flow
- Technical planning
- Restoration monitoring
- Capacity assessment
- Hectares under restoration
- Climate mitigation
- Biodiversity impacts
- Socio-economic impacts

Source: IUCN 2017

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For monitoring of FLR at the national level a prominent examples is the IUCN Bonn Challenge Barometer, which tracks progress in terms of :
Monitors progress in terms of:

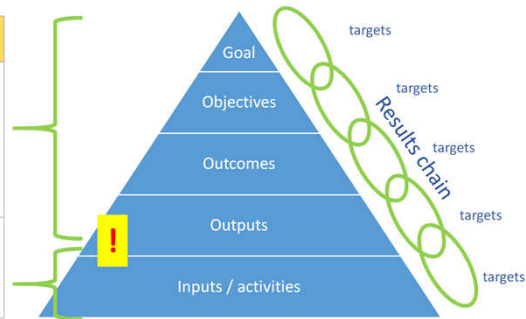
- Policies & institutions
- Financial flow
- Technical planning
- Restoration monitoring
- Capacity assessment
- Hectares under restoration
- Climate mitigation
- Biodiversity impacts
- Socio-economic impacts

Topic 5:

5.4 Project monitoring in FLR

Capture results at different spatial and temporal scales:

Type	Contents
Impact Monitoring	Achievement of social, economic & ecological goals & objectives, including changes of biophysical conditions frequently based on surveys
Process Monitoring	Keeping track of implementing on-going project activities e.g. of implementing annual work plan



At the scale of FLR project monitoring, monitoring captures results at different spatial and temporal scales along the results chain. The fundamental types of FLR project monitoring include impact monitoring and process monitoring. Impact monitoring tracks results at the level of Objectives, Outcomes and Outputs, whereas process monitoring mostly operates at the level of activities and to some extent at the level of Outputs.

Impact monitoring tracks the **Achievement of social, economic & ecological goals & objectives, including changes of biophysical conditions frequently based on surveys**
 Process monitoring on the other hand keeps track of implementing on-going project activities e.g. of implementing annual work plan

Topic 5: 5.5 FLR Project Monitoring & RBM

- Monitoring integral part of project implementation
- Takes place continuously throughout project management cycle
- Informs adaptive management

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Monitoring takes part throughout the FLR project cycle, lessons are continuously learned that lead to the setting of new objectives, the implementation of which once again is tracked and leads to new learning.

- Monitoring integral part of project implementation
- Takes place continuously throughout project management cycle
- Informs adaptive management

Topic 5:

5.5 FLR Project Monitoring & RBM

	Goal	Objective	Plan
Definition	Purpose of FLR project; not measurable; long-term	Accomplishment; measurable; mid-term	Activities; list of actions; short-term
FLR Example 1	Restore degraded land along river basin	20 m buffer along rivers	Plant 100 ha of native species along rivers in Kigali province by end of 2022 by local farmers
FLR Example 2	Increased forest cover	3000 ha of new forest established	Plant 100 ha <i>Entandophragma excelsum</i> in block mixture in Kigali province by 2023
FLR monitoring type	Impact monitoring	Impact monitoring	Process monitoring

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The slide presents an example of FLR monitoring at various levels of the results hierarchy, consisting of goals, objectives and plans. Goals describe the purpose of the FLR project that is not measurable and has a long time frame.

Discrepancy between 3000 ha of new forest established and the planting of 100 ha results from the fact that only one exemplary activity is listed. The full FLR implementation plan will list several activities, which add up to the achievement of the objective

Topic 5:

5.6 Monitoring of FLR projects

Strategic monitoring integral part of FLR - informs *adaptive management*:

- Agree on goods and services that forests should provide (impacts)
- Identify what to monitor (develop criteria related to objectives)
- Define indicators / metrics
- Establish baseline & define targets
- Establish threshold points where further intervention is needed (e.g. seedling survival)
- Develop a sampling design (measure indicators of the selected criteria)
- Collect data and analyze
- Evaluate results and communicate to stakeholders
- Re-evaluate the process for guiding future efforts – adaptive management

Strategic monitoring integral part of FLR: informs adaptive management

1. Agree on goods and services that forests should provide (impacts)
2. Identify what to monitor (develop **criteria** related to objectives)
3. Define indicators / metrics
4. Establish baseline & define targets
5. Establish threshold points where further intervention is needed (e.g., seedling survival)
6. Develop a sampling design (measure **indicators** of the selected **criteria**)
7. Collect data and analyze
8. Evaluate results and communicate to stakeholders
9. Re-evaluate the process for guiding future efforts – adaptive management

Topic 5: 5.7 Operationalization of monitoring

Steps to identify priorities & indicators for FLR monitoring:

1 Why Restoration? 2 Which Land Use? 3 Which Barriers to Sustainability? 4 Which Constraints & Priorities? 5 Which Data? 6 Which Indicators and metrics? 7 What Index?

DETERMINE Goals, Land Use, and Barriers

FILTER by Constraints, Priorities, and Data Availability

SET UP system based on Indicators, Metrics and Optional Index

Source: WRI 2019

- Goals & objectives must be clear
- Data availability, costs, human & technological constraints must be assessed
- Indicators to be defined – need to be “SMART”

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Monitoring needs to be objective and therefore requires a transparent metric. Once clear objectives have been defined, the availability and usefulness of data needs to be considered. Based on this, indicators need to be defined that fulfil so-called SMART criteria.

- Goals & objectives must be clear
- Data availability, costs, human & technological constraints must be assessed
- Indicators to be defined – need to be “SMART”

SMART stands for “specific”, “measurable”, “attainable”; “relevant”; and “timely”.

Topic 5:**5.8 Key FLR monitoring lessons**

- Explicitly state the objectives of monitoring
- Engage stakeholders in design & implementation of monitoring
- Provide adequate funding
- Collect only as much data as needed and will be used for analysis
- Use results to influence management decisions (i.e., adaptive management framework)
- Don't get confused with the many proposed frameworks out there – learn from them and devise the best for your situation!

Key FLR monitoring lessons include:

- Explicitly state the objectives of monitoring
- Engage stakeholders in design & implementation of monitoring
- Provide adequate funding
- Collect only as much data as needed and will be used for analysis
- Use results to influence management decisions (i.e., adaptive management framework)
- Don't get confused with the many proposed frameworks out there – learn from them and devise the best for your situation!

Topic 5:

References and resources

- *Restoration Opportunities Assessment Methodology (ROAM)*. Available at: <https://www.iucn.org/theme/forests/our-work/forest-landscape-restoration/restoration-opportunities-assessment-methodology-roam>
- *Forest Landscape Assessment Tool (FLAT)*, a set of tools for determining ecological conditions and potential threats to forest ecosystems. Available at: <https://www.treesearch.fs.fed.us/pubs/53245>
- Stanturf J.A., Kant P., Lillesø J.-P.B., Mansourian S., Kleine M., Graudal L. and Madsen P., 2015. *Forest landscape restoration as a key component of climate change mitigation and adaptation*. Vienna: IUFRO World Series Volume 34. 72 p.
- <https://files.wri.org/d8/s3fs-public/mapping-together.pdf>



Topic 5:

Small group questions

1. Can you list a few examples of SMART indicators?
2. How would you approach designing the monitoring framework for your FLR project?
3. What are examples for impact indicators in your FLR project?
4. What are examples for process indicators in your FLR project?



Topic 5:

Student assignments

1. For your hypothetical FLR implementation plan prepared under Topic 4, define a list of SMART indicators to keep track of the achievement of objectives.
2. For each indicator, define the mode and frequency of their measurement



Module 2: Credits

Module 2 was developed for ITTO and IUFRO under the GEF-approved project “Fostering Partnerships to Build Coherence and Support for FLR”, which supports the Collaborative Partnership on Forests (CPF) Joint Initiative on FLR.

The following institutions and people collaborated on this module:

- **Institutions:** International Union of Forest Research Organizations (IUFRO)
- **Contributors:** Dr. Andras Darabant, Janice Burns (MSc.), Prof. Dr. John A. Stanturf
- **Layout supporter:** Shona Smith
- **Reviewer:** Dr. Michael Kleine

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