Methodological framework and assessment of potential financial risks associated with biodiversity loss and ecosystem degradation

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Objectives

The aim is to understand the adverse impacts of biodiversity loss and ecosystem degradation on financial systems, the current state of nature risk identification, and develop a methodological framework for assessing financial risks.

Current state analysis: Summarize the existing status of biodiversity and ecosystem risk identification, assessment, and management approaches by financial institutions and stakeholders, evaluating the advantages and drawbacks.

Sectoral impacts: Examine and map adverse economic impacts of biodiversity loss and ecosystem degradation on the economy, their transmission channels and determine which EU sectors will face the most significant financial risk.

Methodological framework development: Build a comprehensive methodological framework to assess financial risks stemming from biodiversity loss and ecosystem degradation for the financial entities and the broader financial sector.
Overview of current best practices
Part 1

Overview of current best practice

- Terminology
- Assessments – exposure and materiality
- Mitigation approaches

Sectoral exposure in the EU

- Rationale and identification of exposed sectors
- Prioritization considering EU economic relevance
- Case studies
Risk categorisation

Transmission channels

Risk Drivers
- Land use change
- Climate change
- Resource use
- Pollution
- Invasive alien species

Risk Types
- Physical risks
  - Acute
  - Chronic
- Transition risks
  - Policy/legal
  - Tech
  - Market
  - Reputation

Systemic dimension of risk propagation

Financial risks
- Credit
- Market
- Liquidity
- Underwriting
- Operational

Risk categorisation

Risk Drivers
- Land use change
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- Physical risks
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  - Policy/legal
  - Tech
  - Market
  - Reputation

Systemic dimension of risk propagation

Transmission channels
- Micro
- Meso
- Macro

Risk categorisation
Risk types

Physical risks
- Acute
- Chronic

Physical interruption of the system
- Landslides, chemical water pollution through water discharges

Transition risks
- Policy/legal
- Tech
- Market
- Reputation

Misalignment to a changing regulatory, policy or societal landscape
- New legislation or technologies
- Changing consumer demands (e.g. less meat consumption)
- Reputation (e.g. climate-related court cases)

Systemic dimension
- Interruption of a system of global proportions – nature-related but also in relation to the financial market
  1) Compounding effects (ecosystem)
  2) Cascading effects (economies)
  3) Contagion effects (financial sector)
Transmission channels

Micro

Meso

Macro

Financial risks

- Credit
- Market
- Liquidity
- Underwriting
- Operational

Can also take effect at sector level

- Disruption of activities/value chain
- Increased litigation

- Changing demand
- Raw material price volatility
Risk Assessment

Risk Types
- Physical risks
  - Acute
  - Chronic
- Transition risks
  - Market
  - Tech
  - Policy
- Systemic dimension of risk propagation

Transmission channels
- Micro
- Meso
- Macro

Risk Drivers
- Land use change
- Climate change
- Resource use
- Pollution
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Financial risks
- Credit
- Market
- Liquidity
- Underwriting
- Operational

Sources of variability

Risk Assessment
- Exposure assessment
  - Impacts
  - Dependencies
- Materiality assessment

Economy and financial system feedback effects
Nature feedback effects

Mitigation Approaches
Applied to

Trinomicons
Risk assessment

1. Exposure assessment

What are a financial institution’s impact and dependencies?

- Transition risk
- Physical risk

Tools aid in the assessment, i.a.:
- Impacts (ENCORE, BFFI)
- Dependencies (ENCORE, BFFI)
- Temporal (GLOBIO, PDF)
- Spatial (IBAT, GBSFI, GLOBIO)
- Intersectorality (IBAT, WWF Risk Filter, EXIOBASE)

2. Materiality assessment

How severe and what magnitude is the financial risk?
Mitigation: Be Proactive

Mitigation hierarchy as general guideline

1 At project/programme level

- Avoid
- Minimize
- Restore
- Offset
- Restore

No net-loss

Engagement programmes

Financial institutions need to understand actions of their investees to demand appropriate actions, i.a.

- Due diligence and environmental impact assessments
- Biodiversity Action Plans
- ESG integration, data disclosure and enhanced reporting requirements
- Incentives and rewards
- Formalise and integrate new strategies and policies
Mitigation: Be Proactive

2. At institutional level

Three main approaches:

1) **Finance-focused mitigation**, e.g. funds for activities that benefit ecosystems – protect and restore

2) **Operational transformation**, e.g. CSR

3) **Risk assessments** and their integration into decision-making as the fundamental step to enable all of the above
Assessing sectoral exposure in the EU
Sectoral exposure in the EU

Rationale:

- Illustrate and examine exposure to nature-related risk
- Understand the elements required to develop sector-specific guidelines to assess and report on nature related risk
- Develop detailed sector-specific assessment of most exposed sectors

Assessment of exposure based on:

- Review of relevant studies and reports
- Stakeholder consultation and engagement
- Reliance on specific tools, models and databases
### Sectors exposed

<table>
<thead>
<tr>
<th>Industry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture and Farming</td>
<td>Water and Waste Services / Water Utilities</td>
</tr>
<tr>
<td>Forestry</td>
<td>Construction and Engineering</td>
</tr>
<tr>
<td>Fishing and Aquaculture</td>
<td>Retail Sale</td>
</tr>
<tr>
<td>Metals and Mining</td>
<td>Air Transportation</td>
</tr>
<tr>
<td>Oil and Gas</td>
<td>Water Transportation</td>
</tr>
<tr>
<td>Automobile and Components</td>
<td>Hospitality, Food and Beverage Services</td>
</tr>
<tr>
<td>Biotechnology and Pharmaceuticals</td>
<td>Hotels and Lodging / Accommodation</td>
</tr>
<tr>
<td>Chemicals (and Biofuels)</td>
<td>Media and Communication / Digital Communication</td>
</tr>
<tr>
<td>Household and Personal Products</td>
<td>Real Estate Services</td>
</tr>
<tr>
<td>Construction Materials</td>
<td>Health Care Delivery</td>
</tr>
</tbody>
</table>

**Industries Exposed to Biodiversity Loss and Ecosystem Degradation Risk**

14
EU companies in exposed sectors

- 15 million (49%) of EU companies active in the sectors exposed to nature related risks
- 7 million (22%) of EU companies applied for or consider applying for bank loans
- 2.3 million (7%) of EU companies relied on bank loans over the past six months

Source: Eurostat Structural Business Statistics, 2021
Source: European Commission and the European Central Banks’s as part of their survey on access to finance of enterprises (SAFE), 2022
Prioritization of exposed sectors

Figure 3-3: Assessment and prioritization of exposure to BES risk

Summary metrics of the significance of exposure

Exposure to BES risk
(scale and severity of the dependence and impact on biodiversity and ecosystems)

Potential economic/financial implications
(scale and severity of its economic/financial implications)

Figure 3-5: Subsector dependence and impact score

Figure 3-7: Relative importance of investment and overall economic relevance
### Prioritization of exposed sectors

**Figure 3-10:** Ranking of sub-sectors based on the significance of the exposure score

**Table 3-5:** Robustness check (sensitivity analysis) of ranking exposed sectors

<table>
<thead>
<tr>
<th>Industry Score</th>
<th>Industry Score</th>
<th>Industry Score</th>
<th>Industry Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real estate and services 0.682</td>
<td>Real estate and services 0.608</td>
<td>Agriculture and Farming 3.978</td>
<td>Agricultur and Farming 2.359</td>
</tr>
<tr>
<td>Construction and Engineering 0.211</td>
<td>Construction and Engineering 0.202</td>
<td>Real Estate and Services 2.121</td>
<td>Construction and Engineering 1.517</td>
</tr>
<tr>
<td>Health Care Delivery 0.205</td>
<td>Health Care Delivery 0.164</td>
<td>Construction and Engineering 2.015</td>
<td>Real Estate and Services 1.063</td>
</tr>
<tr>
<td>Agriculture and Farming 0.171</td>
<td>Agriculture and Farming 0.156</td>
<td>Food and Beverages 462</td>
<td>Food and Beverages 287</td>
</tr>
<tr>
<td>Food and Beverages 0.090</td>
<td>Food and Beverages 0.083</td>
<td>Health Care Delivery 435</td>
<td>Metal Processing 240</td>
</tr>
<tr>
<td>Metal Processing 0.078</td>
<td>Metal Processing 0.075</td>
<td>Water and Waste Services 369</td>
<td>Water and Waste Services 232</td>
</tr>
<tr>
<td>Machinery and Equipment 0.066</td>
<td>Machinery and Equipment 0.063</td>
<td>Metal Processing 303</td>
<td>Machinery and Equipment 205</td>
</tr>
</tbody>
</table>
Case study

Inter-sectoral considerations

Figure 3-11: Exposure to physical and transition risk: Real Estate and Services

Source: Exploring Natural Capital Opportunities, Risks and Exposures (ENCORE)
Impact on insurers

Agriculture

**Underwriting risks:** Climate and nature risks amplify each other, and consequences are severe for the sector: biodiversity loss, pollinators decline, decreased water quantity and quality, soil salinisation, further spread of pests and diseases. These affect yield-loss insurance products, both in terms of number of potential claims and premiums.

**Operational risks:** When risks are not properly assessed, insurers can face significant losses. Nota bene – agricultural insurance in the EU is heavily supported by the public sector, consequently an underestimation of risks could transfer to national budgets.

Construction and real estate

**Underwriting risks:** Insurers face higher claims payouts due to environmental damages, which can exceed the premiums collected if risks are not accurately assessed. Insurers need to adjust premiums to reflect the heightened risks, potentially leading to higher costs for policyholders and reduced demand for insurance coverage.

**Operational risks:** Insurers must ensure that their operations and underwriting practices comply with evolving environmental regulations. This also increases liability risks and thus potential liability claims.

Health care and Pharmaceuticals

**Underwriting risks:** Increased frequency and severity of health issues due to environmental degradation (e.g., new zoonotic diseases, antimicrobial resistance) can lead to higher health insurance claims, potentially exceeding premiums collected if risks are not accurately assessed.

**Market risk:** Nature-related risks and supply chain dependencies can lead to volatility in the availability and pricing of medical supplies and pharmaceuticals, impacting the value of investments for insurers in healthcare and pharmaceutical companies.
Overview of draft framework for assessing nature-related risk in the EU
Several key design considerations are essential to shape the overall structure of the framework.

Is this framework mirroring existing climate and nature frameworks or is it distinct?
This framework uses key structural components, concepts and terminology developed by climate frameworks, as it best reflects what FI already do and understand.
However, the content under risk and exposure components presents some fundamental differences accounting due to specificities of nature related risks.
Where other frameworks are directly relevant and can be used by FIs to complement this framework they are referred to directly.

Is this a prescriptive step by step guidance or a high-level conceptual guidance?
This framework aims at providing applicable and practical guidance through a step-by-step approach.
However, the components of the framework can be considered as distinct building blocks to understanding and assessing nature risks which don’t necessarily need to all be carried out.
The framework aims to describe potential best practice approaches for developing these building blocks without prescribing a restrictive methodology.

How does the framework account for evolving data and methodological improvements?
The framework provides suggested approaches which are applicable with different data and methodological capacities, and therefore adaptable to future developments.
The practical guidance within each step reflects best practice while building in different data and methodological options – from most ambitious to current practice.
This framework will help financial institutions work towards best practice in data challenged environment, with the focus on being flexible in the context of improving data.
The eight framework components

1. Scoping
   1.1 Intention setting
      1.1.1 Define the aim and ambition of the risk assessment
      1.2.1 Define the unit of analysis
   O1.1 Clear definition of the primary use and objective of the assessment and scope, including assessment level

2. Entity level risk assessment
   2.1 Sources of financial risks
      2.1.1 Model physical risks and their drivers (state of nature and ecosystem services flows)
      2.1.2 Model transition risks and their drivers (policy and markets trends)
      2.1.3 Develop a forward-looking analysis of risks and drivers
      2.1.4 Identify systemic risks
   O2.1 Set of risk and driver variables measured quantitatively or qualitatively reflecting relevant aspects of state of nature, markets and policies in targeted sectors and locations, optionally including future pathways

   2.2 Impacts and dependencies exposure
      2.2.1 Estimate direct physical impacts of entity activity on nature
      2.2.2 Estimate direct physical dependencies of entity activity on nature
      2.2.3 Estimate indirect exposure
   O2.2 Quantitative or qualitative measures of direct and indirect physical impacts and dependencies attributable to entity

   2.3 Risk materiality
      2.3.1 Define transmission channels
      2.3.2 Determine potential economic impact of exposure and risks through transmission channels
      2.3.3 Quantify financial impacts at entity level
   O5. Quantitative or qualitative measures of financial impacts of exposure to risks on entity

   2.4 Response to risk
      2.4.1 Define and model entities’ potential responses to risks to assess most likely financial outcomes
   O6. Quantitative or qualitative measures of financial impacts on entity after most likely mitigation has taken place

3. FI level impact assessment and mitigation
   3.1 Financial impacts assessment
      3.1.1 Quantify financial impacts on FI activity (financial modelling)
      3.1.2 Classify financial impacts into risks for FIs
   O7. Quantitative or qualitative measure of potential change in FI’s financial performance resulting from nature risks financial impacts

   3.2 Mitigation actions
      3.2.1 Integrate the assessment results into FI risk management framework
      3.2.2 Prioritise and plan mitigation actions
   O8. Clear action plan for next steps on nature risk management, can include quantified risk mitigation targets and integration procedure
1.1.1 Intention Setting: Define the aim and ambition of the risk assessment

**Purpose**
Define the main use cases and scope of this nature risk assessment to inform key design questions

**Outputs**
Clear definition of the main use case and scope of the nature risk assessment

**Suggested approach**
- a. Establish the **main use case** of the nature risk assessment
- b. Align with **key regulatory frameworks**
- c. Define the **scope** of this assessment

1.1.2 Intention setting: Define the unit of analysis

**Purpose**
Define the **unit of analysis required for the rest of this assessment**. Nature risk assessments can be done at different levels of granularity, ranging from sector wide analysis to asset level assessment. The more specific the unit of analysis is, the higher potential understanding of heterogeneity in nature risk between units and locations. However, increasing the specificity of insights substantially increases the data and modelling challenges. It is therefore key for FI’s to understand the different options and their implications to clearly define the scope and level of granularity early on in the assessment and align it with their use cases.

<table>
<thead>
<tr>
<th>Unit of analysis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sectors or subsectors</td>
<td>Sectors defined by global framework</td>
</tr>
<tr>
<td>Companies</td>
<td>Individual companies operating within each sector</td>
</tr>
<tr>
<td>Asset level</td>
<td>Specific assets for the company of interest, e.g. buildings for a real estate company</td>
</tr>
</tbody>
</table>
Step 1 - Scoping

1.2. Select and categorise most relevant risk drivers, identifying the most relevant for sectors of FI’s

**Purpose**
Identify a long list of relevant risk drivers and narrow them down to a shortlist that that are potentially relevant for FI’s activities, associated with material risks, and are feasible to assess.

**Outputs**
Short list of nature risk drivers most relevant to the FI’s activity in scope, that are material and feasible

**Suggested approach**

a. Obtain a long list of risk drivers for transition and physical risks based on global frameworks

b. Select risk drivers that are most relevant to the FI’s activities

c. Select risk drivers associated with most material transitional or physical risks

d. Finalise the short list of risk drivers by reviewing the modelling feasibility
The framework is categorized in 8 methodology components

1. **Scoping**
   - **1.1 Intention setting**
     - Define the aim and ambition of the risk assessment
     - Define the unit of analysis
   - **1.2 Risk identification**
     - Select and categorise most relevant risk drivers
     - Identify high risk sectors in FI's activity

2. **Entity level risk assessment**
   - **2.1 Sources of financial risks**
     - Model physical risks and their drivers (state of nature and ecosystem services flows)
     - Model transition risks and their drivers (policy and markets trends)
     - Develop a forward-looking analysis of risks and drivers
     - Identify systemic risks
   - **2.2 Impacts and dependencies exposure**
     - Estimate direct physical impacts of entity activity on nature
     - Estimate direct physical dependencies of entity activity on nature
     - Estimate indirect exposure
   - **2.3 Risk materiality**
     - Define transmission channels
     - Determine potential economic impact of exposure and risks through transmission channels
     - Quantify financial impacts at entity level
   - **2.4 Response to risk**
     - Define and model entities' potential responses to risks to assess most likely financial outcomes

3. **FI level impact assessment and mitigation**
   - **3.1 Financial impacts assessment**
     - Quantify financial impacts on FI activity (financial modelling)
     - Classify financial impacts into risks for FIs
     - Integrate the assessment results into FI risk management framework
   - **3.2 Mitigation actions**
     - Integrate and plan mitigation actions
     - Quantify risk mitigation targets and integration procedure

O1.1 Clear definition of the primary use and objective of the assessment and scope, including assessment level
O2.1 Short list of risk drivers relevant for scope and list of targeted sectors for the assessment
O2.1 Set of risk and driver variables measured quantitatively or qualitatively reflecting relevant aspects of state of nature, markets and policies in targeted sectors and locations, optionally including future pathways
O5. Quantitative or qualitative measures of financial impacts of exposure to risks on entity
O6. Quantitative or qualitative measures of financial impacts on entity after most likely mitigation has taken place
O7. Quantitative or qualitative measures of potential change in FI's financial performance resulting from nature risks financial impacts
O8. Clear action plan for next steps on nature risk management, can include quantified risk mitigation targets and integration procedure
2.1.3 Developing a forward-looking analysis of risks and drivers

**Purpose**
Enhance the relevance of risk assessment by materiality and exposure analysis for different potential future pathways in a context of uncertainty.

**Outputs**
Set of variables for risk drivers, transition and physical risks and transmission channels, quantitatively estimated for a set of future pathways with associated narrative.

**Example – Scenario creation process**

- **Scenario creation**
  - The world halts and reverses biodiversity loss by 2050

- **Risk drivers**
  - 30x30 targets are met (Enhanced environmental regulations influencing policy terms)
  - Forest cover increases (Potential changes in natural disaster patterns)
  - Land availability for production decreases (Implications for property insurance and business interruption)

- **Transition risk**
  - Anti-deforestation legislation is strictly implemented (Regulatory compliance costs impacting insured businesses)
  - Land prices increase (Increased property values affecting premiums and claims)
  - Cost of deforestation monitoring tech decreases (Adoption of new technologies in risk assessment and monitoring)

- **Transmission channel**
  - Due diligence costs (Higher costs for risk assessment and compliance checks)
  - Cost of production (Impact on insured businesses leading to changes in premium calculations)
  - Sales of deforestation-free goods (Shifts in market demand influencing business risks and opportunities)
  - Input prices (Fluctuations in supply chain costs affecting insured parties)
Step 2 – Entity level assessment

2.2.1 Estimate direct physical impacts of targeted activity on nature

**Purpose**
Quantify impacts on entities to assess FI’s exposure to nature impacts and associated risks.

**Outputs**
Quantitative or qualitative measure of the targeted activity’s direct footprint on nature using physical metrics, for a set of selected impacts most aligned with targeted risk drivers.

2.3.1 Define transmission channels

**Purpose**
Establish realistic and quantifiable linkages between transition and physical risks and economic impacts.

**Outputs**
Set of relevant transmission channels quantified in key metrics which link each risk to an economic impact at macro, meso or micro level.

### Examples of transmission channels for t-shirt producer

<table>
<thead>
<tr>
<th>Physical risks</th>
<th>Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought events</td>
<td>Supply disruption: Increased claims for crop insurance, higher premiums for water-intensive businesses</td>
</tr>
<tr>
<td>Increased water scarcity</td>
<td>Productivity shock: Increased risk for businesses dependent on water, potential for higher claims and adjusted policy terms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transition risks</th>
<th>Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ban on nitrogen fertilizers</td>
<td>Change in production processes, input prices; Changes in agricultural practices, impact on crop yields, higher premiums for affected sectors</td>
</tr>
</tbody>
</table>
Step 2 – Entity level assessment

2.3.2 Determine potential economic impact of exposure and risks

**Purpose**

To assess the magnitude of economic impact resulting from exposure to nature related risks on companies or sectors, financial institutions will need to understand how and by how much different impacts and dependencies translate into economic impacts.

**Outputs**

Mapping of each impact/dependency to a potential economic impact that could result in a financial impact.

2.4 Define and assess economic actors’ responses to risks to assess financial outcomes

**Purpose**

Quantify the financial impacts after taking into account the ability of firms to mitigate those impacts.

**Outputs**

Quantitative measures of financial impacts on targeted entity after expected operational, market, strategic response.
The framework is categorized in 8 methodology components

1. **Scoping**

   1.1 **Intention setting**
   - Define the aim and ambition of the risk assessment
   - Define the unit of analysis

   O1.1 Clear definition of the primary use and objective of the assessment and scope, including assessment level

   O2.1 Short list of risk drivers relevant for scope and list of targeted sectors for the assessment

2. **Entity level risk assessment**

   2.1 **Sources of financial assessment**
   - Model physical risks and their drivers (state of nature and ecosystem services flows)
   - Model transition risks and their drivers (policy and markets trends)
   - Develop a forward-looking analysis of risks and drivers
   - Identify systemic risks

   O2.1 Set of risk and driver variables measured quantitatively or qualitatively reflecting relevant aspects of state of nature, markets and policies in targeted sectors and locations, optionally including future pathways

   O2.2 Quantitative or qualitative measures of direct and indirect physical impacts and dependencies attributable to entity

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   3.1 **Financial impacts assessment**
   - Quantify financial impacts on FI activity (financial modelling)
   - Classify financial impacts into risks for FIs

   O7. Quantitative or qualitative measure of potential change in FI’s financial performance resulting from nature risks financial impacts

   3.2 **Mitigation actions**
   - Integrate the assessment results into FI risk management framework
   - Prioritise and plan mitigation actions

   O8. Clear action plan for next steps on nature risk management, can include quantified risk mitigation targets and integration procedure

2.2 **Impacts and dependencies exposure**

   - Estimate direct physical impacts of entity activity on nature
   - Estimate direct physical dependencies of entity activity on nature
   - Estimate indirect exposure

2.3 **Risk materiality**

   - Define transmission channels
   - Determine potential economic impact of exposure and risks through transmission channels
   - Quantify financial impacts at entity level

   O5. Quantitative or qualitative measures of financial impacts of exposure to risks on entity

   O6. Quantitative or qualitative measures of financial impacts on entity after most likely mitigation has taken place

2.4 **Response to risk**

   - Define and model entities’ potential responses to risks to assess most likely financial outcomes

   O4. Quantitative or qualitative measures of financial impacts on nature for FI’s activity (financial modelling)

### Table of contents

- Intention setting
- Risk identification
- Sources of financial risks
- Impacts and dependencies exposure
- Risk materiality
- Response to risk
- Mitigation actions

### List of components

1. Intention setting
   - Define the aim and ambition of the risk assessment
   - Define the unit of analysis

2. Risk identification
   - Select and categorise most relevant risk drivers
   - Identify high risk sectors in FI’s activity

3. Sources of financial risks
   - Model physical risks and their drivers (state of nature and ecosystem services flows)
   - Model transition risks and their drivers (policy and markets trends)
   - Develop a forward-looking analysis of risks and drivers
   - Identify systemic risks

4. Impacts and dependencies exposure
   - Estimate direct physical impacts of entity activity on nature
   - Estimate direct physical dependencies of entity activity on nature
   - Estimate indirect exposure

5. Risk materiality
   - Define transmission channels
   - Determine potential economic impact of exposure and risks through transmission channels
   - Quantify financial impacts at entity level

6. Response to risk
   - Define and model entities’ potential responses to risks to assess most likely financial outcomes

7. Mitigation actions
   - Integrate the assessment results into FI risk management framework
   - Prioritise and plan mitigation actions

8. Financial impacts assessment
   - Quantify financial impacts on FI activity (financial modelling)
   - Classify financial impacts into risks for FIs

9. Financial impacts assessment
   - Quantify financial impacts on FI activity (financial modelling)
   - Classify financial impacts into risks for FIs

10. Mitigation actions
    - Integrate the assessment results into FI risk management framework
    - Prioritise and plan mitigation actions

11. Clear action plan for next steps on nature risk management, can include quantified risk mitigation targets and integration procedure

### Techniques

- **Modeling**
- **Quantification**
- **Classification**
- **Integration**
- **Prioritization**
- **Planning**

### Key concepts

- **Physical risks**
- **Transition risks**
- **Systemic risks**
- **Direct impacts**
- **Indirect impacts**
- **Transmission channels**
- **Potential economic impact**
- **Financial modelling**
- **Quantification**
- **Classification**
- **Integration**
- **Prioritization**
- **Planning**

### Key benefits

- Improved decision-making
- Enhanced risk management
- Increased financial resilience
- Better preparedness for future challenges

### Key considerations

- Identifying relevant risk drivers
- Understanding exposure and impacts
- Evaluating potential responses
- Prioritizing mitigation actions
- Integrating risk management into overall strategy
3.1 Quantify financial impacts on FI's activity (financial modelling) and classify these into risk

**Purpose**
Quantify the financial impact on FI's from changes in entities' financial metrics and market responses and translate these into financial risks for institutions

**Outputs**
Quantitative measure of risks to FI's financial performance caused by entities' nature risks

3.2 Integrate the assessment results into management frameworks and create prioritized action plans

**Purpose**
Embedding nature considerations into risk management framework to be more resilient against nature risks

**Outputs**
Appropriate entry points, capacity and organisational needs have been identified to ensure integration of nature risks into risk management procedures and processes

**Illustration – Example of actions needed**

<table>
<thead>
<tr>
<th>Potential entry points</th>
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</tr>
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<tbody>
<tr>
<td>Risk appetite framework</td>
<td>Include financed deforestation</td>
</tr>
<tr>
<td>Credit policies</td>
<td>Sustainable supply chain sourcing policy</td>
</tr>
<tr>
<td>Capital allocation</td>
<td>Max % exposure to uncertified ag.</td>
</tr>
<tr>
<td>Rating</td>
<td>Incorporate nature risk exposure into credit models</td>
</tr>
<tr>
<td>Underwriting</td>
<td>Revenue and profit impairments</td>
</tr>
<tr>
<td>Pricing</td>
<td>Existing risk pricing schedule</td>
</tr>
<tr>
<td>Stress testing</td>
<td>Expected credit losses</td>
</tr>
<tr>
<td>Capital estimation</td>
<td>Nature risk-weighted assets</td>
</tr>
</tbody>
</table>

**Outputs**
Embedding nature considerations into risk management framework to be more resilient against nature risks

**Appropriate entry points, capacity and organisational needs have been identified to ensure integration of nature risks into risk management procedures and processes**

Purpose
Quantify the financial impact on FI's from changes in entities' financial metrics and market responses and translate these into financial risks for institutions

Outputs
Quantitative measure of risks to FI's financial performance caused by entities' nature risks

3.2 Integrate the assessment results into management frameworks and create prioritized action plans

Purpose
Embedding nature considerations into risk management framework to be more resilient against nature risks

Outputs
Appropriate entry points, capacity and organisational needs have been identified to ensure integration of nature risks into risk management procedures and processes

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**Outputs**
Embedding nature considerations into risk management framework to be more resilient against nature risks

**Appropriate entry points, capacity and organisational needs have been identified to ensure integration of nature risks into risk management procedures and processes**

Purpose
Quantify the financial impact on FI's from changes in entities' financial metrics and market responses and translate these into financial risks for institutions

Outputs
Quantitative measure of risks to FI's financial performance caused by entities' nature risks

3.2 Integrate the assessment results into management frameworks and create prioritized action plans

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**Illustration – Example of actions needed**

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## The eight framework components

### 1. Intention setting

1.1 Define the aim and ambition of the risk assessment
1.2 Define the unit of analysis

- O1.1 Clear definition of the primary use and objective of the assessment and scope, including assessment level

### 2. Risk identification

2.1 Sources of financial risks
2.1.1 Model physical risks and their drivers (state of nature and ecosystem services flows)
2.1.2 Model transition risks and their drivers (policy and markets trends)
2.1.3 Develop a forward-looking analysis of risks and drivers
2.1.4 Identify systemic risks

- O2.1 Set of risk and driver variables measured quantitatively or qualitatively reflecting relevant aspects of state of nature, markets and policies in targeted sectors and locations, optionally including future pathways

2.2 Impacts and dependencies exposure
2.2.1 Estimate direct physical impacts of entity activity on nature
2.2.2 Estimate direct physical dependencies of entity activity on nature
2.2.3 Estimate indirect exposure

- O2.2 Quantitative or qualitative measures of direct and indirect physical impacts and dependencies attributable to entity

### 3. Response to risk

3.1 Define and model entities’ potential responses to risks to assess most likely financial outcomes

- O3.1 Quantitative or qualitative measures of financial impacts of exposure to risks on entity

### 4. Risk materiality

4.1 Define transmission channels
4.2 Determine potential economic impact of exposure and risks through transmission channels
4.3 Quantify financial impacts at entity level

- O4.3 Quantitative or qualitative measure of potential change in FI’s financial performance resulting from nature risks financial impacts

### 5. Mitigation actions

5.1 Integrate the assessment results into FI risk management framework
5.2 Prioritise and plan mitigation actions

- O5. Quantitative or qualitative measures of financial impacts on entity after most likely mitigation has taken place

### 6. Financial impacts assessment

6.1 Quantify financial impacts on FI activity (financial modelling)
6.2 Classify financial impacts into risks for FIs

- O6. Quantitative or qualitative measures of financial impacts on entity after most likely mitigation has taken place

### 7. Mitigation actions

7.1 Integrate the assessment results into FI risk management framework
7.2 Prioritise and plan mitigation actions

- O7. Quantitative or qualitative measure of potential change in FI’s financial performance resulting from nature risks financial impacts

### 8. Clear action plan for next steps on nature risk management, can include quantified risk mitigation targets and integration procedure
Thank you for your attention
Thank you for your attention, please contact us for more information

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