



D6.2 Impact Evaluation Plan

D6.2: Impact Evaluation plan

WP 6, T 6.1

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0. Abstract

This report constitutes Deliverable “D6.2 Impact Evaluation Plan” (IEP)”, which is the main outcome of Task “6.1 Impact Assurance”.

The purpose of this report is to describe the evaluation approach that will be used to assess the impact of the project. FORWARDS objectives and expected impacts provided the frame for the evaluation process, which involves monitoring and measuring the project’s results to assess whether they are achieving the desired impact, as well as identifying and mitigating any potential risks or challenges that may arise. The plan also includes the indicators selected for the monitoring and evaluation of the project’s results and desired impacts.

CHAPTER 1 describes the main aim, object, and method for the impact evaluation.

CHAPTER 2 presents the impact evaluation framework, which lays out the objective, scope and boundaries of the impact evaluation process and outlines the key concepts underpinning the assessment. The impact evaluation adopted a result-based approach where objectives are translated into specific, measurable indicators concerning the activities, outputs, outcomes, and impacts.

CHAPTER 3 describes FORWARDS-specific objectives and impacts, which guide the impact evaluation plan. Based on the specific objectives and impacts, indicators were discussed with specific partners (WP leaders and task leaders), in order to select a consistent list covering the project’s activities, outputs, outcomes and impacts, more broadly. Most indicators were extrapolated from the Grant Agreement impact section, while some indicators were elaborated ad-hoc for the purpose of evaluating the impact of the project on the stakeholder community.

Under **CHAPTER 4**, the complete list of KPIs is presented and mapped against specific objectives described in chapter 3.

CHAPTER 5 details the impact monitoring and evaluation process; including the tools for the data collection (i.e primary data (questionnaires and surveys) and secondary data (project documentation elaborated in the scope of specific tasks and WPs). It also details timeframes, roles, and responsibilities within the impact assurance process. Indicators will be monitored and evaluated in order to support the SAB discussions. Annual updates of the IEP will be provided to the SAB, which will outline recommendations to maximize the impact of FORWARDS and The ForestWard Observatory.

1. Introduction

1.1. Objectives of this report

FORWARDS aims to prototype The ForestWard Observatory, a pan-European monitoring and evaluation tool to demonstrate the impact of climate change on forests and provide guidance for practical forest management decisions at strategic and operational levels in the EU. Hence, the project is expected to contribute to relevant impacts on science, the environment, policy development, and practical forest management.

This document presents the methodology and procedures for the FORWARDS impact assurance process in the scope of task 6.1 "Impact Assurance". The "*Impact Evaluation Plan*" (IEP) serves as a monitoring, evaluation, and learning tool to appraise the performance of the project implementation and for the assessment of its impacts. The document guides the collection and monitoring of key performance indicators (KPI) that will feed discussions with the Scientific Advisory Board (SAB), which can provide recommendations to maximize the impact of FORWARDS and The ForestWard Observatory.

FORWARDS' "*D6.2 Impact Evaluation Plan*" outlines the project's impact evaluation framework, the KPIs to measure the achievement of project results and impacts and procedures for data collection and analysis. It adopts a result-based approach for impact evaluation that allows timely feedback to enable learning and adjustments during the project.

D6.2 Impact Evaluation Plan is addressed to all project partners and team members who will use this framework to assess indicators of developing impacts and collect data on processes and steps in impact development throughout the project's lifetime. The results will inform the project's development.

1.2. Methodology

The project consortium adopts a proactive approach to ensure that impacts are effectively measured and evaluated throughout the project's lifecycle. To achieve this, a set of KPIs are developed to effectively measure the project's developments, while also providing insights to support SAB recommendations. As defined in D1.1 Project Management Plan, the SAB will critically review the progress and results of the project, and advise on any concerns that may influence the project objectives.

The development of these KPIs has involved a collaborative effort among all project partners, with input and feedback being incorporated into the final set of KPIs. The KPIs have been developed according to the SMART framework, ensuring they are *specific, measurable, achievable, relevant, and time-bound*. This process aims to make indicators measurable and tangible. In detail:

- *Specific*: meaning that they provide clear and precise information on what is being measured.
- *Measurable*: they can be quantified and assessed using data.
- *Achievable*: they are realistic and can be accomplished within the project's resources and time frame.
- *Relevant*: meaning that they are aligned with the project's goals and objectives.
- *Time-bound*: they are set within the project's time frame.

To this aim, all partners were involved in the process of defining FORWARDS KPIs. One initial workshop was held to gather feedback and input from partners, ensuring that the developed KPIs cover all impact dimensions and project objectives. A validation cycle with partners was then performed to ensure agreement and feasibility. In detail, the process included the following steps:

- 1) Analysis of KPIs in the Grant Agreement to identify potential gaps for the assessment of the project's impact, in line with the SMART approach.
- 2) Workshop during the project kick-off meeting to collect input from the project's partners and investigate new KPIs (not defined in the Grant Agreement) able to better assess the outcomes and impacts of the project. The workshop involved all WPs and project partners.
- 3) Definition of a consolidated list of KPIs, considering the inputs of the two steps above.
- 4) Definition of data collection mechanisms, and timing for data collection for each of the KPIs in the consolidated list.
- 5) Validation of the shortlisted KPIs: shortlisted KPIs were circulated to all partners for validation. A brief explanation of each KPI was provided, and feedback was collected concerning their relevance and feasibility.

Overall, this methodology ensured that the developed KPIs fit the purpose of assessing FORWARDS impacts.

2. Impact Evaluation Framework

The FORWARDS Impact Evaluation Framework lays out the objective, scope, and boundaries of the impact evaluation process and outlines the key concepts underpinning the assessment.

2.1. Why assess?

Impact evaluation and monitoring are important components of impact-oriented project management. It helps to understand the effects of the project and assess whether the objectives are being achieved. Formative impact evaluation is conducted during the implementation of the project and is essential for ensuring that the project is on track to achieve its intended outcomes and impacts. To this regard, FORWARDS aims to advance science-based knowledge to guide forest management, support decision making and the local and national levels, and promote climate change mitigation in the primary sector. These broad impacts will be achieved through a wide range of activities that contribute to setting up the ForestWard Observatory.

As such, FORWARDS evaluation process will include the assessment of the activities and outputs delivered (e.g., services, products), the outcomes reached (i.e., benefits that the target groups derive from the results), and impacts (larger societal/environmental goals the projects aim to contribute to).

The monitoring of the project results and their effects enables the anticipation of any risks and challenges that might hinder the desired impacts of the project.

2.2. What to assess?

The FORWARDS impact evaluation framework draws on a “results-based approach”, where objectives are translated into specific, measurable indicators that can be used to assess the extent to which the project achieves its intended outcomes and impacts. The evaluation then focuses on measuring the actual results achieved by the project against these indicators, using quantitative and qualitative data collection methods. Following the logic model (see Figure 1), results-based evaluations focus on specific types of results, in particular:

- **Outputs** of the project, consisting of tangible results of the activities carried out, are often linked to the planned deliverables.
- **Outcomes** refer to the immediate changes in a situation; outcomes can be observable practices that emerge when stakeholders interact directly with the project's outputs.
- **Impacts** broadly define the changes over a longer period, and affect the wider economy, environment, or society beyond those directly affected by the intervention.

The impact evaluation process employed by FORWARDS will combine the monitoring of KPIs for activities, and outputs (associated with the project implementation and development) with broader outcomes and impacts. The project impacts are often observed over a longer period of time and, therefore, cannot be directly assessed during the project's life cycle. Nevertheless, measuring the project's outputs and outcomes can provide a view of the extent to which the project has contributed to the desired impacts. Although the input indicators are presented in the overall logic of the process (Figure 1), they are not included in the framework due to the very specific nature of the Horizon projects (where the resource allocation is already specified in the proposal phase and monitored in the financial reporting).

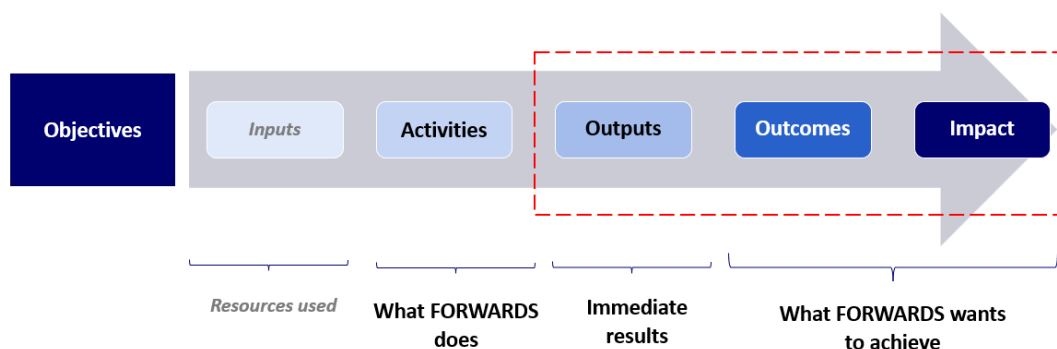


FIGURE 1 LOGIC BEHIND FORWARDS IMPLEMENTATION

The impact evaluation of the FORWARDS project will utilize dedicated KPIs to assess the activities, outputs, outcomes, and impacts. As such, this framework includes the following assessment procedures and objectives:

- 1) **Monitoring the project's progress:** This will primarily involve tracking the indicators of activities and outputs delivered by the project; and comparing them against FORWARDS objectives. To this aim, some of the shortlisted indicators refer to key project deliverables or milestones.
- 2) **Assessing the impacts:** This will include evaluating outcome indicators and examining the project's contributions to achieving broader impacts over the long term. As the impacts of the FORWARDS project are expected to materialize over a longer period than the project duration, outputs (to a certain extent) and outcomes can provide important indications and contributions toward achieving the expected scientific and policy-related impacts.

The impact evaluation process described in this plan guides the impact monitoring and serves as an input for the SAB recommendations to maximize impact as depicted in Figure 2, which describes the high-level view of the impact evaluation process under task 6.1 “Impact Assurance”. The assessment will take place iteratively during the project lifecycle. The detailed evaluation process (*i.e., timing, data collection mechanisms, partners' roles, and responsibilities*) is treated in the dedicated **chapter 4 “Impact Monitoring and Evaluation”**.



FIGURE 2 IMPACT ASSURANCE IN FORWARDS

3. FORWARDS Objectives and Impacts

As shown in Figure 1, the project's specific objectives define the activities, outputs, and outcomes that are necessary to achieve the desired impacts in the long term. This chapter aims to provide an overview of the specific objectives and expected impacts of FORWARDS. Understanding these objectives is crucial for developing indicators that accurately measure the project's progress toward the achievement of the objectives and impacts.

3.1. Project Objectives

The impact evaluation process is designed with the desired objectives and expected impacts in mind. To this regard, FORWARDS outlines six specific objectives that will contribute to the project's main goal of establishing '*The ForestWard Observatory*':

- **Obj1:** Design, develop, and implement an operational pilot network for long-term monitoring of climate impact on forests, and a platform (The ForestWard Observatory) co-designed to meet user needs. To achieve these objectives, FORWARDS will establish a Network of CSF & Restoration Pilots (WP3) and Monitoring Supersites (WP2) through a scheme of grants-to-third parties (WP1). Finally, The ForestWard Observatory will be developed and launched in WP5.
- **Obj2:** Combine ground-based and remote sensing (RS) forest data to provide timely information on climate change impacts, forest status, and detailed characterization of forest disturbances. In the scope of WP2, FORWARDS will award grants to third parties to expand ICP Forests' measurements and better link ground-based measurements with RS products.
- **Obj3:** Identify, quantify, and evaluate options and tools to guide forest restoration activities and CSF and restoration management across Europe, based on a network of pilots that provide evidence-based information on effective CSF & restoration management practices and forward-looking projections. In the scope of WP3, FORWARDS will develop data assimilation routines that allow for the use of European-wide, spatially explicit data on forest structure and composition, obtained from near-real-time monitoring tools integrated into existing forward-looking modelling tools: EFISCEN-Space and LPJ-GUESS²⁴. The routines will be developed and tested, extending the models' functionality. Additionally, a handbook on CSF & Restoration practices will be developed for forest practitioners to systematize knowledge on their effectiveness in supporting climate change mitigation, adaptation, and biodiversity in specific regional settings.
- **Obj4:** Develop systems to integrate and involve key stakeholders and citizens in practical decision-making to tackle climate change impacts through CSF management and forest ecosystem restoration. For this, the WP4 will carry out specific stakeholder and citizen engagement activities to ensure that their values, attitudes, experience, and expertise are incorporated into the co-design of The ForestWard Observatory, and the production and evaluation of CSF & Restoration management.
- **Obj5:** Improve the capacity to provide effective science-based policy support backed by relevant EU-wide information that can guide the development of European policies regarding CSF & Restoration management, protecting the resilience of European forests and timely action against forest disturbances. To foster policymaking, in the scope of WP6, FORWARDS will organize events with relevant stakeholders to discuss and debate the latest developments in pan-European forest

monitoring. Targeted communication and dissemination activities will also be deployed to disseminate the results of the project.

- **Obj6:** Foster collaboration between universities, research institutes, and intergovernmental bodies and liaise with relevant networks and initiatives to maximise FORWARDS' practical impact by promoting synergies, integration, and cooperation and facilitating knowledge exchange with targeted stakeholders and forestry practitioners.

3.2. Expected Impacts

These specific objectives will contribute to achieving broad impacts in the *scientific, economic/technological, and societal* dimensions. In particular, the project will contribute to:

- **Scientific impact (SCI):** Better understanding and enhancing the mitigation potential of ecosystems and sectors based on the sustainable management of natural resources. Advanced understanding and science to support adaptation and resilience of natural and managed ecosystems, water and soil systems, and economic sectors in the context of the changing climate.
- **Policy/Societal impact (SOC):** Efficient monitoring, assessment, and projections related to climate change impacts, mitigation, and adaptation potential to co-design solutions for tackling emerging threats and support decision-making in climate change mitigation and adaptation policies at regional, national European, and global levels.
- **Economic/technological impact (ECT):** Fostered climate change mitigation in the primary sector, including reducing GHG emissions, maintaining natural carbon sinks, and enhancing sequestration and storage of carbon in ecosystems.

The above-mentioned objectives guide the impact evaluation process and drive the development of the specific indicators described in the following section 4.2.

4. FORWARDS Indicators

An initial list of indicators is defined in the project's Grant Agreement, covering mostly the activities and outputs of the project. New KPIs – with respect to the ones identified in the Grant Agreement - have been identified to further capture specific outcomes and impacts of the project. This section presents the full list of KPIs to be monitored as part of the Impact Evaluation Plan, and the methodological aspects underpinning these indicators.

Important to note that in the course of the project, new relevant indicators may be considered to account for any outcome and impact not covered in this document; existing indicators may also be reviewed according to data availability and project progress.

4.1. Type of indicators

Indicators can be classified in various ways based on different criteria. FORWARDS indicators comprise both quantitative and qualitative indicators:

- The quantitative indicators are measured numerically (i.e., numerical values, counts, percentages, or ratios). Examples of quantitative indicators include the number of stakeholder engagement activities or pilot demo sites to be launched.
- The qualitative indicators, on the other side, are based on subjective assessments and involve narrative descriptions rather than numerical counts. They provide nuanced and specific information that cannot be captured through quantitative measures and rely on subjective assessments, observations, or expert opinion. Examples of qualitative indicators include users' experience feedback (KPI09), and quality of stakeholder engagement (KPI30).

In addition, following the logic model described in section 2.2, indicators can be further classified as input/activities, output, outcomes, and impact indicators.

Type	Definition	Example
Activity indicator	Activities performed in the project	Grants launched; Stakeholder workshops performed.
Output indicator	Measures the results produced by a project, as well as the target group's use of the services or products.	CSF practices tested; Novel models and methodologies; The ForestWard Observatory.
Outcome indicator	Measures the project's effects at the target group level.	Improved policymaking; Improved CSF management; Facilitation of early warning systems; Behaviour changes of forest managers and practitioners.
Impact indicator	Measures the project's effects at the societal level.	Fostered climate change mitigation; More resilient forests.

TABLE 1: TYPE OF INDICATORS

4.2. Full list of indicators

A total of **33** key indicators have been elaborated together with project partners, and cover the project's activities, outputs, outcomes, and long-term impacts. As mentioned, most of these indicators will be quantitatively measured, while other indicators will consist of qualitative assessments or will be represented by the project's deliverables or milestones. In the table below, each indicator is classified according to the specific objective of the project that it is related to, as well as the impact area.

Detailed cards for each indicator have been included in the **Appendix**. The cards provide information concerning the KPI and their operationalization, including its *description, calculation formula, unit, and data sources*.

Project Objective	Indicators	ID No.
Objective 1	Third-Party Grants for Monitoring Supersites	KPI03
	Number of Monitoring Supersites Established	KPI04
	ForestWard Observatory Platform - First Version Developed (System Design)	KPI07
	The ForestWard Observatory platform - launched	KPI08
	User Experience Feedback	KPI09
	Number of Pilot Projects Launched	KPI31
	Number of Plots	KPI33
Objective 2	Number of Different Data Streams	KPI01
	Spatio-Temporal Forest Disturbance Characterization Delivery	KPI02
	Number and Type of Tools (Timely Forest Monitoring)	KPI17
	Number of Scientific Publications Produced	KPI19
	Number of Accesses and Citations of Scientific Publications	KPI20
	Number of New Variables Assessed in Near-Real-Time	KPI21
	Number of Re-Initiated ICP Forests	KPI22
	Number of Countries with Re-Initiated ICP	KPI23
	Frequency of Forest Disturbance Characterization	KPI32
Objective 3	Number of Analyzed CSF and Restoration Options	KPI05
	Number of Citations (Observation-Based Module Published)	KPI06
	Forest Carbon Removal	KPI13
	Number of CSF and Restoration Pilots Established in Europe	KPI24
	Models with Extended Capabilities (EFISCEN-space and LPJ-GUESS)	KPI25
Objective 4	Number of Training Sessions/Capacity Building Programs	KPI14
	Number of Practitioners Trained	KPI15
	Number of Downloads of the CSF & Restoration Practices Handbook	KPI16
	Stakeholders' Perceptions of Reporting Interval Reduction	KPI18
	Number of Stakeholder Engagement Activities (by Type)	KPI27
	Number of Stakeholders Engaged (by Type)	KPI28
	Quality of Stakeholder Engagement	KPI30
Objective 5 and 6	Number of Policy Briefs	KPI26
	Number of Dissemination Activities of CSF & Restoration Practices	KPI29
	Number of Editorial Products (D&C)	KPI10
	Outreach of Editorial Products	KPI11
	Engagement Generated by Editorial Products	KPI12

TABLE 2: FULL LIST OF FORWARDS INDICATORS

5. Impact Monitoring and Evaluation

Task “6.1 Impact Assurance” will appraise the performance of the FORWARDS consortium throughout the project, based on the appropriate indicators mentioned in Chapter 4. The process involves the collection of data, monitoring, and evaluation of the results of the project and their impact. The data collected will be analysed and will facilitate the discussions with the Scientific Advisory Board, providing a basis for drawing lessons relating to the project work, and maximizing its impact. The following subchapters detail the evaluation process.

5.1. Data collection & measurement

Overall, the impact evaluation relies on both qualitative and quantitative data. The final list of screened indicators will be mostly collected through the available project documentation and relevant deliverables linked to the specific activities, as well as interviews with task leaders. The specific data collection method(s) for each indicator are detailed in the **Appendix**.

Most KPIs will involve numerical values, counts, percentages concerning the activities and outputs of the project. Due to the nature of the project and results, baseline values are not applicable. However, for some of the indicators, target values have been assessed, and provide a reference point to evaluate the project's achievements. These are presented in the data collection tool to be used by each partner when collecting data.

5.2. Timing and frequency

The evaluation process for the project will be conducted annually, and it will take place prior to the Scientific Advisory Board meeting. The evaluation process will be a comprehensive assessment of the project's performance, including the monitoring and impact evaluation of the KPIs. To ensure the accuracy and effectiveness of the evaluation process, the timing, and the frequency of data collection for each KPI are specified in the data collection tool that will be provided to partners (xls file). In particular:

- **The timing of data collection:** refers to the year in which the result will be available, and it can be any year between Y1 and Y5 of the project duration. This covers the entire duration of the project, (subject to any eventual extensions of the project duration). The timing of data collection will be critical to ensure that the data is collected at the appropriate time to enable the accurate monitoring and evaluation of the project's progress.
- **The frequency of data collection:** Most KPIs will be collected only once, which means that a single measurement will be taken in the year when the result is available. For other KPIs, the frequency of data collection may be yearly, meaning that the measurement will be taken every year. The KPIs that require yearly data collection are indicators that require continuous monitoring.

5.3. Roles and responsibilities

SLU (Swedish University of Agricultural Sciences) is leading Task 6.1 "Impact Assurance" and is responsible for overseeing the monitoring and impact evaluation process of the project. The primary responsibility of

SLU is to ensure that the project meets its intended goals and objectives by keeping track of the specific indicators listed in Table 2, chapter 4. To achieve this, SLU will work closely with all project partners, providing guidance and support throughout the process.

The process of collecting KPIs is a shared responsibility among the project partners based on their roles in the project. The partners are responsible for reporting the necessary KPIs, and SLU will ensure that the required numbers and qualitative assessments are provided for the elaboration of a summary analysis by SLU. The analysis will summarize the status of the project based on the KPIs and will be delivered to the SAB.

To ensure the timely and accurate collection of KPIs, SLU will maintain close contact with all partners before the SAB meeting. This will enable SLU to collect the available KPIs for the intended year and identify any areas that require additional attention or support. Each Work Package leader and task leader in the project will have the responsibility in reporting the listed KPIs related to their respective activities.

5.4. Tools

To ensure effective collection and tracking of the KPIs, a dedicated data collection tool (xls file) has been developed. This file is designed to facilitate the collection, analysis, and reporting of KPIs for the project. The Excel file includes all the KPIs that are defined in the Grant Agreement, as well as additional KPIs that are essential for a more detailed analysis of the project's outcomes and impact.

The Excel file is a tool that enables the team to collect and track KPIs in an organized and efficient manner. The file contains separate tabs for each KPI, with clear instructions on how to input data and calculate results. The KPIs are mapped to each specific objective, and are linked to the work package of reference, responsible for reporting the data.

6. Conclusions

The Impact Evaluation Plan outlined in this report is an essential tool for assessing the performance and impact of FORWARDS. This IEP provides a framework for evaluating the effectiveness of the project in achieving its goals and objectives and will allow for a systematic review of the project's progress.

The FORWARDS approach to impact assessment is focused on not only assessing the project's performance but also the broader impacts along the economic, societal, and environmental areas. The IEP will measure the project's performance in terms of its outputs, outcomes, and impacts. The outputs will be monitored throughout the project implementation phase, and the outcomes will be assessed upon their emergence. The impacts will be measured over the long term and will capture the changes resulting from the accumulation of outcomes and the broader effects on the wider economy and society beyond those directly affected by the intervention.

By implementing this IEP, the FORWARDS project will be able to obtain timely feedback, which will enable learning and adjustments to be made during the project. This approach will ensure that the desired objectives and results are achieved and will ultimately lead to the successful implementation of the FORWARDS project.

References

Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). Evaluation: A systematic approach (7th ed.). Thousand Oaks, CA: Sage Publications.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or REA. Neither the European Union nor the granting authority can be held responsible for them.

7. Appendix

Objective 1: Design, develop, and implement an operational pilot network for long-term monitoring of climate impact on forests, and a platform (The ForestWard Observatory) co-designed to meet user needs.

No. ID	KPI03
Title	Third-Party Grants for Monitoring Supersites
Definition	This KPI tracks the number of grants initiated within the project to establish monitoring supersites across Europe during the specified period.
Related objective	Objective 1
Type	Activity
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI04
Title	Number of Monitoring Supersites Established
Definition	The Number of Monitoring Supersites Established KPI tracks the total count of monitoring supersites that have been successfully established across Europe as part of the project.
Related objective	Objective 1
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI07
Title	ForestWard Observatory Platform - First Version Developed (System Design)
Definition	The ForestWard Observatory Platform - First Version Developed (System Design) KPI represents a significant milestone in the project's progress. It tracks the successful completion of the initial version of the ForestWard Observatory platform, focusing specifically on system design. This KPI measures the achievement of developing the first version of the platform's system design, indicating a key step towards realizing the project's objectives.
Related objective	Objective 1

Type	Output
Calculation	Qualitative assessment
Units	n/a
Expected data source	To be retrieved from project documentation.

No. ID	KPI08
Title	The ForestWard Observatory Platform - Launched
Definition	The ForestWard Observatory Platform - Launch KPI represents a significant milestone in the project's progress. It tracks the official release of the ForestWard Observatory platform to its intended user base.
Related objective	Objective 1
Type	Output
Calculation	Qualitative assessment
Units	n/a
Expected data source	To be retrieved from project documentation.

No. ID	KPI09
Title	User Experience Feedback
Definition	This group of indicators determines how well users of the Forest Observatory are interacting with the platform and its applications. The indicator can gather the number of responses from the stakeholders during the co-designing of the ForestWard platform, as well as attitudinal measures about the platform's use.
Related objective	Objective 1
Type	Outcome
Calculation	Total number; qualitative assessment
Units	n/a
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved; survey with users.

No. ID	KPI31
Title	Number of Pilot Projects Launched
Definition	The Number of Pilot Projects Launched KPI tracks the total count of pilot projects launched within the project. These pilot projects aim to test, monitor, pilot, and demonstrate the adaptive capacity of forest-soil-water systems across various regions in Europe. The pilots also evaluate a set of Nature-Based Solutions (NBSs) based on a comprehensive review of restoration activities.
Related objective	Objective 1
Type	Output
Calculation	Total number
Units	#

Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.
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No. ID	KPI33
Title	Number of Plots
Definition	Total number of plots for monitoring on ICP.
Related objective	Objective 1
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

Objective 2: *Combine ground-based and remote sensing (RS) forest data to provide timely information on climate change impacts, forest status, and detailed characterization of forest disturbances.*

No. ID	KPI01
Title	Number of Different Data Streams
Definition	The Number of Different Data Streams KPI measures the quantity of distinct data streams utilized within the project, including field data and Earth observations. These data streams contribute to the development and implementation of early warning systems for forest disturbances.
Related objective	Objective 2
Type	Activity
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI02
Title	Spatio-Temporal Forest Disturbance Characterization Delivery
Definition	The Spatio-Temporal Forest Disturbance Characterization Delivery KPI measures the successful completion and delivery of a comprehensive set of forest disturbance maps for European forests, covering a period of 20 years. The KPI signifies the project's achievement represents a project milestone.
Related objective	Objective 2
Type	Output
Calculation	Qualitative assessment
Units	n/a
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI17
Title	Number and Type of Tools (Timely Forest Monitoring)
Definition	This indicator refers to the number and type of tools for timely forest monitoring.
Related objective	Objective 2
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI19
Title	Number of Scientific Publications Produced
Definition	The Number of Scientific Publications Produced KPI measures the quantity of scientific publications generated by the FORWARDS project. These publications represent the project's research output, findings, and contributions to the scientific community. The KPI tracks the total count of peer-reviewed articles, conference papers, book chapters, and other scholarly works that result from the project's research activities.
Related objective	Objective 2
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI20
Title	Number of Accesses and Citations of Scientific Publications
Definition	The Number of Accesses and Citations of Scientific Publications KPI measures the impact and visibility of the FORWARDS project's scientific publications. This KPI assesses the frequency with which the project's publications are accessed by readers and cited by other researchers in a particular year. Accesses refer to the number of times the publications are viewed, downloaded, or accessed through various platforms or databases. Citations represent the instances where other researchers reference the project's publications in their own scholarly works.
Related objective	Objective 2
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from external sources (journals' webpages, google scholars, etc).

No. ID	KPI21
Title	Number of New Variables Assessed in Near-Real-Time
Definition	The Number of New Variables Assessed in Near-Real-Time KPI measures the quantity of additional variables that are assessed in near-real-time within the ICP Forests reinitiated in the project.
Related objective	Objective 2
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI22
Title	Number of Re-Initiated ICP Forests
Definition	The Number of Re-Initiated ICP Forests KPI measures the quantity of ICP Forests that have been re-initiated as part of the project (in terms of renewed monitoring; modernised monitoring (with less labour-intensive novel remote and ground-based combinations), and intensified monitoring in ICP Forest plots).
Related objective	Objective 2
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI23
Title	Number of Countries with Re-Initiated ICP
Definition	The Number of Countries with Re-Initiated ICP KPI measures the quantity of countries where the ICP has been re-initiated as part of the project.
Related objective	Objective 2
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI32
Title	Frequency of Forest Disturbance Characterization
Definition	Leveraging on a model-data-earth observation fusion and using wall-to-wall mapping, FORWARDS will develop an early warning system for natural disturbances.

Related objective	Objective 2
Type	Outcome
Calculation	Qualitative assessment
Units	n/a
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

Objective 3: *Identify, quantify, and evaluate options and tools to guide forest restoration activities and CSF and restoration management across Europe, based on a network of pilots that provide evidence-based information on effective CSF & restoration management practices and forward-looking projections.*

No. ID	KPI05
Title	Number of Analyzed CSF and Restoration Options
Definition	The Number of Analyzed CSF (Climate Smart Forest) and Restoration Options KPI measures the quantity of options that have been analyzed within the project.
Related objective	Objective 3
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI06
Title	Number of Citations (Observation-Based Module Published)
Definition	The Number of Citations (Observation-Based Module Published) KPI measures the quantity of citations received by publications that address the forward-looking observation-based modules developed as part of the project. This KPI serves as a proxy indicator of the adoption and recognition of these models within the wider research community.
Related objective	Objective 3
Type	Outcome
Calculation	Total number
Units	#
Expected data source	To be retrieved from external sources (journals' webpages, google scholars, etc).

No. ID	KPI13
Title	Forest Carbon Removal
Definition	This indicator refers to model-based calculations of carbon removal for different CSF options. It quantifies the projected amount of carbon that can be sequestered

	through the implementation of different forest management approaches and restoration activities.
Related objective	Objective 3
Type	Impact
Calculation	n/a
Units	n/a
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI24
Title	Number of CSF and Restoration Pilots Established in Europe
Definition	The number of CSF and restoration pilots established in Europe.
Related objective	Objective 3
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI25
Title	Models with Extended Capabilities (EFISCEN-space and LPJ-GUESS)
Definition	This KPI indicates the availability of models with extended capabilities: (i) understand and predict future threats to European forests and their soils, (ii) enable the assessment of the long-term effectiveness of alternative CSF & restoration management, and (iii) develop a forward-looking system of European forest disturbances based on the early warning system.
Related objective	Objective 3
Type	Output
Calculation	Qualitative assessment
Units	n/a
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

Objective 4: *Develop systems to integrate and involve key stakeholders and citizens in practical decision-making to tackle climate change impacts through CSF management and forest ecosystem restoration.*

No. ID	KPI14
Title	Number of Training Sessions/Capacity Building Programs

Definition	This indicator refers to the number of training sessions provided to practitioners for the utilization of training materials as practical tools (related to disturbances or providing forest management options).
Related objective	Objective 4
Type	Activity
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI15
Title	Number of Practitioners Trained
Definition	The Number of Practitioners Trained KPI measures the quantity of practitioners who have attended training sessions aimed at adopting new practical tools.
Related objective	Objective 4
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader or other actors involved.

No. ID	KPI16
Title	Number of Downloads of the CSF & Restoration Practices Handbook
Definition	The Number of Downloads of the CSF & Restoration Practices Handbook KPI measures the outreach and dissemination of the project's handbook on Climate Smart Forest (CSF) and Restoration practices. The KPI captures the digital downloads of the handbook, indicating the level of interest and engagement from stakeholders, practitioners, researchers, policymakers, and other relevant individuals or organizations.
Related objective	Objective 4
Type	Outcome
Calculation	Total number
Units	#
Expected data source	To be retrieved from external sources (depending on the availability).

No. ID	KPI18
Title	Stakeholders' Perceptions of Reporting Interval Reduction
Definition	The Stakeholders' Perceptions of Reporting Interval Reduction KPI measures the perception of stakeholders regarding the importance of transitioning from a reporting interval of 5-10 years to an annual reporting interval. This indicator reflects

	stakeholders' views on the benefits, challenges, and intentions associated with the reduction of the reporting interval.
Related objective	Objective 4
Type	Outcome
Calculation	% According to the question item
Units	#
Expected data source	Inputs to be collected through short survey administered in relevant engagement activities (depending on the availability); or interviews with the task leader or other feedback mechanisms used to collect stakeholders' perceptions.

No. ID	KPI27
Title	Number of Stakeholder Engagement Activities (by Type)
Definition	The Number of Stakeholder Engagement Activities KPI measures the quantity and variety of engagement activities conducted as part of the stakeholder and citizen engagement process. These activities aim to incorporate stakeholder and citizen values, attitudes, opinions, experience, and expertise into the co-design and evaluation of The ForestWard Observatory and the development and evaluation of Climate Smart Forest (CSF) & Restoration management.
Related objective	Objective 4
Type	Activity
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader; internal template for data collection.

No. ID	KPI28
Title	Number of Stakeholders Engaged (by Type)
Definition	The Number of Stakeholders Engaged (by Type) KPI measures the quantity and diversity of stakeholders engaged in the project. It tracks the number of stakeholders from different types or categories, such as forest practitioners, forest extension services, citizens, researchers, policymakers, NGOs, industry representatives, and other relevant stakeholders. This KPI provides insights into the extent of stakeholder involvement, ensuring a broad representation of perspectives and expertise.
Related objective	Objective 4
Type	Output
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader; internal template for data collection.

No. ID	KPI30
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Title	Quality of Stakeholder Engagement
Definition	The Quality of Stakeholder Engagement KPI assesses the effectiveness and impact of citizen and stakeholder engagement activities in the FORWARDS project. This indicator is determined through a qualitative assessment conducted as part of deliverable D4.5.
Related objective	Objective 4
Type	Outcome
Calculation	Qualitative assessment based on the stakeholder engagement activities
Units	#
Expected data source	Interviews with the task leader or other relevant actors.

Objective 5: *Improve the capacity to provide effective science-based policy support backed by relevant EU-wide information that can guide the development of European policies regarding CSF & Restoration management, protecting the resilience of European forests and timely action against forest disturbances;*

Objective 6: *Foster collaboration between universities, research institutes, and intergovernmental bodies and liaise with relevant networks and initiatives to maximise FORWARDS' practical impact by promoting synergies, integration, and cooperation and facilitating knowledge exchange with targeted stakeholders and forestry practitioners.*

No. ID	KPI26
Title	Number of Policy Briefs
Definition	The Number of Policy Briefs KPI tracks the quantity of policy briefs produced within the project. A policy brief is a concise and informative document that provides key information, analysis, and recommendations on a specific policy issue or topic. This KPI reflects the project's efforts to communicate research findings, insights, and policy recommendations to relevant stakeholders and decision-makers.
Related objective	Objective 6
Type	Activity
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and/or interviews with the task leader

No. ID	KPI29
Title	Number of Dissemination Activities of CSF & Restoration Practices
Definition	The Number of Dissemination Activities of CSF & Restoration Practices KPI measures the total number of activities conducted to disseminate information and promote Climate Smart Forest (CSF) and restoration practices. These activities encompass a wide range of communication efforts, including scientific publications, publications, events, conferences, workshops, webinars, and other dissemination channels.
Related objective	Objective 4

Type	Activity
Calculation	Total number
Units	#
Expected data source	To be retrieved from project documentation and internal templates.

No. ID	KPI10
Title	Number of Editorial Products (D&C)
Definition	The Number of Editorial Products (D&C) KPI measures the total number of publications and editorial materials produced within the project. These editorial products include press releases, news releases, project updates, journalistic articles, journalistic interviews, and other forms of written content created for dissemination and communication purposes
Related objective	Objective 6
Type	Activity
Calculation	Total number
Units	#
Expected data source	Project documentation and specific deliverable.

No. ID	KPI11
Title	Outreach of Editorial Products
Definition	The Outreach of Editorial Products measure the reach and impact of the project's editorial materials in increasing the understanding and social acceptance regarding forests' resilience to mitigate climate change. Specifically, this KPI focuses on the number of impressions achieved by the editorial products, indicating the extent to which the project's messages and information have been disseminated and received by the target audience
Related objective	Objective 6
Type	Output/outcome
Calculation	Total number
Units	#
Expected data source	Project documentation and specific deliverable.

No. ID	KPI12
Title	Engagement Generated by the Editorial Products
Definition	This group of indicators refers to the D&C engagement indicators: • <i>Number of followers,</i> • <i>Number of activities on social media (i.e like, share, comments, etc.), Social Engagement Index (SEI) (measures the level of interest generated in the social community)</i> • <i>Community Engagement Index (CEI).</i>
Related objective	Objective 6

Type	Outcome
Calculation	Total number
Units	#
Expected data source	Project documentation and specific deliverable.