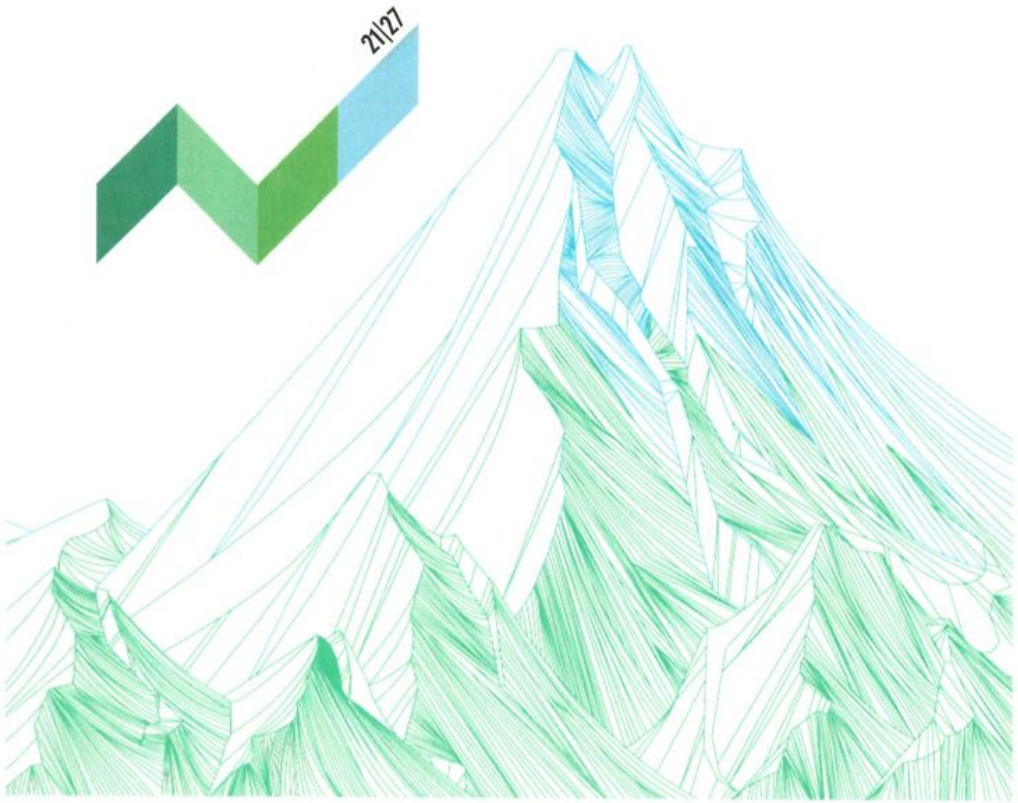
Interreg Co-funded by the European Union

Alpine Space

MOSAIC

MOSAIC
Deliverable Report D.3.2.1

Report on the identification and characterization of promising integration forums



MOSAIC
Deliverable Report D.3.2.1

Report on the identification and characterization of promising integration forums

Document identifier	Deliverable_Uni GOE_D.3.2.1
Due Date	25th October 2025
Document Date	24th October 2025
Deliverable Title	Report on the identification and characterization of promising integration forums
Level of Dissemination	public
Work Package	WP3 - FORCE: Forest labs for raising awareness on resilience of protective forest coping with climate change
Author(s)	Tabea Schaefers, Michael Kirchner, Moritz Lindhorst, Sebastian Mittag [University of Göttingen]

Version	Date	Author(s)	Changes
1	24th October 2025	Schaefers, Kirchner, Lindhorst, Mittag	

Table of Contents

List of Figures

List of Tables

Executive Summary

The successful integration of scientific knowledge into practice is crucial for the effectiveness and sustainability of research projects. For this reason, the MOSAIC project dedicates Work Package 3 (FORCE – Forest labs fOr Raising awareness on resilienCe of protectivE forests coping with CCA) specifically to knowledge transfer processes. Within this work package, Activity 3.2 focuses on the identification and characterization of promising integration forums, which serve as a practical complement to the Forest Living Labs (FLL) established within the project.

Integration forums are understood as formal or informal formats - of either material or conceptual nature - that facilitate the exchange of science-based information between research and practice (cf. Kirchner and Krott, 2020). Examples include expert groups, workshops, or practice-oriented publications. The objective of these forums is to direct scientific findings toward relevant actors in the field of forest-related natural hazard management - actors who not only have an interest in the topic but also possess the necessary resources or authority to implement measures.

In MOSAIC, this approach is embedded in the theoretical framework of the RIU model (Research–Integration–Utilization) (Böcher and Krott, 2016). The model distinguishes three phases of knowledge transfer, emphasizing the integration phase as the central bridge between research and practice. This phase enables the alignment of scientific processes with practical application and thereby supports the effective utilization of research results.

The analysis of identified integration forums across the project countries highlights that knowledge transfer is strongly shaped by national and institutional contexts. Differences are particularly evident in the density and composition of actor networks as well as in the availability and structure of existing integration forum formats. This diversity underlines the need for context-sensitive approaches: knowledge transfer strategies should be tailored to specific actor constellations and institutional settings to maximize their effectiveness.

Overall, the findings demonstrate that the successful transfer of scientific knowledge into practice requires a precise understanding of actor landscapes, the targeted selection of suitable integration forums, and the continuous adaptation of formats to national and institutional conditions. The RIU perspective applied in MOSAIC provides a robust conceptual framework for channeling scientific information effectively into societal and policy processes—thereby contributing to enhanced resilience of protective forests in the context of climate change.

1. Introduction – Identifying integration forums for effective knowledge transfer

The consideration of transfer processes for integrating scientific findings into practice is of crucial importance for the effective success of any research project (Böcher and Krott, 2016). For this reason, the MOSAIC project has dedicated an entire Work Package (WP3: FORCE – *Forest labs fOr Raising awareness on resilienCe of protectivE forests coping with CCA*) to this topic. Within WP3, Activity 3.2 focuses on the identification and characterization of promising **integration forums**, which serve as a practical complement to the Forest Living Labs (FLL) established in Activity 3.1 and presented in Deliverable 3.1.1.

Integration forums are formal or informal formats of a material or conceptual nature that enable actors to exchange science-based information (cf. Kirchner and Krott, 2020). Examples include expert panels, workshops, or practice-oriented journal articles, all of which facilitate direct or indirect interactions between research and practice.
These forums play a key role in channeling selected project results towards relevant actors in the field of forest-related natural hazard management—actors who not only have an interest in the subject but also possess the necessary resources and/or authority to implement measures. Such key actors may, for example, be engaged in forest management, involved in law-making and regulatory processes, or responsible for administrative decision-making.

Within MOSAIC, integration forums are understood as a conceptual component of the **Research–Integration–Utilization (RIU) model of knowledge transfer** (Böcher and Krott, 2016). This model distinguishes three analytical phases in the transfer of scientific information into practice, with particular emphasis on the integration phase. The integration phase acknowledges and bridges the functional differences between the research process on the one hand and practical application on the other, thereby enabling their alignment.

Applied in WP3, the RIU model primarily emphasizes the targeted dissemination of scientific knowledge generated within MOSAIC to carefully selected actors in practice. In this regard, the integration forums identified and analyzed in Activity 3.2 provide an opportunity to establish strong alliances for the project and its outcomes. These allies, consisting of interested and influential actors, can be found across different levels - regional, national (and international) - within each of the project countries.

1.1 Purpose of Deliverable

The deliverable D. 3.2.1 aims to provide a detailed description of identified integration forums that support effective knowledge transfer. To this end, at least two hybrid and/or existing (see Section 2) integration forums relevant to Alpine Space (AS) hot spots in each AS project country will be identified, targeting powerful and interested actors. These integration forums serve as practical recommendations for the project on how to structure knowledge transfer and provide concrete opportunities for MOSAIC researchers to connect the project´s best practice solutions to relevant actors in the field of forest-related natural hazard management.

1.2 Deliverable Overview

Deliverable 3.2.1 provides a structured overview of selected integration forums in each AS project country. For this purpose, a qualitative analysis was conducted, drawing on a document analysis, expert interviews and (participatory) field observations to identify relevant actors with the goal of determining promising integration forums. To assess the suitability of an integration forum, the forums are further characterized by providing information on their level of activity, main tasks, and actor constellation (key, participating and target actors).

2. Theory

The theoretical foundation of this project serves to clarify the conceptual framework in which knowledge transfer processes are examined. It provides the basis for understanding the dynamics between political actors, the structures of their interaction, and the RIU model. This model explains how scientific results can be effectively integrated into decision-making and highlights the specific role of integration forums.

2.1 Assumptions for knowledge transfer

For the theoretical framing of the project, a set of fundamental assumptions serves as a starting point before the RIU model, a specific model of knowledge transfer, is further introduced. These assumptions provide a common understanding of the framework in which political actors operate and the structures shaping their interactions:

- **Interest-based action**: Political actors primarily orient their behaviour according to their respective interests.
- **Power relations**: Actors are embedded in power relationships, where more powerful actors are able to influence the actions of others, for instance through legal measures or financial incentives.
- **Information channels**: Exchanges between actors take place through communication structures that enable the transfer of information.
- **Societal networks**: Power and information relationships do not occur in isolation but are part of a broader web of multiple power relations within societal networks of political actors.

These assumptions provide the foundation for the subsequent more detailed introduction of the RIU model and are illustrated below in Figure 1.

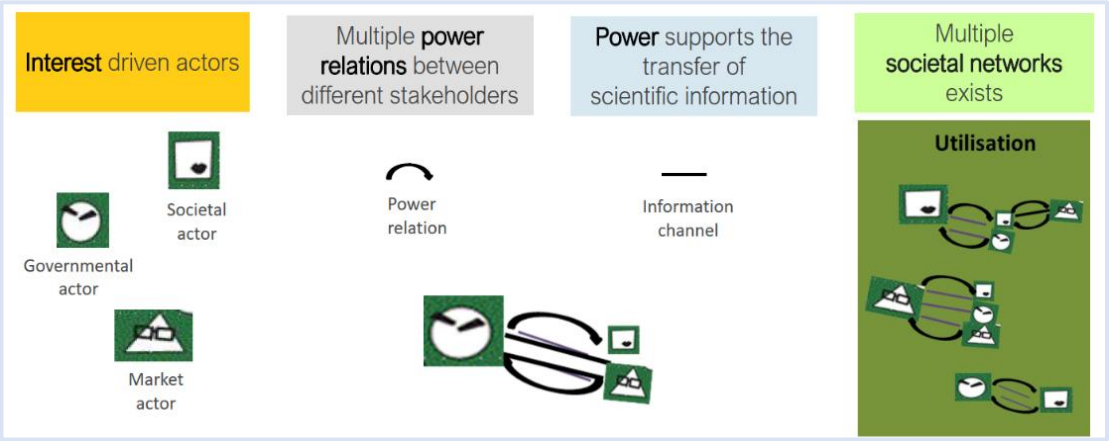


Figure 1: Four assumptions which are relevant to consider for an effective knowledge transfer (own illustration, adapted from Kirchner and Krott, 2020; Böcher and Krott, 2016).

2.2 Power and interests of actors

The guiding concepts of power and interests form the theoretical foundation of the RIU model (Böcher and Krott, 2016, p. 163; Kirchner and Krott, 2022). Regarding power**,** we adopt the definition of Krott (2014), which states that "actor-centred power is a social relationship in which actor A alters the behaviour of actor B without recognising B's will." Interests, by contrast, are conceived as an orientation for action, describing the perceived usefulness that an individual or a group derives from a given object, for example, forests and their function of storing carbon (Krott 2001, p. 5, Sabatier 1988, p.143). In this sense, interests substantially shape the actions of individual actors or groups.

2.3 The RIU model – emphasizing a separated integration phase for knowledge transfer

Designed to analyze knowledge transfer from both normative and descriptive perspectives, the RIU model provides a structured framework by Böcher and Krott (2016). Over time, it has also been applied in ex-ante consulting within scientific projects to optimize knowledge transfer processes (Juerges and Krott, 2018; Kirchner and Krott, 2020; Kirchner and Krott, 2022).

The role of social interactions in knowledge transfer

The RIU model emphasizes that social interactions between actors are crucial for effective knowledge transfer. It conceptualizes a process of integration between science and practice that facilitates the flow of scientific knowledge into practical application (Böcher and Krott, 2016, p. 23; Juerges and Krott, 2018, p. 53).

Within this model, processes shaped by interests and power become visible through the interactions of actors. These dynamics play an important role in introducing scientific information, such as the results produced in the MOSAIC project, into practical use (Böcher and Krott, 2016, p. 162).

Bridging research and practice: different spheres, different goals

Research and practice (utilisation) operate in separate spheres, each with its own logic and codes, which are often difficult to reconcile (Böcher and Krott, 2016; Lehmann and Rieder, 2003). The RIU model provides a structured process of integration (Figure 2) to connect these two worlds (Do et al., 2020).

During the integration phase, practitioners and political actors, each with their specific interests, values, and norms, exchange science-based information (Böcher and Krott, 2016, pp. 3–5). This phase is critical because it links research outputs with practical needs. Integration is bi-directional: practitioners can communicate their expectations for scientific solutions, while at the same time seeing which scientific results researchers can provide.

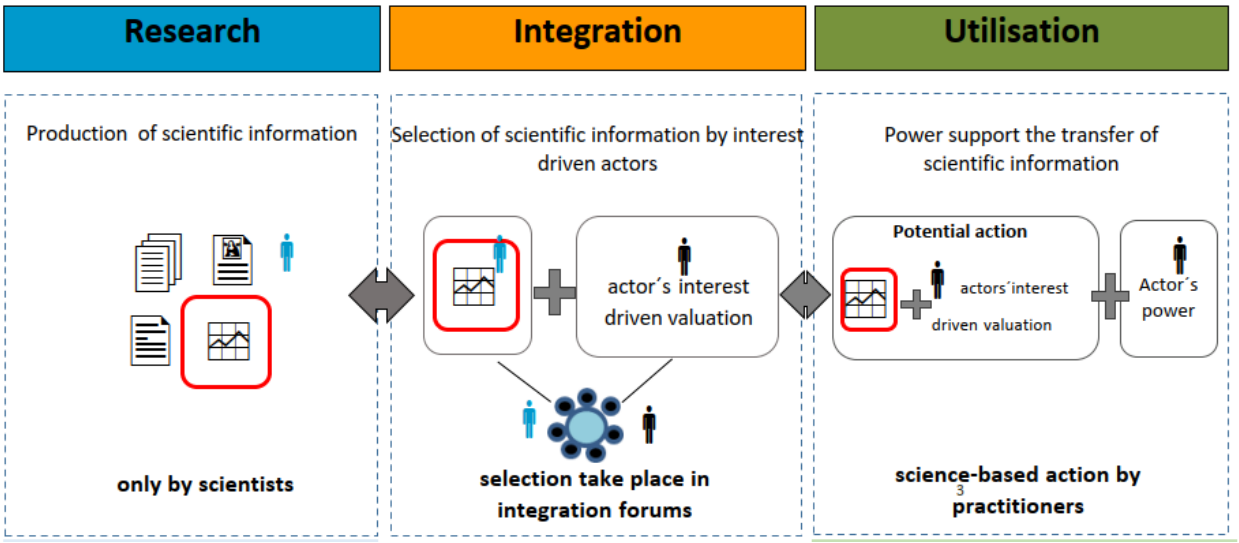


Figure 2: The RIU model (Böcher and Krott, 2016; cf. Kirchner et al. 2022, adapted from Stevanov and Krott, 2021): scientific information is generated in the research phase and transferred into practice (utilization) through a separated integration phase. Within this phase, integration forums serve as conceptual formats in which selected scientific information is transferred. Consisting of specific actor constellations, these forums facilitate a targeted transfer of scientific information to interested and powerful actors, thereby increasing the potential for scientific information to be turned into action.

Adapting scientific information to practical needs

(1) Research and integration activities usually alternate, creating an iterative loop that links scientific work with practical needs, before a final product reaches the utilization phase (Böcher & Krott, 2016, p. 32). Typically, the process starts in the research phase, where scientists produce innovations based on scientific principles, standards, and methods.
(2) These scientific innovations then enter the integration phase, where practitioners can select a preferred scientific solution. If the solution does not fully meet practical needs, it can be sent back to researchers for refinement. The adapted solution is then more likely to be accepted by practitioners.
(3) Once integrated, this adapted scientific solution becomes part of a science-based action by an actor to address practical problems (utilization phase). This marks a successful knowledge transfer (Böcher and Krott, 2016, p. 34). In addition, power processes play a key role: an actor who adopts a solution can influence other actors to apply it, further supporting effective knowledge transfer (Stevanov and Krott, 2021).

Identifying key-actors: a cornerstone for successful knowledge transfer

As highlighted earlier, actors with particular interests and power are central to spreading scientific knowledge effectively. Identifying these key actors at regional and national levels is therefore essential for ensuring the success of any knowledge transfer activities within the MOSAIC project.

2.4 Integration forums for targeted knowledge transfer

Integration forums as formats for exchanging scientific information

Practitioners and political actors come together in formal or informal settings to select and exchange science-based information. Such settings are defined as integration forums (Kirchner and Krott, 2020, pp. 451–452).
These forums are created or maintained by actors to accomplish specific tasks. Some are directly involved in forest management, while others influence it indirectly, for example through nature conservation or by managing conflicts arising from competing interests (Hubo and Krott, 2010, pp. 219–220).

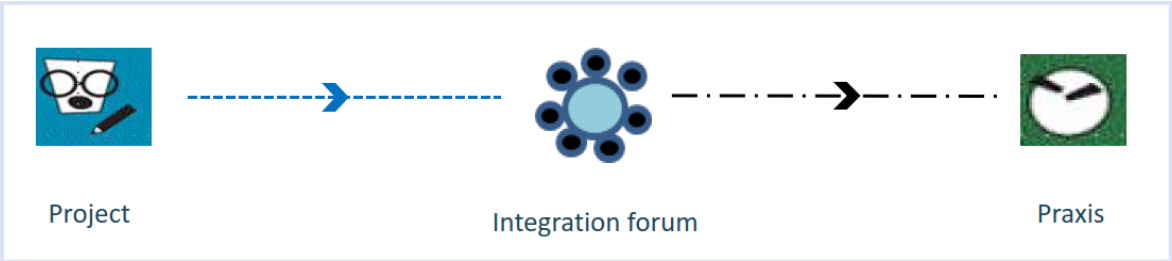


Figure 3: Schematic representation of the conceptual elements project, integration forum, and praxis within the knowledge transfer process (own illustration; see Kirchner and Krott, 2020, p. 5).

Types of integration forums and the role of actors

Three types of integration forums are distinguished in the RIU model: existing, hybrid, and new forums (Kirchner and Krott, 2020, p.452; see Table 1). The classification is based on whether a forum (I) already exists, (II) has a link to science, and is (III) known to the research project. The link between the integration forums to science must either be established or established in the future - for instance, by including a scientist in the forum.

Within these forums, actors with both interest and power can be selectively addressed and potentially act as allies in knowledge transfer (Böcher and Krott, 2016, p. 164). Different roles can be assigned to these actors, such as key actors, participating actors, or target actors (Kirchner and Krott, 2020, p. 455).

Table 1: Types of integration forums and examples (revised after Kirchner and Krott, 2020, p. 6)

Type of integration forum		*Examples of integration forums*	*Actor roles*		
			Key actors (gatekeeper function)	*Participating actors* (part of the forum)	*Target actors* (should be reached by the forum)
Existing	• forum **exists** • has a link to science • is **known by** the project	• Advisory boards	• Federal ministry	Actors selected by forum or key actor	Actors selected by forum, key actor or participating actor
Hybrid	• forum might **exists** • link to science may exist or might be yet established • is **unknown** to the project yet	• Bilateral discussion	• Professional authorities • Decision makers		Actors selected by key actor
		• Expert rounds • Ad-hoc task forces	• Responsible authorities • Internal/ex-ternal experts	Actors selected by key actor	Actors selected by key actor or participating actor
New	• forum **does not exist** but **might be established** by the project • might develop a link to research by the project	• Workshops • Round tables	• Researcher	Actors selected by researcher	Actors selected by researcher or unspecified entity

Bi-directional exchange and fine-tuning of scientific information

Integration forums allow actors to acquire scientific information in a structured way (Kirchner and Krott, 2020; Kirchner and Krott, 2022). At the beginning of a project, these forums are identified and analyzed, and they can be supplemented or expanded throughout the project's duration (Kirchner et al., 2022).

The forums enable a bi-directional selection process. Practitioners can choose scientific information produced by MOSAIC researchers that meets their interests, for instance, in forest or natural hazard management. Simultaneously, researchers can identify which scientific information practitioners require. This selection process also allows fine-tuning: information can be returned to researchers, adapted to the specific needs of a particular actor, and reintroduced into the forum (Stevanov and Krott, 2021; cf. Chapter 2.3). Such exchanges support co-creation and strengthen the link between science and practice.

Defining potential integration forums

A forum is considered relevant when MOSAIC can actively target specific actors and provide them with selected scientific information. This ensures that at least one actor or actor group engages as a key actor, participating actor, or target actor, and can select, adapt, or fine-tune the information according to their interests. Such actors may also use power to implement science-based solutions in practice. A scientific paper alone does not qualify as an integration forum because it lacks the mechanisms for selection and power dynamics among actors.

Applying the RIU model in MOSAIC (WP3)

(I) Identifying key actors

Actors can be individuals or collectives (cf. Bernauer et al., 2022). Relevant actors for MOSAIC interact based on their interests regarding forest-related natural hazard management. Key actors are those who hold particular interests and power to influence other actors in matters concerning forests or natural hazard management in the AS (cf. Schusser, 2013). Their main interests become evident through actions and through the institutional contexts that shape behavior and decisions (North, 1992, p. 3). Such contexts include laws, non-binding instruments, societal norms and traditions, institutions (e.g., ministries, regional governments, municipalities), and organizational structures. Key-actor analysis identifies and maps these actors, assesses their main interests, and evaluates their potential alignment with MOSAIC objectives, supporting knowledge transfer processes.

(II) Identifying integration forums

Information from the key-actor analysis helps in identifying suitable integration forums. Additional guidance comes from targeted questions, prior research, and knowledge of formal procedures, such as forest law requirements at different administrative levels.
Observing existing forums where researchers participate in other issues can also reveal links to new forums. In principle, integration forums across administrative levels can be used to reach actors with scientific information produced by the project (here: MOSAIC).

3. Methodology

This chapter outlines the methodological approach for identifying and analyzing actors, key actors, and integration forums in the context of forest management and forest-related natural hazard management in the AS.

3.1 Qualitative analysis

The methodological foundation of this study is a qualitative approach that combines document and content analysis with expert interviews. Data sources included primary documents, scientific and grey literature, and semi-structured interviews. Findings from different sources were triangulated to minimize bias.

3.1.1 Identification of key actors

To capture relevant key actors at regional to national levels, a snowball sampling technique was applied until no new actors were identified. The process started with a set of documents focusing on actors in forest management and natural hazard management in the AS project countries. Additional actors were identified through web searches, cross-references, and interviews, covering each case study country (Austria, France, Italy, Slovenia, Switzerland).

The characterization of key actors and their interests was based on primary and secondary data, complemented by semi-structured interviews with actors for whom prior evidence of interests existed (GreenRisk4Alps Project Report, 2021; Kirchner and Krott, 2022).

3.1.2 Analysis of integration forums

From the data collected on actors, integration forums were identified and described according to three key dimensions:

1. Defining elements
   - *Existing forums*: already established, linked to science, and known to the project.
   - *Hybrid forums*: potentially existing or relevant forums that may not yet be known to the project.
   - *New forums*: initiated by the project, with external links to science and field-level actors.

2. Actor roles within the forum
   - Key actors serve as gatekeepers, set agendas, and grant access to other actors.
   - Participating actors contribute to discussions and shape specific issues.
   - Target actors are the intended recipients of forum outcomes but are not necessarily forum members (Kirchner and Krott, 2020, p. 455).

   One illustrative example of a relevant actor group are forest owners, who may possess different roles within an integration forum. Owing to their property rights, forest owners hold a strong position in decision-making: within the boundaries of applicable legislation (e.g., forest act, nature conservation act), they can determine forest management practices autonomously. In this sense, they often act as *participating actors*, contributing directly to management decisions. At the same time, forest owners are indispensable as *target actors* for forestry-based measures, since they are the ones implementing concrete activities on their land. Depending on context, they may also function as *key actors*, particularly when their role as landholders gives them leverage to influence or grant access to the forum.

3. Main interest analysis
   Actor interests were derived from the extent and number of their actions, statements and formal responsibilities. These interests range from material ones (e.g., wood provision) to non-material and intrinsic motivations (e.g., landscape aesthetics).

3.2 Data sources and methods

The analyzed data sources and methods used are listed in Table 2 and described below.

Table 2: Data sources and methods used for identifying actors and integration forums

Method	Data Sources	Purpose
Document analysis	E.g., forestry and spatial planning legislation; management guidelines; authority reports; regional databases; scientific and grey literature	Identification of relevant actors and their interests; integration forums; provide contextual background
Project-internal survey	Semi-structured questionnaire distributed to MOSAIC project members (2023)	Identification of additional actors, relations, networks, and integration forums; collect experiences with knowledge transfer tools
Semi-structured interviews	8 interviews with actors from forestry practice, administration, consultancy, forest education, and research	Validate findings from other sources; gain deeper insights into actors' networks and interest structures
Participatory observation	research stays, project field visits, and participation in training courses or workshops relevant to forest and natural hazard management	understanding of dynamics, collaboration patterns, and practical challenges within ongoing knowledge exchange processes

Document analysis

Primary and secondary sources directly or indirectly related to forest management and natural hazard management were systematically reviewed, including forestry and water and spatial planning legislation, management guidelines, authority reports, position papers, and regional databases.

Project-internal survey

At the beginning of the MOSAIC project (2023), a semi-structured questionnaire was distributed among project members to identify additional actors and integration forums, as well as experiences with knowledge transfer tools.

Semi-structured interviews

Interviews were conducted to validate and enrich findings from other sources (cf. Stevanov et al., 2016). In total, eight interviews were carried out with experts from forest practice, administration, consultancy, research, and forest related education. Transcripts of interviews were analyzed to cross-check results and to deepen understanding of actors' networks.

Participatory observation

In addition to document analysis and interviews, participatory observation was applied to gain direct insights into existing integration practices and actor interactions. This included short research stays, project field visits, and participation in training courses or workshops relevant to forest and natural hazard management. These activities provided valuable first-hand understanding of dynamics, collaboration patterns, and practical challenges within ongoing knowledge exchange processes.

4. Results – Integration forums in case study countries

For each of MOSAIC's five AS case study countries—Austria, France, Italy, Slovenia, and Switzerland—we sought to identify at least two integration forums operating at regional or national levels. Each forum was examined in terms of its core characteristics (see Chapter 3.1.1), its main tasks, and the roles of the actors involved (key actors, participating actors, and target actors). Additionally, we assessed how the forum is linked to scientific expertise: either *internally*, when a MOSAIC scientist is already part of the forum, or *externally*, when a scientist must be integrated. The findings for each country are presented in the following Tables 3 - 7 of the subsequent subchapters.

4.1 Austria

Table 3: Identified integration forums in Austria

Type of integration forum	*Integration forum level*	*Name of integration forum*	*Main tasks*	*Key actors*	*Participating actors*	*Target actors*	*Link to research*
Hybrid	• national/ regional	• Annual Meeting of Protective Forest Officers • Bilateral discussion with participants	• Professional exchange on the topic of protective forests at the federal and state levels • Joint coordination for the implementation of activities • Development of future activities	• Federal Ministry of Agriculture, Forestry, Climate, Environment, Regions and Water Management (BMLUK, section III/4)	• Protective forest representatives of the federal states • Protective Forest Hub	• Forest authorities • Forest owners • General public	External
Existing	• national	• Federal Protective Forest Platform (*Bundes-schutz-wald-plattform*) (*held annually*)	• Professional dialogue and networking exchange on current issues in protective forests (e.g., sustainable management, protective forest policy)	• BMLUK (Section III/4) • Protective Forest Hub • Austrian Association for Protective Forest (*Schutzwald-verein*)	• Forest owners • Forest practitioners • scientists • Politicians • General public	• Forest owners • Forest practitioners • scientists • Politicians • General public	External/ internal
Existing	• national	• Online mapping service "Forest Atlas," featuring "*Schutzwald.at*" and "*Naturgefahren.at*"	• Interactive map portal on forests, natural hazards, and biodiversity, offering comprehensive nationwide geodata free of charge	• BMLUK	• BFW • WLV	• Forest owners • Forest managers • General public/citizen	Internal / external
Hybrid	• national/ regional	• Bilateral discussion with • Austrian Forest Technical Service for	• main interest in risk reduction for user • prefers measurements of technical prevention	• BFW	• Austrian Forest Technical Service for Torrent and Avalanche Control (WLV)	• forest owner (association) • citizen • mountain farmer • tourists	Internal

		Torrent and Avalanche Control (WLV) • „protective forest team“of the BMLUK (section III/4)	• advocate the protective function of forests			• professional authorities • internal administration • forest authorities	
	• national	• Forestry Training Centre Traunkirchen	• professional training for people working in the fores	• Forest Research Centre (BFW)	• forest owner • forest manager • forestry worker	• forest professionals • (new) forest owners • citizen	
Hybrid	• national	• Steering Group meeting on protective forests/ Protective Forest Hub)	• Annual meeting of Protective Forest Hub partners to discuss strategic direction and planning of Protective Forest Hub activities	• BMLUK	• (SWZ) • WLV • BFW • ÖBf • BOKU	• WLV • BFW • ÖBf • BOKU • Forest owners • General public	External/ internal
Hybrid	• national	• Members' magazine "Waldverband*aktuell*" (published quarterly)	• Information on current forestry issues relevant for the praxis	• Austrian Forest Association (*Waldverband*, umbrella organization of forest owners)	•	• Forest owners • Forest authorities • (Policy-makers)	External

4.2 France

Table 4: Identified integration forums in France

Type of integration forum	*Integration forum level*	*Name of integration forum*	*Main tasks*	*Key actors*	*Participating actors*	*Target actors*	*Link to research*
	• European	• EUSALP – EU Strategy for the Alpine Region • EUSALP AG8 (Risk Governance)	• promotion of sustainable development and territorial cohesion across the Alpine region through transnational cooperation • to improve natural hazard risk management and strengthen climate change adaptation through coordinated Alpine-wide governance	• EUSALP Co-Leader: • ANCT (France) • Civil protection (Italy)	• national and regional authorities • research institutes • technical agencies in the field of risk prevention and climate adaptation	• regional and local administrations in the Alpine region • political decision-makers • civil protection and planning authorities • forestry administrations • citizen	Internal
	• national	• DGPR – General Directorate for Risk Prevention (*Direction Générale de la Prévention des Risques*) [Ministry of Ecological Transition, Energy, Climate and Risk prevention]	• development of environmental, climate and risk prevention policy • natural hazard risk management	• DGPR	• regional administrations • research institutes • ministries	• regional and local authorities (prefectures, municipalities • citizen	External
	• regional	• DREAL – Regional Directorate for Environment, Planning, and	• regional implementation of state policies	• DREAL	• representatives of specialized agencies of departments and regions	• administration • citizen	External / internal

		Housing (AURAL) (Forest and land use planning WG, Risk club) • DDT – Departmental Directorates of Territories, working groups: - Natural risks - Forest planning - Climate change adaption			• *invited according to the general topic*: - scientists - experts		
	• national • regional	• ANCT – National Agency for Territorial Cohesion (*Agence nationale de la cohésion des territoires*)	• coordination of projects to strengthen resilience and risk prevention in municipalities, especially in rural or disadvantaged areas • link between national policies, regional authorities, and local administrations • supporting mountain policy to preserve and revitalize mountainous territories	• ANCT	• ministerial departments (e.g., DGPR, Ministry of Ecological Transition) • regional authorities • scientific institutions • practitioners	• municipalities • regional authorities	Internal
Existent	• national • regional	• CNPF - National Center for Forest Ownership (*Le Centre national de la propriété forestière*)	• coordination of regional activities of the 11 regional forest ownership centres • fostering sustainable management of private forests	• CNPF	• regional forest centres (CRPF) • research institutes • local authorities • professional forest associations	• private forest owners • regional authorities	External

	• national • regional	• Bilateral discussion with - ONF - National Forest Office (*Office National des Forêts*) - ONF-RTM Mountain terrain restoration services (*Services de restauration des terrains en montagne*)	• management of state and communal forests • RTM: natural hazard prevention: restoration of mountain terrain, protective forest maintenance, avalanche control, forest fire protection	• ONF	• INRAE	• ONF foresters • forest owners	Internal
	•	• reports for member magazines of forest owner associations (e.g., *bulletin de liaison*)	• dissemination of scientific findings on current forestry topics relevant to forest owners	• INRAE	• *respective forest owner associations*	• forest owners	Internal

4.3 Italy

Table 5: Identified integration forums in Italy

Type of integration forum	*Integration forum level*	*Name of integration forum*	*Main tasks*	*Key actors*	*Participating actors*	*Target actors*	*Link to research*
Existing	• national	• Roundtable on forestry supply chain (*Tavolo di filiera forestale*) (at MASAF[1])	• Coordination between actors in the field of forestry, wood supply and energy and politics at national and regional level	• MASAF (Ministry of Agriculture, Food Sovereignty, and Forestry)	Representatives of: • national professional agriculture organizations • MASE[2]; Ministry of culture; Ministry of Enterprises and Made in Italy • CREA[3], Ismea[4], AGEA[5], ISPRA[6] • representatives of the autonomous provinces Trento and Bolzano • CONAF[7] • ISTAT[8] • represantatives of universities with forestry degree programs • representatives of environmental organizations after the law n. 346 from July 8, 1986 • CNEL[9]	• Political administration • Scientists in the field of agriculture and forestry • Enterprises in forestry, bioenergy and wood supply sector,	External
Existing	• national	• Permanent consultation table for the forestry sector (*Tavolo di concertazione permanente del Settore forestale*) (at MASAF)	• Study, deepen, propose coordinated strategies for the forest sector and forest supply chains • Technical consultation • Facilitating coordination among	• MASAF (Ministry of Agriculture, Food Sovereignty, and Forestry)	• Presidency: Head of the forest department in MASAF • representatives of the forest administrations of each Region and autonomous Province • the heads of the four offices of the general	• Political administration (national and regional)	External

			ministries, Regions and other stakeholders • Participation in lawmaking		forest directorate in MASAF (*Direzione generale dell'economia montana e delle foreste*) *upon invitation by the president may join:* • representatives of EU-institutions, central administrations and other national administrations • experts on the topics under discussion		
Existing	• regional (Piedmont; *Piemonte*)	• Regional Technical Committee for Forests and Wood (*Comitato tecnico regionale per le foreste e il legno*)	• advisory body • provides technical and scientific support to the region in relation to forest-related topics and tasks such as forest planning, timber production, hydraulic-forestry adaptations, natural engineering, etc.	• Department of Environment, Energy, and Territory – Forestry Sector of Piedmont (*Direzione Ambiente, Energia e territorio – Settore Foreste della Regione Piemonte*)	*one representative of each of the following institutions*: • Institute for Wood Plants and the Environment • Council for Agricultural Research • agricultural cooperation • forestry companies • wood craftsmen • wood industrialists • professional associations of agronomists and foresters of Piedmont • a representative of the managers of regional protected areas and Natura 2000 network sites • a representative for each of the	• Region Piedmont (government and administration)	External

					most representative agricultural organizations at regional level belonging to the National Council for Economics and Labor *facultative*: • a representative of the State Forestry Corps • a representative of the degree course in Forestry and Environmental Sciences of the Faculty of Agriculture of the University of Piedmont		
Existing	• national	• AINEVA[10] (Interregional Association for coordination and documentation of snow and avalanche problems)	• coordination of actions and initiatives of member agencies in field of snow monitoring and prevention of avalanches • exchange of information, shared methodologies for data collecting, training and courses for professionals, etc.	• AINEVA	• Region Piemonte • Autonomous Region Aosta Valley • Region Lombardia • Autonomous Province of Trento • Autonomous Province of Bolzano • Region Veneto • Autonomous Region Friuli-Venezia Giulia, • Region Marche	• Civil protection • Citizen • Mountain Municipalities • Landowners and land users in mountainous regions	External/ internal
Existing	• national	• ANARF[11] National Association of Regional Forestry Activities (*L'Associazione Nazionale Attività*	• Coordination of action, intervention and study to promote the association as privileged interlocutor in the field of agri-forestry-	• Presidency since 2023: Regional Forestry Agency for Territorial Development and the Environment of Sardinia	• Veneto Agricoltura • Region Basilicata • Regional Irrigation and Forestry Agency – Region Puglia (ARIF[13])	• National and international actors involved in forest policy (Italian government and national forestry administration, EU) • Forest owners	Exernal/ internal

		Regionali Forestali)	pastoral problems • National and international networking and exchange of knowledge • Promote forest management practices for sustainable timber use Main fields: • state-owned forest management (regional forest heritage) • forest management • tree nursery/tree cultivation	(Fo.Re.S.T.A.S.[12])	• Regional Forest Agency – Region Umbria (AFOR[14]) • Autonomous Region Friuli-Venezia Giulia • Regional Agency for Agricultural and Forestry Services of the Region Lombardia (ERSAF[15]) • Pianura Forestry Association (AFP[16]) • Agency Calabria Verde (Aziende Calabria Verde) • Region Sicilia	• Forestry companies	
	• national	• SISEF congresses (*Società Italiana di Selvicoltura ed Ecologia Forestale*)	• Dialog between research and utilization	• SISEF	• Forest scientists • Forest owners • Forest professionals • Forest authorities	• Forest scientists • Forest owners • Forest professionals • Forest authorities	External/ internal

[1] MASAF Ministry of Agriculture, Food Sovereignty, and Forestry (*Ministero dell'agricoltura, della sovranità alimentare e delle foreste*)
[2] MASE Ministry of the Environment and Energy Security (*Ministero dell'Ambiente e della Sicurezza Energetica*)
[3] CREA Council for Agricultural Research and Economics (*Consiglio per la ricerca in agricoltura …*)
[4] ISMEA Institute of Services for the Agricultural and Food Market (*Istituto di Servizi per il Mercato Agricolo Alimentare*)
[5] AGEA Agency for agricultural subsidies (*Agenzia per le erogazioni in agricoltura*)
[6] ISPRA Italian Institute for Environmental Protection and Research (*Istituto Superiore per la Protezionee la Ricerca Ambientale*)
[7] CONAF National Council of Agronomists and Foresters (*Consiglio dell'Ordine Nazionale dei Dottori Agronomi e dei Dottori Forestali*)
[8] ISTAT Italian National Institute of Statistics (*Istituto Nazionale di Statistica*)
[9] CNEL National Council for Economics and Labor (*Consiglio Nazionale dell'Economia e del Lavoro*)
[10] AINEVA Interregional Association for coordination and documentation of snow and avalanche problems

(*Associazione Interregionale di coordinamento e documentazione per i problemi inerenti alla neve e alle valanghe*)

[11] ANARF — National Association of Regional Forestry Activities (*L'Associazione Nazionale Attività Regionali Forestali*)

[12] Fo.Re.S.T.A.S. — (*Agenzia FOrestale REgionale per lo Sviluppo del Territorio e l'Ambiente della Sardegna*)

[13] ARIF — Regional Irrigation and Forestry Agency -Regione Puglia (*Azienda Regionali Attività Irrigue e Forestali – Region Puglia*)

[14] AFOR — Regional Forest Agency – Region Umbria (*Agenzia Forestale Regionale – Regione Umbria*)

[15] ERSAF — Regional Agency for Agricultural and Forestry Services (*Ente Regionale per i Servizi all'Agricoltura e alle Foreste*) (*Regione Lombardia*)

[16] AFP — Pianura Forestry Association (*Associazione Forestale di Pianura*)

4.4 Slovenia

Table 6: *Identified integration forums in Slovenia*

Type of integra-tion forum	*Integration forum level*	*Name of integration forum*	*Main tasks*	*Key actors*	*Participating actors*	*Target actors*	*Link to research*
Existing	• national/ regional	• Planning procedures: Regional forest management plans (*GGO*)	• Preparation of forest management plans (10 years, strategic/regional level) that ensure sustainable and close-to-nature forest management.	• Slovenia Forest Service	• Spatial Ministry • Agricultural Ministry • Environmental Ministry • Water Management Ministry • Nature Conservation Institute (ZRSVN) • Private and state forest owners (SiDG: Slovenski državni gozdovi) • Several stakeholders like Triglav National Park, experts for water management, forest owners (state/private), game management associations, associations for matters of culture heritage etc.	• Forest owners	external
	• national/ regional	• Planning procedures: Forest management unit plans (*GGE*)	• Preparation of forest management unit plans, concretization of management measures in individual forest stands	• Slovenia Forest Service	• Ministry of Agriculture	• Forest owners	external
	• national/ regional	• Online map tool „Forest data viewer"	• Provision of spatial display of forest data and plans (e.g.,	• Slovenia Forest Service	•	• Slovenia Forest Service • Forest managers	external / internal

			forest management areas and units, hunting management areas)			• Forest owners • Hunters • Citizen	
	• national/ regional	• Online lectures for SFS foresters (approx. 1-2 times per month)	• Information and education of foresters • Improving level of knowledge of forest staff	• Slovenia Forest Service (central unit)	• Slovenia Forest Service foresters • External experts	• Slovenia Forest Service foresters and forest managers	internal
	• regional	• Forest Living Lab/Martelo scope Soteska Valley	• Education of foresters on the topic of protective forest management	• Slovenia Forest Service	•	• Foresters of the SFS • other forest personnel • forest owners	internal
Hybrid	• national	• Activities of ProSilva Slovenia	• Information exchange and promotion of an integrated forest management	• ProSilva Slovenia	• *Actors selected by key actor*	• Forest practitioners • Forest owners	internal
	• national	• Journal "Gozdarski vestnik"	• Informing forest practitioners to enhance sustainable and close-to-nature forest management	• Association *Zveza Gozdarskih Društev Slovenjie*	• Slovenia Forestry Institute • Slovenia Forest Service • University of Ljubljana, Biotechnical Faculty • Ministry of Agriculture, Forestry and Food	• Foresters and forest managers of the Slovenia Forest Service • General public	external
	• regional	• Bilateral discussions	• Coordination of different practitioners involved in managing the landscape	• Slovenia Forest Service	• Triglav National Park • University of Ljubljana, Biotechnical Faculty • SFI	• Forest owners	external/ internal

4.5 Switzerland

Table 7: Identified integration forums in Switzerland

Type of integration forum	*Integration forum level*	*Name of integration forum*	*Main tasks*	*Key actors*	*Participating actors*	*Target actors*	*Link to research*
Hybrid	• (inter-) national	• biliteral discussion with PLANAT – National Platform for Natural hazards (*Nationale Plattform Naturgefahren*)	• Extra-parliamentary commission for developing strategies for dealing with risks from natural hazards • Further development of integrated risk management (IRM) • Providing expert advice to the Federal Council • Promoting the exchange of knowledge and experience	• PLANAT	• (UVEK - Department of the Environment, Transport, Energy, and Communications) • PLANAT members (*18 experts from fields including research, professional associations, and insurance companies*)	• National and cantonal adminstrations • Private sector • Citizen	external
Existing	• (inter-) national	• PLANAT conferences	• Promotion of knowledge and experience exchange on the topic of risk management of natural hazards	• PLANAT	• Scientists • Insurance companies • Private sector • National and cantonal administrations	• Scientists • Insurance companies • Private sector • National and cantonal administrations • citizen	external/ internal
Existing	• (inter-) national • inter-cantonal	• KOK - Conference of Cantonal Foresters (*Konferenz der Kantonsförster*) • Specialised "KOK working group on protective forests"	• National conference of the heads of the forestry offices or forest departments of the cantons and the Principality of Liechtenstein • specialist conference for the forest • advisory body of the Conference for Forests, Wildlife and Landscape • Coordination of cantonal interests	• KOK (steering committee)	• Heads of the departments responsible for forests in the cantons and the Principality of Liechtenstein *Sometimes opened up for consultation and inputs by further actors from:* • private sector • science	• Forest cantonal administration • Forest owners	external
Existing	• (inter-) national • inter-cantonal	• bilateral discussion with GWP – Specialized Department for Mountain Forest Care (*Fachstelle für Gebirgswaldpflege*)	• *Exchange of selected scientific information in regard to the potential actor´s interests*: • Public relations work for mountain and protective forests (development information material for the public, e.g., "Practical	• GWP	• *Actors selected by key actor*	• Cantonal forest administration • Forest owners • Forest research	external/ internal

		[*by all cantons, BAFU, and Liechtenstein*]	Guide to Mountain Forestry"); support for cantons in forest PR work • Organization and implementation of continuing education programs for forestry engineers and foresters • Consulting • Promotion of knowledge transfer between research, teaching, and practice • Cooperation with cantonal forestry services			• Forest education	
Existing	• national	• FAN – Natural Hazards Section (*Fachgruppe Naturgefahren*)	• National professional network of experts promoting comprehensive protection against gravitational natural hazards • Main areas of work: hazard mapping and assessment, risk identification and management, measures (structural, planning, organizational, bioengineering) • Promotion of the exchange of experience between practitioners, researchers, and specialist authorities • Dissemination of new research results through various continuing education formats	• FAN (committee)	• *Actors selected by key actor*	• (forest) praxis • (forest) research • Specialist authorities for natural hazard protection	external/ internal
Existing	• national	• Forest knowledge transfer working group (*Arbeitsgruppe Wissenstransfer Wald*) *(bilateral discussions with selected AG members*)	• Objective: Improvement of the knowledge dialog between research, teaching, practice and the public in the forest sector • Development of various projects	• BAFU/FOEN • (Federal Office for the Environment)	• WSL • ETH Zurich • HAFL • Forest Education Center Lyss • Forest education center Maienfeld • WaldSchweiz (Swiss Forest Owners Association) • SFV (Swiss Forestry Association) • VSF (Association of Swiss Forestry Personnel) • Forest Entrepreneurs Switzerland (FUS)	• Actors from teaching, practice, public	Intern / extern (*Some colleagues from the PP institutions are members*)

Existing	• national	• NetworkForest (*NetzwerkWald*)	• Event to network actors from the forest industry, timber, authorities and politics for an exchange on current forest topics	• *WaldSchweiz* (Association of Forest Owners) • Respective cantonal member association	• Forest practitioners • Forest industry • Forest administration • Political decision makers • General public	• Forest practitioner /owners • Forest industry • Forest administrati on • Political decision makers • General public	external
	• national	• ForestCongress (*WaldKongress*)	• Knowledge, exchange and networking event for actors at all levels of the Swiss forest	• WaldSchweiz (Association of Forest Owners)	• Forest practitioners/ owners • Forest industry • Forest administration • Political decision makers • General public	• Forest practitioner s/ owners • Forest industry • Forest administrati on • Political decision makers • General public	external
Existing	• national	• Journals published by "WaldSchweiz" (Association of Forest Owners) - "*Wald und Holz*" - "*La Forêt*"	• Providing information on current forestry topics relevant to practice	• WaldSchweiz (Association of Forest Owners)	• *Actors selected by key actor*	• Forest practitioner /owners • public	external
Existing	• national	• Journal "Schweizerische Zeitschrift für Forstwesen" (SFZ)	• Knowledge transfer, dissemination of scientifically written articles on forests (use, protection, natural hazards, etc.)	• Swiss Forestry Association (*Schweizerischer Forstverein*)	• *Actors selected by key actor*	• Forstakade mikerInnen • Practical forest experts	external/ internal
Existing	• national	• Round forest tables (*Runde Waldtische*) [frequency: twice a year]	• Knowledge, exchange and networking event for actors at all levels of the Swiss forest • Venue: (usually) outside in the forest	• AfW – Working group for the Forest (*Arbeits-gemeinschaft für den Wald*)	• Forest practitioners • Forest scientists • Forest education • Environmental experts • Hunting associations • Recreational groups	• Forest practitioner s • Forest scientists • Forest education • Environmen tal experts • Hunting associations • Recreational groups • citizen	external/ internal
Hybrid	• national	• Bilateral discussion with SBB	*exchange of selected scientific information in regard to the potential actor´s interests:*	• SBB	• SBB • Forest experts • Natural hazard management experts	• Forest owners • Forest experts	external

		Swiss Federal Railways (*Schweizerische Bundesbahnen*)	• Access to data for assessing areas at risk from natural disasters • Protection of own infrastructure against natural hazards		• …	• Natural hazard management experts • adminstration	

5. Conclusion

The RIU model highlights the importance of the interests and influence of relevant actors (Böcher, 2020) and thus provides a solid basis for understanding where and how scientific information can be integrated. The integration forums identified within the MOSAIC project reveal concrete pathways through which scientific findings can effectively reach practical application. Using such forums enables scientific knowledge to be targeted precisely toward interested and influential actors. Within an integration forum, a bidirectional selection process of scientific information takes place, allowing for the fine-tuning and further development of content (Stevanov & Krott, 2021), thereby laying the foundation for co-creative processes between science and practice.

The analysis has shown that knowledge transfer strongly depends on the respective national contexts. Differences are particularly evident in the structure of actor networks, political frameworks, and the already existing formats of integration forums. An empirically based understanding of the relevant actors therefore represents the key prerequisite for successful knowledge transfer.

The country-specific findings illustrate this diversity:
Austria and Switzerland both have a variety of specialized existing forums in which the topics of protective forests and forest-related natural hazard management are directly addressed. Utilizing these existing forums offers great potential to incorporate new scientific information from the MOSAIC project and thereby intensify the exchange between research and practice. A stronger focus could also be placed on reaching the group of forest owners as “actors directly operating in the forest,” for example through tailored communication channels such as member magazines.

In Italy, the identified integration forums address protective forests and forest-related natural hazard management rather indirectly or as a subordinate topic. Emphasizing the relevance of protective forest issues when engaging with these formats is therefore essential and should be particularly considered at the regional level.

Slovenia has a compact actor landscape with few but central key actors who play an essential coordinating role in the field of forest-related natural hazard management. Here, stable yet focused channels for knowledge transfer exist, which can be further strengthened through targeted cooperation.

Overall, the analysis demonstrates that the successful transfer of scientific knowledge into practice requires a precise understanding of actor landscapes, the targeted selection of suitable integration forums, and the continuous adaptation of formats to national and institutional contexts. The RIU perspective applied in the MOSAIC project provides a robust conceptual framework for channeling scientific information purposefully and effectively into societal and political practice processes.

6. Other

6.1 References

Bernauer, T., Jahn, D., Kuhn, P.M., Kritzunger, S. Walter, S. 2022. Einführung in die Politikwissenschaft, 5th updated and expanded edition. Nomos. Baden-Baden.

Böcher, M., 2020. Advanced approaches for a better understanding of scientific knowledge transfer in forest and forest-related policy. Forest Policy and Economics 114, 102165. https://doi.org/10.1016/j.forpol.2020.102165.

Böcher, M., Krott, M., 2016. Science makes the world go round: Successful scientific knowledge transfer for the environment. Springer, Cham.

Do, T.H., Krott, M., Böcher, M., 2020. Multiple traps of scientific knowledge transfer: Comparative case studies based on the RIU model from Vietnam, Germany, Indonesia, Japan, and Sweden. Forest Policy and Economics, 102–134. https://doi.org/10.1016/j.forpol.2020.102134.

GreenRisk4Alps Project Report, 2021. Report on 'Road map for decision targeted communication of green risk management'.

Hubo, C., Krott, M., 2010. Politiksektoren als Determinanten von Umweltkonflikten am Beispiel invasiver gebietsfremder Arten, in: Feindt, P.H., Saretzki, T. (Eds.), Umwelt- und Technikkonflikte. VS Verlag, Wiesbaden, pp. 219–238.

Juerges, N., Krott, M., 2018. Internationale Waldbauforschung für die Praxis – Professioneller Wissenstransfer durch das RIU-Modell. Landbauforsch, Appl Agric Forestry Res, 1–13. https://doi.org/10.3220/LBF1523610463000.

Kirchner, M., Krott, M., 2020. Integrating forest science into natural hazard management praxis: An international case study based on the innovative RIU approach. int. forest. rev. 22, 449–465.

Kirchner, M., Krott, M., 2022. Making science-based natural hazard risk management work within power networks –from co-production models of knowledge transfer to the Research-Integration-Utilisation (RIU) model. International Journal of Disaster Risk Reduction, 103362. https://doi.org/10.1016/j.ijdrr.2022.103362.

Kirchner, M., Stevanov, M., Krott, M., 2022. How to Use Scientific Information: Road Map for Tailoring Your Own Natural Hazard Risk Management Solution, in: Teich, M., Accastello, C., Perzl, F., Kleemayr, K. (Eds.), Protective forests as Ecosystem-based solution for Disaster Risk Reduction (ECO-DRR). IntechOpen.

Lehmann, L., Rieder, S., 2003. Von Mägden und Knechten in Wissenschaft und Politik: Wissensvermittlung als Element des politischen Prozesses. tec21 26, 6–8.
Mayring, P., 2015. Qualitative Content Analysis: Theoretical Background and Procedures, in: Bikner-Ahsbahs, A., Knipping, C., Presmeg, N. (Eds.), Approaches to qualitative research in mathematics education. Examples of methodology and methods. Springer, Dordrecht, Heidelberg, New York, London. Advances in Mathematics Education, pp. 365–380.

North, D.C., 1992. Institutions, institutional change and economic performance. Cambridge University, Cambridge, Mass. The political economy of institutions and decisions.

Schulz, T., Lieberherr, E., Zabel, A., 2018. Network governance in national Swiss forest policy: Balancing effectiveness and legitimacy. Forest Policy and Economics, 89, 42-53. https://doi.org/10.1016/j.forpol.2016.10.011

Stevanov, M., Krott, M., 2021. Embedding scientific information into forestry praxis: explaining knowledge transfer in the Horizon project ALTERFOR and its German case. Forest Policy and Economics 129, 102508. https://doi.org/10.1016/j.forpol.2021.102508.