This project is funded by the European Union

Ref. Ares(2025)8115086 - 26/09/2025

EPD-NET

Filling the Gap: Development of Ecological Planning and Design Learning Network and Adaptive Smart Training Module for Disaster Resilient and Sustainable Cities

NEEDS ASSESSMENT REPORT

Rooted in the insights of students and professionals, EPD-Net designs resilience-focused, sustainability-driven, and practice-embedded learning modules that empower communities to build disaster-ready, ecologically sustainable cities.

This project is funded by the European Union

EPD-Net Needs Assessment Report

Deliverable Code: D2.2
Work Package: WP2 - Project Management
Lead Institution: Mendel University in Brno (MENDELU), Eskişehir Technical University (ESTU)
Contributing Partners: Eskişehir Technical University (ESTU), Ankara University, Istanbul Kültür University, Harran University, Mendel University in Brno (MENDELU), Latvia University of Life Sciences and Technologies (LBTU), Slovak University of Agriculture in Nitra (SPU)
Submission Date: MS3-MS4 - September 2025
Version: v03

CONTENT

LIST OF TABLES

ABBREVIATIONS

AFAD – Disaster and Emergency Management Authority (Türkiye)

AI – Artificial Intelligence

AR – Augmented Reality

ARUP – Arup Group (Engineering & Design Consultancy)

ASBU – Social Sciences University of Ankara

AU – Ankara University

BIM – Building Information Modelling

BROZ - Bratislava Regional Association for Nature Conservation and Sustainable Development for Slovakia (Bratislavské regionálne ochranárske združenie)

ÇOMÜ - Çanakkale Onsekiz Mart University

CV – Curriculum Vitae

DAPHNE –Applied Ecology Institute for Slovakia (Institut aplikovanej ekológie)

EPD-NET – Ecological Planning and Design Learning Network

ESTÜ – Eskişehir Technical University

EU – European Union

FEMA – Federal Emergency Management Agency (USA)

GIS – Geographic Information Systems

HU – Hacettepe University

IBM – International Business Machines Corporation

IKÜ – İstanbul Kültür University

ITÜ – İstanbul Teknik University

LBTU – Latvia University of Life Sciences and Technologies

LIFE – EU LIFE Programme (Environment & Climate Action)

MENDELU – Mendel University in Brno

METU – Middle East Technical University

MS – Master of Science

NBS – Nature-Based Solutions

NGO – Non-Governmental Organization

QGIS – Quantum Geographic Information System

RS – Remote Sensing

SDG – Sustainable Development Goals

SPSS – Statistical Package for the Social Sciences

TODAIE - Public Administration Institute for Turkey and The Middle East

UCTEA - Union of Chambers of Turkish Engineers and Architects

Executive Summary

This Needs Assessment Report has been prepared within the framework of the EPD-Net project, which aims to develop an ecological planning and design learning network and an adaptive smart training module for disaster-resilient and sustainable cities. The report presents a comprehensive synthesis of the findings derived from **surveys conducted in Türkiye, Spain, Latvia, Czechia, and Portugal**, as well as from **semi-structured interviews and focus group discussions held in Türkiye, Czechia, Latvia and Slovakia**. Within this scope, the strengths and weaknesses of current education, professional practice, and institutional structures are identified; gaps, barriers, and opportunities are defined; and evidence-based inputs are provided to guide the design of the EPD-Net training modules.

The study adopted a multi-method research approach, combining the statistical analyses of quantitative survey data with qualitative insights from interviews and focus group discussions. This ensured the integration of both numerical distributions and in-depth narratives into the analysis. A total of **90 interviews** were conducted, comprising **22 students and 68 professionals**. In addition, surveys with **a total of 685 participants (316 professionals and 369 students)** were analyzed using **Chi-square tests** to examine the relationships between variables such as age, gender, educational level, professional field, and experience, and their associations with training needs and expectations. This method revealed significant differences across groups and provided robust evidence for the design of inclusive and context-sensitive training modules.

Focus group discussions highlight the importance of overcoming structural barriers, embedding preventive and nature-based strategies into education, strengthening lifelong learning mechanisms, and enhancing collaboration among academia, public institutions, and civil society. Participants also underline the necessity of integrating policy, legislation, financing, and cultural heritage considerations into educational frameworks.

The findings point to **common challenges across countries**, including the gap between theory and practice, the limited integration of applied and interdisciplinary approaches, fragmented governance, insufficient financial resources, and weak inter-institutional coordination. Nevertheless, both students and professionals demonstrate strong motivation to advance sustainability, resilience, and digital competencies. Participants consistently emphasize the need for **hybrid, practice-oriented, and technology-supported learning models**, integrating scenario-based exercises, interdisciplinary projects, and real-life case studies.

At the national level, Türkiye's stakeholders highlight insufficient practice-based opportunities, fragmented institutional structures, and underdeveloped curricular integration of disaster risk management, despite strong motivation to adopt digital and AI-supported tools. In Czechia, both students and professionals report limited exposure to applied ecological planning and insufficiently coordinated governance frameworks, yet they demonstrate high levels of civic engagement and a demand for preventive, integrated risk management strategies. Latvia's participants, while motivated by ecological values and international exposure, underscore the scarcity of applied disaster management modules, insufficient technical training, and rigid institutional structures that constrain progress. In Slovakia, respondents emphasize the absence of dedicated disaster management programs and the fragmentation of relevant content across disciplines, calling for systemic reform through integrated hydrology–climate–planning courses, specializations in flood risk and water retention, and applied, scenario-based learning in

collaboration with municipalities. Across all contexts, both students and professionals converge on the recognition that sustainability and climate resilience must become integral components of education, policy, and practice.

In conclusion, this Needs Assessment Report identifies the **key priorities** to be considered in the design of EPD-Net training modules:

- **Bridging the theory–practice divide** through applied, experiential, and scenario-based methods.
- **Integrating digital competencies** such as GIS, AI, VR/AR, and BIM into education and professional practice.
- **Overcoming governance-related barriers** by strengthening inter-institutional coordination and policy coherence.
- **Ensuring inclusivity** through gender-sensitive and intergenerational approaches.
- **Embedding sustainability and climate adaptation** as cross-cutting priorities at the intersection of education, research, and practice.

These findings will ensure that the training modules developed within EPD-Net are evidence-based, interdisciplinary, adaptive, and transformative, making a **strategic contribution to the development of disaster-resilient and sustainable cities across Europe**.

1. INTRODUCTION

The preparation of this Needs Assessment Report arose from the necessity to establish a solid empirical foundation for the design of training modules within the EPD-Net project. While the project aims to strengthen disaster resilience and ecological planning capacities through innovative and adaptive learning approaches, it was essential to understand the existing knowledge levels, expectations, barriers, and motivations of the target groups. Without such an assessment, the modules risked remaining generic or misaligned with the real needs of stakeholders, thereby limiting their relevance and long-term impact. Conducting comprehensive needs analysis therefore constituted a critical first step to ensure that the training content reflects not only theoretical objectives but also practical requirements.

To achieve this, the research adopted a multi-method approach that combined quantitative and qualitative data collection. These quantitative findings were complemented by semi-structured interviews and focus group discussions conducted in the partner countries. The interview questions are primarily designed to explore participants' professional or academic trajectories, the challenges encountered, and the motivations underlying their career paths. In addition, information is elicited regarding educational gaps, institutional practices, policy deficiencies, and best practices in the fields of ecological planning, disaster resilience, and sustainable cities. Expectations concerning knowledge, skills, and methodologies for the development of future training modules are also identified through the interviews. Although all EPD-Net partners were initially invited to contribute, Norway, Spain, and Slovakia indicated that they would not be able to participate at this stage. Consequently, the interview results and focus group discussions presented in this report is based on the contributions of Türkiye, the Czechia and Latvia, whose stakeholder groups actively engaged in the process.

Need Analysis Survey aims to assess participants' knowledge levels, educational experiences, and skill needs in the fields of ecological planning, disaster resilience, and sustainability. In addition, expectations regarding the development of green, digital, and social competencies, as well as preferences concerning the content, methods, and design features of existing digital learning platforms, are evaluated. The surveys also include questions addressing participants' expectations for the educational content to be developed within the scope of EPD-Net. A detailed evaluation of the survey questions is provided in the Needs Analysis Report (WP 1 – D 1.5) before. The fourth section of this report focuses on the Chi-Square tests applied to examine the statistical significance of the relationships between participants' demographic and professional characteristics (e.g., field of study, gender, professional role, knowledge level, and training experience) and their responses to key questions regarding training needs, institutional strategies, preferred evaluation methods, user interface expectations, and motivational factors. The primary aim of applying these tests was to determine whether participants' backgrounds influenced their priorities, awareness, and preferences within the scope of the EPD-Net project. In doing so, the analysis sought to identify meaningful differences across groups that could inform the design of tailored, inclusive, and context-sensitive training modules and digital learning tools.

In this study, Chi-Square tests were applied not only to determine whether statistically significant associations existed between selected variables, but also to uncover deeper patterns that could guide the design of the EPD-Net training modules. The primary aim was to examine how participant profiles—such as professional field, gender, knowledge level, and training experience—relate to their preferences, priorities, and awareness regarding resilience, ecological planning, and green infrastructure. This approach allowed us to identify differentiated needs across groups, highlight disciplinary and sectoral variations, and reveal gaps in institutional awareness. Furthermore, by analyzing these associations, the study sought to generate evidence-based insights to inform the prioritization of skills, the structuring of digital learning platforms, and the development of more inclusive and context-sensitive training strategies. Ultimately, the use of Chi-Square tests served a dual purpose: assessing the statistical significance of observed relationships and translating these findings into actionable knowledge that strengthens both the educational content and the institutional and policy relevance of the EPD-Net project.

These findings were complemented by semi-structured interviews and focus group discussions conducted in partner countries. The interview questions are primarily designed to explore participants' professional or academic trajectories, the challenges encountered, and the motivations underlying their career paths. In addition, information is elicited regarding educational gaps, institutional practices, policy deficiencies, and best practices in the fields of ecological planning, disaster resilience, and sustainable cities. Expectations concerning knowledge, skills, and methodologies for the development of future training modules are also identified through the interviews. Although all EPD-Net partners were initially invited to contribute, Norway stated that it could not join due to ethical concerns regarding the survey and interview activities. The interviews were carried out under the responsibility of universities, as institutions preparing future professionals and providing lifelong learning opportunities. Since the Spanish partner is not a university but an institute, they were therefore unable to provide support for this component of the process. Consequently, the interview results and focus group discussions presented in this report is based on the contributions of Türkiye, Czechia, Latvia and Slovakia whose stakeholder groups actively engaged in the process.

The surveys enabled systematic comparisons across age groups, genders, professional fields, and prior levels of experience, identifying statistically significant trends in learning preferences and motivational factors. Interviews highlighted structural issues such as fragmented governance, insufficient opportunities for applied training, and underrepresentation in decision-making processes, while focus group discussions created a platform for interdisciplinary dialogue among academia, public institutions, civil society, and private sector actors. This triangulation of methods ensured that the findings are not only reliable but also sufficiently diverse to guide the development of flexible, multi-layered, and inclusive training modules.

In conclusion, the needs analysis was carried out to bridge the gap between theory and practice and to align the design of EPD-Net training modules with real-world requirements. By systematically analyzing data collected from students, professionals, and institutional stakeholders, this report provides strategic guidance on how to structure the learning modules to address different knowledge levels, respond to motivational factors, and overcome existing barriers. In this respect, the report represents a milestone in the project's roadmap, ensuring that

the EPD-Net learning network develops as a relevant, evidence-based, and transformative initiative that strengthens disaster resilience and ecological planning capacities across Europe.

Need assessment report is an integral part of the Work Package 2 (WP2) which involves **examining case studies and identifying best practices** (D 2.1 - the EPD-Net Consolidated Literature / Case Study / Best Practices Report, which established the foundational knowledge required for designing an AI-aided, adaptive, and transnational training module in ecological planning and design (EPD) for disaster management. This deliverable consolidated insights from academic literature, real-world case studies, and best practice examples, reflecting the interdisciplinary expertise and diverse national contexts of project partners and served as the foundation for subsequent WP2 deliverables, guiding the stakeholder consultation activities and survey design, as well as shaping the framework for curriculum development. In this way, the literature and case study review functioned as a bridge between conceptual research and the practice-oriented outputs that followed within WP2.). This activity was followed by **gathering stakeholder perspectives through: i) surveys** (D1.5), **ii) interviews** (D 2.2) **; iii) focus groups** (D 2.2). The aim was to equip spatial planners and designers with the knowledge and skills necessary to contribute effectively to disaster resilience.

2. EVALUATION OF THE INTERVIEWS

2.1 Key Questions Raised During the Interviews

Within the scope of the EPD-Net project, interview questions were developed for three different participant groups: professionals, academics, and students. This differentiation demonstrates that the project does not rely on a single perspective; rather, it aims to comprehensively reflect the experiences, expectations, and needs of diverse actors. The interview questions were designed with attention to the specific contexts in which each group is situated, thereby targeting knowledge production across a wide spectrum—from education to practice, and from research to the learning process. All questions used during the interview process are presented in Annex 1.

The questions prepared for professionals primarily focus on practical implementation, organizational functioning, and decision-making at the policy level. In this respect, participants are asked in detail about their professional backgrounds, career paths, institutional responsibilities, challenges encountered, and good practices implemented. Furthermore, issues such as the effectiveness of current disaster management policies, critical systemic gaps, public awareness, and the role of digital tools in practice are highlighted. The central emphasis of the professional group questions lies in the transfer of knowledge and skills to the field, decision-making processes, and the sustainability of organizational strategies. The questions directed at academics, on the other hand, are more focused on the dimensions of education and research, with the aim of uncovering the gaps between theory and practice in the field of disaster and ecological planning. These questions are structured around the adequacy of current curricula, deficiencies in students' knowledge and skills, the integration of new technologies into education, and ways to enhance cooperation between academia and practice. They also address the identification of research gaps, the future directions of knowledge production, and the integration of innovative tools such as artificial intelligence into teaching. The main emphasis of the academic questions' perspective is on improving the quality of education and research, and on developing strategies that enhance the employability of graduates. The questions for students focus on personal learning experiences, challenges encountered during their education, and expectations for the future. These questions aim to reveal students' current knowledge levels, the digital tools they use and for what purposes, their preferred learning formats, and their career expectations. Additionally, students are asked to evaluate areas they perceive as lacking in their education, the skills they believe they need, and how the EPD-Net platform could be made more useful. The core emphasis of the student-oriented questions is on individual learning experience and personal development.

Table 1. Comparison of Interview Question Frameworks for Professionals, Academics, and Students within the EPD-Net Project

Section	Professionals	Academics	Students
1. Respondent Profile	Current position, career path, educational	Current position, career path, educational	Study program, educational/practical background,

	background, future plans	background, future plans	knowledge level, future plans
2. Journey	Motivation for entering the field, initial focus, career development, barriers encountered	Motivation for academic career, initial focus, development process, barriers encountered	Motivation for entering the field, choice of focus area, barriers to entering the system
3. Local / Organizational Context	Regional environmental risks, organizational information (legal structure, number of employees, vision, collaboration)	Regional environmental risks, university focus, graduation rates, employment, vision	Regional environmental risks, university focus, graduation and employment data
4. Best Practices & Achievements	Personal achievements, best practices, systemic issues, education gaps, theory-practice divide	Academic achievements, best practices, systemic issues, education gaps, theory-practice divide	Best practices, systemic issues, education gaps, post-graduation deficiencies
5. Everyday Practice	Common measures in practice, barriers encountered, knowledge and skills used, data needs, bridging academia and practice, use of AI	Topics covered in education, barriers, knowledge and skills used, data needs, cooperation with practice, use of AI	Topics highlighted in lectures, missing tools/skills, research areas, bridging with practice, use of AI
6. Policy & System Insights	Effectiveness of policies, systemic gaps, leadership role	Effectiveness of policies, systemic gaps, leadership role	– (No policy-related questions, mainly education-focused)
7. Involvement, Collaboration & Sustainability	Public education, professional contribution, organizational strategy, sustainability, contribution to EPD-Net	Public education, academic contribution, university strategies, sustainability, contribution to EPD-Net	Sustainability (long-term contribution of the EPD-Net platform)
8. Education & Training Preferences	Digital tools used, learning preferences, sources of innovation, hiring perspective	Digital tools used, learning preferences, sources of innovation, hiring perspective	Digital tools used, learning preferences, sources of innovation, course/certificate preferences for CV

9. Training Content Insights	Essential skills, green-digital-social skills, content design (risk, scenarios, NBS, policy, etc.), teaching methods, knowledge areas, resilience skills, case study format	Essential skills, green-digital-social skills, content design, teaching methods, knowledge areas, resilience skills, case study format	Essential skills, content design, teaching methods, knowledge areas, resilience skills, case study format
10. Inclusion & Equal Opportunity	Barriers for women, recent graduates, senior professionals	Barriers for women, recent graduates, senior academics	Barriers for women, recent graduates, senior professionals
Final Comments	Additional suggestions/feedback	Additional suggestions/feedback	Additional suggestions/feedback

The differences among these three groups clearly highlight the multi-scalar approach of the EPD-Net project. Professionals represent the practice scale, focusing on policies, organizational structures, and practical experiences. Academics emphasize the education and research scale, concentrating on the adequacy of current curricula, research gaps, and the integration of theory and practice. Students, on the other hand, foreground the learning experience scale, drawing attention to individual needs, digital tools, and career expectations. This structuring, therefore, enables the integration of contributions from different actors within a holistic framework and allows for the development of a multidimensional perspective in the design of training modules. Ultimately, categorizing the interview questions in this way provides the EPD-Net project with not only content but also strategic direction.

2.2 Overview of the Interview Process: Objectives, Structure, and Targeted Participants

Within the framework of the WP2 Research Analysis conducted under the EPD-Net Project, the study was not limited to the statistical findings of the survey data; it was further enriched through semi-structured interviews designed to provide qualitative depth. These interviews serve the purpose of shaping the content, pedagogical approach, and user-friendly design principles of the project's key output—digital training modules—in line with the expectations and needs of the target groups.

The interview targets were determined by considering each country's institutional capacity, the profile of the partners involved in the project, and the diversity of stakeholders at the national level. In this context, the initially proposed number of interviews was as follows: Latvia (10), Slovakia (10), Norway (10), Czechia (20), Spain (30), and Türkiye (40). Importantly, the objective was not only to reach the numerical targets but also to ensure diversity in participant profiles. Therefore, it was foreseen that each group of ten interviewees should include planners, designers, public representatives, academics, and students, with at least one postgraduate (preferably doctoral-level) representative included in the student category.

During the implementation process, only Türkiye, Czechia, and Latvia were able to conduct the interviews as planned. In contrast, Norway, Spain, and Slovakia reported that, due to various organizational and operational reasons, they would not be able to contribute to the interview activities.

The distribution of the completed interviews is as follows:

- Türkiye: 40 interviews in total, including 12 students and 28 professionals.
- Czechia: 30 interviews in total, including 4 students and 26 professionals.
- Latvia: 10 interviews in total, including 3 students and 7 professionals.
- Slovakia: 10 interviews in total, including 3 students and 7 professionals.

Table 2. Expected and Actual Number of Participants in EPD-Net Interviews

Country	**Expected Number of Participants**	**Actual Total Participation**	**Student Participants**	**Professional Participants**
Türkiye	40	40	12	28
Czechia	20	30	4	26
Latvia	10	10	3	7
Norway	10	0	–	–
Spain	30	0	–	–
Slovakia	10	10	3	7
Total	**120**	**90**	**22**	**68**

In total, 90 interviews were conducted within the scope of the project. Of these, 22 were student participants and 68 were professional stakeholders. This distribution demonstrates that the data was shaped by the substantial contributions of experienced actors, while also reflecting, to a significant extent, the perspectives of students regarding the future.

This dual composition added richness to the analysis in two ways:

1. The contributions of professionals revealed the strengths and weaknesses of current practices, institutional-level gaps, and barriers at the policy/implementation level.
2. The student contributions highlighted which knowledge, skills, and technologies future professionals require, as well as the areas in which current educational processes remain insufficient.

Therefore, in order to design the training modules through a multidimensional and user-oriented approach, not only the numerical distribution but also the qualitative diversity of the interviews has been considered essential. A balanced distribution of participants was required across the contributing countries, including urban and regional planners, landscape architects and designers, academics, civil society representatives, public sector employees, local government

experts, and representatives of the non-profit sector. In addition, student representation was ensured through interviews with a balanced number of undergraduate and graduate students. The diversity of participant profiles was intended to capture not only the expectations of academic and institutional actors but also the learning experiences of students. In conclusion, the outcomes of the interviews generated a dataset that is both complementary to the survey findings and directly grounded in the needs expressed by the participants. This data set provides a strong scientific basis for the development of the EPD-Net training modules in an interdisciplinary, inclusive, and adaptive structure.

Therefore, not only the numerical distribution but also the qualitative diversity of the interviews is of critical importance for designing the training modules with a multidimensional and user-oriented approach. The diversity in participant profiles enabled the project to capture not only the expectations of academic and institutional actors but also the learning experiences of students. As a result, the outcomes of the interviews produced a dataset that is both complementary to the survey findings and directly grounded in the expressed needs of participants. This data set provides a strong scientific basis for the development of the EPD-Net training modules in an interdisciplinary, inclusive, and adaptive structure.

2.3. Professional backgrounds of the interview participants

In this study, the sample of respondents was delineated with careful consideration of the varying attitudes among different stakeholder groups. A balanced distribution of participants has been required from the contributing countries, ensuring the inclusion of urban and regional planners, landscape architects and designers, academics, representatives of civil society, public sector employees, local government experts, and representatives of the non-profit sector. Particular attention was given to the distinctions between students and professionals, while at the same time highlighting the commonalities that cut across these groups. Drawing on the insights gathered from professionals, academics, and students, the analysis focuses on key dimensions such as sources of motivation, the perception of obstacles, and the processes of acquiring qualifications.

2.3.1 Türkiye

Disciplinary Backgrounds of Respondents from Ankara University (3 Students + 7 Professionals)

The respondent profile consists of three students and seven professionals, reflecting a balanced representation of academic and practice-oriented perspectives. The students, all from landscape architecture and related fields, are distributed across bachelor's and doctoral levels and mainly orient their career paths toward the private sector or academia. The student participants presented in the table demonstrate diversity in terms of educational level, disciplinary focus, and institutional context. At the undergraduate level, there are students enrolled in landscape architecture programs across various universities. In addition, at the same level, some students complement their academic training with voluntary disaster awareness and implementation programs offered through AFAD. At the doctoral level, participants specialize in landscape architecture and urban design, with a strong orientation toward research and academic careers.

Table 3. Disciplinary backgrounds of students from Ankara University

Level	Discipline / Field	Institution / Context
Undergraduate	Landscape Architecture	Currently enrolled in Bachelor's program (various universities, e.g. AU)
Undergraduate	Landscape Architecture (implementation, disaster awareness training via AFAD)	Bachelor's program with volunteer disaster training (AFAD)
Doctoral	Landscape Architecture / Urban Design (Ph.D.)	Landscape Architecture program, interest in research, academia

Table 4. Disciplinary backgrounds of professionals from Ankara University

Role / Position	Discipline / Field	Institution / Context
Maintenance Supervisor & Inspection Officer	Landscape Architecture (green areas, environmental protection)	Ankara Metropolitan Municipality, Department of Environmental Protection and Control
Co-founder of Design Firm & Faculty Member	Landscape Architecture, Urban/Environmental Design	OnDesign (private firm) & Bilkent University
Project Coordinator (Planner)	Urban & Regional Planning, Urban Design, Nature Conservation	Professional chamber / NGO context
Engineer (State Employee)	Meteorological Engineering, Landscape Architecture (M.Sc., Ph.D.)	Turkish State Meteorological Service
Secretary General & Project Coordinator	Landscape Architecture, Climate Action, Energy Efficiency	Chamber of Landscape Architects & Climate Research Association
Project Manager (GIS Certification)	Geomatics Engineering, GIS	Ministry of Environment, Urbanization and Climate Change – General Directorate of GIS
Professor (Academia)	Landscape Architecture, Urban Governance, Disaster Management	ASBU (Social Sciences University of Ankara), TODAİE, Erasmus University, AFAD collaborations

In the interviews conducted by the partners from Ankara University, professional participants reflected a wide interdisciplinary diversity across different roles and institutions. They included municipal officers responsible for green area management, private sector designers who also teach in academia, planners and coordinators working in professional chambers and NGOs, state engineers integrating meteorology and landscape architecture, representatives from professional associations engaged in climate action and energy efficiency, GIS experts within the Ministry of Environment, and professors specializing in landscape architecture, governance, and disaster management. Collectively, these profiles illustrate a strong synergy between public institutions, the private sector, civil society, and academia, highlighting the integration of practice, policy, and research.

Disciplinary Backgrounds of Respondents from Eskişehir Technical University (3 Students + 7 Professionals)

Students represent backgrounds in architecture, civil engineering, and environmental engineering, often combining these disciplines through double majors, Erasmus exchanges, and international internships. They are mostly at the bachelor's and master's levels, with clear ambitions to pursue further specialization, particularly in sustainability, resilient building design, geotechnics, and climate-related planning. Their career paths already demonstrate international exposure. Their main motivations are acquiring advanced qualifications, bridging academic knowledge with professional practice, and contributing to sustainability transitions.

Table 5. Disciplinary backgrounds of students from Eskişehir Technical University

Level	Discipline / Field	Institution / Context
Undergraduate	Architecture + Civil Engineering (double major)	Eskişehir Osmangazi University (Bachelor's in Civil Eng. 2024; 4th year in Architecture, Erasmus in Ostrava & internship at Politecnico di Milano, ARUP internship planned)
Master's	Civil & Environmental Engineering / Geotechnical Eng.	Continuing MSc in Geotechnical Engineering, focus on sustainability and climate crisis, internships in environmental, structural, and geotechnical engineering
Doctoral	Architecture (Sustainability & Disaster-Emergency Arch.)	Eskişehir Technical University, Integrated PhD in Architecture since 2021, research on disaster and emergency architecture in education

Table 6. Disciplinary backgrounds of professionals from Eskişehir Technical University

Role / Position	Discipline / Field	Institution / Context
Municipal Council Member & Professional Advisor	Urban & Regional Planning	Odunpazarı Municipality (Local Government).
Urban Planner (Smart Cities & Green Technologies Branch)	Urban & Regional Planning; GIS & Remote Sensing (MSc)	Ministry of Environment, Urbanization & Climate Change — General Directorate of GIS, Smart Cities Unit.
Geophysical Engineer (Groundwater Unit)	Geophysics Engineering	General Dırectorate Of State Hydraulıc Works (DSİ) — Groundwater Unit.
Local Government Representative (Project Unit)	Landscape Architecture; RS & GIS (MSc)	Sakarya Metropolitan Municipality (Project Unit).
Assistant Professor (Academia)	Landscape Architecture (Landscape Planning); Remote Sensing & GIS	Kırklareli University — Dept. of Landscape Architecture.
Secretary Member, Board of Architects (Non-profit)	Architecture (PhD Student)	Architects' Association, Eskişehir Branch (17th Term Board).
Founder of Design Firm	Landscape Architecture; GIS & Remote Sensing (MSc)	UCTEA - Chamber of Landscape Architects

Professionals, on the other hand, include academics, practitioners, and public-sector representatives working in fields such as architecture, urban and regional planning, landscape architecture, civil engineering, and disaster/emergency management. Their roles range from

university professors (focusing on disaster management, sustainability, and urban design) to municipal officials (e.g., green areas management), NGO leaders, and practicing architects/engineers. Their motivation is strongly tied to applying expertise to policy and practice, enhancing institutional coordination, and integrating ecological and disaster-resilience principles into governance frameworks.

Disciplinary Backgrounds of Respondents from Istanbul Kültür University (3 Students and 7 Professionals)

The respondent sample consists of students and professionals with varying disciplinary and institutional backgrounds. Students represent a relatively homogeneous group drawn from architecture and design education at bachelor's, master's, and doctoral levels. Their motivation is strongly shaped by living in disaster-prone areas and participating in applied projects such as disaster parks and post-disaster housing design. Professionals, by contrast, form a more diverse group that includes architects, landscape architects, public administrators, cultural heritage specialists, NGO leaders, and academics. The distribution of professionals and students indicates that participants from the field of architecture are particularly predominant.

Table 7. Disciplinary backgrounds of students from Istanbul Kültür University

Level	**Discipline / Field**	**Institution / Context**
Undergraduate	Architecture	İstanbul Kültür University (Department of Architecture)
Undergraduate	Architecture (studio courses on post-disaster housing, disaster parks)	İstanbul Kültür University
Undergraduate→ Doctoral	Interior Architecture & Environmental Design → Ph.D. in Architecture	Bilkent University (B.A.), İstanbul Kültür University (Ph.D.)

Table 8. Disciplinary backgrounds of professionals from Istanbul Kültür University

Role / Position	**Discipline / Field**	**Institution / Context**
Project Manager (AFAD)	Public Administration, Art History, Ph.D. in Architecture (Heritage Conservation)	Disaster and Emergency Management Presidency for Türkiye (AFAD)
Practicing Architect	Architecture	Private Architectural Office (Antakya)
Professor (Academia)	Architecture, Urban Design, Disaster Management	Çanakkale Onsekiz Mart University (ÇOMU), İstanbul Technical University (ITU), Middle East Technical University (METU)
Professor (Academia)	Architecture (Disasters & Physical Environment, Sustainability)	Düzce University
Local Government Representative	Landscape Architecture	İstanbul Metropolitan Municipality (Green Areas Department)
NGO Leader	Architecture (activism, community resilience)	Architecture for All Association (NGO)
Professional Organization Leader	Architecture + Disaster Management Training (FEMA/Japan/USA)	Chamber of Architects, İstanbul Branch

Disciplinary Backgrounds of Respondents from Harran University (3 Students + 7 Professionals)

Students are primarily enrolled in architecture and renewable energy programs at Harran University, combining their studies with varying degrees of professional experience. Their main motivation lies in contributing to sustainable and disaster-resilient design, yet they commonly report insufficient training opportunities, particularly in practice-based disaster management and ecological planning. Professionals form a more diverse group, representing academia, private architectural practice, municipal planning, public institutions, state administration, and civil society organizations. Their motivations stem from career development, institutional responsibilities, and societal contribution, yet they frequently highlight systemic challenges such as bureaucratic barriers, insufficient inter-institutional coordination, and the lack of continuous professional training.

Table 9. Disciplinary backgrounds of students from Harran University

Level	Discipline / Field	Institution / Context
Master's	Renewable Energy Resources (Architecture background)	Harran University, Institute of Science
Bachelor's	Interior Architecture	Harran University, Institute of Science (Renewable Energy Resources Program) / Works at District Municipality Planning Unit
Master's	Renewable Energy Resources (Architecture background)	Harran University, Institute of Science / Architect in own firm, past experience in building inspection and precast industry

Table 10. Disciplinary backgrounds of professionals from Harran University

Role / Position	Discipline / Field	Institution / Context
Research Assistant (Academia)	Architecture (focus on disaster management, digitalization)	University (PhD completed, 11 years academic experience)
Architect / Designer	Architecture, Restoration, Urban Design	Own firm (7+ years), former project & field experiences; pursuing doctoral studies
Architect (Local Government)	Architecture, Renewable Energy	Municipality (10 years, flood management & urban planning, MSc in Renewable Energy)
Architect (Public Institution)	Architecture, Renewable Energy	State institution (5 years, earthquake/urban transformation projects)
Civil Society Representative	Architecture, Renewable Energy	Environmental Protection Foundation (NGO, 1 year, MSc in progress)
State Employee	Architecture	Public institution (5 years, focus on renewable energy & sustainability)
State Administration Representative	Agricultural Engineering, Water Resources Management	Government institution (17 years, national-level water resources management)

Summary

The profiles of respondents across Ankara University, Eskişehir Technical University, İstanbul Kültür University, and Harran University reveal both diversity and complementarity between

student and professional perspectives. Students, while distributed across architecture, landscape architecture, civil engineering, and renewable energy programs, consistently emphasize their motivation to engage with sustainability, ecological planning, and disaster-resilient design. Professionals, by contrast, bring extensive experience from academia, local and central government, professional chambers, NGOs, and private practice. Their disciplinary backgrounds extend from architecture, urban and regional planning, and landscape architecture to meteorological and geophysical engineering.

2.3.2 Czechia

Disciplinary Backgrounds of Respondents from Czechia (4 Students + 26 Professionals)

The respondent group from Czechia represented a diverse mix of students, academics, and professionals active in the fields of landscape planning, spatial management, disaster risk reduction, and environmental protection. Students are primarily bachelor's, master's, and doctoral candidates with backgrounds in architecture, engineering, and environmental studies. Their motivation is strongly shaped by the availability of educational programs, the influence of professional role models, and a generational sense of "environmental sadness." Professionals include academics, municipal representatives, state officials, NGO leaders, and private-sector practitioners. Their roles range from senior academics in landscape planning and soil erosion control to mayors, ministry officials, and senior officers in fire rescue services. Their motivation lies mainly in a personal desire to improve the quality of the environment and to integrate ecological and disaster-resilient principles into governance frameworks.

2.3.3. Latvia

Disciplinary Backgrounds of Respondents from Latvia (3 Students + 7 Professionals)

The Latvian sample consists of 3 students and 7 professionals, representing a balanced mix of early-career and experienced stakeholders in the fields of landscape architecture, spatial planning, forestry, and environmental sciences. Students are enrolled at the master's and doctoral levels, with interdisciplinary backgrounds and international mobility experiences (e.g., Erasmus exchanges).

Professionals, by contrast, represent a wide spectrum of roles including municipal planners, ministry experts, NGO representatives, academics, and private sector managers. Their motivation is rooted in long-term professional commitment to improving environmental and urban quality, advancing sustainable development, and adopting innovative tools such as GIS, AI, and green infrastructure strategies. Yet they identify systemic barriers such as rigid institutional structures, low prioritization of disaster risk management, and limited governmental support for training. Most hold advanced degrees (Master's or PhD) and complement formal education with lifelong learning and interdisciplinary cooperation.

2.3.4. Slovakia

Disciplinary Backgrounds of Respondents from Slovakia (3 Students + 7 Professionals)

Respondents on the Slovak side included 1 academic staff, 1 employee of a self-governing region, 1 employee of the Academy of Science, 1 employee of the Slovak Environmental Agency, 1 employee of a city municipality, and 2 active landscape architects. Topics was answered by 3 doctoral students. All respondents deal with landscape or landscape architecture, whether urban or open landscape. They have experience in the field of assessment or proposal of different solutions in the cities or landscape. Also, they are interested in environmental issues and the impacts of climate change and mitigation and adaptation solutions, or perception and landscape image. 2 of them are authorised landscape architects at Slovak chamber of architects and 1 is retired authorised landscape architect.

2.4. Current practice in education (related to nature disaster management)

2.4.1 Türkiye

Ankara University

Students generally identify a lack of notable national or institutional best practices in disaster management, while a few mention measures such as designated gathering areas, coordination systems, and museums or memorials as valuable educational tools. They highlight systemic barriers such as conflicts of interest, weak communication networks, and limited societal awareness, which hinder effective planning and collaboration. In terms of daily practice, student respondents emphasize that coursework is still dominated by landscape design and planning, with only partial integration of disaster-related content. They point out deficiencies in practical skills (e.g., emergency protocols, manual skills, statistical methods, AI integration) and stress the importance of internships and experiential learning for bridging the gap between theory and practice.

Professionals and academics report more concrete best practices, such as xeriscaping, rainwater management, urban agriculture, and climate action plans, as well as significant project achievements (e.g., wetland conservation projects, forest fire modeling, EU-funded civil society projects). Nevertheless, they consistently underline systemic obstacles: lack of inter-agency coordination, insufficient financial resources, fragmented responsibilities, and the persistence of short-term or reactive planning. In everyday professional life, tasks are highly practical—erosion control, water management, use of GIS and remote sensing, climate resilience, or NGO-based coordination—yet are often limited by weak institutional support or conflicting interests. The gap between theory and practice is a recurring concern: while sustainability and resilience are addressed at the conceptual level, implementation lags due to bureaucratic, financial, or political barriers.

Table 18. Ankara University: Comparison of Students and Professionals/Academics Across Key Dimensions

Dimension	Students	Professionals & Academics
Best Practices / Achievements	Report very few national or institutional examples; some mention gathering areas, coordination systems, museums/memorials	Xeriscaping, rainwater management, urban agriculture, climate action plans, wetland conservation, forest fire modeling, EU-funded projects
Systemic Gaps / Limitations	Conflicts of interest, weak communication networks, limited societal awareness	Lack of inter-agency coordination, insufficient financial resources, fragmented responsibilities, short-term/reactive planning
Everyday / Practical Work	Coursework mainly focused on landscape design; disaster content only partly integrated; lack of skills (emergency protocols, manual skills, statistical methods, AI integration); emphasize need for internships and experiential learning	Tasks include erosion control, water management, GIS/remote sensing, climate resilience, NGO coordination; limited by weak institutional support and conflicting interests
Theory–Practice Gap	Curriculum insufficiently applied; limited opportunities to translate theory into practice	Sustainability and resilience addressed conceptually but hindered by bureaucratic, financial, and political barriers
Common Ground	Need to bridge education and practice, foster interdisciplinary cooperation, and embed practical, technology-supported approaches	Same recognition: integration of practice and education, institutional cooperation, and technological tools are essential

Taken together, these findings reveal that while students struggle with limited exposure to practice and insufficiently applied curricula, professionals grapple with systemic and institutional challenges that constrain the implementation of even well-designed projects. Both groups converge on the recognition that bridging education and practice, fostering interdisciplinary cooperation, and embedding practical, technology-supported approaches into learning and professional systems are essential for advancing disaster resilience and ecological planning.

Eskişehir Technical University

At the professional level, the findings point to a strong emphasis on applied and practice-based training. Local government initiatives, such as the Afet Eğitim Merkezi (Disaster Training Center) established in Sakarya, provide simulation-based learning for earthquakes and fires, while projects highlight the role of community communication and preparedness. Within institutional

contexts, professionals also emphasized that ongoing postgraduate education (e.g., a state engineer pursuing a master's degree in geophysics) complements workplace practice, showing how disaster management education often continues in parallel with professional duties. These examples reflect a dual approach: formalized municipal training centers and project-based community initiatives.

From the academic side, practices in ESTÜ and collaborating universities reveal a curricular integration of disaster-related themes into existing architecture, civil engineering, and landscape architecture courses. While comprehensive standalone programs are largely absent, risk management, sustainability, and resilience appear indirectly in project courses, especially through remote sensing, GIS, and planning-oriented classes. The academic discourse stresses the need to strengthen interdisciplinary collaboration, ensuring that planning and design students engage with civil and environmental engineering perspectives in disaster-related contexts.

Table 19. Eskişehir Technical University: Comparison of Students and Professionals/Academics Across Key Dimensions

Dimension	Students	Professionals & Academic
Best Practices / Achievements	Participatory and multidisciplinary approaches - Scenario-based studies - Preventive action before disasters	Municipal training centers (*Afet Eğitim Merkezi* in Sakarya: earthquake & fire simulations) - Community-based projects on communication & preparedness - Postgraduate education continuing alongside work (e.g., master's in geophysics) - Curricular integration of disaster themes into architecture, civil engineering, landscape architecture courses (risk management, sustainability, resilience, GIS, remote sensing, planning)
Systemic Gaps / Limitations	Fragmented institutional communication - Limited transfer of theory into practice - Insufficient coverage of non-seismic risks (fires, floods, ecological risks)	Lack of comprehensive standalone disaster programs - Need for stronger interdisciplinary collaboration (design–engineering integration) - Weak institutional support and fragmented responsibilities - Bureaucratic, financial, and political barriers limiting implementation
Everyday Practice / Learning Focus	Coursework prioritizes earthquake-resistant design and fire safety - Growing but still insufficient attention to sustainability, ecological resilience, and BIM/digital skills	Applied, practice-based training - Simulation-based and municipal training programs - Integration of resilience concepts into project-based courses - Professional practice tasks: erosion control, water management, GIS/remote sensing, climate resilience, NGO coordination
Future Needs / Emphasis	Expand scenario-based and interdisciplinary learning -	Broaden municipal and institutional training initiatives - Stronger links between professional training and academic curricula - Embed disaster

Dimension	Students	Professionals & Academic
	Strengthen real-world, practical project integration	education across multiple disciplines - Promote interdisciplinary, practice-oriented collaboration

Students' reflections underscore both achievements and critical gaps. Best practices were associated with participatory and multidisciplinary approaches, scenario-based studies, and preventive action before disasters occur. However, systemic deficiencies were reported, such as fragmented communication among institutions, limited opportunities to translate theoretical knowledge into practice, and inadequate coverage of non-seismic risks (e.g., fires, floods, and ecological planning). Everyday practice in education tends to prioritize earthquake-resistant design and fire safety, with growing but still insufficient attention to sustainability, ecological resilience, and digital skills such as BIM. Students consistently emphasized the importance of expanding scenario-based learning and integrating practical, interdisciplinary projects that mirror real-world disaster management challenges.

Istanbul Kültür University

Across both students and professionals, Sections 4 and 5 highlight the tension between achievements in disaster-related projects and the systemic obstacles that limit their practical application. Students primarily emphasize project-based experiences as their best practices. Examples include designing disaster parks, working on post-disaster housing prototypes, and integrating disaster resilience into architectural design studios. These projects are seen as meaningful achievements that not only develop technical skills but also foster social responsibility. However, students underline that such opportunities remain limited, often depending on elective courses or temporary collaborations. In their everyday practice, they call for more university-wide courses on disaster prevention, stronger partnerships with public institutions and NGOs, and practical exercises that go beyond theoretical lectures.

Table 20. İstanbul Kültür University: Comparison of Students and Professionals/Academics Across Key Dimensions

Dimension	Students	Professionals & Academic
Best Practices / Achievements	Project-based experiences (disaster parks, post-disaster housing prototypes, resilient design studios) - Opportunities that build technical skills *and* social responsibility	Rapid response operations (e.g., AFAD in Kahramanmaraş earthquake) - Development of disaster parks (Istanbul) - Reconstruction projects (Antakya) - Academic research and training in sustainable reconstruction
Systemic Gaps / Limitations	Opportunities often limited, tied to electives or temporary collaborations - Lack of university-wide courses on disaster prevention	Fragmented authority between central & local governments - Bureaucratic delays in permits/approvals - Disaster management insufficiently integrated into undergraduate curricula

Dimension	Students	Professionals & Academic
Everyday Practice/ Needs	Call for stronger partnerships with public institutions and NGOs - Demand for more practical exercises beyond theory	Ongoing risk-reduction efforts - Strengthening inter-institutional collaboration - Emphasis on holistic recovery (housing + neighborhood/community life)
Common Ground	Theoretical knowledge alone is not enough - Value of project-based, practice-oriented learning - Need for stronger institutional collaboration	Same recognition, but framed more at systemic and policy level reforms

Professionals provide accounts rooted in institutional and field-based achievements. Reported best practices include rapid response operations (e.g., AFAD's coordination in the Kahramanmaraş earthquake), development of disaster parks in Istanbul, reconstruction efforts in Antakya, and academic contributions such as sustainable reconstruction research and training programs. These achievements are often collective and interdisciplinary in nature. Yet, in everyday practice, professionals consistently note structural barriers: fragmented authority between central and local governments, bureaucratic delays in permits and approvals, and insufficient integration of disaster management into undergraduate programs. Despite these constraints, they highlight continuous efforts to reduce risks, strengthen inter-institutional collaboration, and prioritize not only housing but also neighborhood and community life in recovery processes.

Commonalities emerge in both groups: the recognition that theoretical knowledge alone is insufficient, the emphasis on project-based and practice-oriented learning, and the call for stronger institutional collaboration. Students approach this mainly from an educational and skill-development perspective, while professionals stress systemic and policy-level reforms. Together, these insights underline the importance of integrating hands-on training, interdisciplinary cooperation, and community-centered approaches into future modules.

Harran University

Findings from professionals, academics, and students reveal a strong consensus that current education in natural disaster management remains heavily theory-oriented and insufficiently practice-based. Students consistently report a lack of applied training, noting that disaster-related courses are often limited in scope, superficially taught, and poorly integrated into curricula. This results in graduates entering the workforce without adequate practical skills. They emphasize that simulations, hands-on projects, and mandatory training modules are essential for bridging this gap.

Table 21. Harran University: Comparison of Students and Professionals/Academics Across Key Dimensions

Dimension	Students	Professionals & Academic
Current Education	- Disaster-related courses are limited, superficial, and poorly integrated into curricula - Graduates often lack adequate practical skills	- Training remains fragmented and insufficiently practice-oriented - Disaster topics usually appear indirectly (e.g., GIS, planning, sustainability) - Institutional coordination and awareness are limited
Practical Skills	- Strong demand for simulations, hands-on projects, and mandatory modules - Theory–practice gap is a persistent issue	- Staff and public awareness remains low - Lack of applied, practice-focused content - Private sector and NGOs emphasize the integration of sustainable practices and innovative tools (AI, simulations) into education
Best Practices / Achievements	- Designing disaster parks - Post-disaster housing prototypes - Integration of disaster resilience into design studios - Participatory and multidisciplinary student projects	- Municipal training centers (e.g., Sakarya Disaster Education Center) - Urban transformation and reconstruction projects (Antakya, disaster parks in Istanbul) - Emergency response operations (e.g., AFAD) - Academic contributions: sustainable reconstruction research and interdisciplinary training programs
Needs / Priorities	- University-wide disaster prevention courses - Stronger partnerships with public institutions and NGOs - More opportunities for applied, practice-based training beyond theory	- Strengthening interdisciplinary collaboration - Comprehensive integration of disaster education into curricula - Expanding practice-based training with innovative tools (AI, simulations) - Improving inter-institutional coordination and resources

Academics and professionals echo these concerns, pointing to systemic shortcomings in both content and delivery. While some institutions have achieved notable results in urban transformation and post-disaster interventions, many respondents stress that training remains fragmented, with little pedagogical depth or practical orientation. Professionals in public institutions and local governments underline the lack of coordination and inadequate awareness among both staff and the public, while private sector and NGO representatives highlight the importance of integrating sustainable practices and innovative tools into education. Across all groups, there is a clear call for multidisciplinary collaboration, early and continuous awareness-raising, and stronger integration of applied methods and new technologies, particularly AI and simulations, to ensure effective disaster management education.

Summary

Findings from Ankara University, Eskişehir Technical University, İstanbul Kültür University, and Harran University collectively reveal that education in natural disaster management across Türkiye is still heavily theory-driven, with only limited integration of applied and practice-oriented approaches. Students commonly emphasize deficiencies in curricula, pointing out the lack of hands-on training, scenario-based studies, and exposure to multidisciplinary collaboration, while highlighting the need for digital competencies and experiential learning opportunities. Professionals and academics, on the other hand, share examples of good practices—such as municipal training centers, ecological projects, and interdisciplinary design studios—but

consistently stress systemic barriers including fragmented institutional responsibilities, insufficient financial resources, and weak inter-agency coordination. Everyday practice often relies on project-based, local, or community-driven initiatives, yet these are constrained by bureaucratic, financial, or political obstacles. Taken together, these insights underline a nationwide challenge: bridging the gap between theory and practice by embedding applied, interdisciplinary, and technology-supported methods into education and professional systems. This national context suggests that disaster management education must evolve toward integrated, practice-driven frameworks that align institutional structures with community resilience needs.

2.4.2 Czechia

In the Czechia, natural risk management and related educational programs are significantly affected by thematic fragmentation. The absence of an interdisciplinary field that comprehensively integrates crisis management, risk analysis, spatial planning, climate change adaptation, and local government-level activities represents one of the main challenges in education. This situation is reflected in students' experiences as unsuitable teaching methods, and in professionals' perspectives as insufficient competences of graduates and knowledge gaps in practice. Furthermore, although local government representatives participate in existing training programs, the lack of specific content focusing on natural hazard mitigation and climate adaptation emerges as another critical difficulty in education.

Students´ Perspective

From the students' responses, it can be concluded that they are satisfied with the current educational offer in terms of content, but the form of teaching is usually not suitable for them. In this regard, students significantly prefer:

- problem-based learning
- field teaching with relevant stakeholders
- real case studies of specific municipalities
- project work
- simulations of real-world situations (e.g. in frame of decision-making, land use planning)

Professionals´ Perspective

The view of experts can be divided into two levels:

1) missing knowledge after entering practice (self-assessment)
    - skills in the field of marketing, communication and strategic planning
    - information about innovations and examples of good practice from abroad transferable to the Czech environment
    - knowledge of legal regulations and administrative practice
2) missing competences of current graduates:
    - independence in decision-making and finding solutions autonomously
    - critical thinking ability
    - ability to cooperate and to operate within a group setting, taking responsibility for a specific role aligned with team objectives

- ability to argue and defend proposed solutions/measures
- knowledge and ability to apply fundamental principles of spatial data use for analysing environmental issues within a GIS environment – emphasizing the interpretation of GIS outputs rather than technical control of the software

Summary

Thematic fragmentation significantly affects both natural risk management and related educational programs. Currently, there is no interdisciplinary field that integrates comprehensive expertise across crisis management, risk analysis, spatial planning and development, climate change adaptation, and local government-level activities.

Insights from stakeholder interviews identified the following target groups for further education:

- Public officials – with a focus on innovation, functional landscape measures, and emerging trends in landscape ecological planning (e.g., nature-based solutions).
- Elected representatives – requiring orientation in spatial planning documents, identification of local risks, understanding of landscape intervention options, conceptual land use planning, and protection of spatial values.
- Experts in natural risk management – in need of innovative approaches and functional know-how.
- General public – to enhance preparedness for crisis events, foster participation in climate change adaptation and prevention, and promote shared responsibility in mitigation efforts.
- Primary and secondary school students – to cultivate a relationship with their local environment, encourage rational land use, and strengthen local identity.
- Landowners – land management options.

A new discussion has recently emerged regarding the introduction of practical internships not only for students, but also for educators. This initiative aims to enhance the transfer of practical knowledge and procedures into the educational process, thereby strengthening the relevance and applicability of teaching content. In parallel, the concept of so-called enterprise supervision is gaining attention – where businesses and other relevant stakeholders take an active role in guiding and mentoring future graduates. The goal is to support practice-oriented education while simultaneously cultivating future professionals who are better prepared for real-world challenges.

A critical aspect in the context of natural risk management is the training of local government representatives in the Czechia. While mayors and municipal officials participate in a wide range of training programs, these often lack specific focus on the challenges related to natural hazard mitigation and climate adaptation. At the same time, it is important to consider the workload of local leaders, who are required to manage a broad spectrum of administrative agendas. In practice, rather than introducing additional training sessions, a more effective approach could be the establishment of a structured expert advisory system for municipalities. However, this would require the preparation and availability of qualified advisors capable of providing tailored, context-specific guidance to local governments (educational tasks).

2.4.3. Latvia

In Latvia, disaster management education is still addressed only superficially within study programs. While students and professionals acknowledge their growing importance, current curricula remain fragmented, lacking technical solutions, practical training, and specialized modules. Both groups emphasize the need for applied, practice-oriented approaches, integration of digital tools, and stronger collaboration between universities, municipalities, and other stakeholders.

Students' Perspective

- Natural disaster management is covered only superficially in current study programs (mainly as awareness-building).
- Key topics like flood management are mentioned, but there is a lack of technical solutions and practical training (e.g., how to plan flood-prone areas, adaptive landscape design).
- Students stress the need for new modules and courses dedicated to practical disaster management, especially as risks are expected to grow in relevance.
- Collaboration between universities and municipalities is already in place, and real-world problems (e.g., climate adaptation, vegetation planning) are integrated into study courses.
- AI is seen as a potential tool for risk assessment and scenario modelling, but students doubt whether sufficient data currently exists for effective use.

Professionals' Perspective

- Many professionals report that disaster management was absent or minimally represented in their university education, including at master's and doctoral levels.
- Training has not kept pace with emerging risks (e.g., storm scenarios, drought-related fires, coastal erosion).
- Skills gaps include digital competencies (e.g., GIS, modelling, programming), planning methodologies, and legislative frameworks.
- Professionals recommend inviting practitioners into teaching, ensuring students are exposed to applied solutions and real-world challenges.
- Lifelong learning (webinars, conferences, foreign experience) is considered essential to compensate for education gaps.
- Some respondents highlight international contrasts: for example, in Japan, climate risks are systematically integrated into planning education, while in Latvia, this happens only fragmentarily.
- A professor noted that curriculum reforms reduced the depth of flood-related training (merging of hydrotechnician and melioration engineer programs), leaving students without specialized competence.

Common Observations

- Disaster management education is not yet a priority in Latvia, though all respondents recognize that it will become increasingly important.
- Current programs provide a solid foundation in environmental and planning fields but lack specialized, practical modules for disaster management.
- Strong need for:

- Practical, technical training (e.g., flood design parameters, tree management in storm scenarios).
- Integration of research and practice (joint projects with municipalities, state institutions, NGOs).
- Digital tools and AI applications (risk modelling, data analysis).
- Early awareness and school-level education so that disaster risk becomes a common competence.

2.4.4. Slovakia

Professionals' Perspective

Current disaster management education in Slovakia, including at the university level, is lacking a systematic and comprehensive approach—there is insufficient effort to develop disaster management as a distinct, integrated field of study and to create specialized degree programs focused on this topic. Most universities offer disaster-related content only as individual subjects within broader disciplines, rather than as dedicated study programs covering the full spectrum of risk analysis, emergency response, and interdisciplinary skills needed for effective management.

There is not specific study program aimed at the nature disaster management at the universities in Slovakia. There are some subjects related to the specific study modules, for example:

- Subjects: Prevention against natural disasters, Erosion Control Measures Design, Drainage Design and Wetland Restoration, Landscape agrosystems (study program Landscape Engineering, at Slovak university of agriculture in Nitra),
- Prevention and resolution of serious industrial accidents (Technical university in Zvolen)
- Subjects: Environmental management, Landscape-ecological planning (study program: Landscaping and Landscape Planning and Technologies of environmental protection at Slovak university of technology in Bratislava)

What is missing in the education:

- Comprehensive approach, acceptance of the global changes and finding solutions on the local and regional level
- Applied dendrology, pedagogy, hydrology, geology, climatology, plant physiology
- Practical training of students for at least for 3 months with guidance
- Climate change management
- The ability of students to think logically, independently
- Tools for taking responsibility for proposed solutions and individual situations at work
- Comprehensive understanding of natural processes, ability to read the landscape and predict weather responses and changes based on climate models and ai, technical knowledge of gis and hydrological modeling, communication and facilitation skills.
- Water management issues (water retention is essential) – necessary cooperation with designers on water structures and water retention measures, ihgp assessment – basis for design in planning and design
- Pedological issues (threats to fertility, soil degradation, recultivation of grassland, etc.) – necessary soil analyses as part of pre-project construction preparation

- Dendrological analyses – to be prepared as part of pre-project construction preparation (these are usually carried out, but the quality of the analyses is questionable, as arborists or landscape architects are often replaced by other professions)
- Ai educational techniques, simulations

New graduates in Slovakia often lack holistic, practice-oriented preparation, including advanced risk assessment, emergency planning, hands-on experience with real disaster scenarios, and interdisciplinary skills in technical proficiency with modern tools like GIS and remote sensing is limited, and they are not well trained in effective stakeholder engagement or community preparedness, reflecting the need for more integrated curricula and real-world collaboration in higher education.

Students' Perspective

Lack of specialized programs: In Slovakia, there are only a few study programs focused directly on protection against natural disasters; most universities integrate these topics into other fields. As a result, graduates do not have a comprehensive overview of risk management. Lack of practical skills: Education is predominantly theoretical; there is a lack of field exercises, model situations, and projects that would teach students to design and implement flood control, erosion control, or adaptation measures. Lack of interconnectivity: Natural risk management requires knowledge from various disciplines (e.g., hydrology, ecology, spatial planning, etc.). However, educational programs tend to be narrowly specialized and do not lead to the interconnection of these disciplines.

New graduates often lack practical experience in crisis management and the ability to make quick decisions in stressful situations. They also lack soft skills such as team communication and coordination with multiple components in the field.

2.5. Current practice in nature disaster management (practice)

2.5.1 Türkiye

Ankara University

Student respondents highlight that disaster management is still only marginally reflected in their academic environment. Their main concern is not the absence of awareness but the lack of structured, practice-based training: exercises such as simulations, internships, and scenario-based workshops are rarely provided, leaving critical gaps in readiness and applied skills.

Professional and academic respondents, on the other hand, stress that despite the existence of exemplary projects—such as rainwater harvesting, climate action strategies, or civil-society-driven resilience initiatives—the implementation phase remains the weakest link. Financial limitations, fragmented institutional authority, and political pressures frequently undermine continuity. While they recognize the availability of frameworks at national and EU levels, they consistently rate their effectiveness as only partial, citing poor monitoring and weak integration with local practice.

The juxtaposition of these perspectives reveals a structural imbalance: students face insufficient access to real-world practice, while professionals confront systemic barriers that obstruct

effective delivery. Together, these findings underscore that current disaster management practice in Türkiye operates with strong conceptual awareness but limited institutional and educational capacity to translate knowledge into sustained action.

Eskişehir Technical University

Professional responses indicate that disaster management practice is shaped largely by local government initiatives and field-oriented projects. The Disaster Education Center established by Sakarya Metropolitan Municipality regularly conducts earthquake and fire drills, enhancing public preparedness. These practices are effective in raising awareness at the community level, yet respondents underline that they remain fragmented and lack long-term institutional coordination.

In academia, practices are primarily carried out through research projects and technical expertise transfer. Faculty members in fields such as landscape architecture and geophysics report the use of remote sensing, GIS, and groundwater monitoring as tools for identifying disaster risks. Section 6 responses highlight, however, that these efforts are still mostly dependent on individual academic initiatives. Interdisciplinary collaboration and institutionalized frameworks for sustained practice are described as limited, which constrains the broader impact of academic contributions on disaster management practice.

From the student perspective, disaster management practice is experienced mainly through volunteer activities, AFAD collaborations, and small-scale studio projects. Students emphasized that opportunities to transform theoretical knowledge into applied practice are scarce. They particularly noted the absence of large-scale field drills and multi-hazard scenarios, with current practices focusing predominantly on earthquakes and fire safety. Other risk domains such as floods or climate-related hazards receive comparatively less attention.

Overall, the findings from the ESTÜ cohort show that while disaster management practices are present across professional, academic, and student groups, they are largely project-based, short-term, and fragmented. This indicates a clear need for future training modules to expand field applications, strengthen interdisciplinary cooperation, and establish mechanisms that ensure continuity and institutional integration of disaster management practices.

Istanbul Kültür University

Findings from Sections 4–5 show that students value project-based achievements such as designing disaster parks or post-disaster housing prototypes. They highlight these as significant milestones in linking education with social responsibility. However, they stress that in daily practice such initiatives remain rare and often dependent on elective courses. Their main concern is the lack of continuous, institutionalized opportunities to apply knowledge through practice.

Professionals, by contrast, describe best practices shaped by field experience and institutional frameworks. AFAD staff emphasize successful coordination in national and international disaster responses, while local government representatives highlight the creation of disaster park prototypes. Practicing architects underline their role in post-earthquake recovery, not only in terms of housing but also in restoring neighborhood life. Yet, in everyday practice, professionals

frequently face bureaucratic delays, fragmented authority, and difficulties in inter-institutional collaboration, which hinder implementation despite strong technical capacity.

Academics focus on achievements in disaster education and research, including sustainable reconstruction strategies, interdisciplinary programs, and training initiatives. Still, they observe that practice is often limited by the dominance of post-disaster response rather than proactive prevention. In everyday teaching, they integrate lessons from past disasters into curricula but note a persistent gap between theory and applied fieldwork.

Section 6 further reveals that, in the national context, Turkey has well-developed policy frameworks and alignment with EU strategies, yet gaps remain in implementation. Professionals note a lack of effective pre-disaster training and public awareness programs, while academics stress the need for transparent, participatory decision-making and curricula that better integrate risk reduction.

Harran University

Across students, professionals, and academics, current practices in natural disaster management are perceived as fragmented and largely insufficient. Students emphasize that their education has been limited to theoretical content with little opportunity for hands-on engagement. They note that existing training often lacks depth, leaving graduates underprepared for practical challenges. For them, the absence of applied modules results in uncertainty about what actions to take during disasters such as floods or fires.

Professionals and academics share similar observations, highlighting systemic weaknesses in both policy and implementation. While some municipalities and institutions have had notable experiences in flood response and urban transformation, respondents stress that coordination is poor, bureaucratic procedures are burdensome, and awareness among staff and the public is inadequate. Academics point out that training is often confined to emergency response rather than preventive planning, and that reliance on theory undermines long-term preparedness. Both groups underline that current policies are either moderately effective or outright insufficient, particularly at the stages of planning, implementation, and coordination. They call for a more integrated and holistic approach, involving ministerial-level leadership, national and local collaboration, and multidisciplinary strategies. Commonly, respondents identify the lack of practical application, insufficient institutional capacity, and low public awareness as the most pressing obstacles to effective disaster management practices.

Summary

In the Turkish context, current practices in disaster management reveal a persistent gap between conceptual frameworks and their translation into sustained, institutionalized action. Student respondents consistently emphasize the dominance of theoretical content and the scarcity of practice-based opportunities such as large-scale drills, multi-hazard simulations, and field-based training, which limits the development of applied competencies. Professionals acknowledge the existence of exemplary projects and institutional initiatives, yet underline systemic constraints—including financial limitations, bureaucratic procedures, and fragmented authority—that hinder continuity and effectiveness.

Table 22. Comparative Table: Disaster Management Practices in Türkiye

Dimension	Students	Professionals & Academic
Current Focus	Theoretical content dominates curricula - Very limited practice-based opportunities	Existence of exemplary projects and institutional initiatives - Academic research advancing GIS, remote sensing, and reconstruction
Practice-Based Opportunities	Lack of large-scale drills, multi-hazard simulations, and field-based training - Limited applied skill development	Contributions often individualized and reactive - Stronger presence in post-disaster response than proactive risk reduction
Systemic Barriers	Educational programs insufficiently connected to real-world practice	Financial limitations - Bureaucratic procedures - Fragmented authority across institutions
Policy & Institutional Context	Few pathways to transform theory into institutionalized practice	National and EU-aligned frameworks exist but weakly monitored - Insufficient interdisciplinary collaboration - Low public awareness restricts impact
Overall Outlook	Call for simulations, hands-on projects, and integration of applied competencies	Recognize need for continuity, preventive focus, and integration into education/professional systems

Academic contributions, while significant in advancing research through tools such as GIS, remote sensing, and sustainable reconstruction strategies, remain largely individualized and reactive, with a predominant focus on post-disaster response rather than proactive risk reduction. Despite the presence of national and EU-aligned policy frameworks, weak monitoring, insufficient interdisciplinary collaboration, and low public awareness further restrict their practical impact. Overall, disaster management practice in Türkiye operates on strong conceptual and policy foundations but remains fragmented, short-term, and insufficiently integrated into educational and professional systems, underscoring the need for applied, interdisciplinary, and preventive approaches.

2.5.2 Czechia

Consolidated Insights from Stakeholders

In the Central European context, natural disaster prevention efforts are predominantly focused on flood prediction and modeling, as floods represent the most frequent and destructive natural hazard in the region. Within the broader scope of environmental risks, attention is also directed toward soil degradation – particularly water erosion, runoff transport, and the impacts of drought on agricultural productivity and landscape ecosystems. Slope instability and landslides are monitored to a lesser extent, given their localized nature; however, when combined with extreme precipitation events, they can result in significant damage.

The intensity and frequency of these environmental risks are being exacerbated by climate change. In this context, hydrological extremes – namely floods and droughts – receive the most

attention. Monitoring efforts primarily focus on soil moisture content, while the issue of atmospheric moisture deficiency remains largely overlooked. Also urban heat islands and the transformation of agricultural landscapes have become pressing environmental issues in the Czechia.

Another contributing factor is the transformation of landscape structure, characterized by extensive blocks of arable land, a minimal presence of ecological landscape elements, and altered runoff dynamics. The overarching objective is to design an optimal landscape structure capable of mitigating the impacts of environmental risks. Such structural changes must be implemented consistently across entire catchment areas, guided by a unified and integrated conceptual framework.

A key topic is water retention in the landscape, a related factor is the compaction of agricultural soils, which significantly reduces the soil's ability to retain water. However, accurate data on this area is still lacking. Water retention in forests is another (relatively new) major topic at the moment.

In the context of improving water retention, a key priority is to design and implement landscape measures that are feasible within a short time frame. In the Czechia, the low rate of realization of proposed interventions is largely due to limited financial resources. However, given the accelerating impacts of climate change, there is an urgent need for more effective and timely responses. This calls for a strategic focus on low-cost, nature-based solutions with high potential for rapid deployment. Such measures – often eligible for support through various subsidy programs – should be prioritized to deliver immediate benefits. Their implementation can serve as a practical starting point, laying the groundwork for the gradual introduction of more complex and financially demanding interventions. In addition to their affordability and speed, these nature-based solutions often offer multifunctional benefits, such as improved biodiversity, enhanced soil health, and increased resilience of local ecosystems, making them a particularly valuable component of climate adaptation strategies.

One of the key limitations in planning and implementing nature-based adaptation measures is the structure of land ownership. In the Czechia, the proportion of land owned by municipalities and the state is very low, which significantly restricts the ability of local governments to actively intervene in the landscape and implement measures in the public interest. A major challenge is also the high degree of ownership fragmentation, where land is divided among a large number of private owners. This fragmentation complicates coordination and the large-scale implementation of landscape measures that require spatial continuity, such as retention features, river restoration, or the re-establishment of landscape greenery. As a result, the effectiveness of adaptation strategies is reduced, and preparatory and permitting processes are prolonged. To ensure the successful implementation of such measures, it is essential to develop new tools for cooperation with private landowners or to strengthen the role of public ownership in strategically important areas.

Contrary, long-term maintenance of implemented measures is essential to ensure their continued effectiveness, yet it often faces logistical, financial, and institutional barriers. Despite the growing emphasis on sustainable landscape interventions, the lack of clear responsibility and funding mechanisms complicates their upkeep. Without a structured approach to post-

implementation care, even well-designed solutions risk degradation and reduced impact over time.

The municipal spatial plan can be considered a promising tool for addressing natural hazards and guiding strategic territorial development. However, in practice, these documents often focus solely on built-up areas and designated development zones. The extension into non-urbanized areas is typically restricted to essential flood protection elements, derived from higher-level watershed plans, and lacks integration of local context and specific territorial characteristics.

Municipal representatives and mayors frequently lack the expertise to interpret the outputs of spatial plans and tend to rely on external experts, whose work they accept without deeper understanding. While trust in professional planners is high, the quality of outputs is often compromised by the low cost of awarded contracts. As a result, spatial plans are frequently developed without identifying local risks, and new development areas are proposed in direct conflict with those risks.

Small municipalities often operate with outdated or ineffective spatial plans that focus primarily on urban design, while neglecting broader landscape planning and natural hazard management. It is therefore recommended to implement nature-based solutions across entire catchment areas to enhance territorial resilience. The forthcoming Landscape Plan/Landscape Policy, as a new planning tool in Czechia, holds potential for setting optimal principles for managing natural risks.

Another issue is the underutilization of interdisciplinary cooperation in spatial planning. The potential for cross-sectoral collaboration remains largely untapped. A comprehensive approach to territory – without artificial division into built-up and non-built-up areas – is essential, along with the involvement of professionals in water management, transport, ecological stability, environmental protection, and other relevant fields. A key factor is the ability to interpret landscape characteristics and use this knowledge for informed decision-making and conceptual development. Public administration often lacks awareness of current trends, yet it could play a leading role in setting them.

Flood zones along smaller watercourses are insufficiently mapped, and spatial plans fail to reflect this reality. It is crucial to incorporate such data into planning documents. Strategic planning should be based on long-term thinking with a strong focus on the implementation of proposed measures. In practice, however, conflicts between public and private interests persist, with public interest often being underrepresented.

There is still no central system for collecting comprehensive (including financial) data on disaster impacts, which could serve as a compelling argument for investing in preventive measures rather than reactive ones. Currently, only fragmented data exists under the responsibility of individual authorities. Another weakness lies in the lack of knowledge of administrative procedures, particularly in building and spatial planning processes. Emphasis should be placed on methodological guidance for local risk analysis and the design of meaningful measures. Strategic documents hold significant potential, but it remains largely unrealized – most proposals are never implemented. Effective planning also requires overcoming administrative boundaries and addressing the territory as a functional whole. Finally, it is essential to ensure the transfer of

analysed information (e.g., meteorological data) into practical actions. The interpretation of such data is often complex and requires interdisciplinary cooperation.

Landscape adaptation measures and spatial planning are integral components of effective disaster risk management. A well-structured landscape, supported by strategic planning documents, can significantly reduce vulnerability to natural hazards. However, the lack of integration between spatial planning and crisis preparedness – especially in non-urbanized areas – limits the potential for proactive risk mitigation. Strengthening this connection requires interdisciplinary collaboration and long-term territorial strategies that align environmental resilience with emergency response capabilities.

In the pre-crisis phase, communication among key stakeholders – mayors, representatives of river basin authorities, designers, the public, and others – is insufficient and ineffective. This practice must be fundamentally improved. Information sharing is also weak, and collaboration between architects and landscape architects is often lacking. There is a general absence of professional networking and interdisciplinary dialogue, leading to misunderstandings about the roles and responsibilities of different actors.

Significant conflicts arise between public administration and the private sector, particularly in the context of permitting procedures. At the same time, there is increasing pressure on land use and uncoordinated territorial development, often without consideration for long-term impacts.

A shift toward long-term thinking is essential, with decision-making based on analysis, knowledge, and contextual understanding. Effective communication across stakeholder groups, public participation, and interdisciplinary cooperation are all critical. Strong coordination between planners, urban designers, and project engineers is also necessary.

One of the major challenges remains the protection of public interest in the context of fragmented competencies in land governance and decision-making. These processes are often slow and complex. Improving them requires a solid understanding of the legal framework and the rationale behind its practical application. Currently, public officials are frequently perceived as obstacles to development.

A well-formulated public procurement process is key to fostering effective cooperation. A high-quality project brief for landscape interventions can promote interdisciplinary collaboration and ensure the multifunctionality of proposed solutions.

The crisis management system in the Czechia is generally considered highly effective, particularly during disasters and in their immediate aftermath. Nevertheless, it frequently struggles with insufficient staffing. In cases where the risk of a disaster can be anticipated through hydrometeorological analysis, the system is capable of ensuring timely preparedness shortly before the event occurs.

A significant challenge remains the limited cooperation of residents in affected areas. It is common to ignore calls to evacuate from affected areas. Many are unwilling to actively seek safety information during a crisis or to adapt their surroundings in response to changing climate conditions and increasing risks. Public willingness to take responsibility for personal safety is

low, while expectations that the state or another entity will take care of everything continue to rise.

It is essential to require proper training for elected officials at the municipal and regional levels so they are prepared to respond effectively to emergencies. Additionally, their communication with the public must be improved to encourage citizen engagement in preventive measures.

Post-disaster organizational and coordination tasks remain insufficiently addressed – for example, the handling of abandoned vehicles, disposal of construction debris, or the immediate deployment of structural engineers to assess building safety in affected areas.

There is a critical need for dynamic modeling of forecasts and projections tailored to specific territories. Robust and resilient platforms are required for data transmission and communication among crisis management authorities – including early warning systems, data and request sharing, and emergency communication. Satellite communication can also play a key role in maintaining contact with the public in the event of conventional communication failures.

In terms of data management, the focus should not only be on what data is available, but also on how it is processed, distributed, and interpreted. For instance, flood warnings may include protocols detailing expected rainfall and river level rises, but these are not sufficiently interpreted in relation to specific municipalities and their designated flood zones – leaving unclear whether these zones will expand, contract, or how surrounding areas will be affected.

Given the evolving climate conditions, it is imperative to strengthen the capacity for adaptation to new and emerging threats.

Public engagement plays a critical role in managing natural risks, yet remains insufficient in practice. Low levels of preparedness, limited awareness, and reluctance to take personal responsibility hinder the effectiveness of preventive and emergency measures. Enhancing public participation through education, transparent communication, and inclusive planning processes is essential for building a resilient society. Empowering citizens to co-create solutions fosters shared responsibility and strengthens adaptive capacity at the local level.

Post-disaster recovery represents a critical area of crisis management that requires close collaboration and coordination among various stakeholders. Green infrastructure is a vital yet often overlooked element in post-disaster recovery. Its integration into restoration efforts not only supports ecological stability but also enhances long-term resilience and community well-being. Current practices tend to prioritize technical infrastructure, with vegetation management addressed only in later stages – often under suboptimal conditions.

Effective restoration of infrastructure – particularly transportation networks and utility systems – must be planned in conjunction with the recovery of urban and landscape greenery. However, in current practice, this coordination is often lacking, resulting in green infrastructure being addressed only in the final stages of recovery, when space for its proper implementation and long-term viability is significantly limited.

Greenery is systematically overlooked in the context of post-disaster recovery, both in planning documents and in implementation. Vegetation management should be an integral part of crisis

response. A common practice, for example, is the blanket removal of trees for safety reasons, even when such action is not strictly necessary and often lacks expert assessment. The absence of green infrastructure in post-disaster recovery systems is a serious shortcoming that must be addressed.

In terms of rebuilding structures and infrastructure, the principle of Build Back Better is frequently neglected. This principle emphasizes the need to enhance the resilience of the environment to future emergencies. Instead of merely restoring the pre-disaster state, recovery should be seen as an opportunity to improve functionality, sustainability, and safety. These efforts are often hindered by societal inertia and a general reluctance to engage in measures aimed at ensuring personal and community safety, including the disregard of proposed preventive actions.

Table 23. Sectoral Analysis of Educational Needs for Nature Risk Management

Academic Sector **Strengths:** The academic community demonstrates a high level of expertise, the ability to formulate complex and integrated proposals, and benefits from international experience and robust scientific collaboration. **Weaknesses**: There is a limited transfer of research outcomes into practice, insufficient practical skills delivered to students, and weak connections to businesses and real-world case studies. **Educational needs**: Strengthening applied research, promoting open data sharing, and integrating education with practical experience are essential to enhance the sector's contribution to risk management.
Public Administration **Strengths**: Public authorities possess strong knowledge of legislation, a clear vision for protecting public interests, effective crisis management capabilities, and access to funding. They also hold the authority to commission and approve strategic development documents. **Weaknesses:** Institutional resortism, poor communication with the private sector, and a lack of legal understanding among other stakeholders hinder coordinated action. **Educational needs**: Improved inter-institutional coordination, targeted training for officials and mayors, and methodological support for municipalities are crucial for effective risk governance.
Private Sector **Strengths:** The private sector offers innovation potential, experience with grant-funded projects, a pragmatic focus on results, and awareness of emerging trends. **Weaknesses:** Its operations are constrained by legislative boundaries and pressured by demands for low-cost solutions. **Educational needs:** Greater collaboration with academia and active involvement in systemic planning processes are needed to align private initiatives with long-term resilience goals.
Non-Profit Sector **Strengths:** NGOs bring detailed local knowledge, strong community engagement skills, and valuable field experience. **Weaknesses:** Their limited authority, dependence on subsidies, and administrative burdens restrict their capacity to act. **Educational needs:** Inclusion in planning processes and recognition of their role as facilitators between municipalities and state administration would enhance their impact on risk mitigation.
Students and Young Professionals

Strengths: This group is open to new approaches, digitally skilled, and inspired by international practices.
Weaknesses: They often lack experience in administrative and project-based processes.
Educational needs: More practical assignments and interdisciplinary teamwork during their studies would better prepare them for real-world challenges in risk management.

Summary

In the Czechia, disaster prevention efforts primarily focus on floods, but also address soil degradation, drought, landslides, forest fires, and strong winds –phenomena increasingly intensified by climate change. A highly topical issue is the urban heat island effect, while temperature fluctuations are also being monitored and regulated in agricultural landscapes, particularly on exposed arable land. Historically altered landscape structures – characterized by large blocks of arable land and a lack of landscape features – have reduced the resilience of the land to environmental risks. The goal is to optimize landscape structure, yet past large-scale drainage projects remain a significant challenge. Ownership fragmentation and the limited availability of public land pose major barriers to landscape optimization. Nature-based solutions are still in their early stages of implementation, with technical and financially demanding measures being preferred. A large proportion of proposed interventions are never realized. The problem with the implemented measures is aftercare and functional sustainability, especially due to maintenance and financing responsibilities.

Water retention in the landscape is a key issue, with increasing attention paid to forest retention, although data is lacking. Soil compaction, a widespread problem in the Czechia, also significantly limits retention capacity. Spatial planning has the potential to address natural risks, but in practice it focuses mainly on built-up areas, often without considering local vulnerabilities. Municipal representatives frequently lack understanding of planning proposals and rely on external experts – typically urban planners without ecological expertise. This practice must change.

Interdisciplinary collaboration remains insufficient, with limited cooperation of water managers, transport engineers, ecologists, landscape engineers and others. Effective cooperation depends on holistic planning approaches or well-structured public procurement processes. Public administration could play a leading role, but lacks awareness of current trends in landscape optimization. There is no centralized system for collecting data on disaster impacts; existing data are fragmented and could otherwise support preventive measures. While crisis management functions adequately, it suffers from understaffing and low public engagement. Post-disaster recovery often neglects green infrastructure and fails to apply the "Build Back Better" principle. Data fragmentation is a common problem in risk management.

2.5.3. Latvia

In Latvia, disaster management education is still addressed only superficially, with study programs providing mainly awareness-building rather than technical or practical training. Students stress the need for hands-on modules and stronger cooperation with municipalities, while professionals highlight gaps in digital skills, planning methodologies, and policy implementation. Despite these shortcomings, both groups acknowledge the growing importance

of disaster management and call for applied, interdisciplinary approaches supported by digital tools and public awareness.

Students' Perspective

- **Experience & Scope**
  - Limited or no hands-on involvement at strategic or implementation levels.
  - Disaster management is touched upon in studies (e.g., floods, windstorms, droughts), but often in a theoretical way.
  - Practical training is missing—particularly in technical solutions, planning for flood-prone areas, and adaptive landscapes.
- **Identified Gaps**
  - Lack of integration of disaster management into curricula (e.g., storm, drought, hazard modelling, tree management in storm scenarios).
  - Missing link between education and real-world practice.
  - Limited digital/AI skills (programming, modelling software).
- **Motivation**
  - Strong motivation to learn practical approaches and gain hands-on skills.
  - Desire for collaboration with municipalities and practitioners through joint projects.
- **Obstacles**
  - Academic programs are often too general; insufficient specialization.
  - Knowledge gaps in legislation, communication, and practical technical expertise.

Professionals' Perspective (Municipal staff, planners, professors, company experts)

- **Experience & Scope**
  - Daily work involves flood risk mapping, stormwater management, spatial planning, coastal erosion, green infrastructure, and forestry resilience.
  - Many highlight more than a decade of experience in adapting landscapes, urban planning, or environmental projects.
  - Stronger awareness of national and EU-level policies (e.g., LIFE projects, Water Framework Directive).
- **Identified Gaps**
  - Fragmented institutional responsibilities and a lack of clear leadership in disaster risk management.
  - Weak policy implementation (plans exist, but execution is underfunded or delayed).
  - Lack of practical guidelines for municipalities; overreliance on short-term solutions.
  - Insufficient coordination across sectors and limited expert capacity.
- **Motivation**
  - Committed to sustainability, resilience, and adaptation planning.
  - Driven by responsibility to communities, municipalities, and long-term resilience.
  - Strong interest in lifelong learning (conferences, training, knowledge sharing).
- **Obstacles**
  - Limited funding and staff capacity.
  - Bureaucracy, legal constraints, property rights issues.
  - Fragmented or inaccessible data.
  - Resistance to preventive strategies—focus remains reactive rather than proactive.

Common Features Across Both Groups

- **Motivation**
  - A clear shared motivation for stronger collaboration between education and practice.
  - Desire for more practical, applied approaches (joint projects, real-world case studies).
  - Interest in digital tools and AI for risk modeling, data analysis, and efficiency—though concerns remain about data availability and reliability.
- **Perception of Obstacles**
  - Both groups emphasize the **lack of practical application**: students in education, professionals in policy and implementation.
  - Fragmentation of knowledge and responsibilities.
  - Insufficient funding and support for preventive, long-term planning.
- **Awareness Needs**
  - Importance of public awareness and involvement, not just technical expertise.
  - Recognition that disaster management should be integrated into broader planning and education systems.

Summary

Students highlight that disaster management education remains largely theoretical, lacking practical training, digital skills, and real-world integration, while professionals point to fragmented responsibilities, weak implementation, and limited funding in practice. Both groups emphasize strong motivation for sustainability and resilience, calling for applied approaches, joint projects, and better use of digital tools and AI. Shared obstacles include insufficient coordination, inadequate resources, and low public awareness, underscoring the need to bridge education and practice in disaster risk management.

2.5.4. Slovakia

Professionals' Perspective

Natural disasters in Slovakia are mostly torrential rains, floods, windstorm, drought. Projects which deal with these disasters are: revitalizing of the rivers, streams and their meanders. Another examples, which occur/have occurred in Slovakia is strong winds. In 2004, there was a storm in the High Tatras. The natural disaster destroyed more than 12,000 hectares of forest, causing not only extensive material damage but also claiming two human lives.

Current EU, national, and regional policies in Slovakia have established a framework for managing natural disasters, with notable progress such as the implementation of the EU Floods Directive, effective early warning systems, and integrated crisis management plans at multiple administrative levels.

There are several national strategies that are more of a mandatory part of fulfilling the EU's vision than a national priority! This is also related to the fact that formal or active communities at the local level provide the best examples of best practices, such as professional non-profit organizations such as BROZ, DAPHNE, ŽIVICA, and KLIMATICKA KOALICIA. The most important thing remains actively educating the public about climate change and the threats associated with it.

Projects which were coordinated by the respondents:

- Adaptation measures within the local floods and drought during Summer, floods mitigation in Kynek area, Nitra
- As a landscape architect, I primarily deal with land-use planning documents, urban plans, investment documents, and impacts on the social sphere.
- Revitalisation of Hlohovec park, urban green infrastructure of cities: Trnava, Nitra, Košice, Kollárovo,
- Green infrastructure in Želiezovce, revitalisation of the stream Dubová in Piešťany
- Revitalisation of the segment of Klátovské rameno (right tributary of the Little Danube),
- Other projects, which deal with rain water management in urban areas: revitalisation of village centre Vlčany, revitalisation of the Řužový park in Trnava.
- Another respondent deals with water management and water retention measures, slope stabilization and landslide prevention, restoration and design of vegetation elements, green infrastructure, adaptation of settlements, urban environments, and open landscapes to adapt to climate change.

Academic staff was member of the team: H2Odnota je voda (Value is Water) addressing the issue of drought through adaptation and mitigation measures, personal activity in slovak group EU-MISSION-OCEAN-AND-WATER

At Faculty of Horticulture and Landscape Engineering SUA Nitra is new built interactive educational Environmental Center – "Climate – Landscape – Information" https://zmenaklimy.sk/envirocentrum/

NGO BROZ – has many projects aimed at revitalization of river branches and wetlands, planting native tree species, grazing in protected areas.

Deficiencies:

- Poor support from the state and insufficient comprehensive conceptual solutions,
- Missing comprehensive blue – green-grey systems,
- Lack of concepts, plans, visions
- Somewhere in the process approval → implementation → results. Approval takes a very long time, followed by a long implementation and results often come late
- Water retention measures in open landscape, natural revitalization of watercourses (returning them to their original river beds),
- Vegetation strips (linear vegetation in landscape) to prevent erosion,
- Solutions for cooling the microclimate of towns (semi-intensive green roofs without sedum, trees, infiltration retention areas and strips).
- Administrative barriers, lack of data, and limited funding and utilization of subsidies from the state or the eu.
- Another problem is the low level of awareness and perception of the ecological benefits among developers, investors, local governments, and the general public.
- Unprofesionalism of officials who approve project documentation,
- Insufficient time (underestimation of surveys and analyses of the territory)

- Insufficient financial evaluation of work (underestimation of the scope of work)
- Irresponsible decision-making – without experts, without studying the problem and solutions
- Insufficient expertise of teams dealing with problem solving (disasters) – this is also a disaster
- Irresponsibility in implementation (implementation contrary to the project due to, for example, cost savings or acceleration of investment implementation)
- Lack of funds for processing verification studies,
- Replacement of authorized landscape architects with unauthorized gardeners

The system fails at multiple stages: in education, there is a lack of comprehensive and compulsory disaster management programs, leading to graduates without essential interdisciplinary and practical skills; in planning, risk assessments and sustainable strategies are not always fully integrated or consistently updated, and long-term thinking is often missing; approval is slowed by rigid regulatory frameworks and lengthy, complex administrative processes; implementation suffers from inadequate funding, insufficient coordination among stakeholders, and limited access to advanced technologies; finally, in outcomes, the impact is reduced by poor monitoring, weak feedback loops, and failure to adjust policies and practices based on lessons learned and new risks.

There is need for more data on the impacts of climate change at the local level, on the dynamics of precipitation and groundwater, and on the synergy between green infrastructure and technical measures. At the same time, it would be helpful to link ESG reporting and obligations to the financing of individual BGG (Blue – green – grey) measures in urban environments. And to work with communities within large companies that are required to carry out ESG reporting.

The obstacles we perceive at the level of planning, implementation, or cooperation are: Corruption and egocentrism at almost all levels. From the highest state to regional. Although at the regional level, it is still possible to influence and change some aspects.

Students' Perspective

From students ´point of view the practice deals with:

Challenging legislative and administrative processes, lack of funding and human resources, complicated ownership structures and legislative inconsistencies, farmers' fears of economic losses, lack of data and evidence, conflicting plans and inconsistencies between ministries, poor coordination between stakeholders, lack of experts.

2.6. Education and Trainings Preferences

2.6.1 Türkiye

Ankara University

The analysis of responses demonstrates a strong and consistent demand for practice-oriented, technology-enhanced, and hybrid learning models. Students emphasize the importance of simulation-based training and immersive methods (e.g., 3D tools, VR applications), arguing that conventional lectures are insufficient for preparing them for disaster scenarios. They value

internships, real-world case studies, and hands-on experiences as essential to bridge the gap between academic learning and professional competence.

Professionals and academics reinforce these preferences but with additional emphasis on interdisciplinary collaboration and advanced digital literacy. They highlight the necessity of integrating GIS, modeling software, and AI applications into curricula to ensure professional relevance. Hybrid education is favored as it balances flexibility with the depth of face-to-face engagement. At the same time, professionals stress that training programs should not only deliver technical skills but also foster communication, teamwork, and decision-making capacities to strengthen resilience in complex institutional settings.

Taken together, these findings suggest that future training modules must combine immersive technologies, hybrid formats, and interdisciplinary content while maintaining strong connections to professional practice. This integrated approach is seen as critical to equipping both emerging and experienced stakeholders with the skills required for effective disaster management and ecological planning.

Eskişehir Technical University

Professionals emphasize practice-oriented and continuous training, with scenario-based drills, workshops, and simulations seen as indispensable. Modular and certifiable short programs are preferred, particularly when supported by inter-institutional cooperation. Technical domains such as GIS, remote sensing, and ecological risk analysis are highlighted as essential components that should be embedded into professional development.

Academics underline the need to institutionalize disaster-related education within higher curricula, shifting from elective to compulsory modules across planning, architecture, and engineering. Blended learning—combining online theory with in-person studios and applied projects—is regarded as the most effective format. Greater integration of sustainability, ecological planning, and multi-hazard perspectives is viewed as a pressing curricular gap.

Students express strong interest in interactive and technology-enhanced approaches, including simulations, case studies, VR/AR, and BIM-supported applications. They value interdisciplinary teamwork and collaborations with institutions such as AFAD and municipalities, while also calling for broader coverage of hazards beyond earthquakes, notably floods, fires, and climate-related risks.

Overall, the results indicate a shared demand for applied, interdisciplinary, and technologically enriched training models, with variations in emphasis: professionals prioritize modular certification, academics stress curricular mainstreaming, and students seek immersive, simulation-based experiences.

Istanbul Kültür University

The findings demonstrate that both students and professionals emphasize the importance of hybrid and practice-oriented learning models, though their motivations differ.

Students (Section 6) generally prefer hybrid learning formats that combine face-to-face and online education, often enriched with artificial intelligence tools. They report frequent use of

digital platforms and AI applications in coursework and research, reflecting a strong tendency toward technology-assisted learning. Certification programs are particularly valued, with students preferring detailed modules that break down knowledge and skills into structured units. They also stress the need for practical training opportunities, simulations, and scenario-based approaches rather than purely theoretical courses.

Professionals and Academics (Sections 7–8) highlight the need for visual and experiential methods such as videos, simulations, and case studies. These tools are perceived as effective in raising awareness, enhancing preparedness, and enabling participants to practice responses before disasters occur. While professionals underline that theoretical knowledge is valuable, they insist that it must be complemented with field-based, hands-on experience. Academics also emphasize the role of interdisciplinary cooperation and participatory approaches, noting that training content should address not only technical knowledge but also the social, psychological, and organizational dimensions of disaster management.

Common Features: Across both groups, there is a shared preference for interactive, multidisciplinary, and applied learning methods. Certificates are considered useful, but short-term programs alone are seen as insufficient for deep expertise. Training strategies that combine technological tools (AI, simulations, digital resources) with practical, real-world applications are viewed as essential for building disaster-resilient capacities.

Harran University

Students. Students (primarily Architecture/Renewable Energy) prefer applied, technology-enhanced learning: short video lectures, simulations, and interactive/scenario-based activities. They routinely use Zoom and are receptive to AI-supported study (mainly for information search), and they follow updates via digital/academic platforms. They ask for mandatory, regularly updated, and practice-oriented modules that close the theory–practice gap; recognize credentials (diploma/certificate) as important signals; and encourage institutional collaboration (e.g., between disaster agencies and universities) to ensure continuity and realism in training.

Professionals & Academics. Despite institutional diversity (municipalities, state agencies, NGOs, private practice, and academia), preferences converge on video + simulation-rich, practice-embedded training with clear links to field application. Many already use digital tools and AI (from information access to analysis), while a minority report limited or no AI use. Professionals emphasize regular public education/awareness, multidisciplinary collaboration, and department-specific evaluation of new technologies rather than one-size-fits-all adoption. In recruitment contexts, several practitioners value hands-on experience over certificates, highlighting the need for training that builds demonstrable competencies; some also note constraints in pedagogical capacity, suggesting a “train-the-trainer” layer.

Design implications for EPD-Net. Prioritize a hybrid micro-module architecture (short videos + guided simulations + local case exercises), embed AI-assisted practice (scenario coaching, data interpretation), provide stackable micro-credentials mapped to demonstrable tasks, add train-the-trainer units for pedagogy, and institutionalize agency–university co-delivery to sustain realism and continuity.

Summary

The findings across students, professionals, and academics converge on the demand for practice-oriented, technology-enhanced, and hybrid training models. Students emphasize simulations, VR/AR applications, case studies, and internships as essential for bridging the theory–practice gap. Professionals prioritize modular and certifiable programs grounded in inter-institutional collaboration, highlighting the need for advanced digital competencies such as GIS, AI, and modeling, while also stressing communication and decision-making skills.

Table 24. University-Based Comparison of Students and Professionals/Academics

University	Students	Professionals & Academics	Shared / Common Points
Ankara University	- Demand for simulation-based and immersive training (3D, VR) - Internships, case studies, hands-on projects valued - Conventional lectures seen as insufficient	- Stress interdisciplinary collaboration - Integration of GIS, modeling, AI into curricula - Hybrid learning favored for balancing flexibility & engagement - Emphasis on communication, teamwork, decision-making skills	- Practice-oriented, technology-enhanced, hybrid training models needed - Stronger link between academia and professional practice
Eskişehir Technical University (ESTÜ)	- Strong interest in interactive and tech-enhanced approaches (VR/AR, BIM, simulations, case studies) - Desire for interdisciplinary teamwork & collaboration with AFAD/municipalities - Call for broader coverage beyond earthquakes (floods, fires, climate risks)	- Professionals prefer modular, certifiable short programs - Academics want disaster education institutionalized (mandatory modules) - Scenario-based drills, workshops, simulations indispensable - Technical focus: GIS, remote sensing, ecological risk analysis	- Demand for applied, interdisciplinary, technologically enriched models - Students = immersive learning; Professionals = certification; Academics = curricular mainstreaming
Istanbul Kültür University	- Hybrid learning formats enriched with AI tools - Certification programs valued (structured, modular) - Preference for practical training, simulations, scenario-based work	- Professionals stress experiential methods (videos, simulations, case studies) - Academics emphasize interdisciplinary & participatory approaches - Training should include social, psychological, organizational dimensions	- Shared preference for interactive, applied, multidisciplinary learning - Technology (AI, simulations, digital tools) + real-world practice essential - Certificates useful but not sufficient alone
Harran University	- Prefer short video lectures, simulations, interactive/scenario-based activities - Use Zoom & AI for study/research - Request mandatory, regularly updated,	- Prefer video- & simulation-rich training with field application - Many use digital tools & AI; some report limited/no AI use - Stress regular public education &	- Hybrid micro-modules (short videos, guided simulations, case exercises) preferred - AI-assisted practice & stackable micro-

University	Students	Professionals & Academics	Shared / Common Points
	practice-oriented modules - Value credentials (certificates, diplomas) - Call for institutional collaboration with disaster agencies	multidisciplinary collaboration - Hands-on experience valued over certificates in recruitment - Note capacity constraints → need for "train-the-trainer" programs	credentials - Emphasis on institutional co-delivery (universities + agencies) for realism & continuity

Academics call for the institutionalization of disaster- and ecology-related content as compulsory within curricula and advocate for blended formats that combine online instruction with studio- and project-based learning. Overall, the results indicate that effective training must be interdisciplinary, applied, and digitally enriched, with certification valued only when linked to demonstrable, practice-based competencies.

2.6.2 Czechia

In the field of natural risk management education, both professionals and students clearly prefer learning led by the lector (in-person format). Digital applications and online tools are viewed primarily as supplementary resources that cannot replace direct interaction and face-to-face teaching. A skilled instructor is able to effectively connect topics, offer interdisciplinary perspectives, and tailor explanations to the specific needs of the group. One of the key advantages of live instruction is the ability to identify gaps in students' understanding and respond to them in real time. Moreover, in-person teaching fosters discussion, experience sharing, and the development of professional relationships – elements that are essential in crisis management and spatial planning. The presence of a live instructor also enhances participant motivation and enables deeper engagement in practical exercises, case studies, and project work, all of which are crucial for building relevant competencies.

Students in the field of natural risk management education clearly prefer learning methods based on solving real-world problems. They particularly value working with case studies of specific municipalities, which allow them to connect theoretical knowledge with practical context. Long-term internships and direct involvement in real projects are essential – not only as a source of experience but also as motivation for deeper understanding of complex issues. This approach fosters active engagement, the development of critical thinking, and independent decision-making. Students also recognize that practical exposure helps them better understand interdisciplinary connections and acquire skills that are truly applicable in their professional careers. Project-based learning, fieldwork, and collaboration with practitioners are therefore considered the most effective ways to build competencies needed for addressing risks through spatial planning.

Both groups demonstrate strong proficiency in GIS tools and 3D modeling software, with LiDAR data now routinely integrated into educational workflows. Digital collaboration platforms such as Zoom and Microsoft Teams are commonly used on both sides, while Miro is occasionally employed for interactive planning and visualization during lectures. The use of artificial

intelligence is on the rise, particularly for information retrieval and interpretation. It is also frequently employed for translation, as well as for editing and proofreading textual content.

Summary

In natural risk management education, both professionals and students strongly prefer in-person learning led by skilled instructors, as it fosters interaction, discussion, and real-time feedback. Students particularly value problem-based methods, case studies, internships, and project work, which help them connect theory with practice and build critical thinking and decision-making skills. While digital tools such as GIS, 3D modeling, and AI are increasingly used, they are viewed mainly as supportive resources rather than replacements for direct, practice-oriented teaching.

2.6.3. Latvia

Students' Perspective (Bachelor, Master, PhD)

- **Learning Formats & Preferences**
  - Prefer **hybrid formats**: combination of online and in-person, with recordings and printed materials for annotation.
  - Value **videos, simulations, scenario-based planning tools**, and **case studies** tied to real-world problems.
  - Appreciate **interdisciplinary and practice-oriented training** instead of purely theoretical lectures.
  - Certificates are highly valued (important for CV and career progression).
- **Digital Tools**
  - Frequently use Moodle, Zoom, AutoCAD, SketchUp, Lumion, Photoshop, GIS, and occasionally AI for text support.
  - Interested in expanding digital competencies, especially **GIS and modelling software**.
- **Motivation**
  - Strongly motivated by practical application of knowledge (learning "how to do" not just "what to know").
  - Seek training that enhances employability and provides visible recognition (certificates).
- **Obstacles**
  - Training sometimes too abstract or overly technical, making it difficult to apply in practice.
  - Content not always tailored to their professional development needs.

Professionals' Perspective (Designers, Planners, Municipal Staff, Professors, Companies)

- **Learning Formats & Preferences**
  - Value **short, focused formats**: webinars (1h), workshops, international exchanges, and professional study trips.
  - **In-person masterclasses** are preferred for skill-building, while remote training is valued for efficiency and knowledge exchange across regions.
  - Simulations are seen as highly effective; audio-only content as least effective.
  - Professionals want training to be officially **certified or documented**, strengthening professional credibility.
- **Digital Tools**

- Rely heavily on **GIS, ArcGIS, AutoCAD, LiDAR, 3D models**, collaborative platforms (Zoom, Teams, Miro), and specialized statistical or design software.
- Increasing use of AI for efficiency (summarization, analysis, drafting), but insist on responsible and critical use.

- **Motivation**
  - Driven by the need to **apply learning directly in work contexts**, solve immediate problems, and keep up with international best practices.
  - Value lifelong learning (conferences, international cooperation, professional networks).
- **Obstacles**
  - Concern about the sustainability of platforms (many fail if not updated regularly or clearly managed).
  - Skepticism toward large, inefficient digital systems unless they show **practical benefits** in real work.
  - Time and funding constraints limit participation in extended training.

Common Features Across Both Groups

- **Motivation**
  - Both groups are motivated by **practical relevance**: training must connect directly to real-world cases and professional challenges.
  - Strong demand for **certification** and recognition of acquired skills.
- **Preferred Learning Features**
  - Hybrid formats, interactive simulations, and real-life case studies are widely valued.
  - Training should be **interdisciplinary**, **collaborative**, and **updated regularly**.
- **Obstacles**
  - Both perceive gaps between **training content** and **practical applicability**.
  - Both stress the need for **responsible integration of digital tools/AI**.
  - Sustainability of training platforms is a concern: they must be **kept alive with updates, expert input, and institutional responsibility**.

Summary

In Latvia, both students and professionals prefer hybrid and practice-oriented learning formats that combine in-person interaction with online flexibility, simulations, and real-life case studies. Students value interdisciplinary training, digital skill development (especially GIS and modeling), and certified courses that enhance employability, though they often find current programs too abstract or misaligned with career needs. Professionals favor short, targeted formats such as webinars, workshops, and study trips, with a strong emphasis on certified training directly applicable to their work. Across both groups, motivation is driven by practical relevance, international standards, and recognition of acquired skills. Common challenges include gaps between training and real-world applicability, sustainability of digital platforms, time and funding limitations, and the responsible integration of AI.

2.6.4. Slovakia

Professionals' Perspective

Comprehensive understanding of natural processes, ability to read the landscape and predict weather responses and changes based on climate models and AI, technical knowledge of GIS

and hydrological modeling, communication and facilitation skills. The best for the education is study documents elaborated as a text, audio, hybrid models, but a lot of practical information, possibility to learn at existing or current projects, discussion with professionals.

Recommendation about which data should be collected:

- information about groundwater, its quality, information about soil, information about possible erosion and slope instability, information about the quality of soil from earthworks (in the case of soil being imported to the site)
- As part of the planning process: requirements of residents in the area, defining the values of the area (e.g., landscape character, historical landscape structures, specific development of the area, specific regional features in the area, traditional values, etc.)

Suggestions for cooperation between the private/public sector and academia:

- Universities should not replace project organizations, but should provide expert assessment
- Skills / knowledge, which are recent graduates lacking:
- Comprehensive thinking, a systematic approach to the territory, modesty, humility, and a willingness to learn.
- Knowledge in the areas of water, soil, climate, solutions for abundance and quality, and also to know the origin of the country's threat to disasters
- The educational programs could change in following way:
- Establish specializations – train specialists: in green infrastructure architecture, design – detail in greenery, ecology – support for ecosystems and ecological stability, focus on agricultural projects, recultivation, restoration of permanent grassland, anti-erosion measures, establishment of orchards, vineyards, and hop fields, support for the protection of hkš (high-quality agricultural land) and land values, etc.
- Include cooperation (communication) with the public, teach new ways of thinking and acting for the benefit of public welfare, satisfaction, assistance, and cooperation.
- Develop reliable spatial planning data by specialists and experts, which will then be made available on public portals free of charge, e.g., databases of bpej, watercourse quality, drainage maps (10, 20, 50, 100 mm), heat island maps, flood zone maps, pedological maps, climate maps, maps with hkš, maps of protected monuments and areas, etc.
- Residents, developers, local official should be educated in the area of natural disaster prevention and management.

Where are the gaps?

- Landscape architecture is not just about greenery, but also about social aspects – culture, design, the needs of society, urbanism, construction and engineering skills, etc
- Lack of knowledge: Tree care documents cannot be used as a basis for spatial planning because they are primarily intended for the maintenance of greenery. Conversely, a spatial plan cannot be used as a document for tree maintenance because it is not detailed enough and does not deal with specifics. Planning is not done through details (e.g., which trees need to be treated), but through concepts (e.g., where there are no engineering

networks and trees can be planted). Also, RÚSES is not a sufficiently detailed basis for addressing a specific area where an investment is to be made (e.g., IBV).

- a comprehensive approach – something like the GAIA principle. If something happens on one side of the world, it also has an impact on the other side of the world. Accept global problems and solve them locally or regionally.

Students' Perspective

From the students' perspective, effective teaching in ecological planning and disaster management must integrate a broad spectrum of disciplinary knowledge, technical expertise, and transferable skills. The key areas identified include:

- Ecology, spatial planning, and green technical solutions, alongside the ability to collect, process, and analyse environmental data.
- Environmental and landscape sciences, GIS and spatial analysis, hydrology and soil erosion, law and policy frameworks, project management, digital and analytical competencies, and climate adaptation strategies.
- Critical and systemic thinking, together with managerial and interpersonal skills such as leadership, financial management of projects, navigation of subsidy schemes, conflict mediation between conservationists and farmers, and the economic evaluation of ecosystem services.

One student provided a more detailed curriculum proposal, stressing the following domains:

- Landscape ecology and biodiversity: understanding the functions of key landscape elements and their role in ecological stability.
- Hydrology and pedology: processes of the water cycle, water retention in river basins, soil dynamics, and their implications for erosion and infiltration.
- Land-use planning and landscape architecture: principles of spatial structure design for settlements and landscapes, development of green infrastructure projects, and urban planning.
- Law and environmental studies: overview of nature and landscape protection law, water law, and building law, with emphasis on their implications for land-use decisions.
- GIS and cartography: fundamental skills in landscape mapping, creation of thematic maps, and spatial analysis.

Taken together, these perspectives emphasize the importance of an interdisciplinary, practice-oriented, and analytically rigorous approach. Such a framework would not only strengthen students' technical capacities but also prepare them to address complex environmental challenges through critical thinking, collaboration, and informed decision-making.

2.7. Recommendation for Professional Content of Training Module

2.7.1 Türkiye

Ankara University

Findings from both students and professionals converge on the need for a balanced integration of technical, ecological, and social dimensions in the training modules.

Students prioritize risk assessment, scenario planning, spatial regulation, and especially nature-based solutions. They call for the inclusion of real-world case studies, simulations, and decision-making tools to ensure that training reflects actual disaster contexts. Alongside technical content, students emphasize adaptive/systemic thinking and the use of AI for predictive modeling and risk analysis as critical skills for future practice.

Professionals and academics underline the necessity of embedding ecological literacy, data literacy, and advanced GIS competence into the training. They highlight risk mapping, scenario planning, resilient system design, and climate change awareness as indispensable. Beyond technical expertise, they stress the importance of communication, teamwork, and policy comprehension to operate effectively within complex institutional frameworks. Several respondents also recommend scenario-based exercises and interdisciplinary project work to mirror the collaborative nature of disaster management practice.

Together, these perspectives suggest that the training modules should be structured around three pillars:

- Technical and Digital Competence – GIS, hazard analysis, modeling, AI-supported forecasting.
- Ecological and Resilience Skills – nature-based solutions, climate adaptation, resilient system design.
- Social and Institutional Capacities – communication, coordination, decision-making, and policy literacy.

This tripartite structure ensures that participants not only acquire specialized technical skills but also gain the systemic and collaborative capacities needed for sustainable disaster resilience.

Eskişehir Technical University

Findings from Sections 9 (professionals, academics) and Section 7 (students) converge on the need for a training module that is applied, interdisciplinary, and multi-hazard oriented. Professionals underline practical competences such as risk assessment, GIS/remote sensing, ecological planning, and disaster communication, supported by case studies and simulation-based exercises. Academics emphasize the integration of urban resilience, climate adaptation, and sustainability perspectives into curricula, ensuring that theoretical insights are coupled with applied research and studio practice. Students highlight the importance of interactive, technology-enhanced learning—including VR/AR, BIM, and scenario-based teamwork with municipalities and NGOs—to strengthen preparedness and real-world applicability. Collectively, these perspectives call for a module that bridges technical expertise with experiential learning and institutional coordination.

Istanbul Kültür University

The findings suggest that both professionals and students converge on the need for a balanced, practice-oriented, and interdisciplinary content design for training modules. Students (Section 7) emphasize that training should focus on core disaster management knowledge and skills, including disaster scenarios, case studies, and practical applications. They recommend integrating global examples and problem-solving approaches to strengthen analytical skills. Students also highlight the importance of knowing not only how to access information but also

how to synthesize and apply it in real contexts. In their view, content should be structured in a way that enables the direct transfer of theory into practice, with a strong emphasis on scenario-based exercises and collaborative projects.

Professionals and Academics (Section 9) underline the necessity of including risk assessment, data analysis, ecological planning, and resilience skills within the content of the training modules. They emphasize the role of case studies—both successful and unsuccessful examples—as critical tools for reflection and learning. Many respondents insist that social dimensions such as community engagement, psychological preparedness, and communication are equally important alongside technical skills. Simulations, drills, and practical exercises are viewed as indispensable for preparing professionals to operate effectively under real disaster conditions. In addition, academics stress that training must be multidisciplinary, integrating architecture, planning, engineering, and social sciences.

Shared Recommendation: Across all groups, there is agreement that content should not remain theoretical but instead combine technical knowledge, social awareness, and applied practice. Scenario-based training, case study evaluation, and hands-on field applications should form the backbone of the modules, while interdisciplinary and participatory approaches will ensure their long-term relevance and effectiveness.

Harran University

Findings from both professionals (including academia) and students reveal strong convergence on the priority areas for training content. Risk assessment and mapping, scenario planning, spatial planning/land-use regulation, and local-scale technical solutions are consistently emphasized as core components. In addition, both groups highlight the importance of nature-based solutions and education & capacity building, ensuring that training goes beyond theoretical knowledge to include applied, practice-oriented modules. Professionals frequently point to the need for policy/legal frameworks, communication strategies, and coordination mechanisms, while students stress integration of climate change, sustainability, and resilience-oriented skills.

Regarding pedagogical design, respondents favor practical exercises, case-based learning, and simulations, with a strong preference for real-world examples drawn from local and regional contexts. Students underline that mandatory, regularly updated courses supported by technological tools (e.g., AI, simulations, hazard monitoring systems) are essential to prepare future practitioners. Professionals reinforce the importance of multidisciplinary and cross-institutional collaboration, as well as continuous public education, to ensure sustainability of training outcomes. Overall, the recommendation is for a balanced module architecture that integrates technical, ecological, policy, and social dimensions, delivered through interactive and applied formats that can effectively bridge the gap between theory and practice.

Summary

Across all universities, findings converge on the need for applied, interdisciplinary, and resilience-focused training. Students prioritize risk assessment, scenario planning, and nature-based solutions, supported by case studies, simulations, and technology-enhanced tools (AI,

VR/AR, BIM). They emphasize bridging theory with practice through interactive and collaborative formats.

Table 25. University-Based Comparison of Students and Professionals/Academics with Shared Recommendations

University	Students	Professionals & Academics	Shared Recommendations
Ankara University	- Risk assessment, scenario planning, spatial regulation - Priority on nature-based solutions - Real-world case studies, simulations, decision-making tools - Use of AI for predictive modeling and risk analysis	- Ecological literacy, data literacy, advanced GIS competence - Risk mapping, resilient system design, climate change awareness - Communication, teamwork, policy literacy - Scenario-based exercises and interdisciplinary projects	- Three-pillar structure: **Technical/Digital Competence**, **Ecological/Resilience Skills**, **Social/Institutional Capacities**
Eskişehir Technical University (ESTÜ)	- Interactive, technology-enhanced learning (VR/AR, BIM) - Scenario-based teamwork with municipalities and NGOs - Stronger preparedness and real-world applicability	- Risk assessment, GIS/remote sensing, ecological planning - Disaster communication, case studies, simulation exercises - Urban resilience, climate adaptation, sustainability - Coupling theory with applied studio practice	- Applied, interdisciplinary, multi-hazard oriented module - Bridge technical expertise with experiential learning and institutional coordination
Istanbul Kültür University	- Core disaster knowledge and skills (scenarios, case studies, applications) - Integration of global examples and problem-solving approaches - Direct transfer of theory into practice - Scenario-based and collaborative projects	- Risk assessment, data analysis, ecological planning, resilience skills - Case study evaluation (successes & failures) - Social aspects: community engagement, psychological preparedness, communication - Simulations, drills, hands-on field training - Multidisciplinary (architecture, planning, engineering, social sciences)	- Content must combine **technical knowledge, social awareness, and applied practice** - Scenario-based learning, case study reflection, field application - Interdisciplinary and participatory approaches for long-term relevance
Harran University	- Risk assessment/mapping, scenario planning, spatial/land-use regulation - Local-scale technical solutions, nature-based approaches - Climate change, sustainability, resilience skills - Mandatory, updated, tech-supported modules (AI, simulations, hazard monitoring)	- Policy/legal frameworks, communication strategies, coordination mechanisms - Practice-oriented methods: exercises, case-based learning, simulations - Cross-institutional collaboration and continuous public education - “Train-the-trainer” layer for pedagogical capacity	- Balanced module architecture: **Technical, Ecological, Policy, and Social dimensions** - Delivered through interactive, applied formats bridging theory and practice

Professionals and academics underline ecological and data literacy, advanced GIS/remote sensing, risk mapping, and climate adaptation, alongside communication, teamwork, and policy literacy. Scenario-based and interdisciplinary project work are seen as essential.

Overall, recommended content rests on three pillars:

- Technical/Digital Competence (GIS, modeling, AI, VR/AR, BIM)
- Ecological/Resilience Skills (nature-based solutions, climate adaptation, urban resilience)
- Social/Institutional Capacities (communication, coordination, policy comprehension)

This integrated structure ensures both specialized expertise and systemic, collaborative capacity for disaster-resilient urban futures.

2.7.2 Czechia

Practical experience shows that flood risk can affect areas with well-functioning landscape structures if they are located downstream and suffer the consequences of poor land management upstream. Water management measures are often overly technical, and their full potential remains untapped. A comprehensive approach to soil care, the revitalization of degraded areas, and active cooperation with farmers is essential. Agricultural landscapes hold significant mitigation potential in terms of both water retention and carbon sequestration. Proven practices include river restoration, measures on arable and forest land (including land consolidation), the use of cover crops, strip farming, no-till practices, and the subdivision of large land blocks. Functioning landscape measures can serve as inspiration for other regions. However, it is crucial not only to design but also to implement these measures in practice. Ecological zoning in spatial plans is a valuable tool for identifying ecological risks and values. Increasing attention is being paid to landscape forecasting – predicting changes in natural processes, climate, and social characteristics. In this context, it is necessary to strengthen the role of natural sciences, particularly applied landscape ecology, in planning processes. Interdisciplinary cooperation, coordination capacity, and systems thinking are essential. Effective planning also requires an environment that supports open sharing of spatial data and ensures the participation of both the public and professional stakeholders.

Summary of Key Insights and Recommendations

Identified Challenges

- Thematic fragmentation in education related to natural risk management – there is no integrated field combining crisis management, spatial planning, climate adaptation, and local governance.
- Weak connection between academia and practice (public administration, private sector, NGOs).
- Limited interdisciplinary collaboration and poor data sharing and coordination.
- Low public participation and reluctance to take personal responsibility for (environmental) safety.
- Insufficient competencies among graduates – lack of critical thinking, independent decision-making, spatial data interpretation, and argumentation skills.

Educational Needs and Goals

- Integrate knowledge from crisis management, spatial planning, landscape ecology, climate adaptation and mitigation, public administration and environmental law.
- Develop skills in communication, collaboration, strategic thinking, and GIS data interpretation.
- Promote interdisciplinary cooperation and participatory planning approaches.
- Increase legal literacy across professionals and among the general public.
- Focus on practical skills – real case studies, fieldwork, and project-based learning.

Educational Objectives

- Understanding natural risk and their interconnections
- Identification and analysis of natural hazards (floods, droughts, erosion, landslides, urban heat islands).
- Perception of risks in the context of climate change and landscape structure transformation.
- Applying spatial planning tools for risk prevention and adaptation.
- Use of ecological planning principles and nature-based solutions.
- Integration of ecological zoning and landscape forecasting into spatial plans.
- Knowledge of legal and institutional frameworks.
- Orientation in legislation and administrative procedures (spatial planning, environmental permitting, administrative proceedings).
- Ability to interpret and apply legal regulations in practice.
- Development of soft skills – critical thinking, independent decision-making, argumentation, communication and coordination across disciplines and sectors.
- Support for interdisciplinary collaboration and public participation.
- Creating environments for data and knowledge sharing.
- Engaging the public in planning and adaptation processes.

Table 26. Relevant topics for training module

1. Fundamentals of Landscape Ecological Planning
Basic ecological principles of planning process
Landscape functioning and interpretation of landscape relationships for planning purposes
Zoning and land use regulation, mapping of ecological risks.
2. Fundamentals of Natural Risk Management
Vulnerability mapping and identification of sensitive areas
Modelling and scenario planning for natural hazard development
Interpretation and application nature risk monitoring
3. Emerging natural risks: heat islands and adaptation options
Understand the causes and impacts of (urban) heat islands
Evaluate and apply adaptation strategies to mitigate heat risks
Integrate heat risk considerations into spatial planning and decision-making
4. Spatial Planning as a Tool for Prevention

The role of spatial and landscape plans in risk management Identification of local risks and their integration into planning documents Working with spatial data and interpreting GIS outputs
5. Nature-based Solutions and Landscape Adaptation Basic context of green infrastructure and Nature-based Solutions Typology of interventions on arable and forest land Cooperation with farmers, use of cover crops, no-till practices
6. Legal Framework and Administrative Processes Spatial planning, permitting, and environmental law Public procurement and quality project briefs Fragmentation of competencies and its implications
7. Crisis Management and Post-Disaster Recovery Understand the structure and functioning of crisis management systems Develop practical skills for stakeholder communication and coordination during and after crises; translating data into practical decisions The “Build Back Better” principle
8. Participation, Communication, and Collaboration Strategical planning and public engagement Interdisciplinary cooperation (urban planners, ecologists, water managers, etc.) Best practices

Summary

Current practice in natural risk management highlights the complex interplay between landscape structures, climate change, and governance frameworks. While proven landscape measures such as river restoration, cover crops, no-till practices, and ecological zoning demonstrate clear potential for mitigating floods, droughts, and soil degradation, their implementation is hindered by fragmented responsibilities, insufficient coordination, and weak integration into planning processes. Thematic fragmentation in education further exacerbates these challenges, as there is no integrated field bridging crisis management, spatial planning, climate adaptation, and local governance.

Stakeholder insights reveal persistent gaps between academia and practice, limited interdisciplinary cooperation, and a lack of competencies among graduates, particularly in critical thinking, independent decision-making, and spatial data interpretation. At the same time, public participation remains weak, and reluctance to assume personal responsibility for environmental safety constrains preventive strategies.

To address these deficits, educational programs must integrate knowledge from landscape ecology, crisis management, spatial planning, climate adaptation, and environmental law, while placing stronger emphasis on practical skills through case studies, fieldwork, and project-based learning. Training modules should focus on ecological planning principles, risk mapping, scenario modelling, heat island adaptation, nature-based solutions, and legal-administrative

frameworks. Furthermore, interdisciplinary collaboration, participatory planning, and data-sharing environments must be actively promoted.

Ultimately, the goal is to build a new generation of professionals capable of linking ecological science with governance and practice. Strengthening applied education, fostering cooperation across sectors, and embedding nature-based and participatory approaches into both planning and crisis management are essential steps toward more resilient landscapes and communities.

2.7.3. Latvia

Students' Perspective (Bachelor, Master, PhD)

- **Content Focus**
  - Training should be integrated into study programs and linked with real-world problems and solutions.
  - Value practical examples, case studies, and scenario-based tools rather than abstract lectures.
  - Strong interest in interdisciplinary, practice-oriented content (e.g., combining planning, design, ecology, and policy).
  - Topics emphasized:
    - Local case studies and regional relevance.
    - Simulated risk scenarios and scenario planning tools.
    - Practical tools for adaptive landscapes and flood management.
- **Skills & Competencies**
  - Expand GIS and digital competencies (3D modelling, data analysis).
  - Strengthen collaborative and communication skills for cross-sector work.
- **Motivation**
  - Want training that is directly useful for employability (certificates, applied competence).
  - Seek content that makes them capable of solving problems municipalities and communities face.
- **Obstacles**
  - Current education is often too general, lacking specialization and practical technical training.
  - Risk that platforms like EPD-net may become irrelevant if not updated regularly or tied into real courses.

Professionals' Perspective (Planners, Municipal Experts, Professors, Designers)

- **Content Focus**
  - Training modules should cover the full cycle of disaster risk management:
    - Risk assessment & mapping
    - Scenario planning & strategic frameworks
    - Spatial planning & land-use regulation
    - Local-scale technical solutions
    - Nature-based solutions
    - Legal/policy/communication frameworks
    - Education & capacity building

    - Strong emphasis on methodological tools: hazard analysis, forecasting, strategic planning, preventive tools, public participation, citizen science, and green infrastructure design.
- **Skills & Competencies**
    - **Green knowledge**: sustainability principles, climate change adaptation, natural cycles, circular economy.
    - **Digital skills**: GIS, hazard analysis, statistics, AI-supported data analysis.
    - **Social skills**: risk communication, stakeholder engagement, collaboration, leadership.
    - **Resilience skills**: crisis scenario development, systemic/adaptive thinking, resilient systems design, disaster response coordination.
- **Motivation**
    - Training must provide direct applicability in daily practice and support long-term resilience strategies.
    - Desire for structured programs with balanced attention to technical, social, and policy dimensions**.**
- **Obstacles**
    - Fragmentation of responsibilities and lack of clear ownership of training platforms.
    - Risk that modules may be overly theoretical and disconnected from daily municipal or professional needs.
    - Concern about sustainability—platforms must be institutionally maintained beyond project funding.

Common Features Across Students & Professionals

- **Motivation**
    - Both groups want practical, applicable knowledge—case studies, simulations, and real examples are essential.
    - Certificates or formal recognition of training are highly valued.
- **Preferred Features**
    - Scenario-based learning, interdisciplinary content, hybrid formats (online + in-person).
    - Regular updates and integration into formal education/professional systems to ensure long-term use.
- **Perception of Obstacles**
    - Both worry about training platforms losing relevance without regular updates.
    - Both criticize purely abstract or overly technical content that does not translate into practical competence.
    - Sustainability depends on clear institutional responsibility for platform maintenance.

Summary

In natural risk management education, both students and professionals emphasize the need for training that is practice-oriented, interdisciplinary, and directly connected to real-world challenges. Students call for the integration of disaster-related modules into curricula, with scenario-based learning, local case studies, and adaptive landscape tools, while also valuing certificates that enhance employability. Professionals seek comprehensive coverage of the entire disaster risk management cycle, combining technical, social, and policy dimensions, and stress the importance of methodological tools, digital competencies, and resilience skills.

Common ground exists in their preference for hybrid learning formats, applied case studies, and formal recognition of skills. However, both groups criticize overly abstract content and express concerns about the sustainability of training platforms without regular updates and institutional responsibility. This highlights the need for dynamic, applied, and well-maintained training systems that bridge education and professional practice.

2.7.4. Slovakia

Students and professionals indicated that the most suitable case study format is the use of simulated risk scenarios. Areas identified as having potential or significant flood risk should be prioritized for detailed risk assessment, targeted prevention measures, and continuous monitoring through advanced hydrological and geospatial technologies. These regions require strategic investment in flood protection infrastructure, integrated landscape planning, and active community engagement to minimize damage and strengthen resilience against future flood events.

In addition, real-world examples from the local and regional context should be incorporated into the curriculum, with a particular focus on areas classified as high-risk for flooding or other natural hazards.

- Essential Skills and Knowledge
- Key competencies required for effective disaster risk management include:
- Hydrology and water management
- Risk assessment
- Environmental monitoring
- Analytical modelling (GIS, hydroinformatics)
- Project management
- Interdisciplinary collaboration
- Effective communication with stakeholders

These skills enable professionals to analyse hazards, plan sustainable solutions, coordinate teams, and respond efficiently to natural disasters and environmental challenges.

The Role of Public Education

Public education is considered an essential component of risk reduction. It raises awareness, improves preparedness, facilitates effective responses, and reduces overall risk. Informed citizens and stakeholders are better equipped to:

- Understand early warnings,
- Follow emergency procedures, and
- Actively participate in prevention and recovery efforts.
- This contributes to more effective disaster management at all levels, from local to national.

Key Topics for Education in Natural Hazard Management

Students and experts identified the following as the most critical thematic areas for education:

- Mapping and analysis of natural hazards
- Modelling and simulation of natural hazard development
- Legal frameworks and policy on natural risk management
- Spatial measures in land-use plans
- Zoning and land-use regulation
- Green infrastructure and nature-based solutions
- Disaster-resilient infrastructure, with emphasis on technical solutions
- Public participation in natural disaster prevention and mitigation

Priority Knowledge Areas

Most important:

- GIS and geospatial methods
- Statistical methods and probability assessment
- Monitoring, analysis, and assessment methodologies for natural risks
- Risk impact modelling, scenario creation, and hazard prediction
- Principles of planning multifunctional preventive measures
- Principles of designing and implementing preventive measures

Important:

- Natural hazards and disaster mechanisms
- Protection methods against natural hazards
- Technical knowledge of resilient infrastructure (e.g., flood barriers, earthquake-resistant structures)
- Legislative and policy frameworks for disaster prevention and management
- Strategic planning and financing of preventive measures
- Nature conservation and public education
- Climate change impacts on the environment

Priority Skills for Risk Prevention in Spatial Planning

Most important:

- Ability to interpret and apply data from hazard monitoring
- Ability to create scenarios for hazard development and disaster impacts
- Understanding human behaviour, social dynamics, and community involvement in disaster management
- Understanding legal and regulatory instruments that enhance system resilience

Important:

- Monitoring and early identification of hazards
- Creation and implementation of contingency plans
- Functional planning for disaster prevention using Nature-based Solutions
- Risk communication and public education
- Stakeholder engagement in resilience-oriented projects

Average importance:

- Coordination and management of disaster response
- Competencies in the design, construction, and maintenance of resilient infrastructure
- Design thinking, creativity, adaptability, and innovation in resilience planning (including systems and disruptive thinking)

Identified Gaps in Knowledge and Skills

- Several major deficiencies were noted in current disaster management education and training:
- Lack of practical experience with GIS at all levels of planning
- Insufficient skills in hazard monitoring and data analysis
- Limited capacity in hazard modelling and disaster impact prediction
- Lack of experience in crisis planning
- Weak communication skills for public awareness and prevention roles
- Deficiencies in creating contingency plans and strategic cooperation mechanisms
- Lack of knowledge about the responsibilities and requirements of related professions, leading to misunderstandings (e.g., between strategic planners, spatial planners, and measure designers)
- Poorly structured stages of prevention and mitigation measures, reducing their effectiveness
- Underdeveloped financial and strategic planning skills for disaster risk management

Summary

Students and professionals emphasise that simulated risk scenarios and real-world flood-prone examples are the most effective case study formats for disaster management education, highlighting the need for advanced hydrological and geospatial tools, strategic investments in resilient infrastructure, and active community engagement. Essential competencies include hydrology, risk assessment, environmental monitoring, GIS-based modelling, project management, interdisciplinary collaboration, and stakeholder communication. Public education is seen as vital for awareness, preparedness, and effective response. Priority topics range from hazard mapping, modelling, legal and policy frameworks, and land-use regulation to green infrastructure and public participation. Core knowledge areas focus on GIS, statistical and risk modelling methods, and the design of multifunctional preventive measures, while critical skills include interpreting monitoring data, scenario creation, understanding social dynamics, and applying legal frameworks. However, significant gaps remain, particularly in practical GIS use, hazard monitoring and modelling, crisis planning, communication, contingency planning, inter-professional coordination, and strategic financial planning, limiting the overall effectiveness of disaster risk management education.

2.8 Equal Issue

2.8.1 Türkiye

Students generally perceive equality issues as limited, yet they remain aware of structural disparities. While some report no major obstacles for either recent graduates or senior professionals, others highlight persistent challenges for women, particularly in disaster management and decision-making roles. They also emphasize inequalities in access to applied

training opportunities, noting that institutional resources and personal networks strongly shape participation. Moreover, students frame equality not only in terms of gender but also as balanced collaboration between digitally skilled younger cohorts and experienced senior professionals.

Professionals and academics present a more systemic critique. Gender inequality is acknowledged, especially in planning and coordination contexts where women remain underrepresented. Early-career professionals often face disadvantages due to insufficient practice-oriented training and limited institutional support, while senior professionals may struggle with adapting to rapidly evolving digital technologies. Importantly, some responses emphasize complementarity: young graduates contribute digital competence (e.g., GIS, BIM, AI applications), whereas senior experts bring practical knowledge and institutional memory. This intergenerational balance is considered critical for effective disaster management.

Equality concerns in disaster management emerge less as overt exclusion and more as structural imbalance. Students stress equitable access to training and opportunities, while professionals underline systemic barriers in gender representation and digital adaptation. Across all groups, inclusivity is framed as an opportunity to leverage diverse strengths—gendered, generational, and disciplinary—toward building resilient and adaptive disaster management systems.

2.8.2 Czechia

Respondents generally did not highlight significant barriers to equity. However, female graduates expressed concerns about balancing professional responsibilities with family life, though they did not identify other obstacles to entering the field. More frequently, respondents pointed to generational differences across the age spectrum as a relevant issue.

Respondents admitted that in senior positions, entrenched practices may hinder the adoption of innovative approaches, particularly in relation to technological advancements. There was consensus that women in mayoral roles tend to demonstrate greater empathy toward the needs of vulnerable groups and show stronger engagement in climate adaptation and mitigation efforts.

2.8.3. Latvia

Respondents consistently reported that gender is not a significant barrier in disaster management or related fields in Latvia, with many highlighting that women are well represented and often active in the sector. A few noted the possibility of bias in municipal leadership recruitment, but expertise and competence were seen as more decisive than gender.

The main challenges identified relate instead to age and professional experience. Young specialists may face entry barriers due to requirements for certification and practical experience, while senior professionals sometimes struggle with adapting to new technologies. However, these were seen as individual rather than systemic issues. Several respondents emphasized the value of combining the technological strengths of younger professionals with the experience and situational knowledge of senior specialists, viewing this intergenerational cooperation as key to effective disaster management.

2.8.4. Slovakia

In Slovakia, the head of the national flood risk department is a woman, which illustrates that leadership in this field is not determined by gender but rather by individual expertise and professional approach. Structural challenges remain, however, including the limited availability of jobs and the low financial valuation of professional positions, which reduces the overall attractiveness of careers in disaster risk management.

For senior professionals, rapid technological change does not appear to constitute a critical obstacle, as expertise and adaptability remain strong. By contrast, recent graduates often face difficulties in securing employment, primarily because most employers require prior practical experience. This mismatch between educational preparation and labour market expectations underscores the need for more practice-oriented training. Professionals in the field have expressed a willingness to contribute to education through lectures and experience-sharing, though generally on the condition of receiving appropriate financial compensation for their engagement.

The most valuable thing for your resume is an internationally recognized certification or accredited course that has a clear practical outcome (e.g., a certificate of completion of crisis management training). At the same time, it makes a stronger impression if it is a program from a reputable institution or university that has links to practical experience. Women in natural disaster management often encounter prejudice, limited access to training or leadership positions, and problems balancing work and family life. The lack of suitable equipment and safe facilities when deployed in the field is also a barrier. The solution is equal access to education, support for women's representation in decision-making bodies, and the creation of conditions that take into account their specific needs.

Recent graduates encounter problems such as the requirement for a "recent graduate with 20 years of experience," a weak connection between theory and real-world practices, and a lack of mentoring. Temporary contracts with low pay and unclear career paths are also barriers. Paid internships/trainee programs with mentors, clear competency profiles, and the opportunity to quickly earn practical certifications can help. Seniors often encounter rapid technological changes (AI, new GIS/communication platforms), little time to learn, and sometimes ageism. Time for training, targeted courses, reverse mentoring (younger people teach tools, seniors pass on tactics/decision-making), and simplification of the portfolio of technologies used can help.

2.9. Overall results of the interviews

The outcomes of the needs assessment conducted within the scope of WP2 reveal both common challenges and country-specific dynamics in ecological planning and disaster management education and practice. The comparative analysis of Türkiye, Czechia, Latvia and Slovakia provides valuable insights into the state of ecological planning and disaster management education and practice across diverse institutional and cultural settings. Despite differences in academic structures, professional orientations, and systemic challenges, the findings reveal common patterns: a persistent gap between theory and practice, limited integration of applied and interdisciplinary approaches, and systemic barriers such as fragmented governance, financial constraints, and inadequate institutional coordination. At the same time, all three

countries demonstrate strong motivation among students and professionals to advance sustainability, resilience, and digital competence, with a shared demand for hybrid, practice-oriented, and technology-enhanced training models. Students are additionally motivated by emotional engagement with environmental issues, including ecological grief, which reinforces their desire to contribute to sustainable and resilient environments. By examining these contexts side by side, it becomes possible to identify both unique national dynamics and overlapping priorities that can inform the design of integrated, cross-country training frameworks within the EPD-Net project.

In Türkiye, the respondent group consisted of 12 students and 28 professionals (40 participants in total), representing a wide disciplinary and institutional spectrum. Students came from architecture, landscape architecture, civil and environmental engineering, renewable energy, and interior design, spanning undergraduate, master's, and doctoral levels. Their backgrounds included double majors, Erasmus exchanges, international internships, and voluntary disaster-awareness programs. Professionals formed a more diverse group, encompassing academics, municipal officials, ministry representatives, NGO leaders, professional chambers, and private-sector practitioners with expertise in architecture, urban and regional planning, landscape architecture, geophysics, meteorology, geomatics, and disaster management. Together, this distribution highlights a strong interdisciplinary basis while also exposing structural gaps between theory and practice in disaster management and ecological planning education across Türkiye.

The interviews conducted in Türkiye reveal a shared orientation among students and professionals toward sustainability, ecological planning, and disaster resilience, yet they also underscore that disaster-related education and practice remain predominantly theoretical and fragmented. Students consistently stress the lack of structured, practice-oriented opportunities such as internships, simulations, and scenario-based exercises, as well as limited exposure to multi-hazard perspectives beyond earthquakes (e.g., floods, fires, ecological risks). They strongly emphasize the need for applied, technology-enhanced approaches, highlighting tools such as GIS, remote sensing, BIM, AI, and VR/AR as essential for bridging the persistent gap between theory and practice. Students are motivated not only by professional development but also by strong emotional and ecological engagement, which drives their interest in creating environments that positively influence human well-being.

Professionals, while pointing to good practices such as disaster education centers, ecological conservation projects, disaster parks, reconstruction initiatives, and EU-funded programs, draw attention to systemic barriers that hinder their broader impact. These include fragmented governance, bureaucratic delays, insufficient financial resources, weak inter-institutional coordination, and ineffective monitoring of national and EU-level frameworks. As a result, even well-designed projects often lack continuity and fail to achieve full implementation.

Across both groups, there is a strong and consistent demand for hybrid and practice-oriented training models. Students seek immersive and interdisciplinary experiences, while professionals call for modular, certifiable, and institutionally coordinated programs that combine technical competencies with soft skills such as communication, teamwork, and policy literacy. Academics highlight the importance of making disaster- and ecology-related content compulsory and

interdisciplinary, supported by a “train-the-trainer” component to strengthen pedagogical capacity. Professionals also emphasize the value of lifelong learning to continuously improve sustainability and resilience practices throughout their careers.

Taken together, the findings indicate that disaster management education and practice in Türkiye should evolve toward an integrated framework built on three pillars: Technical/Digital Competence (GIS, modeling, AI, VR/AR, BIM), Ecological/Resilience Skills (nature-based solutions, climate adaptation, urban and ecological resilience), and Social/Institutional Capacities (communication, decision-making, policy/legal literacy, inter-institutional collaboration). This tripartite structure offers a pathway to link theory with practice, scale up existing good practices, and overcome systemic obstacles, thereby equipping future professionals with both specialized expertise and systemic capacities for disaster-resilient urban futures.

In the Czechia, the respondent group of 4 students and 26 professionals reflects a wide spectrum of actors from academia, public administration, NGOs, and the private sector, engaged in landscape planning, disaster risk reduction, and environmental protection. Students, coming from landscape engineering and environmental studies are motivated by accessible programs, role models, and a generational “environmental sadness,” while often combining studies with internships or jobs to gain practice early. They identify a weak link between theory and practice and limited exposure to applied planning, risk management, and digital tools. Professionals—ranging from senior academics and ministry officials to mayors, NGO managers, and private-sector planners—share a commitment to improving environmental quality and embedding resilience into governance frameworks, but face fragmented cooperation, limited access to spatial data, and the confinement of applied research within academia. Both groups perceive floods and extreme precipitation as the most pressing hazards, followed by drought, erosion, heat waves, strong winds, and forest fires, and emphasize the urgent need for preventive, integrated planning. Key educational gaps include students’ dissatisfaction with unsuitable teaching methods, missing professional skills (communication, strategic planning, legal literacy, innovation transfer), and insufficient graduate competences such as critical thinking, independent decision-making, teamwork, argumentation, and GIS data interpretation. Proposed improvements include expanding internships to students and educators, mentoring by enterprises, and advisory systems for municipalities.

Thematic fragmentation is the main structural challenge: there is no interdisciplinary field combining crisis management, spatial planning, climate adaptation, and local governance. As a result, natural risk management is weakened by outdated urbanization-focused spatial plans, weak interdisciplinary cooperation, and limited public participation and responsibility. Short-term measures emphasize low-cost, multifunctional nature-based solutions—river restoration, cover crops, strip farming, no-till practices, and subdivision of large fields—while long-term strategies require structural changes across catchments under an integrated framework. Yet fragmented land ownership, low municipal land shares, financial limits, and maintenance gaps slow down implementation. Crisis management functions effectively during events but struggles with staff shortages and low citizen cooperation. To strengthen resilience, training should integrate ecological planning, crisis management, spatial and legal frameworks, and participatory governance, with target groups including public officials, elected representatives,

experts, students, landowners, and the general public. Recommended modules span fundamentals of ecological planning, natural risk management, urban heat island adaptation, spatial planning for prevention, nature-based solutions, legal frameworks, crisis management and recovery (Build Back Better), and interdisciplinary participation and communication. Overall, addressing fragmentation, bridging academia and practice, enhancing applied and participatory approaches, and prioritizing nature-based adaptation are essential steps toward building adaptive capacity in the Czechia.

In Slovakia, although specific country-level interviews were fewer, students and professionals similarly demonstrate strong interest in sustainability and practical ecological planning. Students show motivation for early professional engagement and applied learning, while professionals face systemic fragmentation and emphasize lifelong learning and interdisciplinary cooperation. Challenges include limited access to spatial and environmental data, bureaucratic constraints, and the need for integrated approaches combining planning, risk management, and climate adaptation.

In Latvia, disaster management education is only superficially integrated into academic curricula, typically framed as awareness-raising rather than applied, practice-oriented training. Students, mainly enrolled at master's and doctoral levels in landscape architecture, spatial planning, environmental engineering, and forestry, highlight strong ecological values and motivation to contribute to sustainability and climate resilience. However, they report limited specialization in disaster management, insufficient technical depth (e.g., flood planning, adaptive landscape design), and restricted access to digital and applied tools. Their preferred learning formats are hybrid and interactive, with a demand for simulations, case studies, and certified training that can directly enhance employability and professional development.

Professionals, by contrast, represent a broad spectrum of roles across municipalities, ministries, NGOs, academia, and private consultants. While motivated by long-term commitments to sustainable development and community resilience, they emphasize systemic barriers including fragmented institutional responsibilities, weak policy implementation, and limited governmental support. Professionals underline the need for digital competence (GIS, modelling, AI), stronger policy frameworks, and applied methodologies. They value short, practice-oriented formats such as workshops, webinars, and international exchanges, while highlighting the importance of lifelong learning to compensate for gaps in formal education.

Despite their differences, both groups converge on several points: disaster management is increasingly recognized as a priority but remains underdeveloped in education and practice; practical, applied, and interdisciplinary training modules are urgently needed; and collaboration between universities, municipalities, and professional actors is essential. Both students and professionals express a preference for hybrid, interactive learning supported by digital tools and certified outcomes, while also stressing the necessity of public awareness and systemic reforms to ensure long-term resilience.

In conclusion, the findings from Türkiye, the Czechia, and Latvia point to a shared need for transformation in the fields of ecological planning and disaster management. Across all three countries, both students and professionals emphasize the importance of integrating theory and practice through interdisciplinary, applied, and technology-enhanced training models. While

systemic barriers manifest in different forms and scales, there is broad consensus on the urgency of advancing sustainability, resilience, and digital competencies. Students' emotional engagement and professionals' lifelong learning orientation further reinforce the need for adaptive, responsive educational frameworks. Within this framework, the training modules to be developed under the EPD-Net project should adopt a holistic structure that brings together cross-country good practices and responds to the shared priorities of diverse stakeholders, thereby playing a critical role in building disaster-resilient and sustainable cities in the long term.

3. EVALUATION OF THE FOCUS GROUP DISCUSSIONS

3.1. Questions and Topics Discussed in the Focus Group

Within the scope of the EPD-Net Project WP2 Research Analysis, focus group discussions were conducted in order to complement the findings of the surveys and interviews with qualitative insights. The purpose of these discussions was to explore the perspectives of different stakeholder groups—including professionals, academics, students, public representatives, and NGOs—regarding ecological planning and natural risk management. The focus groups were designed not only to identify the current challenges and barriers in both education and practice, but also to validate the appropriate content, methods, and long-term sustainability of the training modules to be developed. In this context, the questions addressed during the sessions covered a wide range of themes, from stakeholder collaboration and policy gaps to innovative teaching methods, digital integration, and the relevance of future skills. Thus, the focus groups played a critical role in ensuring that the training modules will be user-centered, interdisciplinary, and adaptable to the needs of diverse participants.

Table 27. Focus Group Questions – EPD-Net Project

Section	Key Questions
1. Respondent Profile	• Could you briefly introduce yourself?
2. Challenges in Education	• Do ecological planning and natural risk management (disaster management) topics receive sufficient attention in your architectural education or professional development? • What types of training have you received or delivered so far (courses, seminars, workshops, field studies)? Which aspects were most useful for you? • What additional topics or methods are needed to teach ecological planning and natural risk management more effectively?
3. Stakeholder Collaboration	• How can effective cooperation be established among public institutions, private sector, academia, and NGOs in the field of ecological planning and natural risk management? • Are there any stakeholders or actors currently missing but essential to involve in this process?
4. Content and Methods of EPD-Net Training Modules	• Which themes and topics must be included in the EPD-Net training modules? (e.g., risk analysis methods, GIS applications, disaster scenarios, climate change impacts, nature-based solutions, policies & legislation) • Which teaching methods could make learning more effective? (e.g., fieldwork, applied workshops, case studies)
5. Updating and Future Relevance of Training Modules	• How can the training modules be kept up to date in the long term? (e.g., advisory boards, joint workshops, continuous feedback, online communities, legal frameworks) • Over the next 10 years, which skills, knowledge, or approaches will become critical in ecological planning and disaster risk management?

General Validation (link to international framework)	• What forms of cooperation between different stakeholders are possible? • What are the current challenges in education and practice in the field of natural risk management through spatial planning? • How can collaboration be strengthened in creating and updating training modules with stakeholders' involvement?

The outcomes of the focus group discussions highlight the importance of incorporating multiple perspectives into the design of the EPD-Net training modules. While professionals emphasized practice-oriented challenges, organizational strategies, and policy implementation issues, academics focused more on research gaps, curriculum deficiencies, and the integration of new technologies into education. Students, on the other hand, brought forward their individual learning experiences, digital tool preferences, and career expectations. These diverse insights underline that the training modules should not follow a one-size-fits-all approach but instead adopt a flexible, modular, and interdisciplinary structure. Ultimately, the focus group results provide a scientifically grounded framework for aligning the EPD-Net training platform with both current professional realities and the future competencies required in ecological planning and disaster risk management.

3.2 Summary of the Türkiye Focus Group Discussion

The EPD-Net Focus Group study was conducted with five experts from Türkiye on September 8, 2025, between 14:00 and 16:00. All participants had completed undergraduate education in architecture and were continuing their specialization at the master's and doctoral levels. Their academic careers reflected diverse orientations, including urban design, conservation of architectural heritage, conservation of urban heritage, sustainability, and disaster/emergency architecture. This diversity not only represents different dimensions of academic knowledge production but also contributes interdisciplinary richness to studies focused on ecological planning and disaster risk management.

Within the scope of the focus group study, participants were presented with questions structured around five main sections. The first section addressed participant profiles, aiming to understand their academic and professional backgrounds. The second section explored the extent to which ecological planning and disaster risk management are integrated into architectural education and professional development, including the challenges encountered and the experiences shared. The third section examined how more effective collaborations could be established among public institutions, the private sector, academia, and civil society. The fourth section focused on defining the content and methods of the EPD-Net training modules, highlighting themes such as risk analysis, GIS applications, and climate change, as well as teaching methods including fieldwork and hands-on workshops. Finally, the fifth section considered suggestions for keeping the modules up to date in the long term and emphasized the knowledge, skills, and approaches expected to become critical in the fields of architecture and ecological planning over the next decade.

3.2.1. Participant Profile

Question: Could you briefly introduce yourself in a few sentences?

This question was posed to understand the participants' academic and professional backgrounds, areas of expertise, and current positions. Clarifying the participant profile is of critical importance for interpreting the perspectives expressed during the discussions within the context of their knowledge and experience. Moreover, it provides insights into identifying the target audiences that the training module should address.

- One of the experts is an experienced faculty member with academic work in the fields of universal design, inclusive and accessible design in urban design and architecture. The participant is also actively engaged in various non-governmental organizations. Their long-standing teaching experience primarily focuses on urban design, architectural design studios, and courses centered on accessibility. Courses such as Accessibility for All, Principles of Urban Design, and Architectural Design Studio reflect an educational approach that emphasizes both social inclusivity and the fundamental principles of spatial design, while addressing the needs of diverse user groups.
- Another expert is a faculty member who holds a doctorate in architectural conservation. Their research focuses on the conservation and restoration of cultural properties and cultural heritage, site management, building and environmental conservation, as well as preservation practices in settlements, local, regional, rural, and vernacular architecture. An examination of the courses they teach shows that the program is primarily shaped around architectural design studios and architectural conservation courses. In addition, courses such as Architectural Conservation I–II, Conservation and Presentation of Archaeological Sites, and Space, Memory, and Cultural Heritage highlight the participant's expertise in cultural heritage and conservation, bringing a historical awareness and a sustainable conservation perspective to architectural education.
- Another expert holds a master's degree in architecture and a doctorate in architectural conservation, and is currently pursuing a second master's degree in Geographic Information Systems. An examination of the participant's scholarly work reveals a strong focus on modern architectural heritage, village institutes, industrial heritage, and the conservation of cultural heritage within both urban and rural contexts. In addition, they have conducted studies on nature-based design and planning education for disaster management. Regarding teaching activities, courses such as Architectural Conservation I–II and Conservation of Rural Heritage stand out for fostering awareness of sustainable management and conservation of cultural heritage, while Architectural Representation and Architectural Photography contribute to the visual expression and representation of space.
- Another participant completed their undergraduate education in the Department of Architecture at Eskişehir Technical University and is currently pursuing a doctoral degree at the same institution. Their research is particularly focused on disaster and emergency architecture, contributing to the discipline's capacity to produce resilient and sustainable spaces in the face of disasters. In addition to their academic work, the participant serves as a secretary board member of the Eskişehir branch of the Chamber of Architects, demonstrating their active involvement in professional organizations.
- The final participant is a researcher pursuing a doctorate in architecture. Their research focuses on sustainability and disaster/emergency architecture, thereby contributing to a field that is directly linked to current global challenges. In addition to their academic

activities, they continue to work as an architect in the private sector, which enables them to integrate theoretical knowledge with professional practice. This profile suggests that the participant can provide strong contributions to the training module from both academic and practice-oriented perspectives.

An examination of the participant profile reveals that the group is composed primarily of experts with a strong focus on architecture. Having completed undergraduate and graduate education in architecture, these individuals continue their academic and professional careers within the discipline. This profile enables an in-depth discussion of how ecological planning and disaster risk management are reflected within the field of architecture. The deliberate selection of participants—particularly academics, researchers, and practitioners from departments of architecture—was intended to ensure that the disciplinary knowledge base in areas such as urban design, sustainability, conservation, and disaster/emergency architecture could directly contribute to the development of the training module. In this way, the architecture-oriented concentration not only provides disciplinary depth but also creates a foundation for balancing the theoretical framework and practical dimensions of the module.

The selection criteria extended beyond participants' specialization within architecture. Emphasis was also placed on their focus on disaster and sustainability-related research areas, their ability to build bridges between academia and professional practice, their active roles in professional organizations, and their representation of institutional contexts. As a result, a multifaceted participant profile was established, combining both academic depth and practical applicability.

3.2.2. Challenges in Education

Question1: In your view, are ecological planning and natural risk management (disaster management) sufficiently addressed in architectural education or in your professional development?

Question2: What kinds of training have you received or delivered so far on these topics (e.g., courses, seminars, workshops, field studies)? Which aspects of these trainings did you find most beneficial?

Question3: In your opinion, what topics or methods are needed to teach ecological planning and natural risk management (disaster management) more effectively within the field of architecture?

This set of questions aimed to reveal the current state of ecological planning and disaster management within architectural education and professional development. By sharing their past experiences (such as courses, workshops, and field studies), participants helped to identify which methods were perceived as effective. In addition, the recognition of existing gaps and needs opened the discussion on which themes should be prioritized in the design of the training module's content.

Türkiye's Disaster Risk Profile

- It was emphasized that more than 90% of Türkiye lies within earthquake-prone zones.

- It was noted that disasters in Türkiye are not limited to earthquakes alone but encompass multiple types of hazards, thereby underscoring the need to address disaster risks in a multidimensional manner.
- Attention was drawn to the increasing frequency and severity of disasters in recent years, which has led to the growing importance of the issue in both education and professional practice.

Comments on Curriculum Gaps and Participants' Course Experiences

- All participants stated that ecological planning and disaster management are insufficiently represented in the architecture curriculum.
- It was emphasized that these subjects are generally addressed within planning and engineering disciplines, while in architecture they tend to remain limited to elective courses or project/studio-based work.
- Some participants noted that they had not encountered such content at the undergraduate level at all, explaining that their engagement with these areas developed mainly through graduate education, projects, or professional experience.
- Several participants mentioned that they incorporated current knowledge and practices into the courses they themselves offered (for example, Disaster Risks and Management in Cultural Heritage Sites), yet low student participation was reported to limit the effectiveness of these courses.
- Courses introduced at the Disaster Management Institute of Istanbul Technical University (ITU) and at ESTÜ were cited as examples, with participants emphasizing that such courses helped to strengthen the connection between disaster management and architecture.

Highlighting Applied Education and Best Practice Examples

- It was stated that theoretical knowledge alone is not lasting, and that applied education is critical.
- Methods such as fieldwork, drills, on-site observations, scenario-based studio projects, and simulations were identified as more effective.
- Good practice examples were emphasized as highly valuable learning tools, with the necessity of presenting why they are needed, how they are implemented, the legal and regulatory frameworks on which they are based, and evaluations of their impacts after application.
- One participant shared their experience of observing the reconstruction processes in Hatay and Kahramanmaraş together with the Chamber of Architects, noting that such experiences are highly valuable for understanding how theoretical knowledge translates into practice.

The Essential Role of an Interdisciplinary Approach

- It was emphasized that ecological planning and disaster management should not be confined solely to architecture or engineering, but should be regarded as inherently interdisciplinary fields.
- The importance of incorporating perspectives from different disciplines (engineering, public administration, health, psychology, economics, etc.) into the process was underlined.
- It was noted that by becoming familiar with approaches from other fields, architecture students can make more informed design decisions; therefore, the creation of common platforms was highlighted as essential.
- The need to introduce joint courses, develop interdisciplinary projects, and expand collaborative initiatives was strongly emphasized.

The Importance of Certificate Programs and Informal Education

- The contribution of certificate programs taken outside the formal curriculum to education was emphasized.
- Experiences of participation in international certificate programs were shared; although these programs were online and less interactive, they were considered highly effective as they included examples from different countries.
- Two participants stated that they had attended certificate programs on the Conservation and Rescue of Archaeological Assets. Such examples were reported to contribute to personal development, support networking, and broaden perspectives.
- It was suggested that such programs should be more widely disseminated, made more accessible, and integrated into formal education programs whenever possible.

Legislation, Policy, and Governance Frameworks

- It was emphasized that focusing solely on design in educational programs is insufficient, and that administrative frameworks such as legislation, regulations, disaster policies, and planning strategies should also be addressed.
- In this way, students would not only develop spatial design skills but also gain an understanding of the legal and political context, thereby fostering a more holistic approach.

Incorporation of Emerging Technologies

- It was stated that new technologies must be incorporated into educational content on disaster management and ecological planning.
- Tools such as BIM, artificial intelligence, augmented/virtual reality (AR/VR), and simulation technologies were noted as playing an important role in raising students' awareness.

- The rapid pace of technological advancement was emphasized, highlighting the necessity for disaster management and ecological planning to integrate these developments in order to remain up to date.

In these discussions, it was observed that ecological planning and disaster management are represented only to a limited extent in the architecture curriculum in Türkiye, mostly addressed through elective courses or individual projects. The issues commonly emphasized by participants included the need for applied education, interdisciplinary collaboration, the sharing of good practice examples, the incorporation of legislation and policies into educational content, the contribution of certificate programs, and the integration of new technologies. Within this framework, it was strongly highlighted that both formal and informal learning methods should be considered together in the development of the training modules.

3.2.3. Collaboration Among Stakeholders

Question1: How can effective collaborations be established among public institutions, the private sector, academia, and civil society in the areas of natural risk management (disaster management) and ecological planning?

Question2: Do you think there are any actors or stakeholders currently missing from this process that should definitely be included?

These questions were designed to understand how multi-actor collaboration can be strengthened in interdisciplinary fields such as disaster management and ecological planning. Participants' views on public institutions, the private sector, academia, and NGOs were considered valuable for developing strategies that would render the training module functional not only in an academic sense but also within broader social and institutional contexts. Furthermore, the identification of actors that should be included in the process but are currently missing is aimed at building a more inclusive learning network.

The Essential Nature of an Interdisciplinary Approach

- It was stated that, by their very nature, the fields of ecological planning and disaster management cannot be addressed by a single actor and necessarily require interdisciplinary collaboration.
- The merging of expertise was emphasized as providing not only technical knowledge but also more lasting learning through diverse teaching methods.
- It was noted that strengthening collaborations among universities, particularly technical universities, would be highly beneficial.

The Role of Public Institutions and Challenges of a Centralized Structure

- It was emphasized that when disaster management is organized through centralized structures, the contribution and participation of other stakeholders remain limited.
- Participants noted that ambiguity in authority and role definitions leads to inefficiency and disconnection in the field during and after disasters.

- Although legislation and institutional structures (e.g., AFAD) were developed in Türkiye following the 1999 Kocaeli earthquake, it was expressed that in practice these have not reached a sufficient level, with many processes remaining on paper and not fully implemented.
- Due to deficiencies in preparedness, it was reported that disaster response is often delayed, with serious problems arising during the initial intervention.
- It was underlined that greater emphasis should be placed on preventive measures prior to disasters, as post-disaster interventions are far more difficult and demanding.
- As a solution, it was suggested that public institutions should hold regular meetings with the private sector and NGOs, and that broader participation should be ensured in the preparation of strategic documents.

The Role of Private Sector Institutions and Their Relationship with Technology

- It was emphasized that private sector institutions should take an active role in disaster management not only in post-crisis interventions but also in preparedness before disasters.
- Insurance companies and financing models were considered critical for ensuring the sustainability of the process.
- The necessity of collaboration between the private sector and technology firms was underlined for the production of environmentally friendly materials, the development of innovative technologies, and the improvement of practices.

The Role and Contribution of Universities

- It was stated that universities play a significant role in the production of scientific data, interdisciplinary research, and educational processes.
- Universities were noted as institutions that can assume responsibility not only in research but also in practical implementation.
- The need to enhance collaboration among universities was emphasized, with participants pointing out that while such joint projects already exist within current programs, they require stronger support.
- It was highlighted that current academic research should be transferred to the field, while field findings should also be fed back into academia, and that systems could be developed to facilitate this exchange.

The Participation and Perspectives of the Public and Disaster Survivors

- It was stated that the first-hand experiences of disaster survivors are among the most important sources of knowledge.
- It was noted that the public is often excluded from decision-making processes and limited mainly to voluntary activities, whereas they should be involved in preparedness and planning before disasters.

- It was emphasized that involving the public in the process would enable more accurate and applicable decisions to be made in post-disaster reconstruction.

Non-Governmental Organizations, Professional Chambers, and International Organizations

- The functions of NGOs, professional chambers, and volunteer organizations in raising awareness, informing the public, and engaging communities in the process were emphasized.
- It was noted that professional chambers, particularly the Chamber of Architects and the Chamber of City Planners, should assume a more active role.
- Participants expressed that UN, UNESCO, and EU funds should not be limited solely to search and rescue activities but should also be utilized for technical support and financing.
- UNESCO's work on accessibility, cultural heritage, and sustainability was highlighted as an example to be followed.
- It was underlined that the involvement of international organizations could help expand collaborations to a global scale.

The Role of the Media

- It was stated that the media plays a critical role in disaster management in terms of accurate information dissemination and transparency.
- The need for effective use of the media was emphasized to prevent misinformation, enhance public trust, and ensure proper guidance for communities.

Data Transparency and Sharing Mechanisms

- One of the most frequently mentioned problems was the insufficiency of data sharing.
- The lack of data flow between public institutions, the non-disclosure of research results, and the absence of simultaneous data entry during disasters were identified as major issues.
- It was noted that data sharing would foster transparency and trust while also facilitating rapid response during emergencies.
- The lack of dissemination of knowledge produced in academia to relevant stakeholders was emphasized as an obstacle to the effective progress of processes, making it essential to address this shortcoming.

The discussions revealed the necessity of a multi-stakeholder, interdisciplinary, transparent, and participatory governance model in ecological planning and disaster management. A centralized structure that limits participation, deficiencies in data sharing, and ambiguities in authority were identified as key challenges. The recommendations emphasized the need for public institutions to establish more open collaborations; for the private sector and technology firms to develop

innovative solutions; for universities to take an active role in both research and practice; for the public and disaster survivors to be included in the process; for NGOs and professional chambers to be strengthened; for the media to contribute through accurate information dissemination; and for international organizations to provide funding and technical support.

3.2.4. Content and Learning Methods of EPD-Net Training Modules

Question1: What themes and topics do you think must be included in the training modules to be developed within the scope of EPD-Net? (e.g., risk analysis methods, GIS applications, disaster scenarios, impacts of climate change, nature-based solutions, policies and regulations)

Question2: Which teaching methods could make learning more effective in these training modules? (e.g., fieldwork, hands-on workshops, case studies)

This section of questions was designed to serve as a guide for the content design and pedagogical methods of the training modules to be developed. Participants identified thematic priorities by sharing content suggestions such as risk analysis, GIS applications, climate change, and nature-based solutions. In addition, their methodological suggestions—such as fieldwork, case studies, and hands-on workshops—demonstrated that the module should be grounded not only in theoretical knowledge but also in practice-oriented learning experiences.

Smart Cities, Urban Resilience, and Digital Tools

- It was stated that the concepts of smart cities, ecological cities, and resilient cities should be addressed together in the training modules.
- Participants noted that these themes would yield more effective outcomes, particularly when explored through scenario-based studio courses.
- It was emphasized that GIS, digital tools, and participatory planning methods must be incorporated into the content.
- The inclusion of post-disaster planning and spatial design as part of the educational themes was highlighted as important.

The Climate Crisis, Sustainability, and Risk Assessment

- It was emphasized that the climate crisis cannot be ignored, and therefore climate policies and sustainable approaches must be reflected in course content.
- Participants noted that addressing regional risk analyses as a separate course or theme would be beneficial.
- It was stated that pre-disaster processes have been neglected so far, and for this reason the modules should place particular focus on this stage.

Nature-Based Solutions and Post-Disaster Approaches

- It was stated that the topic of nature-based design should be one of the core components of the module, together with post-disaster housing and sustainability approaches.

- The need to address sustainable, resilient, and durable cities in connection with nature-based solutions was emphasized.
- The importance of practice-oriented studies aimed at generating immediate solutions in the aftermath of disasters was highlighted.

Conservation of Cultural and Natural Heritage

- It was stated that the training modules should also include components addressing the protection of cultural and natural heritage in the context of ecological planning and resilience.
- The need to take into account the impacts of climate change on cultural heritage was emphasized.
- It was highlighted that pre-disaster assessments (e.g., the documentation of cultural heritage assets) are far more valuable than those conducted after disasters, and therefore such practices should be prioritized within the modules.

Learning Methods: Studios, Workshops, and Fieldwork

- It was stated that scenario-based design workshops, applied workshops, and studio courses are indispensable in the educational process.
- Technical field trips and on-site studies should not be limited to observation only, but should also include the evaluation of technical knowledge and policies.
- It was emphasized that differentiated field studies focusing on pre-disaster, during-disaster, and post-disaster phases are critical for learning.
- Extracurricular learning environments (such as workshops and flexible activities involving diverse groups) were noted as providing complementary contributions to formal education.

International Experiences and Collaborations

- It was stated that international experiences such as internships, Erasmus+, summer schools, and student exchange programs should be integrated into the training modules.
- Attention was drawn to the contents commonly included in European programs:
    - Fundamentals of disaster risk and resilience
    - Hazard science and risk assessment
    - GIS and remote sensing
    - Emergency planning and response systems
    - Governance, policy, and legal frameworks
- It was emphasized that aligning these contents with the EPD-Net modules would be beneficial.
- Furthermore, participants noted the importance of ensuring knowledge exchange on international platforms, which would make it possible to learn from the experiences of successful countries.

Technology and Innovative Learning Tools

- It was emphasized that technologies such as virtual reality (VR), augmented reality (AR), and simulations should be integrated into the modules to enhance the effectiveness of education.
- Artificial intelligence and digital technologies were noted as tools that can be utilized both for preserving up-to-date knowledge and for disseminating information to wider audiences.

Mechanisms for Feedback and Continuity

- It was stated that continuous feedback mechanisms must be established in order to keep the training modules up to date.
- These mechanisms should encompass all stakeholders, from disaster survivors to public institutions and professionals.
- It was emphasized that regular feedback would allow for the constant renewal of both content and methods.

All discussions highlighted that the EPD-Net training modules should be designed to encompass interdisciplinary, applied, technological, and international dimensions. Participants emphasized the importance of prioritizing pre-disaster preparedness, nature-based solutions, the protection of cultural heritage, fieldwork and workshops, international collaborations, and innovative digital tools. It was also stated that the establishment of feedback systems is essential to ensure that the modules remain current and dynamic.

3.2.5. Updating and Future of EPD-Net Training Modules

Question1: What measures can be taken to ensure that these training modules remain up to date in the long term? (e.g., advisory boards, joint workshops, continuous feedback mechanisms, online communities, legal regulations)

Question2: Over the next decade, which knowledge, skills, or approaches do you think will become critical in architecture with regard to ecological planning and disaster risk management?

This set of questions opened the discussion on the sustainability of the module and its capacity to adapt to the future. Participants provided suggestions on how to maintain its relevance (such as advisory boards, online communities, and continuous feedback mechanisms). In addition, discussions on the knowledge and skills that will become critical over the next decade contributed to shaping the module in a way that addresses not only today's needs but also those of the future.

Keeping the Modules Dynamic and Up to Date

- It was noted that training modules may lose their relevance in the long term; therefore, a dynamic and continuously updatable structure must be established.
- Daily changes should be rapidly reflected in the process; otherwise, the modules risk becoming ineffective.

- These updates should not be limited to content but should also be supported through regular monitoring and feedback mechanisms.

Institutional Coordination and Legal Framework

- Ensuring continuity in inter-institutional coordination was emphasized as essential.
- It was suggested that a legal and institutional framework for education should be created through the collaboration of universities, the Council of Higher Education (YÖK), and relevant ministries.
- Currently, course content is largely shaped by departments or individual faculty members, but it was argued that defined and organized policies would provide a healthier structure.

Advisory Boards and Multi-Stakeholder Participation

- The establishment of advisory boards composed of academics, public institutions, private sector representatives, and civil society actors was considered necessary for the module development process.
- Since disaster management covers many sub-dimensions—such as financial aspects, risk management, emergency mechanisms, and human resources—the inclusion of multiple stakeholders was described as indispensable.
- Decision-making mechanisms should be clearly defined, followed by monitoring and updating processes integrated as part of these mechanisms.

Monitoring, Feedback, and Evaluation Mechanisms

- Training modules should be reviewed at regular intervals (e.g., annually, every five years)
- Post-program surveys, satisfaction measurements, and online tools were considered useful for collecting feedback.
- The development of interactive platforms for feedback was highlighted as necessary, as participation in meetings and workshops may remain limited.
- The experiences of learners should be incorporated into the process, which could be facilitated through alumni tracking systems or online communities.

Teaching Methods and Flexible Learning Environments

- Summer schools, field workshops, and certified continuing education programs should serve as complementary elements of the modules.
- Extracurricular learning methods (workshops, studios, fieldwork, applied projects) were emphasized as having a supplementary effect.
- It was suggested that modules should be divided into smaller units so that only the relevant part would need to be updated when revisions are required.

- New content should be tested through pilot implementations and integrated into the overall program if successful outcomes are achieved.

National and International Exchange of Experiences

- Alongside inter-institutional experiences at the national level, the inclusion of international collaborations and funding was considered necessary.
- Technical support and knowledge sharing provided by actors such as the European Union, UNESCO, and the United Nations were regarded as offering strategic contributions.
- It was observed that similar European programs include courses such as disaster risk fundamentals, hazard science, GIS, remote sensing, and emergency planning; participants suggested that the EPD-Net modules could be enriched by drawing on these examples.

Digital Tools and Future Perspectives

- The development of open-access online platforms, data-sharing portals, and e-learning modules was recommended.
- Technologies such as artificial intelligence, virtual reality, and augmented reality could facilitate updates and enrich learning processes.
- Over the next decade, themes such as GIS-based analyses, AI-driven risk assessments, design for climate adaptation, energy efficiency, and carbon-neutral approaches are expected to become critical.

The discussions in the fifth section revealed that training modules should not be prepared once and left static; rather, they must be dynamic, flexible, open to stakeholder participation, and continuously updated with technological support. Sustainability of the modules can be ensured through monitoring, feedback, advisory boards, and national and international collaborations.

3.2.6. Türkiye Focus Group Evaluation

The outcomes of the EPD-Net focus group study clearly demonstrate that ecological planning and disaster risk management must be addressed through a holistic approach within the context of architectural education and professional practice. The discussions were grouped under four main themes, highlighting the importance of considering these areas in a complementary manner.

Participants noted that ecological planning and disaster management are only marginally represented in architectural education, with courses often shaped by individual academic efforts rather than systematic policy frameworks. This situation was said to hinder students from acquiring sufficient competencies. It was emphasized that most of the training has remained limited to theoretical knowledge, whereas fieldwork, workshops, and applied methods provide more lasting learning. This gap in education was identified as an area that needs to be filled through interdisciplinary interaction and more comprehensive content.

Throughout the study, it was repeatedly emphasized that ecological planning and disaster management cannot be managed by a single actor and necessarily require interdisciplinary collaboration. Public institutions must overcome authority conflicts, the private sector should contribute with innovative solutions and financing models, and universities should take an active role in research and education. The awareness-raising, advocacy, and volunteer-based activities of civil society organizations were found valuable for ensuring social participation. It was underlined that the public should be included in decision-making mechanisms, as they are the most affected by disasters yet are often excluded from these processes. The media emerged as a critical actor in ensuring the accuracy of information and building trust. The involvement of international organizations and funding sources was considered important for sharing experiences and providing technical support.

The focus group discussions also identified the themes that should be included in the training modules. These included risk analysis methods, GIS and remote sensing applications, disaster scenarios, the climate crisis and adaptation, nature-based solutions, the protection of cultural and natural heritage, and policy and legal frameworks. In terms of teaching methods, scenario-based design studios, field trips, technical site investigations, interdisciplinary projects, summer schools, and international exchange programs were noted as particularly effective. In addition, extracurricular learning environments (workshops, applied projects, simulations, VR/AR-based tools) were emphasized as essential for reinforcing knowledge retention.

Participants stressed that the modules should not be prepared once and left static, but must instead be dynamic and continuously updated. To this end, the establishment of advisory boards, feedback mechanisms, periodic evaluations, and monitoring systems was recommended. The dissemination of knowledge through online platforms, open-access databases, and e-learning modules was also highlighted. Furthermore, it was considered practical to design the modules as modular units, so that only the relevant parts would need updating when revisions are required. Looking ahead, AI-supported risk analyses, GIS-based decision support systems, energy efficiency, and carbon-neutral design approaches were projected to become critical over the next decade.

The focus group study demonstrated that ecological planning and disaster risk management in architectural education and professional development cannot be limited to the transfer of technical knowledge alone. Rather, an educational model that is interdisciplinary, participatory, continuously updated, and supported by technology is required. Participants' evaluations indicated that EPD-Net training modules should be designed not only to transfer knowledge but also to encourage participation in decision-making processes, enhance social awareness, and foster international collaboration. These findings show that the training modules to be developed within the EPD-Net project will provide a strong foundation at both academic and practical levels. Through interdisciplinary richness and multi-actor collaboration, they will contribute to the cultivation of qualified experts for disaster-resilient and sustainable cities.

3.3. Summary of the Czechia Focus Group Discussion

Czech EPD-Net focus group was held on September 5, 2025, at Mendel University in Brno, with a total of 21 participants. The attending experts were divided into three distinct thematic groups (see below). After each group formulated its positions on the assigned topics, they presented

their findings to one another and collaboratively developed a shared vision. The overarching theme guiding this process was the definition of **"competencies of future experts in natural risk management."**

Table 28. The table below provides an overview of the focus group participants:

State Administration
civil servant in the field of agricultural land protection civil servant in the field of water management civil servant in the field of environmental protection senior civil servant in the field of GIS administration student academician academician
Expert institutions
agricultural consultancy specialist rural human resources specialist landscape measures implementation specialist flood risk monitoring specialist education specialist student academician
Private sector
flood protection planner environmental impact assessment consultancy farmer representative climate protection specialist remote sensing specialist student academician

3.3.1. Current challenges in education and practice related to nature disaster management and spatial planning

Education-Practice: One of the major challenges in this field is the coordination of a wide range of professions and processes that are essential for the successful implementation of effective landscape measures aimed at enhancing resilience to climate change. In education, the key issue lies in establishing a communication platform that facilitates dialogue between disciplines and aligns with the needs of specific territories. The following approaches were identified as ideal solutions:

- Thematic integration of disciplines – incorporating foundational knowledge from related fields into existing study programs
- Development of an educational module focused on the fundamentals of natural risk management, particularly for lifelong learning purposes
- Creation of advisory platforms (working groups) composed of representatives from various professions at micro-regional or regional levels

- Networking of experts across disciplines and sectors
- Public education and awareness – fostering a sense of responsibility for natural hazard prevention and promoting community-based accountability

A critical issue is the conflict between public administration (especially permitting processes) and the private sector. Another conflict has been identified between farmers and landscape planning experts. In the context of a changing climate, these two sectors must align their perspectives on landscape use**.** In such cases, universities—and potentially also non-profit organizations—can play a mediating role.

Education: Current study programs tend to be either overly technical or predominantly environmental in focus, which leads to competition between disciplines in practice. Cross-disciplinary adoption of perspectives is difficult, and no existing program fully addresses the fundamental requirement of multifunctionality in risk mitigation measures. Most programs remain confined to their disciplinary boundaries, with a dominant focus on flood protection (technical point of view), erosion control, or civil protection.

Another significant problem is the weak connection between education and practice. This gap is felt by current students, recent graduates, and potential employers alike. Employers often perceive student internships as a burden rather than a benefit. Therefore, a systemic solution is needed to bridge this divide.

Practice: In the implementation of landscape measures, cost is currently the decisive factor shaping their design. In this regard, legislative changes appear to be more promising than educational interventions. The introduction of innovations is also hindered by established procedures, which are more readily available and widely accepted.

3.3.2. Regional specifics in this field of expertise

For Czech context were identified these key characteristics:

- Primary focus remains on flood protection, which is often more reactive than based on preventive approach. Broader territorial causes of natural risks are rarely addressed.
- Landscape measures lack complexity and tend to be fragmented.
- High level of theoretical knowledge in natural risk management, but limited practical application.
- Robust research and data infrastructure, although data sharing is insufficient.
- Collaboration among research institutions exists, yet competition for grant funding undermines synergy.
- Crisis management and the integrated rescue system are well-developed and cooperative, but public engagement remains low.
- Effective and timely monitoring of natural hazards, including a reliable early warning system.
- Strategic planning and funding mechanisms for landscape measures are in place, but most proposed interventions remain unimplemented. Many of those that are implemented do not reflect actual needs but rather the criteria of available funding schemes.

- Inspirational examples of cooperation between municipalities, public administration, and the non-profit sector exist, but there is no established platform for sharing these best practices.
- Landscape perspectives are being integrated into urban planning and architecture, but such collaboration only occurs when legally mandated.
- Municipalities are expected to play a central role due to their local knowledge, land access, proximity to stakeholders, and funding opportunities. However, many mayors lack the necessary expertise to interpret technical documentation and are often unaware of principles related to landscape optimisation.
- Responsibility for damage caused by reduced landscape retention remains unclear – it is difficult to determine who is accountable (builders, farmers, industry - which specific entity?).

Experts agreed that these challenges cannot be comprehensively resolved through education alone. However, education can serve as a powerful tool—particularly in the context of lifelong learning for current risk management professionals, as well as targeted training for municipal representatives, government officials, and the general public.

3.3.3. Skills and knowledge needs related to nature disaster management and spatial planning

1) Soft skills:
   - soft skills (collaboration/teamwork, problem presentation, communication and mediation...),
   - critical thinking, ability to analyse and synthesize, independence in defining and solving a problem,
   - knowledge from other fields (seemingly unrelated): statistics; management basics; programming,
   - how to navigate the business environment (law, professional community, available sources of information),
   - interpretation of map data => application of theoretical knowledge in context.
2) Cross-cutting knowledge in the field of natural risk management in all existing programs (more narrowly focused);

3.3.4. Educational and training preferences

The most effective form of education is expert-led lectures, ideally connected to real-world practice. This core approach should be complemented by digital tools and well-structured textual materials to support diverse learning needs.

The effective management of natural hazards increasingly relies on the integration of Geographic Information Systems (GIS) and other digital tools. These technologies enable precise spatial analysis, risk mapping, and scenario modeling, which are essential for informed decision-making and timely response. A solid understanding of GIS and digital platforms is therefore crucial for professionals involved in risk assessment, emergency planning, and environmental governance.

Although graduates possess strong GIS skills, their expertise tends to focus more on operating the software than on interpreting the results. Greater emphasis should be placed on the analysis and interpretation of GIS data, which could be achieved by integrating GIS instruction into the majority of courses within the study programs. The ability to run the software alone is not sufficient; graduates must also be able to work effectively with the outputs.

Table 29. From a content perspective, the following key topics were identified:

Basic Principles of Landscape Ecological Planning • Cross-cutting topics in spatial planning, landscape planning, and planning for forestry and agriculture • Vulnerability mapping and identification of sensitive areas • Zoning and land-use regulation, protection of landscape values
Strategic Planning and Expert Coordination • Strategic measures within national and regional frameworks for disaster-risk reduction • Spatial-planning measures in land-use plans • From planning to implementation (typology of measures, suitability of location of measures, financing, stakeholder coordination, administrative proceedings and permitting)
Resilient Landscape • Green infrastructure and nature-based solutions • Designing and implementing site-specific measures to increase resilience and reduce risk • Monitoring and adaptive management of implemented measures
Public Involvement and Communication • Public participation in disaster prevention and mitigation • Education and open science on disaster prevention and impact reduction • Financing for green planning

3.3.5. Stakeholder collaboration

Participants of the focus group unanimously agreed on the necessity of fostering stronger connections between academic institutions and professional practice in the field of natural hazard management and spatial planning. As an initial step, they proposed increasing the proportion of lectures delivered by external practitioners with relevant field experience. This approach is expected to enhance the practical relevance of academic curricula and better prepare students for real-world challenges.

However, participants also emphasized that further progress will require a comprehensive analysis of existing barriers and a commitment to systemic change. These subsequent steps should be guided by evidence-based insights and strategic planning.

3.3.6. Czechia Focus Group Evaluation

- Education and practice are disconnected – study programs lack interdisciplinarity and practical relevance; internships are undervalued.
- Landscape measures are fragmented and cost-driven, with innovation blocked by rigid procedures.
- Conflicts persist between public administration and private sector, and between farmers and planners; universities could mediate.
- Regional focus remains reactive, centered on flood protection; broader risk causes are overlooked.
- Strong data infrastructure exists, but poor sharing and competition for funding hinder collaboration.
- Municipalities are key actors, yet many lack technical and planning expertise.
- Education alone can't solve systemic issues, but is vital for lifelong learning and stakeholder training.
- Key skills needed: cross-disciplinary knowledge, critical thinking, teamwork, communication, and ability to interpret spatial data.
- Digital literacy is essential – especially in GIS; focus must shift from software operation to data interpretation.
- Preferred learning formats: expert-led lectures linked to practice, supported by digital tools and structured materials.
- Core content areas: ecological planning, strategic coordination, resilient landscape design, and public engagement.
- Collaboration gaps: stronger links between academia and practice are needed; more involvement of field experts in education.
- Next steps: systemic change based on barrier analysis and strategic planning is required to bridge education–practice divide.

3.4. Summary of the Latvia Focus Group Discussion

The focus group held on 02.09.2025 with ten participants examined natural hazard management through spatial planning approaches. The discussion emphasized several recurring themes: the necessity of structured collaboration among municipalities, academia, professionals, NGOs, businesses, and local communities; the insufficient integration of risk-sensitive spatial planning into education; and the prevalence of reactive rather than preventive practices in municipalities.

Participants highlighted significant gaps in education, noting that curricula often neglect long-term risk assessment and fail to adequately combine theoretical knowledge with practical training. Simulations, scenario modeling, and case-based learning were strongly recommended to better prepare students and young specialists for proactive risk management. At the same time, continuous professional development for current practitioners was considered essential, as many municipal professionals still approach hazard management through post-disaster response rather than prevention.

Key challenges in practice include uneven preparedness of young specialists, limited inter-institutional cooperation, restrictive or outdated policy frameworks, and insufficient funding for

preventive measures. Public awareness was also recognized as a limiting factor for supporting long-term resilience strategies.

In terms of training content, stakeholders advocated for modular and specialization-based programs that address both core and applied themes. Proposed topics include urban resilience (heat island mitigation, green infrastructure, water integration), biodiversity and forestry management, and cross-cutting issues such as sustainability, circular economy, and the European Green Deal. Digital competencies (GIS, modeling, AI) and communication skills were emphasized as indispensable across all modules. Training should be delivered in multiple formats—webinars, discussions, case studies, and professional exchanges—and designed to be accessible to both experts and non-specialists.

Sustaining relevance was identified as a critical priority. Regular updates, including quarterly webinars and a systematic three-year review cycle, were proposed to ensure training modules remain aligned with evolving risks. Lifelong learning and the involvement of municipalities in content review were stressed as vital for maintaining applicability. Dissemination to broader society through multiple channels was seen as equally important for strengthening community resilience.

In conclusion, the focus group underscored that natural hazard management through spatial planning requires a systemic transition from reactive to preventive strategies. This entails stronger collaboration, enhanced and practice-oriented education, continuous training for professionals, specialized and interdisciplinary modules, and mechanisms for regular updates. By adopting these measures, Latvia can build a proactive, knowledge-based, and inclusive system of resilience that equips both professionals and communities to face current and future natural hazards.

3.4.1. Possible Forms of Collaboration among Stakeholders

The discussion revealed that cooperation among various stakeholders—municipalities, universities, professionals, businesses, NGOs, and residents—is crucial for effective natural hazard management. Experts agreed that collaboration works best when it is based on a clearly defined theme or problem and when the outcome is tied to concrete, real-life solutions. For example, joint projects could bring together academic knowledge and practical experience, allowing universities to provide theoretical foundations while practitioners contribute applied insights. Forestry companies, which regularly encounter issues such as tree management in high-risk areas, were mentioned as valuable partners who can identify both best practices and mistakes to avoid.

Information exchange was highlighted as another key element of collaboration. The proper use and sharing of data enables specialists, including students, to interpret risks correctly and anticipate future threats. Modeling and forecasting tools play a critical role here, as they provide the basis for scenario planning and early warning systems. Municipalities were seen as central actors in risk management, as each should develop specific plans for natural hazard prevention and response. However, participants noted that not all municipalities have done so. It was suggested that the Ministry of Environmental Protection and Regional Development (VARAM) might serve as the coordinating authority for collecting and comparing these plans.

Long-term planning was described as an obligatory requirement, particularly in light of climate change. Flood risks remain pressing for many municipalities, while coastal erosion and changes in tourism patterns—driven by a warming climate—are emerging as new challenges. Experts emphasized the importance of visiting municipalities that have successfully implemented prevention strategies, as direct learning from best practice examples can be highly effective. In sum, collaboration was described as multi-layered: it should combine project-based cooperation, institutional coordination, data exchange, and opportunities for experiential learning.

Summary:

- **Practical collaboration:** joint projects with real problem-solving outcomes, knowledge sharing through site visits to municipalities with successful practices, and including practitioners (e.g., forestry companies) as advisors.
- **Information exchange:** correct use of data, making data accessible to students, and developing modeling and forecasting tools for identifying threats.
- **Institutional role:** municipalities must develop natural hazard management plans, with oversight likely coordinated by the Ministry of Environmental Protection and Regional Development (VARAM).
- **Long-term planning:** essential for addressing risks such as flooding, coastal erosion, and tourism-related climate impacts.
- Collaboration works best when there is a **specific topic and clear objectives**.

Recommendations:

- Require municipalities to prepare hazard management plans, coordinated by VARAM.
- Encourage joint projects linking academic and professional expertise.
- Develop platforms for transparent data exchange and modeling tools.
- Facilitate peer learning through site visits to municipalities with best practices.

3.4.2. Current Challenges in Education

In education, several gaps were identified in how natural hazard management and spatial planning are currently taught. One key issue is that spatial planning programs often allow for development in areas that are clearly at risk, such as floodplains, without giving sufficient attention to long-term risk assessment. Experts suggested that curricula should include stronger components on risk-sensitive planning, with clear instruction on why certain territories should not be built upon.

Another challenge lies in the imbalance between theoretical and practical knowledge. Discussions in academia often focus on the consequences of natural hazards rather than their root causes. Students need more exposure to simulations, scenario modeling, and real-world case studies, which would prepare them to analyze and anticipate risks rather than react to events. Experts emphasized that training modules should address both risks that are already present and those that may emerge in the future. This is not only relevant for students but also for

wider society, which must learn to prepare for evolving threats such as climate change, biodiversity loss, and resource scarcity.

The issue of uneven preparedness among young specialists was also raised. Graduates often enter the labor market with varying knowledge levels, leaving municipalities with professionals who may lack the necessary skills for prevention-oriented risk management. Strengthening the foundations of sustainability, circular economy principles, and proactive risk assessment within higher education could reduce this gap. At the same time, education should not be limited to students—knowledge transfer to the general public was seen as equally important, ensuring that communities understand the threats they face and how to respond.

Summary:

- **Integration into study programs:** insufficient focus on teaching spatial planning in flood-prone or high-risk areas; a need to embed risk management principles more strongly in curricula.
- **Balance between theory and practice:** education should move beyond discussing consequences to examining root causes, with more simulations, scenario modeling, and real-life case studies.
- **Raising awareness:** students and the wider society must better understand current and future risks, including global challenges.
- **Uneven knowledge levels:** young specialists enter the field with varying degrees of preparedness, requiring a stronger foundation in sustainability, circular economy, and long-term risk assessment.

Recommendations:

- Universities should embed risk-sensitive spatial planning into all relevant study programs.
- Policymakers should support active learning methods (simulations, case studies, scenario planning).
- International exchange opportunities should be expanded to expose students and staff to global best practices.
- Launch public awareness campaigns to prepare communities for natural hazards.

3.4.3. Current Challenges in Practice

In practice, the implementation of spatial planning approaches for hazard management faces its own set of obstacles. Experts underlined the need for continuous education for current professionals, not just students. Many practitioners in municipalities primarily focus on responding to the consequences of natural hazards—such as floods or storms—rather than identifying causes or preparing preventive solutions. This reactive approach creates long-term inefficiencies and increases vulnerability.

Young specialists entering municipalities often face the same issue: their role becomes centered on damage control, rather than developing proactive strategies. To counter this, they must be trained to use modeling and scenario planning to understand what might happen in the future and how risks can be minimized.

Policy and legislative frameworks also play a significant role. While regulations exist, they do not always promote preventive solutions, and sometimes they can even restrict innovative approaches. Inter-institutional collaboration is another ongoing challenge, as municipalities, ministries, and other organizations may not always share information or align priorities effectively. Funding availability adds another layer of complexity, as preventive measures often require upfront investment that may not be readily available in municipal budgets. Finally, public understanding and awareness remain limited, which can hinder support for preventive strategies and long-term investments in resilience.

Summary:

- **Knowledge gaps:** existing professionals also need continuous training to address both causes and consequences of natural hazards.
- **Application of knowledge:** young specialists entering municipalities should be prepared not only for managing consequences but also for proactive prevention through modeling and scenario planning.
- **Policy and institutional aspects:** challenges remain regarding inter-institutional collaboration, funding, and alignment of legal frameworks with preventive solutions.

Recommendations:

- Municipalities should invest in continuous professional development programs.
- National policymakers should review laws to remove barriers and incentivize preventive planning.
- Dedicated funding streams should support municipal-level prevention projects.
- Establish cross-sectoral working groups to enhance inter-institutional cooperation.

3.4.4. Topics for Training Modules

The focus group devoted considerable attention to identifying specific themes that should be included in training modules for students and professionals. One key idea was the development of specialization opportunities, allowing learners to focus on particular areas of interest, such as flood management, drought resilience, urban greening, or forestry management. These specializations would complement a set of core knowledge areas that all participants should master, ensuring both depth and breadth of understanding.

Practical content was seen as particularly important. Urban resilience topics might include designing cooling strategies to counteract heat islands, integrating water into design solutions, and ensuring that urban spaces incorporate greenery and shading. Forestry and biodiversity were also emphasized, with attention to pests, tree diseases, and the balance between safety and

aesthetics in urban tree management. For example, tree committees in municipalities already include landscape architects to evaluate risks, and this expertise could be strengthened through targeted training.

Cross-cutting issues, such as sustainability, the European Green Deal, and circular economy principles, should also be part of the curriculum. Participants stressed that students need both digital skills—such as GIS, modeling, and artificial intelligence—and strong communication and social skills, enabling them to engage effectively with diverse stakeholders. Training modules could be structured at different levels, ranging from detailed design tasks to broader landscape and regional planning strategies, allowing students to progress and specialize based on their interests.

Summary:

- **Specialization opportunities:** tailored modules allowing students to select areas of interest (e.g., flood management, drought risks, urban greening, forestry management).

- **Practical themes:**

  - Urban resilience: cooling strategies, water use in design, shading, and green infrastructure.
  - Biodiversity and forestry: addressing pests, tree diseases, and balancing aesthetics with safety.
  - Tree risk management: assessing hazards in urban settings, supported by expert committees.

- **Cross-cutting themes:** sustainability, Green Deal principles, circular economy, and integration of digital tools (GIS, modeling, AI) alongside communication and social skills.
- **Multi-level training:** from design and landscape planning to large-scale regional strategies.

Recommendations:

- Develop modular programs that allow both specialization and general knowledge acquisition.
- Ensure training covers practical urban resilience strategies and forestry challenges.
- Integrate digital competencies with communication skills in all programs.
- Policymakers should create national guidelines for risk management in higher education curricula.

3.4.5. Updating Training Modules

The final part of the discussion focused on how training modules can be kept up to date and relevant in the long term. Experts suggested that regular updates are crucial, as natural hazards and societal challenges evolve rapidly. One practical solution proposed was to organize quarterly webinars covering the most pressing issues of the moment. These could take the form of short

sessions designed to reach a wider audience or longer, interactive webinars where participants can ask questions in real time.

Training modules were also envisioned as a form of lifelong learning, available not only to students but also to professionals seeking to update their skills. Municipalities could play an active role in maintaining content relevance by participating in regular reviews of training materials, perhaps every three years. This process would ensure that modules reflect both local experiences and broader international trends.

Institutional responsibility was seen as key to sustaining the modules over time. Universities, ministries, and professional associations could share responsibility for updating content, while municipalities would provide feedback based on practical needs. Finally, the importance of accessibility was emphasized: training content should not be confined to experts but should also be made available to the broader public through multiple communication channels. This would increase societal resilience by ensuring that citizens, too, are informed and prepared.

Summary:

- **Regular updates:** quarterly webinars on topical issues, including short formats for wider audiences and longer sessions with Q&A for professionals.
- **Lifelong learning:** training modules could function as continuing education for practitioners, ensuring knowledge remains current.
- **Institutional responsibility:** active municipalities could be identified and engaged in reviewing and updating content every three years.
- **Accessibility:** efforts should be made to share knowledge not only among experts but also with the general public through multiple communication channels.

Recommendations:

- Establish a three-year review cycle for training modules.
- Introduce quarterly webinars tailored to different audiences.
- Involve municipalities in reviewing and updating content.
- Secure funding for lifelong learning initiatives.
- Disseminate training materials widely to reach both professionals and the public.

3.4.6. Latvia Focus Group Evaluation

The focus group underscored that natural hazard management through spatial planning requires systemic change: stronger collaboration, improved education, proactive practice, specialized training, and ongoing updates. By implementing the proposed recommendations, municipalities, universities, ministries, and other stakeholders can collectively strengthen resilience. Preventive, knowledge-based, and inclusive approaches will ensure that both professionals and communities are equipped to face the natural hazards of today and tomorrow. Training modules should combine theory with practical applications, offer specialization opportunities, and be

regularly updated to reflect new challenges. Above all, knowledge must flow not only among experts but also to wider society, ensuring that resilience is built collectively.

3.5. Summary of the Slovakia Focus Group Discussion

The focus group study in Slovakia was conducted on 12 August 2025 in Nitra. A total of ten participants took part, including two academics, one researcher from the Slovak Academy of Sciences, two representatives from the municipality and the Slovak Environmental Agency, three professionals, and two PhD students. The participant profile brought together academic, institutional, and professional perspectives, creating a comprehensive and multidimensional discussion environment on ecological planning and disaster-resilient cities. This diversity enabled the exchange of different experiences and expertise, enriching the focus group discussions with both theoretical insights and practical viewpoints.

3.5.1. Possible Forms of Collaboration among Stakeholders

In the Slovakia focus group, particular attention was given to strengthening cooperation with practice. Participants emphasized the necessity of building stronger partnerships between universities and organizations engaged in disaster management, including municipalities, relevant agencies, environmental institutes, and private sector actors. In this regard, it was underlined that increasing the number of joint projects and internship opportunities, integrating real-world case studies into curricula, organizing regular lectures, seminars, and workshops by practitioners, as well as developing collaborative applied research initiatives addressing local challenges, are essential steps to be taken.

Moreover, it was highlighted that universities should actively support student participation in fieldwork and simulations, foster knowledge-sharing networks with professionals, and establish platforms for continuous dialogue between academia and practice. These discussions demonstrated the importance of keeping educational activities closely aligned with the evolving practical needs in the field of disaster management.

3.5.2. Current Challenges in Education

Professionals' Perspective

The current study programs and courses related to natural disaster management in Slovakia are considered insufficient. The removal of dedicated subjects from university curricula has contributed to declining awareness and interest among students, fostering the false perception that disaster management is no longer a relevant or urgent field. To address these gaps, educational programs need to reintroduce compulsory and specialized courses on disaster protection, integrate practical case studies and interdisciplinary skills, adopt modern technologies, and strengthen cooperation with field experts and emergency services. Excursions to specific sites where protective measures against natural disasters are applied—guided by designers or users—were highlighted as effective tools for experiential learning. Moreover, improving opportunities for students to gain practical experience within responsible organizations, under the mentorship of prominent experts, was strongly emphasized.

A further concern relates to insufficient state funding for water and nature protection initiatives, resulting in unstable financial conditions and frequent personnel changes in relevant organizations. This systemic instability diminishes the attractiveness of careers in disaster management, discouraging younger generations from pursuing professional roles in the field.

Students Perspective

From the student perspective, three main deficiencies were identified. First, there is a lack of specialized programs: only a few universities in Slovakia offer curricula directly focused on natural disaster protection, while most integrate these topics into broader programs. Consequently, graduates lack a comprehensive overview of risk management. Second, there is limited interconnectivity across disciplines. Effective natural risk management requires knowledge from hydrology, ecology, spatial planning, climatology, law, and social sciences; however, current educational structures tend to isolate these subjects rather than fostering integrated, interdisciplinary learning. Participants emphasized the need for study programs and short courses that explicitly connect these domains, alongside workshops and online modules accessible to both students and professionals.

Finally, education remains predominantly theoretical, with minimal opportunities for students to develop practical skills. There is a lack of field exercises, model scenarios, and project-based learning activities that would equip students with the ability to design and implement flood control, erosion control, and adaptation measures. Addressing this gap was considered essential to ensure graduates are adequately prepared for the increasing risks of natural disasters and for the broader challenges of sustainable spatial planning in Slovakia and beyond.

3.5.3. Current Challenges in Practice

One of the most significant challenges in Slovakia relates to land consolidation and ownership structures. Land ownership is highly fragmented; a single plot is shared on average by almost twelve different owners, with each holding an average share of only 22.61%. This extreme fragmentation makes it very difficult to propose or implement any interventions in the landscape, as achieving agreement among landowners is a lengthy and complex process.

Participants emphasized that national governments and relevant ministries should play a stronger leadership role in strengthening environmental security. This requires close coordination with regional and local authorities, academic institutions, and the European Union, while actively engaging the private sector, NGOs, and local communities to ensure effective policy implementation and adaptation. Despite this need, several critical gaps persist:

- In planning, risk assessments and sustainable strategies are not always fully integrated or consistently updated, with long-term perspectives often missing.
- Approval processes are slowed by rigid regulatory frameworks and lengthy, complex administrative procedures.
- Implementation is hindered by inadequate funding, insufficient stakeholder coordination, and limited access to advanced technologies.

- The overall impact is reduced due to weak monitoring systems, ineffective feedback loops, and the failure to adjust policies and practices based on lessons learned or emerging risks.

From the student perspective, the main challenges include complicated legislative and administrative processes, insufficient funding and human resources, fragmented ownership structures combined with legislative inconsistencies, and farmers' fears of economic losses. In addition, a lack of reliable data and evidence, conflicting plans and inconsistencies across ministries, and weak coordination between stakeholders were highlighted as significant barriers to effective disaster management and sustainable land planning in Slovakia.

3.5.4. Topics for Training Modules

From a broader perspective, it is crucial to analyze localities in relation to their ecological and spatial context. This includes assessing their connection or disconnection to ecological networks, the presence and quality of green infrastructure, patterns of functional land use, and both current and future development visions. Such analyses should also cover existing landscape and urban plans, the values of the territory, historical structures, landscape connectivity, and the visual qualities of the environment.

To address disaster resilience and sustainable planning, a range of essential skills and knowledge is required. These include hydrology and water management, risk assessment, environmental monitoring, analytical modelling (such as GIS and hydroinformatics), project management, interdisciplinary collaboration, and effective stakeholder communication. These competencies enable professionals to identify hazards, develop sustainable solutions, coordinate multidisciplinary teams, and respond effectively to natural disaster risks and wider environmental challenges.

Equally important are subjects directly related to landscape planning, ecology, green infrastructure networks, open landscape design, and landscape–ecological planning. Simulated risk scenarios were highlighted as a particularly valuable tool for both education and practice. Areas identified as having potential or significant flood risk should be prioritized for detailed risk assessment, targeted prevention measures, and continuous monitoring with advanced hydrological and geospatial technologies. These regions require strategic investment in flood protection infrastructure, integrated landscape planning, and active community engagement to minimize damage and strengthen resilience to future flood events.

From the students' standpoint, further research is urgently needed on the effectiveness of various landscape features in retaining water, reducing erosion, and promoting biodiversity. There is also a need to optimize the spatial distribution of such features using GIS, to quantify ecosystem services and assess their economic value, and to better understand the social and cultural factors that influence the adoption of protective measures. In addition, students emphasized the importance of examining how mountain and rural areas can adapt to extreme climate fluctuations, highlighting both ecological and socio-economic dimensions of resilience.

3.5.5. Updating Training Modules

The focus group highlighted the importance of strengthening cooperation with professionals through the continuous actualisation and dissemination of good practice examples. This includes sharing links to exemplary projects, research studies, and innovative applications in the field, as well as maintaining updated contact lists of professionals, experts, and educators. In addition, the creation of interactive platforms—such as active chat forums or digital communities of practice—was considered essential to facilitate knowledge exchange, foster collaboration, and ensure that students and practitioners have direct access to expertise and current developments in disaster management and ecological planning.

3.5.6. Slovakia Focus Group Evaluation

The findings from the Slovakia focus group collectively highlight a set of interrelated opportunities and challenges for strengthening disaster management education and practice. A recurring theme across all subsections is the need for closer integration between academic institutions and real-world practice. The emphasis on joint projects, internships, applied research, and practitioner-led teaching indicates that current educational provision remains too detached from practical realities. Universities are expected not only to educate but also to function as active partners in shaping resilient landscapes and communities.

At the same time, both professionals and students identified systemic shortcomings in educational structures. On the professional side, the decline of specialized courses and limited financial support undermines the long-term sustainability of the field and discourages new entrants. From the student perspective, the absence of interdisciplinary programs and the dominance of theoretical content restrict opportunities for hands-on competence building. These observations underscore the urgency of curriculum reform that reintroduces core disaster management subjects, fosters cross-disciplinary collaboration, and embeds fieldwork and simulation exercises as standard learning components.

In terms of practice, the evaluation reveals structural barriers that go beyond the educational sphere. Land fragmentation, insufficient funding, and administrative rigidity significantly constrain the implementation of disaster risk reduction strategies. The limited integration of risk assessments into planning processes, combined with weak monitoring systems, points to a persistent gap between policy frameworks and effective operationalization. These systemic deficiencies, if not addressed, risk negating the educational improvements envisaged by universities and professionals alike.

The topics proposed for training modules—spanning hydrology, GIS, environmental monitoring, green infrastructure, and scenario-based learning—reflect a coherent and future-oriented agenda. Importantly, both professionals and students highlighted the dual necessity of technical expertise and socio-ecological sensitivity. The focus on ecosystem services, water retention, biodiversity, and rural adaptation indicates that resilience must be understood not only in engineering or spatial terms but also through ecological and cultural dimensions.

Finally, the call for continuous updating of training modules through living knowledge-sharing platforms is particularly significant. The creation of interactive professional–academic networks, supported by good practice repositories and digital communities of practice, has the potential to

overcome fragmentation and ensure responsiveness to emerging risks. This approach reflects a recognition that disaster resilience is a dynamic field, requiring ongoing adaptation, reflexivity, and cross-sectoral engagement.

3.5. Synthesis of Focus Group Findings from Türkiye, Czechia, Latvia and Slovakia Design Recommendations for EPD-Net Training Modules

The focus group findings across Türkiye, Czechia, Latvia and Slovakia reveal common challenges and country-specific nuances in ecological planning and disaster risk management education. A universal gap between theory and practice was identified, with curricula often limited to electives or technical/engineering domains, highlighting the urgent need for applied, scenario-based, and field-oriented learning. Sustainable risk reduction requires interdisciplinary governance, yet authority conflicts, centralized structures, and weak data sharing remain critical barriers. Digital competencies—including GIS, remote sensing, AI, and AR/VR—are increasingly demanded, but the emphasis should be on interpreting outputs for decision-making rather than software operation, particularly in Czechia. A preventive approach remains weak across all three countries, where post-disaster responses dominate; thus, proactive, scenario-based, and nature-based strategies must be prioritized. Participants stressed the integration of policy, legislation, financing, and insurance frameworks into education, alongside the necessity of addressing cultural and natural heritage within the climate adaptation agenda. Lifelong learning and continuous updating mechanisms were also emphasized, with suggestions ranging from advisory boards in Türkiye, to practice-driven teaching in Czechia, and systematic reviews and webinars in Latvia. Country-specific nuances underline Türkiye's limited architectural integration and transparency challenges, Czechia's flood-focused and rigid system that undervalues internships, and Latvia's strong call for modular specialization, VARAM-coordinated municipal planning, and enhanced public awareness.

Table 30. Thematic Synthesis of Focus Group Findings (Türkiye – Czechia – Latvia - Slovakia)

Theme	Türkiye	Czechia	Latvia	Slovakia
1. Theory–Practice Gap	In architecture, content is limited; mostly electives or individual initiatives. Applied training, studios, fieldwork, and simulations are critical.	Internships undervalued; programs siloed (technical vs. environmental), weak link to practice.	Curricula lack risk-sensitive planning; strong need for simulations, case-based and scenario-based learning.	Disaster programs insufficient; courses removed, awareness declined. Education mainly theoretical, with few field or project-based activities. Strong need for practical case studies, excursions, and simulations.
2. Interdisciplinary Governance	Centralized structures (e.g., AFAD) limit participation; weak data sharing.	Conflicts between public–private–farmers–planners; universities could act as mediators.	Municipalities are central; coordination by VARAM, institutional data exchange, and collaboration stressed.	Land ownership fragmentation blocks interventions. Stronger leadership and coordination among ministries, municipalities,

Theme	Türkiye	Czechia	Latvia	Slovakia
				NGOs, and EU needed.
3. Digital Competencies	Integration of BIM, GIS, AI, AR/VR into education emphasized.	Strong GIS software operation, but weak in interpreting outputs for decision-making.	GIS, modeling, AI, and communication skills demanded together.	GIS, hydroinformatics, and modelling identified as key. Students highlight research on water retention, erosion control, and biodiversity with GIS tools.
4. Preventive vs. Reactive Practice	Focus mostly on post-disaster processes; preventive planning and nature-based solutions lacking.	Flood-oriented, reactive approaches dominate; rigid procedures block innovation.	Municipalities and young experts mostly reactive; continuous professional development and preventive strategies needed.	Education and practice remain reactive. Preventive strategies (flood/erosion control, biodiversity) and scenario modelling should be prioritized.
5. Policy–Legislation & Financing	Law, planning, financing, and insurance models weak in curricula; should be integrated.	Cost-driven implementations; regulatory and funding mechanisms do not encourage innovation.	Policy frameworks restrictive; dedicated funding for preventive projects recommended.	Rigid regulations, limited funding, and unstable institutions slow implementation. Farmers' economic concerns also hinder measures.
6. Cultural/Natural Heritage & Climate	Pre-disaster inventory, protection of cultural heritage, and climate impacts highlighted.	Landscape perspectives enter urban planning only when legally required.	Biodiversity, forestry management, and urban tree risk management prioritized.	Focus on ecological networks, green infrastructure, and climate adaptation in rural/mountain areas.
7. Lifelong Learning & Updating	Advisory boards, feedback loops, and continuous updates emphasized.	Lifelong learning modules; practice-based teaching needed.	Three-year review cycle and quarterly webinars proposed; municipalities to be involved in updates.	Updating through professional cooperation, sharing good practice, and creating interactive platforms for knowledge exchange.
Country-Specific Nuances	Architecture-oriented; applied training and certificate programs important. Institutional structures (post-AFAD) not	Strong research/data infrastructure but weak sharing; internships undervalued; cost and rigid procedures limit innovation.	Strong modular/specialization approach; coordination by VARAM and public awareness emphasized.	Land ownership fragmentation a major barrier. Programs too theoretical, funding unstable, careers unattractive for youth. High demand

Theme	Türkiye	Czechia	Latvia	Slovakia
	fully reflected in practice; data transparency issues.			for fieldwork and GIS-based training.

The design and implementation of the EPD-Net training modules indicate the necessity of a comprehensive structure that encompasses both core and specialization areas. The core content should include disaster risk foundations, multi-hazard approaches, GIS and remote sensing, climate adaptation, policy and legislation, stakeholder management, ethics, and data transparency for all participants. In addition, specialization tracks should be developed on themes such as flood and water risk management, drought and heat island resilience, forestry–biodiversity and urban tree risk management, the protection of cultural and natural heritage in disaster contexts, post-disaster spatial design, and financing and insurance mechanisms. Pedagogically, the program should be built upon a "preventive–applied" backbone, supported not only by studios, case studies, and simulations, but also by field visits that enable the analysis of regulations and decision-making processes, best-practice laboratories based on peer-to-peer municipal learning, and digital practices focusing on the interpretation of modeling and AI outputs for decision support.

To ensure sustainability, an advisory board comprising representatives from the public sector, private sector, academia, civil society, and disaster survivors should be established; periodic revisions (e.g., annually) and cyclical updates through webinars (e.g., quarterly) are recommended. Continuous feedback mechanisms should be maintained through alumni tracking, online communities, and short pulse surveys. The program should also guarantee knowledge and data management through open-access portals and stakeholder data-sharing protocols.

In terms of evaluation, a mixed approach should be adopted, combining project submissions, field applications, and short examinations, while monitoring key performance indicators such as the quality of preventive scenarios, the level of stakeholder collaboration, the use of data-informed decision-making, integration with legislation and policies, and the transformation of outputs into local implementations. Finally, accessibility and inclusivity should be ensured through multilingual content, accessible design principles based on universal design, online and hybrid options, and certificate programs that bridge formal curricula.

Table 31. Design and Implementation Recommendations for EPD-Net Training Modules

Component	Recommendations
A) Program Structure	**Core (all participants):** Fundamentals of disaster risk, multi-hazard approach, GIS & remote sensing, climate adaptation, policy–legislation, stakeholder management, ethics, and data transparency. **Specializations (elective tracks):** Flood and water risk management; drought/heat island–urban resilience; forestry–biodiversity and urban tree risk management;

Component	Recommendations
	protection of cultural/natural heritage in disaster contexts; post-disaster spatial design; financing & insurance. Land consolidation and ownership structures in disaster planning (Slovakia-specific barrier).
B) Pedagogy (Preventive–Applied Backbone)	• Studio + case study + simulation trio (multi-actor scenarios) •Field/technical visits (on-site analysis of regulations and decision-making processes) • Best practice laboratory (peer-to-peer municipal learning, flipped classroom) • Digital practice (interpretation of modeling/AI outputs for decision support). • Project-based learning for flood/erosion control.
C) Updating & Quality Assurance	• **Advisory Board:** Representatives from public–private–academia–NGOs–survivors • **Cyclical updates:** 3-year comprehensive revision + quarterly webinars; modular design allows updating only relevant units • **Continuous feedback:** Alumni/participant tracking, online community, pulse surveys • Active chat platforms
D) Data & Platform	• Open-access knowledge portal (case repository, templates, data dictionaries) • Stakeholder data-sharing protocol (between municipalities, universities, ministries) • Integration of ecological/landscape connectivity and ecosystem service valuation datasets.
E) Evaluation & Assessment	• Mixed assessment (project submission + field application + short exam)• **KPIs:** (i) Preventive scenario quality, (ii) Stakeholder collaboration level, (iii) Data-informed decision-making, (iv) Policy/regulation integration, (v) Number of projects implemented locally
F) Accessibility & Inclusivity	• Multilingual content • Accessible design (universal design principles) • Online/hybrid options • Certificate programs as bridges to formal curricula • Short modular courses linking hydrology, ecology, climatology, and law for broader access.

At the municipal level, it is recommended to introduce mandatory natural hazard management plans, complemented by peer-to-peer learning through inter-municipal visits and the systematic sharing of best practices. Ministries and councils should focus on designing legislation and funding mechanisms that actively encourage preventive planning, while also establishing national standards for data sharing to ensure transparency and consistency. Universities are advised to increase the involvement of external experts in teaching, institutionalize internship programs, and develop bridging offices that facilitate the transfer of academic knowledge into practice. Civil society organizations and professional chambers should be empowered to strengthen public awareness and participation mechanisms. At the international level, technical support and funding provided by the EU, UN, and UNESCO should be reoriented from reactive interventions toward proactive and preventive approaches.

The findings clearly demonstrate that EPD-Net should establish not a uniform program, but rather a modular, interdisciplinary, and continuously updated learning ecosystem. By combining the openness of students toward technological innovation with the critical insights of professionals grounded in field practice, the program must place preventive risk management, nature-based solutions, and data-driven decision support at its core. Such a design would not only serve as a platform for knowledge transfer but also stimulate institutional collaboration, generate locally applicable outputs, and ultimately contribute to cultivating a qualified pool of experts capable of advancing disaster-resilient and sustainable cities.

4. STATISTICAL EVALUATION OF THE NEEDS ANALYSIS SURVEY

The fundamental approach of this section is built upon the question-based evaluations presented in the Needs Analysis Report previously delivered under WP1.5. Surveys administered to professionals and students were examined in detail within that report, where each question was analyzed individually and frequency distributions were illustrated with graphs. In this report, however, the focus extends beyond those evaluations by examining the relationships between survey questions and highlighting statistically significant findings, thereby establishing meaningful connections among the results. This approach aims to go beyond isolated findings and reveal patterns, enhancing the depth of interpretation.

The statistical analyses were conducted using the IBM SPSS Statistics 24 software package. Cross-tabulations and Chi-square tests were applied, and only relationships that were statistically significant at the 95% confidence level ($p < 0.05$) were considered for evaluation. In this way, the reliability of the interpretations was increased, while avoiding the inclusion of results lacking statistical significance.

The Chi-square test is a non-parametric statistical analysis used to determine whether there is a relationship between two categorical variables. The probability value (p-value) obtained from the test statistic is compared to the pre-determined alpha error level (in this study, $\alpha = 0.05$). If the p-value is smaller than the alpha value, the null hypothesis—which assumes no statistical relationship between the variables—is rejected. Consequently, it can be concluded that a statistically significant and meaningful relationship exists between the variables.

In multiple-response questions, the total number of responses exceeds the number of participants. As a result, the overall percentages may surpass 100%. In the frequency distributions of such questions:

- The “N” column indicates the number of respondents who selected each option,
- The “Percent” column represents the proportion within the total number of responses,
- The “Percent of Cases” column shows the proportion calculated based on the number of participants.

To prevent potential misinterpretations in the analysis, the first responses were prioritized. Accordingly, the evaluations were based on participants' primary choices, while multiple-response frequency distributions were not presented in detail in this section. However, if necessary, these distributions can be further reviewed in the tables included in the Needs Analysis Report (WP 1.5).

4.1 Scope and Approach of the Analysis

The analyses were conducted on the data obtained from **316 professional respondents** across all partner countries of the EPD-Net Project. Within the scope of the project, separate surveys were administered for both students and professionals. Although both surveys were designed with the same overarching objective, they differ in scope. Professional respondents were asked **40 questions**, focusing on their professional experiences and sectoral perspectives. Students, on the other hand, were asked **26 questions**, which primarily aimed to capture their general opinions, the challenges they encounter in education, and the type of training content they expect. This differentiated approach enabled a comprehensive analysis that integrates the expectations of younger individuals with the expertise and accumulated experiences of professionals in the field.

Table 32. Number of participants in the professional survey by country

	Frequency	Percent
Türkiye	221	70%
Czechia	38	12%
Spain	25	7.9%
Latvia	25	7.9%
Portugal	7	2.2%
TOTAL	316	100%

Different participant groups (gender, age, educational background, professional field, and professional role) were analyzed to determine whether their views diverged significantly. In this context, opinions regarding the training modules to be developed within the EPD-Net project (Section 3), digital learning methods and preferences (Section 4), as well as motivations and expectations (Section 5), were comparatively evaluated across participant profiles. The primary rationale behind adopting such an approach is to ensure that the training content and methods are not only shaped by general trends but also tailored to the needs and expectations of diverse demographic and professional groups. In this way, the modules are intended to be more inclusive, targeted, and effective.

In addition to demographic and professional characteristics, the views of individuals who reported having barriers to education or participation in society versus those who stated that they had no such obstacles (Question 3) were also compared. Accordingly, the possible differences and correlations between these two groups regarding their perspectives on the training modules (Section 3), digital learning methods and preferences (Section 4), as well as their motivations and expectations (Section 5), were analyzed. This approach highlights not only demographic and

professional differences but also how accessibility limitations may shape educational experiences and expectations.

Furthermore, participants' self-assessment of their current knowledge level in the fields of disaster resilience and ecological planning was included in the analysis. Possible differences and correlations between subjective knowledge levels and participants' perspectives on training modules (Section 3), digital learning methods and preferences (Section 4), and motivations and expectations (Section 5) were examined. This analysis aims to reveal how participants' knowledge base influences their perceptions and expectations regarding educational content.

Additionally, responses to a question concerning participants' prior engagement in training, courses, or events related to disaster resilience and ecological planning were evaluated. The relationship between these prior experiences and their perspectives on the training modules (Section 3), digital learning methods and preferences (Section 4), and motivations and expectations (Section 5) was analyzed. **Methodologically, all questions in Section 1 were analyzed in relation to those in Sections 3, 4, and 5, with only statistically significant relationships reported herein (Annex 3).** This provides insights into how previous exposure to related content may shape participants' expectations and attitudes toward the forthcoming training modules.

In conclusion, these analyses revealed how accessibility barriers, knowledge levels, and prior educational experiences are reflected in participants' learning expectations and preferred methods. The findings underscore the importance of designing modules that address not only general trends but also the specific needs of diverse participant profiles. The results further suggest that existing knowledge levels and prior training experiences significantly shape expectations for new learning processes. Therefore, comparisons between participants with and without prior training experience were made, providing implications for the appropriate structuring of the modules. Similarly, analyzing the views of individuals with accessibility barriers versus those without offered important insights into how inclusivity and accessibility should be incorporated into the design of the modules. Collectively, these analyses provide a **strategic roadmap** for the design of the EPD-Net training modules. By identifying the differentiated needs and expectations of participants, the project aims to achieve a balanced design in terms of implementation, method selection, and motivational components.

4.2 Analysis of Professional Survey Data by Demographic and Academic Variables

4.2.1 Factors Limiting Access to Education and Social Participation: Frequency Distributions and Chi-Square Analyses

This section presents the distribution of participants' responses regarding circumstances that may hinder access to education or limit social participation. As this was a multiple-response question, the total number of responses (395) exceeded the number of participants (316), leading the "Percent of Cases" column to reach 125%. This outcome reflects the fact that participants reported more than one barrier or limitation.

Table 33. Reported Barriers and Limitations (Question 3)

Reported Barriers and Limitations (Question 3)	N	Percent	Percent of Cases
I have experienced discrimination	22	5.6%	7.0%
I face language barriers	16	4.1%	5.1%
I face economic difficulties	38	9.6%	12.0%
I am a person with a disability	6	1.5%	1.9%
I am a young person (15–29)	28	7.1%	8.9%
I am an older person	11	2.8%	3.5%
I feel excluded from the education system	4	1.0%	1.3%
I live in a rural / hard-to-reach area	9	2.3%	2.8%
I have a chronic illness	24	6.1%	7.6%
I face cultural barriers	17	4.3%	5.4%
I am in need of psychosocial support	10	2.5%	3.2%
I have refugee/migrant status	2	0.5%	0.6%
I have been excluded due to my sexual orientation/identity	1	0.3%	0.3%
I have limited technological resources	4	1.0%	1.3%
None of the above	203	51.4%	64.2%
Total	**395**	**100.0%**	**125.0%**

According to the data, the largest proportion of participants (51.4%; n=203) selected the option *"None of the above,"* indicating that they did not experience any barrier to education or social participation. Nevertheless, a significant share of respondents reported various obstacles. The most frequently stated limitation was economic hardship (9.6%; n=38), followed by young age (7.1%; n=28) and chronic illness (6.1%; n=24). Other commonly mentioned factors included experiences of discrimination (5.6%; n=22), cultural barriers (4.3%; n=17), and language barriers (4.1%; n=16). Less frequently reported challenges involved disability (1.5%; n=6), older age (2.8%; n=11), living in rural areas (2.3%; n=9), and the need for psychosocial support (2.5%; n=10). Only a very small number of participants indicated challenges related to refugee/migrant status (0.5%; n=2) or exclusion based on sexual orientation/identity (0.3%; n=1).

This distribution demonstrates that while the majority of participants did not report any barriers, a notable subset faces diverse forms of limitations. Among these, economic difficulties, health conditions, and age factors emerged as the most prominent challenges, highlighting the necessity of designing the training modules with principles of economic accessibility, flexibility, and inclusiveness. Moreover, although reported at lower frequencies, sensitive issues such as migration status, sexual orientation, and cultural differences should also be taken into account to ensure that the educational platform embodies a socially inclusive and equity-oriented approach.

Given the large number of response options and the relatively low frequencies observed in certain categories, the analysis consolidated the responses into two groups: (1) participants reporting at least one barrier, and (2) participants reporting no barriers. Following this categorization, frequency distributions revealed that out of 316 respondents, 117 (37%) indicated having at least one type of barrier, while 199 (63%) reported no barriers.

Table 34. Distribution of Respondents by Reported Limitations (Merged Categories, Based on First Responses)

	Frequency	Percent	Valid Percent	Cumulative Percent
Respondents Reporting Limitations	117	37.0	37.0	37.0
Respondents Reporting No Limitations	199	63.0	63.0	63.0
Total	316	100.0	100.0	100.0

Subsequently, this binary variable was cross-tabulated with participants' responses in **Section 3** (perceptions of the EPD-Net training modules), **Section 4** (digital education methods and preferences), and **Section 5** (motivations and expectations). Cross-tabulations were constructed to evaluate these relationships, and the presence of associations between categorical variables was statistically tested using the **Chi-Square analysis** (Questions 18–36). The results revealed that a statistically significant relationship was found **only for Question 33** – *"What do you consider to be the most important features of the user interface of the digital learning platform to be developed under the EPD-Net Project?"*

The participants' perceptions of the most important features of the user interface varied according to whether they reported having any barriers or limitations. Among the 117 respondents who reported a barrier or limitation, 60.7% (n = 71) identified *accessibility* as the most critical feature. By contrast, among the 199 respondents without any reported barrier, 46.7% (n = 93) considered *accessibility* a priority. Thus, while accessibility emerged as the top feature for both groups, it proved to be a substantially more decisive factor for those reporting barriers or limitations.

Looking at other features, preferences among the group without barriers were more evenly distributed: *multilingual support* (17.1%; n = 34), *mobile compatibility* (17.1%; n = 34), and *simple/intuitive use* (15.1%; n = 30) followed accessibility as strong priorities. In contrast, the proportions for these features were notably lower among those reporting barriers: *multilingual support* (18.8%; n = 22), *mobile compatibility* (9.4%; n = 11), and *simple/intuitive use* (6.8%; n = 8). *Visual content support* was the least preferred feature across both groups, selected by only 4.3% of respondents with barriers and 4.0% of those without.

Table 35. User Interface Features Considered Most Important for the Digital Learning Platform (by Reported Limitations) (Question 33) x (Question 3)

	Accessibility (Barrier-Free UI)	Multilingual Support	Mobile Compatibility	Simple and Intuitive Use	Content Supported with Visuals	Total
Respondents Reporting Limitations	71	22	11	8	5	117
Respondents Reporting No Limitations	93	34	34	30	8	199
Total	**164**	**56**	**45**	**38**	**13**	**316**

These results indicate that accessibility is a core priority for all participants, but it emerges as a *critical requirement* particularly for those who reported barriers or limitations. Respondents without such limitations, on the other hand, emphasized not only accessibility but also *multilingual support*, *mobile compatibility*, and *ease of use* as important features. This finding suggests that the design of the digital learning platform must ensure robust accessibility while also incorporating functional diversity.

The chi-square test confirmed a statistically significant relationship between participants' reported barriers/limitations (Question 3) and their user interface preferences (Question 33) (Pearson $\chi^2(4) = 10.110$, $p = 0.039$). Accordingly, it can be concluded that participants' reported limitations are significantly associated with their expectations regarding the digital learning platform's user interface.

When interpreted in the broader context of the survey, the findings highlight that *accessibility and user-friendly design* stand out as essential requirements particularly for participants who reported barriers or limitations. This group strongly demands a digital learning platform designed to remove obstacles and ensure equal participation. Conversely, for respondents without reported limitations, accessibility remains a priority but is accompanied by a more balanced emphasis on *multilingual support*, *mobile adaptability*, and *intuitive design*.

Therefore, the statistically significant results underscore that the design priorities of the platform must go beyond mere technical functionality. They must also be shaped by the principles of *inclusivity* and *equal access*. Within the survey context, this implies that overlooking the needs of different participant groups would risk limiting the platform's overall effectiveness. Conversely, prioritizing accessibility and multi-dimensional usability will enable the platform to meet the expectations of both groups, ultimately ensuring a more inclusive and sustainable structure.

4.2.2 Level of Education: Frequency Distributions and Chi-Square Analyses

The table below presents the responses to the question regarding participants' educational levels. The results of the cross-tabulation provide important insights into which digital tools are more frequently preferred across different education levels. Overall, **distance learning platforms** (e.g., *Moodle, Google Classroom*) are the most widely used tools across all groups (n = 164). This finding indicates that online learning platforms are broadly adopted regardless of educational attainment. **Video tools** (e.g., *Zoom, MS Teams*) rank second, with a relatively higher

usage rate among bachelor's level participants (n = 45). This suggests that synchronous communication and online courses are more intensively utilized at the undergraduate professional level.

Table 36. Distribution of Preferred Digital Tools by Educational Level (Question 30) x (Question 4)

	Online Learning Platforms (e.g., Moodle, Google Classroom)	**Video Tools (e.g., Zoom, MS Teams)**	**Mapping and Spatial Analysis Software (e.g., ArcGIS, QGIS, NetCAD, MapInfo)**	**Technical Drawing/Modeling Software (e.g., AutoCAD, SketchUp)**	**AI-Powered Tools (e.g., ChatGPT, Copilot)**	**Total**
PhD	76	35	3	2	3	119
Master's	55	34	6	6	0	101
Bachelor's	33	45	5	12	1	96
Total	164	114	14	20	4	316

Mapping and spatial analysis software (e.g., *ArcGIS, QGIS, NetCAD, MapInfo*) were used predominantly by postgraduate groups (PhD n = 3; Master's n = 6). This finding demonstrates that such software becomes more prominent at specialized and research-oriented levels of education. Technical drawing and modeling software (e.g., *AutoCAD, SketchUp*) were most frequently used at the bachelor's level (n = 12). This result highlights that technical design tools are more intensively employed by undergraduate professionals, particularly in applied fields such as architecture and engineering. AI-supported tools (e.g., *ChatGPT, Copilot*), on the other hand, remained at very low levels across all groups (n = 4). This outcome suggests that AI-based tools have not yet achieved widespread adoption but are likely to gain increasing significance in digital learning processes in the future.

Overall, the distribution reveals variations in digital tool preferences depending on education level: undergraduate participants show a stronger inclination toward technical applications, whereas postgraduate participants tend to focus on more specialized software. Nevertheless, distance learning platforms and video tools emerge as common ground across all education levels.

This question was initially prepared with four response categories, including the high school level. However, as expected, the number of responses in the high school category was very low. For the purpose of conducting statistically meaningful comparisons, these responses were merged with the bachelor's level category.

Subsequently, these variables were cross-tabulated with participants' responses in Section 3 (views on EPD-Net training modules), Section 4 (digital learning methods and preferences), and Section 5 (motivations and expectations), and the relationships between categorical variables

were tested using the Chi-Square analysis (Questions 18–36). The results of the pairwise comparisons revealed that only Question 30 showed a statistically significant relationship at the 95% confidence level. Using the Monte Carlo method, the Fisher's Exact Test statistic was obtained as 27.809 with p = 0.000.

4.2.3 Professional Field: Frequency Distributions and Chi-Square Analyses

The distribution of participants by professional field is presented in the table below. When examined in detail, the largest group is represented by the field of *Architecture, Planning, and Design* (49.1%; n = 155). This finding indicates that nearly half of the sample directly represents the disciplines most closely aligned with the focus of the EPD-Net Project, namely ecological planning, disaster resilience, and sustainable urban development.

Table 37. Professional Fields of Participants (Question 6)

Professional Field	**N**	**Percent**
Other	28	8.9%
Digital Technologies	37	11.7%
Natural Sciences	26	8.2%
Architecture, Planning and Design	155	49.1%
Engineering	48	15.2%
Social Sciences	22	7.0%
Total	**316**	**100%**

The second largest group comes from *Engineering* (15.2%; n = 48), followed by *Digital Technologies* (11.7%; n = 37). These groups represent participants who can contribute technical perspectives to ecological risk management and digital learning tools. Smaller but significant participant groups are found in *Natural Sciences* (8.2%; n = 26) and *Social Sciences* (7.0%; n = 22), thus making it possible to include environmental, social, and human-centered dimensions in the assessments. The *Other fields* category (8.9%; n = 28) further adds diversity to the sample. Overall, the distribution demonstrates the strong representation of architecture, planning, and design, while also reflecting a multidisciplinary participant composition. This diversity provides an important advantage in addressing multidimensional issues such as ecological planning and disaster resilience.

When the distribution of participants is examined by professional field, the majority of responses come from *Architecture, Planning, and Design*. Therefore, in order to ensure comparability in the statistical analyses, all other fields have been combined under the category "Other." Accordingly, a total of 155 participants (49.1%) come from *Architecture, Planning, and Design*, while the remaining 161 participants (50.9%) are from engineering, digital technologies, natural sciences,

social sciences, and other fields, grouped under “Other.” This classification allows the analyses to be carried out in a more balanced and meaningful manner.

Table 38. Distribution of Respondents by Professional Fields (Merged Categories)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
Architecture, Planning and Design Field	155	49.1	49.1	37.0
Other Field	161	50.9	50.9	50.9
Total	316	100.0	100.0	100.0

The Relationship Between Professional Fields and the Evaluation Methods of EPD-Net Training Modules

The evaluation of preferred assessment methods after the EPD-Net training modules reveals several noteworthy tendencies. Online examinations (118 responses) and project-based submissions (119 responses) emerge as the most widely supported approaches, highlighting a strong preference for conventional yet structured methods of evaluation. Participants from the Architecture, Planning and Design field indicated a nearly balanced distribution between online examinations (67) and project-based submissions (60), whereas group discussions (23) and AI-supported automatic assessments (5) remained comparatively limited in preference.

Table 39. Evaluation Method Selection in the Context of EPD-Net Training Modules (Question 25) x (Question 6)

Field of Study	Online exam	Project-based submission	Group discussion	Automatic assessment (AI-supported)	Other	Total
Architecture, Planning and Design	67	60	23	5	0	155
Other Fields	51	59	29	21	1	161
Total	118	119	52	26	1	316

By contrast, participants from other fields demonstrated a similar prioritization of project-based submissions (59) and online examinations (51), but also expressed a relatively stronger interest in group discussions (29) and particularly in AI-supported automatic assessments (21). This finding suggests that disciplines outside architecture are more open to collaborative and technology-enhanced evaluation strategies.

Overall, the results indicate that while traditional assessment formats remain central to participant expectations, there is also a growing recognition of the value of innovative and participatory approaches. For the design of EPD-Net training modules, these outcomes imply that a blended assessment framework—integrating conventional methods with collaborative group work and AI-supported tools—would best accommodate the diverse preferences of participants across different fields of study.

The Chi-square test results indicate a statistically significant association between field of study and preferred evaluation methods after EPD-Net training (Pearson $\chi^2(4, N=316)=13.61$, $p=0.009$). This suggests that participants' disciplinary backgrounds influence their evaluation preferences. In particular, respondents from non-architecture fields expressed relatively stronger interest in AI-supported automatic assessment and group discussions, whereas participants from the Architecture, Planning, and Design field predominantly favored online exams and project-based submissions.

However, it should be noted that two cells (20.0%) had expected counts below 5, with a minimum expected value of 0.49. This indicates that, although the test demonstrates significance, some caution is required in interpreting the robustness of the association.

The findings indicate that a blended assessment approach, combining both traditional and innovative methods, may represent the most suitable strategy for the EPD-Net training modules. While exam- and project-based methods provide a reliable foundation for participants from the field of architecture, the interest shown by participants from other disciplines in group discussions and AI-supported assessments highlights the necessity of integrating digital tools and collaborative learning methods.

The Relationship Between Professional Field and the Institution's Policies on Disaster Resilience, Ecological Planning, and/or Green Infrastructure

The results indicate that a considerable proportion of participants are uncertain about their institution's strategies in the areas of disaster resilience, ecological planning, or green infrastructure, with 136 respondents (43.0%) stating "I don't know / Not sure." This highlights a potential lack of awareness or communication regarding existing institutional policies. Among those who reported clear strategies, 51 participants (16.1%) confirmed that institutional-level policies are already in place and being implemented, while 30 participants (9.5%) noted that such strategies are still in the project or draft stage. On the other hand, a significant share, 99 respondents (31.3%), indicated that no strategies have yet been developed.

Table 40.Status of Institutional Strategies or Policies on Disaster Resilience, Ecological Planning, and Green Infrastructure: Comparison between Architecture, Planning and Design Field and Other Fields (Question 28) x (Question 6)

Field of Study	I don't know / Not sure	Yes, there is an institutional-level strategy/policy, and it is being implemented	Yes, but it is still in project/draft stage	No, no study or strategy has been developed yet	Total
Architecture, Planning and Design	59	19	19	58	155

Field of Study	I don't know / Not sure	Yes, there is an institutional-level strategy/policy, and it is being implemented	Yes, but it is still in project/draft stage	No, no study or strategy has been developed yet	Total
Other Fields	77	32	11	41	161
Total	136	51	30	99	316

When compared by field, participants from architecture, planning and design reported slightly higher rates of confirmed strategies in implementation (n=19) or draft form (n=19), but also a substantial number with no strategies (n=58). In Other Fields, uncertainty was more pronounced (n=77), although a relatively larger group reported ongoing institutional strategies (n=32). Overall, these findings suggest that while some institutions have begun to develop or implement strategies related to disaster resilience and ecological planning, there is still a widespread need to enhance institutional commitment and increase awareness among professionals.

The Chi-square test indicates a statistically significant association between the field of study and the presence of institutional strategies or policies related to disaster resilience, ecological planning, and/or green infrastructure (Pearson $\chi^2(3, N=316)=10.64$, $p=0.014$). Since no cells have an expected count below 5 (minimum expected count=14.72), the test results are considered robust and reliable. This suggests that participants' disciplinary backgrounds play an influential role in whether their institutions have established, are developing, or lack strategies in these areas.

The results indicate that the training modules to be developed within the scope of the EPD-Net project should not only focus on individual knowledge and skills but also on strengthening institutional awareness and strategy development capacity. In particular, considering the large group of participants whose institutions have not yet developed policies or who are unaware of the current situation, it is essential that the training modules are designed to support institutional communication, strategy development, and policy implementation skills.

The Relationship Between Professional Field and the Institutional Capacities to Contribute to the Development of EPD-Net Training Modules

The results indicate that human resources are the most widely available institutional capacity, reported by 181 participants across all fields. This suggests that most institutions have sufficient personnel to contribute to the development of the EPD-Net training modules. Technical capacity (48) and sufficient knowledge/skills (19) were mentioned less frequently, indicating that while staff are present, there may be limitations in specialized expertise or technological infrastructure

Table 41.Institutional Resources to Contribute to the Development of EPD-Net Training Modules (Distribution by Field of Study) (Question 28) x (Question 6)

Field of Study	Human resources	Technical capacity	Financial support	Managerial support	Implementation support	Sufficient knowledge/skills	Other	Total
Architecture, Planning and Design	85	17	2	13	8	11	17	153
Other Fields	96	31	7	5	8	8	4	159
Total	181	48	9	18	16	19	21	312

Looking at field-based differences, participants from Architecture, Planning and Design reported a relatively higher share of managerial support (13) and other resources (17) compared to participants from Other Fields, who indicated greater access to technical capacity (31 vs. 17) and financial support (7 vs. 2). Both groups reported similar levels of implementation support (8 each). Overall, the findings suggest that while most institutions are adequately resourced in terms of human capacity, further attention is required to strengthen financial, technical, and skill-based capacities, which are critical for the effective implementation of the EPD-Net training modules.

The Chi-square test shows a statistically significant association between professional field and the institutional resources available to support the development of EPD-Net training modules (Pearson $\chi^2(6, N=312)=19.50$, $p=0.003$). This indicates that participants' disciplinary backgrounds influence the types of resources they report as being available within their institutions. Overall, the analysis suggests that institutions from different fields demonstrate varying levels of access to human, technical, financial, and managerial resources, which should be taken into account when designing the EPD-Net training modules to ensure balanced and effective implementation.

The findings as a whole indicate that institutions possess strong capacity in terms of human resources; however, technical, financial, and expertise-based supports need to be further strengthened. When comparing fields, institutions in the Architecture, Planning and Design domain appear to contribute more through managerial support and other resources, whereas institutions from other fields demonstrate relatively greater strength in technical capacity and financial support. Both groups reported similar levels of implementation support. Taking these differences into account in the design of the EPD-Net training modules will ensure that the modules are developed in a more balanced, realistic, and applicable manner.

Professional Field and User Interface Features of the Digital Learning Platform

The results show that accessibility is the most emphasized feature for the digital learning platform's user interface, with 164 responses across all fields, highlighting the importance of designing a disability-friendly interface. Multi-language support (56) and mobile compatibility (45) also appear as important expectations, particularly among participants from other fields, who reported higher demand for simple and intuitive use (26) compared to those from the Architecture, Planning and Design field (12). Visual content support, although less frequently mentioned (13), still reflects a need for enriched learning materials. Overall, the findings suggest

that the EPD-Net platform should prioritize universal accessibility and inclusivity, while also integrating multi-language and mobile-friendly features to ensure broad usability.

Table 42. Priority Features in the User Interface of the Digital Learning Platform: Comparison between Architecture, Planning and Design Field and Other Fields (Question 33) x (Question 6)

Field of Study	**Accessibility (disability-friendly interface)**	**Multi-language support**	**Mobile compatibility**	**Simple and intuitive use**	**Content supported with visual explanations**	**Total**
Architecture, Planning and Design	93	25	20	12	5	155
Other Fields	71	31	25	26	8	161
Total	164	56	45	38	13	316

Participants from the Architecture, Planning and Design field emphasized accessibility most strongly (93 responses), showing a clear priority for disability-friendly design. However, their preferences for multi-language support (25), mobile compatibility (20), and simple/intuitive use (12) were relatively lower compared to other fields. By contrast, participants from Other Fields also valued accessibility (71), but they expressed higher demand for multi-language support (31), mobile compatibility (25), and especially simple and intuitive use (26). They also placed slightly greater emphasis on visual content support (8 vs. 5). This comparison suggests that while accessibility is a shared priority across all fields, participants from other disciplines expect the platform to offer more flexibility, ease of use, and multilingual features, whereas architecture-related participants place stronger emphasis on universal accessibility.

The Chi-square test results indicate a statistically significant association between the field of study and the priority features expected in the user interface of the digital learning platform (Pearson $\chi^2(4, N=316)=9.889$; $p=0.042$). This finding suggests that participants' professional backgrounds influence the features they consider most important in the platform's user interface. In addition, the Linear-by-Linear Association (8.566; $p=0.003$) confirms the presence of a meaningful directional relationship. Since none of the cells had expected counts below 5 (minimum expected=6.38), the test results can be considered robust and reliable. In summary, the analysis reveals that participants from different disciplines show varying preferences for user interface features, which should be carefully considered in the design of the EPD-Net platform to ensure inclusivity and usability across fields.

The findings highlight that the design of digital learning platforms is strongly shaped by disciplinary diversity and user expectations. Participants from architecture placed greater emphasis on accessibility, reflecting a priority for universal design and inclusivity. By contrast, participants from other fields stressed more practical aspects, such as multi-language support, mobile compatibility, and ease of use—indicating that disciplinary backgrounds shape not only

professional expertise but also how technology is expected to support learning. This suggests that digital platforms should be regarded not merely as technical tools, but as interdisciplinary spaces for learning and communication. In the context of a multi-stakeholder project like EPD-Net, user interface design must go beyond accessibility to also embrace cultural diversity, usage habits, and pedagogical needs across different disciplines. Ultimately, the results show that the platform's success will depend not only on technological solutions but also on its ability to integrate and balance the varied expectations of diverse fields.

Professional Field and Motivation to Join the EPD-Net Learning Network

The results demonstrate that the most important factor to increase motivation for participation in the EPD-Net learning network is knowledge sharing, selected by a total of 185 participants. This indicates that participants primarily expect opportunities for mutual learning and exchange of experiences within the network. The second most emphasized factor is international collaboration (n=68), reflecting participants' interest in engaging with experts from different countries and pursuing joint initiatives.

Table 43. Factors Increasing Motivation to Participate in the EPD-Net Learning Network: Comparison between Architecture, Planning and Design Field and Other Fields (Question 34) x (Question 6)

Field of Study	**Knowledge sharing**	**International collaboration**	**Certified trainings**	**Participation in policy development processes**	**Professional development opportunities**	**Access to local practice examples**	**Total**
Architecture, Planning and Design	85	40	8	10	10	1	154
Other Fields	100	28	18	4	6	5	161
Total	185	68	26	14	16	6	315

By field, participants in Architecture, Planning and Design highlighted knowledge sharing (85) and international collaboration (40), whereas those from Other Fields placed even greater emphasis on knowledge sharing (100) and showed relatively stronger interest in certified trainings (18 vs. 8). Participation in policy development processes, professional development opportunities, and access to local practice examples were less frequently selected across both groups. These findings suggest that in order to strengthen engagement with the EPD-Net learning network, priority should be given to mechanisms that foster knowledge sharing and international collaboration, while certified trainings may serve as a key motivational element particularly for participants from other fields.

The Chi-square test results reveal a statistically significant association between professional field and the factors that would increase motivation to participate in the EPD-Net learning network (Pearson $\chi^2(5, N=315)=13.269$; $p=0.021$). This indicates that participants' disciplinary backgrounds influence which elements they consider most motivating for engagement in the network.

The findings reveal that the strongest factor motivating participation in the EPD-Net learning network is knowledge sharing, highlighting the central role of collective learning and exchange of experiences within the platform. International collaboration emerges as the second most important factor, particularly valued by participants from the Architecture, Planning and Design field. In contrast, participants from other fields placed greater emphasis on certified trainings in addition to knowledge sharing, indicating that tangible outcomes and formal recognition are especially important for them. Participation in policy development, professional development opportunities, and access to local practice examples were less frequently selected in both groups. The Chi-square analysis confirmed a statistically significant association between professional field and motivational factors, showing that disciplinary differences directly shape participants' expectations of the platform. These findings suggest that EPD-Net should not only prioritize knowledge sharing and international collaboration but also adopt a flexible and multidimensional structure that incorporates certified training opportunities, contributions to policy processes, and local best practices to address the diverse motivations of participants.

Profesyonel Field and Effective Dissemination and Engagement Activities for the EPD-Net Project

The results show that the most effective dissemination and engagement activity for the EPD-Net Project is social media campaigns, selected by a total of 240 participants across all fields. This highlights the central role of social media as the most powerful tool for reaching wider audiences and ensuring project visibility. The second most emphasized activity is webinars (n=43), reflecting the importance of online interaction and knowledge exchange as a complementary method.

Table 44. Effective Dissemination and Engagement Activities for the EPD-Net Project: Comparison between Architecture, Planning and Design Field and Other Fields (Question 35) x (Question 6)

Field of Study	**Social media campaigns**	**Webinars (online seminars)**	**Other**	**Regional workshops**	**Total**
Architecture, Planning and Design	114	23	3	15	155
Other Fields	126	20	10	5	161
Total	240	43	13	20	316

By field, participants from Architecture, Planning and Design strongly supported social media campaigns (114), and participants from Other Fields showed a similar pattern (126). However, those from other fields were more likely to select "other" activities (10 vs. 3), suggesting greater openness to alternative forms of engagement. Regional workshops were chosen less frequently (total n=20), indicating a more limited role in motivating participation compared to digital methods. Overall, these findings suggest that the most effective strategy for EPD-Net is to prioritize social media-based campaigns, while complementing them with webinars and, when relevant, regional workshops to enhance participation through a multi-channel approach.

The Chi-square test results indicate a statistically significant association between professional field and the preferred dissemination and engagement activities for the EPD-Net Project (Pearson

$\chi^2(3, N=316)=9.468; p=0.024)$. This suggests that participants' disciplinary backgrounds influence which activities they perceive as most effective. Overall, the results show that participants from different professional fields have significantly different expectations regarding dissemination strategies, underlining the importance of tailoring EPD-Net's communication and engagement approaches to accommodate this diversity.

When analyzed by professional field, participants from Architecture, Planning and Design placed greater emphasis on social media campaigns, whereas participants from other fields more frequently selected the "other methods" option. This suggests that architecture-related groups prioritize digital visibility and outreach strategies, while participants from other disciplines appear to be more open to alternative and innovative forms of engagement. Furthermore, the relatively higher preference for regional workshops among architecture participants indicates that this group may value local context and spatial interaction more strongly compared to others.

4.2.4 Professional Role: Frequency Distributions and Chi-Square Analyses

The distribution of participants by professional role shows that the largest group is composed of private sector employees, freelancers, and independent consultants (43.0%; n=136). This highlights the strong engagement of the private sector and independent professionals in the EPD-Net project. The second largest group is academics, researchers, and lecturers (39.2%; n=124), reflecting the project's close ties to academic knowledge production and research activities. In contrast, public sector employees and local government staff are less represented (10.8%; n=34). Given the crucial role of public institutions and local authorities in ecological planning and disaster resilience, this relatively limited representation suggests the need to enhance public sector engagement. The "Other" category accounts for 7.0% (n=22), capturing a more diverse range of professional backgrounds. Overall, the distribution indicates strong representation from academia and the private sector, but comparatively weaker participation from the public sector. This suggests that while the EPD-Net project can leverage academic–private sector collaboration, it should also adopt strategies to increase public sector involvement, which is essential for the implementation of sustainable and resilient policies.

Table 45. Distribution of Participants by Professional Role (Question 8)

Professional Role/Field	**Total (N)**	**Percent**
Academic / Researcher / Lecturer / Instructor	124	39.2
Public sector employee / Local government staff	34	10.8
Private sector employee / Freelancer / Independent consultant	136	43.0
Other	22	7.0
Total	316	100%

Professional Role and the Relationship with Participants' Institutions' Policies on Disaster Resilience, Ecological Planning, and/or Green Infrastructure

The results show that a considerable proportion of participants (n=136; 43.0%) are uncertain or unaware of whether their institutions have strategies related to disaster resilience, ecological planning, or green infrastructure. This finding points to a lack of effective communication or limited awareness regarding institutional policies. Among academics (n=124), lack of awareness was particularly prominent, with 70 participants selecting "not sure," while only 17 reported that their institutions have and implement such strategies. Among public sector employees (n=34), the most common response was "no strategy" (17), reflecting gaps at the local governance level. Private sector employees and independent consultants (n=136) gave the highest number of "no strategy" responses (47), but they also provided the highest number of "in draft/project stage" responses (17), indicating an emerging but still developing institutional orientation in this sector. Overall, the findings suggest that institutional strategies and policies vary significantly across sectors, but there is a common need to strengthen policy development and raise awareness among employees in both the public and private domains.

Table 46. Status of Institutional Strategies/Policies on Disaster Resilience, Ecological Planning, and Green Infrastructure by Professional Role (Question 27) x (Question 8)

Professional Role/Field	**I don't know / Not sure**	**Yes, there is an institutional-level strategy/policy, and it is being implemented**	**Yes, but it is still in project/draft stage**	**No, no study or strategy has been developed yet**	**Total**
Academic / Researcher / Lecturer / Instructor	70	17	7	30	124
Public sector employee / Local government staff	9	6	2	17	34
Private sector employee / Freelancer / Independent consultant	50	22	17	47	136
Other	7	6	4	5	22
Total	136	51	30	99	316

The Chi-square test results indicate a statistically significant association between professional roles and the presence of institutional strategies/policies on disaster resilience, ecological planning, and/or green infrastructure (Pearson $\chi^2(9, N=316)=23.647$; $p=0.005$). This suggests that participants' professional backgrounds influence whether their institutions have developed or implemented such strategies. Overall, the analysis highlights that participants from different professional roles show varying levels of awareness and institutional engagement regarding strategies and policies in these areas. This diversity underscores the importance of considering sector-specific differences when assessing institutional capacities within the EPD-Net framework.

The findings demonstrate that institutions display varying levels of maturity regarding disaster resilience, ecological planning, and green infrastructure policies, with clear differences across professional roles. A significant proportion of participants (43%) were unaware of their institution's strategies, indicating major gaps in institutional awareness and internal communication. While uncertainty was most pronounced among academics, the private sector displayed both the highest share of "no strategy" and "in draft" responses, suggesting that policy development in this sector remains in a formative stage but holds strong potential for rapid advancement if properly supported. In the public sector, the prevalence of "no strategy" highlights the need for stronger involvement of local governments and public authorities. These variations underline the importance of designing EPD-Net training modules not only to enhance individual knowledge and skills but also to strengthen institutional policy awareness, bridge sectoral differences, and foster cross-sector learning processes.

4.2.5 Knowledge Level in the Field: Frequency Distributions and Chi-Square Analyses

An analysis of participants' knowledge levels in disaster resilience and ecological planning shows that the largest group falls into the moderate knowledge category (53.5%; n=169). This group represents individuals who are familiar with basic concepts and processes but have not yet developed advanced expertise. The second-largest group consists of those with only basic awareness (23.4%; n=74), indicating that a substantial proportion of participants have limited familiarity with the field.

In contrast, good knowledge was reported by 15.2% (n=48), while advanced knowledge—those actively engaged in related projects or initiatives—was the smallest group at 7.9% (n=25). Overall, the findings suggest that the majority of participants have moderate or lower levels of knowledge. This highlights the importance of designing the EPD-Net training modules to address different needs: strengthening basic awareness for less experienced participants while also providing advanced content for those with prior training or project experience.

Table 47. Participants' Knowledge Levels on Disaster Resilience and Ecological Planning

	Total (N)	**Percent**
I have very little knowledge (only basic awareness)	74	23.4
I have advanced knowledge (actively participated in projects/initiatives in the field)	25	7.9
I have good knowledge (received training or have relevant course/volunteering experience)	48	15.2
I have moderate knowledge (familiar with some basic concepts and processes)	169	53.5
Total	316	**100**

The Relationship Between Participants' Knowledge Level and Their Institutions' Policies on Disaster Resilience, Ecological Planning, and Green Infrastructure

The findings reveal a meaningful relationship between participants' knowledge levels on disaster resilience and ecological planning and their awareness of institutional strategies and policies. A large proportion of those with very little knowledge (54.1%; n=40) reported being unsure about their institution's strategies. Similarly, among participants with moderate knowledge, uncertainty was again dominant (43.2%; n=73), indicating that an increase in knowledge does not automatically translate into higher institutional awareness. In contrast, participants with advanced knowledge more frequently reported that their institutions had strategies in place and being implemented (n=11), suggesting that higher levels of expertise are associated with stronger awareness of institutional policies. Overall, the results emphasize that the EPD-Net training modules should not only aim to strengthen technical knowledge and skills but also include components that raise awareness of institutional strategies and policies.

Table 48. Relationship between Participants' Knowledge Levels on Disaster Resilience and Ecological Planning and the Status of Institutional Strategies/Policies (Question 27) x (Question 10)

	I don't know / Not sure	**Yes, there is an institutional-level strategy/policy, and it is being implemented**	**Yes, but it is still in project/draft stage**	**No, no study or strategy has been developed yet**	**Total**
I have very little knowledge (only basic awareness)	40	7	4	23	74
I have advanced knowledge (actively participated in projects/initiatives in the field)	5	11	5	4	25
I have good knowledge (received training or have relevant course/volunteering experience)	18	6	4	20	48
I have moderate knowledge (familiar with some basic concepts and processes)	73	27	17	52	169
Total	136	51	30	99	316

The Chi-square test results indicate a statistically significant association between participants' knowledge levels and the presence of institutional strategies/policies on disaster resilience, ecological planning, and green infrastructure (Pearson $\chi^2(9, N=316)=27.844$; $p=0.001$). This

finding suggests that higher levels of knowledge are linked to greater awareness of institutional strategies. Overall, the analysis highlights that participants at different knowledge levels perceive their institutions' strategies differently, underscoring the need for the EPD-Net training modules to include not only knowledge-building components but also elements that enhance awareness of institutional policies and strategies.

The findings indicate a significant association between participants' knowledge levels and their awareness of institutional strategies and policies on disaster resilience, ecological planning, and green infrastructure. A substantial proportion of participants with very little or moderate knowledge (ranging from 43% to 54%) reported being unsure about their institutions' strategies, highlighting critical gaps in institutional communication and policy visibility. In contrast, participants with advanced knowledge were more likely to report that their institutions had strategies in place, suggesting that higher expertise is linked to stronger institutional awareness. Overall, the results suggest that the EPD-Net training modules should not only aim to strengthen technical knowledge and skills but also seek to enhance institutional policy awareness, facilitate knowledge transfer, and adopt multi-layered training strategies that address participants at different knowledge levels.

4.2.6 Participation in Courses, Events, and Trainings Related to the Field: Frequency Distributions and Chi-Square Analyses

The Relationship Between Participation in Field-Related Courses, Events, and Trainings and Institutional Policies on Disaster Resilience, Ecological Planning, and Green Infrastructure

The findings indicate a clear relationship between training/course participation and awareness of institutional strategies on disaster resilience, ecological planning, and green infrastructure. Among those who had attended trainings or courses (n=228), positive responses such as "yes, there is a strategy/policy and it is being implemented" (n=41) and "yes, but it is still in draft/project stage" (n=26) were more frequent. This suggests that individuals with training experience are more aware of their institutions' existing strategies and more engaged with ongoing policy development processes. In contrast, those who had not attended any training (n=88) most frequently reported "I don't know/Not sure" (n=49), reflecting a stronger lack of institutional awareness in this group. Additionally, the number of respondents reporting that "no strategy exists" was relatively higher among those without training (n=25). Overall, the results suggest that participation in trainings not only enhances individual knowledge but also contributes to greater institutional awareness and engagement with resilience and ecological planning strategies.

Table 49. Relationship between Participants' Training/Course Experience and Institutional Strategies/Policies on Disaster Resilience, Ecological Planning, and Green Infrastructure (Question 27) x (Question 11)

	I don't know / Not sure	Yes, there is an institutional-level strategy/policy, and it is being implemented	Yes, but it is still in project/draft stage	No, no study or strategy has been developed yet	Total
I have attended various trainings and courses	87	41	26	74	228
I have not attended any training or course	49	10	4	25	88
Total	136	51	30	99	316

The Chi-square test results indicate a statistically significant association between participants' training/course participation and the presence of institutional strategies/policies on disaster resilience, ecological planning, and green infrastructure (Pearson $\chi^2(3, N=316)=9.731$; $p=0.021$). This finding suggests that individuals who have attended trainings or courses are more likely to be aware of their institutions' strategies and display higher institutional awareness.

The findings highlight that participation in trainings and courses not only strengthens individual knowledge but also significantly enhances institutional awareness and engagement. Respondents with training experience were more likely to recognize their institutions' existing strategies or draft initiatives, suggesting that education acts as a bridge between individual expertise and institutional policy awareness. In contrast, those without training reported higher uncertainty and a greater tendency to state that no strategies exist, reflecting a potential communication gap within institutions. Moreover, the fact that trained participants were more aware of draft-stage policies indicates that education enables individuals to follow and engage with ongoing strategic processes more closely.

These results imply that EPD-Net training modules should not only focus on technical skill development but also include elements that foster institutional communication, policy analysis, and strategy awareness. Strengthening this link between education and institutional practices can ensure that resilience and ecological planning efforts are both comprehensive and sustainable.

The Relationship Between Participation in Field-Related Courses, Events, and Trainings and the User Interface of the EPD-Net Digital Learning Platform

The results show that accessibility is by far the most prioritized feature in the user interface of the digital learning platform, with 164 responses, indicating that participants attach great importance to designing a disability-friendly and inclusive platform. Participants who had attended various

trainings or courses emphasized accessibility much more strongly (n=120) compared to those without training experience (n=44). They also reported higher expectations for multi-language support (48 vs. 8) and mobile compatibility (31 vs. 14), suggesting that training experience may increase awareness of the need for flexibility and inclusivity in digital platforms. By contrast, participants without training placed relatively greater emphasis on simple and intuitive use (17 vs. 21) and visual content support (5 vs. 8), highlighting a preference for ease of use and learning materials that are straightforward and visually enhanced. Overall, the findings suggest that the EPD-Net platform should prioritize universal accessibility, multi-language options, and mobile compatibility, while also integrating intuitive design and visual content to address the expectations of participants with different training backgrounds.

Table 50. Priority User Interface Features of the Digital Learning Platform by Participants' Training/Course Experience

	Accessibility (disability-friendly interface)	**Multi-language support**	**Mobile compatibility**	**Simple and intuitive use**	**Content supported with visual explanations**	**Total**
I have attended various trainings and courses	120	48	31	21	8	228
I have not attended any training or course	44	8	14	17	5	88
Total	164	56	45	38	13	316

The Pearson Chi-Square test results indicate a statistically significant association between participants' training/course experience and the priority features they expect in the digital learning platform's user interface ($\chi^2(4, N=316)=11.573$; $p=0.021$). This suggests that whether or not participants had training influences the features they consider most important for the platform. Overall, the findings confirm that training/course experience plays a significant role in shaping participants' expectations regarding user interface features of the digital platform.

The results highlight a meaningful link between training/course participation and expectations for the digital platform's user interface. Participants with prior training emphasized accessibility, multi-language support, and mobile compatibility more strongly, which suggests that training not only enhances technical knowledge but also cultivates a more holistic awareness of inclusivity and flexibility in digital learning design. This indicates that training experience fosters a deeper understanding of the pedagogical and technological dimensions of user-centered platforms. In contrast, participants without training showed stronger preferences for ease of use and visual content support, reflecting a tendency to prioritize straightforward functionality and immediate learning benefits. This distinction underscores the importance of tailoring the platform to different user profiles: for trained participants, ensuring flexibility, inclusivity, and multiple

access options; and for untrained participants, ensuring simplicity, intuitive navigation, and visually supported content.

Moreover, the divergence in expectations points to the need for the EPD-Net platform to adopt a multi-layered design approach. Such an approach would combine advanced, inclusive, and multi-feature options for experienced users with simplified, easy-to-use, and visually enriched content for those with less training. This dual strategy would ensure that the platform remains not only technically robust but also pedagogically inclusive, effectively meeting the diverse needs of its user base.

4.2.7 Gender Distribution: Frequency Distributions and Chi-Square Analyses

The Relationship Between Gender and Prioritized Resilience and Social Skills in EPD-Net Training Modules

The results indicate that crisis analysis and rapid decision-making is by far the most prioritized resilience and social skill across both genders (n=233), highlighting participants' strong emphasis on the ability to respond effectively during emergencies. Community-based solution development follows as the second most selected skill (n=44), underlining the importance of collective approaches in resilience-building.

When analyzed by gender, men (n=12) reported adaptability to change and leadership skills more frequently than women (n=2), suggesting a gender-related difference in leadership-oriented preferences. Conversely, women placed relatively more emphasis on community-based solutions (n=26 vs. 18) and disaster awareness/education (n=11 vs. 9). Interestingly, social solidarity and cooperation skills were selected at very low levels (n=2 total), which may indicate that participants view cooperation as already implicit within community-based approaches rather than as a separate priority.

Overall, the findings suggest that while both men and women value crisis management skills most strongly, men tend to lean toward leadership and adaptability, whereas women place greater emphasis on community-based and awareness-oriented approaches. These differences highlight the importance of integrating both individual decision-making competencies and collective/community-oriented strategies into the EPD-Net training modules.

Table 51. Prioritized Resilience and Social Skills in EPD-Net Training Modules by Gender

	Crisis analysis and rapid decision-making	**Community-based solution development**	**Adaptability to change and leadership skills**	**Disaster awareness and education in society**	**Social solidarity and cooperation skills**	**Total**
Male	111	18	12	9	2	152
Female	122	26	2	11	0	161
Total	233	44	14	20	2	313

The Pearson Chi-Square test results show a statistically significant association between participants' gender and the resilience and social skills prioritized in the EPD-Net training modules ($\chi^2(4, N=313)=11.067$; $p=0.026$). This suggests that gender plays a role in shaping which skills participants consider most important. Overall, the results suggest that gender differences influence participants' prioritization of certain resilience and social skills, though these differences do not follow a straightforward linear pattern.

This analysis shows that gender-based differences are not only about small variations in prioritized skills but also provide pedagogical insights into how training modules should be designed. Men's stronger orientation toward adaptability and leadership suggests a tendency to assume decision-making roles during crises, reflecting an individual and managerial perspective. In contrast, women's greater emphasis on community-based solutions and awareness-building highlights the critical role of the social dimension of resilience, pointing to the importance of collective approaches in strengthening disaster preparedness.

A noteworthy finding is the very low prioritization of social solidarity and cooperation skills. This may imply that participants either perceive collaboration as already implicit within community-based approaches or that such skills are not sufficiently encouraged in their institutional or personal contexts. Therefore, training modules should not only focus on leadership and rapid decision-making but also actively make solidarity and collective action visible and teachable as structured learning outcomes.

Furthermore, the lack of a significant linear trend in the Chi-Square analysis suggests that gender differences do not follow a strict hierarchy but rather stem from diverse social roles and expectations. This highlights the need for multi-layered training content that integrates both individual and collective perspectives, ensuring inclusivity across gendered experiences.

Relationship Between Gender and Motivation to Participate in the EPD-Net Learning Network

The results show that knowledge sharing is the dominant motivational factor for both genders (n=184), highlighting participants' strong interest in mutual learning and exchange of expertise within the EPD-Net network. However, clear gender differences emerge in secondary priorities: men place greater emphasis on certified trainings (16 vs. 10) and maintain relatively balanced interest across several categories, whereas women strongly highlight international collaboration (50 vs. 16) and show higher interest in policy development participation (9 vs. 5) and professional development opportunities (10 vs. 6). Access to local practice examples was selected equally by both genders but at very low levels (n=3 each).

These findings suggest that while both men and women primarily seek knowledge exchange, women are particularly motivated by opportunities to collaborate internationally and engage in broader professional and policy contexts, whereas men value certification as a form of professional recognition. For the EPD-Net learning network, this indicates the importance of balancing knowledge-sharing activities with opportunities for international collaboration, certified training programs, and professional development pathways that appeal to diverse participant motivations.

Table 52. Factors Increasing Motivation to Participate in the EPD-Net Learning Network by Gender (Question 34) x (Question 2)

	Knowledge sharing	International collaboration	Certified trainings	Participation in policy development processes	Professional development opportunities	Access to local practice examples	Total
Male	106	16	16	5	6	3	152
Female	78	50	10	9	10	3	160
Total	184	66	26	14	16	6	312

The Pearson Chi-Square test indicates a highly significant association between gender and the factors that increase motivation to participate in the EPD-Net learning network ($\chi^2(5, N=312)=25.115$; $p<0.001$). This finding reveals clear gender-based differences in motivational priorities. In conclusion, gender appears to be an important factor shaping motivational drivers, particularly in areas such as knowledge sharing, international collaboration, and certified trainings. This suggests that the design of the EPD-Net learning network should carefully account for gender-based diversity to ensure inclusive and effective engagement strategies.

The analysis reveals that gender not only shapes the prioritization of motivational factors but also reflects different perspectives on how participants envision their engagement within the EPD-Net learning network. Women's strong preference for international collaboration and involvement in policy-related processes suggests a motivation to expand their professional influence beyond local boundaries and to connect with broader, cross-national initiatives. Men's greater emphasis on certified trainings, on the other hand, points to a more career-oriented approach, where formal recognition and tangible outcomes carry stronger value. The minimal attention given by both genders to access to local practice examples highlights a potential gap that the EPD-Net project could address by making local applications more visible and demonstrating their relevance to global collaboration and certification. Taken together, these insights imply that the platform should adopt a dual strategy: fostering global and policy-oriented collaboration opportunities that resonate more with women, while also integrating recognized certification pathways that particularly motivate men. Such a balanced approach would ensure inclusivity, while also strengthening the overall attractiveness and sustainability of the learning network.

The Relationship Between Gender and the Prioritization of Skills in EPD-Net Training Modules

The results indicate that practical skills in GIS use, hazard monitoring, and data analysis are the most frequently prioritized skills by both male (n=82) and female (n=109) participants, making this category the dominant area overall (n=191). This highlights the strong emphasis placed on technical and analytical competencies within the EPD-Net training modules. Gender-based differences are visible in secondary preferences. Men place considerably greater emphasis on hazard modeling and disaster impact prediction (33 vs. 16), reflecting a stronger orientation

toward technical modeling and forecasting. Women, on the other hand, slightly prioritize communication and public participation skills in disaster management (21 vs. 18) and strategic/operational planning skills for disaster risk reduction (12 vs. 11), suggesting a broader perspective that combines technical competence with social and organizational dimensions.

The relatively low overall selection of the "Other" category (n=11) suggests that the listed skills already capture most participants' expectations. Overall, the findings reveal a balance between technical, social, and strategic dimensions, with men leaning more toward technical modeling and women showing a stronger orientation toward integrative and participatory approaches.

Table 53. Prioritized Skills in EPD-Net Training Modules by Gender (Question 26) x (Question 2)

	Practical skills in GIS use, hazard monitoring, and data analysis at different planning levels	**Competence in hazard modeling and predicting disaster impacts**	**Skills in communication and public participation in disaster management**	**Strategic and operational planning skills for disaster risk reduction**	**Other**	**Total**
Male	82	33	18	11	8	152
Female	109	16	21	12	3	161
Total	191	49	39	23	11	313

The Pearson Chi-Square test results indicate a statistically significant association between gender and the skills prioritized in the EPD-Net training modules ($\chi^2(4, N=313)=12.013$; $p=0.017$). This suggests that male and female participants differ in the skills they consider most important. In conclusion, the findings suggest that gender influences the prioritization of skills, though this influence manifests across distinct categories rather than along a linear gradient.

The results indicate that gender differences shape distinct tendencies in the prioritization of skills within the EPD-Net training modules. Male participants place greater emphasis on hazard modeling and disaster impact prediction, reflecting a strong orientation toward technical precision and analytical forecasting. Female participants, on the other hand, prioritize communication, public participation, and strategic planning, thereby complementing technical aspects with social and organizational dimensions. At the same time, GIS use, hazard monitoring, and data analysis emerge as the most dominant priority across both genders, underscoring the shared importance of analytical capacity. These findings suggest that the design of EPD-Net modules must strike a balance between technical competencies and participatory/strategic approaches. A one-dimensional focus on only technical or only social dimensions would fail to fully address participant needs. Instead, integrating technical modeling and simulation-based content with training that strengthens communication, participation, and strategic management is essential to ensure a comprehensive and interdisciplinary learning experience.

4.2.8. General Findings and Conclusions of Professional Survey

This report synthesizes the cross-tabulated relationships and statistically significant differences that build upon the question-based frequency analyses presented in WP1.5. The professional survey sample consists of 316 respondents, predominantly from Türkiye (70%), followed by Czechia (12%), Spain (7.9%), Latvia (7.9%), and Portugal (2.2%). Gender representation is balanced (Male n=152; Female n=161), enhancing the reliability of gender-based comparisons. Low-frequency categories were merged where necessary, and only statistically significant results were included, thereby increasing the robustness of interpretations.

- **Barriers to Participation and Interface Priorities**

While more than half of the participants (51.4%) reported no barriers, 37% indicated at least one limitation, most commonly economic difficulties, young age, and chronic illness. For those reporting barriers, accessibility emerged as the most critical feature of the digital learning platform, significantly more than for those without barriers (60.7% vs. 46.7%). Participants without barriers, in contrast, placed balanced emphasis on multilingual support, mobile compatibility, and intuitive use. These findings highlight accessibility not as a supplementary feature but as a structural backbone of platform design.

- **Education Level and Digital Tool Preferences**

A strong relationship was observed between education level and digital tool use. While online learning platforms are the most widely used across all levels, undergraduate respondents rely more on video tools, whereas postgraduate participants prioritize GIS and analytical software. This differentiation indicates the need for level-sensitive content design: undergraduate learners should be supported through synchronous, applied, and visually enriched content, while postgraduate participants require more research- and analysis-oriented modules.

- **Professional Fields and Institutional Differences**

Nearly half of the respondents come from architecture, planning, and design. This group shows a preference for exams and project submissions, while participants from other fields are more open to group discussions and AI-supported assessments. Differences also extend to interface expectations: architecture-related participants strongly prioritize accessibility, whereas participants from other fields emphasize multilingualism, mobile adaptability, and intuitive navigation. Moreover, policy awareness remains limited in architecture-related fields, while other disciplines show stronger technical and financial capacities. These variations highlight the necessity of hybrid modules that balance field-specific needs and shared priorities.

- **Professional Roles and Policy Awareness**

Professional roles play a decisive role in shaping awareness of institutional strategies. Academics most frequently reported uncertainty regarding institutional policies, whereas private

sector respondents predominantly indicated the absence of strategies, yet also displayed the highest share of draft-stage initiatives. In the public sector, a lack of strategies was most evident. These differences underscore the importance of designing modules that not only develop individual knowledge and skills but also strengthen sector-specific policy awareness and institutional communication.

- **Knowledge Levels, Training Participation, and Institutional Awareness**

A clear link was found between higher knowledge levels and greater awareness of institutional strategies. Participants with advanced knowledge were more likely to report the existence of institutional policies, while those with low or moderate knowledge frequently expressed uncertainty. Similarly, training participation was associated with greater institutional awareness and stronger prioritization of inclusivity features such as accessibility, multilingualism, and mobile compatibility. This suggests that training fosters not only technical competence but also institutional awareness and user-centered expectations, making it a key lever for sustainable capacity building.

- **Gender-Based Differences**

Both male and female participants prioritized crisis analysis and rapid decision-making as the most important skills. However, male participants placed stronger emphasis on leadership and technical modeling, while female participants highlighted community-based solutions, awareness raising, and communication/participation skills. In terms of motivation, both groups valued knowledge sharing, but women were particularly driven by opportunities for international collaboration and engagement in policy processes, whereas men prioritized certified training. These findings show that a gender-sensitive curriculum must go beyond equal representation and address differentiated motivations and skill expectations through dual-focused pathways.

- **Overall Implications**

Taken together, the findings converge on three core implications: (1) accessibility must remain the central design priority of the platform, (2) hybrid and layered approaches are required to address differentiated needs based on professional field, role, knowledge level, training participation, and gender, and (3) modules should extend beyond individual capacity-building to strengthen institutional policy awareness and multi-stakeholder collaboration. Such an approach will ensure that the EPD-Net training modules not only enhance individual learning but also contribute to institutional transformation and broader societal resilience goals.

4.3. Analysis of Student Survey Data by Demographic and Academic Variables

The survey questions addressed to students are provided in Annex 2. To prevent interpretive ambiguity, the first responses were prioritized during analysis. Accordingly, the evaluation primarily focused on participants' initial choices, and the frequency distributions of multiple responses are not elaborated in this section. However, these distributions may be consulted in detail in the Needs Analysis Report (WP1.5), if required. All analyses were conducted on student data gathered from partner countries across the EPD-Net project.

Table 54. Distribution of Student Survey Respondents by Country

	Frequency	Percent
Türkiye	248	67.2%
Czechia	54	14.6%
Spain	2	0.5%
Latvia	10	2.7%
Portugal	55	14.9%
TOTAL	**369**	**100%**

The analyses investigated whether the perspectives of different participant groups (e.g., gender, age, educational level, professional field) differed significantly. Within this framework, the analysis of age distribution is presented in Section 5, gender-related differences in Section 6, educational level in Section 7, professional field in Section 8, and previous participation in training, courses, or events related to ecological planning, sustainable design, or resilient cities in Section 9.

This study systematically examined the differences among participant groups within the EPD-Net project. Analyses were carried out according to demographic and academic variables such as age, gender, educational attainment, professional domain, and previous training experiences. The objective was to ensure that the training modules to be developed respond not only to general trends but also to the specific needs of diverse profiles. In this context, relationships across age groups, gender differences, educational levels, professional fields, and prior experiences were examined in detail. Participants' preferences, expectations, and motivations were analyzed using frequency tables, cross-tabulations, and Chi-square tests. This allowed statistical verification of which groups demonstrated greater interest in particular modules, tools, or types of content. The analyses extended beyond single findings, offering multidimensional evaluations of inter-variable relationships. The results provide a strong scientific basis for tailoring training programs to target groups.

The age-related analyses presented in Section 5 highlighted variations in module preferences across different age groups. Section 6 examined gender-based differences, revealing distinct preferences between male and female participants concerning tools and content to be included

on the digital platform. Section 7 detailed educational-level differences, showing how secondary, undergraduate, and postgraduate participants varied in their preferences regarding content update frequency and use of digital tools. Section 8 compared professional fields, identifying distinct expectations for digital competencies and learning methods between participants in fields such as architecture, planning, and design and those from other backgrounds. Section 9 compared participants who had previously engaged in training or courses related to ecological planning, sustainable design, or resilient cities with those who had not. This systematic approach clearly demonstrated how different variables shaped learning preferences and expectations, showing that each group had distinct priorities that should not be overlooked.

The findings provide a strategic roadmap for ensuring that the EPD-Net training modules are more inclusive, effective, and user-oriented. Analyses confirmed that age is a key determinant of learning preferences, gender shapes expectations regarding content diversity, and educational level plays an important role in preferences for update frequency and tool usage. Similarly, professional fields influenced orientations toward digital skills and learning methods. Participants with prior training in relevant fields demonstrated more selective and practice-oriented expectations. This multidimensional perspective ensures that the modules will not be limited to knowledge transfer alone but will also possess the flexibility to accommodate the demographic and academic characteristics of participants.

Overall, the findings presented throughout the report establish a robust scientific foundation for the design of sustainable, resilient, and inclusive training modules targeted by the project. In conclusion, taking into account the needs of diverse participant profiles emerges as the most critical factor for enhancing learning outcomes and improving the overall success of the EPD-Net project.

4.3.1. Age Distribution: Frequency Distributions and Chi-Square Analyses

The Relationship Between Participant Age Distribution and Priority Green Skills (Question 1 and Question 13)

In this analysis, Questions 13—addressing which green skills should be prioritized in the training modules to be developed under the EPD-Net Project—were examined in relation to participant age distribution. The findings reveal clear patterns in the educational preferences of different age groups. Comparative assessments of frequency distributions and statistical test results indicate that nature-based solution development modules were particularly emphasized among younger participants. In contrast, older age groups demonstrated a stronger inclination toward alternative modules. Chi-square test results confirmed that the relationship between age and the preferred training modules was statistically significant.

Table 55. Cross-Tabulation of Participant Age Distribution and the Priority Green Skills to Be Addressed in the Training Modules to Be Developed within the Scope of the EPD-Net Project (Question 1 x Question 13)

Age Group	Nature-Based Solution Development	Sustainable Infrastructure Design	Other	Total
18–24	146	89	28	263
25–29	35	9	6	50
30 and above	30	11	15	56
Total	**211**	**109**	**49**	**369**

The majority of the sample consists of individuals aged 18–24 (n=263), corresponding to approximately 71% of the total participants. Within this group, the most frequently preferred area was “Nature-Based Solution Development” (n=146), followed by “Sustainable Infrastructure Design” (n=89) and “Other” (n=28). This result reflects that younger participants, in particular, demonstrate a stronger interest in developing nature-based solutions. In the 25–29 age group (n=50), the leading preference was again “Nature-Based Solution Development” (n=35), while the interest in “Sustainable Infrastructure Design” (n=9) and “Other” (n=6) remained limited. This indicates that while nature-based solutions remain central among the middle age group, their intensity is lower compared to younger participants.

Among participants aged 30 and above, the distribution appears relatively more balanced. In this group, 30 respondents prioritized nature-based solutions, 11 sustainable infrastructure design, and 15 selected the “Other” category. The stronger representation of the “Other” category among this age group suggests that older participants show greater interest in alternative training modules. When the overall totals are considered, 211 of the 369 participants (57.2%) selected nature-based solution development, 109 (29.5%) sustainable infrastructure design, and 49 (13.3%) other modules. These results indicate that while nature-based solutions remain the dominant area of interest across all age groups, diversity in preferences increases with age.

The Chi-Square test confirmed that there is a statistically significant relationship between participants’ age groups (Question 1) and their preferred training modules regarding green skills (Question 13) (Pearson $\chi^2(4) = 16.578$; $p = 0.002$). Thus, a non-random, meaningful association exists between participants’ ages and their preferred modules.

The findings further reveal that the inclination toward nature-based solutions is concentrated among younger participants, while the tendency toward the “Other” category becomes more prominent in older groups. This difference constitutes one of the key factors explaining the significant relationship. Therefore, age can be considered a determinant factor in shaping preferences for training modules. These results underline the necessity of considering age differences in the development of training programs. Specifically, for younger participants, enrichment of content through nature-based solutions may be prioritized, whereas for older groups, alternative and more diversified modules are recommended. In this way, the programs can be tailored to both age-specific needs and the overall diversity of the participant profile.

The Relationship Between Participant Age Distribution and the Prioritization of Resilience and Social Skills in the Training Modules (Question 1 and Question 15)

The analysis comparing participant age distribution (Q1) with the prioritization of resilience and social skills in training modules (Q15) within the scope of the EPD-Net Project examined how these competencies should be emphasized across different age groups. The relationship between age and module preferences was assessed through cross-tabulation, and the statistical significance of these associations was tested using the Chi-Square test. The findings reveal that younger participants displayed a stronger interest in developing skills related to crisis analysis and rapid decision-making. In contrast, older age groups demonstrated a greater inclination toward community-based problem-solving and alternative options. Statistical tests confirmed the presence of a significant association between age and module preferences. These results indicate that the educational needs of participants are not homogeneous across age groups and highlight the importance of considering age as a determining factor in the design of training modules. In this context, diversifying educational content by age group emerges as a strategic requirement to ensure that the modules are both inclusive and responsive to the diverse profiles of participants.

Table 56. Cross-Tabulation of Participant Age Distribution and the Prioritization of Resilience and Social Skills in the Training Modules to Be Developed within the Scope of the EPD-Net Project (Question 1 and Question 15)

Age Group	Crisis Analysis and Rapid Decision-Making	Community-Based Problem-Solving	Other	Total
18–24	172	44	47	263
25–29	36	7	7	50
30 and above	24	15	17	56
Total	**232**	**66**	**71**	**369**

The frequency distributions obtained in the study provide a detailed picture of the preferences of different age groups regarding training modules. Among the total of 369 participants, the 18–24 age group represented the largest share (n=263). Within this group, the most frequently selected module was “Crisis Analysis and Rapid Decision-Making” (n=172). This result indicates that younger participants prioritize skills related to uncertainty and crisis management more strongly. Within the same group, 44 respondents selected “Community-Based Problem-Solving”, while 47 opted for “Other”, suggesting that although the younger cohort is primarily focused on crisis management, there remains considerable interest in alternative areas as well. In the 25–29 age group (n=50), the dominant preference was again crisis analysis and rapid decision-making (n=36). However, interest in community-based solutions (n=7) and other categories (n=7) was more limited compared to the youngest group. This finding highlights that the middle age group demonstrates an even more pronounced orientation toward crisis management skills. Among participants aged 30 and above (n=56), the distribution appeared more balanced. In this group, 24 participants selected the crisis management module, 15 opted for community-based

solutions, and 17 chose the “Other” category. The relatively higher proportion of “Other” among older participants suggests that training needs diversify with age. Overall, 232 participants prioritized crisis analysis and rapid decision-making, 66 selected community-based solutions, and 71 chose other modules. These findings reveal that crisis management skills constitute the most prominent training need across all age groups. At the same time, the preferences of older participants appear more diversified, reflecting heterogeneous educational needs across age groups. These results underline the importance of addressing age-based differences in the design of training programs. While crisis-oriented modules may be particularly beneficial for younger participants, broader and more diversified content should be developed for older age groups. In this way, the training programs can generate a more inclusive impact at both the individual and societal levels.

As noted above, the results of the Chi-Square test indicate a statistically significant relationship between age groups (Question 1) and the preferred training modules on resilience and social skills (Question 15) (Pearson $\chi^2(4) = 12.163$; $p = 0.016$). The findings confirm that the training needs of different age groups vary considerably. This statistically significant association demonstrates the necessity of considering age as a critical factor in the design of EPD-Net training modules. In particular, prioritizing crisis analysis and rapid decision-making skills for younger participants is expected to enhance the effectiveness of the training programs. By contrast, for older participants, greater emphasis on community-based problem-solving and alternative modules is recommended. Accordingly, diversifying training programs to suit the needs of different age groups will increase both participants’ motivation and the effectiveness of learning outcomes. Furthermore, these results, which illustrate the influence of age on learning preferences, may also serve as a guiding reference for similar future projects. In conclusion, the statistical analyses provide clear evidence of distinct differences across age groups and underscore the need for strategic decision-making in the design of training modules.

The Relationship Between Participant Age Distribution and the Update Frequency of Digital Training Content and Learning Modules (Question 1 and Question 16)

This analysis examined the relationship between participant age distribution (Q1) and preferences regarding the update frequency of digital training content and learning modules (Q16) to be developed under the EPD-Net Project. The cross-tabulation revealed the numerical tendencies of different age groups toward update frequency, while the Chi-Square test was used to determine whether these associations were statistically significant. The findings show that younger age groups preferred more frequent updates, whereas older groups demonstrated a greater tendency toward modules that are either updated only when necessary or kept stable. The Chi-Square test confirmed that these differences were not random, indicating that age is a significant variable shaping participants’ perceptions of update frequency. These results offer direct insights that can contribute to the project’s content development strategies. In total, the update frequency preferences of 367 participants were analyzed according to their age groups. As shown in Table 5, the largest share of respondents belonged to the 18–24 age group (n=262). Within this group, 93 participants supported updating every six months, while 86 participants stated that once a year would be sufficient. On the other hand, 60 participants preferred updates only in cases of major changes or needs, and 23 participants considered fixed content appropriate. These findings demonstrate that although the younger group is more open to regular

and frequent updates, a portion of them adopt a more flexible approach. Conversely, older participants exhibited a clear inclination toward less frequent or need-based updates, suggesting that training content strategies must be diversified according to the age composition of participants.

Table 57. Frequency Distribution of Participant Age Groups and the Update Frequency of Digital Training Content and Learning Modules to Be Developed within the Scope of the EPD-Net Project (Question 1 and Question 16)

Age Group	Every 6 months	Fixed content	Updated only when major changes or needs arise	Once a year	Total
18–24	93	23	60	86	262
25–29	16	3	13	17	49
30 and above	9	3	34	10	56
Total	**118**	**29**	**107**	**113**	**367**

In the 25–29 age group, a total of 49 participants were included. Within this group, 16 respondents preferred updates every six months, while 17 favored updates once a year. In addition, 13 participants supported updates only in cases of major changes, and 3 respondents expressed a preference for fixed content. This distribution suggests that the middle age group adopts a more moderate stance toward update frequency compared to younger participants. Among participants aged 30 and above (n=56), 34 preferred that content be updated only when needed, 10 opted for annual updates, 9 for updates every six months, and 3 for fixed content. These findings indicate that older participants are more inclined toward less frequent updates and place greater emphasis on stability. In the overall sample, 118 respondents favored updates every six months, 113 opted for annual updates, 107 supported updates only when necessary, and 29 preferred fixed content. These results highlight that different age groups exhibit distinct tendencies regarding update frequency. Younger participants' preference for more frequent updates may be attributed to their stronger need to access rapidly changing information and remain up to date. Conversely, older participants' emphasis on stability is reflected in their preference for less frequent or need-based updates.

The results of the Chi-Square test confirmed that there is a statistically significant relationship between age groups and preferences for the frequency of content updates (Pearson $\chi^2(6) = 32.727$; $p = 0.000$). The findings demonstrate that age is a determining factor in shaping preferences regarding the update frequency of digital content. Younger participants' demand for frequent updates reflects their need for rapid access to information and constant relevance, whereas older participants' search for stability reinforces their inclination toward less frequent updates. Therefore, it is crucial to design educational content flexibly, tailored to the expectations of different age groups. Strategically, training programs should address the needs of younger participants by providing frequent updates, while simultaneously accommodating

older groups who prefer stability through less frequent or fixed content. In conclusion, the Chi-Square test confirms that there is a significant association between age groups and preferences for update frequency. This relationship can provide valuable guidance for ensuring that the digital content developed within the EPD-Net Project is more effective, inclusive, and user-oriented.

The Relationship Between Participant Age Distribution and Benefits Reported By Participants (Question 1 and Question 18)

This section examines the relationship between participant age distribution (Q1) and the benefits reported by participants (Q18) within the scope of the EPD-Net Project. The analysis demonstrates how the gains obtained from the training modules and project processes differ across age groups. Both frequency distributions and Chi-Square test results are presented in detail. The findings reveal that technical skill acquisition and conceptual knowledge enhancement were more prominent among younger age groups. By contrast, older participants showed a stronger inclination toward developing solutions to real-life problems and benefiting from project experience. The Chi-Square test confirmed that these differences were statistically significant, indicating that age is a determining factor influencing learning outcomes. In particular, participants in the 18–24 age group demonstrated a higher tendency to focus on technical skills, while participants aged 30 and above emphasized applied learning and experiential gains. These distinctions suggest that training modules should be designed flexibly to accommodate the needs of different age groups. Overall, the findings provide a valuable framework for understanding the relationship between age and perceived benefits, underscoring the importance of tailoring educational content to diverse participant profiles.

Table 58. Frequency Distribution of Participant Age Groups and the Reported Benefits (Question 1 and Question 18)

Age Group	**Acquisition of Technical Skills *(e.g., GIS use, data analysis, climate simulation tools)***	**Increased Conceptual Knowledge and Awareness *(ecological planning, disaster resilience, sustainability, etc.)***	**Project Experience and Applied Learning Opportunities**	**Practice in Developing Solutions to Real-Life Problems**	**Other**	**Total**
18–24	137	58	26	21	21	263
25–29	34	8	6	0	2	50
30 and above	23	8	8	5	12	56
Total	**194**	**74**	**40**	**26**	**35**	**369**

An examination of the cross-tabulation in Table 58 shows that participants in the 18–24 age group most frequently reported benefits in terms of technical skills acquisition (e.g., GIS use, data analysis, climate simulation tools). This finding indicates that younger individuals possess a

higher capacity for adaptation to digital tools and technically oriented content. In the same age group, the relatively high rate of conceptual knowledge and awareness gains further reflects an increased awareness of ecological planning, disaster resilience, and sustainability. Among the 25–29 age group, technical skills remained important, but conceptual knowledge enhancement emerged more prominently. However, benefits derived from project experience and applied learning were relatively limited in this group. By contrast, participants aged 30 and above placed greater emphasis on project experience and applied learning opportunities. Notably, this group attached more importance to practical engagement with real-life problem-solving. The higher proportion of responses in the "Other" category among this group also suggests greater diversity in expectations and benefits. The results of the Chi-Square test support these observations. The Pearson Chi-Square value ($\chi^2(8) = 21.209$, $p = 0.007$) was found to be statistically significant, confirming a strong relationship between age and the type of benefits gained. Specifically, younger age groups prioritized technical and theoretical benefits, while older participants emphasized experiential and applied benefits. These findings underscore the necessity of differentiating training programs by age group. For younger participants, technology-based and innovative tools appear to be more effective, whereas for older participants, case studies, project-based learning, and field applications can provide a more impactful learning experience. In conclusion, the analyses demonstrate that age functions not merely as a demographic variable but as a critical determinant shaping the direction of learning outcomes. Accounting for these differences offers a significant strategy for enhancing the effectiveness of the training modules within the EPD-Net Project.

4.3.2. Gender Distribution: Frequency Distributions and Chi-Square Analyses

The Relationship Between Participants' Gender and the Preferred Tools, Content, or Resources to Be Included in the Digital Learning Platform (Question 2 and Question 22)

This section examines the relationship between participants' gender and their preferences regarding the tools, content, or resources they would like to see in the digital learning platform to be developed within the scope of the EPD-Net Project, based on the comparison of Question 2 and Question 22. The analysis seeks to demonstrate how gender differences influence learning preferences in digital education environments. The preferences of participants were first assessed using cross-tabulation, and the statistical significance of these differences was then tested through the Chi-Square analysis. The findings indicate that female participants expressed a stronger demand for video-based case studies, AI-supported counseling, and open course materials, while male participants showed a greater tendency toward interactive applications. This outcome highlights that gender-based differences lead to distinct expectations within the learning process. The significant results obtained from the Chi-Square test confirm that these differences are not random, but statistically meaningful. Therefore, it is crucial to account for gender differences when designing digital learning platforms to ensure accessibility, inclusivity, and effectiveness. In this context, diversified tools and content can provide a structure that accommodates different learning styles and supports more effective engagement.

Table 59. Frequency Distribution of Participants' Gender and the Preferred Tools, Content, or Resources to Be Included in the Digital Learning Platform to Be Developed within the Scope of the EPD-Net Project (Question 2 and Question 22)

Gender	Interactive Applications	Video Case Studies	AI-Supported Counseling	Simulations	Open Course Materials	Total
Male	74	17	9	10	2	112
Female	128	49	41	21	17	256
Total	**202**	**66**	**50**	**31**	**19**	**368**

An examination of the frequency distribution in Table 59 reveals that 66% of male participants preferred interactive applications. This finding indicates that men are more inclined toward learning methods requiring active engagement and user interaction. In contrast, 50% of female participants prioritized video case studies, suggesting that women place greater emphasis on visual content and scenario-based examples within the learning process. Additionally, female participants demonstrated broader interests across multiple resources: 16% selected AI-supported counseling, 8% simulations, and 7% open course materials. This highlights women's diverse orientation toward various forms of learning support. For male participants, preferences for AI-supported counseling (8%) and simulations (9%) remained comparatively limited.

Chi-square test results confirmed that there is a statistically significant relationship between gender and preferred tools ($\chi^2 = 11.605$, $p = 0.021$). These findings suggest that gender differences shape not only the type of content but also the broader learning experience. Women's stronger preference for AI-supported counseling and open course materials reflects a demand for guidance and easy access to knowledge, whereas men's focus on interactive applications demonstrates a higher prioritization of problem-solving and experiential learning. Taking these differences into account is critical for ensuring inclusivity in the design of digital learning platforms. Learning content should incorporate approaches that reflect both gender-based distinctions and individual learning styles. Such an inclusive design would provide flexible and accessible environments that meet the expectations of both female and male participants. Furthermore, the integration of AI-driven personalized learning pathways could effectively balance these differences. Overall, the results underscore that acknowledging gender differences in the design of the EPD-Net platform will enhance the quality of learning outcomes.

4.3.3. Level of Education: Frequency Distributions and Chi-Square Analyses

The Relationship Between Participants' Educational Levels and the Update Frequency of Digital Learning Content and Modules (Question 4 and Question 16)

This section examines the relationship between participants' educational levels and their preferences regarding the update frequency of digital learning content and modules to be developed within the scope of the EPD-Net Project, based on Questions 4 and 16. Educational attainment is a critical variable that directly influences individuals' modes of accessing knowledge and their learning needs. For this reason, it is essential to consider differences associated with educational level in the design of digital learning environments. The analysis first

employed a cross-tabulation to explore the distribution of participants' preferences, followed by a Chi-square test to determine the statistical significance of the relationship between educational level and update frequency. The results demonstrate distinct patterns across educational levels. In particular, undergraduate and associate degree graduates valued regular updates, while high school graduates favored need-based updates, and postgraduate (master's and doctoral) participants leaned toward either fixed content or updates only in the case of critical changes. The statistical findings confirm that these differences are not random but rather reflect meaningful distinctions across groups. Consequently, educational level should be considered as a significant determinant in planning digital learning modules.

An examination of the frequency distribution in Table 60 shows that undergraduate and associate degree holders formed the dominant group in terms of update preferences. Among the 269 participants in this category, 100 requested updates every six months, 85 preferred annual updates, 63 indicated updates should occur only when major changes arise, and 21 opted for fixed content. This distribution highlights the tendency of bachelor-level participants to place greater importance on regular updates. For the 68 high school graduates, 26 preferred updates only in cases of significant changes, 20 favored annual updates, 15 supported biannual updates, and 7 requested fixed content. This suggests that high school participants adopted a more flexible and pragmatic perspective, focusing primarily on need-based updates. By contrast, the 31 postgraduate participants displayed a different pattern: 18 preferred updates only when significant changes occurred, 9 were satisfied with annual updates, only 3 opted for biannual updates, and 1 requested fixed content. This distribution demonstrates that individuals with higher education levels adopt a more selective approach to updates. Overall, the findings indicate that the demand for regular updates is concentrated among undergraduates, while high school graduates exhibit more pragmatic, need-driven preferences. Meanwhile, postgraduate participants tend to emphasize stability and favor updates tied to critical changes, reflecting an increased pursuit of depth and consistency in accessing knowledge at higher educational levels.

Table 60. Frequency Distribution of Participants' Educational Levels and Preferences Regarding the Update Frequency of Digital Learning Content and Modules to Be Developed within the Scope of the EPD-Net Project (Q4 and Q16)

Educational Level	**Every 6 Months**	**Fixed Content**	**Only When Major Changes or Needs Arise**	**Once a Year**	**Total**
Master's / Doctorate	3	1	18	9	31
Associate / Bachelor's	100	21	63	85	269
High School	15	7	26	20	68
Total	**118**	**29**	**107**	**114**	**368**

The results indicate that there is a statistically significant relationship between educational level and preferences regarding update frequency ($\chi^2(6) = 24.522$, $p = 0.000$). Since the obtained p-value is smaller than 0.05, this relationship is not coincidental. The findings highlight, in particular, the contrast between the undergraduate group's preference for regular updates and the master's/doctoral group's tendency toward selective, need-based updates. This outcome

demonstrates that strategies for updating digital content should be differentiated according to educational level. For example, more frequent periodic updates may enhance motivation among undergraduate participants, whereas postgraduate learners prefer stability and updates tied only to critical changes, emphasizing the need for a more consistent content management approach for this group. Furthermore, the high school group displayed a moderate degree of flexibility. Their inclination toward both annual updates and need-based updates indicates a more balanced approach. The findings clearly suggest that the frequency of digital content updates should be determined with explicit consideration of the target audience's educational level. In conclusion, the Chi-square analysis confirms that educational level is a critical factor influencing digital learning preferences. As education level increases, preferences tend to become more selective and stability-oriented, while lower levels emphasize flexibility and practicality. This finding underscores the need for a multi-dimensional strategy in content update planning within the scope of the EPD-Net Project.

The Relationship Between Participants' Educational Levels and the Digital Tools Actively Used in Their Educational Life (Question 4 and Question 20)

This section examines the relationship between participants' educational levels and the digital tools they actively use in their educational life, based on Questions 4 and 20. The use of digital tools is one of the fundamental factors that enriches learning experiences and enhances efficiency in educational processes. Differences in tool preferences across educational levels highlight the diversity of learning needs. First, the distribution of responses was evaluated through a frequency table, followed by a Chi-square test to assess the statistical significance of the observed differences. The findings indicate that associate and bachelor's degree participants employ a wide range of digital tools, reflecting broader exposure and integration of various resources into their learning. At the master's and doctoral levels, the use of digital tools appears more selective yet more intensive, suggesting targeted engagement with specialized applications. In contrast, high school graduates were primarily oriented toward basic and more accessible digital tools, highlighting a different pattern of engagement. The results of the Chi-square test confirm that these differences are not coincidental. Therefore, in the design of digital learning content, it is essential to take into account the tool usage habits associated with different educational levels. This approach will ensure that digital learning environments are responsive to the varied needs and expectations of learners across different educational backgrounds.

Table 61. Frequency Distribution of Participants' Educational Levels and the Digital Tools Actively Used in Their Educational Life (Q4 and Q20)

Educational Level	Distance Learning Platforms (e.g., Moodle, Google Classroom)	Video Teaching Tools (e.g., Zoom, MS Teams)	Spatial Analysis / Technical Drawing and Modeling Software	Other	Total
Master's / Doctorate	16	12	4	0	32

Educational Level	Distance Learning Platforms (e.g., Moodle, Google Classroom)	Video Teaching Tools (e.g., Zoom, MS Teams)	Spatial Analysis / Technical Drawing and Modeling Software	Other	Total
Associate / Bachelor's	120	77	58	14	269
High School	22	22	11	14	69
Total	**158**	**111**	**73**	**28**	**370**

An examination of the frequency distribution in Table 61 shows that associate and bachelor's degree students reported the highest numbers across all categories. Within this group, 120 participants actively used distance learning platforms, 77 used video teaching tools, 58 relied on technical software and modeling programs, and 14 reported using other tools. This distribution indicates that undergraduate-level students prioritize diversity in their use of digital tools. At the master's and doctoral levels, usage appears more limited but highly focused. Sixteen participants reported using distance learning platforms, 12 used video teaching tools, and 4 relied on technical software. The absence of preferences in the "Other" category suggests that postgraduate participants concentrate primarily on selected academic-oriented tools. This pattern reflects a more research-driven and specialized approach to digital tool use. For high school participants, 22 reported using distance learning platforms, 22 used video teaching tools, 11 preferred technical software and modeling applications, and 14 relied on other tools. This indicates that while high school learners are more oriented toward basic learning tools, they also show some engagement with alternative resources.

Overall, distance learning platforms emerged as the most widely used tool, with 158 participants, followed by video teaching tools (n=111) and technical software (n=73). The "Other" category was the least preferred, with 28 participants. These findings suggest that participants' learning processes are primarily shaped by synchronous/asynchronous course platforms and video-based applications. The Chi-square test results confirm that there is a statistically significant relationship between educational level and the types of digital tools used ($\chi^2(6) = 24.342$, $p = 0.000$). Since the p-value is smaller than 0.05, the relationship is not coincidental. The analysis highlights that undergraduate participants exhibit the highest diversity in tool use, whereas master's and doctoral students demonstrate a more selective, academically focused use. In contrast, high school participants rely primarily on basic and more accessible tools.These findings indicate that as educational level increases, there is a clear trend toward specialization in digital tool use, while at intermediate levels diversity dominates. The Chi-square analysis further shows that although distance learning platforms are widely used across all groups, differences are more pronounced in the use of technical software. The intensive use of such tools at the undergraduate level underscores the strong link between technical proficiency and educational level, while at the postgraduate level these tools appear to serve more research-oriented purposes. In conclusion, the results clearly demonstrate that educational level is a decisive factor in digital tool usage. As educational attainment increases, the tendency toward focused and selective use becomes more evident, while at lower levels accessibility and

practicality are prioritized. This finding provides an important insight for the design of digital learning content within the scope of the EPD-Net Project.

The Relationship Between Participants' Educational Levels and the Most Important Features Required in the User Interface of the Digital Learning Platform (Question 4 and Question 23)

This section analyzes the relationship between participants' educational levels and the most important features expected in the user interface of the digital learning platform to be developed within the scope of the EPD-Net Project, based on Questions 4 and 23. The findings indicate that the success of digital learning platforms is directly linked to the functionality of their user interfaces and the extent to which they are user-friendly. The analyses reveal that individuals with different educational backgrounds demonstrate distinct expectations from digital learning tools. For instance, master's and doctoral participants placed greater emphasis on multilingual support, whereas high school graduates highlighted accessibility and mobile compatibility as top priorities. The associate and bachelor's group showed a more balanced distribution, giving simultaneous priority to several features. The results underscore the importance of tailoring the platform design to the needs of different user profiles according to educational level. Chi-square test results confirm that there is a statistically significant relationship between educational level and user interface expectations. This suggests that both the content and technological infrastructure of the platform must be designed in line with the diversity of the target audience. By addressing these differences, the EPD-Net platform can effectively meet the expectations of users across various educational levels and provide a more inclusive and efficient learning environment.

Table 62. Frequency Distribution of Participants' Educational Levels and the Most Important Features Required in the User Interface of the Digital Learning Platform to Be Developed within the Scope of the EPD-Net Project (Q4 and Q23)

Educational Level	**Accessibility (disability-friendly interface)**	**Multilingual support**	**Mobile compatibility**	**Simple and intuitive use**	**Content supported with visual explanations**	**Total**
Master's / Doctorate	11	13	5	3	0	32
Associate / Bachelor's	142	44	47	24	12	269
High School	26	17	10	13	3	69
Total	**179**	**74**	**62**	**40**	**15**	**370**

According to the frequency analysis results presented in Table 62, accessibility emerged as the most highly demanded feature across all educational groups. This finding underscores the necessity of developing disability-friendly interfaces in line with the principle of inclusivity in digital platforms. The emphasis on accessibility was particularly pronounced among

associate/bachelor's degree participants. By contrast, multilingual support appeared as a major need among master's and doctoral participants, reflecting the demand for broader language options among users who consume content in both academic and international contexts. Participants with a high school background placed stronger emphasis on accessibility and mobile compatibility, indicating their higher reliance on mobile devices and prioritization of ease of use.

Content supported by visual explanations was identified as the least preferred option across all groups. This result suggests that users attach greater importance to the functionality and accessibility of content than to its visual aspects alone. Simplicity and intuitive use were highlighted more strongly by both the high school and associate/bachelor's groups. The Chi-square test results ($p = 0.010$) confirmed that there is a statistically significant relationship between educational level and user interface preferences. This finding validates the variability in platform expectations among users with different educational backgrounds. Notably, the stronger orientation of master's/doctoral participants toward more specific needs highlights the necessity of flexibility in platform design. Meanwhile, the associate/bachelor's group, representing the largest user base, indicates that the core features of the platform should be shaped with their needs in mind. The emphasis of high school participants on accessibility and mobile compatibility underscores the importance of strategies to reduce technological access inequalities. Furthermore, the limited demand for visual content implies that visual elements alone are insufficient to enhance the learning experience; instead, they should be integrated with other functions such as accessibility and multilingual support.

The analysis results demonstrate that a one-size-fits-all approach to user interface design would be inadequate. Instead, integrating features tailored to the needs of different user groups is essential. By taking this diversity into account, the EPD-Net platform can increase both user satisfaction and learning effectiveness. The Chi-square analysis results further confirmed a statistically significant relationship between educational level and the preferred features of the digital learning platform's user interface. The Chi-square test statistic was $\chi^2(8) = 20.147$ with a significance level of $p = 0.010$, confirming the reliability of this relationship. Examination of the findings revealed that master's and doctoral participants placed particular emphasis on multilingual support, reflecting the need for international interaction and access to multilingual content in academic contexts. For associate and bachelor's participants, accessibility was identified as the most critical feature, demonstrating their strong emphasis on inclusivity in digital content. High school participants, in addition to accessibility, highlighted mobile compatibility, pointing to their reliance on practical and fast access solutions.

Content supported with visual explanations was again among the least preferred features in all groups, suggesting that core interface functions take precedence. In the analysis, approximately 20% of cells showed expected frequency values below the threshold; however, this did not significantly affect the overall validity of the results. The adequate sample size supported the statistical power of the test. The significant results clearly demonstrate that a uniform user interface design would not be sufficient. Instead, modular and flexible design features that respond to the different needs of users at various educational levels should be adopted. The prioritization of accessibility is a critical finding, as it ensures that the platform can effectively serve a broad audience, including users with disabilities. The emphasis on mobile compatibility

reflects the expectations of younger users for mobility and ease of access in digital learning. Finally, multilingual support emerges as a strategic necessity, especially for higher education groups, to strengthen the international functionality of the platform. In conclusion, the Chi-square analysis findings confirm that user interface design is significantly associated with educational level, highlighting the importance of developing customized solutions tailored to different user profiles during the design process.

4.3.4. Analyses Related to Participants' Fields of Study

The Relationship Between Participants' Fields of Study and the Digital Skills to Be Prioritized in the Training Modules (Question 6 and Question 14)

This section examines the relationship between participants' fields of study and the digital skills to be prioritized in the training modules to be developed within the scope of the EPD-Net Project, based on Questions 6 and 14. The analysis reveals that the digital skill requirements of participants working in architecture, planning, and design disciplines differ significantly from those in other fields. While frequency distributions quantitatively illustrate these differences, Chi-square analyses test whether these variations are statistically significant. This dual approach ensures that the training content can be designed not only in line with general trends but also in response to discipline-specific expectations.In the context of digital skills, several themes stand out, including spatial analysis, AI-supported planning, data analysis, and climate simulations. The results also show that the perceived need for updating training content varies across fields of study: some disciplines demand dynamic and frequent updates, while others prefer more stable content. These findings clearly demonstrate that interdisciplinary differences must not be overlooked. Accordingly, the digital learning modules of the EPD-Net Project should be designed in a flexible, modular, and field-specific manner. Such an approach would ensure that the project outputs are functional and beneficial for professionals not only in architecture and planning but also in other disciplines.

Table 63. Frequency Distribution of Participants' Fields of study and the Digital Skills to Be Prioritized in the Training Modules to Be Developed within the Scope of the EPD-Net Project (Q6 and Q14)

Field of Study	**Map Literacy and Spatial Analysis (e.g., GIS)**	**AI-Supported Planning and Decision Support Systems**	**Technological Tools and Data Analysis Skills**	**Digital Climate Modeling and Simulation Skills**	**Smart City Technologies and Data Management**	**Total**
Architecture, Planning, and Design Fields	83	65	65	32	25	231
Other	64	34	34	25	11	139
Total	**147**	**99**	**99**	**57**	**36**	**370**

The frequency distribution in Table 63 demonstrates the variation in digital skill priorities across participants' fields of study. Among the 231 participants working in architecture, planning, and design, the majority emphasized *map literacy and spatial analysis skills*. This finding underscores the critical importance of geographic information systems (GIS) and spatial data for professional applications in these disciplines. Within the same group, *AI-supported planning and decision support systems* were also highly prioritized, reflecting the growing demand for integrating next-generation technologies into spatial planning. *Technological tools and data analysis skills* were relatively less preferred in architecture and planning fields. This may be attributed to the fact that these groups tend to focus more on visual and spatial outputs rather than data analysis itself. Similarly, interest in *digital climate modeling and simulation skills* remained relatively limited, suggesting that climate-related risks are addressed as a secondary concern within the discipline. *Smart city technologies and data management* were prioritized by only a small group of respondents.The 139 participants from other fields demonstrated a more balanced distribution. Although spatial analysis remained a key priority in this group, the proportion was lower compared to the architecture and planning cohort. Both *AI-supported planning* and *technological tools* also received notable attention among participants from other disciplines. Interestingly, demand for *digital climate modeling and simulation* in this group was very limited, while *smart city technologies* were also less frequently prioritized. In total, across the 370 participants, *spatial analysis* emerged as the most frequently selected skill (n=147). This was followed by *AI-supported planning* (n=99). *Technological tools and data analysis skills* were prioritized by 57 participants, while *climate modeling* and *smart city technologies* were marked by 36 and 31 participants, respectively. This distribution indicates that while priorities differ across disciplines, the general trend leans strongly towards spatial analysis and AI-supported planning.

The Chi-Square test results confirm that there is a statistically significant relationship between participants' fields of study and the digital skills to be prioritized in the training modules to be developed under the EPD-Net project. The Pearson Chi-Square value was calculated as 10.464 with 4 degrees of freedom. The obtained *p*-value was 0.033, which is lower than the 0.05 threshold, and therefore considered statistically significant. This finding demonstrates that participants from different fields prioritize digital skills differently. The total valid sample size used in the analysis was 370, which strengthens the reliability of the results. The findings suggest that training modules should be diversified to reflect the needs of participants from different sectors. In particular, certain sectors appear to place greater emphasis on specific digital skills. This underscores the necessity for flexibility and modularity in training design. The results may also serve as strategic guidance for the EPD-Net project by highlighting which skills are perceived as more critical in different fields. Thus, training content can be prioritized sectorally. Importantly, the statistical significance of the results confirms that the observed distribution is not random. In conclusion, the analysis supports the development of need-based modules tailored to the EPD-Net project's target audience.

The Relationship Between Participants' Fields of Study and the Update Frequency of Digital Training Content and Learning (Question 6 and Question 16)

This section examines the relationship between participants' fields of study (Q6) and their views on the update frequency of digital training content and learning modules to be developed within the scope of the EPD-Net project (Q16). The analysis presents participants' perspectives on how frequently digital training materials should be updated, comparing expectations across different professional domains. The frequency tables reveal that participants working in architecture, planning, and design fields tend to prefer more regular and frequent updates. In contrast, respondents from other professional domains show a stronger inclination towards need-based updates. The Chi-Square analysis confirms that these differences are statistically significant, demonstrating that the field of work has a determining effect on participants' preferences. The findings indicate that a one-size-fits-all update policy would be insufficient for the EPD-Net project. Instead, differentiated, flexible, and modular strategies tailored to specific fields of study should be adopted. Such an approach would not only enhance user satisfaction but also improve the overall effectiveness of the content. Consistent with existing research in the field of educational technologies, this study highlights the importance of strategic content planning. In conclusion, the findings underscore the necessity of sustainable and domain-oriented content management within the EPD-Net project.

Table 64. Frequency Distribution of Participants' Fields of Study and the Update Frequency of Digital Training Content and Learning Modules to Be Developed within the Scope of the EPD-Net Project (Q6 and Q16)

field of study	**Every 6 months**	**Content should remain fixed**	**Should be updated only when significant changes or needs arise**	**Once a year**	**Total**
Architecture, Planning, and Design Fields	92	20	43	76	231
Other	26	9	64	38	137
Total	**118**	**29**	**107**	**114**	**368**

The frequency table presented in Table 64 clearly illustrates the tendencies of participants regarding the update frequency of training content across different fields of study. Among the 231 participants working in architecture, planning, and design fields, the majority emphasized the necessity of regular updates. Within this group, the highest preference was for the "every 6 months" option (n=92), followed by "once a year" (n=76). In contrast, only 20 participants favored fixed content, while 43 argued that updates should occur only when significant changes arise. In other professional fields, represented by 137 participants, a different distribution pattern was observed. The strongest inclination in this group was toward "updates when necessary" (n=64). A total of 38 participants preferred annual updates, while only 26 requested biannual updates. Fixed content was chosen by a very limited number (n=9). Across the overall sample of 368 participants, 118 preferred updates every six months, 114 opted for annual updates, and 107

favored need-based updates, whereas only 29 supported fixed content. This distribution highlights the divergence in perspectives on the necessity of updates across occupational groups. In fields such as architecture, planning, and design, a technology-oriented professional culture necessitates frequent updates, while in other fields with a more stable knowledge base, need-based updates are more prominent. This divergence indicates that a one-size-fits-all approach to content management would be insufficient. In conclusion, the frequency table reveals a clear differentiation across fields of study and provides strategic guidance for planning.

The Chi-Square analysis assessed whether the relationship between professional field and update frequency was statistically significant. The Pearson Chi-Square value was found to be 36.229, with a significance level of p=0.000. This result confirms that there are strong and significant differences among the groups. In other words, participants' fields of study have a determining effect on their preferences regarding update frequency. The analysis further confirms that participants in architecture, planning, and design place greater emphasis on frequent updates, while participants from other fields lean toward a "needs-based update" approach. Thus, a strong consistency is observed between the statistical analysis and the frequency distributions. The findings demonstrate that the EPD-Net project should not adopt a uniform update policy but rather implement differentiated strategies tailored to specific fields. Such an approach will not only enhance user satisfaction but also increase the overall effectiveness of the content. This statistically significant difference should not be overlooked in strategic content planning, as field-specific expectations directly affect participants' engagement with the project. Furthermore, the results highlight the importance of flexible and modular content design. Similar studies in the field of educational technologies have shown that such differences are critical to the long-term success of projects. Therefore, the implementation of field-based differentiated update strategies within the EPD-Net project is scientifically justified.

The Relationship Between Participants' Fields of Study and the Types of Benefits Provided by the EPD-Net Project (Question 6 and Question 18)

In this section, the relationship between participants' fields of study and the types of benefits provided by the EPD-Net project was analyzed by examining Question 6 and Question 18. As shown in Table 65, among the total of 370 participants, the distribution of preferences across different benefit categories reveals notable patterns. Among the 231 participants from the fields of architecture, planning, and design, the highest preference was observed for *"acquisition of technical skills"* (n=128). This result highlights the strong expectations of professionals in these disciplines regarding digital tools and technical applications. Within the same group, 36 participants identified *conceptual knowledge and awareness-raising* as the most important benefit. A total of 28 respondents emphasized *project experience and opportunities for applied learning*, while only 19 considered *problem-solving practices in real-life contexts* as a primary benefit. Additionally, 20 participants selected *other* benefits.By contrast, the 139 participants from other professional fields displayed a different distribution. While the most frequently cited benefit was again the *acquisition of technical skills* (n=66), the number of participants highlighting *conceptual knowledge and awareness-raising* was higher in this group (n=39). A total of 12 participants emphasized *project experience and practical learning opportunities*, whereas only 7 highlighted *real-life problem-solving practices*. Fifteen respondents selected *other* categories of

benefits. In the overall sample, 194 participants prioritized *technical skill acquisition* as the key benefit of the EPD-Net project. Meanwhile, 75 participants emphasized *conceptual knowledge and awareness-raising*, 40 highlighted *project experience*, 26 underscored *problem-solving practices*, and 35 selected *other* benefits. This distribution demonstrates that technical skills are perceived as the most fundamental benefit across all participants, regardless of their field of work. However, the higher rate of emphasis on conceptual knowledge among participants from non-architecture fields is particularly noteworthy. These findings underline the need for the EPD-Net project to design its outputs in a way that not only strengthens technical competencies but also fosters conceptual understanding and awareness among participants from diverse disciplines.

Table 65. Frequency Table of Participants' Fields of Study and the Types of Benefits Provided by the EPD-Net Project (Question 6 and Question 18)

Field of Work	**Acquisition of technical skills (e.g., GIS use, data analysis, climate simulation tools)**	**Increased conceptual knowledge and awareness (e.g., ecological planning, disaster resilience, sustainability, etc.)**	**Project experience and opportunities for applied learning**	**Practice in solving real-life problems**	**Other**	**Total**
Architecture, Planning, and Design Fields	128	36	28	19	20	231
Other	66	39	12	7	15	139
Total	**194**	**75**	**40**	**26**	**35**	**370**

The results of the chi-square test indicate that there is a significant relationship between participants' fields of study and the benefits gained from the project. The Pearson Chi-Square value was calculated as 10.351, with a significance level of $p = 0.035$. This value demonstrates that, at the 5% significance level, there are statistically significant differences between the groups. In other words, the perceived benefits vary according to the participants' professional fields. Among participants from non-design-related professions, conceptual knowledge enhancement and diverse learning outcomes appear to be more prominent. This difference highlights the contribution of interdisciplinary approaches to diversifying the project's outputs. The statistically significant findings suggest that EPD-Net does not provide the same type of benefits for all fields but instead offers differentiated advantages depending on professional backgrounds. This demonstrates the project's broad scope of impact. Furthermore, the results emphasize the importance of considering participants' professional domains in the design of educational content. While technical outcomes are prioritized in certain disciplines, knowledge and awareness gains are more strongly demanded in others. The chi-square analysis confirms that these differences are not coincidental but are distributed in a statistically meaningful way. Therefore, it can be concluded that the field of work is a critical determinant in assessing the

outcomes of the EPD-Net project. In conclusion, the findings scientifically support that the EPD-Net project creates an interdisciplinary impact grounded in professional diversity.

The Relationship Between Participants' Fields of Study and the Most Important Features Required in the User Interface of the Digital Learning (Question 6 and Question 23)

In this section, the relationships between participants' fields of study and the key features of the user interface of the digital learning platform to be developed within the EPD-Net project are analyzed using frequency and Chi-Square tests. The effectiveness of digital learning platforms is closely linked not only to the quality of their content but also to the accessibility, functionality, and user-friendliness of their interfaces. Understanding which aspects are prioritized by participants from different disciplines is critical to ensuring the broad acceptance and usability of the platform. While the frequency tables illustrate which features are most valued, the Chi-Square analysis tests whether these preferences are statistically associated with participants' fields of study. Thus, the findings provide a scientific basis for the interface development process and reinforce the importance of a user-centered design approach. According to the frequency table, the most emphasized user interface feature among participants from the fields of architecture, planning, and design is accessibility. Within this group, 129 participants identified accessibility as the most important factor. This result highlights the prominence of inclusive and user-friendly design principles, which are inherently significant in these fields. For participants from other professional domains, multilingual support emerges as a more distinctive priority. A total of 36 respondents in this group selected this option, reflecting the needs of users with diverse linguistic backgrounds.

Among participants from architecture and design fields, mobile compatibility and simplicity of use were reported at comparatively lower levels. This indicates that these groups prioritize the removal of access barriers and ensuring content is available to a broad range of user profiles, rather than focusing primarily on ease of operation. In contrast, in the "other" group, mobile compatibility was emphasized by 25 participants, a considerable proportion that points to the growing importance of learning in field-based and mobile environments.Visual content supported with illustrations was the least preferred option in both groups. This suggests that participants value accessibility and usability more than visual appeal. Even within the architecture, planning, and design group, visual features were not considered a priority, with accessibility being seen as far more critical.

Overall, 179 participants selected accessibility, making it the most dominant feature. Multilingual support ranked second, with 74 selections, an important finding for the platform's potential use on an international scale. Mobile compatibility was selected by a total of 62 participants, reflecting the role of mobile technologies in modern learning practices. A total of 40 participants highlighted simple and intuitive use, underlining the importance of user-friendly design as a non-negligible factor. Visual content supported with illustrations was chosen by only 15 participants, demonstrating that users assign greater value to functional aspects rather than the visual attractiveness of the platform. In conclusion, the frequency analysis reveals that participants are more focused on accessibility, multilingual support, and mobility, while visual and aesthetic factors are of lower priority.

Table 66. Frequency Table of the Relationship Between Participants' Fields of Study and the Most Important Features Required in the User Interface of the Digital Learning Platform to Be Developed within the Scope of the EPD-Net Project (Question 6 and Question 23)

Field of Study	Accessibility (disability-friendly interface)	Multilingual support	Mobile compatibility	Simple and intuitive use	Content supported by visual explanations	Total
Architecture, Planning and Design Fields	129	38	37	20	7	231
Other Fields	50	36	25	20	8	139
Total	**179**	**74**	**62**	**40**	**15**	**370**

The Chi-Square test results indicate a statistically significant relationship between participants' fields of study and their user interface preferences. The Pearson Chi-Square value was calculated as 15.385 with a significance level of p=0.004. Since this value is below the 5% error margin, the null hypothesis is rejected, confirming that differences exist between the groups. These results particularly reveal that preferences for accessibility and multilingual support vary according to professional fields. The predominance of accessibility within the architecture and design group aligns with this field's sensitivity to inclusive design. Conversely, the emphasis on multilingualism among participants from other fields reflects the need for interdisciplinary diversity and international interaction. Preferences regarding mobile compatibility also differ between the two groups; while the architecture and planning group placed less emphasis on this feature, it was highlighted more strongly in other fields. This divergence can be attributed to the nature of professional practices and learning environments.

The Chi-Square results further show that visual content preferences were consistently low across both groups and statistically less decisive. The variation in interface needs according to professional field underscores the importance of adopting a user-centered approach. The findings suggest that instead of a uniform design, flexible solutions sensitive to the requirements of different professional groups should be developed. These results also provide critical insights for the platform's applicability across diverse geographical and cultural contexts. The presence of statistically significant differences among participant expectations highlights the necessity of user segmentation in the development process. In this way, the user interface can be designed not only to ensure technical functionality but also to address cross-professional differences in expectations. The results of the Chi-Square analysis thus serve as a guiding framework, embedding a user-centered design perspective into the project.

The Relationship Between Participants' Fields of Study and the Most Effective Methods for Sharing or Promoting EPD-Net Training Modules (Question 6 and Question 25)

In this section, the relationship between participants' fields of study and the most effective methods for sharing or promoting EPD-Net training modules is analyzed by examining Question

6 and Question 25. The aim is to provide a scientific basis for the development of strategic communication plans through the assessment of participants' preferences regarding promotional methods according to their professional fields. The frequency table highlights which methods participants considered to be more effective, while the Chi-Square analysis tests whether these preferences differ significantly among occupational groups. In this way, the project can be developed with a user-centered approach not only in terms of content but also in communication strategies.

Table 67. Frequency Table of Participants' Fields of Study and the Most Effective Methods for Sharing or Promoting EPD-Net Training Modules (Question 6 and Question 25)

6 – Field of Work	**Social Media Campaigns**	**Webinars (Online Seminars)**	**Regional Workshops**	**Other**	**Total**
Architecture, Planning, and Design Fields	146	41	19	25	231
Other Fields	98	17	3	21	139
Total	**244**	**58**	**22**	**46**	**370**

When examining the frequency table in Table 67, it becomes evident that both participant groups regard social media campaigns as the most effective method of dissemination. Within the architecture, planning, and design group, 146 participants selected this option, while 98 participants from other fields did the same. In total, 244 respondents prioritized social media, reflecting the decisive influence of digital communication in contemporary contexts. This finding supports the prioritization of social media–based strategies for reaching younger audiences with higher levels of digital literacy. Webinars were identified as the second most preferred method. In the architecture and design group, 41 participants considered webinars appropriate, compared to 17 participants from other fields. The fact that a total of 58 respondents indicated webinars highlights the growing interest in online and interactive learning environments. Regional workshops, on the other hand, received relatively limited preference. Only 19 participants in the architecture group and 3 in the other group considered this method effective. This low percentage suggests that in-person activities are less favored due to spatial and time constraints.

The "Other" category was chosen by 25 participants in the architecture group and 21 participants in other fields, indicating a demand for alternative methods beyond social media and webinars. Overall, the dominance of social media campaigns is aligned with contemporary communication dynamics. At the same time, the prominence of webinars points to participants' pursuit of interaction in digital environments. The limited preference for workshops suggests constraints related to logistics, while the notable proportion of participants selecting "Other" reveals openness to more creative and diversified methods.

The results of the Chi-Square analysis confirm that there is a statistically significant difference between participants' fields of study and their preferred methods of dissemination. The Pearson Chi-Square value was calculated as 9.041 with a significance level of $p = 0.029$, indicating that preferences differ by professional field under the 5% significance threshold. In the architecture

and design group, webinars and workshops were relatively more frequently preferred. This finding reflects the discipline's inherent emphasis on applied and interactive methods. In contrast, participants from other fields demonstrated a stronger preference for social media campaigns. This suggests that different professional groups exhibit distinct tendencies in terms of communication channels and dissemination preferences. While social media represents a strong common ground across groups, second-choice preferences emerge as statistically significant differentiators. The greater preference for webinars among the architecture group indicates that this cohort may benefit more from digital seminar formats. Although workshops were selected at relatively low rates, the statistically significant difference between groups underscores that this option should not be overlooked. Moreover, the considerable selection of the "Other" category across both groups emphasizes openness to diverse dissemination approaches. Taken together, these results suggest that the project's dissemination strategy should adopt a flexible and multi-channel approach. Social media campaigns should serve as the primary method, but webinars and alternative methods must also play a significant complementary role. The Chi-Square findings reinforce the importance of considering group-specific differences, particularly regarding webinars and other innovative strategies, in the development of tailored dissemination plans.

The Relationship Between Participants' Fields of Study and the Digital Tools They Use Most Actively in Their Educational Life (Question 6 and Question 20)

Designing the EPD-Net project content in alignment with participants' existing digital habits is a strategic requirement for ensuring the project's effectiveness. In this context, the frequency tables illustrate which digital tools participants use most intensively and reveal how these usage patterns differ across professional groups. The Chi-Square analysis further evaluates whether these differences are statistically significant. In this way, the findings provide a scientific foundation for tailoring project outputs to the needs of the target audience.

Particularly, distance learning platforms, video-based instructional tools, and technical software emerge as the most prominent tools in learning processes. Additionally, data on the use of next-generation AI-supported tools reflect how digital transformation is being integrated into the field of education. This analysis contributes to identifying the most appropriate sets of tools that can strengthen EPD-Net's digital learning ecosystem. Therefore, the patterns of digital tool use across different fields of study should be considered a guiding parameter in the design of the project.

Table 68. Frequency Table of Participants' Fields of Study and the Digital Tools They Use Most Actively in Their Educational Life (Question 6 and Question 20)

Field of Study	Distance learning platforms (e.g., Moodle, Google Classroom)	Video teaching tools / Educational video platforms (e.g., Zoom, MS Teams)	Mapping and spatial analysis software (e.g., ArcGIS, QGIS, NetCAD, MapInfo)	Technical drawing / modeling software (e.g., AutoCAD, SketchUp)	AI-powered tools (e.g., ChatGPT, Copilot)	Survey/quiz tools (e.g., Google Forms, Kahoot)	Total
Architecture, Planning and Design Fields	104	70	20	31	5	1	231
Other	54	47	17	5	11	4	138
Total	**158**	**117**	**37**	**36**	**16**	**5**	**369**

As shown in the cross-tabulation in Table 68, the most preferred tools among both the architecture, planning, and design group and participants from other fields are distance learning platforms. In the architecture group, 104 participants reported actively using these tools, while in the other group the number was 54. With a total of 158 users, this finding highlights the central role of such platforms in digital education. The second most frequently used tools are video-based teaching platforms, with 70 users from the architecture group and 47 from the other group. This result underlines the need for synchronous teaching methods. Mapping and spatial analysis software was particularly common among the architecture group, with 20 participants selecting this option, compared to 17 in the other group. This reflects the way tool preferences vary in relation to professional requirements. Technical drawing and modeling software was used by 31 participants in the architecture group but only 5 in the other group. This clearly demonstrates profession-specific differences in tool usage. AI-powered tools were used by 11 participants in the other group, but only 5 in the architecture group, suggesting that interest in AI-based solutions varies depending on the field of expertise. Survey and quiz tools represented the least-used category, with only 5 participants in total. This low figure indicates that assessment tools are relatively limited in individual use.

Overall, the findings suggest that the core learning tools for both groups are distance learning platforms and video-based tools. However, technical drawing and spatial analysis software are concentrated specifically within the architecture group, while AI-powered tools are used more actively by the other group. These differences demonstrate that digital tool preferences diversify according to professional context. In conclusion, the frequency data clearly reflects both shared areas of use and profession-specific distinctions.

Chi-square test results confirm a statistically significant relationship between participants' fields of study and the digital tools they use (Pearson $\chi^2(5) = 21.331$; $p = 0.001$). In particular, significant differences exist in the use of technical drawing and spatial analysis software: the architecture group reports high levels of usage, whereas the other group shows very limited engagement. Conversely, AI-powered tools are more commonly used in the other group, indicating that such tools have a broader interdisciplinary and general applicability. Distance learning platforms and video-based tools are preferred at high rates in both groups, suggesting that these tools form a common ground in the digitalization of education. Although survey and quiz tools showed very low usage and did not produce significant differences in the statistical test, they nonetheless reflect general usage tendencies. The analysis highlights the need to consider profession-specific digital tool preferences in the educational design process. These differences strengthen the case for customization in content development and user interface design. Moreover, the results confirm that the architecture group is more dependent on technical software, while other groups tend to adopt more general digital tools. Therefore, in the EPD-Net project, a hybrid integration of digital tools tailored to the needs of both groups is recommended.

The Relationship Between Participants' Knowledge Level in Disaster Resilience and Ecological Planning and the Digital Skills Expected to Be Prioritized in the Training Modules (Question 8 and Question 14)

In this section, the relationship between participants' current knowledge level in disaster resilience and ecological planning and the digital skills expected to be prioritized in the training modules to be developed within the scope of the EPD-Net project is analyzed. Cross-tabulations between Question 8 (knowledge level) and Question 14 (priority digital skills) were examined, thereby statistically testing the role of participants' knowledge base in shaping the content of the training modules. The frequency tables clearly demonstrate which digital skills are considered more important by the participants. For example, participants with higher levels of knowledge tend to prioritize more advanced skills (e.g., AI-supported planning, climate modeling), while those with lower levels of knowledge focus on more fundamental skills (e.g., map literacy, basic data analysis). This differentiation highlights the need for training modules to be designed in a layered and modular structure, capable of addressing the needs of all user profiles.

The Chi-Square analysis tested whether these observed tendencies were random and revealed a statistically significant relationship between participants' knowledge levels and their prioritization of digital skills. This finding demonstrates that training modules should not only be designed in line with general trends but also adapted according to the existing competence levels of participants. The results underscore the necessity of adopting a data-driven and needs-oriented content development approach within the EPD-Net project. Furthermore, the varying knowledge levels of participants require that the project outputs emphasize flexibility and personalization. Such an approach will not only enhance the effectiveness of the learning process but also strengthen user satisfaction and the overall impact of the project. The findings also provide valuable guidance for the planning of similar educational projects in the future.

Table 69. Cross-tabulation of Participants' Knowledge Level in Disaster Resilience and Ecological Planning and the Digital Skills Expected to Be Prioritized in the Training Modules to Be Developed within the Scope of the EPD-Net Project (Question 8 and Question 14)

How do you assess your current level of knowledge in the field of disaster resilience and ecological planning?	**Map literacy and spatial analysis (e.g., GIS)**	**AI-supported planning and decision support systems**	**Technological tools and data analysis skills**	**Digital climate modeling and simulation skills**	**Smart city technologies and data management**	**Total**
Very little knowledge (only basic awareness)	24	31	19	5	9	88
Good level of knowledge (I have received training or have course/volunteering experience)	34	13	10	9	0	66
Moderate level of knowledge (I know some basic concepts and processes)	89	55	28	22	16	218
Total	**147**	**99**	**57**	**36**	**25**	**370**

When examining the frequency table in Table 69, it is observed that participants with a moderate level of knowledge assign the highest priority to map literacy and spatial analysis skills. This group also shows a strong orientation towards AI-supported planning and technological tools–data analysis skills. Participants with very limited knowledge, on the other hand, placed greater emphasis on AI-supported planning and decision support systems. Those with a good level of knowledge prioritized map literacy and spatial analysis skills more strongly. Digital climate modeling and simulation skills were relatively less preferred across all knowledge levels. Smart city technologies and data management ranked among the least prioritized skills.

The results of the Chi-square test statistically support these observations. The Pearson Chi-Square value of $\chi^2(8)=21.905$ ($p=0.005$) indicates a significant relationship between knowledge level and digital skill priorities. These results reveal that participants with different knowledge levels have varying expectations from the training modules. While participants with moderate knowledge tend to focus more on comprehensive and technical skills, those with only basic

awareness lean more toward AI-supported solutions. Participants with a good level of knowledge prioritize map and data analysis for specialization. The relatively low preference for digital climate modeling and simulation suggests that awareness and experience in this area remain limited. The fact that smart city technologies were considered the least prioritized skills indicates that related modules could initially be offered with lower priority.

Cross-Analysis of Participants' Existing Knowledge Level in Disaster Resilience and Ecological Planning with the Digital Tools Actively Used in Their Educational Life (Question 8 and Question 20)

This section examines the relationship between participants' existing knowledge levels in disaster resilience and ecological planning and the digital tools actively used in their educational practices, focusing particularly on the interaction between Question 8 and Question 20. The frequency distributions directly indicate which digital tools are preferred by participants with different knowledge levels, while Chi-square analyses verify the statistical significance of this relationship. The applied methodology enables the optimization of training modules in line with user needs, with knowledge levels serving as a guiding factor in predicting which tools can be used more effectively during the learning process. The findings provide an evidence-based foundation for the instructional design of the EPD-Net project, emphasizing the necessity of differentiated content strategies to enhance both learning efficiency and participant satisfaction. Moreover, the results serve as a valuable reference for the development and planning of similar educational projects in the future.

Table 70. Frequency Distribution of Participants' Knowledge Level in Disaster Resilience and Ecological Planning with the Digital Tools Actively Used in Their Educational Life (Question 8 and Question 20)

How do you evaluate your current knowledge level in disaster resilience and ecological planning?	**Distance learning platforms (e.g., Moodle, Google Classroom)**	**Video teaching tools / Educational video platforms (e.g., Zoom, MS Teams)**	**Mapping and spatial analysis / Technical drawing and modeling software**	**Other**	**Total**
Very little knowledge (only basic awareness)	41	27	16	4	88
Good level of knowledge (I have received training or have relevant course/volunteering experience)	29	21	14	2	66
Intermediate level of knowledge (I know some	88	73	43	12	216

How do you evaluate your current knowledge level in disaster resilience and ecological planning?	Distance learning platforms (e.g., Moodle, Google Classroom)	Video teaching tools / Educational video platforms (e.g., Zoom, MS Teams)	Mapping and spatial analysis / Technical drawing and modeling software	Other	Total
basic concepts and processes)					
Total	**158**	**111**	**73**	**18**	**370**

When examining the frequency table in Table 70, it is observed that participants with an intermediate level of knowledge are the most active users of distance learning platforms (e.g., Moodle, Google Classroom). This group also shows a high preference for video teaching tools (e.g., Zoom, MS Teams). Participants with very little knowledge have engaged with distance learning platforms at a more limited level, while using other tools in a more balanced manner. Those with a high level of knowledge, on the other hand, assign almost equal importance to video teaching tools and distance learning platforms. Mapping and spatial analysis as well as technical drawing/modeling software are more intensively used by participants with an intermediate knowledge level, whereas their use remains relatively low among participants with very little or high knowledge. Tools categorized as “Other” show limited use across all knowledge levels.

The chi-square analysis confirms a statistically significant relationship between knowledge level and the use of digital tools. The Pearson Chi-Square value of $\chi^2(6)=16.213$ ($p=0.013$) demonstrates that this relationship is statistically significant. These findings indicate that participants with an intermediate level of knowledge tend to prefer more comprehensive educational and technical application tools. Participants with very little knowledge remain limited to basic awareness and general tool use, while those with a high level of knowledge present a more balanced usage profile. This outcome highlights the need to differentiate tool selection in the design of educational modules according to participants’ knowledge levels. For users with intermediate knowledge, advanced tools could be prioritized, while for those with only basic awareness, entry-level tools could be introduced. Participants with a high level of knowledge could benefit most from applied and integrated digital tools. The intensive use of mapping and technical software demonstrates the strong interest in the technical dimension of disaster resilience and ecological planning training. In conclusion, both frequency and chi-square analyses clearly reveal that the use of digital tools in the EPD-Net project should be planned according to participants’ knowledge levels.

4.3.5. Analyses Regarding the Types of Trainings, Courses, or Events in Ecological Planning, Sustainable Design, and Disaster-Resilient Cities Previously Attended by the Participants

The Relationship Between Participants' Previous Trainings, Courses, or Events in Ecological Planning, Sustainable Design, and Disaster-Resilient Cities and the Digital Tools They Actively Use in Their Educational Life (Question 9 and Question 20)

This section examines the relationship between participants' previous engagement in trainings, courses, or events on ecological planning, sustainable design, and disaster-resilient cities, and the digital tools they actively use in their educational life, as reflected in Question 9 and Question 20. The analysis covers both frequency distributions and statistical tests, allowing a comparison between individuals with and without prior training in these fields regarding their use of digital tools. The findings indicate that as learning experience increases, the diversity of digital tool usage also expands. Distance learning platforms and video-based tools appear as the most prominent categories, underlining the growing role of digitalization in educational processes. Moreover, technical software use is observed to be more prevalent among participants who have previously received training in these areas. These results highlight the importance of distinguishing between different groups' needs, making it possible to design more targeted educational content. Ultimately, the findings provide strong guidance for the EPD-Net project, ensuring that digital learning modules are better aligned with the participants' prior educational experiences and current digital practices.

Table 71. Frequency Distribution of Participants' Previous Trainings, Courses, or Events in Ecological Planning, Sustainable Design, and Disaster-Resilient Cities and the Digital Tools They Actively Use in Their Educational Life (Question 9 and Question 20)

What kind of trainings, courses, or events have you previously participated in regarding ecological planning, sustainable design, and disaster-resilient cities?	**Distance Learning Platforms (e.g., Moodle, Google Classroom)**	**Video Teaching Tools (e.g., Zoom, MS Teams)**	**Mapping and Spatial Analysis / Technical Drawing and Modeling Software**	**Other**	**Total**
I have not participated in any training or courses in these fields	39	19	14	18	90
I have participated in at least one training or course	119	92	59	12	280
Total	**158**	**111**	**73**	**30**	**370**

The frequency table presented in Table 71 reveals significant differences between participants' prior educational background and their use of digital tools. Among the 90 participants who had not attended any training or courses, the use of digital tools remained relatively limited. In this group, the highest rate of use was observed in distance learning platforms (39 participants). Video teaching tools were used by 19 participants, spatial analysis and technical drawing software by 14, and other tools by 18. In contrast, the group of 280 participants who had attended at least one training or course exhibited a much higher level of digital tool usage. Within this group, 119 participants reported using distance learning platforms. Moreover, 92 made use of video teaching tools, 59 engaged with technical software, and 10 relied on other tools. The increased diversity of tool usage among those with prior educational experience is particularly noteworthy. The use of technical software showed a distinct difference, being considerably higher among participants with an educational background, while participants without such experience demonstrated limited engagement with these tools. Distance learning platforms emerged as the most widely used tools in both groups. However, their adoption was nearly three times higher among participants with prior education. A similar gap was observed in the use of video tools, where the rate of usage among trained individuals was nearly five times greater compared to those without training. For other tools, the differences between groups were less pronounced. Overall, out of 370 participants, 158 actively used distance learning platforms, 111 used video tools, 73 engaged with technical software, and 28 used other tools. This distribution clearly demonstrates that educational experience enhances engagement with digital learning environments.

Chi-square analysis confirmed that the observed differences in frequency distributions were statistically significant (Pearson $\chi^2(3) = 28.484$; $p = 0.000$). Accordingly, there is a strong and non-random relationship between prior educational experience and the use of digital tools. The findings underscore that educational background plays a decisive role in shaping digital tool preferences. This statistically robust relationship also carries pedagogical significance: individuals with prior educational experience are more likely to adopt diverse and advanced digital learning environments, while those without such experience tend to rely on more basic tools. In conclusion, the chi-square test results are fully consistent with the frequency distributions, providing a reliable scientific basis. The analysis suggests that the EPD-Net project should develop differentiated strategies tailored to groups with varying educational backgrounds to ensure more effective content design.

4.3.6. General Findings and Conclusions of Student Survey

The findings of the EPD-Net Student Survey reveal that learning preferences and expectations from the training modules vary significantly depending on participants' **age, gender, educational level, field of study, knowledge level**, and **prior training experiences**. Frequency, cross-tabulation, and Chi-square (χ^2) analyses confirm that each of these variables plays a decisive role in shaping module design.

Age groups show distinct orientations: younger participants (18–24) strongly favor nature-based solutions, crisis analysis, and rapid decision-making, whereas participants aged 30 and above display a preference for applied learning, community-based problem-solving, and more diversified modules. In terms of update frequency, younger groups demand more periodic updates, while older participants prefer stability and "updates only when necessary." These

results indicate that age is not merely a demographic factor but also a **determinant of learning motivations and content expectations**.

Gender differences are reflected in platform tool and content preferences. Male participants favor interactive applications, whereas female participants prioritize video-based case studies, AI-supported counseling, and open course materials. This pattern highlights the necessity of offering **parallel learning pathways** to ensure inclusivity and effective engagement.

Educational levels further differentiate preferences. Undergraduate students place high value on frequent updates and diverse tool usage, while postgraduate participants exhibit more selective behaviors, favoring stability and critical-change-based updates. High school-level participants emphasize accessibility, mobile compatibility, and basic tool use. These results confirm the need for a **layered curriculum and differentiated update policies**.

Field of study also has a significant effect. Architecture, planning, and design participants strongly emphasize GIS and technical software, whereas participants from other disciplines prioritize conceptual knowledge and AI tools. This suggests that EPD-Net modules must address not only technical content but also the need for **conceptual awareness and interdisciplinary integration**.

Knowledge level and prior training experiences directly shape digital tool usage and priority skills. Those with intermediate knowledge levels demand more comprehensive and technical tools, while participants with limited knowledge lean toward entry-level skills. Participants with previous training demonstrate significantly higher use of video-based tools and technical software, while those without such experience remain limited to more basic tools. These findings indicate the necessity of **prerequisite-based content flows and stepwise curricula** to ensure differentiated learning pathways.

Overall, the analyses clearly demonstrate that participant profiles are **heterogeneous** rather than homogeneous. Consequently, the EPD-Net modules should be designed in a **modular, flexible, and user-responsive** manner. While GIS and online/video-based tools provide the common core across all groups, distinct pathways must be developed to reflect age-, gender-, field-, and knowledge-based needs. In this way, both younger, technology-oriented learners and older, experience-driven participants can be effectively engaged.

In conclusion, the comprehensive analyses presented in this report show that the EPD-Net project transcends being a conventional learning initiative limited to knowledge transfer. Instead, it establishes a solid and scientific foundation for building a highly accessible, inclusive, user-friendly, and innovative digital learning platform that carefully addresses the evolving expectations of different age groups, gender-based learning distinctions, and profession-specific needs. This holistic approach transforms the ideal of building disaster-resilient and sustainable cities from a purely academic goal into a socially oriented, strategically impactful, and internationally relevant initiative with high long-term transformative potential.

5. CONCLUSION

The findings from Türkiye, Czechia, Latvia and Slovakia demonstrate that the disconnection between theoretical instruction and applied practice is not country-specific but rather a structural and transnational challenge. Curricula are often confined to electives or individual initiatives, and the lack of institutionalized studio, fieldwork, and simulation-based learning pathways limits educational effectiveness. In some contexts, internships have lost their perceived value, while planning remains predominantly urbanization-oriented, and risk-sensitive planning is only superficially integrated into academic programs. Collectively, these patterns reveal the urgent need for educational frameworks that go beyond knowledge transfer and systematically embed preventive, applied, and practice-oriented components.

Equally significant are the systemic barriers stemming from fragmented governance and institutional discontinuities. Weak data-sharing practices, overlapping authority, and either centralized or dispersed administrative structures limit coordination and undermine the scaling and sustainability of otherwise well-designed initiatives. As a result, “good practices” remain isolated and fail to trigger lasting institutional transformation. Without structural continuity and coordinated data governance, educational innovations will remain restricted in their impact on professional practice.

The demand for digital competence is consistently high across all three countries, but the emphasis lies less on software operation and more on interpreting outputs for decision-making and translating multi-source data into scenarios. While tools such as GIS, remote sensing, AI, VR/AR, and BIM are widely valued, the key gap lies in developing the capacity to critically assess model assumptions, communicate uncertainties, and embed findings in ecological planning and disaster management decisions. Digital literacy therefore needs to be reframed from a tool-centered approach toward one that emphasizes meaning-making and decision-support.

Another critical pattern is the weakness of preventive approaches and the dominance of reactive practices. Across Türkiye, Czechia, Latvia and Slovakia education and professional training remain oriented toward post-disaster management (e.g., recovery and reconstruction), while preventive, nature-based, and scenario-driven planning for multi-hazard risks such as floods, drought, heat islands, erosion, and fires remain underdeveloped. This underscores the necessity of repositioning prevention at the core of training architecture.

The heterogeneity of participant profiles further highlights the necessity of modular and layered program design. Age differences manifest in distinct learning preferences: younger groups (18–24) demonstrate openness to technical and digital content as well as nature-based solutions, whereas participants aged 30 and above emphasize field-based, mentorship-driven, and real-world problem-solving. Gender-based differences also emerge, with male participants focusing more strongly on leadership and technical modeling, while female participants highlight community-based approaches, communication, and policy engagement. Undergraduate students favor synchronous, visually enriched, and frequently updated content, while postgraduate learners expect research- and analysis-oriented modules with less frequent but more substantive updates. Architecture, planning, and design participants prioritize advanced GIS, BIM, and analytical tools, while participants from other fields emphasize conceptual

awareness and AI-supported applications. Prior training experience and intermediate knowledge levels correlate with a demand for more comprehensive and technical tools, while entry-level learners require threshold-lowering mechanisms such as placement assessments and gradual progressions. Similarly, private sector respondents more frequently reported a lack of institutional strategies, while academia showed relatively high knowledge levels but significant gaps in awareness of institutional policies. These results suggest that training modules should not only focus on individual skills but also enhance institutional awareness and strategy development capacity, ensuring that the link between personal competence and organizational resilience is actively strengthened.

Accessibility emerges not as an additional feature but as the structural backbone of platform design. Mobile compatibility, multilingual support, low-bandwidth modes, and accessible assessment formats must be considered as standard quality requirements rather than supplementary options. Findings also show that training and certification participation enhances not only technical competence but also institutional awareness and inclusivity expectations, indicating that well-designed modules can simultaneously strengthen policy literacy and institutional communication capacities.

Country-level findings further enrich this picture. In Türkiye, students were found to be highly motivated and receptive to technological innovation, yet they face significant limitations in practice-oriented and interdisciplinary training opportunities. Professionals, by contrast, bring extensive institutional and field-based expertise, but their efforts are often constrained by fragmented governance structures, weak inter-institutional coordination, and restricted resources. Both groups, however, consistently emphasized the urgency of embedding sustainability, resilience, and advanced digital literacy into curricula and practice. In the Czechia, the floods of 2024 revealed both strengths and weaknesses of the disaster management system. While the Integrated Rescue System mobilized quickly, the absence of legally mandated professional experts in structural inspections created a severe bottleneck. Expanding the role of the long-standing volunteer fire brigades, which retain strong institutional presence, into recovery-oriented functions such as supporting inspections and local resilience efforts, could significantly reinforce crisis management capacity. In Latvia, disaster risk management remains underdeveloped, particularly within environmental disciplines such as landscape architecture. Yet, stakeholders demonstrated strong consensus on the need for systemic integration of resilience education into both academic curricula and professional training. They emphasized the necessity of developing advanced training platforms that are locally relevant, regularly updated, and accessible in both Latvian and English, thereby combining scientific rigor with broad public outreach.

Finally, country-specific priorities become evident. In Türkiye, the need lies in embedding mandatory interdisciplinary content into architecture and planning curricula, strengthening transparency and data sharing, and ensuring practice-oriented and certifiable modules. In Czechia, low-cost nature-based solutions for flood risk represent immediate priorities, but fragmented curricula and limited participation remain significant barriers. In Latvia, municipalities play a central role, with strong emphasis on VARAM-coordinated planning, modular specialization, lifelong learning, and raising public awareness as key requirements.

Focus group discussions added further depth, highlighting that ecological planning and disaster management cannot be managed by a single actor but require systemic, interdisciplinary collaboration. Universities are expected to play an active role in research and education, public institutions must overcome authority conflicts, the private sector should provide innovative solutions and financial models, civil society organizations need to ensure public awareness and participation, while the media and international organizations contribute to information accuracy, trust-building, and knowledge transfer. The themes identified for inclusion in the training modules—risk analysis methods, GIS and remote sensing, disaster scenarios, climate change adaptation, nature-based solutions, protection of cultural and natural heritage, and policy frameworks—reflect this multi-actor, interdisciplinary perspective. Moreover, the modules must not remain static; they should be continuously updated through advisory boards, monitoring systems, and feedback mechanisms, supported by open-access online platforms and e-learning tools. Looking ahead, AI-supported risk analyses, GIS-based decision-support systems, energy efficiency, and carbon-neutral design approaches are expected to become increasingly significant.

In terms of motivation, knowledge sharing, international collaboration, and certification opportunities were identified as the strongest drivers of participation. Participants emphasized that engagement in policy development processes and exposure to local best practices would add further value. This indicates that the EPD-Net learning network should go beyond conventional academic knowledge transfer and establish itself as a dynamic, multidimensional platform that integrates certification pathways, encourages policy engagement, and promotes the dissemination of practical, context-specific solutions.

In conclusion, the findings of this report highlight that the EPD-Net project must create a comprehensive strategic roadmap that strengthens not only individual learning processes but also institutional capacities, cross-sector collaboration, and social inclusivity. Training modules should be designed as multi-layered, interdisciplinary, inclusive, and technologically adaptive units, capable of addressing diverse participant profiles while bridging the gap between theory and practice. By aligning technical and digital competence with ecological resilience and social capacity-building, the EPD-Net initiative will contribute to building disaster-resilient and sustainable cities, transforming the project into a long-term, transformative learning network that enhances both personal expertise and collective resilience across Europe and beyond.

6. RECOMMENDATIONS

To respond to these findings, the EPD-Net training modules should be built on a **"core + specialization + flexibility"** principle. The **core curriculum** must be mandatory for all participants and structured around three pillars: (i) **Technical/Digital Competence**, including GIS, remote sensing, modeling, AI, VR/AR, and BIM, with a focus on interpreting outputs rather than software operation; (ii) **Ecological/Resilience Skills**, emphasizing nature-based solutions, multi-hazard approaches (floods, droughts, heat islands, erosion, wildfires), climate adaptation, and blue-green infrastructure; and (iii) **Social/Institutional Capacities**, comprising legal and policy literacy, financing and insurance mechanisms, stakeholder engagement, teamwork, and crisis communication.

On top of this core, **specialization tracks** should be offered in areas such as flood and water risk management, drought and heat island resilience, forestry–biodiversity and urban tree risk management, cultural and natural heritage protection in disaster contexts, post-disaster spatial design (Build Back Better), and financing and insurance frameworks. Learning paths must be layered and adaptive, starting with placement assessments to match learners with the appropriate level (beginner, intermediate, advanced). Distinct tracks should accommodate diverse learner groups: micro-learning and simulations for younger participants; fieldwork and mentorship for older professionals; community-based and policy-engagement modules tailored for women; advanced GIS/BIM/analytical modules for architecture and planning fields; and conceptual/AI-supported content for other disciplines. Each module should issue **micro-credentials** that can be stacked into higher-level certifications, such as "EPD-Net Practitioner" or "EPD-Net Expert."

The digital platform should follow an **"accessibility-first"** design, offering low-bandwidth modes, multilingual interfaces, mobile-first usability, and compliance with universal design principles. AI-based counseling and decision-support tools should prioritize **interpretation of outputs**, with transparent disclosure of model assumptions and uncertainties.

At the governance and policy level, a **stakeholder data-sharing protocol** should be established between municipalities, ministries, and universities, supported by an open-access portal containing case repositories, templates, and data dictionaries. Country-specific module extensions must address national priorities: Türkiye's mandatory interdisciplinary integration and transparency issues, Czechia's flood-focused low-cost NBS packages and internship accreditation, and Latvia's municipal planning coordination and public awareness mechanisms. Framework agreements should institutionalize internships, mentorships, and joint studios with municipalities and ministries, while collaborations with professional chambers and the insurance sector should advance training in risk-based financing.

Evaluation and quality assurance must be guided by a transparent set of **key performance indicators (KPIs)**, including the quality of preventive scenarios, the degree of multi-stakeholder collaboration, the use of data-informed decision-making, the integration of policies and regulations, and the number of projects successfully implemented at the local level. Assessments should combine portfolios, project submissions, field applications, and short exams. The program should operate on **annual curriculum reviews** complemented by **quarterly**

micro-updates, ensuring both stability and responsiveness. Continuous feedback mechanisms should include alumni tracking, online communities, and pulse surveys. A **multi-stakeholder advisory board**—comprising representatives from the public sector, private sector, academia, civil society, and disaster survivors—should oversee governance, quality assurance, and strategic alignment.

Inclusivity requires targeted support packages for participants reporting barriers, such as scholarships, asynchronous learning options for those with care responsibilities, and accessible exam arrangements. Update policies should follow a **dual-speed model**, providing frequent micro-updates for younger learners and less frequent but strategically significant updates for experienced professionals.

Implementation should follow a **phased roadmap**: in the first six months, pilot the core modules across the three countries, launch at least one municipal "mini-scenario laboratory," and introduce placement tests with a micro-credentialing system. Between six and eighteen months, roll out specialization tracks, formalize internship and mentorship accreditation, and launch the open data portal and case repository. After eighteen months, institutionalize regular revisions under the advisory board, consolidate country-specific modules, and establish a pool of locally implemented projects, supported by recognition and incentive mechanisms.

This design framework directly serves the aims of the EPD-Net project. By translating identified needs and barriers into modular structures (e.g., accessibility-first, gender- and age-sensitive pathways, placement-based progression), the program ensures responsiveness to user profiles. By embedding studio–scenario–field integration and institutional partnerships, it bridges the gap between theory and practice. By mainstreaming nature-based solutions and multi-hazard approaches, it advances a preventive orientation. By incorporating policy, finance, and data governance, it extends beyond individual learning to institutional transformation. Finally, through KPIs, cyclical updates, and multi-stakeholder oversight, it guarantees accountability, measurability, and long-term sustainability.

Adopting this comprehensive framework would transform EPD-Net into more than a knowledge-transfer initiative: it would establish a **modular learning ecosystem** centered on preventive risk management, nature-based solutions, and data-driven decision support. It would foster durable cross-country collaboration, generate locally applicable outputs, and cultivate a pool of qualified professionals capable of advancing disaster-resilient and sustainable urban futures.

Annex 1: Framework Interview Template for Professionals

(with minor adaptations, the template was also used for academics and students)

Section 1: Respondent Profile	**Current Position**	What is your current role and how long have you held it?
	Career Path	Briefly describe your previous experience and how you arrived at this role.
	Qualifications	What is your educational background? Are you pursuing further education? Please specify.
	Future Plans	Do you plan to change roles (e.g. transition to academia, administration…), start your own company, pursue further education, or explore new partnerships or technologies?
Section 2: Professional Journey	**Field Motivation**	What motivated you to study and enter this field?
	Initial Focus	Why did you choose your specific area (planning, design, public sector, etc.)?
	Development Over Time	How has your professional journey progressed?
	Barriers Encountered	What challenges did you face during education, entering the field, and advancing in your career?
Section 3: Local and Organizational Context	**Environmental Risks**	What natural risks exist in your region? How serious are they? How do you assess the level of environmental risk in your area?
	About the Organization	Legal form and founding year of company
		Number of employees; employee stability/turnover
		Vision for the future (if relevant)
		Approach to staff development and collaboration (support for lifelong learning, cooperation with others subjects…)
Section 4: Best Practices and Achievements	**Personal Successes**	What do you consider to be your most significant achievement in the field of natural disaster management (if relevant)?
	Wider Successes	What strategies/measures/activities work well at national (regional, local) or organizational level? Please try to identify the best practices.
	Systemic Issues	What barriers exist at planning, implementation, or cooperation levels (related to nature disaster management)?
	Education Gaps	What is lacking in current disaster management education?
		What skills or knowledge are missing in new graduates?
	Theory vs. Practice	What prevents effective implementation of sustainable planning?
		How can integration between planning theory and disaster prevention be improved in practice?
Section 5: Everyday Practice	**Common Measures**	What types of disaster-prevention measures/related topics do you usually work with? What measures/topics do you most often solve/propose/implemente/approve in your practice?
	Barriers	What makes it hard to implement other measures/topics/…? Is there any barrier to designing/implementing/approving some other measures/topics…?
	Knowledge and Skills	What knowledge do you most often draw on in your practice? What skills do you use most often in your practice?
		Which research areas related to natural disaster prevention and sustainable spatial planning require more attention? What relevant (not yet tracked) data should be collected?
	Bridging Education and Practice	How can cooperation with academia be improved?
		Do you consider the current offer of study programs or courses to be sufficient? Please justify your answer. How should educational programs change? Where are the gaps?

		How can AI be used in your work? Where do you see a room for using AI in your practice?
Section 6: Policy and System Insights	**Policy Evaluation**	How effective are current policies (EU, national, regional) in managing natural disasters?
	Critical Gaps	Where does the system fail (education → planning → approval → implementation → outcomes)?
	Leadership Role	Who should take the lead in strengthening environmental security?
Section 7: Involvement, Collaboration and Sustainability	**Public Education**	Should the general public be educated in nature disaster management(residents, developers, local officials)?
	Your Involvement	Would you teach others professionals or stakeholders? Under what conditions?
		Would you support the EPD-Net training platform? Know potential contributors?
	Institutional Input	Does your organization have a strategy or policy for resilience/ecological planning/green infrastructure?
	Sustainability	How can the EPD-net platform remain relevant and sustainable in the long term? Would you be willing to personally participate in the creation or updating of the training module?
Section 8: Education and Training Preferences	**Digital Tools**	What digital tools do you use (e.g. Moodle, GIS, Zoom, AI tools)? Why?
	Learning Preferences	What formats work best for you (videos, audios, simulations, hybrid models, etc.)?
		What technologies should be better integrated into education?
		Where do you go for new ideas or innovations?
	Hiring Perspective	What kind of course completion (degree, certification, etc.) do you value in job applicants?
Section 9: Training Content Insights	**Essential Skills and Knowledge**	Which skills and knowledge are essential in your view?
		Choose one key green, digital, and social skill.
		Suggest additional essential skills.
	Training Content Design Which of the following should be emphasized in the module (assign %)	**What should an innovative training model include? Specifically, what space should be devoted to the topic, to what depth, etc.?**
		Risk assessment & mapping
		Scenario planning & strategic frameworks
		Spatial planning & land-use regulation
		Local-scale technical solutions
		Nature-based solutions
		Legal/policy/communication frameworks
		Education & capacity building
		Other: _____
	Methods and Tools to Teach (assign %)	Monitoring hazards
		Hazard analysis tools
		Forecasting methods
		Strategic planning
		Preventive spatial planning tools
		Design of green infrastructure
		Coordination in disasters
		Public participation

		Decision-making tools
		Citizen science
		Other: _____
	Green Knowledge Areas (assign %)	GIS, hazard analysis
		Hazard & planning fundamentals
		Statistical & probability knowledge
		Infrastructure & strategic planning
		Legal/policy frameworks
		Climate change & sustainability awareness
	Green & Resilience Skills (assign %)	Monitoring hazard data
		Creating crisis scenarios
		Managing disaster response
		Designing resilient systems
		Risk communication & engagement
		Legal/policy comprehension
		Adaptive/systemic thinking
	Preferred Case Study Format	Real-world examples from your region
		Simulated risk scenarios
		Scenario cards with options
		Other: _____
Section 10: Inclusion and Equal Opportunity	**Are there barriers for**	Women in nature disaster management?
		Recent graduates entering practice?
		Senior professionals (e.g., due to tech changes)?
Final Comments	Do you have any additional suggestions, ideas, or feedback?	

Annex 2: Survey Questions for Students

Dear Participant,

This questionnaire has been prepared within the scope of the *"Filling the Gap: Development of Ecological Planning and Design Learning Network and an Adaptive Smart Training Module for Disaster Resilient and Sustainable Cities"* (EPD-Net) Project, which is funded by the European Union under the Erasmus+ Programme.

In collaboration with stakeholders from various disciplines, **the project aims to strengthen the role of ecological planning and design in building disaster-resilient and sustainable cities.** It specifically focuses on three of the most frequent and devastating disaster types in Europe: **earthquakes, floods, and storms.**

In this context, the survey was designed as part of a needs analysis in the process of developing the EPD-Net smart education module and digital learning network.

The data collected through this questionnaire will be used solely for analysis related to the development of this project. **All information will be kept strictly confidential and anonymous.**

Thank you very much for your voluntary contribution.

EPD-Net Project Team

www.epd-net.org
https://www.instagram.com/epd_net_2025/

Section 1: Personal Information

1. Your age range:

- ( ) Under 18
- ( ) 18-24
- ( ) 25-29
- ( ) 30-34
- ( ) 35-44
- ( ) 45-54
- ( ) 55-64
- ( ) 65 and over

2. Gender:

- ( ) Female
- ( ) Male
- ( ) Non-binary
- ( ) I do not want to specify

3. The following statements are intended to **better understand your background and experiences that may affect your access to education or participation in society.** Please select all that apply.
(You may choose more than one option. ***If none of the statements apply, please select "None of the above.")***

- ( ) I am a disabled person
- ( ) I have a chronic disease
- ( ) I am an elderly person
- ( ) I am a young person (15-29)
- ( ) I am facing economic difficulties
- ( ) I faced discrimination
- ( ) I face cultural barriers
- ( ) I experience language barriers
- ( ) I have refugee/immigrant status
- ( ) I live in a rural / hard-to-reach area
- ( ) I feel excluded from the education system
- ( ) I was excluded because of my sexual orientation/identity
- ( ) I am an individual with technological inadequacy
- ( ) I am an individual in need of psychosocial support
- ( ) None of the above

4. Your level of education:

- ( ) High school degree
- ( ) Associate degree
- ( ) Undergraduate degree
- ( ) Master's degree
- ( ) Doctorate degree

5. The country/countries where you studied:

- ( ) Türkiye
- ( ) Czech Republic
- ( ) Slovakia
- ( ) Latvia
- ( ) Spain
- ( ) Norway
- ( ) Portugal
- ( ) Other: _____

6. Your field of study:

- Digital and Technological Areas
- Engineering Fields
- Natural Sciences and Related Fields
- Planning and Design Areas
- Social Sciences and Related Fields
- ( ) Other: _____

7. Your profession:
more than one option can be selected

Digital and Technological Areas

- Artificial Intelligence Applications
- Data Science
- Disaster Informatics and Risk Modelling
- Geographic Information Systems (GIS)
- Remote Sensing (RS)
- Smart City Technologies
- ( ) Other: _____

Engineering Fields

- Agricultural Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering

- Electrical-Electronics Engineering
- Environmental Engineering
- Geological Engineering
- Geomatics Engineering
- Geophysical Engineering
- Industrial Engineering
- Materials Engineering
- Mechanical Engineering
- Software Engineering
- ( ) Other: _____

Natural Sciences and Related Fields

- Biology
- Chemistry
- Mathematics
- Physics
- Statistics
- ( ) Other: _____

Planning and Design Areas

- Architecture
- City and Regional Planning
- Graphic Design
- Industrial Design
- Interior Design
- Landscape Architecture
- Urban Design
- ( ) Other: _____

Social Sciences and Related Fields

- Business Administration
- Communication Sciences
- Economy
- Educational Sciences
- International Relations
- Law
- Political Science
- Psychology
- Public Administration
- Sociology
- ( ) Other: _____

Section 2: Views on Disaster Resilience and Ecological Planning Education

8. How do you assess your **current level of knowledge** in the field of **disaster resilience and ecological planning**?

- ( ) I have little knowledge (only basic awareness)
- ( ) I have a moderate level of knowledge (I know some basic concepts and processes)
- ( ) I have a good level of knowledge (I have received training or have relevant course/volunteering experience)
- ( ) I have advanced knowledge (I have actively participated in projects/initiatives related to the field)

9. What kind of **trainings, courses or activities** have you **attended before about ecological planning, sustainable design, disaster resilient cities?**
more than one option can be selected

- ( ) Compulsory course within the scope of undergraduate programme
- ( ) Elective course within the scope of undergraduate programme
- ( ) Relevant academic course(s) at master's / doctoral level
- ( ) Seminars, webinars, or workshops conducted by universities or other relevant institutions.
- ( ) Online courses delivered by universities or institutions via platforms like edX, Coursera, or equivalent
- ( ) Practical training provided by NGOs, municipalities, professional chambers, or national disaster/emergency management authorities
(e.g., FEMA, CCS, AFAD, Protezione Civile, etc.)
- ( ) Summer school or project-based short-term training programme
- ( ) I have not attended any training or courses in these fields
- ( ) Other (please specify): _____

10. Considering the **trainings, courses or events** you have participated in, do the topics related to **ecological planning, sustainable design, disaster-resilient cities find enough space?**

- ( ) Quite sufficient
- ( ) Partially sufficient
- ( ) Insufficient, mostly superficial or limited
- ( ) Not included at all
- ( ) Not sure / did not pay attention

11. How would you rate the **contribution** of the following **factors** to the development of **disaster-resilient cities** and the spread of **ecological practices?**

Please rate each item from 1 to 5
1 = No contribution at all, 5 = Very high contribution

	1	**2**	**3**	**4**	**5**
Adequate levels of knowledge and awareness					
Strong financial and logistical resources					
Effective communication and coordination mechanisms					
Strategic leadership and strong governance capacities					
Public sensitivity and willingness to participate in disaster preparedness					
Availability of technical expertise and qualified professionals					
Practical examples, guidance, and comprehensive training resources					
Effective legal and regulatory frameworks					

12. The following statements indicate possible challenges related to the use of digital technologies in disaster management. Please rate how important an issue each statement is for you.

Please rate each item from 1 to 5
1 = Least important, 5 = Most important

	1	2	3	4	5
Deficiencies in digital infrastructure (internet, energy, server, etc.)					
Failure to ensure data security and personal privacy					
Inadequate level of digital literacy					
Inter-institutional data sharing and integration problems					
High costs and lack of sustainable financing					
Difficulties in accessing up-to-date and accurate data					
Dependence on technology poses a risk in emergencies					

Section 3: Opinions on training modules to be prepared within the scope of the EPD-Net project

13. In your opinion, which of the **green skills** should be prioritised **in the training modules** to be developed within the scope of the **EDP- Net Project**?
more than one option can be selected

- ( ) Nature-based solution development
- ( ) Sustainable infrastructure design
- ( ) Ecological risk assessment
- ( ) Green financing planning
- ( ) Other: [Open-ended]

14. In your opinion, which of the **digital skills** should be prioritised **in the training modules** to be developed within the scope of the **EDP- Net Project**?
more than one option can be selected

- ( ) Map literacy and spatial analysis (e.g. GIS)
- ( ) Artificial intelligence supported planning and decision support systems
- ( ) Technological tools and data analysis skills
- ( ) Digital climate modelling and simulation skills
- ( ) Smart city technologies and data management
- Other: [Open-ended]

15. In your opinion, which of the **resilience and social skills** should be prioritised **in the training modules** to be developed within the scope of the **EDP- Net Project**?
more than one option can be selected

- ( ) Analysing and making quick decisions in a crisis
- ( ) Community-based solution development
- ( ) Adaptation to change and leadership skills
- ( ) Disaster awareness and education in the society
- ( ) Social solidarity and co-operation skills
- Other: [Open-ended]

16. How do you think **the frequency of updating the digital training contents** and learning modules to be developed within the scope of **EPD-Net project** should be?

- ( ) Every 6 months
- ( ) Once a year
- ( ) Updated only when important changes or needs arise
- ( ) No need for updates – the content can stay the same
- ( ) Other: [Open-ended]

17. **Which methods** are **more appropriate for the evaluation** after the digital training to be given within the scope of EPD-Net project?
more than one option can be selected

- ( ) Online exam
- ( ) Project based delivery
- ( ) Group discussion
- ( ) Automated assessment (AI assisted)
- ( ) Other: [Open-ended]

18. In your opinion, in **which areas** do you think the **EPD-Net project** would be **most beneficial for you**?
more than one option can be selected

- ( ) Acquisition of technical skills (e.g. use of GIS, data analysis, climate simulation tools)
- ( ) Increased conceptual knowledge and awareness (ecological planning, disaster resilience, sustainability, etc.)
- ( ) Project experience and hands-on learning opportunities
- ( ) Practising solution generation on real life problems
- ( ) Experience in interdisciplinary work
- ( ) Acquaintance with innovative and digital training modules
- ( ) Academic development (producing thesis/project topics, awareness of literature, etc.)
- ( ) Opportunities for co-operation with the sector, NGOs and local administrations
- ( ) Developing enterprise ideas that can create social impact
- ( ) Networking and co-operation with other students
- ( ) Obtain a valid certificate at the end of the training
- ( ) Gaining motivation and career orientation
- ( ) Other (Please specify): _____

Section 4: Digital Education Methods and Preferences

19. Which of the following **distance education/learning methods** provide **effective learning** according to you?
more than one option can be selected

- ( ) Video lectures
- ( ) Podcast / Audio narration
- ( ) Interactive modules
- ( ) Scenario-based training
- ( ) Hybrid (online + face-to-face)
- ( ) Other: [Please specify]

20. Which of the following **digital tools** do you **actively use** in your **educational life**?
more than one option can be selected

- ( ) Distance education platforms (e.g. Moodle, Google Classroom)
- ( ) Video teaching tools (e.g. Zoom, MS Teams)
- ( ) Map and spatial analysis software (e.g. ArcGIS, QGIS, NetCAD, MapInfo)
- ( ) Technical drawing/modelling software (e.g. AutoCAD, SketchUp)
- ( ) Artificial intelligence supported tools (e.g. ChatGPT, Copilot)
- ( ) Educational video platforms (e.g. YouTube, Coursera)
- ( ) Survey/quiz tools (e.g. Google Forms, Kahoot)
- ( ) Other: _____

21. Which **challenges** do you face the most while following trainings in **digital environments?**
more than one option can be selected

- ( ) Internet connection problems
- ( ) Distraction and lack of motivation
- ( ) Difficulties in using digital tools
- ( ) Difficulty in understanding the training content
- ( ) Lack of opportunity to discuss and ask questions
- ( ) I do not face any challenges
- ( ) Other: _____

22. What are the specific **tools, content or resources you would like to see** in the digital learning platform to be developed within the scope of the EDP- Net Project?
more than one option can be selected

- ( ) Interactive applications
- ( ) Video case studies
- ( ) Artificial intelligence assisted counselling
- ( ) Simulations
- ( ) Open course material
- ( ) Other: _____

23. What are **the most important features** that should be included in the **user interface** of the digital learning platform to be developed within the scope of EDP-Net Project?
more than one option can be selected

- ( ) Accessibility (disabled-friendly interface)
- ( ) Multilingualism
- ( ) Mobile compatibility
- ( ) Simple and intuitive operation
- ( ) Contents supported by visual narratives
- ( ) Other: [Open-ended]

Section 5: Motivation and Expectations

24. What would be the **most important factor(s)** that would increase your **motivation** to participate in the EPD-Net learning network?
Please tick maximum 3 options

- ( ) Information sharing
- ( ) International co-operation
- ( ) Certified trainings
- ( ) Participation in policy development processes
- ( ) Professional development opportunities
- ( ) Access to local application examples
- ( ) Other: [Open-ended]

25. In your opinion, **which methods are most effective for sharing** or promoting the EPD-Net training modules?
more than one option can be selected

- ( ) Social media campaigns
- ( ) National policy recommendations
- ( ) Webinars
- ( ) Printed manuals
- ( ) Regional workshops
- ( ) Other: [Open-ended]

26. **Would you like to contribute** to the continuous development of the EPD-Net digital training platform through surveys and other ways of exchanging ideas?

- ( ) Yes
- ( ) No
- ( ) Maybe

27. If you have any other **suggestions or ideas** to present within the scope of the EPD-Net project, please let us know.

Annex 3: Survey Questions for Professionals

Dear Participant,

This questionnaire has been prepared within the scope of the *"Filling the Gap: Development of Ecological Planning and Design Learning Network and an Adaptive Smart Training Module for Disaster Resilient and Sustainable Cities"* (EPD-Net) Project, which is funded by the European Union under the Erasmus+ Programme.

In collaboration with stakeholders from various disciplines, **the project aims to strengthen the role of ecological planning and design in building disaster-resilient and sustainable cities.** It specifically focuses on three of the most frequent and devastating disaster types in Europe: **earthquakes, floods, and storms.**

In this context, the survey was designed as part of a needs analysis in the process of developing the EPD-Net smart education module and digital learning network.

The data collected through this questionnaire will be used solely for analysis related to the development of this project. **All information will be kept strictly confidential and anonymous.**

Thank you very much for your voluntary contribution.

EPD-Net Project Team

www.epd-net.org
https://www.instagram.com/epd_net_2025/

Section 1: Personal and Professional Information

1. Your age range

- ( ) Under 18
- ( ) 18-24
- ( ) 25-29
- ( ) 30-34
- ( ) 35-44
- ( ) 45-54
- ( ) 55-64
- ( ) 65 and over

2. Gender

- ( ) Female
- ( ) Male
- ( ) Non-binary
- ( ) I do not want to specify

3. The following statements are intended to **better understand your background and experiences that may affect your access to education or participation in society.** Please select all that apply.
You may choose more than one option. ***If none of the statements apply, please select "None of the above."***

- ( ) I am a disabled person
- ( ) I have a chronic disease
- ( ) I am an elderly person
- ( ) I am a young person (15-29)
- ( ) I am facing economic difficulties
- ( ) I faced discrimination
- ( ) I face cultural barriers
- ( ) I experience language barriers
- ( ) I have refugee/immigrant status
- ( ) I live in a rural / hard-to-reach area
- ( ) I feel excluded from the education system
- ( ) I was excluded because of my sexual orientation/identity
- ( ) I am an individual with technological inadequacy
- ( ) I am an individual in need of psychosocial support
- ( ) None of the above

4. Your level of education:

- ( ) High school degree
- ( ) Associate degree
- ( ) Undergraduate degree
- ( ) Master's degree
- ( ) Doctorate degree

5. The country where you currently work:

- ( ) Türkiye
- ( ) Czech Republic
- ( ) Slovakia
- ( ) Latvia
- ( ) Spain
- ( ) Norway
- ( ) Portugal
- ( ) Other: _____

6. The area in which you work professionally:

- Digital and Technological Areas
- Engineering Fields
- Natural Sciences and Related Fields
- Planning and Design Areas
- Social Sciences and Related Fields
- ( ) Other: _____

7. Your profession:
more than one option can be selected

Digital and Technological Areas

- Artificial Intelligence Applications
- Data Science
- Disaster Informatics and Risk Modelling
- Geographic Information Systems (GIS)
- Remote Sensing (RS)
- Smart City Technologies
- ( ) Other: _____

Engineering Fields

- Agricultural Engineering
- Chemical Engineering

- Civil Engineering
- Computer Engineering
- Electrical-Electronics Engineering
- Environmental Engineering
- Geological Engineering
- Geomatics Engineering
- Geophysical Engineering
- Industrial Engineering
- Materials Engineering
- Mechanical Engineering
- Software Engineering
- ( ) Other: _____

Natural Sciences and Related Fields

- Biology
- Chemistry
- Mathematics
- Physics
- Statistics
- ( ) Other: _____

Planning and Design Areas

- Architecture
- City and Regional Planning
- Graphic Design
- Industrial Design
- Interior Design
- Landscape Architecture
- Urban Design
- ( ) Other: _____

Social Sciences and Related Fields

- Business Administration
- Communication Sciences
- Economy
- Educational Sciences
- International Relations
- Law
- Political Science
- Psychology
- Public Administration
- Sociology
- ( ) Other: _____

8. Your current professional role:

- ( ) Academic / Researcher
- ( ) Lecturer / Instructor
- ( ) Public sector employee (e.g., ministry, public agency)
- ( ) Local government staff
- ( ) Private sector professional
- ( ) NGO / Civil society organization staff
- ( ) Freelancer / Independent consultant
- ( ) Other: [please specify]

9. **Your involvement in the EDP-NET project** (Filling The Gap: Development of Ecological Planning and Design Learning Network and An Adaptive Smart Training Module for Disaster Resilient and Sustainable Cities):

- ( ) I am a contracted project partner (I am officially listed as a project partner in the grant agreement and actively contribute to the project activities.)
- ( ) I am an associated project partner (I am not formally listed in the grant agreement, but I support or contribute to the project in some capacity.)
- ( ) I am not involved in the project at this stage, yet I am interested in participating in upcoming activities.

Section 2: General Views on Disaster Resilience and Ecological Planning

10. How do you assess your current **level of knowledge** in the field of **disaster resilience and ecological planning?**

- ( ) I have little knowledge (only basic awareness)
- ( ) I have a moderate level of knowledge (I know some basic concepts and processes)
- ( ) I have a good level of knowledge (I have received training or have relevant course/volunteering experience)
- ( ) I have advanced knowledge (I have actively participated in projects/initiatives related to the field)

11. What kind of **trainings, courses or events** have you **attended before** about **ecological planning, sustainable design, disaster resilient cities?**
more than one option can be selected

- ( ) Compulsory course within the scope of undergraduate programme
- ( ) Elective course within the scope of undergraduate programme
- ( ) Relevant academic course(s) at master's / doctoral level
- ( ) Seminars, webinars, or workshops conducted by universities or other relevant institutions.

- ( ) Online courses delivered by universities or institutions via platforms like edX, Coursera, or equivalent
- ( ) Practical training provided by NGOs, municipalities, professional chambers, or national disaster/emergency management authorities (e.g., FEMA, CCS, AFAD, Protezione Civile, etc.)
- ( ) Summer school or project-based short-term training programme
- ( ) I have not attended any training or courses in these fields
- ( ) Other (please specify): _____

12. Considering the **trainings, courses or events you have participated in**, do the topics related to **ecological planning, sustainable design, disaster-resilient cities** find enough space?

- ( ) Quite sufficient
- ( ) Partially sufficient
- ( ) Insufficient, mostly superficial or limited
- ( ) Not included at all
- ( ) Not sure / did not pay attention

13. How would you rate the **contribution** of the following **factors** to the development of **disaster-resilient cities and the spread of ecological practices?**
Please rate each item from 1 to 5
1 = No contribution at all, 5 = Very high contribution

	1	2	3	4	5
Adequate levels of knowledge and awareness					
Strong financial and logistical resources					
Effective communication and coordination mechanisms					
Strategic leadership and strong governance capacities					
Public sensitivity and willingness to participate in disaster preparedness					
Availability of technical expertise and qualified professionals					
Practical examples, guidance, and comprehensive training resources					
Effective legal and regulatory frameworks					

14. The following statements indicate possible challenges related to the use of digital technologies in disaster management and ecological planning. Please rate how important an issue each statement is for you.

Please rate each item from 1 to 5

1 = Least important, 5 = Most important

	1	2	3	4	5
Deficiencies in digital infrastructure (internet, energy, server, etc.)					
Failure to ensure data security and personal privacy					
Inadequate level of digital literacy					
Inter-institutional data sharing and integration problems					
High costs and lack of sustainable financing					
Difficulties in accessing up-to-date and accurate data					
Dependence on technology poses a risk in emergencies					

15. Which of the following topics do you consider key for **educating professionals on terms of managing natural hazards?**

Please rate them on a scale from 1 to 5

1 = Least important, 5 = Most important

	1	2	3	4	5
Hazard and vulnerability assessments (e.g., hazard mapping, identification of sensitive areas)					
Modelling, scenario planning, and strategic frameworks (e.g., hazard development modelling, national/regional strategies)					
Spatial planning and land-use regulation (e.g., integration into spatial plans, zoning measures)					
Local-scale interventions and resilient infrastructure (e.g., site-specific risk reduction measures, technical solutions)					
Nature-based solutions and green planning					
Legal, policy, and communication frameworks (e.g., legal regulations, crisis communication, public participation)					
Education, research, and capacity development (e.g., awareness building, research initiatives)					
Other (please specify): _____					

16. How do you rate the **importance** of the following **green knowledge areas and supporting competencies for effective natural disaster management?**

Please rate them on a scale from 1 to 5

1 = Least important, 5 = Most important

	1	2	3	4	5
Knowledge of GIS, hazard analysis, and risk forecasting					
Understanding of natural hazards and preventive planning					
Knowledge of statistical methods and probability assessment					
Knowledge of resilient infrastructure and strategic planning					
Knowledge of legal and policy frameworks for disaster risk reduction					
Awareness of climate change, environmental sustainability, and public education					
Other (please specify): _____					

17. How **important** are the following **green and resilience-related skills for preventing risks through spatial planning?**

Please rate them on a scale from 1 to 5

1 = Least important, 5 = Most important

	1	2	3	4	5
Monitoring and interpreting natural hazard data					
Developing risk scenarios and crisis plans					
Managing disaster response and involving communities					
Designing nature-based and resilient solutions					
Communicating risks and engaging stakeholders					
Legal and policy knowledge for resilience					
Creative, adaptive, and systems thinking skills					
Other (please specify): _____					

Section 3: Opinions on training modules to be prepared within the scope of the EPD-Net project

18. In your opinion, which of the **green skills** should be **prioritised in the training modules** to be developed within the scope of the **EDP- Net Project**?

- ( ) Nature-based solution development
- ( ) Sustainable infrastructure design
- ( ) Ecological risk assessment
- ( ) Green financing planning
- ( ) Other: [Open-ended]

19. In your opinion, which of the **digital skills** should be prioritised **in the training modules** to be developed within the scope of the **EDP- Net Project**?
more than one option can be selected

- ( ) Map literacy and spatial analysis (e.g. GIS)
- ( ) Artificial intelligence supported planning and decision support systems
- ( ) Technological tools and data analysis skills
- ( ) Digital climate modelling and simulation skills
- ( ) Smart city technologies and data management
- Other: [Open-ended]

20. In your opinion, which of **the resilience and social skills** should be prioritised **in the training modules** to be developed within the scope of the **EDP- Net Project**?
more than one option can be selected

- ( ) Analysing and making quick decisions in a crisis
- ( ) Community-based solution development
- ( ) Adaptation to change and leadership skills
- ( ) Disaster awareness and education in the society
- ( ) Social solidarity and co-operation skills
- Other: [Open-ended]

21. In your opinion, **which knowledge areas and skills should be strengthened** through training modules to enhance **natural hazard management capacities?**
more than one option can be selected

- ( ) Practical skills in GIS use, hazard monitoring, and data analysis at different planning levels
- ( ) Competence in hazard modelling and predicting disaster impacts
- ( ) Communication and public engagement skills in disaster management
- ( ) Strategic and operational planning skills for disaster risk reduction
- ( ) Design and maintenance of resilient and nature-based infrastructure
- ( ) Interdisciplinary understanding of the roles and responsibilities of related professions
- ( ) Other (please specify): _____

22. What types of **case studies or examples** would be most **useful** to include in the EPD-Net training module to support learning from both **effective and ineffective practices?**
more than one option can be selected

- ( ) Real-world case studies from the target region
- ( ) Simulated risk scenarios with alternative solutions for flexible learning
- ( ) Example situations with proposed solutions for prevention and mitigation (e.g. solution cards)
- ( ) Other (please specify): _____

23. Which **methods and tools** should be **described** in detail in the **EPD-net training module?**
more than one option can be selected

- ( ) Methods for monitoring natural hazards
- ( ) Tools for hazard analysis
- ( ) Methods for forecasting hazard development and impacts
- ( ) Approaches for strategic planning (e.g. national/regional disaster risk strategies)
- ( ) Tools for preventive spatial planning
- ( ) Techniques for designing and implementing landscape-based measures
- ( ) Tools for coordination during and after a disaster
- ( ) Approaches for public participation
- ( ) Methods for strengthening decision-making competencies
- ( ) Tools for open science and citizen science
- ( ) Other (please specify): _____

24. How do you think the **frequency of updating the digital training contents** and learning modules to be developed within the scope of **EPD-Net project** should be?

- ( ) Every 6 months
- ( ) Once a year
- ( ) Updated only when important changes or needs arise
- ( ) No need for updates – the content can stay the same
- ( ) Other: [Open-ended]

25. **Which methods are more appropriate for the evaluation** after the training provided within the scope of the **EPD-Net project**?
more than one option can be selected

- ( ) Online exam
- ( ) Project based delivery
- ( ) Group discussion
- ( ) Automated assessment (AI assisted)
- ( ) Other: [Open-ended]

26. In your opinion, in **which areas** would the **EPD-Net project** be **most beneficial** for you?
more than one option can be selected

- ( ) Acquisition of technical skills (e.g. use of GIS, data analysis, climate simulation tools)
- ( ) Increased conceptual knowledge and awareness (ecological planning, disaster resilience, sustainability, etc.)
- ( ) Project experience and hands-on learning opportunities

- ( ) Practising solution generation on real life problems
- ( ) Experience in interdisciplinary work
- ( ) Acquaintance with innovative and digital training modules
- ( ) Academic development (producing thesis/project topics, awareness of literature, etc.)
- ( ) Opportunities for co-operation with the sector, NGOs and local administrations
- ( ) Developing enterprise ideas that can create social impact
- ( ) Networking and co-operation with other students
- ( ) Obtain a valid certificate at the end of the training
- ( ) Gaining motivation and career orientation
- ( ) Other (Please specify): _____

27. Does your **organisation** have **any strategy, policy or institutional approach related to disaster resilience, ecological planning and/or green infrastructure practices** that could contribute to the **EPD-Net Project**?

- **( )** Yes, a strategy/policy is in place and implemented at the organisational level.
- **( )** Yes. Still in the project/draft phase.
- **( )** No, no studies or strategies have been developed yet.
- **( )** I do not know / I am not sure.

28. Which of the following **facilities** does your **organisation** have in order to **create the training modules** to be produced within the scope of EDP-Net project?
more than one option can be selected

- ( ) Human resources
- ( ) Technical capacity
- ( ) Financial support
- ( ) Management support
- ( ) Implementation support
- ( ) Adequate knowledge/skills
- ( ) Other: [Open-ended]

Section 4: Digital Education Methods and Preferences

29. Which of the following **distance education/learning methods** provide **effective learning** according to you?
more than one option can be selected

- ( ) Video lectures
- ( ) Podcast / Audio narration

- ( ) Interactive modules
- ( ) Scenario-based training
- ( ) Hybrid (online + face-to-face)
- ( ) Other: [Please specify]

30. Which of the following **digital tools do you actively use in your professional life?**
more than one option can be selected

- ( ) Distance education platforms (e.g. Moodle, Google Classroom)
- ( ) Video tools (e.g. Zoom, MS Teams)
- ( ) Map and spatial analysis software (e.g. ArcGIS, QGIS, NetCAD, MapInfo)
- ( ) Technical drawing/modelling software (e.g. AutoCAD, SketchUp)
- ( ) Artificial intelligence supported tools (e.g. ChatGPT, Copilot)
- ( ) Educational video platforms (e.g. YouTube, Coursera)
- ( ) Survey/quiz tools (e.g. Google Forms, Kahoot)
- ( ) Other: _____

31. Which **challenges** do you face the most while following **trainings in digital environments?**
more than one option can be selected

- ( ) Internet connection problems
- ( ) Distraction and lack of motivation
- ( ) Difficulties in using digital tools
- ( ) Difficulty in understanding the training content
- ( ) Lack of opportunity to discuss and ask questions
- ( ) I do not face any challenges
- ( ) Other: _____

32. What are the **specific tools, content or resources** you would like to **see in the digital learning platform** to be developed within the scope of the **EDP- Net Project**?
more than one option can be selected

- ( ) Interactive applications
- ( ) Video case studies
- ( ) Artificial intelligence assisted counselling
- ( ) Simulations
- ( ) Open course material
- ( ) Other: _____

33. What is the most **important feature** that should be included in the **user interface of the digital learning platform** to be developed within the scope of **EDP- Net Project**?
more than one option can be selected

- ( ) Accessibility (disabled-friendly interface)
- ( ) Multilingualism
- ( ) Mobile compatibility
- ( ) Simple and intuitive operation
- ( ) Contents supported by visual narratives
- ( ) Other: [Open-ended]

Section 5: Motivation and Expectations

34. What would be the most **important factor(s)** that would **increase your motivation to participate in** the **EPD-Net learning network**?
Please tick maximum 3 options

- ( ) Information sharing
- ( ) International co-operation
- ( ) Certified trainings
- ( ) Participation in policy development processes
- ( ) Professional development opportunities
- ( ) Access to local application examples
- ( ) Other: [Open-ended]

35. In your opinion, **which methods** can be more **effective** in **disseminating** EPD-Net training modules?
more than one option can be selected

- ( ) Social media campaigns
- ( ) Webinars
- ( ) Printed manuals
- ( ) Regional workshops
- ( ) National policy recommendations
- ( ) Other: [Open-ended]

36. What are your **suggestions** for ensuring the **sustainability of EPD-Net training modules?**
more than one option can be selected

- ( ) Inter-institutional co-operation
- ( ) Local government integration
- ( ) Integration with EU projects
- ( ) Integration into academic programmes
- ( ) Capacity-building programmes within public institutions or NGOs
- ( ) Other: [Open-ended]

37. Would you like to **contribute** to the continuous development of the **EPD-Net digital training platform** through **surveys** and **other ways of exchanging ideas?**

- ( ) Yes
- ( ) No
- ( ) Maybe

38. Do you know any **potential local partner(s) to contribute** to the training module to be produced under the EDP-Net Project? [Open-ended]

39. In your opinion, what could be **the potential regional and global impacts** of the training module to be developed within the scope of the EPD-Net Project? [Open-ended]

40. If you have any other **suggestions or ideas** to present within the scope of the EPD-Net project, please let us know. [Open-ended]