

RESPONSE

Building Response Frameworks under existing
& new Marine Pollution Challenges in the Black Sea



Deliverable D 3.1

**Operation plans on marine pollution
training on a national level**



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Executive Summary

This deliverable (D3.1) reports on Task 3.1 of the RESPONSE project, focusing on the development of national operational plans for marine pollution preparedness and emergency response training. The task combined methodological design, national planning, and regional validation in a coherent sequence of actions.

The first step was the development of a structured methodology, prepared in Milestone 6. The methodology is built around ten interlinked steps, ranging from definition of objectives and scope to stakeholder engagement, needs assessment, curriculum design, training deployment, and follow-up. Each step was designed to ensure that training is participatory, practical, and aligned with national and regional strategies. This approach emphasizes integration with institutional responsibilities and EU frameworks.

The second step was the preparation of draft national operational plans, undertaken by the four Black Sea partners (Bulgaria, Georgia, Romania, and Ukraine). These plans were based on the common methodology but tailored to national contexts and priorities. They build on the results of previous project activities, including stakeholder analysis, surveys, interviews, and national workshops, and thus reflect both institutional and societal needs.

The third step was the organization of the regional online workshop (11 September 2025). The workshop gathered more than 120 participants from six countries, representing authorities, NGOs, academia, and the private sector. Using interactive tools, participants validated the objectives, activities, stakeholder groups, recruitment mechanisms, performance indicators, and evaluation methods of the national plans. This step was crucial in ensuring coherence, comparability, and cross-country alignment, while also allowing adjustments based on stakeholder feedback. The workshop results confirmed the relevance of the methodology and strengthened the ownership of the national partners.

As a result, four national operational plans on marine pollution training have been finalized. These plans represent the first RESPONSE training schemes at national level, tailored to partner needs and validated regionally. The deliverable demonstrates the successful attainment of Achievement Indicator 8 ("increased number of operation plans per BS country"), as defined in the Grant Agreement, and contributes directly to Work Package 3 objectives: (i) developing comprehensive operational plans to solidify the application and effectiveness of marine pollution training, (ii) empowering the set-up and operation activities towards marine pollution management, and (iii) monitoring the performance of training curricula and highlighting new perspectives.

Project background and context

The RESPONSE project, funded by the European Union under Grant Agreement No. 101124661, aims to establish advanced training schemes and curricula for marine pollution preparedness and emergency response in the Black Sea region. The consortium brings together universities, research institutes, and NGOs from Greece, Bulgaria, Romania, Ukraine, and Georgia, ensuring a multidisciplinary and cross-country approach.

Building on the results of Deliverable 1.1 (stakeholder analysis) and Deliverable 1.2 (needs assessment), the project identified gaps in training programs, differences in national approaches, and the need for harmonization across the region. Deliverable 2.2 further provided a monitoring and evaluation framework, including achievement, outcome, and impact indicators, which serves as a reference for developing and assessing the new training plans. These previous results directly inform Task 3.1, where national operational plans are designed, tested, and validated through regional cooperation.

Various training programs, platforms and curriculum have been implemented to monitor marine pollution and ensure knowledge integration and dissemination. Still, training material, best practices, standards and protocols often differ among platforms and programs, hindering progress towards implementing an integrated, transdisciplinary and multidisciplinary marine pollution training system. Peculiar events, such as armed conflicts, create new environmental and societal challenges that call for international, coordinated responses.

RESPONSE acknowledges the importance of deeper understanding of marine ecosystems and river-delta-sea connections, the need for development of harmonized procedures, standards and methodologies in marine monitoring across the Black Sea countries to support healthy and resilient seas and foster integrated marine governance. The sustainable changes that are required for the establishment of efficient, advanced training schemes that would be integrated with the challenges, goals and specificities of the scientific and social context and make the most of the untapped capacity of stakeholders to promote regional awareness in the field.

In view of the background and context described above, the four overarching objectives of RESPONSE are: 1) IDENTIFY and UNDERSTAND the institutional and societal gaps and needs for effective, integrated, transdisciplinary and multidisciplinary marine pollution training systems; 2) DEVELOP effective training programs by assembling, integrating, and improving the most promising approaches and results into a comprehensive framework that consists of a set of methodological training tools, databases, policy recommendations, and background information; 3) SUPPORT the implementation of the EU and Regional Strategies, by developing operational guidelines for effective application, updating, monitoring and management of training programs on marine pollution; 4) EMPOWER marine pollution training, monitoring and mitigation by involving, inspiring and influencing stakeholders through a broader vision of co-design, co-creation, co-establishment, co-implementation and co-assessment of the training programs.

In this context, Deliverable 3.1 contributes to Work Package 3 by: (i) developing tailored national operational plans, (ii) ensuring their validation through a regional workshop, and (iii) demonstrating progress towards Achievement Indicator 8 of the Grant Agreement. This deliverable represents a key step in achieving the overarching project objective of supporting the implementation of EU and regional strategies on marine pollution preparedness and response.



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Aim of the Task

The aim of Task 3.1 is to translate the relevant specific objective into concrete action. The aim of this task is to develop operation plans on marine pollution training on a national level, to provide comprehensive capacity-building educational programs on a regular basis. While WP3 seeks to develop operational frameworks, empower their implementation, and monitor performance, Deliverable 3.1 specifically contributes by producing four (4) tailored national operation plans for training and validating them through a regional workshop. This provides the foundation for subsequent real training activities under the RESPONSE project.

The following aspects will be defined within the regional workshop: (i) the objectives to be accomplished, (ii) the activities and tools to be used in the training courses, (iii) the stakeholder groups to be involved, (iv) the processes for recruiting and retaining new participants, (v) key performance indicators (task 2.2), as well as quality indicators and evaluation criteria (awareness-raising activities, mutual learning activities, updating of concepts and new technologies for monitoring and mitigation, etc.), (vi) the timetable for actions and the roles of training administrators, and finally (vii) procedures, guidelines, and templates for interaction with participants and stakeholders, with a view to effectively collecting feedback to be used for performance evaluation (task 3.3) and for reporting results along with any problems and/or issues encountered during the training courses.

The training capacity for all stakeholders involved in marine pollution incidents in the Black Sea will rely on the co-created training curricula (Task T2.1) and the operational use of the Digital Toolkit (Task 2.3). Operational preparedness will include exercises and organisation for rapid mobilisation upon request. In the long term, operational plans will involve a wide range of authorities and organisations (from Tasks 1.1 and 4.2) carrying out their own training programmes with the support of Tasks 2.3 and 2.4, as well as contributing to the training of trainers.

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Introduction

This report outlines the activities involved in Task 3.1 of the RESPONSE project, which aims to develop an operational plan for marine pollution training at a national level. To support this process, a regional workshop was organised on 11 September 2025, bringing together stakeholders from Black Sea countries who are involved in marine pollution response activities.

The workshop was part of the methodology established in Milestone 6 and the draft plans presented in Milestone 7. It contributed to the evaluation and adjustment of the initial methodological framework developed for the national operational plans.

Together, these steps ensure that the plans are relevant at the national level and coherent at the regional level, providing the basis for further RESPONSE training activities.

This creates an evidence-based foundation for developing national operational plans and ensures that the RESPONSE project aligns with stakeholder needs.

1. Methodology for the Design and Implementation of Operational Plans of MP Preparedness and Emergency Response Training

A structured and unified methodology was developed in Milestone 6 (M6), for planning training courses in the field of marine pollution preparedness and emergency response, particularly in contexts affected by armed conflict. This methodology (Figure 1) comprises ten interdependent steps to guide the development, delivery and integration of courses into broader institutional systems. These steps reflect a participatory and adaptable approach geared towards sustainability and regional impact. The online Regional stakeholder consultation Workshop is also part of the methodology and has contributed in the evaluation and potential adjustment of the initially developed methodological frameworks of operational training plans.

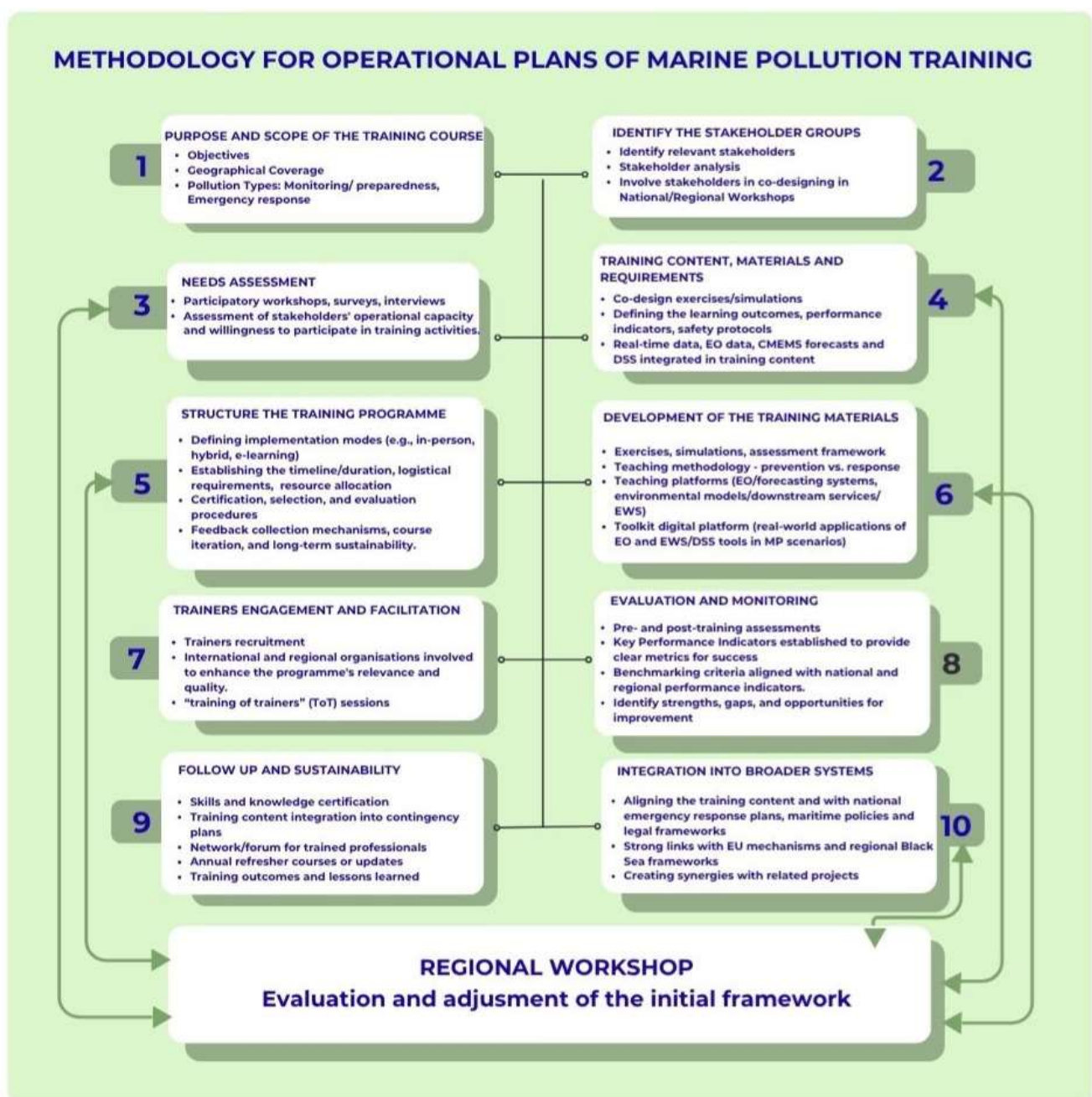


Figure 1: Flowchart of the methodological framework for planning the training courses

Step 1 – Definition of purpose and scope of training courses

The training course designed to support the Marine pollution monitoring, reporting, management and mitigation within the Black Sea Basin, with particular attention to pollution caused by regional armed conflicts, is considered to fulfil four primary objectives:

- to train port authority personnel and shipping operators in implementing port waste reception procedures and pollution prevention measures under specific legislation frameworks (e.g. MARPOL).
- to improve the understanding of local government units and civil protection authorities on their roles in marine pollution emergency response and post-incident recovery.
- to train environmental and emergency response personnel in the rapid assessment, rescue, and rehabilitation - ensuring deployment of a coordinated wildlife response team within 24 hours of a pollution incidents, including armed conflicts.
- to train volunteers for participation in joint naval/marine exercise with focus on marine pollution preparedness and response.

Institutional preparedness aims to strengthen the understanding, coordination, and preparedness of local and national government institutions, including the General Inspectorates for Emergency Situations, the Ministries of Environment, Naval Authorities, and Port Administrations, as well as environmental protection organizations and NGOs that promote marine environmental protection awareness in each country. In the event of a marine pollution emergency, it is essential that these institutions understand their roles, which include alert protocols, chain of command, and post-incident recovery procedures.

The training course should clearly define the geographical scope it addresses, as this will shape both the content and the practical relevance of the material. If the course targets local-level response, focusing on specific coastal zones, ports, or MPAs, it should incorporate the distinct environmental, ecological, and operational characteristics of those locations - such as local species at risk, common pollution sources, existing infrastructure, and the roles of local authorities.

If the course is intended for a country-level application, it should be designed to reflect the national legislative framework, response structures, institutional responsibilities, and key challenges specific to that country. This includes alignment with national contingency plans, coordination mechanisms among national and regional authorities, and the integration of real-case scenarios based on past incidents or identified risks within the country's marine environment.

Each BS region's environmental vulnerabilities should be considered to ensure that the training program is grounded in the operational realities of each partner country.

A key part of developing an effective operational training plan for marine pollution preparedness and response was clearly defining the types of pollution the training would address.

Based on past incidents and consultations with stakeholders, the training will prioritise five main types of pollution: oil spills, chemical spills, plastic pollution, sewage and hazardous substances resulting from shipwrecks and maritime accidents, including those involving armed conflict. The technical focus, target audience, required equipment, procedures and response strategies included in the training will be determined by this scope.

Extensive research conducted in earlier phases of the project detailed key issues related to marine pollution and emergency incidents requiring an immediate response. These issues were identified through the in-depth analysis presented in Deliverable 1.3, as well as through continuous interaction and consultation with stakeholders (D1.1, D1.2 and D2.1).

Step 2 – Identification of the stakeholder groups to be involved

After defining the purpose and scope, the next essential step in designing a training course on marine pollution preparedness and response is to identify the main stakeholders for whom the course is intended (in accordance with D1.1) and conducting a stakeholder analysis in terms of influence, capacity and their role in preparedness/response. The contribution of stakeholders to the co-design stage of the training programme was taken into account through workshops organised at national and regional levels (in accordance with D2.1).

The planner included an assessment of the stakeholders' context, previous training, the timing of their most recent participation in training courses and preparedness exercises, and their expertise and operational capacity in responding to marine pollution incidents.

Within the RESPONSE project, this step was implemented exhaustively through in-depth mapping and analysis of the stakeholders involved. This led to a comprehensive understanding of the stakeholder network, as documented in D 1.1, D1.2 and D2.1.

Step 3 – Needs assessment

Once the target groups of stakeholders to participate in the training courses had been identified, an in-depth assessment of their specific needs was carried out. This step was essential to ensure that the training would be relevant, effective and tailored to each group's current capabilities and areas for improvement.

Key needs have been identified through close collaboration with stakeholders using surveys, interviews and participatory workshops. Additionally, analysing past pollution incidents and response actions can highlight weaknesses or gaps in preparedness. An assessment of existing training frameworks and the technical and operational capacity of stakeholders is necessary to determine what is already in place and where improvements are needed.

Within the RESPONSE project, these steps were implemented through an in-depth analysis of stakeholder profiles using a combination of tools, including direct communication, one-to-one discussions, questionnaires, interviews and co-creation workshops (as documented in deliverables D1.1, D1.2 and D2.1). A review of existing training structures was carried out, identifying critical gaps, together with an assessment of stakeholders' operational capacity and willingness to participate in training activities.

Step 4 - Defining training content, materials and additional requirements

Jointly aligning curricula ensures that all training requirements are directly aligned with those developed in collaboration with relevant stakeholders, including maritime institutions, academic partners, regulatory bodies, NGOs and volunteer groups.

This involves correlating training modules with the defined competencies, integrating feedback from end users and industry to ensure real-world relevance, and maintaining a dynamic alignment process to adapt to the continuously evolving operational challenges of marine pollution

management. This approach also guarantees compliance with national and international standards for maritime training and pollution control.

Practical exercises and experimental activities are developed to align with the specific requirements of the Marine Pollution (MP) curriculum. The necessary actions are as follows:

- developing practical exercises and simulations based on scenarios adapted to the core competencies of each MP training module.
- defining the learning outcomes, performance indicators and safety protocols for each experimental component.
- Integrating real-time data, EO data and marine forecasts from CMEMS, as well as decision support tools (DSS), in order to simulate realistic conditions for marine pollution response.
- ensuring that exercises support the development of individual skills and operational coordination at team level;
- aligning exercise content with the latest scientific standards, environmental policies and regulatory requirements.

The functional and technical requirements of IT platforms and toolkits supporting the delivery and application of marine pollution training programmes must be defined.

This should include specifying user needs, accessibility standards and interoperability requirements for the training toolkit, identifying the digital tools, software and platforms needed for real-time simulation, environmental impact/NEBA data analysis and interactive training, ensuring the platform supports modularity for scalable, customisable training delivery (e.g. based on role, region or threat level), integrating visualisation tools for marine environment data, early warning systems and pollution modelling, and prioritising user experience, multilingual support and security compliance in platform design.

Step 5 – Structure the training programme

The training deployment specification establishes clear specifications for launching and operationalising MP training in local, national and regional contexts (institutional and legislative). The following actions will be included:

- Defining implementation modes (e.g., in-person, hybrid, e-learning, defining whether there will be simulation exercises, field demonstrations, and site visits) tailored to different stakeholder groups and operational settings;
- Establishing the timeline—duration, logistical requirements, and resource allocation for effective training; Develop guidelines for trainer certification, participant selection, and evaluation procedures;
- Ensure integration with the training calendars of institutions/stakeholders, emergency response training, and continuing education/learning pathways. Establish mechanisms for feedback collection, course iteration, and long-term sustainability.

Step 6 – Development of the training materials

The development of training materials will include a diverse and comprehensive set of resources designed to support effective learning and practical application. These will include manuals, guides, and standard operating procedures (SOPs) to provide structured guidance, as well as case studies on past marine pollution events, including armed conflicts, to provide real-world context and lessons learned. Multimedia elements, such as videos and interactive simulations, will enhance engagement and experiential understanding. Where necessary, materials will be translated into local languages to ensure accessibility and inclusiveness. Within the RESPONSE project, all training content will include a digital component and will be integrated into the RESPONSE digital toolkit, facilitating flexible, scalable, and user-friendly delivery for all stakeholder groups.

The development of training modules aims to create a structured program of results-based modules tailored to the main areas of marine pollution preparedness and response. The development of these modules involves the following actions: (1) Designing modular content for beginner, intermediate, and advanced levels of training and practice in the field of marine pollution, (2) Aligning the content of the modules with international maritime training standards and jointly designed curriculum frameworks; (3) Incorporating multimedia resources, case studies, and scenario planning to enhance engagement and realism; Providing role-specific pathways (e.g., navigators, port authorities, environmental specialists, NGOs/volunteer groups) within the curriculum.

Exercises, simulations, and the MP assessment framework

Versatile and replicable exercise models will be developed, adaptable to different marine contexts and pollution scenarios. Key variables such as spill size, weather conditions, environmental sensitivity, and coordination between agencies will be incorporated into specific simulations. Exercises will be aligned with international response protocols, national emergency frameworks, and environmental regulations. Each simulation will be framed with pre- and post-exercise briefings to provide contextual understanding and enhance learning outcomes; Performance-based assessment frameworks will be linked to module-specific learning objectives and real-world competencies (in accordance with T2.2); Simulation-based assessments, decision-making tasks, and scenario response assessments will be integrated to test operational readiness. Standardization and fairness of assessment criteria will be ensured, while maintaining flexibility for contextual adaptation. Feedback mechanisms and structured post-assessment reviews will be incorporated to support learning and continuous improvement.

Teaching methodology will adopt evidence-based training methods, adapted to both the prevention and emergency response contexts, by aligning the instructional approach with the distinct requirements of preventive training – such as risk forecasting, policy planning and preparedness strategies.

The actions taken involve the use of differentiated instructions for preparedness (e.g. policy planning, risk forecasting, NEBA) vs. rapid response (e.g. Decision Support Systems (DSS), field deployment, coordination), combining classroom training with experiential learning and digital simulations. Collaborative training and knowledge sharing among colleagues will be promoted. Real marine pollution (MP) events and lessons learned/case studies will be integrated into the training strategy; Risk assessment, policy simulation and scenario planning will be used to improve preparedness training. Decision-making under pressure, communication chains and field coordination in emergency response training will be prioritised. Dual methodologies development

will link strategic planning and tactical execution. Both methods will be ensured to promote interdisciplinary coordination and real-time adaptability.

Teaching platforms providing services/software/tool kits available for the marine environment/earth observation (EO) data and models will be introduced (using tools available for the marine environment, EO/forecasting systems and environmental models/downstream services/early warning system (EWS) to support training in the field of MP).

Satellite-based EO services, Copernicus Marine Environment Monitoring Service (CMEMS) products and marine forecasting tools will be integrated into teaching platforms; Trainees will have access to real-time and historical datasets for pollution tracking and response modelling. Stakeholders will be trained on interpreting model results and integrating them into operational decisions. The compatibility of data formats and supporting information with existing national and regional digital infrastructure will be ensured.

CMEMS-DSS/toolkit demonstrator Configuration will be used to showcase real-world MP applications; Functional demonstrators integrating Copernicus Marine Environment Monitoring Service (CMEMS) tools, national/regional downstream services and EWS and DSS will be implemented, as well as for advanced training in MP research. This involves setting up demonstration environments to showcase real-world applications of EO and EWS/DSS tools in MP scenarios, providing guidance, hands-on sessions and test cases for training participants. Demonstrators will be integrated with existing institutional/ legislative frameworks and regional systems. Early feedback from users will be facilitated to improve the relevance and usability of the system.

Toolkit platform development aims to build a dynamic, user-oriented digital platform to host, manage and disseminate the (re)configurable set of training tools. The Toolkit platform implementation involves the design of a web portal with modular access based on role, function and institutional level. Interactive dashboards and customisable training paths will be incorporated. Analyses associated with the stages will include tracking participation, performance and impact indicators.

Step 7 – Trainers engagement and facilitation

Recruiting the right trainers is a key element in ensuring the success of the training program. It involves selecting qualified experts with specialized knowledge in marine ecology, spill response, and emergency management to deliver effective and credible instruction. Involving international or regional organizations such as EMSA and IMO further enhances the program's relevance and quality. Additionally, providing "training of trainers" (ToT) sessions helps build a sustainable pool of skilled facilitators who can continue delivering the training beyond the initial phase.

Step 8 – Evaluation and Monitoring

Evaluation and monitoring are essential components of the training process, aimed at measuring the effectiveness, efficiency, and overall impact of the MP training system against predefined benchmarks. This step involves conducting pre- and post-training assessments to quantify knowledge gained by participants, as well as gathering participant feedback through surveys and forms to capture their experiences and suggestions. Performance is also observed and evaluated during practical drills to assess real-time application of skills. Key Performance Indicators such as the percentage of participants demonstrating improved knowledge or the speed of response during

simulations are established to provide clear metrics for success. Benchmarking criteria are developed based on the best international practices and aligned with national and regional performance indicators. The collected data is thoroughly analysed to identify strengths, gaps, and opportunities for improvement, with findings used to continuously refine the training curricula, instructional methods, and digital toolkits, ensuring that future training cycles are increasingly effective and responsive to stakeholder needs.

Step 9 – Follow up and sustainability

Follow-up and sustainability are critical to ensuring the long-term impact of the marine pollution training program. Upon completion, participants should receive certificates recognizing their newly acquired skills and knowledge. Efforts should be made to encourage the integration of the training content into contingency plans, reinforcing its practical application within existing frameworks. To foster ongoing collaboration and knowledge exchange, a network or forum for trained professionals should be established, providing a platform for continuous communication and support. Annual refresher courses or updates should be planned to maintain and enhance competencies over time. Additionally, training outcomes and lessons learned should be regularly documented and shared through reports and policy briefs to inform stakeholders and support policy development.

Step 10 - Integration into broader systems

To ensure the marine pollution training program has a lasting and wide-reaching impact, it is essential to integrate it into broader systems and frameworks. This involves aligning the training content and objectives with existing national emergency response and maritime policies/legal frameworks, ensuring consistency and support from relevant authorities. Additionally, establishing strong links with European Union mechanisms and regional Black Sea frameworks/ Black Sea Commission, will promote coordination and harmonization across borders, enhancing regional preparedness and response capabilities. The training outcomes and best practices should also be incorporated into the capacity-building components of related projects, creating synergies and reinforcing the overall effectiveness of marine pollution management efforts.

1.1. Regional Online workshop – scope and objective

The regional online workshop, held on 11 September 2025, was designed to validate the draft national operational plans and to refine the methodology for marine pollution training developed under Milestone 6. The workshop aimed to review the scope and activities of the training plans, to align them with regional priorities, and to strengthen stakeholder involvement across the Black Sea countries.

The workshop scope and objectives

The workshop has been designed to support the development of operational plans for marine pollution training programs of the Black Sea partners, with particular attention to pollution caused by regional armed conflicts.

It is part of a series of activities starting with identification of key elements of the regional legal and institutional background and training needs in the context of an analysis of the available Black Sea marine pollution knowledge. The following steps comprise co-development of training programmes

with key stakeholders to prepare for the holding of actual trainings and further regional exchange and planning.

The objectives of the workshop are to help partners develop comprehensive operational plans to solidify the application and effectiveness of marine pollution training and to support the alignment of the national planning process with the regional priorities; to guide the Black Sea partners in the refinement and improvement of the contents of country-level planning before the expected physical presence training-of-trainers events. The workshop has helped with the evaluation and adjustment of the initial frameworks designed on national level.

Building upon the methodological guide and Digital Toolkit created under the RESPONSE project, the process leads to the development of new generation training schemes and the establishment of region-wide early warning mechanisms. The scope of the workshop reaches out further to the support of comprehensive capacity building schemes and their update on regular basis in the future.

The workshop has outlined the contents of the new training courses and curricula to be implemented in each Black Sea country and defined the key areas to be addressed to meet the training objectives.

Workshop participants and stakeholder representation

The RESPONSE partners used the findings of the stakeholder mapping process performed within the project and invited for participation representatives of the key stakeholders for each country. Those key stakeholders have been described as organisations and institutions that have a coordinating role defined in a legal act, or possess unique expertise in the marine environment. Smaller consultancies and NGOs have been included because of their networking role, accumulated knowledge and skills in training at national and international level.

The invitations for participation were sent to key stakeholders who had been involved in the co-creation process (D2.1) and to institutions with identified needs as well as to selected organisations and authorities among the stakeholders' networks (D1.2). The selection intended to bring together local and national governments and institutions from the Black Sea countries and to assist the cross-border process of understanding, coordination, and preparedness for marine pollution training. Environmental agencies, scientists and NGOs played a key role in bringing together the institutions and promoting across borders marine environmental protection awareness and preparedness for marine pollution emergencies.

The event gathered 125 participants (54 men and 71 women) from the Black Sea countries involved in the RESPONSE project, representing governmental authorities, research and academic institutions, maritime administrations, environmental agencies, NGOs, and private sector actors. This broad participation ensured a balanced representation of expertise and interests relevant to marine pollution preparedness and response. Figures 2-4 present the makeup of the representation by country and by category.

A total of 125 participants from Bulgaria, Georgia, Romania and Ukraine, the partners team from Greece and the Black Sea Commission Pollution and Monitoring officer located in Istanbul, Turkey took part in the online event. This considerable number reveals the regional stakeholders' interest in the project. The number of participants from Ukraine is markedly larger than those from the other

Black Sea partner countries. The fact can be attributed to the project focus on pollution from armed conflicts and the active involvement of stakeholders related to Black Sea marine pollution response.

Figure 3 presents the professional affiliations of participants in the workshop in total numbers. The majority of representatives were from research institutions. This category is somewhat overrepresented though the different institutes vary a lot in their profiles and areas of competence. They add to the overall picture of professional expertise involved in the project. The substantial involvement of authorities is among the workshop achievements. It may be relevant to consider jointly, as one group, the representation of national and local authorities and agencies as in most cases they bear responsibilities for taking action in case of emergency and coordination of the monitoring of the state of the marine environment. Thus, they come second and provide a balance to the largest group. Academia and NGOs come next. They are adequately represented as they are expected to provide reliable background to the training process. Finally, though not in significance, is the smallest category of the private business sector. Involving more businesses in the training process remains one of the important tasks of the project.

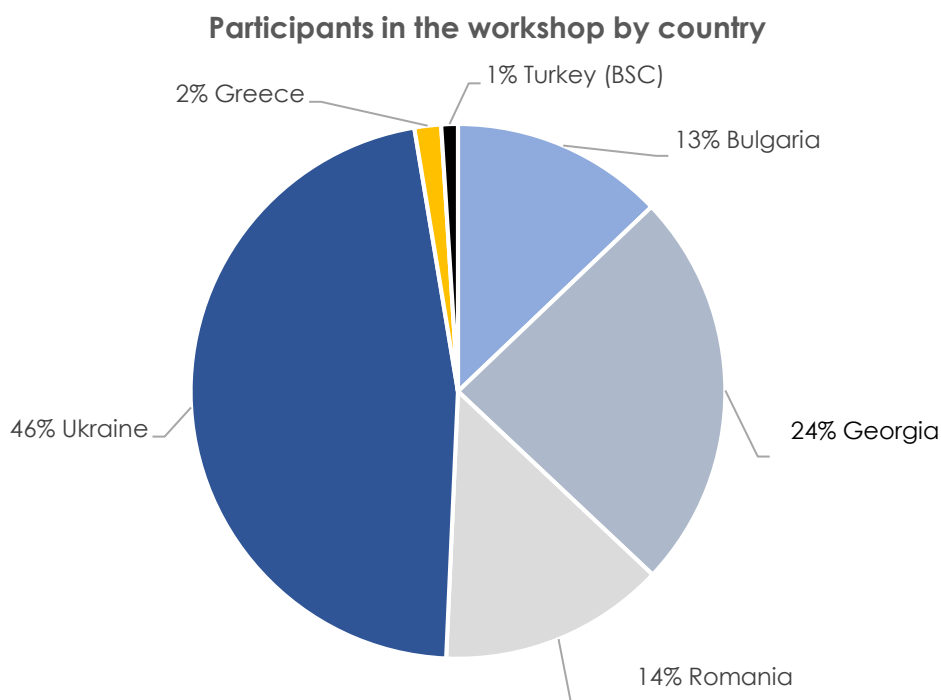


Figure 2: Distribution of workshop participants by country — Ukraine had the largest share (46%), followed by Georgia (24%), Romania (14%), Bulgaria (13%), Greece (2%), and Turkey (BSC) (1%). The chart highlights the broad regional representation and collaborative engagement within the Black Sea basin.

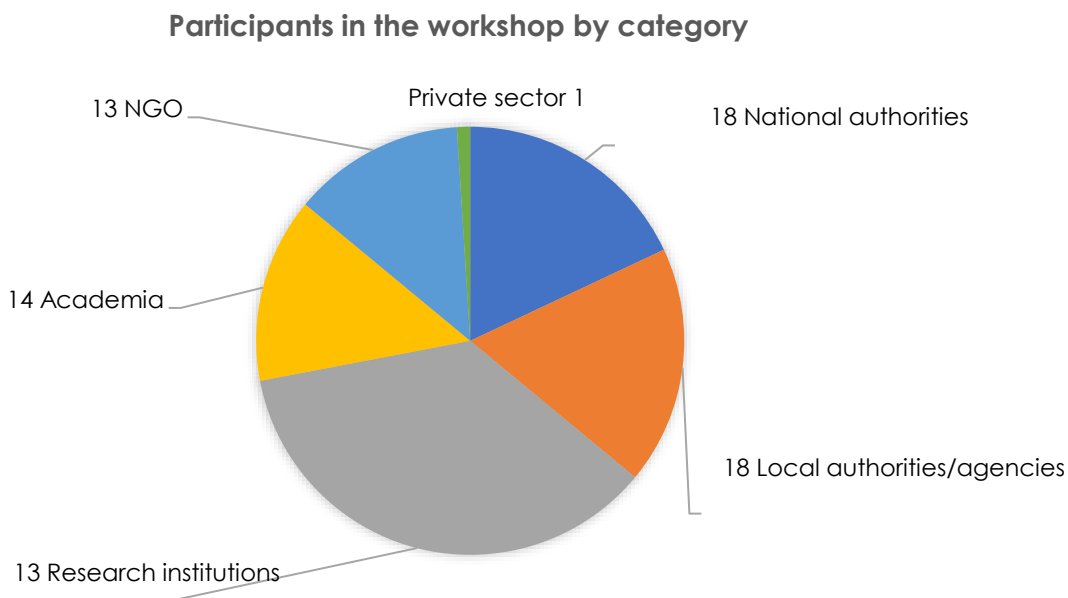


Figure 3: Distribution of participants by institutional category — national and local authorities (36 participants combined) dominated the group, followed by academia (14), research institutions (13), NGOs (13), and a private sector representative

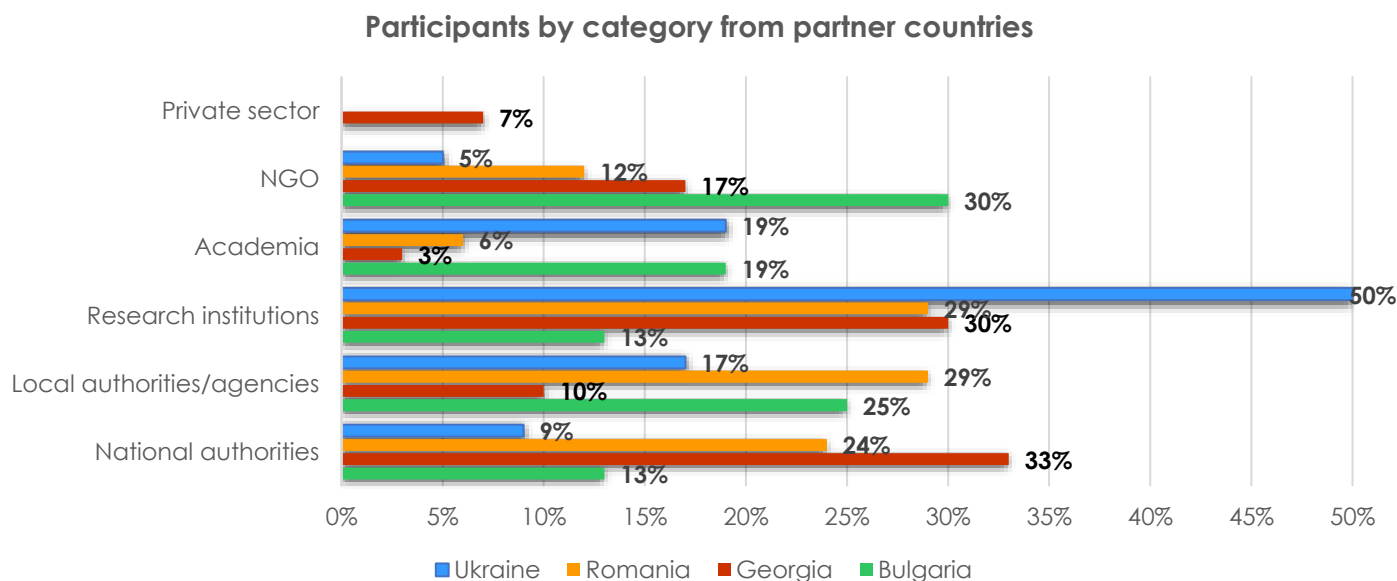


Figure 4: Cross-country distribution of participants by institutional category — Ukraine led in research representation, Georgia in authorities, Bulgaria in academia and NGOs, while Romania showed a balanced profile across all sectors.

Figure 4 presents a breakdown of the representation of stakeholder categories by country. The four Black Sea partner countries that have prepared national operational training plans are included in the presentation. On the positive side, the categories are fairly balanced the research institutes from Ukraine, which outnumber the other categories. Businesses are represented only in Georgia, which enriches the profiles of stakeholders and the overall picture of participants.

Interactive process and tools

The online presentation and communication process of the workshop used an interactive presentation and audience engagement tool, (i.e. Mentimeter - <https://www.mentimeter.com/>) throughout the workshop and Google drive for the final feedback evaluation form. The tools were employed to facilitate the dialogue and collect structured feedback in real time. The focus was on creating an inclusive and participatory process, rather than on the specific technical platform applied. The input collected through these tools supported the adjustment of national plans and enhanced stakeholder ownership of the training process.

The interactive presentation tool (Mentimeter) used a series of questions grouped by themes that represented key elements of the operational plans. After instructions on how to use the platform from the coordinator of the Georgian partner and the lead partner, a welcome from the Black Sea Commission, and an introduction to the project and the workshop objectives, attention turned to the following five topics.

Group A *Key training objectives* included primary focus, pollution types of interest, expected outputs and outcomes, technology integration, interest in training on armed conflicts pollution. Group B *Target audiences* included questions related to the main target audiences and the recruitment of new participants in training activities. Group C *Training activities and tools* collected opinions and made assessments on the effectiveness of lectures, practical exercises, field exercises, interactive learning, case study analysis, technology enhanced learning etc., budget and infrastructure for training. Group D *Temporal and geographic aspects* asked participants to prioritize scales most relevant to partner's needs, geographic areas, relevant lengths and frequencies of training. And finally group E *Success metrics* identified plans how to measure the success of the training programs and the achievements of the participants.

Each of the above main groups of questions contains subgroups, and the interactive platform offers participants to indicate their preferences for each of them. The results are reported in real time and made available to partners and stakeholders in the Black Sea countries. The resulting picture is analysed and used to improve national operational training plans on marine pollution preparedness and response. Priorities and preferences are presented in the annexes to the report. For example, the top preferences for types of pollution for training were oil pollution (21.6% of votes), marine litter (20.6%) and conflict-related pollution (10.3%), alongside newer challenges such as pharmaceuticals and invasive species.

The Annexes 2-5 to this report present the workshop summary and agenda and the list of questions for stakeholder engagement. The Analysis of the questionnaire results for each section has been integrated in the report correlating it to the partner partners' national plans and the workshop key areas.

Workshop discussion on the objectives of training

The workshop used the questions under group A to collect opinions on the Key Training Objectives of the courses under the national operational plans. The first set focused on the Primary training focus, offering choices between response, preparedness and a combination of the two. Over half of the participants supported courses that combined both response and preparedness, and there was also strong support for prevention and planning. National plans of the partners reveal interest in both preparedness and response.

The marine pollution topics of interest assessed by the participants included nine options: oil pollution, heavy metals (e.g. mercury, lead, cadmium), other contaminants (e.g. persistent organic pollutants (pops), chemical spills, hazardous substances); radioactive contamination; industrial discharge pollution; marine litter (e.g. macro-, micro-, nano-plastics debris, ghost fishing gear, other solid waste); sewage and wastewater discharge; biological pollution (e.g. invasive species, ballast water); conflict-related pollution (e.g. military vessel incidents, naval warfare environmental impact, ammunition dumping and munitions, infrastructure debris); emerging pollutants (e.g. pharmaceuticals and personal care products, nanomaterials) and other to be ranked from 1 to 5 where 5 is high priority and 1 is low priority. Oil pollution emerged as the highest priority, followed closely by marine litter. A group of pollutants with similar importance included sewage and wastewater discharge, biological pollution, conflict-related pollution, and other contaminants. These priorities reflect the realities of the region — where oil is a major shipping cargo, plastics contamination and eutrophication are widespread, and pollution from military activities, naval warfare, persistent chemicals, and chemical spills pose growing threats. The ranking helped partners validate and readjust their training priorities. The option for putting stronger emphasis on national level priorities remains available to them.

Training outputs and expected outcomes were assessed and ranked from high to low in the following way: environmental rehabilitation techniques, risk assessment and prevention, response network coordination, rapid assessment capabilities, understanding of roles and responsibilities of various authorities, technology integration, team building and collaboration, search and rescue operations, legal and regulatory compliance, communication protocols. The selection provided insights into the priorities of the target audience focused on improvement of the state of the marine environment and pollution prevention, risk assessment and integrating various stakeholders in collaborative networking.

Though technology integration has been defined as focus of strong interest on many occasions, including the regional workshop, the participants remained realistic about it, recognizing the fact that new technologies use and integration depends on cost and feasibility. Out of a set of eight technologies of interest, remote sensing and satellite monitoring appeared to be most interesting, followed closely by real-time data analytics platforms and GIS mapping and tracking systems. Given the profiles of participants, it is difficult to advise prioritization on national level regarding technologies such as predictive modelling software, IoT sensors and monitoring devices, virtual/augmented reality training tools, drone surveillance systems, mobile communication apps. Those definitely are better suited to audiences with a technical and engineering background.

The need to integrate security considerations was reconfirmed by the workshop and the anticipations from the training. Outputs related to military pollution topics of top interest focused on threat assessment protocols, response procedures in conflict zones to produce outcomes such as marine pollution reduction and control in conflict zones. Both partners from Ukraine regard the coordination with military and security forces to be an important outcome. The project focus on pollution from armed conflicts prevention and remediation as training objective was validated by the workshop that provided different aspects and detailed suggestions for training outputs and outcomes.

2. National operation plans for training programs on marine pollution preparedness and emergency response of the Black Sea partners

The Black Sea partners developed national operation plans for marine pollution training programs using the comprehensive framework for designing and implementing marine pollution preparedness and emergency response training developed under the RESPONSE project, with a focus on pollution caused by armed conflicts. The national operation plans are tailored to the specific needs of stakeholders at the national level. They are built around the logical steps described in particular in the adopted methodology described in M6. The first version of national operation plans for marine pollution training (T 3.1) prepare the partners for the actual physical presence training of selected stakeholders (training of trainers) and present their ideas on how to organize, achieve operational readiness, and conduct the training courses (T3.2).

2.1. National Training Plan in Bulgaria

This review presents the Bulgarian national operation plan for training on marine pollution preparedness and response and the validation and adjustments based on outcomes of the regional online workshop as part of the adopted methodology of training.

Step 1 Definition of purpose and scope - objectives, geographical coverage, pollution types

The national training plan in Bulgaria has the main purpose to enhance the ability of the Bulgarian authorities and institutions to monitor and respond effectively to incidents of marine pollution. Institutional preparedness aims to strengthen the understanding, coordination, and preparedness of local and national government institutions, and ensure the support of environmental protection agencies and NGOs that promote marine environmental protection awareness in Bulgaria.

Key training objectives identified in the co-creation process include:

- to increase the understanding of local government units and civil protection authorities on their roles in marine pollution emergency response and post-incident recovery and enhance their capacity to address the issues;
- to train the staff of administrations, institutions and agencies involved in marine pollution preparedness and emergency response on specific marine pollution issues in accordance with the relevant legislative framework;
- to introduce authority personnel to new technologies to monitor a pollution incident for immediate response;
- to strengthen the capacities of environmental authorities, emergency response units, and other key stakeholders in responding to marine pollution incidents arising from or occurring during armed conflicts;
- to support the training of civil engineers on the subject Response to disasters and accidents in the Black Sea at the Technical University – Varna;
- to support training of volunteers for participation in joint (naval/marine) exercise with focus

on marine pollution preparedness and response;

- to train environmental and emergency response personnel in the rapid assessment, rescue, and rehabilitation of oiled or contaminated marine wildlife.

The partner team has identified clearly the roles of administrations and governments in preparedness, emergency response, and post-incident recovery. As both local authorities and maritime administrations have important though slightly different roles depending on the concrete situations, they are designated adequately in the objectives.

The national workshop identified the needs of stakeholders with regard to incorporating training content comprising monitoring and emergency response topics, with emphasis on practical exercises, demonstration, good practices and analysis of past incidents, and demonstrations of modern technology use. The regional workshop reconfirmed that training plans incorporating both preparedness and emergency response received the strongest overall support. The objectives of the national plan for Bulgaria comprise these two aspects and the regional workshop reaffirmed the chosen focus of the national training plan.

Geographical coverage

Because of various considerations, the training course in Bulgaria is intended for application on country level. The region covered is the Black Sea coastal area with the related regional and municipal administrative units, and the national sea area with the maritime spaces defined in the Bulgarian legislation and the related Bulgarian maritime search and rescue response area, also defined in the legislation. These areas are associated with the national responsibilities for protection of the marine environment and the specific responsibilities of institutions in case of maritime emergencies, preparedness, and response to marine pollution incidents. Stakeholders from the three coastal regions have been involved in the co-creation process, also from the central maritime and port institutions in the capital.

As marine pollution can easily move between regions, the course is designed to be relevant to the whole coastal and sea area. It is designed to reflect the Bulgarian legislative framework, response structures, institutional responsibilities, and key challenges. That includes alignment with national contingency plans, coordination mechanisms in case of emergencies, and integration of case-studies of past incidents with analyses, conclusions, and recommendations. The Black Sea regional legal framework with reference to national obligations is also included.

The regional workshop took into account the fact that each country can define the geographical scope of the training plans according to the specific realities of the country. The Bulgarian national plan followed the adopted methodology in defining the geographical coverage.

Types of pollution

The national plan defined the types of pollution the training would address after the partner team had reviewed of the evaluation of the monitoring and assessment framework on marine pollution in Bulgaria (M2) based on the Updated Assessment of the State of the Marine Environment (2021), which is part of the Marine Strategy of Bulgaria. The existing Bulgarian monitoring and assessment framework comprehensively covers parameters such as eutrophication, chemical contaminants, and invasive species. There is a growing database on marine litter, which should make it possible to assess the state of its impact in the future.

The extensive research conducted in earlier phases of the RESPONSE project (D1.3) identified the key Black Sea issues related to marine pollution and emergency incidents requiring an immediate response: pollution with heavy metals, radioactive contamination, nutrients, pesticides, marine litter, oil pollution, pollution due to war conflicts. Specific feature of the research is pollution associated with armed conflicts. Monitoring of pollution with new technologies is of particular interest for training purposes.

Further review of past incidents and consultations with stakeholders prioritized five main types of pollution for the RESPONSE project: oil spills, chemical spills, plastic pollution, sewage and hazardous substances resulting from shipwrecks and maritime accidents, including those involving armed conflict. The technical focus, target audience, required equipment, procedures and response strategies included in the training were determined by this scope.

The pollution types addressed for preparedness focus primarily on: pollution with contaminants (heavy metals, chemicals), oil pollution, eutrophication (nutrients), marine litter, pollution from armed conflicts (including a complex of pollution types).

The plan also envisages emergency response training on pollution types associated with: oil pollution/spills, chemical pollution/spills (e. g. spills from bulk cargo of mineral nitrogen fertilizers), pollution due to war conflicts. The information for the training comes from national emergency response plans, reports on past incidents, research on war pollution incidents.

The workshop helped the Bulgarian team reassess and readjust the training priorities. Oil pollution was reconfirmed as top priority, as well as marine litter, sewage and waste water, nutrients, chemical pollution, biological pollution, conflict related pollution. The workshop also helped the team prioritize the training outputs and outcomes with environmental rehabilitation techniques reconfirmed as an important output, along with risk assessment prevention, response network coordination, and rapid assessment capabilities. Legal and regulatory compliance and search and rescue are considered as important as team building and collaboration. The workshop reconfirmed the focus on training on the use of technologies. Remote sensing and satellite monitoring was reconfirmed as top focus for the training. The regional workshop reconfirmed the need for training on pollution from armed conflicts and allowed the Bulgarian team readjust the training content and align with the prioritization.

Step 2 – Identification of the stakeholder groups to be involved

The key stakeholders for Bulgaria have been identified in D1.1 on the basis of review of the national legal framework, combined with survey and interviews, and include a short, though not exhaustive, list of stakeholders on national level: Executive Agency Maritime Administration, Ministry of Interior, General Directorate 'Fire Safety and Civil Protection', Black Sea Basin Directorate, District Varna, District Burgas, Institute of Oceanology – BAS, Technical University of Varna, Dept Ecology and Environmental Protection. Those are characterized by a combination of attributes: defined coordinating role and obligations in a legal act, unique expertise, skills in training. Smaller consultancies and NGOs can also be included because of their networking role, accumulated knowledge, and skills in training at national and international level. Those institutions were assessed as target audiences for the training. The process of analysis of stakeholders in terms of influence, capacity, and role in preparedness/response continued.

Prioritizing for the co-creation workshop was conducted to reflect stakeholder influence, capacity, and role in preparedness/response: decision-makers in marine pollution response, relevant administrations and agencies, research institutes, universities, training centres, marine business associations, NGOs, and volunteer groups.

Analyses have shown that very few institutions have in-house training programmes. The annual Marine Breeze Exercise is the only notable example, involving the navy, the maritime administration, the border police, the Black Sea Basin Directorate and other institutions, and foreign participants.

Some employees in the maritime and port administration and government structures have received training as seafaring professionals. However, this does not apply to all employees, nor does it involve regular updates to their training. International cross-border projects provide (multi)-institutional training support that is usually topic-specific, e.g. vessel traffic monitoring systems.

The publicly available training plans and curricula on preparedness and emergency response to nature and man-incited technogenic disasters (with some relation to marine pollution) are those of technical universities, the naval academy, training centers for seamen, universities, and training centers of the interior ministry. They are mostly oriented to disaster response plans and institutions, as designated in the National Disaster Response Plan. Monitoring and emergency response to pollution of the marine environment is covered rather briefly in some programmes and is not included in others. Therefore, existing training programmes need to be updated and developed further.

Most institutions are not involved in the development of training materials especially on marine pollution and emergency response and pollution remediation, except for oil pollution. Many institutions however apply collaborative efforts with other official institutions, such as ministries, state agencies, involved in activities addressing marine pollution from the military conflict in the Black Sea. Few key experts have specific expertise on specific marine pollution topics and the Marine Strategy Framework Directive (MSFD) descriptors, related to the National Marine Strategy of Bulgaria, mostly marine researchers from the Institute of Oceanology – BAS.

The project team has not identified any Life Long Learning programmes focused specifically on preparedness and emergency response to marine pollution for employees of the key stakeholders (transport administrations, local and regional authorities).

The following two groups of target participants have been identified in the process of preparation for the training: 1) decision makers, representatives of administrations and institutions, especially people participating in civil defence units and teams, emergency response teams, businesses involved in training activities, local communities, volunteers, NGOs, media etc. – interested in short 1-to-1.5-day courses, problem-oriented training, use of the project online platform and tools; 2) representatives of education institutions and academia, university students, distance learning students, other maritime professionals - interested in extracurricular programmes and studies, use of combinations of modules, use of the online platform and tools of the project.

The main target participants in the training identified by the workshop belong to the first group. The workshop designated as main target participants the emergency response teams and environmental agencies, followed closely by the local authority administrations. Bulgarian legislation assigns preparedness and emergency response functions related to marine pollution to both emergency response teams (of maritime administrations and border police) and

emergency/civil defence teams of the local authorities. The workshop prioritization of target audiences covers adequately the situation in Bulgaria. Moreover, the funding for remediation measure in case of accidents is provided to the local authorities. The workshop findings support the target participants identified on the Bulgarian scene.

Step 3 – Needs assessment

As part of the training design process, and once the target stakeholder audiences for the training courses have been identified, the following existing training gaps and monitoring challenges have been listed in view of the curriculum topics:

Training gaps and monitoring challenges:

- Oil spills are the focus of most in-house training.
- Few comprehensive programs address pollution in a broader sense (chemical spills, garbage, hazardous substances).
- Maritime academies are in compliance with IMO/MARPOL standards for seafarers, but do not thoroughly cover multi-agency response or advanced surveillance.
- Data collection is fragmented and carried out by different agencies (e.g. Black Sea Basin Directorate, Institute of Oceanology, Health Inspectorates).
- There is a need to integrate the indicators of the Marine Strategy Framework Directive (MSFD) and to ensure synergy with the National Oil Pollution Emergency Plan for the Black Sea.

Stakeholder recommendations addressing specific training needs

Need for modular, practical, and adaptable training to include topics:

- Pollution sources and impacts – oil spills, hazardous substances, eutrophication, marine litter
- Preparedness and response strategies – National contingency plans, risk assessment, decision-making
- Technological innovations – digital monitoring tools, remote sensing, modelling and AI applications/EWS
- Policy and governance – MARPOL, Bucharest Convention, EU Directives
- Practical training and exercises – fieldwork, case studies, real-time response simulations
- Public communication improvement (media handling, volunteer engagement, local community outreach).
- Multi-stakeholder coordination (navy, port authorities, communities).

The training needs of the operational plan audiences are supported by the finding and prioritization of the workshop topics, expected outputs and outcomes.

The workshop offered a selection of methods for recruiting new participants in the training. Top priority was collaboration with partner organisations. The set of nine methods for recruitment identified by the workshop offered an opportunity to adjust and diversify the recruitment for the national training in Bulgaria.

Step 4 – Definition of the training content, materials, and further requirements

Starting with co-designed curricula alignment the partner team mapped the contents of the training modules to support the competencies defined in the co-creation process in Bulgaria correlated with regional co-creation.

The team has developed practical training material, exercises and experimental activities that meet the specific curriculum requirements of selected marine pollution training modules. The selected modules are aligned with the prioritization performed at the regional co-creation workshop. The curriculum areas are aligned with the identified stakeholder needs. They also envisage the integration of scientific and digital tools, a focus of interest in all project countries. The training puts an emphasis on best practices, success stories, and innovative approaches fostering collaboration to be integrated in the training. The modules for Bulgaria follow the pattern approved at the regional co-creation workshop. The learning outcomes are identified. Performance is measured with tests and scoring system of performance for the module. The exercises try to integrate real-time data and MP decision-support tools (DSS) to simulate realistic marine pollution intervention conditions. The design of the exercises supports both individual skills development and team-based operational coordination. The training provides an opportunity to align experimental content with the latest scientific standards, environmental policies, and regulatory requirements. The curricula correlated with training modules for Bulgaria is part of M7.

The training toolkit for Bulgaria should be designed with the needs of diverse learners in mind, prioritizing open accessibility to internet, and ensuring interoperability with various systems. Key considerations include making the toolkit perceivable, operable, understandable, and robust, while also allowing for integration with other learning platforms and technologies.

The defined training content, materials, and technical requirements for the operation plan for Bulgaria are supported by the findings and assessments of the regional workshop. They are aligned with the validated topics, expected outputs and outcomes.

Step 5 – Structure the training programme

Deployment modes in Bulgaria are designed to suit the specific needs of the stakeholder groups identified within the RESPONSE framework. Each module will be customized for different stakeholder groups, indicatively decision-makers and emergency responders; academia and technical universities students; general public and volunteers.

The groups of decision makers, emergency response personnel, volunteers, and NGOs can be involved in in-person, hybrid, e-learning forms of training. The time span is 1 to 1.5 days; resource allocation and logistics depend on the particular training session. Initial version of guidelines for trainer selection/certification of trainers and the evaluation procedures will be approved by the partnership. Suggestion for training calendar for Bulgaria will be developed and approved at the national training workshop to ensure integration into institutional training and planning activities. The Technical University – Varna in collaboration with RESPONSE team has developed a training programme of its own for a new subject entitled "Response to disasters and accidents in the Black Sea", one semester of training with lectures and exercises with total number of 120 lessons, lectures, and exercises, bringing 4 credits. This programme already functional since the beginning of the semester is independent from the project but its establishment is related to the RESPONSE co-creation process and useful synergies can be established. A variety of forms of training will be used

lectures (in-person), seminars, practical exercises. Development of practical exercises and experimental activities that meet the specific curriculum requirements of selected marine pollution training modules is envisaged.

The online workshop helped to readjust the structure of the operation plan for marine pollution training in Bulgaria. There will be a stronger focus on practical exercises, demonstrations, and case-study analysis prioritized by the regional workshop.

Step 6 – Development of the training materials

This step involves development of training modules; design of marine pollution exercises, simulations, and assessment framework; selection of teaching methodology; teaching platforms CMEMS-DSS/toolkit demonstrator configuration; and Toolkit platform development.

The BSNN with support from Bulgarian stakeholders and volunteers is involved in the development of the Training Modules. The ideas of the national co-creation workshop collated with the regional co-creation suggestions are reflected in them. They respect all specific requirements for the actions. Each module will be customized for different stakeholder groups. The other elements of the training materials have been addressed according to the requirements of the methodology.

The regional workshop has contributed a lot to the readjustment of plans regarding the training tools and resources, their use, effectiveness, and the preferences of the partner organization. The review of training tools prioritized simulation and modelling tools followed by presentation and communication tools. The identified training tools support the process of preparation for the physical training with stakeholders in Bulgaria.

The workshop helped the participants identify the resources needed and compare them to the available resources for the training. Those two perspectives helped readjust the national plan to the realities of the country. Funding, equipment, and technology were identified by the workshop as the most necessary resources for the training. The workshop focused on technical infrastructure availability and budget availability so that partners could plan realistically. Time scales of the training revealed considerable variety of scales and the workshop provided clear support for this variety. The workshop reaffirmed the application of the adopted methodology and its application in the Bulgarian operation plan.

Step 7 – Trainers' engagement and facilitation

Recruiting the right trainers was identified as a key element in ensuring the success of the operational plan for training. The selection of qualified experts for training in Bulgaria will be planned and implemented in view of the available resources. The team has identified skilled communicators and trainers. The organisation can rely on its networking contacts in the marine ecology institutes and agencies and the maritime administrations and companies. Contacts in the academia and technical sphere and involvement of qualified lecturers and experts will also help in ensuring the success of the training program. Experts with practical experience in preparedness and response to maritime accidents and maritime will be invited to deliver instruction. Visiting experts from IMO, EMSA and EU institutions would be invited if possible and supported by availability of resources.

The regional workshop put a special emphasis on budget and resources availability, which is relevant to trainers' engagement. The workshop also helped adjust the operational training frequencies.

Step 8 – Evaluation and Monitoring

Evaluation and monitoring of training under the national operation plan involve pre- and post-training assessments to quantify knowledge gained by participants, as well as gathering participant feedback through surveys and forms to capture their experiences and suggestions. Performance is also observed and evaluated during practical exercises or drills to assess the real-time application of skills. Key performance indicators such as the percentage of participants demonstrating improved knowledge or the speed of response during simulations are established to provide clear metrics for success. Benchmarking criteria are developed based on international best practices and aligned with national and regional performance indicators.

Success metrics reviewed and prioritized by the workshop have helped to readjust the monitoring and evaluation process of the national training plan. The workshop prioritized practical skills demonstration and pre/post-training assessment as major ways to measure the success of the training program and they were adopted by the Bulgarian plan. The variety of success metrics reviewed and ranked at the workshop would be considered along with identification of resources and expertise for their application.

Evaluation and monitoring of the task 3.1 implementation, as part of the project logical framework, is also envisaged in the operational plan. The RESPONSE team in cooperation with project partners has designed a set of criteria for measuring the training achievements, performance effectiveness, and impact within the overall project context. They are integrated in the project monitoring and evaluation framework. The specific objective indicator of RESPONSE is achieved with development of 4 tailored training operational plans (3-4). The suggested impact indicators: (change in target groups, capacities, innovation, plans content etc.) include: learner satisfaction, knowledge retention, long-term knowledge retention, practical relevance, and application.

The workshop served to readjust the selection of the most appropriate types of the assessment of the trainees introducing stronger focus on practical competency and skills assessment. The workshop suggested a variety of impact success metrics that could be used and adapted to the national plan, the most important being institutional integration and stakeholder confidence, and community integration.

Step 9 – Follow up and sustainability

The Bulgarian operation plan envisages follow-up activities on national level and will continue with the established tradition to present certificates recognizing the participants' newly acquired skills and knowledge. Efforts will continue to encourage integration of the RESPONSE training content in contingency plans, practical exercises, inclusion in networking events. Project achievements and training outcomes and lessons learned will be documented and shared through networks, events, stakeholder meetings. Additionally, training outcomes and lessons learned should be regularly documented and shared through reports and policy briefs to inform stakeholders and support policy development. Upon completion, participants should receive certificates recognizing their newly acquired skills and knowledge. Efforts should be made to encourage the integration of the training content into contingency plans, reinforcing its practical application within existing frameworks.

The workshop has validated all those activities and initiatives while two sustainability activities to the national plan were included: revision of operational guidelines developed in the RESPONSE project and revision of training programs developed in the RESPONSE project.

Step 10 - Integration into broader systems

The national plan for Bulgaria supports the aligning of the training content and objectives with existing national emergency response and maritime policies in Bulgaria, in view of the European Union mechanisms and regional Black Sea frameworks promoting coordination and harmonization across borders, enhancing regional preparedness and response capabilities. The partner national team will seek to integrate RESPONSE training outcomes and best practices into capacity-building components of related projects, creating synergies and reinforcing the effectiveness of marine pollution management efforts. Synergies with other projects related to preparedness and emergency response will be sought.

The workshop validated the integration activities envisaged in the Bulgarian national plan as the participants expressed very strong support for the establishment of regional networks of collaborators for cross border exchange (4.0 points average from maximum 5) and for the start of new initiatives for training (3.8 points average support from maximum 5).

2.2. National Training Plan in Georgia

The national operation training plan in Georgia was designed following the adopted project methodology.

Step 1 Definition of purpose and scope - objectives, geographical coverage, pollution types

In Georgia the institutional context and needs have been clearly defined. Georgia's framework for marine pollution response involves several key institutions, notably the Ministry of Environmental Protection and Agriculture (MEPA) (responsible for environmental policy and monitoring via the National Environment Agency) and the Ministry of Economy and Sustainable Development (through its Maritime Transport Agency, overseeing maritime safety and spill response). Local bodies (e.g. Adjara Autonomous Republic's environmental department) and NGOs, such as Greens Movement of Georgia / Friends of the Earth – Georgia (GMG/FoE-GE) also play roles. A Stakeholder Analysis (D1.1) revealed that while these agencies have clear mandates, coordination and training are areas for improvement. There are few dedicated inter-agency training programs; most existing training focuses on oil spill response within individual organizations, with limited multi-institutional exercises. Georgia does maintain an oil pollution contingency plan under the Maritime Transport Agency (aligned with the Black Sea regional contingency framework), but preparedness for other pollution types (plastic debris, chemical spills, etc.) is ad hoc. This gap was echoed in the Needs Assessment (D1.2), which highlighted the need for better coordination, updated knowledge (e. g. modern tools), and sustained funding for training. In short, Georgia's institutions require a more comprehensive and harmonized training scheme to improve national response capacity.

The partner team has identified clearly the roles of institutions in the country and the respective needs. The regional workshop reported the strongest overall support for training plans that include both preparedness and emergency response which in reflected in the national plan for Georgia. The workshop validated chosen focus, priorities and approach of training plan for Georgia.

Geographical coverage

The adopted methodology for the project allows freedom of choice for coverage of the plans. The training course for Georgia is intended for national level application. It is associated with national responsibilities and institutions. Stakeholders from the national institutions and agencies have been involved in the co-creation process, which is the basis for the development of the plan.

The national plan of Georgia is aligned with the adopted methodology. The regional workshop validated the country level approach to plan according to the specific realities of the country.

Types of pollution

The national plan of Georgia focused mainly on oil pollution, plastics/solid waste/debris pollution, wastewater, nutrients and chemical pollution. They correlate with the results of the research conducted under the RESPONSE project. D1.3 presenting the research results identified the key issues related to marine pollution in the Black Sea and emergency incidents requiring an immediate response as follows: pollution with heavy metals, radioactive contamination, nutrients, pesticides, marine litter, oil pollution, pollution due to war conflicts. The research specific pollution type associated with armed conflicts. The use of modern technologies to monitor pollution was emphasized.

The adopted methodology for national plans focused on five main types of pollution for the REPNSE project: oil spills, chemical spills, plastic pollution, sewage, nutrients and hazardous substances resulting from shipwrecks and maritime accidents, including those involving armed conflict.

The regional workshop validated the Georgian plan with oil pollution as top priority, followed by marine litter, sewage and waste water, nutrients, chemical pollution, biological pollution, conflict related pollution. The workshop validated the training outputs and outcomes. Environmental rehabilitation techniques, including nature-based solutions, a top priority emerging from the workshop, is a significant element of the operational plan for Georgia. The workshop reconfirmed the focus on pollution from armed conflicts.

Step 2 – Identification of the stakeholder groups to be involved

The key stakeholders from Georgia identified as target audience were included in the national operation plan. Those involve participants from the Ministry of Environmental Protection and Agriculture (MEPA), the National Environment Agency, the Ministry of Economy and Sustainable Development, the Maritime Transport Agency, local authority units like the Adjara Autonomous Republic's environmental department, environmental NGOs with expert capacity on the project issues, and local authorities (municipalities).

The regional workshop designated as main target audience participants the emergency response teams and environmental agencies, followed closely by the local authorities, port authorities and other sectors. The workshop validated the target audience of the national operation plan for Georgia.

Step 3 – Needs assessment

Specific emphasis was placed on needs assessment in the Georgian national plan. It highlighted the need for better coordination, updated knowledge, integrated use of modern technology for monitoring, and sustained funding for training. Georgia's institutions need to adopt a comprehensive and harmonized training scheme to improve national response capacity.

The training needs of the target audiences in Georgia presented in the national operational plan are reconfirmed by the prioritization, expected outputs and outcomes of the regional workshop. The regional workshop put an emphasis on the selection of methods for recruiting new participants in the training. Top priority was collaboration with partner organisations. It is in line with the needs of target audiences in Georgia.

Step 4 – Definition of the training content, materials, and further requirements

Based on the co-creation process and outcomes and the project's framework for training (Milestone 6), Georgia's national training course is structured as a modular program covering the full spectrum of marine pollution preparedness and response. It builds directly on the curriculum model developed in WP2 and aligns with the common Black Sea training framework, while reflecting Georgia's specific needs. The curriculum comprises multiple modules, each focused on a thematic area, validated by the participants. The curriculum envisages the integration of scientific and digital tools, and a focus on pollution from armed conflicts. Innovative approaches fostering collaboration are integrated in the operational training plan. The modules and curricula are part of milestone M7.

The defined training content, materials, and technical requirements for the national operation plan for Georgia were validated by the review of content and assessments of the regional workshop. They are aligned with the validated topics, expected outputs and outcomes.

Step 5 – Structure of the training programme

The National Training Course in Georgia would be designed to be delivered through a combination of workshops, dedicated short courses, and integration into academic programs. A dual-track approach would be used to reach: (1) current professionals (government officials, port/Coast Guard officers, emergency responders, NGO staff) via short, focused trainings and drills; and (2) students and young professionals via university curricula or longer certificate courses. For the first group, modules could be offered as intensive training workshops (e. g. a 1-2-day course on spill response) or on-site seminars, which would suit busy practitioners. Related special short 1-day course for technical personnel would address oil spill modelling capacity building. For the second group, elements of the curriculum may be incorporated into relevant degree programs (e.g. environmental science, maritime engineering) at Georgian universities, such as Batumi Shota Rustaveli State University (BSU), Tbilisi State University (TSU), Ilia State University (ISU), etc., ensuring sustainability of knowledge uptake. The Batumi State Maritime Academy (BSMA), as well as potentially the Environmental Information and Education Centre (EIEC) under MEPA, would be expected to be key hubs for delivering the training, in collaboration with project partners and international experts. Where possible and feasible, content would be delivered in Georgian language (with materials translated from the project's outputs) to maximize accessibility.

The online regional workshop helped to validate the adopted structure of the operation plan for marine pollution training in Georgia.

Step 6 – Development of the training materials

The training course would employ interactive and practical pedagogies. Each module would include case studies drawn from Black Sea incidents and hands-on exercises or simulations (for example, a tabletop exercise in Module 4, or a field drill in Module 7) to reinforce theoretical knowledge. The approach will follow Milestone 6 guidance on using experiential learning and

simulations for marine pollution training. Additionally, the course would leverage the project's digital toolkit, offering trainees exposure to real datasets and decision-support tools (such as marine satellite data, forecasting models, and GIS applications). This not only would improve technical skills but also familiarize participants with the digital resources being developed under RESPONSE and other initiatives (e. g. the Black Sea SoS System of Systems developed by the EU H2020 DOORS project, Interreg CARE SEA and others).

The regional workshop validated the process for development of the training materials for Georgia. It helped identify the needed and available resources and adjust the development process to the specific situation in the country.

Step 7 – Trainers' engagement and facilitation

The Georgian project team will rely for the training on national expertise and qualified maritime experts, administration experts, researchers and academia. The success of the training will be ensured by the careful selection of experts as lecturers for the training of trainers and the identification of experts with good practical experience in preparedness and response to maritime pollution accidents, will tap expert resources from RESPONSE and other projects.

The regional workshop validated the approach of the Georgian team by putting an emphasis on the availability of budget and resources for the training. It is important in terms of planning the trainers' engagement.

Step 8 – Evaluation and Monitoring

The evaluation and monitoring of the training process, aimed at measuring the effectiveness, efficiency, and overall impact of the pollution preparedness and response training system will follow the framework envisaged for the RESPONSE project in D2.2. The project team in cooperation with project partners has designed a set of criteria for measuring the training achievements, performance effectiveness and impact. They are integrated in the project monitoring and evaluation framework. The national team will take part in conducting pre- and post-training assessments to quantify knowledge gained by participants, as well as gathering participant feedback through surveys and forms to capture their experiences and suggestions. Performance will also be observed and evaluated during practical exercises to assess real-time application of skills. The partner will provide feedback to the responsible partners so that the collected data should be analysed to identify achievements and opportunities for improvement.

Success metrics reviewed and prioritized by the regional workshop have helped readjust the national monitoring and evaluation process. The regional workshop prioritized practical skills demonstration and pre/post-training assessment as top selection for measuring the success of the training program. The regional workshop identified a variety of impact success metrics to use on national level.

The results will be collated and described in the common data collection tool set-up to report and evaluate the performance of the training activities held by each BS partner, including Georgian, to monitor progress based on indicators of the RESPONSE monitoring and evaluation strategy, to be reflected in the joint D3.3 Report on the training courses performance (responsible for deliverable is Georgian partner GMG/FoE-GE due by project M34).

Step 9 – Follow up and sustainability

The national training course in Georgia is co-created with stakeholders, and moving forward, their engagement would continue in implementation. Georgian authorities are expected to endorse the training program and possibly integrate it into the national system (e. g. as part of contingency plan procedures or civil servant training requirements, and/or part of the environmental education programming). The workshop participants – representing agencies, academia, and NGOs – are expected to act as champions of the new curriculum within their organizations. This means, for instance, the Maritime Transport Agency and NEA and other relevant agencies (such as MIA coastguard) could incorporate modules into their routine staff trainings and drills. The ultimate aim would be to institutionalise the training: to make regular marine pollution training a standing practice in Georgia, continuously strengthening the capacity.

The regional workshop has reconfirmed the approach for follow up and sustainability adopted by the Georgian team. Thus, the national plan for the country is aligned with the adopted project methodology.

Step 10 - Integration into broader systems

The completion of the first training course in Georgia would serve as a demonstration exercise for the long-term effort to institutionalize marine pollution training. For this initial course, the top selected theme is marine litter—addressing its presence in various compartments of the Black Sea: beaches, floating debris, seabed deposits, and river borne inputs. The course would also cover different particle sizes, including macro-, micro-, and even nano-litter, and would introduce monitoring and collection methods suitable for each type. This thematic focus responds directly to pressing pollution issues identified along Georgia's coastline and offers a practical entry point for implementing multidisciplinary monitoring and response techniques, as outlined in the RESPONSE framework. Cooperation with the BSB Interreg SAVE SEA and H2020 DOORS projects would be sourced to maximise quality & impact.

Georgia's National Training Course under the RESPONSE project would be a comprehensive, tailored curriculum that addresses identified gaps in marine pollution preparedness and response. It reflects both the local context (national plans, stakeholder structure, Black Sea specific issues) and the state-of-the-art practices in the field (modern tools, international standards, co-created content). By implementing this course, Georgia would significantly enhance its ability to prevent and manage marine pollution incidents, contributing to a safer and more resilient Black Sea environment. The training course would also contribute that those Georgian stakeholders remain actively involved in the regional knowledge network and ready to cooperate in cross-border pollution response, fulfilling one of the core goals of RESPONSE project.

The regional workshop validated the emphasis on support for the creation of a regional knowledge network and the partner readiness to cooperate in cross-border pollution response. This strong emphasis confirms the commitment of the national plan for Georgia to the adopted methodology.

2.3 National Training Plan in Romania

This is a review of the national operational plan for training for Romania and the reflection on it of the regional online workshop as part of the adopted methodology of training.

Step 1 Definition of purpose and scope - objectives, geographical coverage, pollution types

The main objective of the training plan in Romania is to improve the response capacity of local authorities in the event of marine pollution, by fostering a deeper understanding of the issues involved. This will bring local stakeholders closer to the Marine Pollution Contingency Plan, helping the country to fulfil its obligations under EU membership and maritime policies.

In light of the current state of preparedness and response to marine pollution incidents in Romania, the following key training objectives have been identified.

Key training objectives identified in the co-creation process include:

- o To raise awareness among local, national and regional stakeholders of marine pollution emergencies and post-incident recovery, and to improve their ability to address these issues through marine pollution response exercises.
- o To provide training to the staff of administrations, institutions and agencies involved in marine pollution preparedness and emergency response, focusing on specific marine pollution issues in accordance with the relevant national and regional legislative framework
- o To initiate the implementation of state-of-the-art technologies for the monitoring pollution incidents, thereby facilitating an immediate response;
- o To enhance the expertise of environmental authorities, emergency response units and other key stakeholders in responding to incidents of marine pollution arising from or occurring during armed conflicts.
- o to support the training of the relevant authorities to participate in the planned joint (naval/marine) exercise, focusing on the rapid assessment, rescue and rehabilitation of oiled or contaminated marine wildlife using the NEBA approach.

During the national workshop, the partner team, coordinated by NIMRD, identified the needs of stakeholders with regard to incorporating practical scenarios, live exercises, and modern simulation, modelling, and monitoring methods for marine pollution. The regional workshop reconfirmed that training plans incorporating both preparedness and emergency response received the strongest overall support. This will enable the Romanian team to integrate preparedness and emergency response more effectively into the national training plan, strengthening capacity building within current training schemes.

Geographical coverage

The training course is designed for use at a national level in Romania. It covers the Black Sea coastal area and the relevant regional and municipal administrative units, as well as the national sea area, as defined in Romanian legislation.

With a general focus, the course reflects the Romanian legislative framework, response structures, institutional responsibilities and key challenges. This includes alignment with national contingency plans and coordination mechanisms for emergencies, as well as the integration of case studies of past incidents, including analyses, conclusions and recommendations. The regional legal framework of the Black Sea in relation to national obligations is also covered.

The regional workshop followed the adopted methodology, which allows each country to define the geographic scope according to its national environmental situation and realities, and reconfirmed Romania's national training operation plan.

Types of pollution

The national training plan addresses the types of marine pollution identified in the Monitoring and Assessment Framework for Marine Pollution in Romania (M2).

All types of pollution associated with the eleven environmental descriptors in the Marine Strategy Framework Directive (MSFD), which express the state of the marine environment, are subject to a national monitoring programme and specific environmental objectives. These objectives are included in a "Programme of Measures" (PoM), developed to contribute to the achievement or maintenance of good environmental status (GES) in Romanian national waters, as required by Article 13 of the MSFD.

Oil pollution is the main priority and occupies an important place in the Romanian national plan, which mainly focuses on marine litter, contaminants (e.g. heavy metals), eutrophication (i.e. nutrient pollution) and pollution caused by armed conflicts.

Regarding emergency response training, the national plan includes training on pollution caused by oil and chemical spills, mainly from bulk cargoes of nitrogen mineral fertilisers, as well as pollution caused by armed conflicts in neighbouring countries. The training plan supports and improves the implementation of the national emergency plan by presenting reports on past incidents and research on the impact of marine pollution caused by armed conflict, including noise pollution. Particular focus is given to incorporating remote sensing techniques (high-resolution EO) into the curriculum for monitoring anchorage areas and tracking the routes of oil tankers and fishing vessels. This will help stakeholders to identify abandoned fishing gear, which causes constant mortality among marine mammals. Stakeholders emphasised the importance of integrating techniques for identifying point and diffuse sources of marine pollution, as well as emerging pollutants such as microplastics. EO techniques and hydrological modelling will be incorporated into the training programme as valuable tools for marine pollution preparedness and response.

Step 2 – Identification of the stakeholder groups to be involved

The main stakeholders for Romania were identified in D1.1 based on the analysis of the national legal framework, surveys and interviews, and include a short but non-exhaustive list of stakeholders at the national level: Romanian Naval Authority (ANR), Agency for the Safety of Human Life at Sea (ARSVOM), Border Police, Emergency Situations Inspectorate (both belonging to the Ministry of the Interior), GeoEcoMar Institute, Danube Delta National Institute for Research and Development (INCDD), Ovidius University of Constanța, Naval Academy Mircea cel Bătrân (ANMB), Constanța Maritime University, Mare Nostrum and Oceanic Club (both NGOs), Dobrogea Litoral Romanian Waters Administration, Constanța Maritime Ports Administration (APMC), Maritime Hydrographic Directorate (DHM) and County Public Health Directorate.

These institutions were assessed as a target group for training, being defined by a combination of coordination roles and obligations set out in a legal act, National and Regional Contingency Plan, unique expertise, and competences in the field of Marine Pollution.

The Romanian Centre for Training and Improvement of Personnel in Naval Transport (Ceronav) and NGOs can also be included due to their networking role, accumulated knowledge and expertise in training at national and international levels.

The process of analysing stakeholders was continued in D1.1, establishing an order of priority for invitations to the co-creation workshop that reflects the influence, capacity, and role of stakeholders in preparedness/response: decision-makers in the field of marine pollution response, actively involving relevant administrations and agencies, research institutes, universities, training centers, maritime business associations, NGOs, and volunteer groups.

Analysis has shown that the majority of institutions involved have discontinuous internal training programmes. A notable example is the annual marine pollution response exercise in winter 2024, which involved the ANR/Romanian Naval Authority, ARSVOM, the Border Police, OMV-Petrom and other institutions.

Employees of the maritime port administration and water authorities within government structures have received professional training in maritime navigation. However, due to budgetary limitations and restrictions, this training is not periodically updated as required by statute. This is compensated by various international cross-border projects with multi-institutional support for training, which is usually subject-specific, for example, ship traffic monitoring systems/AIS and radio communication.

Training plans and programmes on preparedness and emergency response to natural and/or man-made disasters (including marine pollution) are few and far between for civil society organisations and the public. Training programmes are offered by technical universities specialized in petrochemicals, the Naval Academy, training centres for seafarers, universities and the training centres of the Ministry of Transport and the Ministry of Internal Affairs. These programmes mainly focus on disaster response plans and institutions as set out in the National Contingency/Response Plan for Disasters and Oil Pollution. Monitoring and emergency response to marine pollution are addressed rather briefly in some programmes and are omitted from others that are more comprehensive. Therefore, existing training programmes need to be updated and further developed.

With the exception of NIMRD, which held four MSFD training sessions with all national-level stakeholders in 2023, most institutions are not involved in developing training materials, particularly with regard to marine pollution, emergency response, and pollution remediation. However, during the SI-POCA project, NIMRD specialists provided many key experts with specific knowledge on certain topics related to marine pollution and Marine Strategy Framework Directive (MSFD) descriptors. Under the coordination of DHM and ANR, many institutions are collaborating with official bodies, such as ministries and state agencies, on activities targeting marine pollution caused by the military conflict in the Black Sea.

No continuing education programmes focusing specifically on marine pollution preparedness and response for key stakeholders (e.g. transport administrations and local and regional authorities) were identified.

The following two target groups were identified during the preparation of the training:

- 1) Decision-makers and representatives of administrations and institutions, particularly those involved in civil defense units and teams, emergency response teams, enterprises engaged in training activities, local communities, volunteers, NGOs and the media. This category is interested in short courses lasting 1–1.5 days, problem-oriented training and the use of the project's online platform/toolkit.

2) Representatives of educational institutions and other maritime professionals interested in long-term/semi-annual extracurricular programmes and studies, and in the use of module combinations, the online platform/toolkit created in the project.

The main participants identified by the workshop belong to the following groups: Emergency response teams/ARSVOM and Romanian Naval Authority, Environmental agencies/EPA and DSJP, Local authorities/Romanian Water Administration, Constanta Port Administration, etc.

Romanian legislation assigns the responsibility for preparing for and responding to marine pollution emergencies to emergency response teams belonging to the maritime administrations and border police, as well as to emergency response and civil defence teams belonging to local authorities (prefectures and city halls in Constanța and Tulcea). The workshop's focus on the target audience effectively addressed the situation in Romania, considering that local authorities are responsible for financing remedial measures in the event of marine pollution accidents. The workshop's conclusions support the idea that the identified participants are willing to take part in marine pollution training programmes, which is a necessity for many of the institutions involved.

Step 3 – Needs assessment

Following the identification of target stakeholder groups, the assessment of their needs and the identification of gaps in the training program and monitoring challenges were highlighted in the program development process:

Training gaps and monitoring challenges:

- Even though some of the capacities for rapid response training are present at the national level, there is still no extensive expertise in the scientific assessment of oil pollution.
- The need for continuous identification of risks and pollution sources.
- The need for continuous training is essential. Most training programmes focus primarily on routine maritime operations aligned with IMO and EU standards.
- Training in marine pollution emergency response is not widely integrated into existing or compulsory study programmes, as most training programmes focus on routine maritime operations.
- The necessity to incorporate Marine Strategy Framework Directive (MSFD) indicators into educational courses in Romania. Even though there are national emergency plans for oil spill response, broader pollution issues (e.g. hazardous substances, eutrophication and microplastics) require additional training efforts.

Stakeholder recommendations addressing specific training needs

Need for modular, practical, and adaptable training to include topics:

- Strengthen capacity building with modern technologies (Earth Observation (EO) Technologies/ Aerial Surveillance and Drones, EWS, numerical modeling).
- Expand exercises focused on rapid response preparedness under the National Contingency Plan, specifically for regional conflict-related pollution, including emerging pollutants.

- Practical scenarios and live exercises to improve professionals' preparedness in case of emergency.
- Legal framework extension in relation to Marine Pollution international and European Union Legal Framework.
- Extend the university curricula on pollution impact and short courses for existing professionals.
- Organize networking exercises and public awareness campaigns on marine pollution, including its spread during extreme weather events.
- Enhance and expand interactive modular training programs for national and institutional networking, based on established syllabus.

The training needs of stakeholders in Romania were identified, validated and supported by the workshop to better design, plan and adjust to specific local needs the operational plan for Romania.

Step 4 – Definition of the training content, materials, and further requirements

The jointly designed study programs improve preparedness and response to marine pollution emergencies in the Romanian EEZ/western Black Sea by supporting early warning mechanisms, promoting interagency cooperation, and integrating modern monitoring and response technologies. The identified gaps and improvement proposals are supported by actions such as aligning the training process with new operational challenges in marine pollution management, ensuring compliance with national and international standards, and mapping training module content to support the competencies defined during the co-creation process in Romania. The MP module syllabus for the training programmes includes practical training, exercises and experimental activities that align with its specific requirements.

Several practical training materials and exercises have been developed, as well as specific experimental activities that meet the requirements of the curriculum. Performance is measured using tests and a performance rating system for each module.

The exercises use real-time data services (EO) and decision support tools (DSS) to simulate realistic intervention and operational coordination conditions in marine pollution events.

The requirements for the toolkit/IT platform support the delivery and implementation of training programmes, enabling the provision of customised training programmes in marine pollution with multiple IT support capabilities, systems, and data access. The design of the platform will take into account the prioritisation of user experience and comply with security standards, providing users access to a secure, intuitive and easy-to-use IT platform.

The training toolkit for Romania will be designed with the needs of different categories of learners in mind, prioritising free internet access and ensuring interoperability with various systems. Key considerations include ensuring the toolkit is noticeable, operable, understandable and robust, while allowing integration with other learning platforms and technologies.

The training content, materials and technical requirements defined for the Romanian operational plan were supported and validated by the regional workshop's conclusions and assessments. These are aligned with the validated themes, outcomes and expected effects.

Step 5 – Structure the training programme

The training programme for the operational plan in Romania aims to establish clear specifications and requirements for MP training within the local, national and regional context (including the institutional and legislative framework).

The programme provides various course delivery methods (e.g. face-to-face training, e-learning or a hybrid approach) that can be tailored to different stakeholder groups and operational contexts. These methods will be considered alongside the development of the timetable, training duration, logistical requirements and resource allocation to ensure effective training. Guidelines will also be developed for trainer certification, participant selection and evaluation procedures. Integration with stakeholder training schedules will be ensured. Mechanisms for collecting feedback, iterating courses, and ensuring long-term sustainability will be established.

Specific implementation modalities in Romania are designed according to the needs of identified stakeholder groups. A designed training module takes 1–1.5 days to complete, taking into account resource allocation and coordination for a specific training session. A specific procedure will be developed for the selection and certification of trainers, and the training schedule for Romania will be established and approved during a national training workshop to ensure its integration into institutional and legal frameworks.

The long-term training programme will last one semester and will include lectures, seminars and exercises for specific groups of academic and university stakeholders interested in regular and extracurricular programmes and studies, online platforms and tools.

The regional workshop contributed to readjusting the structure of the operational plan for training in marine pollution in Romania. The workshop's conclusions validated the requirements for the training programme's structure in Romania.

Step 6 – Development of the training materials

At this stage, the training modules were developed based on three fundamental principles: relevance to the local context, alignment with international standards and the possibility of long-term use. All materials were adapted to the institutional, legal and environmental realities specific to Romania's coastal region. To ensure accessibility and inclusivity, the content was prepared in both Romanian and English, with a particular focus on terminology used in national emergency protocols and regional cooperation agreements. A set of tools to support trainers in delivering the course is also being developed. These include presentations aligned with each session, notes to guide facilitators in delivery and adaptation, structured group exercises and a comprehensive simulation.

Each module follows a structured programme with clearly defined learning outcomes, activities and assessment points. The modules are designed to be adaptable and reusable for future replication at national or regional levels.

To promote practical learning, the course includes a realistic, scenario-based simulation of a potential oil spill near the ports of Midia and/or Constanța.

A framework has been developed for assessment that includes both formative (e.g. questionnaires and team feedback) and summative (e.g. a final test and self-assessment) components.

The teaching methodology combines preparedness training with rapid response capabilities training adapted to Romania's institutional framework.

Teaching is supported by a hybrid platform that facilitates face-to-face sessions at the NIMRD Constanța training centre, which is equipped with a digital projector and facilities for group work. Remote participation is also possible via Microsoft Teams or equivalent platforms, ensuring accessibility for institutional participants from other regional centres. Access to e-learning modules hosted on the RESPONSE training website (in partnership with the NIMRD IT team) will also be provided. Specific online access to the training modules will be provided via the toolkit platform.

Following the workshop discussions, the programme will include a special segment on the configuration of CMEMS-DSS/Toolkit demonstrators. This segment familiarises trainees with data for marine pollution emergencies, including demonstrations of DSS systems in several downstream services developed for the western Black Sea based on real-time oceanographic forecasts; practical tutorials for extracting and analysing CMEMS datasets; and more. This practical module is designed for technical staff from Romanian Water Administration, Constanta Public Health Directorate, Romanian Water Authority and the environmental division of the Ministry of the Environment.

The toolkit will also support a potential train-the-trainer (ToT) component, offering self-paced modules, templates for local adaptation and multilingual navigation.

The regional workshop validated the materials and tools outlined in the Romanian operational training plan, paying particular attention to budgetary constraints and the availability of local resources.

Step 7 – Trainers' engagement and facilitation

The training course, developed for Romanian stakeholders, will be led by a team of national and international trainers with multidisciplinary expertise. The course will be coordinated by the Grigore Antipa National Institute for Marine Research and Development (INCDM). Trainers will be selected based on their technical expertise, pedagogical skills, and familiarity with general marine pollution issues and the relevant national legal and institutional frameworks for marine pollution prevention and response. Trainers will also act as moderators in plenary discussions, simulation debriefings and evaluation activities. To ensure all training module topics are covered, trainers must demonstrate expertise in marine environmental governance and legal frameworks, and experience in applying legal provisions to practical pollution response scenarios. Knowledge of Romanian port infrastructure and emergency logistics is also important.

Trainers must understand the structure of Romania's national emergency plan, the chain of command in the event of pollution incidents and the role of key institutions in coordination.

The workshop placed particular emphasis on budget and resource availability, which is relevant for trainer involvement. The workshop also contributed to adjusting operational training options according to the frequency of training sessions.

Step 8 – Evaluation and Monitoring

As part of the project, impact indicators were developed, including learner satisfaction, knowledge retention, long-term knowledge retention, practical relevance and application.

The evaluation will be carried out using a multi-instrumental approach and will be administered online or on-site at the beginning of the training programmes. This will include a pre-training survey to assess participants' expectations, basic knowledge of marine pollution, and previous experience with pollution events.

A standardised test comprising multiple-choice and short-answer questions will be administered at the beginning and at the end of the course to assess progress in the learning process. Short, structured daily feedback forms will assess the clarity and relevance of the course content, levels of engagement, trainer performance, logistical arrangements, and materials.

All participants will complete a post-training evaluation form to provide final feedback on their overall satisfaction with the content and structure of the course.

Trainers and facilitators will analyse the effectiveness of the session and group dynamics, identifying strengths and areas for improvement.

During the workshops, the selection of the most appropriate types of student assessment was adjusted, with a stronger emphasis on assessing practical skills and abilities. The workshop suggested a variety of success indicators that can be adapted for use in the Romanian national plan. The most suitable indicators are institutional integration, stakeholder trust and community integration.

Step 9 – Follow up and sustainability

The training programme for Romania is not a one-off activity, but rather a catalyst for the long-term development of preparedness and response capacity in the event of marine pollution. A structured monitoring strategy and a forward-looking sustainability plan have therefore been integrated from the design phase onwards.

NIMRD will develop a series of concrete monitoring actions to ensure that the knowledge, skills and tools acquired during the course are applied, multiplied and further developed beyond its initial delivery.

A future extension of the modules is planned, and a selection of motivated and high-performing participants will be invited to take part. The aim of this extension is to enable the replication of the course within their institutions or regions.

The continued involvement of national institutions, such as the Ministry of Environment, the National Navigation Authority and the General Inspectorate for Emergency Situations, will support the integration of training modules into national emergency planning exercises and the institutional accreditation or approval of future training sessions. It will also facilitate policy alignment with RESPONSE recommendations.

The workshop validated all these activities and initiatives to ensure the follow-up and sustainability of Romania's national training plan.

Step 10 - Integration into broader systems

The training course is aligned with Romania's existing frameworks for marine environmental protection and civil emergency planning. These include the National Marine Pollution Emergency Plan, which is coordinated by the Constanța Prefecture with direct support from the Ministry of Environment and the Romanian Naval Authority (ANR).

The modular structure of the course allows it to be integrated into sectoral and academic training programmes. The training content complements existing EU-funded projects and instruments in Romania, including the Operational Programme for Infrastructure (POIM), which is implemented jointly with Bulgaria and will enable future initiatives to be supported by the Black Sea Commission (BSC).

The training's approach and content are designed to be interoperable with broader European frameworks, particularly the Marine Strategy Framework Directive (MSFD), the operationalisation of Descriptors 8 (Contaminants) and 10 (Marine Litter) and the EU Civil Protection Mechanism (UCPM) and its capacity-building objectives. This facilitates the complementary use of the Common Emergency Communication and Information System (CECIS Marine Pollution) platform, through which Romanian authorities can report and coordinate cross-border incidents.

The regional workshop reconfirmed support for the integration activities set out in Romania's national operational plan for marine pollution preparedness and response, as reflected in the participants' vote.

2.4. National Training course in Ukraine

This review presents the national operational plan for training on marine pollution preparedness and response for Ukraine and the validation and adjustments based on outcomes of the regional online workshop as part of the adopted methodology of training.

Step 1 Definition of purpose and scope - objectives, geographical coverage, pollution types

The training program aims to enhance the preparedness and response capacities of Ukrainian state authorities, local governments, non-governmental organizations (NGOs), and specialized institutions involved in monitoring and addressing marine pollution emergencies—particularly those resulting from armed conflict. Key stakeholders include one of the most influential and the relevant stakeholders - the State Organization "Ukrainian Sea Ports Administration" - USPA.

Key training objectives

In the light of Ukraine's current capacities for preparedness and response to marine pollution incidents, the following core training objectives have been delineated:

Objectives of the training course:

- to improve the understanding of local government units and civil protection authorities regarding their roles in marine pollution emergency response and post-incident recovery;
- to provide targeted training to personnel from relevant administrations, institutions, and agencies on marine pollution response procedures aligned with national and international legislative frameworks;
- to familiarize competent authorities with new technologies for real-time monitoring and immediate response to marine pollution events;
- to strengthen operational capacities of environmental authorities, emergency response units, and other stakeholders to manage pollution incidents arising from or exacerbated by armed conflict;

- o to support the training of students of Ukrainian Universities (namely: Kherson State Maritime Academy, National University "Odessa Maritime Academy", Odesa National Marine University etc.) on the topic "Response to Disasters and Accidents in the Black Sea.";
- o to facilitate the training of volunteers for active participation in joint naval and marine exercises focused on marine pollution preparedness and response;
- o to support training of environmental and emergency response personnel with the skills for rapid assessment, rescue, and rehabilitation of oiled or contaminated marine fauna.

The Ukrainian team has analysed stakeholder roles and identified the responsibilities of administrations and governments in preparedness, emergency response, and post-incident recovery. The objectives vary a lot and address training needs of different categories of stakeholders envisaging traditional means and modern real-time monitoring technologies. The focus on pollution management related to armed conflicts is an important aspect of the objectives.

The regional workshop reported revealed that the participants support strongly training plans that include both preparedness and emergency response. The objectives of the national plan for Ukraine comprise those interrelated aspects. In this sense the workshop reconfirmed the training objectives of the national operation plan for Ukraine.

Geographical coverage

The training course is designed for implementation at the national level in Ukraine. It focuses on the Black Sea coastal area, encompassing relevant regional and municipal administrative units, and the designated maritime zones as defined by Ukrainian legislation, including the national maritime search and rescue area. These zones fall under Ukraine's national responsibility for marine environmental protection and outline the specific mandates of relevant institutions in situations involving maritime emergencies, preparedness efforts, and response to pollution incidents—particularly those linked to war-related impacts.

As of today, there is no officially approved methodology in Ukraine for assessing contamination caused by militaristic impact. Due to martial law, pollution data are being collected for the air and coastal areas, but not for the marine environment, owing to security constraints and prohibitions imposed by the armed forces.

The regional workshop took into account the fact that each country can define the geographical scope of the training plans according to the specific realities of the country. The geographical scope of the plan for Ukraine defines the outline of the area rather than the types of sites in view of their relation to the state of the marine environment, as discussed at the workshop.

Types of pollution

- o Monitoring, preparedness

The training plan envisages pollution types identified in the monitoring and assessment framework on marine pollution within the RESPONSE project (M2). Those types of pollution reflect the work in Ukraine on the alignment with the Marine Strategy Framework Directive (MSFD) — Directive 2008/56/EC of the European Parliament and Council, part of the EU accession process. The achieving of Good Environmental Status (GES) in the national marine waters is supported by some key instruments:

- Commission Decision (EU) 2017/848: Defines criteria and methodological standards for assessing GES, including standardized methods for monitoring marine pollution.

- Status of Environment and Climate in Ukraine (2025): A Joint Research Centre (JRC) report that benchmarks Ukraine's environmental performance, including marine pollution, in the context of EU accession and Chapter 27 of the EU Acquis.

The main document regulating water environment monitoring in Ukraine is the Resolution of the Cabinet of Ministers of Ukraine dated September 19, 2018 No. 758 "On Approval of the Procedure for State Water Monitoring". It defines the procedure for conducting state water monitoring, including systematic observations of the state of water bodies and sources of pollution. This resolution entered into force on January 1, 2019.

The aforementioned documents collectively guide Ukraine's alignment with EU environmental legislation, particularly in the Black Sea region, and form the basis for evaluating marine pollution monitoring frameworks.

The pollution types addressed in the training plan focus primarily on: pollution with contaminants (heavy metals), oil, eutrophication (nutrients), marine litter/ Parts of the training will touch on to the other pollution types identified above depending on the topic. The training plan will involve, pollution caused by armed conflicts (including a complex of pollution types).

o Emergency response

The plan includes training initiatives focused on pollution linked to emergency situations, with particular emphasis on marine contamination arising from armed conflicts, oil discharges and spills, as well as chemical releases.

For emergency responses Ukrainian authorities use standard protocols for response on oil disasters and other chemical pollutions, contaminations. The main responsible bodies for such types of pollutions are represented by State Emergency Service of Ukraine, Ministry of Environmental Protection, Department of Ecology of Odesa Regional State Administration, State Ecological Inspection of Ukraine, State Organization "Ukrainian Sea Ports Administration" – USPA. But as for military pollutions, there is no officially approved methodology in Ukraine for assessing such pollutions affect. According to the martial law restrictions, military pollution data are not being collected especially for the marine environment. The data on military actions impact including marine ecosystems pollutions can be collected by authorized bodies, i.e. by the Armed Forces of Ukraine. The further dissemination of such a data is strongly controlled, restricted and secured according to the martial law.

The regional workshop supported the Ukrainian partners in the readjustment of their training priorities. At the workshop the strongest support was for military and oil pollutions. Oil pollutions take place during maritime transport functioning and other activities but also make great influence on marine ecosystems during armed conflicts (crude-oil, diesel or gasoline spills that accompany shipwrecks) which was designated as top priority, followed by marine litter, sewage and waste water, nutrients, chemical pollution, biological pollution, conflict related pollution. The workshop guided the Ukrainian team in the process of prioritizing of the training outputs and outcomes, drawing specific attention to the environmental rehabilitation techniques, the top priority, followed by risk assessment prevention, response network coordination, and rapid assessment capabilities. Legal and regulatory compliance and search and rescue are considered as important as team

building and collaboration. A very important point for Ukraine is the fact that the workshop reconfirmed the focus on training on the use of technologies. Remote sensing and satellite monitoring was reconfirmed as top focus for the training. Another very important focus for Ukraine, the regional workshop reconfirmed the importance of topics related to pollution from armed conflicts.

Step 2 – Identification of the stakeholder groups to be involved

The key stakeholders in sphere of marine pollution preparedness and response in Ukraine have been identified at the start of the Project (in D1.1). Their identification was provided on the basis of the national legal framework analysis, collecting data about stakeholders from professionals, and then – with help of surveys and interviews. Short initial list of stakeholders on national level was prepared:

Ministry of Environmental Protection, State Emergency Service of Ukraine, Department of Ecology of Odesa Regional State Administration, State Ecological Inspection of Ukraine, Ukrainian Scientific Center of Ecology of the Sea, Izmail State Humanitarian University, National Shipbuilding University “Admiral Makarov”, National Environmental Center of Ukraine, Institute of Econology, Zeleniy List CO, Afalina CO.

The list is not exhaustive, it was extended during further analysis and during performing the next deliverables. As a result of the further analysis one of the most relevant key-stakeholders was identified, namely: the State Organization “Administration of Ukrainian Sea Ports” (or Ukrainian Sea Ports Administration (Authority) - USPA). This stakeholder played one of the most significant roles for co-creation process (D 2.1).

The team of the Ukrainian partner has grouped and classified all stakeholders as: decision-makers in marine pollution response; relevant administrations and agencies responsible for the state of the marine environment and training; research institutes, universities; training centres; associations of coastal and marine economic sectors; marine / coastal environmental protection NGOs; volunteer groups, regional organisations, programmes, projects. The total number of potential stakeholders analysed is 172, namely:

- Decision-makers involved in marine pollution response (5),
- Administrations / Agencies responsible for the state of the marine environment and training for marine pollution response (31),
- Universities, Research Institutes, Training Centres (31),
- Associations of coastal and marine economic sectors (48),
- Marine / coastal environmental protection NGOs (51),
- Regional organisations, programmes, projects (2 relevant projects).

The number of key stakeholders that were identified as the most relevant for the Project aims, according to the institutional roles, responsibilities, structure, needs, and training capacity in Ukraine - is 11.

However, the team has not identified training programmes or courses of the basic key stakeholders focused on marine pollution preparedness and emergency response. This affects

negatively their involvement in the process of marine pollution management. Some of the stakeholders, such as The State Emergency Service of Ukraine are not available for the communication and study within the project because of the martial law restrictions. The information about their training courses and capabilities is with restricted access.

State ecological inspections of Ukraine and the Department of Ecology of Odesa regional state administration have trainings, dedicated to different types of pollutions, but reactions on marine pollutions are described in the training courses mainly in the aspect of reaction to oil spills. There are some information and knowledge data bases (that actually play role of the courses) that are dedicated to pollution and litter response, for instance, caused by plastic and micro-plastic emission. There are no intersectoral training programs that are available for use by different actors. Universities, namely, Odesa maritime academy, Odesa marine university, Kherson maritime academy (now relocated in Odesa) have training courses dedicated to different types of pollution but most often they are not coordinated with real actors, i. e. organizations that really perform prevention and mitigation measures on marine pollutions.

The capacity and the role Ukrainian stakeholders in the sphere of marine pollution response are defined by international and regional conventions and the national legislation: MARPOL 73/78, Bucharest Convention and Annexes, Merchant Shipping Code of Ukraine, Law of Ukraine "On Environmental Protection", Law of Ukraine "On Sea Ports"; "Maritime Strategy of Ukraine until 2030" etc.

Stakeholders in this matter are state bodies, business entities, supervisory/control bodies, and the public. The procedure for stakeholder interaction in the prevention, detection and elimination of marine pollution was identified in our study and 2 main groups of the stakeholders (actors) were detected:

1) Ministry of Environmental Protection and Natural Resources of Ukraine which forms and implements state policy in the field of environmental protection of marine ecosystems with its acting body - The State Ecological Inspectorate of Ukraine is a central executive body that implements state policy in the field of environmental protection, including in the areas of prevention, detection, localization and elimination of emergencies related to marine pollution;

2) The Ministry of Community and Territorial Development of Ukraine with its acting body - USPA, a state institution that carries out measures to organize and ensure the safety of navigation within the water areas of seaports and on the approaches to them, complies with the norms and requirements of the legislation of Ukraine regarding environmental protection, rational use and reproduction of natural resources and ensuring environmental safety through the units of the environmental safety service in the ports of Ukraine by implementing measures to prevent/prevent pollution of the water area of ports and approach channels by discharges from vehicles (vessels and other watercraft) and port coastal facilities.

The procedure for stakeholder interaction in the prevention, detection and elimination of marine pollution is established by the Resolution of the Cabinet of Ministers of Ukraine dated July 17, 2019 No. 670 "On approval of the procedure for interaction of the state enterprise "sea ports administration of Ukraine" and the state environmental inspectorate to ensure compliance with environmental protection legislation in the event of detection of cases of discharge of pollutants by vessels (floating vessels) within the seaport water area".

In the aspect of capacity building and role in preparedness/response estimation we have identified one of the most serious problems: there is no systemic process of training professionals in marine pollution preparedness and response. Seafarers are trained on marine pollution issues, mainly MARPOL requirements, related to service on board merchant vessels. Information on training courses for the professionals, related to emergency response to military pollution aspects, including sea-border authorities, sea-police, state emergency service specialists is now restricted for use under the martial law.

The project team has not identified any life-long-learning on marine pollution that is taught institutionally. There are self-education programmes and practices among employees of the key stakeholders.

One of the best facilities for anti-pollution training on the sea had Kherson State Maritime Academy (KSMA), including special equipment, facilities and trainers. But now the territory of KSMA is temporarily occupied by Russian militaries and all the staff of KSMA is evacuated to Odesa.

For the time being the Administration of Sea Ports of Ukraine, is in charge of the complex of trainings, equipment and other capabilities.

The State Organization USPA obtained training equipment from specialized producing and trading corporations as advertising sample in order to test to promote new types of equipment. USPA uses the schemes of state-private, public-private partnership and cooperation.

As for NGOs, engaged in response-oriented trainings, the most of its funding is formed due to the projects, supported by International or EU funds.

The following groups of the stakeholders have been identified in the process of preparation for the training. They are target groups that were involved in the co-design of the training agenda and the main stakeholders that took part in the interviews:

1) authorities, decision makers, representatives of administrations and institutions, state administrations, departments, local communities, volunteers, NGOs, media etc. – interested in short-term courses for professionals, problem-oriented training, use of the project online platform, digital tools and data-bases (namely State Environmental Inspectorate of the South-Western District; Department of Ecology and Natural Resources of Odesa Regional State Administration, Ukraine Sea Ports Administration; Ukrainian scientific center of Ecology of Sea (UkrSCES).

2) representatives of scientific institutions, universities, distance learning students, other maritime professionals - interested in education obtaining, graduation and magister-degree-studies, use of institutional research and education infrastructure (Kherson State Maritime Academy - Kherson State Maritime Academy (KSMA); Odesa State Ecological University, Odesa National University named after I.I. Mechnikov.

One of the best abilities to involve the main stakeholders in co-designing the training agenda have been the co-creation workshop with attendees from the Odessa, Mykolaiv, and Kherson regions of Ukraine representing key stakeholders from the RESPONSE perspective: State Organization "Institute of Market and Economic & Ecological Researches of the National Academy of Sciences of Ukraine", the Black Sea Branch of the Ukrainian Ecological Academy of Sciences, Department of Ecology and Natural Resources of the Odesa Regional State

Administration, Department of Environmental Management of the Administration Board of the State Organization "Ukrainian Sea Ports Administration" – USPA, State Ecological Inspectorate of the South-Western District (Mykolaiv and Odesa Regions), Ukrainian Research Institute of Medical Rehabilitation and Resort Therapy of the Ministry of Health of Ukraine, Ukrainian scientific center of Ecology of Sea (UkrSCES), Institute of Climate-Oriented Agriculture of the NAAS of Ukraine, State Institution "Institute of Marine Biology of the National Academy of Sciences of Ukraine", Kherson State Maritime Academy, Odessa I.I. Mechnikov National University, Odessa National University of Technology, Institute of Artificial Intelligence and Robotics of Odesa Polytechnic National University, National Natural Park "Kuyalnytskyi".

The main target audiences designated for participation in the training in Ukraine have been reconfirmed by the regional workshop. The workshop identified as main target participants the emergency response teams and environmental agencies, followed closely by the local authority administrations. The list of target audiences discussed and rated at the workshop cover all the groups identified on national level. The roles assigned by the Ukrainian legislation were covered adequately and were validated by the participants in the workshop. The regional workshop findings provide a wider regional picture of target audiences supporting the preparation process in Ukraine.

Step 3 – Needs assessment

As part of the training design process, and once the target stakeholder audiences for the training courses have been identified, the following existing training gaps and monitoring challenges have been listed in view of the curriculum topics:

Training gaps and monitoring challenges:

- Ukrainian actors in sphere of the response-training require more systemic and net-work-supported training scheme with better financial and technical support in order to improve national response capacity.
- Data collection is restricted by the martial law. Some available aspects of the data collection are fragmented and carried out by different agencies (e.g. the Ukrainian scientific center of Ecology of Sea, State Ecological Inspection, The Institute of Marine Biology).
- There are no national plans and protocols of emergency response available for the study, because of the martial law. The materials are available for the State Emergency Service, Marine Guardians, Sea Police and other representatives of the defense forces.
- There is low degree of the involvement of professionals and trainers into the curricula implementation;
- Destruction huge parts of equipment for training as result of the war.

Stakeholder recommendations addressing specific training needs

Need for modular, practical, and adaptable training to include:

- Addressing three main focus areas for training: marine pollution prevention cases and protocols; restoration of the marine environment; control on the protection of the natural environment

- Methodology for evaluation of damages to the marine ecosystems caused by armed conflicts.
- Bucharest Convention and recommendations for its amendments and adoption of a separate Protocol on pollution from military impacts on the marine environment
- Creation of a single information platform for monitoring pollution and training on its use and coordinating support actions
- Integrating innovative technologies into the process of training experts on national level
- Integration of field-training, case studies and professional practices in the training process
- Modules for training suited to different target audiences: students, representatives of controlling bodies at the state, regional or municipal level, environmentally aware citizens
- Tailored training programs designed for universities (1 semester or more) and emergency response to marine pollution (1 – 2 weeks) and modular subprogrammes including training on pollution from military conflicts
- Training in the use of AI for marine pollution modelling
- Competences and requirements for certification

The training needs of the Ukrainian audiences identified for the Ukrainian operational plan were validated by the regional workshop. The discussions at workshop supported the needs identified on national level. They were supported by the findings and prioritization of topics by the regional workshop, the expected outputs and outcomes.

The regional workshop, with regard to the specific requirements for its implementation, offered a selection of methods for recruiting new participants in the training. Top priority was collaboration with partner organisations. The set of nine methods for recruitment identified by the workshop offered an opportunity to adjust and diversify the recruitment for the national training in Ukraine.

Step 4 – Definition of the training content, materials, and further requirements

The training content co-design process in Ukraine is conducted by the IMEER NASU and BSB UEAS with help of the stakeholders. The content will meet the current needs of stakeholders and ensure the programme will address preparedness, emergency response and the new challenges of marine pollution.

IMEER NASU and BSB UEAS with support of key-stakeholders, particularly the Administration of Sea Ports of Ukraine, will update the structure and approaches, methods, content of the curricula.

The exercises and practical experiments will follow the thematic review from Annex 1 of the milestone M7. Practical training and experimental activities are aligned with the specific syllabus requirements, modern policies and practical demand in the sphere of Marine Pollution (MP), especially training modules that respond to pollution challenges caused by military actions in Ukraine. The general and specific learning outcomes will be defined according to the modules objectives and needs of the stakeholders, identified during the co-creation sessions.

Parameters for the use of the learning platforms, toolkits, IT-tools, and AI means for the better implementation of the marine pollution emergency response training programmes have been

identified. Special emphasis has been placed on the development of common interactive database for emergency response to marine pollution and identification of mitigation measures. The practical exercises will support all the theoretical learning materials, and will help to form practical competencies in the sphere of the marine pollution response. Thematically, practical exercises are foreseen for all the training modules and special sessions proposed for the curricula in Ukraine.

Due to the key stakeholders involvement (namely: Department of Ecology and Natural Resources of the Odesa Regional State Administration, Department of Environmental Management of the Administration Board of the State Organization "Ukrainian Sea Ports Administration" – USPA, State Ecological Inspectorate of the South-Western District (Mykolaiv and Odesa Regions), Ukrainian scientific center of Ecology of Sea (UkrSCES)) there option for the use specialized software (PowerSim and iThink programmes) for the Marine Pollution consequences forecasting.

The organizational basis for the use of the learning platforms (Moodle, Google-Classes) is formed due to the activities of the IMEER NASU in the sphere of the higher education quality assurance. Also due to the IMEER NASU coordinating efforts the South-Ukrainian Scientific Council of AI learning has already been formed and the platform for the better provision of AI use in scientific and education activity is formed.

The regional workshop reconfirmed that the training toolkit for Ukraine should be designed with the needs of diverse and numerous groups of stakeholders in mind, ensuring interoperability with various systems. Key considerations include making the toolkit perceivable, operable, understandable, and robust, while also allowing for integration with other learning platforms and technologies.

The defined training content for Ukraine, the training materials, and technical requirements for the IT tools and operation plan are supported by the findings and assessments of the workshop. They are aligned with the validated topics, expected outputs and outcomes performed at the regional workshop.

Step 5 – Structure the training programme

The National Training Course in Ukraine would be designed and delivered by key groups of stakeholders (actors): Universities, Scientific organizations, State authorities and NGOs. But the single framework for these actors is to be developed.

The national teams propose to use tailored approaches for the training programme in order to reach: 1) students; 2) professionals (ecological inspectors, other officials, seafarers port/Coast Guard officers, emergency responders, NGO staff); 3) volunteers and NGO staff.

For the first group the curriculum may be delivered as part of relevant degree programs (e. g. by National University "Odessa Maritime Academy, Odesa National university, Kherson State Maritime Academy). Theoretical materials and practical (case) studies may be delivered both by education or scientific staff and by practitioners.

For the second and the third groups of trainees the short-term courses may be used, but the difference will in the level of professional detail in the training materials, that are given by professional trainers, professors and other authorized staff. May be delivered in on-line and off-line forms, systematically or in case of demand. May be organized by Scientific Institutions, by

Administration of Sea Ports of Ukraine, by State Ecological Inspection, by Universities, NGOs or other authorized organizations.

The online workshop validated the structure of the operation plan for marine pollution training in Ukraine. There is a strong focus on practical exercises and practical learning in the national operation plan for Ukraine. It is in line with the strong focus on practical exercises, field studies and case-study analysis prioritized by the regional workshop.

Step 6 – Development of the training materials

The training materials development is to be organized in the manner that allows to take into account all the necessary theoretical basis, practical exercises, relevant up-to-date knowledges, methodologies and techniques.

The proposals for the development of training modules have been formulated by the IMEER NASU and BSB UEAS experts according to the data of the institutional basis, existing curricula, stakeholder analysis, due to the best practices learning. The update of the training modules has been performed with stakeholder participation, the interviews with stakeholders and in the co-creation process.

The IMEER NASU and BSB UEAS with help of the stakeholders will be involved in the process of such the Toolkit platform development. This step involves development of training modules; design of marine pollution exercises, simulations, and assessment framework; selection of teaching methodology; teaching platforms CMEMS-DSS/toolkit demonstrator configuration; and Toolkit platform development.

The regional workshop has reviewed the training tools, prioritized simulation and modelling tools followed by presentation and communication tools. The listed training tools support the process of preparation for the physical training with stakeholders in Ukraine. The regional workshop has contributed a lot to the readjustment of plans regarding the training tools and resources, their use, effectiveness, and the preferences of the partner organization.

The workshop helped the participants identify the resources needed for training and compare training objectives with the available resources for the training. Those two perspectives helped readjust the national plan and ground it in the realities of the country. Funding, equipment, and technology are identified by the regional workshop as central resources for the training. The workshop focused on technical infrastructure availability and budget availability so that partners can plan realistically. Time scales of the training revealed considerable variety of scales and the workshop provided clear support for this variety.

Step 7 – Trainers' engagement and facilitation

Recruiting the most relevant trainers is a key element in ensuring the success of the training program, especially under the current war challenges.

The national training course is co-created and will be regularly updated with stakeholder involvement. Ukrainian system of Higher Education Quality Assurance encourages engaging of stakeholders and practitioners in teaching activities. Therefore, most of educational and scientific organizations in Ukraine already use the stakeholder engagement approach.

The completion of the first training course under Milestone 7 would serve as one of the best practices and steps toward a long-term effort for development and institutionalization of marine pollution-response training courses in Ukraine.

Thus, the Ukrainian National Training Course under the RESPONSE project would be a comprehensive, tailored curriculum that addresses modern challenges, such as marine pollution from military actions, and forms adequate national capacity in preparedness and response to marine pollution. Apart from national and local aims, the curricula will meet EU and international objectives and reach compliance with standards and rules in the field.

Due to the RESPONSE project the training course would stimulate the establishment of a marine pollution prevention and emergency response knowledge network with partners in the region and the EU.

The IMEER NASU and BSB UEAS efforts will help in the facilitation of the professional trainers' engagement. The regional workshop put a special emphasis on budget and resources availability, which is relevant to trainers' engagement. The workshop also helped adjust the operational training frequencies. International experts from IMO, EMSA, EU environmental experts on marine pollution can provide valuable training input if their participation is ensured and provided for by institutions and specialized projects.

Step 8 – Evaluation and Monitoring

Evaluation and monitoring of the training process under the National Operation Plan of Ukraine is a process similar to that in the other partner countries. It involves pre- and post-training assessments to quantify knowledge gained by participants, as well as gathering participant feedback through surveys and forms to capture their experiences and suggestions. Performance will also be observed and evaluated during practical exercises and drills to assess real-time application of skills.

The regional workshop prioritized practical skills demonstration and pre/post-training assessment as major ways to measure the success of the training program and they can be adapted to the Ukrainian plan. The success metrics evaluated at the workshop can be partially adapted and incorporated in the Ukrainian plan. Success metrics reviewed and prioritized by the regional workshop have helped to readjust the monitoring and evaluation process of the national training plan.

Evaluation and monitoring under task 3.1 related to the task implementation, as part of the overall project logical framework, is also envisaged in the operational plan. The RESPONSE team in cooperation with project partners has designed a set of criteria for measuring the training achievements, performance effectiveness, and impact within the overall project context. They are integrated in the project monitoring and evaluation framework. The specific objective indicator of RESPONSE is achieved with development of 4 tailored training operational plans (3-4). The suggested impact indicators: (change in target groups, capacities, innovation, plans content etc.) include: learner satisfaction, knowledge retention, long-term knowledge retention, practical relevance, and application.

A particular emphasis has been placed on assessing impacts beyond immediate project outcomes. Short-, medium-, and long-term impact indicators have been proposed to capture the sustainability and broader significance of the project's interventions over time. Feedback

from regional stakeholder meetings has been incorporated to ensure that the indicators are relevant, practical, and aligned with the priorities and expectations of the project's partners.

To support systematic data collection and analysis, a clear and straightforward database structure has been developed. This structure ensures both information security and data reliability while enabling partners to track outcomes and impacts effectively. Additionally, potential risks to the M&E process – including data quality, regional differences, stakeholder engagement, and institutional and financial constraints – have been identified, along with mitigation strategies to address them.

The basis of the proposed indicator system is made up of the following 8 indicators:

- Improved level of knowledge and understanding of the marine pollution preparedness and response institutional, societal, training, and scientific background in the Black Sea countries;
- Stakeholders successfully co-develop and assess a comprehensive training framework on marine pollution preparedness and response;
- Stakeholders are more knowledgeable on the digital data and tools of MPPR and the practical guidance on implementing best practices;
- Stakeholders offer support and exchange experience with each other on training/theoretical issues, methodology, etc;
- Stakeholders express satisfaction with training programme/ events, digital tool;
- Stakeholders evaluate operational plans and offer improvements for integration;
- Stakeholder institutions design and implement their training programmes of marine pollution preparedness and response;
- Stakeholders formulate policy recommendations for improvement of preparedness and response and integration in further projects and activities.

These indicators relates to improving the knowledge and skills of stakeholders. The goal is to ensure participants gain a better understanding of the existing framework for marine pollution response, including its institutional, societal, training, and scientific aspects. This includes successful co-development of a comprehensive training framework and making stakeholders more knowledgeable about digital data and tools, along with best practices. These indicators collectively demonstrate that the project is effectively building the capacity of individuals and organizations to respond to marine pollution incidents.

Another key role of these indicators is to show that the project has fostered a sustainable network of stakeholders. By measuring if stakeholders offer support and exchange experience with each other, the project can assess whether it has created a community of practice that will continue to operate after the project's completion. This collaboration ensures that knowledge and expertise are shared and updated continuously, which is crucial for long-term sustainability. To complement immediate indicators, we also suggested seven impact indicators (II) for measurement of longer impact (up to 10 years) of the project.

Finally, these indicators measure the practical and policy-level impact of the project. They assess whether stakeholders are not only more knowledgeable but are also actively evaluating operational plans, offering improvements, and formulating policy recommendations. The ultimate goal is for stakeholder institutions to design and implement their own training programs based on the project's framework. This demonstrates a transition from project-driven activities to self-sustaining practices, showing that the project's outcomes have been fully integrated into the ongoing work of the participating institutions and will have a lasting effect on regional marine pollution preparedness.

The regional workshop served to readjust the selection of the most appropriate types of the assessment of the trainees introducing stronger focus on practical competency and skills assessment. The workshop suggested a variety of impact success metrics. Some of them can be adopted and used to measure the success of the national plan of Ukraine. Dedicated funding and professional expertise if available can help with the evaluation and monitoring methods reviewed by the regional workshop. Top priorities were institutional integration and stakeholder confidence, as well as community integration.

Step 9 – Follow up and sustainability

Sustaining the impact of the marine pollution training program is crucial. Upon completion, participants will receive certificates acknowledging their newly acquired skills and knowledge. We will actively encourage the integration of the training content into national contingency plans and practical exercises, reinforcing its direct application within existing frameworks.

To foster continuous learning and collaboration, we will establish a network or forum for trained professionals. This platform will facilitate ongoing communication, support, and knowledge exchange. Additionally, annual refresher courses or updates will be planned to maintain and enhance competencies over time.

Project achievements, training outcomes, and lessons learned will be consistently documented and shared through reports, policy briefs, and stakeholder engagements. This ensures informed decision-making and supports the development of effective policies.

IMEER NAS Ukraine and BSB UEAS are committed to these follow-up activities at the national level. They will continue the tradition of presenting certificates and driving the integration of RESPONSE training content into practical applications and networking events. All project achievements and insights will be shared through various channels to maximize reach and impact.

The regional workshop has validated the envisaged activities and initiatives incorporated in the Ukrainian National Operation Plan¹ for marine pollution preparedness and emergency response.

¹ Ukraine does not have a single, overarching "National Operation Plan for marine pollution" publicly detailed, but is instead focusing on international cooperation, regional projects, and strategies to address marine pollution threats. Key initiatives include the approval of the Maritime Security Strategy's implementation plan, which addresses pollution, and participation in regional projects like the [Black Sea SIERRA](#) and [Blueing the Black Sea](#) initiatives. These efforts aim to build response capacity for both conflict-related and man-made pollution, restore ecosystems, and improve monitoring and management across the region.

The Cabinet of Ministers of Ukraine has approved the implementation plan for the Maritime Security Strategy of Ukraine
<https://mod.gov.ua/en/news/the-cabinet-of-ministers-of-ukraine-has-approved-the-implementation-plan-for-the-maritime-security-strategy-of-ukraine>

Step 10 - Integration into broader systems

During the workshop it was suggested that it is strategically correct to provide the integrating of the main aspects of the training course into the broader systems and frameworks. This means aligning the training content and objectives with existing national emergency response and maritime policies. This approach guarantees consistency and strong support from relevant authorities.

We are also forging strong links with European Union mechanisms and regional Black Sea frameworks. This will foster cross-border coordination and harmonization, significantly boosting regional preparedness and response capabilities.

Furthermore, we will actively incorporate the training outcomes and best practices into the capacity-building efforts of related projects. This creates crucial synergies, reinforcing the overall effectiveness of marine pollution management.

IMEER NAS Ukraine and BSB UEAS will lead efforts to align the training content with national policies in Ukraine, keeping EU mechanisms and Black Sea regional frameworks in mind to enhance cross-border coordination and response. Concurrently, IMEER NAS Ukraine and BSB UEAS will focus on integrating RESPONCE training results and best practices into other projects' capacity-building components, maximizing the impact of marine pollution management initiatives.

The workshop validated the integration activities envisaged in the Ukrainian National Plan and reconfirmed commitments expressed in it. The participants expressed very strong support for the establishment of regional networks of collaborators for cross border exchange and would welcome the start of new initiatives for training in the region.

3. Activities and tools to be used during the training courses

The activities and tools to be used in the marine pollution preparedness and response training courses and validated by the regional workshop were defined based on the national plans of the Black Sea partners. The responses on the interactive platform sector provided a review of the stakeholder preferences. The participant feedback in the evaluation form also added specific aspects to the preferences of the target audiences.

These elements reflect a flexible, modular and practical approach geared towards the real needs of those involved, while allowing for the integration of other curricular options in the future.

All four countries opted for a modular training format tailored to different participant categories. Bulgaria, Romania and Ukraine offered short courses lasting 1–3 days for professionals in administration and response teams. Bulgaria and Georgia also incorporated semester-long university courses into existing academic programmes. For instance, the Technical University of Varna in Bulgaria has introduced a new 120-hour course entitled 'Response to disasters and accidents in the Black Sea. It should be pointed out that the training course of the Technical University – Varna, follows the requirements of its own institutional process and uses the official methodology adopted by the university. However, experts from the university team participated in the co-creation process and will support project trainings in the future. The Bulgarian team expects useful synergies from the collaboration with the university.

As a first step of the assessment, the participants provided a selection of preferred types of training activities choosing between lectures, practical exercises, interactive learning activities, case study analysis, technology-enhanced learning. Practical exercises and case-study analysis also ranked very high. The rating was based on detailed content outline for the six activities.

- Lectures: traditional instructor-led presentations, webinar-style remote lectures, panel discussions with multiple experts
- Practical exercises: hands-on equipment demonstrations, sample collection and testing procedures, equipment maintenance and calibration, safety protocol practice sessions
- Field activities: on-site pollution assessment visits, harbor/port inspection tours, shoreline survey exercises, water and sediment sampling fieldwork, equipment deployment training, real-time monitoring activities, cleanup operation participation
- Interactive learning activities: scenario-based simulations, role-playing exercises, crisis response drills, decision-making workshops
- Case study analysis: historical incident reviews, best practice examinations, success and failure case studies, regional case study development
- Technology-enhanced learning: online learning modules, mobile learning apps, interactive digital platforms, video-based learning, artificial intelligence tutoring systems

Second, the training tools and resources were assessed in terms of their effectiveness and according to the preferences on behalf of the participants. The simulation and modelling tools (pollution dispersal models, weather and oceanographic models, risk assessment software, response planning simulations, cost-benefit analysis tools, decision support systems, virtual training environments) ranked first. The result can be attributed to the interest in technology use and the need for planning

support and risk assessment. The presentation and communication tools (PowerPoint presentations, interactive presentation software, digital whiteboards and collaboration tools, multimedia tools such as videos and animations and document sharing platforms) ranked second. Those are the training tools that enjoy the widest popularity and are the most established and accessible in all countries. The workshop revealed that national training plans adequately reflect realities in the region. The high interest in field equipment and instruments and also for data analysis and monitoring tools ranking in the next two places can be attributed to the high level of commitment to practical exercises and the use of technologies. Geographic and mapping tools did not rank very highly, which can be attributed to the complexity and the time required for training on GIS applications, satellite imagery use, spatial data use. The geographic and mapping tools however are very useful for demonstration purposes. The reference materials and resources, comprising manuals, guidelines, standards, databases of scientific literature, videos, best practices etc. were underestimated or perhaps taken as granted. Despite the fact that they received the least support, they are basic training tools and the national plans of the partner countries clearly reveal that they will be used for the training courses.

The tools identified as priorities by the questionnaire participants (see Annex 3, Section C) are already included in the curriculum plans. Simulation and modelling tools, which were voted for by 61.8% of participants, will be used to create realistic scenarios involving real-time data and decision-making in uncertain conditions. Field equipment and measuring instruments will be presented in practical exercises. GIS and mapping tools, as well as digital data analysis tools, will support applied learning and be integrated into the RESPONSE digital platform.

A common feature of the courses is the use of real-time simulations based on real pollution scenarios involving either oil or chemicals or resulting from armed conflicts (a particular concern in Ukraine and Bulgaria). These simulations are supported by field exercises carried out in partnership with port authorities, civil protection directorates and oceanography institutes. All countries have included collaborative activities in their plans, such as workshops, forums and exchanges of best practices, which are aimed at strengthening inter-institutional coordination. These activities are complemented by case studies and scenario-based learning based on real events in the Black Sea region.

The resources actually available for training comprise administrative support, expertise on the topics of training and sometimes training facilities. Equipment, transport, technology and funding are less common. Needs for budget, equipment and technology emerged as top priority for the training resources of the Black Sea partners. In terms of technical infrastructure, advanced computer hardware and software systems, specialized software licenses and technical staff to support them, big needs have been identified. The workshop confirmed the serious budget constraints of regional stakeholders.

Interaction, opinion polling and real-time training evaluation will continue to be facilitated using online interactive tools like Mentimeter. Additionally, each country has the option to integrate national tools (e.g. existing e-learning platforms, alert applications and naval simulators), ensuring regional customisation and interoperability.

4. Stakeholder groups to be involved in the process of training_____

The success of training programmes for marine pollution preparedness and response depends crucially on the active involvement of stakeholders from all relevant sectors. In this regard, the national plans developed under the adopted methodology for Bulgaria, Romania, Georgia and Ukraine share a common vision of engaging a wide range of institutional, academic, private and community actors, each with their own roles and responsibilities, in the prevention, monitoring and response to marine incidents.

Based on the analyses for the national operation plans, the following general classification of stakeholder groups to be involved in the training process has been outlined by the workshop:

- Public authorities with direct responsibilities: civil protection and emergency response departments, port authorities, coast guards and maritime border police, environmental protection agencies and water departments, academic and research institutions (maritime and technical universities, oceanography institutes and marine ecology research centres), students and teachers specialising in engineering, environmental protection and risk management, economic operators and critical infrastructures, port administrations and shipping companies, operators of offshore oil and chemical installations, towing, marine sanitation and post-spill recovery companies;
- Non-governmental sector and local communities include NGOs active in the field of marine environment and biodiversity conservation, volunteers involved in disaster response or participatory monitoring, representatives of the media, local councils and community organisations;
- Decision-makers and planners: Relevant ministries (environment, transport and interior), public policy and contingency plan coordinators, inter-institutional networks and marine governance platforms.

This structure provides a common basis but also allows for customisation at national and regional levels depending on existing institutions, applicable legislation and current preparedness levels.

Participants in the regional workshop voted to prioritize the actors they consider most relevant for involvement in training. Five groups of participants were identified:

- Emergency response teams (76.5%)
- Port authorities (73.5%)
- Environmental agencies (73.5%)
- Students and academics (44.1%)
- Volunteers and NGOs (14.7%)

The highest expectations are directed towards operational actors (response teams, ports, environmental agencies), but also towards local decision-makers and academia – all of whom are essential to ensuring a coordinated and effective response. National plans include specific adaptations for each group. Courses for professionals are concentrated and include simulations, exercises and tabletop exercises. Courses for the academic sector are semester-long and include

applied research activities. Courses for volunteers include practical exercises and community campaign involvement.

Analysis of data from the interactive and audience engagement tool and national plans indicates a consensus on the key actors involved. The study highlights the need for a diversification of engagement methods (training, co-creation, dissemination), as well as the establishment of a transnational coordination framework. This framework is expected to facilitate the capitalisation of accumulated experience and enhance regional response capacity.

5. Process of recruiting new participants and retaining them_____

After the assessment of the stakeholder groups and the validation of the approach applied for their selection by the national plans, the workshop addressed an issue closely related to the training audiences, the process of recruiting new participants in the training and retaining them (section B2). The participating stakeholders were asked to rank nine options suggesting methods for effectively recruiting new participants to training programmes. Those comprise:

- Onboarding of new staff and responders through mandatory training sessions.
- Post-incident recruitment for ad-hoc training following major incidents or regulatory/technological updates.
- Outreach campaigns via newsletters, websites, and social media.
- Collaboration with partner organizations to nominate and engage participants.
- Targeted invitations to relevant authorities, institutions, and NGOs.
- Participation incentives (certificates, recognition, professional development credits).
- Recommendations from past participants.
- Engagement at events such as workshops, conferences, and stakeholder meetings.
- Open calls or application forms published on project or institutional platforms.

Collaboration with partner organisations and engagement at events received very strong support. Targeted invitations and participant incentives also featured prominently. Training of new staff and recommendations from new participants followed next as targeted approach was considered more effective than outreach campaigns and open calls for applications on project and institutional platforms. Post incident recruitment for ad-hoc training following major incidents was not considered very effective and easy to accomplish. The long list of options offering to the participants a variety of methods to choose from is an achievement of the workshop and a contribution to the process of preparation for the trainings on national level.

Retention of the participants in the training and their engagement in the update of training plans and the buildup of knowledge and capacity is one the major challenges of the training process.

An effective marine pollution training programme must combine relevant content and modern tools with a strategic process for attracting and retaining participants. An analysis of the national plans of the four participating countries shows that, as well as being addressed logistically, recruitment and retention are considered an integral part of the RESPONSE curriculum's sustainability and scalability.

In all four BS countries, the recruitment and retention process was designed around three strategic axes:

1. Identifying the target audience through existing networks: Ministries, agencies and local authorities involved in environmental protection and emergency management; Universities and research institutions with relevant programmes; NGOs, volunteer networks and local communities; Maritime and port companies.

2. Promoting participation through clear benefits: obtaining certifications and formal recognition of skills, access to the RESPONSE digital platform, multimedia materials and regional professional networks, participation in real simulations, exercises and practical events, and the opportunity to contribute to the development of curriculum modules through feedback and co-creation.
3. Diversification of communication channels: email campaigns, stakeholder networks and institutional platforms; presentations at universities and relevant events; use of social media and local press for recruitment among volunteers and communities.

The workshop validated the recruitment and retention process and proceeded further with assessment of the timeline and roles of training administrations.

6. Timeline of the actions and the roles of the training administrators

The timescales most relevant for the training needs were selected for approval of the target audience based on experience and institutional considerations. The options offered for selection and validation were:

- Immediate response (hours to days)
- Short-term management (days to weeks)
- Medium-term recovery (weeks to months)
- Long-term prevention and planning (months to years)
- All time scales equally important

The partners from the Black Sea countries and other institutions there that would serve as training administrators within the project and in the follow up period have a principal role in the design of the training courses and the appropriate selection of their timescale. In the process of validation at the workshop all timescales received approval but the option "All time scales equally important" received the strongest support. Long-term options were also strongly supported, while flexible days to weeks trainings remain a priority for two-three project partners and other future training administrators in the region.

The training administrators were provided a wide scope of geographic environmental contexts to select for the trainings while the list itself allowed for multiple selection options and flexibility. Coastal areas and ports were the most popular options followed by estuaries and river mouths. The selection can be attributed to concerns for specific preparedness and response problems in those areas. Open sea seems to be a lower priority for coastal target audiences.

When employers and partners in institutions were asked about commitments for their employees to participate in trainings per person/per year, the time period 1 – 3 weeks was the most popular, followed by the more flexible and realistic 1 – 3 days, while the options 3 – 5 hours and 1 – 2 months received small support. In the questionnaire of the interactive platform, 41.2% of participants stated that they can allocate 1–3 weeks/year for training, which indicates a high level of availability, but also the need for a flexible and efficient approach to recruitment, focused on the calendar and priorities of each audience category.

Further assessment of timelines provided by participants in the role of training administrators revealed considerations about the ideal frequency for repeating training in their organization, taking into account the type, subject and scope of the training. They were provided the following options:

- Annual refresher courses to maintain knowledge and skills.
- Bi-annual or quarterly drills (tabletop and field-based) for operational readiness.
- Every 2–3 years: Full-scale exercises involving multiple stakeholders and agencies.
- Onboarding sessions for new staff and responders.

- Ad-hoc training after major incidents or regulatory/technological updates.
- Continuous e-learning modules available for self-paced refreshment.

Capacity building being a continuous and reiterative process was confirmed by the prevailing support for annual refresher courses. Distant learning and lifelong learning are very popular, hence the strong support for continuous e-learning. Full scale exercise with multiple stakeholders received considerable support, the other frequencies and the related forms seemed to be less familiar to the participants though quite flexible and adaptable to specific circumstances.

The workshop validated and reconfirmed the variety of possible timelines and time scales of the actions and the available options for the training administrators involvement.

7. Procedures, guidelines and templates for interacting with participants and stakeholders

Participant retention and maintaining interest and engagement in national plans is linked to three main factors:

1. Practical relevance of training: according to the success metrics of the online platform Section E1, 64.7% of participants consider practical demonstrations of skills to be the most effective training method. Consequently, training will focus on real-life applications, simulations, working with real data, and concrete scenarios.
2. Recognition and professional advancement: The national plans propose the development of certification programs, including through the integration of modules into university curricula (e.g., UT Varna). Participants will be able to access progressive levels of competence (from introductory to advanced), which encourages recurrent participation.
3. Creating a learning and practice community: all countries support the idea of forming a network of graduates to serve as a forum for sharing best practices. This network will benefit from continuous access to RESPONSE platform resources, regional events, content updates, and new modules.

Participants expressed their appreciation of the workshop's interactive and digital format, their interest in examples of good practice from Black Sea riparian countries, and their desire for shorter, more flexible sessions, including an online option (Annex 4). These suggestions support the concept of a participant-centred training approach that is easily accessible yet offers high-quality, directly applicable content.

Effective implementation of the RESPONSE training programme requires well-structured planning and clear definition of the roles of training administrators at national and regional levels. Analysis of the national plans in Bulgaria, Romania, Georgia and Ukraine reveals a shared vision involving coordinated yet adaptable stages to address the unique requirements of each country.

In all four countries involved in the project, the national plans developed within the adopted methodological framework provide for a multi-level approach, in which responsibilities for organizing, delivering, and monitoring courses are clearly distributed among several institutional actors. This model allows for good coordination between the levels of decision-making, education, implementation, and community involvement.

At the national level, relevant ministries—such as those for the environment, transport, interior, or education—along with specialized government agencies (e.g., maritime authorities, environmental protection agencies, civil protection directorates) play a central role in the overall coordination of the training process. These institutions are responsible for curriculum approval, ensuring compliance with national and European legislation, and providing the necessary resources and legitimacy for the program to be delivered in all target regions.

At the institutional and educational level, technical universities, maritime academies, and research institutes in the four countries are directly responsible for adapting the content to the local context, as well as for the effective delivery of the modules to the various groups of participants. In addition,

these institutions play an active role in assessing student performance, co-creating training materials, and providing certification for program graduates.

At the operational and technical level, project partners such as BSNN (for Bulgaria), national NGOs, and IT support teams contribute significantly to organizational logistics, the operation of the RESPONSE digital platform, and the conduct of technical exercises and simulations. These actors ensure that participants benefit from an interactive, technologically up-to-date educational experience that is appropriate to their level of training.

Last but not least, at the community level, local NGOs, volunteers, local council representatives, and the media play a key role in promoting the courses, recruiting participants, and facilitating practical training in coastal communities. This involvement supports the expansion of the training network beyond institutional boundaries, generating a broader impact on community awareness and resilience.

This distribution of roles allows for the creation of a functional training ecosystem, in which each level contributes its specific expertise and together ensures the coherent, relevant, and sustainable implementation of the program in the Black Sea region.

An important element proposed in the national operation plans is aligning the training schedule with the existing activities and plans of the institutions involved (e.g., national civil protection exercises, academic training sessions, international projects)

In Bulgaria, the new university course is synchronized with the academic year. In Romania, it is planned to integrate training into the National Contingency Plans. In Ukraine, there are proposals to coordinate with crisis response initiatives triggered by armed conflict. In Georgia, local NGOs suggest synchronisation with community awareness campaigns.

The online workshop offered suggestions and ideas on the structure and forms of interaction with participants in the training and stakeholders. Those included forms of interaction to measure the success of the training programme, selection of the most appropriate types of assessment of the trainees from the training organisation, forms to measure the potential to implementation of training program in the respective region. The ideas suggested within the workshop content gave the partners freedom to select those that may be appropriate and suitable for their specific training process and the interaction with stakeholders related to it. This process supports monitoring of training performance and its evaluation.

In addition to the online workshop process with the variety of suggestions for interaction, on a higher level the Task 3.1, which integrates the common methodology, national operation plans and regional workshop, uses the guiding principles of the project overall logical framework and the procedures for reporting on the achievement of special objectives and their indicators.

Effective interaction with participants and stakeholders within the RESPONSE project is governed by a set of standardised procedures, operational guidelines and reporting templates. These were all developed in accordance with the project's logical framework and the objectives set out in Work Package 3 (WP3).

The entire process of planning and delivering training programs was based on a well-defined logical framework linking the activities carried out with the specific objectives and expected results of the project. Thus, Specific Objective 8 – *"Developing comprehensive operational planning to*

strengthen the implementation and effectiveness of marine pollution training" – was achieved by developing and validating four operational training plans, one for each partner country in the Black Sea region: Bulgaria, Romania, Georgia, and Ukraine.

These national plans, adapted to the context of each country, were developed using a common methodology, co-created and validated during the regional workshop. They were added, where appropriate, to the existing training plans in each country, thus constituting the first official RESPONSE training plans at national level.

Through this action, the national teams contributed directly to the achievement of Indicator of Achievement AI.8 – "Increase in the number of operational plans per Black Sea riparian country" – demonstrating the applicability of the methodology and the commitment to strengthening response capacities.

The interaction process with stakeholders is supported by a monitoring and evaluation procedure that includes: Pre- and post-training questionnaires to assess individual progress, standardised feedback forms, such as those used in the regional workshop (see Annex 4), assessment of practical skills in simulations and applied activities, written reports prepared by national coordinators within one month of activity completion (T3.1)

The results of the evaluations are analysed and integrated into the project's overall reporting system based on the logical framework matrix. The targeted impact indicators include increased learner satisfaction, knowledge retention rate, practical applicability of the acquired skills and active stakeholder involvement in planning and evaluation.

To ensure consistency in the stakeholder engagement process, a series of common guidelines and templates were developed and used in all four countries:

1. Invitation and recruitment templates for participants tailored to target groups (decision-makers, operators, students, etc.).
2. Registration and informed consent forms for monitoring participation and collecting ethical data.
3. Facilitation guides for workshops, simulations, and thematic training.
4. Structured feedback mechanisms based on digital tools (e.g., Mentimeter) and standard evaluation forms.
5. Internal reporting templates used by country coordinators to document progress, obstacles, and recommendations.

This procedural and logical approach directly contributes to General (Overarching) Objective 3 of the RESPONSE project: 'Supporting the implementation of EU and regional strategies by developing operational guidelines for the application, updating, monitoring and management of marine pollution training programmes.'

At the same time, it supports Outcome 3 (D2.2): 'Stakeholders support regional strategies for marine pollution preparedness and response (MPPR) through the co-development, co-implementation and co-evaluation of operational training plans, alongside outcome indicators 4, 5 and 6 (relating to stakeholder involvement, plan quality and regional integration). The templates for reporting on

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the achievement of those indicators related to outcome 3 are numbers 4, 5, 6 and are represented in Table 2.

Table 2: Framework of project overarching objectives, outcomes and outcome indicators

Overarching Objectives		Outcomes	Outcome indicators
IDENTIFY and UNDERSTAND	institutional and societal gaps and needs for effective, integrated, transdisciplinary and multidisciplinary marine pollution training systems.	Marine pollution preparedness and response (MPPR) institutional, societal, training, and scientific background identified and understood by stakeholders	OI-1. Improved level of knowledge and understanding of the MPPR institutional, societal, training, and scientific background in the BS countries
DEVELOP	effective training programs by assembling, integrating, and improving the most promising approaches and results	Effective and comprehensive framework of concepts for training programmes on MPPR co-created and operationalized by stakeholders and project	OI-2. Stakeholders successfully co-develop and assess a comprehensive training framework on MPPR
			OI-3. Stakeholders are more knowledgeable on the digital data and tools of MPPR and the practical guidance on implementing best practices
SUPPORT	implementation of the EU and Regional Strategies, by developing operational guidelines for effective application, updating, monitoring and management of training programs on marine pollution.	Stakeholders enabled to support the regional strategies for MPPR by co-developing, co-applying, co-evaluating operational training plans for MPPR	OI-4. Stakeholders offer support and exchange experience with each other on training/theoretical issues, methodology, etc
			OI-5. Stakeholders express satisfaction with training programme/ events, digital tool OI-6. Stakeholders evaluate operational plans and offer improvements for integration
EMPOWER	marine pollution training, monitoring, and mitigation by involving, inspiring, and influencing stakeholders	Key stakeholders actively involved in regional activities for engaging institutions in action plans on MPPR training and networking and integrating scientific findings about the Black Sea into the wider socio-economic, environmental and cultural concerns	OI-7. Stakeholder institutions design and implement their training programmes of MPPR OI-8. Stakeholders suggestions formulate policy recommendations for improvement of preparedness and response, and integration in further projects and activities

8. Feedback collection, performance assessment and evaluation_

Collecting feedback, evaluating performance and continuously monitoring progress are all essential components of the RESPONSE project, ensuring the quality, relevance and adaptability of training activities. This process was implemented using common tools and methodologies validated at the regional level in all four partner countries (Bulgaria, Romania, Georgia and Ukraine).

Feedback was collected through a combination of digital forms completed by participants at the end of training sessions and workshops (e.g., the standard form used in the regional workshop on September 11, 2025—see Annexes 2 & 4), real-time surveys using interactive presentation and audience engagement tools, which allowed for interactive participation and immediate visualization of preferences and perceptions, pre/post-training questionnaires applied to measure perceived progress and subjective impact of the courses, qualitative feedback collected in open discussions, stakeholder interviews, and dedicated sections of workshops.

Examples of appreciative feedback (Annex 4): "Interactive approach, useful digital demonstrations, clear workshop structure"; "Modern tools, high participation, quick real-time reactions"; "Practical value of the content and openness of experts to dialogue". Constructive suggestions were also identified: preference for shorter or flexibly structured sessions (e.g., half-day), improvement of notifications and access to Mentimeter codes; integration of examples.

Performance assessment within the RESPONSE training program was structured around a set of key indicators that reflect both the individual progress of participants and the institutional and regional impact. These indicators were designed to be applied uniformly across all four partner countries, while allowing for adaptation to the specificities of each national context.

The first key indicator is the level of satisfaction of participants, measured by scores given at the end of each training session, using a standard scale from 1 to 5. The project's objective is for at least 50% of respondents to give a score of 4 or 5, thus indicating that the training was relevant, well delivered, and applicable.

The second indicator concerns the retention of acquired knowledge, assessed through pre- and post-training tests. The aim is for at least 70% of participants to achieve significantly improved results after completing the training modules, confirming the effectiveness of the materials, teaching methods, and support provided.

Another important aspect is the practical applicability of the training – the extent to which the skills acquired can be put into practice in the participants' daily work. This indicator is assessed through self-assessments, interviews, and observations made during practical exercises. The focus is on relevance and transferability, not just theoretical knowledge.

Long-term retention is an impact indicator that reflects the sustainability of learning. It is assessed through questionnaires administered 3–6 months after the end of the course, and the objective is to obtain clear evidence that participants have retained and continued to use the knowledge and skills they have acquired.

Finally, a cross-cutting indicator is the quality of inter-institutional coordination, measured by the degree of collaboration between the institutions involved, the expansion of joint training plans, and the active involvement of relevant actors in updating and implementing the curriculum. This provides an overview of the maturity and sustainability of the intervention at the system level.

Assessment is not seen as a final stage, but as an integral part of the entire educational cycle: before training establishing the level of knowledge, expectations, and profile of participants; during the course - quick polls, interactive activities, interim feedback, after training -tests, interviews, formal feedback.

9. Conclusions and recommendations

The implementation of the training program within the RESPONSE project demonstrated the capacity of national and regional teams to develop a coherent, applicable, and sustainable framework for marine pollution preparedness and response in the Black Sea region. Based on the activities carried out within work package WP3 and the contributions from the four participating Black Sea countries – Bulgaria, Romania, Georgia, and Ukraine – four national training plans were formulated and adopted, the first of their kind to be developed in an integrated manner in the region.

These plans are the result of a participatory and common methodological approach, validated during the regional co-creation workshop, and linked to the project objectives through clear progress and impact indicators. Specifically, Achievement Indicator AI.8 on increasing the number of operational plans per riparian country was achieved, thus directly contributing to Specific Objective 8 – "Developing comprehensive operational planning for training".

Furthermore, the stakeholder consultation and engagement process, using modern interactive presentation and audience engagement tools, digital forms, and interactive sessions, confirmed the relevance of the topics addressed, identified priority target groups, and validated the need for a modular, practical, and scalable training model.

Key findings were:

- ✓ Oil pollution, marine litter, and chemical contaminants were identified as the most important types of pollution to address in training;
- ✓ Emergency response teams, port authorities, and environmental agencies are the most important stakeholders for direct involvement;
- ✓ Participants prefer annual training with a focus on practical applications, simulations, and case studies;
- ✓ Performance evaluation should focus on demonstrating practical skills and long-term impact;
- ✓ Participants appreciated the interactive approach but recommend more flexibility in organization and integration of regional best practices.

Recommendations to be considered are:

1. Continue developing the curriculum in a modular and scalable format, tailored to the needs of each target group (decision-makers, operators, students, NGOs).
2. Strengthening the RESPONSE digital platform to become a permanent tool for learning, collaboration, and access to up-to-date resources.
3. Integrate training plans into existing national strategies, including contingency plans, university curricula, and inter-agency exercises.
4. Update and simplify monitoring and evaluation indicators so that they are easy to apply and report on in all participating countries.

5. Institutionalize the feedback process through standard mechanisms (surveys, post-course questionnaires, follow-up sessions) for continuous improvement.
6. Create a regional network of graduates and trainers to support knowledge transfer, exchange of good practices, and continuous learning.
7. Supporting countries in extending the program to new stakeholder groups (e.g., the private sector, local authorities, informal education).

Coordinated, participatory, and well-planned training can become an essential pillar for increasing resilience to marine pollution in the Black Sea region. Through regional cooperation, the use of technology, and the active involvement of stakeholders, the project is laying the foundations for a sustainable preparedness and response system that will benefit both the environment and society.

Annexes

Annex 1. Tables Key Performance Indicators

The procedures and guidelines for determining the outcome indicators are represented in tables A1-7.

Table A1-1. Structure of evaluation process based on outcome indicator OI-1.

Indicator	OI-1. Improved level of knowledge and understanding of the marine pollution preparedness and response institutional, societal, training, and scientific background in the BS countries
SMART Indicator	SI-1. Number of stakeholders demonstrating increased knowledge ($\geq 20\%$ improvement in post-training assessment scores) on MPPR aspects.
Baseline	5 responses per country – 20 on project level
Target	5/6 responses per country – 20/22 on project level
Data Collection	M 24
Deadline	M 28
Tool	Questionnaire (to reveal knowledge, understanding, pollution types, regional process; short semi-structured interview with key stakeholders, in person or by phone – questions to be elaborated and included in annex)
Responsible	BSNN ; IMEER NASU; INCDM – NIMRD
Corresponding deliverable	D1.1, D1.2, D1.3
Reporting	Short summary report

Table A1-2. Structure of evaluation process based on outcome indicator OI-2.

Indicator	OI-2. Stakeholders successfully co-develop and assess a comprehensive training framework on marine pollution preparedness and response
SMART Indicator	SI-2. Number of stakeholders actively participating in the co-development and evaluation of the MPPR training framework

Baseline	20 stakeholders involved in co-development and evaluation of the MPPR training framework
Target	30 stakeholders involved in co-development and evaluation of the MPPR training framework
Data Collection	M 27
Deadline	M 30
Tool	Workshops summary, observations, analysis
Responsible	INCDM – NIMRD
Corresponding deliverable	D2.1; D.3.3
Reporting	Short summary report

Table A1-3. Structure of evaluation process based on outcome indicator OI--2.

Indicator	OI-2. Stakeholders are more knowledgeable on the digital data and tools of marine pollution preparedness and response and the practical guidance on implementing best practices
SMART Indicator	SI-3. Number of stakeholders expressing the intention to use the Digital Toolkit
Baseline	20 stakeholders use/comment on the use of the Digital toolkit
Target	30 stakeholders use/comment on the use of the Digital toolkit
Data Collection	M 30
Deadline	M 36
Tool	Survey during the presentation of the toolkit; website visitor counter
Responsible	AUTH
Corresponding deliverable	D2.1
Reporting	Automatised counts on the website, which is visible all the time; Final report

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Table A1-4. Structure of evaluation process based on outcome 3 indicator OI-4.

Indicator	OI-4. Stakeholders offer support and exchange experience with each other on training/theoretical issues, methodology
SMART Indicator	SI-4. Number of cross-country or inter-institutional exchanges, meetings, or collaborative activities between stakeholders on MPPR training and methodology.
Baseline	10 cross-country or inter-institutional exchanges
Target	12 cross-country or inter-institutional exchanges
Data Collection	M 24
Deadline	M 28
Tool	Questions asked by project team members in short surveys (ex., how often stakeholders share experience? how often they meet? how often they communicate? what topics attract most significant interest?); interviews, partner reports on project events, deliverables
Responsible	All Project Partners
Corresponding deliverable	D2.1; D3.3
Reporting	D3.3

Table A1-5. Structure of evaluation process based on outcome 3, indicator OI-5.

Indicator	OI-5. Stakeholders express satisfaction with training programme /events, digital tool
SMART Indicator	SI -5. Number of participants rating satisfaction ≥ 4 on a 5-point Likert scale for RESPONSE events.
Baseline	20 stakeholders rating satisfaction ≥ 4
Target	30 stakeholders rating satisfaction ≥ 4
Data Collection	M 25
Deadline	M 31
Tool	Mentimeter survey during workshops and pilot events; communication with stakeholders/key stakeholders, interviews in media, publications

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Responsible	All Project Partners
Corresponding deliverable	D2.1, D2.2., D 2.3., D 2.4
Reporting	D3.3

Table A1-6. Structure of evaluation process based on outcome 3, indicator OI-6.

Indicator	OI-6. Stakeholders evaluate operational plans and offer improvements for integration
SMART Indicator	SI-6. Number of recommendations (suggestions) received from stakeholders on operational plans.
Baseline	3 suggestions
Target	5 suggestions
Data Collection	M 27
Deadline	M 30
Tool	Suggestions provided via partner teams, in writing, communicated on behalf of institutions/organisations
Responsible	INCDM – NIMRD; BSNN
Corresponding deliverable	D 3.1, 3.2
Reporting	Short report and presentation on the project assembly/workshop (D3.3), other project meetings.

Table A1-7. Structure of evaluation process based on outcome 4, indicator OI-7.

Indicator	OI-7. Stakeholder institutions design and implement their training programmes of marine pollution preparedness and response
SMART Indicator	SI -7 Number of stakeholders institutions implement their training programmes
Baseline	4 on project level
Target	5 on project level
Data Collection	M 32

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Deadline	M 36
Tool	Programmes openly available, presented by stakeholders, reports/interviews, publications
Responsible	GMG/FoE-GE
Corresponding deliverable	D 3.3
Reporting	Presentation on the final project event

Table A1-8. Structure of evaluation process based on outcome indicator OI-8.

Indicator	OI-8. Stakeholders` suggestions formulate policy recommendations for improvement of preparedness and response and integration in further projects and activities
SMART Indicator	SI-8. Number of stakeholder that formulate policy recommendations
Baseline	3 suggestions on project level
Target	5 suggestions on project level
Data Collection	M 30
Deadline	M 36
Tool	Suggestions provided via partner teams, in writing, communicated on behalf of institutions/organisations, outlined in open sources, analyses etc
Responsible	GMG/FoE-GE
Corresponding deliverable	D3.3
Reporting	Presentation on the final project event

Annex 2. Questionnaire

Online list of question for stakeholders' engagement enabled to support the regional operational training schemes for marine pollution preparedness and response

A. KEY TRAINING OBJECTIVES

A1 Primary training focus – What is your main interest?

please select

- Response (immediate action during incidents)
- Preparedness (prevention and planning)
- Both response and preparedness

A2 Marine pollution topics of interest

How would you prioritise the training modules according to marine pollution type they address? (rank from 1 to 5, where 5 is high priority and 1 is low priority)

- Oil pollution**
- Heavy metals** (e.g. mercury, lead, cadmium)
- Other contaminants** (e.g. persistent organic pollutants (POPs), chemical spills, hazardous substances)
- Radioactive contamination**
- Industrial discharge pollution**
- Marine litter** (e.g. macro-, micro-, nano-plastics debris, ghost fishing gear, other solid waste)
- Sewage and wastewater discharge**
- Biological Pollution** (e.g. invasive species, ballast water)
- Conflict-Related Pollution** (e.g. Military vessel incidents, naval warfare environmental impact, ammunition dumping and munitions, Infrastructure debris)
- Emerging Pollutants** (e.g. Pharmaceuticals and personal care products, nanomaterials)
- Other** _____

A3 Main training outputs and expected outcomes

What should be the primary outputs, gains, and knowledge generated through the training?

Please rank these in order of priority (1 = highest priority).

- Rapid assessment capabilities
- Search and rescue operations
- Environmental rehabilitation techniques
- Response network coordination
- Team building and collaboration

- Risk assessment and prevention
- Communication protocols
- Legal and regulatory compliance
- Understanding of roles and responsibilities of various authorities
- Technology integration
- Other: _____

A4. Technology integration

Are you interested in introducing new technologies, tools, or methods to improve monitoring and immediate response capabilities?

please select

- Yes
- No
- Depends on cost/feasibility

If yes, which technologies are of interest?

please select

- Remote sensing and satellite monitoring
- Drone surveillance systems
- Real-time data analytics platforms
- Mobile communication apps
- GIS mapping and tracking systems
- Predictive modeling software
- IoT sensors and monitoring devices
- Virtual/Augmented reality training tools
- Other: _____

A5. Armed conflicts and security considerations

Are you considering the need for armed conflict scenarios and improving authority knowledge and response capabilities?

please select

- Yes
- No
- Not applicable to our context

If YES:

What would you anticipate from the training?

please select

- Threat assessment protocols
- Coordination with military/security forces
- Response procedures in conflict zones
- Environmental rehabilitation techniques
- Marine pollution reduction and control in conflict zones
- Other: _____

B. TARGET AUDIENCES

B1. Who do you consider as the main target participants for your training programs?

please select

- Port authorities
- Shipping operators
- Maritime students/academics
- Emergency response teams
- Coast guard personnel
- Environmental protection agencies
- Local government officials
- Private sector stakeholders
- Volunteers
- Other: _____

B2. What methods do you consider most effective for recruiting new participants to training programs?

please select

- Onboarding of new staff and responders through mandatory training sessions.
- Post-incident recruitment for ad-hoc training following major incidents or regulatory/technological updates.
- Outreach campaigns via newsletters, websites, and social media.
- Collaboration with partner organizations to nominate and engage participants.
- Targeted invitations to relevant authorities, institutions, and NGOs.

- Participation incentives (certificates, recognition, professional development credits).
- Recommendations from past participants.
- Engagement at events such as workshops, conferences, and stakeholder meetings.
- Open calls or application forms published on project or institutional platforms.
- Other _____

C. TRAINING ACTIVITIES AND TOOLS

C1. What types of training activities do you consider most effective or preferable for your organization? *Please select your preferred training activities:*

C1.1. Lectures

- Traditional instructor-led presentations
- Webinar-style remote lectures
- Panel discussions with multiple experts

C1.2. Practical exercises

- Hands-on equipment demonstrations
- Sample collection and testing procedures
- Equipment maintenance and calibration
- Safety protocol practice sessions

C1.3. Field activities

- On-site pollution assessment visits
- Harbor/port inspection tours
- Shoreline survey exercises
- Water and sediment sampling fieldwork
- Equipment deployment training
- Real-time monitoring activities
- Cleanup operation participation

C1.4. Interactive learning activities

- Scenario-based simulations
- Role-playing exercises
- Crisis response drills
- Decision-making workshops

C1.5. Case study analysis

- Historical incident reviews
- Best practice examinations
- Success and failure case studies
- Regional case study development
- C1.6. Technology-enhanced learning**
 - Online learning modules
 - Mobile learning apps
 - Interactive digital platforms
 - Video-based learning
 - Artificial intelligence tutoring systems

C2 What training tools and resources do you find most effective or prefer to use in your organization?

please select

- C2.1. Presentation and communication tools**
 - PowerPoint presentations
 - Interactive presentation software (Canva)
 - Digital whiteboards and collaboration tools
 - Multimedia content (videos, animations)
 - Document sharing platforms
- C2.2. Geographic and mapping tools**
 - GIS applications (ArcGIS, QGIS)
 - Satellite imagery and remote sensing tools
 - GPS and navigation systems
 - Online mapping platforms (Google Earth, OpenStreetMap)
 - Spatial analysis software
 - Drone mapping and surveying tools
- C2.3. Data analysis and monitoring tools**
 - Statistical analysis software (R, SPSS, Excel)
 - Database management systems
 - Real-time monitoring dashboards
 - Data visualization tools

- Environmental modeling software
- Sensor networks and IoT platforms
- Mobile data collection apps
- C2.4. Simulation and modeling tools**
 - Pollution dispersal models
 - Weather and oceanographic models
 - Risk assessment software
 - Response planning simulators
 - Cost-benefit analysis tools
 - Decision support systems
 - Virtual training environments
- C2.5. Field equipment and instruments**
 - Water quality testing kits
 - Sampling equipment and containers
 - Portable analytical instruments
 - Safety equipment and Personal Protective Equipment (PPE)
 - Communication devices (radios, satellite phones)
 - Documentation tools (cameras, tablets)
 - Cleanup and response equipment
- C2.6. Reference materials and resources**
 - Technical manuals and guidelines
 - Regulatory frameworks and standards
 - Best practice databases
 - Scientific literature and research papers
 - Case study libraries
 - Training videos and documentaries
 - Expert contact networks

C3. Resource requirements

C3.1 What resources do you have AVAILABLE for the training?

please select

D3.1 OPERATION PLANS ON MARINE POLLUTION TRAINING ON A NATIONAL LEVEL

- Training facilities
- Equipment and materials
- Subject matter experts/instructors
- Funding/budget allocation
- Administrative support
- Technology infrastructure
- Transportation/logistics
- Other: _____

C3.2 What resources do you NEED for the training in addition?

please select

- Training facilities
- Equipment and materials
- Subject matter experts/instructors
- Funding/budget allocation
- Administrative support
- Technology infrastructure
- Transportation/logistics
- Other: _____

C3.3 What technical infrastructure requirements do you have AVAILABLE for the training?:

please select

- High-speed internet connectivity
- Advanced computer/hardware systems
- Specialized software licenses
- Mobile device compatibility
- Cloud storage and computing
- Technical support staff
- Other: _____

C3.4 What technical infrastructure requirements do you NEED for the training in addition?:

please select

- High-speed internet connectivity

- Advanced computer/hardware systems
- Specialized software licenses
- Mobile device compatibility
- Cloud storage and computing
- Technical support staff
- Other: _____

C3.5 Do you have sufficient budget and consistent funding for providing training?

please select

- Yes
- No
- Partially

D. TEMPORAL AND GEOGRAPHIC ASPECTS

D1. Which time scales are most relevant for your training needs?

please select

- Immediate response (hours to days)
- Short-term management (days to weeks)
- Medium-term recovery (weeks to months)
- Long-term prevention and planning (months to years)
- All time scales equally important

D2. Geographic and Environmental Context

What environmental settings are most relevant?

please select

- Open sea
- Coastal waters and nearshore areas
- Ports and harbors
- Estuaries and river mouths
- Other specific environments: _____

D3. What is the time commitment your organisation is likely to spend for their employees to participate in trainings per year/per person?

- 3-5 hours
- 1-3 days
- 1-3 weeks

- 1-2 months

D4. What do you consider to be the ideal frequency for repeating training in your organization, taking into account the type, subject and scope of the training?

please select

- Annual refresher courses to maintain knowledge and skills.
- Bi-annual or quarterly drills (tabletop and field-based) for operational readiness.
- Every 2–3 years: Full-scale exercises involving multiple stakeholders and agencies.
- Onboarding sessions for new staff and responders.
- Ad-hoc training after major incidents or regulatory/technological updates.
- Continuous e-learning modules available for self-paced refreshment.
- Other _____

E SUCCESS METRICS

E1. How will you measure the success of the training program?

please select

- Pre/post-training assessments
- Practical skill demonstrations
- Response time improvements
- Coordination effectiveness
- Participant feedback scores
- Long-term performance tracking
- Cost-benefit analysis
- Other: _____

E2. Select the most appropriate types of the assessment of the trainees for your organisation

please select

- Skills-based testing
- Written examinations
- Practical competency assessments
- Peer evaluations
- Self-assessment tools
- Certification programs

E3. How will you measure the potential to implementation of training program in your region:

- Increased confidence in applying new knowledge
- Developed capability to implement the training approaches
- Level of introduction to monitoring system in your country
- Other

E4. Which of the following indicators do you consider most effective for assessing the impact of a training program?

(You may select more than one)

- Stakeholder confidence** – the extent to which trainees and professionals feel more confident and capable of applying new knowledge and methods in real-world marine pollution preparedness and monitoring.
- Institutional integration** – the degree to which training modules and operational guidelines are formally adopted and embedded in institutional frameworks, curricula, and capacity-building strategies.
- Relevance** – whether the training content is seen by participants and trainers as useful, context-appropriate, and applicable to both scientific practice and societal needs.
- Collaboration** – the ability of training to foster cooperation among scientific, institutional, and community stakeholders, leading to joint initiatives, shared monitoring, or collaborative outputs.
- Guidelines adoption and improvement** – the extent to which operational guidelines are applied, regularly updated, and aligned with evolving needs and institutional practices.
- Community empowerment and awareness** – how well training enables local actors and community groups to participate actively, contribute knowledge, and take ownership of preparedness and response activities.
- Regional networking and cross-border collaboration** – the contribution of training to building regional stakeholder networks, strengthening cross-country partnerships, and supporting coordinated responses beyond national boundaries.

E5. What is probability that the training modules or operational guidelines will be introduced to at your institution

- Less than 20%
- 20-50 %
- 50-70%
- 70-100 %

E6. How likely you would start joint initiative on implementation of new trainings with other partners in the regions?

- Very unlikely
- Unlikely
- It is possible
- Likely

- Very likely

E7. What type of initiative is it likely that your organisation introduces?

- Awareness campaigns about marine pollution
- Community workshop about the training programs
- Community workshop about the operational planning
- Revision of operational guidelines developed in the "Response" project
- Revision of training programs developed in the "Response" project

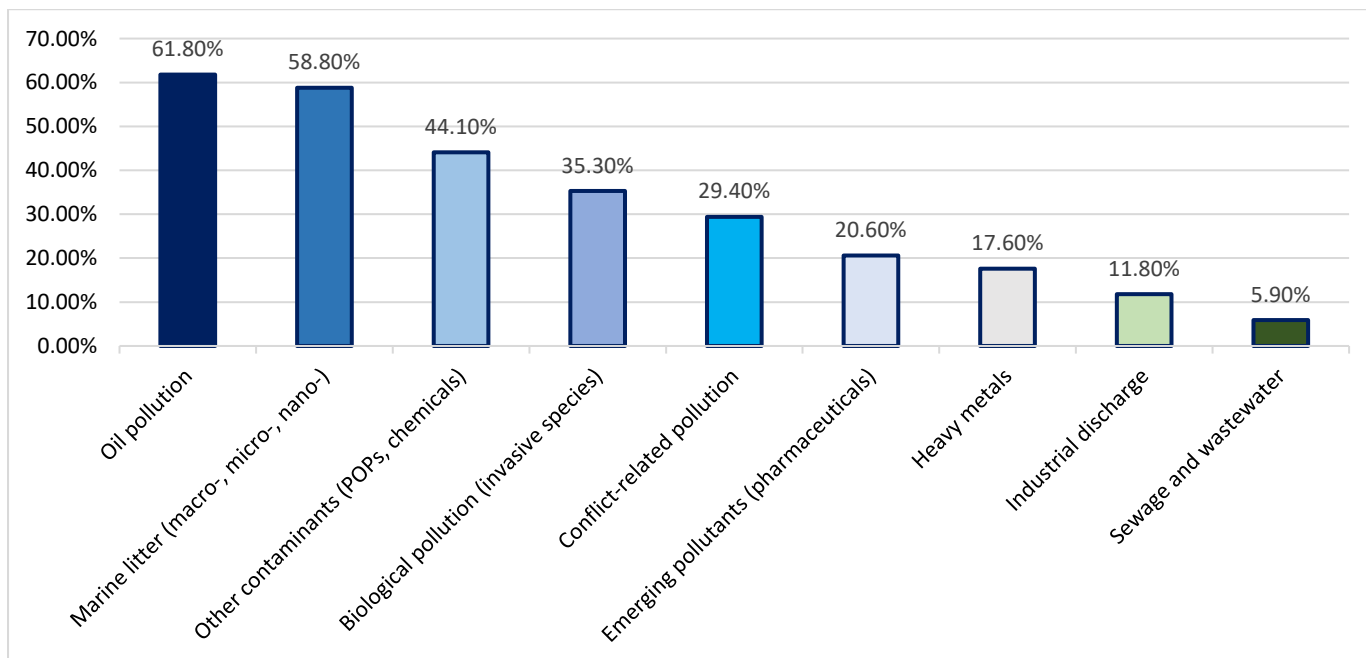
E8. How likely your organisation will become a member of the regional network for cross-border exchanges or collaborations?

- Very unlikely
- Unlikely
- It is possible
- Likely
- Very likely

Annex 3. Analysis of questionnaire results for each section

Section A – Marine Pollution Topics of Interest

Pollution Type	Votes	% of total votes (97)	% of participants (34)
Oil pollution	21	21.6%	61.8%
Marine litter (macro-, micro-, nano-)	20	20.6%	58.8%
Other contaminants (POPs, chemicals)	15	15.5%	44.1%
Biological pollution (invasive species)	12	12.4%	35.3%
Conflict-related pollution	10	10.3%	29.4%
Emerging pollutants (pharmaceuticals)	7	7.2%	20.6%
Heavy metals	6	6.2%	17.6%
Industrial discharge	4	4.1%	11.8%
Sewage and wastewater	2	2.1%	5.9%

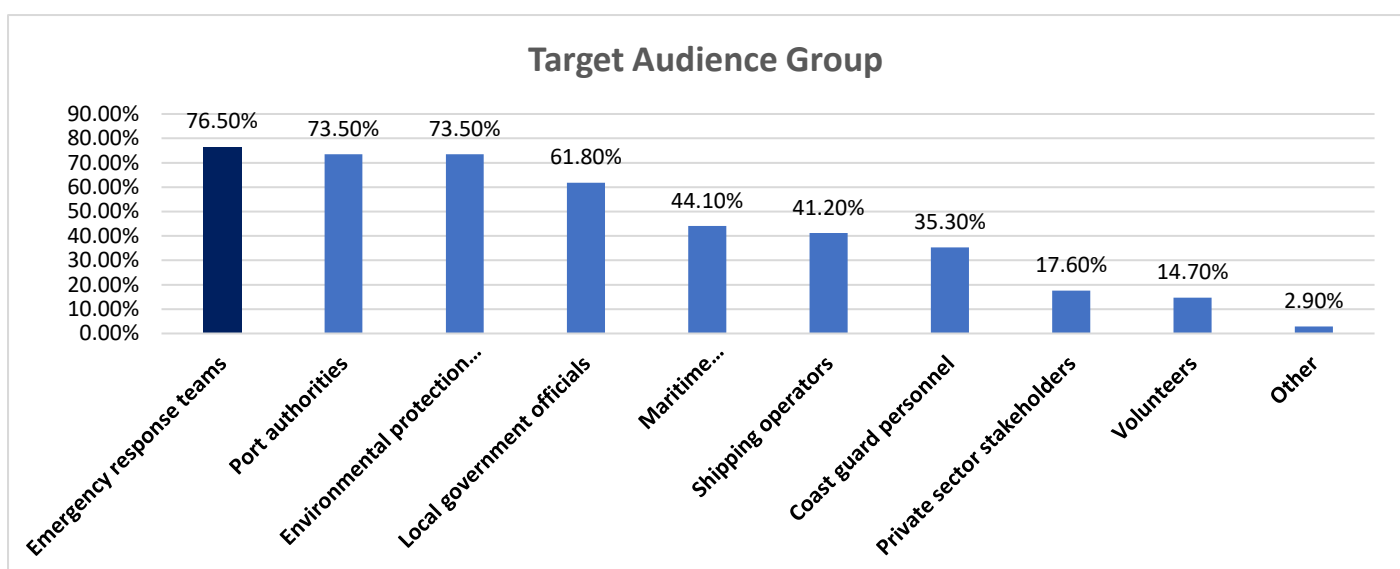


Section B1 – Main Target Audiences

Target Audience Group	Votes	% of total votes (150)	% of participants (34)
Emergency response teams	26	17.3%	76.5%
Port authorities	25	16.7%	73.5%

D3.1 OPERATION PLANS ON MARINE POLLUTION TRAINING ON A NATIONAL LEVEL

Environmental protection agencies	25	16.7%	73.5%
Local government officials	21	14.0%	61.8%
Maritime students/academics	15	10.0%	44.1%
Shipping operators	14	9.3%	41.2%
Coast guard personnel	12	8.0%	35.3%
Private sector stakeholders	6	4.0%	17.6%
Volunteers	5	3.3%	14.7%
Other	1	0.7%	2.9%



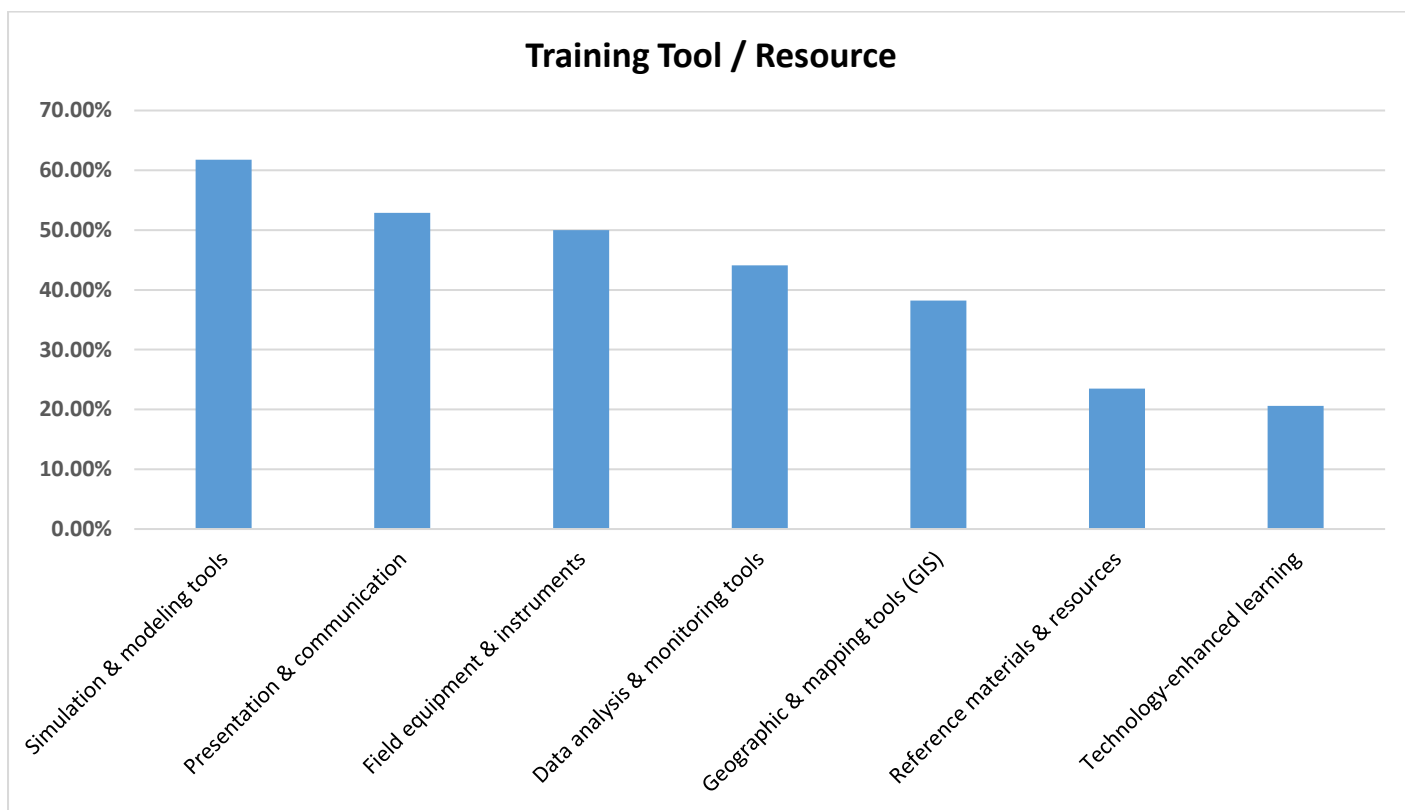
Section C – Training Tools and Resources

Training Tool / Resource	Votes	% of total votes (99)	% of participants (34)
Simulation & modeling tools	21	21.2%	61.8%
Presentation & communication	18	18.2%	52.9%
Field equipment & instruments	17	17.2%	50.0%
Data analysis & monitoring tools	15	15.2%	44.1%
Geographic & mapping tools (GIS)	13	13.1%	38.2%
Reference materials & resources	8	8.1%	23.5%

D3.1 OPERATION PLANS ON MARINE POLLUTION TRAINING ON A NATIONAL LEVEL



Technology-enhanced learning	7	7.1%	20.6%
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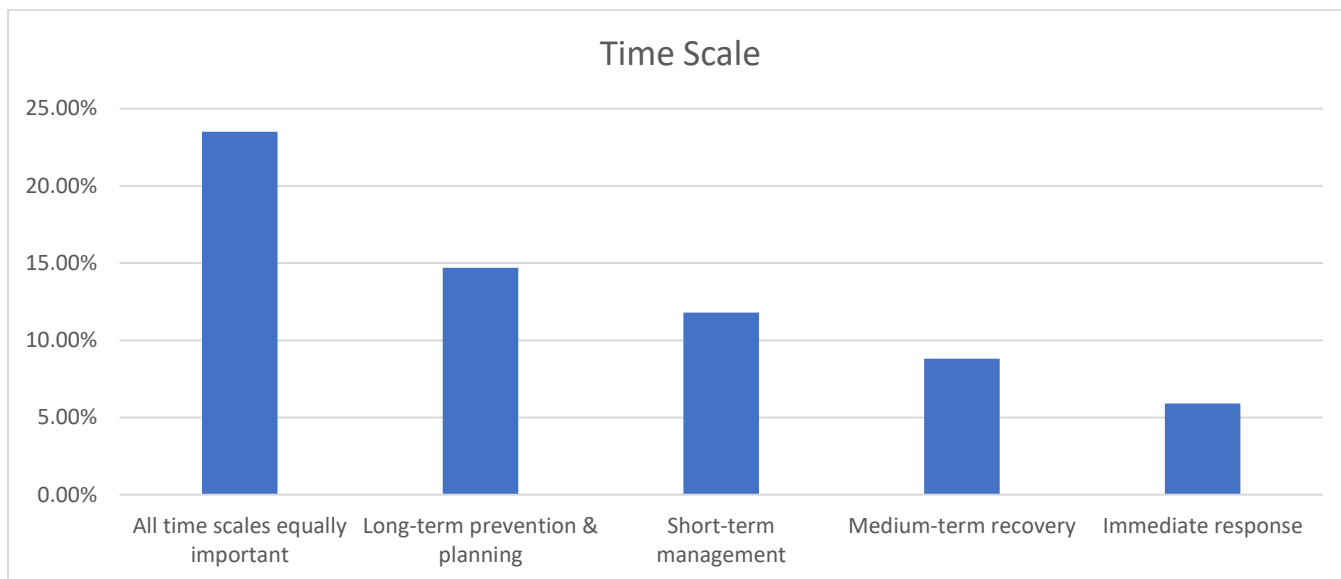


Section D – Temporal Aspects

D1. Relevant Time Scales

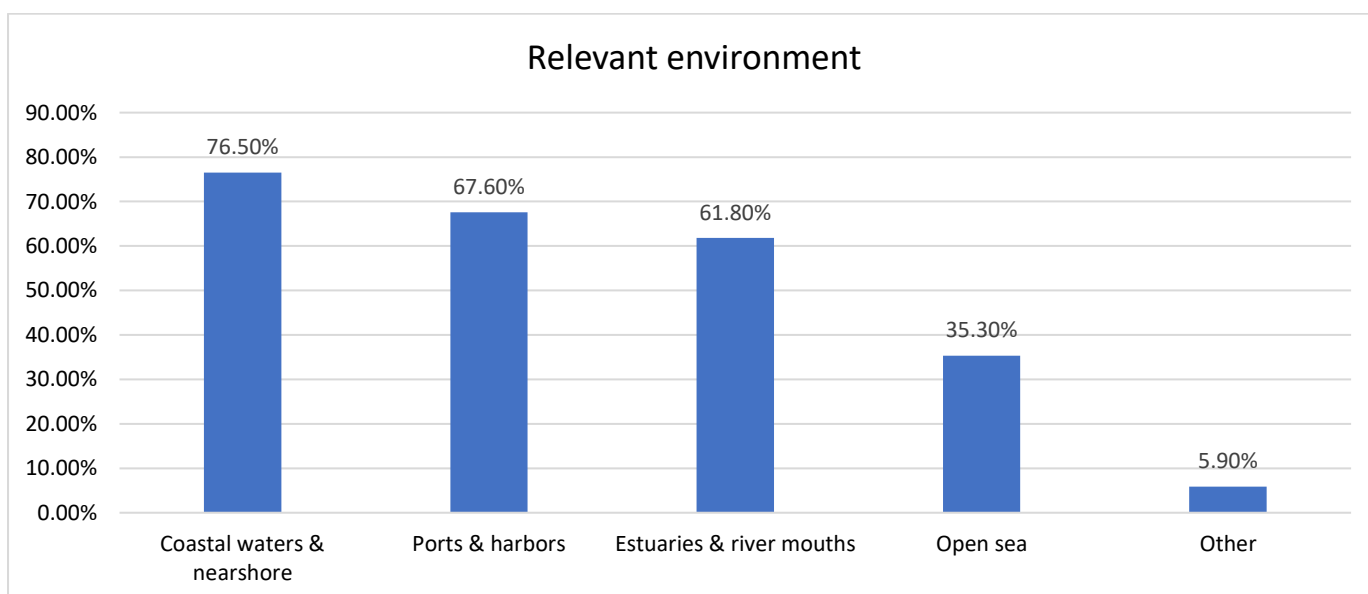
Time Scale	Votes	% of total votes (22)	% of participants (34)
All time scales equally important	8	36.4%	23.5%
Long-term prevention & planning	5	22.7%	14.7%
Short-term management	4	18.2%	11.8%
Medium-term recovery	3	13.6%	8.8%
Immediate response	2	9.1%	5.9%

D3.1 OPERATION PLANS ON MARINE POLLUTION TRAINING ON A NATIONAL LEVEL



D2. Relevant Environments

Environment	Votes	% of total votes (84)	% of participants (34)
Coastal waters & nearshore	26	31.0%	76.5%
Ports & harbors	23	27.4%	67.6%
Estuaries & river mouths	21	25.0%	61.8%
Open sea	12	14.3%	35.3%
Other	2	2.4%	5.9%

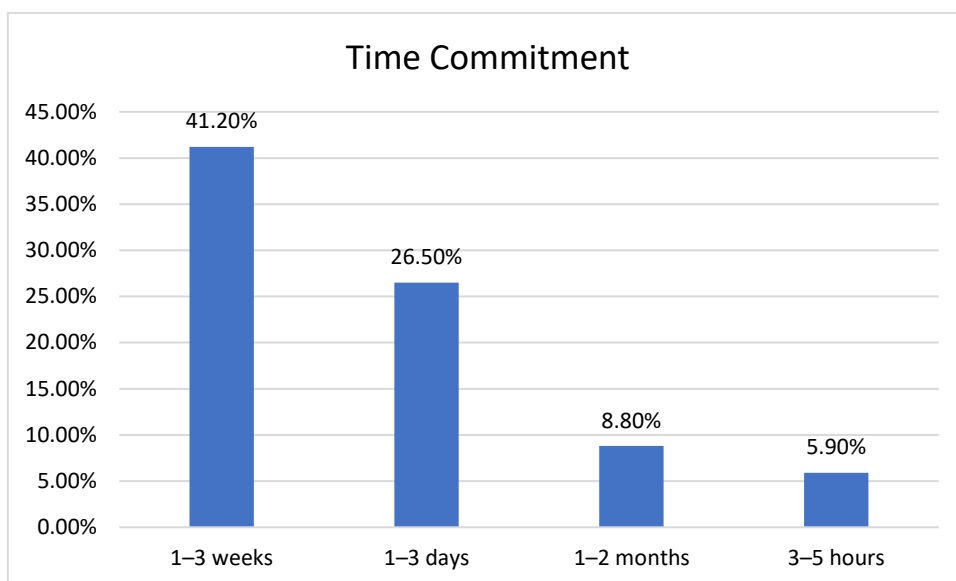


D3. Time Commitment per Year

Time Commitment	Votes	% of total votes (28)	% of participants (34)
1-3 weeks	14	50.0%	41.2%
1-3 days	9	32.1%	26.5%

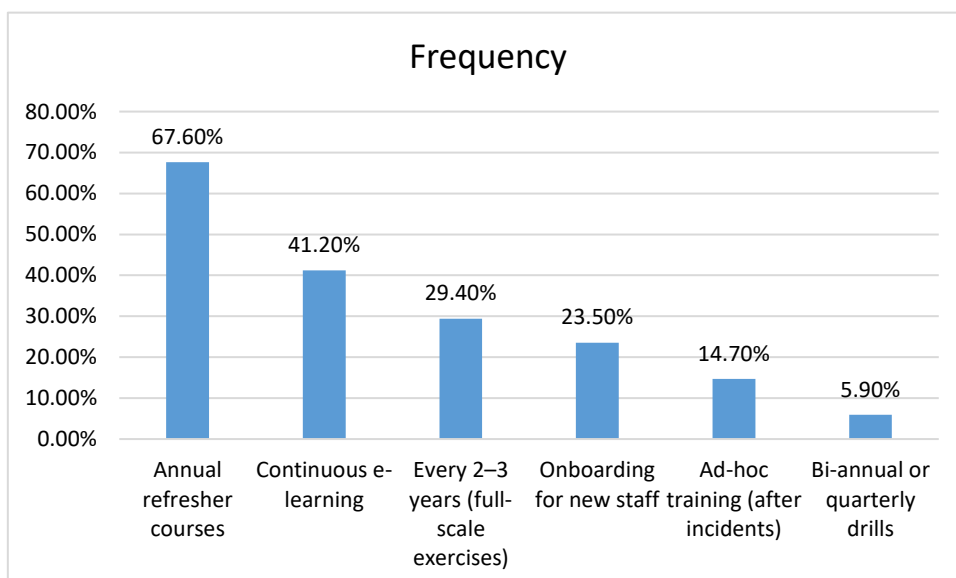
D3.1 OPERATION PLANS ON MARINE POLLUTION TRAINING ON A NATIONAL LEVEL

1-2 months	3	10.7%	8.8%
3-5 hours	2	7.1%	5.9%



D4. Ideal Training Frequency

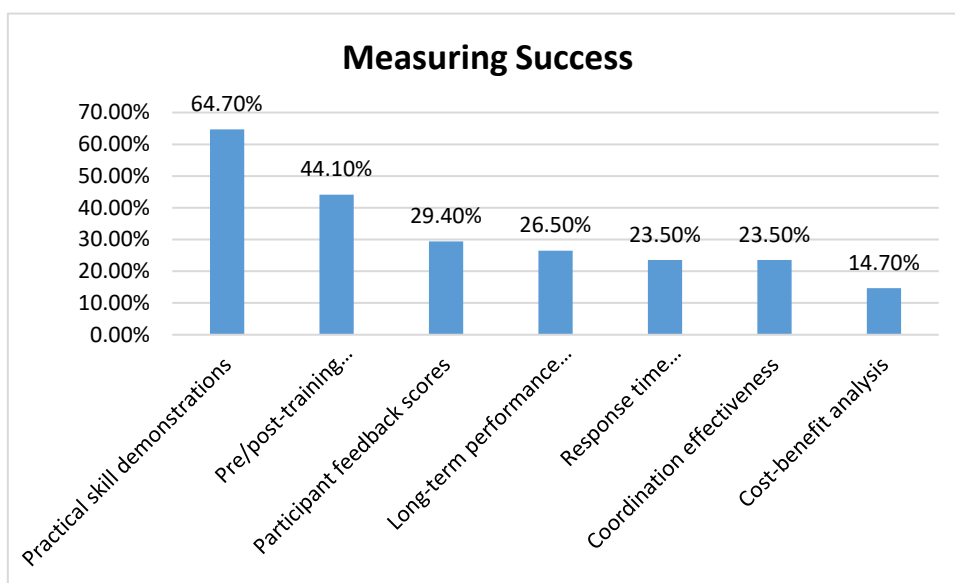
Frequency	Votes	% of total votes (62)	% of participants (34)
Annual refresher courses	23	37.1%	67.6%
Continuous e-learning	14	22.6%	41.2%
Every 2-3 years (full-scale exercises)	10	16.1%	29.4%
Onboarding for new staff	8	12.9%	23.5%
Ad-hoc training (after incidents)	5	8.1%	14.7%
Bi-annual or quarterly drills	2	3.2%	5.9%



Section E – Success Metrics

E1. Measuring Success

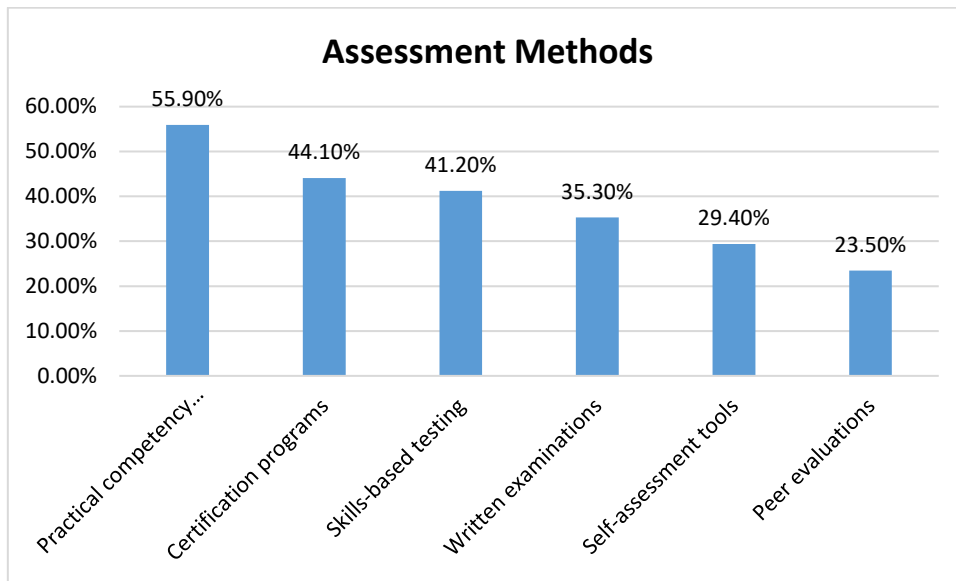
Method	Votes	% of total votes (64)	% of participants (34)
Practical skill demonstrations	22	34.4%	64.7%
Pre/post-training assessments	15	23.4%	44.1%
Participant feedback scores	10	15.6%	29.4%
Long-term performance tracking	9	14.1%	26.5%
Response time improvements	8	12.5%	23.5%
Coordination effectiveness	8	12.5%	23.5%
Cost-benefit analysis	5	7.8%	14.7%



E2. Assessment Methods

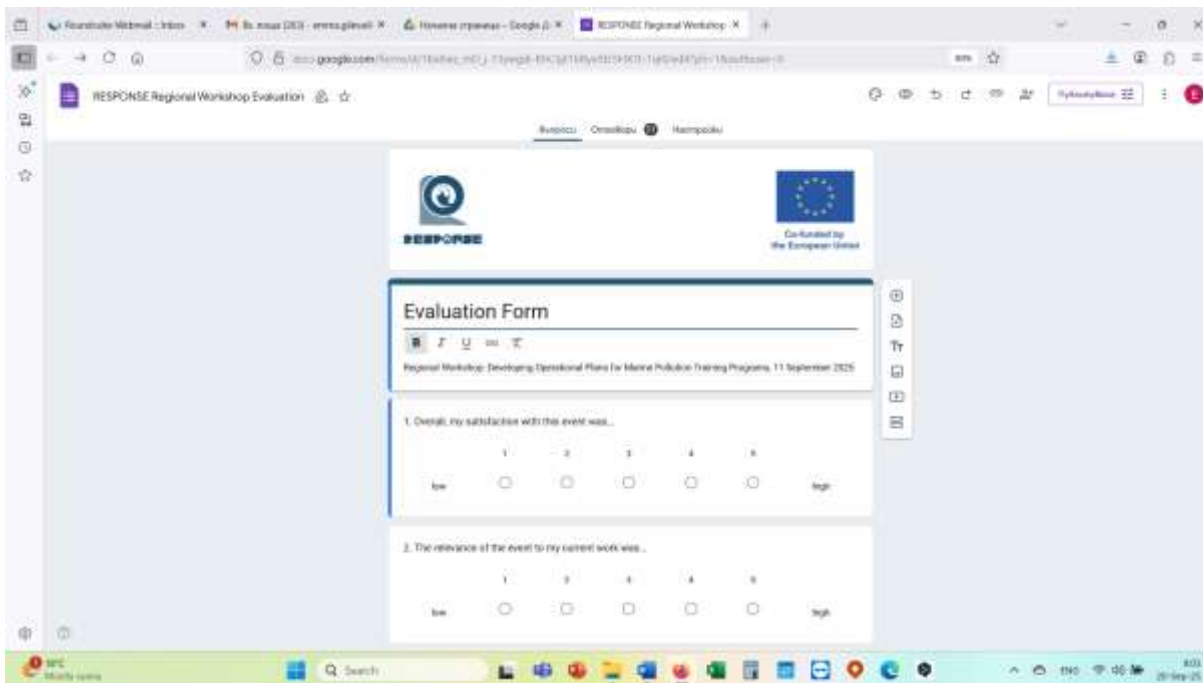
Method	Votes	% of total votes (58)	% of participants (34)
Practical competency assessments	19	32.8%	55.9%
Certification programs	15	25.9%	44.1%
Skills-based testing	14	24.1%	41.2%
Written examinations	12	20.7%	35.3%
Self-assessment tools	10	17.2%	29.4%
Peer evaluations	8	13.8%	23.5%

D3.1 OPERATION PLANS ON MARINE POLLUTION TRAINING ON A NATIONAL LEVEL



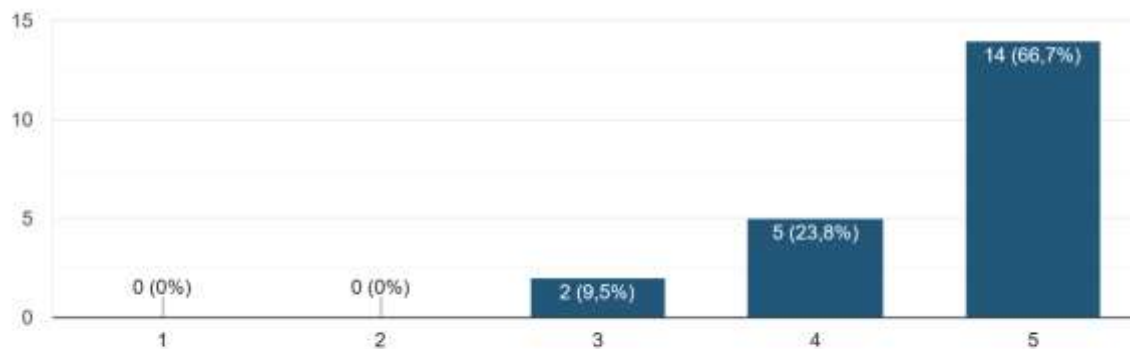
Annex 4. Feedback Evaluation

Regional Workshop Developing Operational Plans for Marine Pollution Training Programs, 11 September 2025



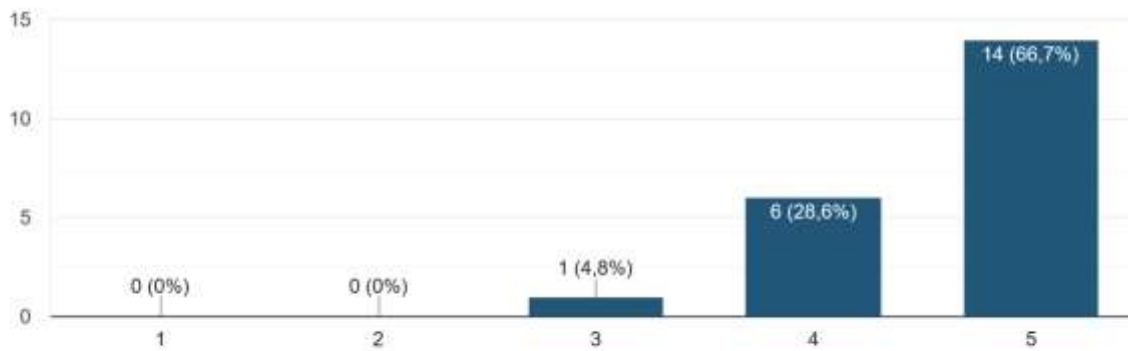
1. Overall, my satisfaction with this event was...

21 отговора



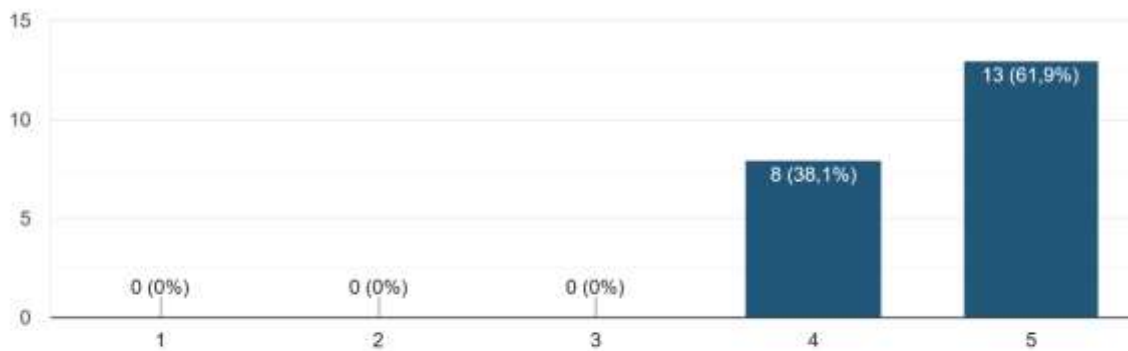
2. The relevance of the event to my current work was...

21 отговора



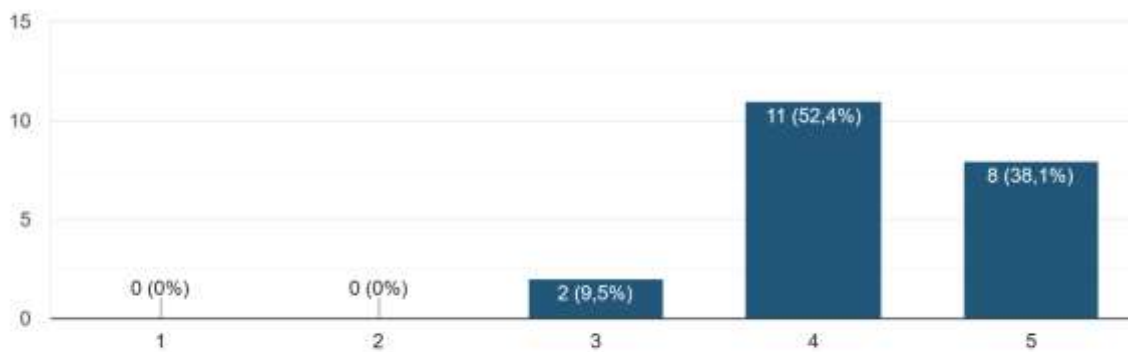
3. The usefulness of the exchange on marine pollution training programs is...

21 отговора



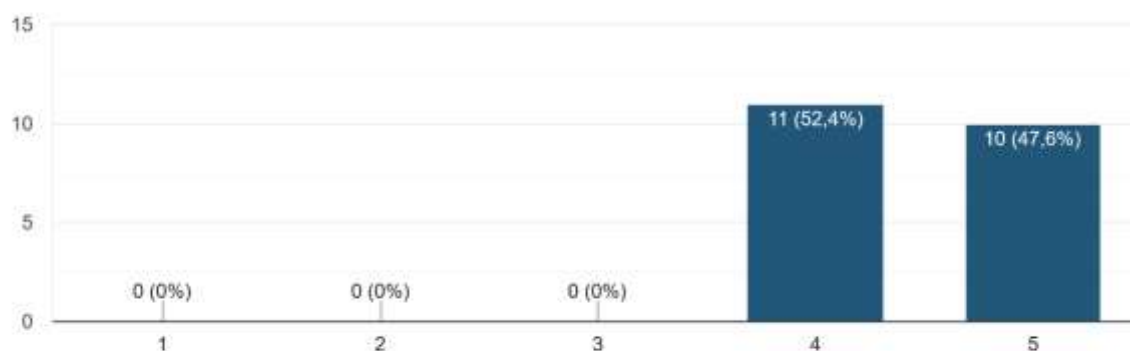
4. The benefit of meeting colleagues and exchanging information in an international context was...

21 отговора



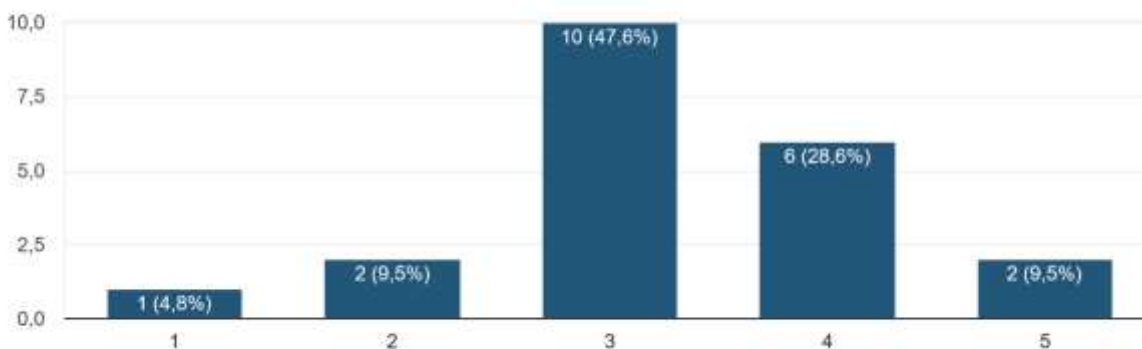
5. Overall, the quality of discussions and dialogue for this event was...

21 отговора



6. The duration of the event was...

21 отговора



7. What did you like about the workshop?

14 responses:

- The way participants' opinion were taken via the questionnaire.
- motivation
- Modern tools, dialogue
- Real time interaction, immediate response and results.
- Smooth running and high participation during entire meeting
- A little short.
- The topic, the presenters and the response method
- the project goals, the way the workshop was moderated
- Good to learn new tools and participate in the survey
- Thanks
- Willingness of a scientists to share knowledge and skills to raise awareness among citizens
- Interactive approach, demonstration of digital tools and training curricula.
- lots of information and a well-structured conference

8. What could be improved in following events?

12 responses:

- N/A
- the communication/participation of the participants
- Partners involvement
- A little bit shorter training and to be just half a day, before or after lunch. That gives more flexibility and opportunity to take a part in all activities
- More discussions, face-to-face mode
- Less overlapping answers to the questions
- such questionnaires could be simply set for on-line filling-in, or sent by e-mail to the interested stakeholders for filling-in - this gives the opportunity to the responders to answer the questions in a time, convenient to them, considering more precisely their answers and arguments
- Would be good to receive a reminder about the event and the link/code to mentimeter somewhere in the chat.
- Efforts
- Examples of good practices from Black Sea countries.
- None

Annex 5. Agenda of the Regional Online Workshop

RESPONSE project Regional Workshop: The development of operation plans on marine pollution training programs

AGENDA 11 - September 2025

10:00 Bulgaria, Greece, Romania, Ukraine Time, 11:00 Georgia Time ONLINE,

Zoom link <https://us06web.zoom.us/j/82332194385>

10:00 – 10:05 Official Opening

10:05 - 10:15 RESPONSE project in a nutshell – Dr. Anastasia I. Tsavdaridou, Aristotle University of Thessaloniki, Greece

10:15 - 10:30 Scope and objective of the workshop – Emma Gileva, Black Sea NGO Network, Bulgaria

10:30 - 10:40 Steps to follow in the workshop – Mamuka Gvilava, Greens Movement of Georgia / Friends of the Earth – Georgia

10:40 - 10:50 Introduction of the Participants

10:50 - 11:00 Short break

11:00 - 11:30 Interactive Section A: Key Training Objectives

11:30 – 12:00 Interactive Section B: Target Audiences

12:00 - 12:30 Interactive Section C: Training Activities and Tools

12:30 – 12:40 Short break

12:40 – 13:10 Interactive Section D: Temporal Aspects

13:10 – 13:40 Interactive Section E: Success Metrics

13:40 – 14:00 Open discussion