



23-24 NOVEMBER

2021

ARAB STATES REGIONAL HIGH-LEVEL WORKSHOP
**NATURE-BASED SOLUTIONS
FOR HYDRO-METEOROLOGICAL
HAZARDS**

ORGANISED BY

UNESCO Regional Bureau for Sciences in the Arab States

UNESCO Section on Earth Sciences and Geohazards Risk Reduction OPERANDUM project



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1. EXECUTIVE SUMMARY

This report presents the proceedings and outcomes of the Arab States Regional High-Level Workshop on “Nature-based Solutions for hydro-meteorological hazards” hosted online by the United Nations Educational, Scientific and Cultural Organization’s (UNESCO) Regional Bureau for Sciences in the Arab States and UNESCO’s Section on Earth Sciences and Geo-Hazards Risk Reduction on November 23-24, 2021. The meeting was co-organized with experts from University of Bologna (Italy) and other consortium members of the EU-funded OPERANDUM project.

25 representatives from 7 Arab countries participated in the meeting, including government officials, senior scientists and academics, decision-makers, private sector and consultants. In addition, several OPERANDUM partners joined the workshop, including coordinators of the case studies in Italy and Greece.

The overall purpose of the meeting was to bring together experts in disaster risk reduction and environmental management to exchange views, experiences and lessons regarding Nature-based Solutions (NbS) for disaster risk reduction across the Arab Region, and to identify needs and priorities for promoting NbS uptake. During the workshop, participants presented national and regional experiences, focusing on the ongoing efforts, gaps and challenges related to NbS for disaster risk management. OPERANDUM partners shared experiences, challenges and solutions as part of the NbS co-creation process at Open-Air Laboratories in the Mediterranean region, and engaged in discussions with regional experts on the potential of upscaling concepts and solutions.

The outcomes of the discussions will be used to develop a shared roadmap for the increased and sustainable uptake of NbS for DRR in the Arab Region. The roadmap will enhance and provide practical guidance for the implementation of NbS through a series of recommendations tailored to the regional context.



2. INTRODUCTION

This report presents the proceedings and outcomes of the Arab States Regional High-Level Workshop on “**Nature-based Solutions for hydro-meteorological hazards**” organized online by the UNESCO Regional Field Office for Arab States, UNESCO’s HQ Section on Earth Sciences and Geo-Hazards Risk Reduction and experts from University of Bologna on November 23-24, 2021.

2.1. Background

Nature-based Solutions (NbS) are solutions to societal challenges that are inspired and supported by nature. NbS include “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (IUCN).

UNESCO’s Regional Field Office for Arab States together with UNESCO’s Section on Earth Sciences and Geo-Hazards Risk Reduction and experts from University of Bologna invited representatives of the Arab States to participate in two half-day high-level online workshops aiming to explore the policy context and the potential to enhance regional uptake of NbS in rural landscapes.

The workshop aims to provide the platform for a regional dialogue on perspectives and challenges related to existing policies and implementation practices of ecosystem-based approaches for disaster risk reduction. Outcomes of the discussions will support the development of an NbS roadmap on both a regional and an international level.

The workshop was organized together with OPERANDUM, a large-scale demonstrator project funded by the European Union that aims to reduce hydro-meteorological risks in rural territories through co-designed, co-developed, co-deployed, tested and demonstrated innovative NbS. The project provides science-based evidence for the usability of NbS and best practices for their design based on participatory processes.

The OPERANDUM project foresees a multilevel stakeholder engagement from the local community to the international level to leverage the widest possible acceptance of NbS. In addition, OPERANDUM establishes a framework for the strengthening of NbS-based policies according to local legislation and promotes technology and innovation in NbS.

More information: www.operandum-project.eu/.

2.2. Objectives

- Highlight the connection between environmental, disaster risk reduction and climate change adaptation policies in the Arab region.

- Shed the light on rural areas and natural habitats in building resilience and present the multiple benefits provided by ecosystems for disaster risk reduction (DRR), including climate change adaptation and mitigation.
- Share knowledge and skills on co-creating NbS for DRR in rural areas.
- Introduce initiatives and case studies from other regions, including OPERANDUM innovative approaches.
- Discuss the potential for coordinated uptake of NbS at regional level.

2.3. Meeting Modality

The workshop was organized online in an interactive format over a period of two half days. The first day consisted of a keynote presentation on the global context of NbS followed by national presentations and discussions on key challenges related to NbS implementation. Day 2 focused on the formulation of recommendations to promote NbS uptake in the Arab Region based on the previous sessions, as well as on challenges and good practices shared by OPERANDUM partners, and a roundtable discussion of regional high-level experts.

A total of 25 representatives from the Arab Region participated in the meeting. The following countries were represented: Algeria, Libya, Egypt, Lebanon, Syria, Yemen and Oman. A list of participants is presented in Annex II. The participants included representatives of governmental institutions, research and academic institutions, and regional and non-profit organizations, and the private's sector. The workshop provided insights from high-level experts, decision-makers and consultants with experience in disaster risk reduction, climate change adaptation/mitigation, nature-based solutions, and environmental and agricultural management.

3. WORKSHOP OVERVIEW

3.1 General set-up

The workshop consisted of four main sessions, including a keynote lecture, national presentations of the NbS context, presentations of the OPERANDUM project and roundtable discussions on the regional NbS context and way forward. The workshop was moderated by UNESCO. A detailed Agenda is provided in Annex I.

Day 1. November 23, 2021

- Introduction and welcome
- Keynote presentation: Nature-based Solutions for reducing risks - global perspective
- National presentations of the NbS context, actions and challenges (two sessions)
- Interactive survey
- Conclusions of Day 1

Day 2. November 24, 2021

- Opening and recap of Day 1
- OPERANDUM presentation: NbS for DRR in rural areas
- Roundtable on regional NbS context
- Brainstorming for NbS Roadmap in Arab States
- Conclusions and summary of recommendations

3.2. DAY 1 Sessions (November 23, 2021)

The meeting was opened with two welcome speeches:

Ms Elsa Sattout, *Programme Specialist at UNESCO Cairo Office*, moderated the event and welcomed participants on behalf of Mr Bisher Imam, **OIC of UNESCO Cairo Office**, to the workshop organized together with UNESCO's section on Earth Sciences and geohazards risk reduction and the EU-funded OPERANDUM project.

Mr Soichiro Yasukawa, *Programme Specialist at UNESCO HQ Section on Earth Sciences and Geohazards Risk Reduction*, welcomed participants to the workshop and set the stage for the cross-regional exchange of nature-based practices to address environmental risks in the Arab Region and to pave the way for sustainable uptake of NbS at the regional level.

Ms Irina Pavlova, *Project Officer at UNESCO HQ Section on Earth Sciences and Geohazards Risk Reduction*, outlined the workshop structure and arrangements for Day 1.

Keynote presentation

Mr Fabrice Renaud, *School of Interdisciplinary Studies at University of Glasgow, IUCN Commission on Ecosystem Management (CEM)*, gave a presentation on the global overview of Nature-based Solutions for reducing risks, including the NbS concept and evidence base, examples of applications across the world, and links to global and EU policy frameworks.

National presentations on NbS context, actions and challenges

During two dedicated sessions, country representatives presented challenges linked to environmental, social, technical and institutional factors, with a view on existing policy instruments and gaps, and future perspectives. The following countries were presented:

Algeria:

Algeria is exposed to a range of hydrometeorological hazards such as desertification, sandstorms, heat and flash floods. The country deploys various policy mechanisms and strategies to combat the impacts of natural hazards and climate change including in

collaboration with international organizations. Several policy instruments exist to address these issues and are deployed through national and international institutions, including national land use and development plans integrating DRR, the National Climate Plan, and disaster management and reduction plans. Examples of NbS include the Green Dam initiative as a tool to combat desertification, as well as various other reforestation efforts to combat erosion and landslides (notably following recent forest fire outbreaks in the northern regions), the Oasis system, a model that combines environmental, socio-economic and cultural dimensions and allows populations to settle in conditions of extreme aridity, and National Flood Control Plans. NbS are considered important and useful in reducing environmental risks if they are planned within an organized framework and with the engagement of citizens and local stakeholders. NbS must be integrated into local and national policies, scientific research must be enhanced to promote skills development, trust building, and public acceptance.

Egypt:

Egypt is exposed to various natural hazards, including coastal and flash floods, earthquakes, rockslides, extreme heat, sand storms, and water scarcity. Most of Egypt's population and infrastructure are concentrated in the Nile Delta and along the Mediterranean coast, making the country vulnerable to the impacts of sea level rise, particularly inundation and saltwater intrusion. Over the past 20 years, natural hazards have caused severe economic damages and loss of life. Egypt has adopted several DRM-related policy instruments, including, Egypt's Vision 2030 and Egypt's National Strategy for Adaptation to Climate Change and Disaster Risk Reduction. Egypt supports the achievement of the targets outlined in the Paris Agreement by prioritizing the sustainability of agricultural, environmental, water, energy and managed land sectors, e.g., by setting mitigation targets and outlining adaptation strategies for the most vulnerable sectors. NbS have been implemented in the past based on traditional knowledge and practices. Examples include the restoration of lakes in the Nile delta, the construction of artificial wetlands, and (mangrove) reforestation to improve the management of coastal areas. To promote the coordinated implementation of NbS, it is considered necessary to integrate traditional and indigenous knowledge streams into sustainable techniques adapted to local community needs. It is furthermore considered beneficial to promote innovation, and public-private partnerships to finance DRR solutions, including NbS, as well as financial assessments associated with specific strategic objectives. To drive these developments, it is crucial to foster public awareness of NbS and improve relevant skills of citizens and practitioners to design, implement and monitor solutions.

Syria:

Many critical ecosystems in Syria are at risk due to desertification, forest fragmentation, soil erosion and degradation, and depletion of water resources. Syria is also vulnerable to a number of natural hazards, including coastal and river flooding, earthquakes, extreme temperatures, and drought. Desertification threatens great parts of Syria, particularly the area between the Badia region in the west and the agricultural lands in the east. While Syria has adopted various policy instruments to manage disaster risks, such as the Guide to Green Architecture, the National Environment Act (2012) and the National Drought Management Strategy (2009), the country suffers from a history of political and social

instability, resulting in mismanagement of natural resources, a lack of inclusive scientific processes, and restricted access to scientific information. Despite these systemic issues, Syria cooperates with international organisations and NGOs to implement projects on the ground. A first step towards promoting NbS for disaster management requires tackling some of these major issues by creating public platforms and making information available to all groups of society, as well as developing skills, mobilizing resources, and integrating NBS into existing DRM policies.

Yemen:

Yemen's ecosystems are subject to high pressures resulting from anthropogenic activities and natural phenomena. Throughout history, the country has been subjected to various natural hazards, including earthquakes, landslides, tsunamis (geophysical), and extreme temperatures, drought, desertification, floods, storm surges, dust storms and cyclones (hydro-meteorological). National priorities in line with the Sendai Framework for Disaster Risk Reduction include increasing the resilience of the ecosystem to climate change, preserving the sustainability of natural resources and supporting local communities. These priority areas are supported by policies on NbS and disaster risk management, such as DRM planning and mitigation measures, Disaster risk mapping and risk-reducing programs (food security, water, and urban development), Intended Nationally Determined Contributions (INDC) (2015), and National Adaptation Programme of Action (NAPA) (2009). Effective solutions for addressing environmental risks through NbS must adopt a comprehensive approach involving stakeholders at all levels of society by raising awareness and sharing experiences, information and scientific advances.

Oman

Oman is exposed to various natural hazards including earthquakes, sand storms, floods and cyclones, many of which are exacerbated through the impacts of climate change. Moreover, many critical ecosystems are under pressures resulting from anthropogenic activities such as overgrazing, loss of habitat, overuse of marine resources, damage to coastal and marine ecosystems and introduction of invasive species. Oman has adopted several DRM Policy Instruments and Tools including Multi-Hazard Early Warning Systems, and national climate adaptation plans, such as the National Strategy for Adaptation and Mitigation of Climate Change 2020-2040 (2019), and Intended Nationally Determined Contributions (INDC). NbS-related initiatives and projects are predominantly associated with tsunami risk management plans, as well as rural development plans with a focus on agricultural practices. NbS are considered critical in reducing climate-related risks highlighting the need for promoting their uptake and mainstreaming through knowledge sharing, capacity building, and regional cooperation.

Interactive survey

An interactive poll was launched to gather feedback to a series of questions pertaining to the relevance and challenges of NbS as perceived by national and regional representatives. The survey results showed that NbS are considered important and useful for addressing major societal challenges, in particular i) climate adaptation, resilience and mitigation, ii) water management, iii) coastal resilience and marine protection, and iv) economic development and employment. The main challenges for implementing NbS were grouped into three categories: political, institutional and technical.

The policy-related challenges were mainly associated with weak or poor risk governance, particularly related to rural areas, and existing gaps between the science and policy-making sector. Institutional challenges included insufficient financial resources, a lack of integrated approaches to risk assessment, and a lack of NbS standards and guidelines. Major technical challenges were related to the lack of experience, skills, and capacity of practitioners, a lack of integrated databases on disaster loss and climate hazards, insufficient access to information, and a lack of monitoring and evidence of NbS efficacy.

Based on the survey results and main talking points that emerged from the discussions several conclusions were drawn:

- NbS implementation requires the active engagement of stakeholders at all levels of society from experts to the local community
- NbS uptake should be promoted at government level through policy and regulatory frameworks
- There is a need for increased investments in the science of NbS
- Open access to information remains a major challenge to promoting awareness
- Coordinated uptake at the regional level requires mapping of NbS data and existing examples, including traditional practices

3.3. DAY 2 Sessions (November 24, 2021)

The second day of the workshop opened with a recap of Day 1 outcomes and an outline of the structure and targets of the upcoming sessions.

Ms Elsa Sattout welcomed all participants, including representatives from the Arab Region and experts of the OPERANDUM project.

Mr Soichiro Yasukawa summarized the main discussion items and outcomes of Day 1 and focused on common/overarching challenges and barriers related to NbS implementation in the focus region.

NbS for disaster risk reduction in rural areas: OPERANDUM project

OPERANDUM partners presented innovative methodologies of NbS co-creation to manage hydro-meteorological risks in rural territories, including related challenges and best practices based on case studies at Open-Air Laboratories (OAL). Subsequent discussions addressed the opportunities for adapting and upscaling the solutions to the Arab region.

The presentations highlighted the concept of NbS and introduced the OPERANDUM project. The major challenges and lessons learnt within the project are related to evidence-building, developing effective protocols for NbS co-design and co-development and increasing public acceptance of NbS. The Geospatial Information Knowledge Platform (GeoIKP), a digital hub for NBS, was introduced as a tool to improve knowledge and awareness of NbS by disseminating project results, as well as relevant data acquired through case studies across the world.

The Open-Air Laboratory Greece was introduced as an OPERANDUM case study where periodic flooding and droughts pose serious risks to the communities and the environment. Natural Water Retention Measures were deployed to increase water storage and infiltration and reduce water flow at the pilot sites. Examples include restoration and stabilization of the riverbanks, re-meandering the river course, cleaning the bed material load and widening of the riverbed. The NBS are currently being replicated across the regions.

The Open-Air Laboratory Italy extending across three different sites is exposed to flooding, storm surges, coastal erosion and salt intrusions. The NbS deployed on-site include planting of herbaceous perennial deep rooting plants to prevent river bank failures induced by surface erosion and thereby mitigate flood risk, and implementation of an artificial dune to protect the coast from storm surges and flooding. Advanced monitoring techniques are deployed on site and lab experiments are conducted to determine specific plant species that can effectively function as resilient natural barriers to salt intrusions to protect agricultural lands, reinforce the riverbank and preserve inland water quality.

The discussions highlighted the regional interest in the presented concepts and solutions deployed at the Open-Air-Laboratories, as well as the coupling of traditional concepts with innovative elements. The GeoIKP was welcomed as a multi-stakeholder knowledge platform for NbS with case studies from around the world. National and regional representatives were encouraged to contribute to the platform by joining the global community and enhancing the existing knowledge base.

Roundtable on regional Nature-based Solutions context

The expert roundtable provided a regional overview of the role of NbS for rural resilience, addressing rural challenges to sustainably managing climate-related risks while considering the regional policy context and discussing existing NbS initiatives. Based on the previous discussions, first recommendations were formulated for overcoming these challenges.

The panelists agreed that NbS can play a vital role in providing long-term stability, resilience and well-being of societies. Major regional challenges for the implementation of NbS include insufficient financial resources, limited awareness of NbS, limited databases on disaster loss and climate hazards, and marginalization of rural areas. Emphasis was placed on the need to invest in DRR to minimize vulnerability and move from reactive to proactive risk reduction. To reach these objectives at regional level, the following recommendations were shared: 1) To assess how NbS can be comprehensively introduced in the region by identifying similarities and differences between countries; 2) to perform integrated risk assessments to quantify the economic and social impacts, 3) to build a scientific evidence base that supports NbS for DRR. Accordingly, an enabling environment for NbS must include the exchange of knowledge, information and best practices, and regional cooperation.

Several examples of NbS were presented within the region, such as constructed mountain lakes in Egypt to protect low-lying regions from flooding, as well as other water-related NbS including programs promoted by the EU-delegation to Egypt related to water and wastewater, desalination, rural development and sustainable water consumption, as well as awareness-raising on water scarcity. In the context of urban environments, the Lebanon Green Building Council supports the transition to a green and sustainable built environment to mitigate the negative effect of climate change by lowering emissions from buildings and providing a certification system for buildings that adopt environmental parameters. In the regional context, the Global Climate Change Alliance was mentioned as a useful platform for dialogue and exchange of experience between the EU and developing countries on climate policy and on practical approaches to integrate climate change into development policies.

4. WORKSHOP OUTCOMES

In this section, the main outcomes of the workshop are presented which specifically address technical, institutional and policy-related gaps and needs relevant to NbS for DRR as well as corresponding recommendations.

INSTITUTIONAL (organizational & structural levels)

Resource management and implementation: existence of specialized institutions, fully functional and able to implement activities, effective allocation of responsibilities, standardized procedures, cross-sectoral collaboration

TECHNICAL (individual & organizational levels)

Professional expertise and capacities associated with NbS: knowledge & technical skills, availability of equipment, access to data and information, public awareness and acceptance

POLICY (governance & coordination levels)

Ability to take effective decisions and actions on NbS: integration of NbS in national policies, coherency of policy and regulatory frameworks, coordinated and effective governance structures, political and public awareness and discourse on NbS.

Gaps / needs

Technical

- Lack of access to NbS-related data and information;
- Lack of documentation of traditional knowledge and management of ecosystems and climate change impacts at national and regional level / Need for country-specific inventory and mapping of NbS including traditional knowledge streams and practices;
- Need for capacity building activities (in particular for NbS design, implementation and monitoring) and knowledge exchange at local level;
- Need to establish regional standards and practical guidelines for upscaling NbS that can be adapted to local contexts;
- Need to assess financial and other forms of national resources, and legislative and administrative measures required to adopt and carry out NbS-related actions;
- Need to mobilize financial resources and incentivize research projects focused on NbS and related technologies (e.g., for monitoring and data collection).

Institutional

- Need to foster cooperation between national and regional organisations;
- Lack of regional (peer-learning) platforms to exchange scientific practices;
- Need to foster data exchange at regional level;
- Lack of standard NbS protocols, implementations are based on local knowledge;
- Lack of public awareness and communication campaigns;
- Lack of cooperation and resource mobilization mechanisms.

Policy

- Need for national and sub-national strategies on adaptation and mitigation of climate change with a focus on NbS across the Arab region;
- Need to integrate NbS elements in policy, research and innovation strategies;
- Need for regional adaptation and application of global NbS standards through contextualization to the regional, national and local context;
- Need for inclusive multi-stakeholder consultations, with a focus on local and traditional knowledge;
- Traditional knowledge shall be contextualized taking into account the evolution of the land use and management /rural areas throughout time since their use;
- Encouragement of private-public partnerships related to NbS implementation;

Recommendations

Technical

Identification of common challenges and needs across Arab countries to determine how NbS can be contextualised and effectively implemented as a whole throughout the region;

Integrated assessment of vulnerability and improved understanding of economic and

social impacts on key sectors;
 Commissioning of targeted research projects geared at solving NbS-related issues and challenges;
 Creation of regional database on NbS-related data (we will create a new database or capitalise on the database initiated under the Atlas platform (sure we should build on this if you accept);
 Capacity building activities on NbS design, implementation and monitoring;
 Creation of technical guidelines on co-creation of NbS for DRR.

Institutional

Facilitate the establishment of mechanisms and networks to systematically collect, access and share knowledge and information between all stakeholders; including cross-cutting data related to NbS;
 Enhance data exchange and expertise from local to international level through cooperation, knowledge sharing and bilateral agreements between countries.

Policy

Organize regional and national workshops and focused group periodical meetings and discussions to provide further recommendations to inform regional, national and local strategies for disaster risk reduction and resilience that include NbS elements;
 Develop policy briefings and advocacy activities addressed to policy makers and leaders of organizations aiming to increase their knowledge and awareness of NbS for DRR;
 Foster NbS support by the Arab Coordination Mechanism on DRR at the League of Arab States.

5. CONCLUSIONS & SUMMARY

A total of 40 participants from 9 countries (7 Arab countries & 2 Mediterranean/EU countries) attended the Arab States Regional High-Level Workshop on “Nature-based Solutions for hydro-meteorological hazards”, including governmental representatives/ policy-makers, senior scientists, decision-makers, and consultants.

The overall purpose of this meeting was to bring together experts on disaster risk reduction and environmental management to exchange views, experiences and lessons learnt on NbS for disaster risk reduction in the Arab region. The workshop created a space for sharing knowledge and good practices across the Arab region on NbS and other disaster resilience initiatives. Presented projects and initiatives highlighted the deployment of ecosystem-based interventions at the community level to reduce climate risks and promote nature

conservation and management. Finally, the workshops addressed the potential for promoting the coordinated adoption of NbS for disaster risk reduction in the focus region. In this context, possible barriers and facilitators for wider implementation of solutions were examined.

Country representatives from Algeria, Egypt, Lebanon, Oman, Syria and Yemen had a chance to share their perspectives and experiences on NbS for disaster risk reduction. The participants recognized common gaps and barriers to NbS implementation across countries.

Partners of the OPERANDUM (Open-air laboratories for nature-based solutions to manage hydro-meteorological risks) provided key insights into challenges and lessons learned based on case studies in rural areas of the Mediterranean region. The discussions highlighted the value of cross-regional sharing of approaches and examples, and addressed the potential for replicating and adapting the presented concepts and paradigms.

The roundtable and subsequent brainstorming session on the regional NbS context were very useful for identifying technical, institutional and policy gaps and needs, and for formulating recommendations for promoting the uptake of NbS for disaster and climate risk management in the Arab region.

The outcomes of the workshops will be used to produce a shared roadmap for the increased and sustainable uptake of NbS for disaster risk reduction in the Arab Region. The roadmap will enhance and provide practical guidance for NbS implementation through a series of recommendations tailored to the regional context. The results may also be used to derive overarching recommendations on fostering NbS at the global level. The follow up with Member States shall be ensured through the agenda of the Arab Coordination Mechanism for DRR affiliated to the League of Arab States in Cairo.

6. ANNEXES

Annex I: Workshop Agenda

Arab States Regional High-level Workshop:
Nature-based Solutions for hydro-meteorological hazards
online on 23-24 November 2021

Day 1: November 23 2021, 11.00-14.00 EGY

11.00 - 11.20	<u>Opening</u>
11.20 - 11.45	<u>Nature-based solutions for reducing risks</u> Keynote presentation on the current status of Nature-Based solutions for reducing risks, global perspective.
11.45 - 12.45	<u>National perspective on NBS for rural resilience (part 1)</u> Participants from Arab States will share insights from a national perspective.
12.45 - 13.00	<i>Comfort break</i>
13.00 - 13.45	<u>National perspective on NBS for rural resilience (part 2)</u> Participants from Arab States will share insights from a national perspective.
13.45 - 13.55	<u>Interactive poll for all participants</u> NBS Challenges and opportunities in Arab States
13.55 - 14.00	<u>Conclusion of Day 1</u>

Day 2: November 24 2021, 11.00-14.00 EGY

11.00 - 11.10	<u>Opening</u>
11.10 - 11.40	<u>Nature-based Solutions for DRR in rural areas</u> Lecture on the concept of NBS in the context of disaster risk reduction, climate change mitigation/adaptation, and sustainable development. OPERANDUM solutions and best practices will be presented as NBS case studies to manage hydro-meteorological risks in European rural areas.
11.40 - 12.40	<u>Roundtable on regional context</u> Moderated roundtable aims to provide an overview of the Arab Region focusing on the role of NBS and Eco-DRR for rural resilience, addressing rural challenges particularly climate-driven risks, at the regional policy context.
12.40 - 13.10	<i>Comfort break</i>
13.10 - 13.50	<u>Road map for NBS large scale initiatives in Arab States</u> Open discussion on opportunities and gaps related to the uptake of NBS. Conclusions will be used to develop policy recommendations to encourage the uptake of NBS in rural areas.
13.50 - 14.00	<u>Closing</u>

Annex II: List of Participants

Country	Name	Position, Affiliation
Algeria	Kadid Yamina	Professor at the National Higher School of Agronomy, Algiers
Algeria	Abderrahmane Boukadoum	Ministry of environment and Director of climate change
Algeria	Makhlouf Boutiba	Professor at the University Of Science And Technology Houari Boumediene, Algiers
Algeria	Merzouk Ouyed	Professor at the University Of Science And Technology Houari Boumediene, Algiers
Algeria	Lakhdari Fattoum	Ex Director of the Center for Scientific and Technical Research on Arid Regions (CRSTRA)
Egypt	Kamel Mostafa El-Sayed	Head of the Middle East Region Office, Water Resources Expert, Arab Organization for Agricultural Development (AOAD)
Egypt	Manal Fawzy	Professor, chair of Environmental Sciences at University of Alexandria
Egypt	Mohammad Tala't Al-Hinaoi	Director General of the Nature Conservation Sector Environmental Affairs Agency
Egypt	Antar M. Sameh	Director General of the Department of Geology and Excavations - Apparatus Environmental Affairs
Egypt	Elsa Sattout	UNESCO Regional Bureau for Sciences in the Arab States.
Egypt	Mohamed Abdel - Maksud Abdel-Fattah	Head of Crisis and Disaster Sector Information and Decision Support Center - Cabinet
France	Lesly Barriga	UNESCO HQ section on Earth Sciences and Geohazards Risk Reduction
France	Sérgio Esperancinha	UNESCO HQ section on Earth Sciences and Geohazards Risk Reduction
France	Soichiro Yasukawa	UNESCO HQ section on Earth Sciences and Geohazards Risk Reduction
France	Zahra Amirzada	UNESCO HQ section on Earth Sciences and Geohazards Risk Reduction

France	Irina Pavlova	UNESCO HQ section on Earth Sciences and Geohazards Risk Reduction
France	Valentina Di Fazio	UNESCO HQ section on Earth Sciences and Geohazards Risk Reduction
Greece	Depy Panga	Project Specialist, Innovative Technologies Centre, OPERANDUM partner (Open Air Lab Greece)
Greece	Michael Loupis	Professor at National and Kapodistrian University of Athens, Director of Innovative Technologies Centre, OPERANDUM partner (Open Air Lab Greece)
Germany	Paul Bowyer	Senior scientist at the German Climate Service Center (GERICS), OPERANDUM partner
Italy	Laura Sandra Leo	Senior assistant professor, University of Bologna, OPERANDUM partners
Finland	Katriina Soini	Principal Research Scientist and Research Manager at Natural Resources Institute, Finland, OPERANDUM partner
Italy	Paolo Ruggieri	University of Bologna, OPERANDUM partner (Open-Air Lab Italy)
Italy	Silvana Di Sabatino	Professor in the Department of Physics and Astronomy, University of Bologna, Operandum coordinator
Italy	Teresa Carlone	Research Fellow at University of Bologna, Operandum partner
Italy	Beatrice Pulvirenti	Associate Professor at University of Bologna, OPERANDUM partner (Open-Air Lab Italy)
League of Arab States	Shahira Wahbi	Ambassador, Chief of Natural Resources Sustainability & Partnership, League of Arab States
Lebanon	Pierre Dammous	President of Green Building Council Lebanon
Oman	Mahmood Alkhayari	Meteorological services
Oman	Suad Almanji	Research Assistant at Sultan Qaboos University
Syria	Ahmad Adris	Department of Geological and Hydrological Research and Studies General Authority for Remote Sensing application for climate change

Syria	Giath Doun	Head of the Department of Environmental Research and Studies and Regional Planning, General Authority for Remote Sensing
Syria	Manhal Alzoubi	General Commission for Scientific Agricultural Research (GCSAR), natural resources research administration
Syria	Mohammed Abou Hammoud	Director of the Natural Disaster Mitigation Fund and Head of the Early Warning Unit in the Syrian Ministry of Agriculture
UK	Fabrice Renaud	Professor, School of Interdisciplinary Studies at University of Glasgow, IUCN Commission on Ecosystem Management (CEM)
UK	Prashant Kumar	Professor and Chair in Air Quality and Health, founding Director of the Global Centre for Clean Air Research (GCARE), at the University of Surrey, UK
Spain	Albert Sorolla	Technical Director at Naturalea
Yemen	Nader Bausnaid	Head of Marine Environment Section Geological Survey & Minerals Resources

Annex III: List of Presentations

- **Fabrice Renaud**, “Nature-Based Solutions for reducing risks: Global perspective.”
- **Nader Badr Basuaid**, “Nature-Based Solutions for Climate Hazards.”
- **Silvana Di Sabatino**, “OPERANDUM project”
- **Beatrice Pulvirenti**, “OAL Italy, Panaro river. Flood risk due to riverbank erosion.”
- **Kamel Mustafa Al-Sayed**, “Building resilience and resilience in vulnerable rural communities. For frequent floods - St. Catherine District.”
- **Michael Loupis**, “OAL Greece: Nature Based Solutions Implemented.”
- **Shahira Wahbi**, “NbS for DRR in the Arab Region.”

*Presentations can be downloaded via following the link:

https://drive.google.com/drive/folders/1mAqD0Dqjo76KXBY7lqDitIRm7WdS_Zp3

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