

EMUNI Conference & Ripam 10.5.

Ancient Hydrologic Systems and Water Management in the Mediterranean Region

Rencontres Internationales du Patrimoine Architectural Méditerranéen – 16th EMUNI Conference

10 – 11 October 2024 • Piran, Slovenia



Schedule of EVENTS along the RIPAM 10.5 and EMUNI 16th Annual Conference

Thursday 10 October 2024

EMUNI Conference Opening and high-level panel discussion "*Higher education as a bridge between the two shores of the Mediterranean*"

Venue: *Tartini Theatre (Piran)*

8.00- 9.00 Registration

9.00-10.00 **Conference Opening and welcome notes**

Rado Bohinc, President, EMUNI University

Christian Poletti, Deputy Mayor of Piran Municipality

Jernej Širok, Acting Director-General at the Higher Education Directorate, Ministry of higher education, science and innovation

Melita Gabrič, State Secretary, Ministry of Foreign and European Affairs

Nasser Kamel, Secretary General, Union for the Mediterranean

10.00-11.30 **Panel discussion "*Higher Education as a Bridge between the Two Shores of the Mediterranean*"**

Moderator: **Mouin Hamze**, Chairperson, EMUNI Management board

Rado Bohinc, President, EMUNI University

Nasser Kamel, Secretary General, Union for the Mediterranean

Maria Cristina Pedicchio, Vice Chairperson, EMUNI Management Board

Luigia Melillo, Rector, Pegaso International

Alaa Abdelwahed Abdelbary, Vice President, Arab Academy for Science, Technology and Maritime Transport

Michele Civiero, President, Across the Mediterranean Sea

11.30-12.30 **International Scientific Conference Kick-off with keynote speakers**

Mounir Ghribi, Director, International Cooperation and Research Promotion, National Institute of Oceanography and Applied Geophysics OGS & Jean Monnet Centre of Excellence on Sustainable Blue Economy, EMUNI University

Daniela Pittaluga, Professor, RIPAM & University of Genova

Octavi Quintana Trias, PRIMA

Khaled Abu Zeid, Senior Regional Water Resources Director Centre for Environment & Development for the Arab Region & Europe (CEDARE)

Alessandro Leto, Director, Water Academy

12.30-13.30 Lunch

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16th EMUNI-RIPAM 10.5 International Scientific Conference "Past Hydrologic Systems and Water Management in the Mediterranean"

Venue: **EMUNI Premises**

- 13.30-16.00** Parallel sessions 1-2, papers' presentation
- 16.00-16.15** Parallel sessions 1-2, Q&A
- 16.15-16.45** Coffee break & Poster presentation
- 16.45-19.15** Parallel sessions 3-4, papers' presentation
- 19.15-19.30** Parallel sessions 3-4, Q&A

Gala dinner with graduation ceremony (all participants)

Venue: **Hotel Art Tartini (Piran)**

- 20.00-20.30** Cocktail Reception
- 20.30-22.30** Conference Dinner

Friday 11 October 2024

16th EMUNI-RIPAM 10.5 International Scientific Conference "Past Hydrologic Systems and Water Management in the Mediterranean"

Venue: **EMUNI Premises**

- 8.30-10.15** Parallel sessions 5-6, papers' presentation
- 10.15-10.30** Parallel sessions 5-6, Q&A
- 10.30-10.50** Daniela Paliaga Book's presentation
- 10.50-11.50** Wrap up and conclusions
- 12.00-14.00** Guided tour of Piran
- 14.00-15.00** Lunch (Venue: *Pirat Restaurant*)
- 15.30-19.00** Visit of the Sečovlje Salt Pans

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Session 1 - Water and its social implications

Thursday, 13:30 – 16:15 – Room A

Zoom link <https://us06web.zoom.us/j/81961843783?pwd=oQFD CivYN4Db aPrnQbsxwwCYNDnrXq.1>

Today, as in the past, water is a precious resource. Especially in some regions of the Mediterranean area, water supply has been, and still is, problematic. In this section, we look at the different contexts, especially trying to grasp the social aspects that may be behind the search, collection, storage and use of water. Sometimes these aspects, especially for the past, can be deduced from written sources and archive research therefore becomes essential. For the contemporary context, looking at water as a resource can in some cases be a source of conflict; also in this case, thinking about what happened in the past can, in some cases, help in resolving disputes. This part of the research, therefore, can be seen as a further, and perhaps different, aspect of sustainability

Chairman: *Mounir Ghribi, Director, International Cooperation and Research Promotion, National Institute of Oceanography and Applied Geophysics OGS & Jean Monnet Centre of Excellence on Sustainable Blue Economy, EMUNI University*

- S1-01 **Jurisdictional conflicts as a form of sharing-practice: water and conduits between Cerdanya and Sierra Nevada (XVIII-XXI c.)**
 Anna Maria STAGNO, Ylenia PACIOTTI, Giulia BIZZARRI, José María MARTÍN CIVANTOS, José ABELLAN SANTISTEBAN
University of Genova, Italy - University of Granada, Spain
- S1-02 **Alger moderne. La question des réservoirs publics et des citernes domestiques**
 Dalila KAMECHE
EPAU Alger, Algérie
- S1-03 **Evolving Water Management Practices in Oasis Regions with Balancing Tradition and Modernity for Socio-Economic Stability: Narrative Review**
 B. HAMDAOUI, I. RAFIQ, F.Z. SAHLI, J. KARKOURI, S. EZZEROUALI
Ibn Tofail University, Morocco - University of Dhofar, Sultanate of Oman
- S1-04 **Traditional irrigation system in Milan as a resource for a sustainable city**
 Paola BRANDUINI
Politecnico of Milan, Italy
- S1-05 **Ancestral innovation and sustainability: Exploring traditional irrigation and storage systems in Morocco**
 Abdelmalek GOUMIH, Imane EL ADNANI, Ibna Fatima EZZAHRA, Hassan LAOUANE, Mounsif IBNOUSSINA
Cadi Ayyad University, Marrakech, Morocco - Mohammed VI Museum for the Civilization of Water in Morocco, Marrakech, Morocco
- S1-06 **Techniques et systèmes d'irrigation et de partage de l'eau au Sahara Algérien**
 Abdelmadjid BOUDJELLA
Université de Tlemcen, Algérie

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- S1-07 **The Khettaras System, the social management of water and the scarcity of water resources in the era of climatic variability in the Moroccan Oases**
Abdelaziz EL-ARABY
Ibn Tofail University -Kénitra, Morocco
- S1-08 **Triora et le système d'eau de la République de Gênes (1261 - 1797)**
Silvana VERNAZZA, Caterina GARDELLA
Fondazione Massone, Recco, Italie - Soprintendenza Archeologia Belle Arti e Paesaggio per la città metropolitana di Genova e la provincia di La Spezia, Italie
- S1-09 **Water Diplomacy in the South Mediterranean: Mitigating Conflicts and Promoting Cooperation**
M.R. SULEIMAN, M. SLIGHOUA, A. HADDAD
Euromed University of Fes, UEMF, Morocco
- S1-10 **Accès informel à l'AEP dans les quartiers à habitat spontané. Cas de Berbessa en Algérie**
F. BOUSTIL, M. BENABBAS, M. POULOT
Université de Blida 1 Algérie - Université Biskra Algérie - Université Paris Nanterre, France

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Session 2 - From the sacred vision of water to a careful management of this resource

Thursday, 13:30 – 16:15 – Room B

Zoom link <https://us06web.zoom.us/j/87636004990?pwd=4m1Yl39XbCLgbhzlUiZGaXJRAERKyV.1>

In some geographical contexts and in some civilizations, water has taken on a sacred value: sacred because it carries values, sacred because it is heavily used in religious functions. These aspects are transversal to the two shores of the Mediterranean. Knowing these aspects and preserving them allows for the preservation of cultural identities that have strongly characterized the Mediterranean environment in the past. In this case, it makes sense to talk about the transmission of a specific intangible heritage linked to the material heritage that is still visible in some territorial contexts, at least as ruins. From this intangible heritage linked to the sacredness of water, another intangible heritage comes, at least for the past and for some civilizations: the habit to a careful management of this resource. Where water is a scarce resource, where it is difficult to intercept, transport and conserve it, these good practices of careful management were well rooted in the operational practices of the populations. Sometimes in the current context, these aspects have been partly lost or are being lost; reasoning on these aspects therefore becomes essential especially for the new generations.

Chairman: *Khaled AbuZeid, Regional Water Director, Centre for Environment & Development for the Arab Region & Europe (CEDARE)*

S2-01 **Knowledge and enhancement of heritage at risk: ice-houses in mountain territories**

Manuela MATTONE, Silvia RESCIC, Giulia FORMATO, Fabio FRATINI
Politecnico di Torino, Italy - CNR-ISPC, Sesto Fiorentino, Italy

S2-02 **Sacred Wells: pagan survivals and Christian worship**

Alessandra PANICCO
Politecnico di Torino, Italy

S2-03 **La Foggara, un savoir-faire et un ordre socio-spatial**

Samia MOUKHENACHI, Lyna Nour Djahene BRAHAMIA
Badji Mokhtar Annaba University, Algeria

S2-04 **From open courtyards to enclosed sanctuaries: Techniques for the assessment of ablution spaces in Marrakech's historic mosques**

Khaoula ADMOU, Hajar MOUSSANNIF, Mounsi IBNOUSSINA
Cadi Ayyad University, Marrakech, Morocco

S2-05 **“Venice is in the water, but has no water”. From historical knowledge an example of sustainability and resilience**

Francesco TROVÒ, Caterina REDANA
University Iuav of Venice, Italy

S2-06 **Gestion de l'eau et adaptation au contexte territorial : les structures du passé en Ligurie lues avec les outils de l' «archéologie des ressources naturelles» (Italie)**

Daniela PITTALUGA, Stefania PANTAROTTO
Università di Genova, Italy

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- S2-07 **Gestion durable des ressources en eau souterraines: le cas du système des ghouts dans la région du Souf**
Salima KADRI*, Assia KADRI
Université Constantine 3 Salah Boubnider, Constantine, Algérie.
- S2-08 **The forms of water in the history and transformation of the Sicilian Landscape**
Alberto ANELLO, Antonino MARGAGLIOTTA
Università degli Studi di Bari "Aldo Moro", Italy - Università degli Studi di Palermo, Italy
- S2-09 **Hydrogeological and hydrochemical study of the Foggaras of the Touat region (Fenoughil), South West Algeria**
Mohamed Fouzi BEKKOUCH, Djelloul ZENATI, Ibrahim LASGAA
University Centre Ali Kafi Tindouf, Algérie

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Poster Session

Thursday, 16:15 – 16:45

This session shows applications of ancient water systems, and case studies

Chairman: *Giovanni Pancani, Dipartimenti di Architettura, Università di Firenze, RIPAM Permanent Committee*

- PS-01 **Harnessing Traditional Khettara Systems for Modern Thermal Regulation in Marrakech**
Khadija BABA, Wiçal CHEIKHI, Najma LAAROUSSI, Younes EL RHAFARI, Abderrahman NOUNAH
Mohammed V University, Rabat/Salé, Morocco
- PS-02 **Khettara: Traditional System of Transporting Groundwater in Morocco**
Younes EL RHAFARI, Abderrahman NOUNAH, Badr-saoud ALAOUI
Mohammed V University, Rabat/Salé, Morocco - Miftah Essaad Foundation for the Intangible Capital of Morocco
- PS-03 **Water management and land defense: Roman artificial lake emissaries**
Laura PALMIERI DEL BEATO, Carla BARTOLOMUCCI, Simonetta CIRANNA
University of L'Aquila, Italy
- PS-04 **Sustaining Heritage: Geospatial analysis and enhancement of Morocco's Khettaras**
Sana SIMOU, Khadija BABA, Abderrahmane NOUNAH
Mohammed V University Rabat, Morocco
- PS-05 **Assessing the Impact of Climate Change on the Water-Energy-Food Nexus in Southeastern Morocco: A Case Study of the Wadi Guir Watershed**
Badre MESSAOUDI, Lahcen KABIRI, Ismail AÏT LAHSSAINE, Mohammed EL HAFYANI, Badre ESSAFRAOUI, Abdelhakim KADIRI, Jean ALBERGEL
Moulay Ismail University, Errachidia, Morocco - University of Applied Sciences, Karlsruhe, Germany - Ibn Zohr University, Agadir, Morocco - University of Montpellier, Montpellier, France.

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Session 3 - Water and the landscape: changes and possibilities for conservation

Thursday, 16:45 – 19:30 – Room A

Zoom link <https://us06web.zoom.us/j/81961843783?pwd=oQFD CivYN4Db aPrnQbsxwwCYNDnrXq.1>

In this session, the aspects of water in terms of collection, transport and storage are analyzed, and how these works at different levels can affect the landscape. In fact, all these works have created major changes in the landscapes in the past, whether desert, agricultural or urban. In some cases, the most recent transformations have completely erased these traces, in other contexts, however, even if partially, they are still visible. In this last case, making people understand that ruins, apparently with little meaning, are instead the expression of a culture of water gone by, can be of great help also for their conservation and as a warning for the future. In this session, we wanted to deal with both interventions in non-urbanized areas (desert or rural) and those in urban areas. In some historical contexts, water has not only been associated with essential needs but also as a creative and artistic element of architecture within gardens and nymphaeums. In these cases, understanding and preserving these aspects is a fundamental part of the conservation of a certain type of architecture.

Chairman: Fabio Fratini, RIPAM Permanent Committee

- S3-01 **Water supply and management of Lake Garda lemon houses: A close connection between irrigation and the landscape**
S. BARONTINI, B. BETTONI, A. BULGARI, M. PELI, A. CAZZANI
Università degli Studi di Brescia, Brescia, Italy - Politecnico di Milano, Milano, Italy
- S3-02 **Water, mills and channels: between rural archaeology and history. Case studies from western Ligurian Apennines (17th- 21st c.)**
Anna Maria STAGNO, Alessandro PANETTA, Caterina PIU, Laura MORO, Sara PIRAS
Università di Genova, Italy - ISEM-CNR, Italy
- S3-03 **Water supply system in Ottoman Damascus and Constantine: Comparative study**
Aisha DARWISH, Ouafa SAIGHI
University of Bahrain, Bahrain - University of Constantine 3, Algeria
- S3-04 **Le développement enviromental et technologique - Valorisation du patrimoine méditerranéen, « El Hnaya et La Foggara »**
Amel GHRAB, Fateh OUDINA
Université de Gabés, Tunis, Tunisie - Université de M'sila, Algérie.
- S3-05 **Historical Evolution of Water Management in Liguria: From Agricultural Landscapes to Coastal Gardens**
Patrizia BURLANDO
University of Genoa, Italy
- S3-06 **Historical water drainage systems in Palermo (Sicily) in medieval and modern examples. Qanat, water towers, cisterns**
Maria Teresa CAMPISI
University Kore of Enna, Italy

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- S3-07 **Palermo, historic center between water and greenery: a possible future?**
Carmen GENOVESE
Ministero della Cultura, Italia
- S3-08 **Offshore groundwater aquifers: a promising resource? Insights from the RESCUE project**
Cristina CORRADIN
Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Trieste, Italy
- S3-09 **Sahrij Labgar : un ouvrage hydraulique millénaire à Marrakech (Maroc). Interrogations et comparaisons**
Daniela PITTALUGA, Mounsif IBNOUSSINA, Fabio FRATINI, Silvia RESCIC, Hadda LAMIA, Ali LIMAM, Goumih ABDELMALEK, Admou KHAOULA, Karima MAZIRH, Hafsa MATICH
Università di Genova, Italy - Université Cadi Ayyad, Marrakech, Maroc - CNR-ISPC, Sesto Fiorentino, Italy - University of Florence, Italy - INSA, Lyon, France
- S3-10 **Water supply in military coastal systems in XIX e XX century in Sardinia (Italy). Knowledge and musealization**
Giovanni Marco CHIRI, Donatella Rita FIORINO
Università degli Studi di Cagliari, Italy
- S3-11 **The water and marble of the Apuan (Italy)**
Pierpaolo FREDIANI
Architect, Italy

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Session 4 - Water in reuse and memory recovery projects. From analysis to project

Thursday, 16:45 – 19:30 – Room B

Zoom link <https://us06web.zoom.us/j/87636004990?pwd=4m1Yl39XbCLgbhzlUiZGaXJRAERKyV.1>

In many Mediterranean contexts the presence of water determined the birth of settlements, and also of specific productive activities that drew energy for their work from water. Often, in the past, canalizations and hydraulic systems have changed the territory, qualifying it; in other cases, today, the abandonment of these productive systems, the abandonment of hydraulic structures in favor of new and other systems has left sites on the territory that now ask to be recovered, restored and, in some cases, reused.

In the session, some examples of detailed and interdisciplinary study of these contexts are examined with the aim, also, of their recovery. The particularity of these sites requires, in fact, in some cases, particular precautions even in the preliminary study of the project: an accurate survey, studies on any specific materials used, precautions taken in the processing and in the installation of the materials... All this leads to an accurate knowledge and is an essential premise for their conservation.

Chairman : Khadija Baba, Ecole Supérieure de Technologie de Salé, Mohammed V University in Rabat, RIPAM Permanent Committee

S4-01 **The role of geophysics in identifying, characterising and protecting groundwater**

Federico DA COL, Flavio ACCAINO, Massimo GIORGI, Stefano PICOTTI

National Institute of Oceanography and Applied Geophysics – OGS, Trieste, Italy

S4-02 **The "memory" of the presence of water in restoration projects. Some cases in Arab-Norman architecture in Sicily**

Zaira BARONE

Università degli Studi di Palermo, Italy

S4-03 **The fulling mills in Remole, Bagno a Ripoli (Florence)**

Giovanni PANCANI, Matteo BIGONGIARI, Lorenzo MATTEOLI

University of Florence, Italy

S4-04 **De la restitution du réseau hydraulique de Muslubium, l'antique port disparu**

Manel OUARET LADJOUZE, Ahmed BRARA

Université A. Mira de Bejaia, Algérie - 2AB Consulting & Expertise, Alger, Algérie

S4-05 **Scan to GIS methodologies for the multi-scalar representation of water landscapes**

Silvia LA PLACA*, Sandro PARRINELLO

University of Pavia, Italy - University of Florence, Italy

S4-06 **Irrigation systems in oases: case of khattarat**

Mohamed LAGHZIL, Mohamed AZROUR, Mounsi IBNOUSSINA, Polona OBLAK

Université Moulay Ismaïl, Errachidia, Maroc - Université Cadi Ayyad, Marrakech, Maroc - Emuni University, Piran, Slovenia

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- S4-07 **L'aqueduc de la rive droite de la Soummam, un essai de restitution**
Imad Taki Eddine SEGHIRI, Mohamed DAHLI
E.P.A.U, Algérie - Université de Mouloud Mammeri de Tizi-Ouzou, Algérie
- S4-08 **Built City and Dug City. An opportunity for reconnection**
Angelo GANAZZOLI, Emanuele RICHIUSA
Politecnico di Bari, Italy - Università degli Studi di Bari "Aldo Moro", Italy
- S4-09 **The Aqueduct of Ain Zeboudja: Last Witness of Hydraulic Works from the Regency of Algiers during the Ottoman Period, Between Influences and Constructive Innovations**
Naima ABDERRAHIM MAHINDAD
University Blida 1, Algeria
- S4-10 **Les Foggaras système hydraulique à sud Algerian : patrimoine ou un système durable?**
Salima SAOUCHI, Derbal KADDOUR
Institut de Gestion des Technologies Urbaines, M'Sila - Algérie

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Session 5 - Climate change and new perspectives for compatible water management

Friday, 08:30 – 10:30 – Room A

Zoom link <https://us06web.zoom.us/j/81989027868?pwd=4okxbtKDvdqoZwihwG7ufbCBwz5LZc.1>

Wise environmental interventions, attentive to the physical characteristics of places. This was the nature of Roman centuriations, Arab and Norman hydraulic systems in Sicily, the recovery of underground water and in the transport of water to the surface in Morocco and Algeria. In the past, these systems proved to be adaptable to climate change. Sometimes socio-economic changes have caused their abandonment and accelerated their degradation. Research in documents testifies this.

Their re-adaptation and reuse may be possible: forecasting studies based on digital terrain models, with GIS information systems and predicted extreme climate events show how in some cases these ancient systems may still be current and may have a role in the future, even taking into account ongoing climate change.

A combination of several actions is desirable: on the one hand the recovery of ancient hydraulic systems, on the other a combination of “nature-based solutions, like urban greening, parks and rooftops, ...

Chairman: Michele Civiero, *Across the Sea*

S5-01 **Technology and tradition: an integrated approach to water management in semi-desert regions**

Luca IOTTI, Cristian CONCOLLATO, Polona OBLAK

Bambini nel Deserto ONLUS, Italy

EMUNI University, Slovenia

S5-02 **Blue Centuriation: The Hydraulic Heritage of Roman Centuriation of Padua for Climate Change Adaptation**

Tanja KREMENIĆ, Mauro VAROTTO, Francesco FERRARESE

University of Insubria, Italy - University of Padova, Italy

S5-03 **Historic fresh-water sources in the coastal Mediterranean Town of Piran**

Erik KRALJ, Cécil MEULENBERG, Daniela PALIAGA JANKOVIĆ

Science and Research Centre of Koper - Mediterranean Institute for Environmental Sciences, Slovenia

S5-04 **L'aqueduc d'Hippone : Témoin du temps passé**

Fatma Zohra HARIDI, Ali BOULEMAREDJ, Ala Eddine LAQUIER, Amel SAÏFI

Université 8 mai 1945, Guelma, Algérie - Université de Badji Mokhtar, Annaba, Algérie - Fonction publique, Guelma, Algérie

S5-05 **Rivers, Lakes, and Seas: Reflections on the Significance of Water in Egyptian Children's Literature**

Heidi Mohamed BAYOUMY

Faculty of Arts, Cairo University, Egypt

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Session 6 - Climate change and new perspectives for compatible water management

Friday, 08:30 – 10:30 – Room C

Zoom link <https://us06web.zoom.us/j/83636659487?pwd=TGoO1GlopTfk1DypbR0kCmfZZXKO3G.1>

Water, climate change, the influence of changes on possible water pollution are some of the topics covered in this session. Sustainable green technologies will also be discussed.

Integrated visions between historical knowledge of water management, contemporary needs, the interactions that exist between water, agriculture, energy production and the ecological approach are considered in projects presented in this session. Water will also be examined in its different aspects: water with drinkable characteristics and water with different degrees of salinity. Studies will be presented for a more effective characterization and consequently a more correct use.

Among the different aspects that the "water" issue entails there is also that of the involvement of stakeholders and in any case of citizens: today as in the past. The session shows how water resource management models combine tradition, innovation and sustainability.

Chairman: *Younes El Rhaffari, Higher School of Technology in Salé, Mohammed V University in Rabat, Morocco, RIPAM Permanent Committee*

- S6-01 **Water management and climate change adaptation: insights from traditional water systems in the Palermo countryside (Sicily, IT)**
 Maria Luisa GERMANÀ, Pietro TODARO
Università di Palermo, Italy
- S6-02 **Assessment of Flood Mitigation Strategies: A Case Study of the Aït Athmane Center in the Errachidia Region**
 A. KADIRI, B. ESSAFRAOUI, B. MESSAOUDI, I. AÏT LAHSSAINE, B. AIT SAID, A. KASSOU, L. KABIRI
Université Moulay Ismail, Errachidia, Maroc - Moulay Ismail University, Meknes, Morocco
- S6-03 **New Era in Solving Water Scarcity for Agriculture-Food Systems Using Green Technology: From Theory to Application in MENA Region**
 Ramia AL BAKAIN
The University of Jordan, Jordan
- S6-04 **Hydrological modeling to support the co-design of water management strategies revitalizes traditional water uses**
 Davide Danilo CHIARELLI, Nikolas GALLI, Maria Cristina RULLI
Politecnico di Milano, Italy
- S6-05 **LTA, history of an Italian aqueduct**
 Roberta PALETTA
Livenza Tagliamento Acque - Servizio Acquedotto, Livenza, Italy