



الجامعة الأورومتوسطية بفاس
EUROMED UNIVERSITY OF FES
UNIVERSITÉ EUROMED DE FÈS

SDG15 Report

Land life

2024





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SDG15 report : Life on land

Introduction

Sustainable Development Goal number 15, dedicated to Life on Earth, represents an essential pillar of our commitment to a planet in balance. It underlines the urgency of protecting, restoring and promoting the sustainable use of terrestrial ecosystems, forests and the biodiversity that sustains them. This report looks at the critical challenges and innovative approaches needed to achieve the ambitious goals of SDG 15, highlighting the critical importance of preserving biological diversity and ensuring the sustainability of terrestrial ecosystems for generations to come .

The fifteenth goal of the United Nations SDGs aims to establish sustainable management of terrestrial ecosystems (forests and mountains) by preserving biodiversity and soils, limiting the long-term impacts of natural disasters.

In this context, a certain number of educational and research activities are deployed by the Euromed University of Fez through teaching modules, end-of-study projects (PFE), research and patents.

Training

Master in Environmental Engineering and Water Management (GEGE)

- Natural and disturbed systems - Microbiology;
- Materials in the environment and methods of analysis;
- Pollution, nuisances and impacts;
- Environmental economics;
- Environmental policy and society;
- Water, soil and air;
- Water quality in watersheds - Aquatic ecology;
- Water treatment;
- Modeling of hydroecosystems;
- Water Management.

Master in Transport and Sustainable Mobility (TMD)

- Energy and climate change;
- Transport externalities: elements of analysis and calculations;
- Environmental and transport economics;
- Sustainable development ;
- Sustainable transport;
- "Transport and sustainable mobility" integrative project.

Civil engineering cycle (GC)

- Engineering geology;
- Load hydraulics and free surface hydraulics;
- Hydrology and hydrogeology;
- Road infrastructure;
- Building energy;
- Environment (EIA);
- River hydraulics and watercourse development;
- Maritime hydraulics and port engineering;

- Advanced Geotechnical Engineering;
- Railway infrastructure and remote-controlled systems;
- Land use planning and suitability for urbanization;
- Bridges and crossing structures.

End-of-studies projects

- Sanitation and health safety: application on a pilot case – STEP Ain Aouda;
- Valorization of wet pomace for feeding boilers;
- Biochar and biogas treatment;
- Activated sludge and MBBR fluidized bed for wastewater treatment;
- Physico-chemical characterization of industrial liquid waste and proposal of treatment solutions;
- Numerical simulations of supercritical flows at the location of narrowing channels: taking into account friction, dispersion and turbulence;
- Route of the Rabat-Fez high-speed line;
- Study of the construction of a crossing structure on the El Qati valley as part of the protection against flooding of the natural, architectural and built environments of Ighil N'Oumgoune;
- Sidi Abbou Dam – Hydraulic, hydrological study, sizing and verification of static and seismic stability (embankment dike system);
- Sizing of a reinforcement solution for the Wave project excavations in Tangier;
- Study of a wastewater treatment plant;
- Physico-chemical characterization of sludge from OCP WWTPs: Assessment of agronomic and environmental quality.

Research projects and doctoral theses

- Anti-bacterial and anti-viral coatings from marine waste (research project);
- Treatment of water contaminated by vegetable water using bio-sourced adsorbents (research project);
- CO₂ sequestration by sponge biomass (research project);
- New approach to formulating clay-based geo-polymers for additive manufacturing (research project);
- Synthesis of bio-sourced cementitious materials for construction using additive manufacturing (research project);
- Cellulose nanocrystals for the design of biodegradable plastics (defended doctoral thesis);
- Food packaging and catalyst by modification of crustacean shells (defended doctoral thesis).

Patents

- Antibacterial and antiviral adhesive films based on crosslinkable viologens (A. El Kadib, N. Katir, M. Boundor, MA Benzaouia, National Patent MA. National Patent MA. N°60439. 05/15/2023).
- Sprayable antibacterial and antiviral formulations for surface coatings (A. El Kadib, M. Bousmina, MA Benzaouia, N. Katir, M. Elfahime, National Patent MA. N°58510. 11/21/2022).
- Construction process based on monolithic structure technology (Abderrahim Belabid, Hajar Akhzouz, Hanane Elminor, Hassan Elminor. 12/30/2022).

Scientific publications

- HR Vanaei, A. El Magri, MA Rastak, S. Vanaei, S. Vaudreuil, A. Tcharkhtchi. Numerical-Experimental Analysis toward the Strain Rate Sensitivity of 3D-Printed Nylon Reinforced by Short Carbon Fiber. *Materials*. 15(24), (2022).<https://www.mdpi.com/1996-1944/15/24/8722>

- O. Benmoussa “Population and Economic Development: A Counterintuitive Relationship for a Sustainable World”. *International Journal of Advanced and Applied Sciences* 10(3), (2022), pp. 14-25, 2023
- N Hammi, M Kedzierska, N Wronska, N Katir, J Dhainaut, S Royer, Mr. Bryszewska, K. Miłowskavs, A. El Kadib. *Boron nitride embedded in chitosan hydrogel as hydrophobic, promising metal-free, sustainable antibacterial materials. *Materials Advances*, 2023, <https://doi.org/10.1039/D3MA00445G>
- N Wronotska, * N Katir, M Nowak-Lange, A El Kadib, K Lisowska. Biodegradable Chitosan-Based Films as an Alternative to Plastic Packaging. *Foods*, 12 (2023) 3519
- A. Brik, M. El Kadiri, T. El Assimi, P. Dambruoso, R. Beniazza, G. Gouhier, A. El Kadib, M. Lahcini. * Bismuth supported on phosphonium functionalized chitosan as sustainable heterogeneous catalysts for one-pot Biginelli condensation. *Molecular Catalysis*, 548 (2023) 113422
- N. Hammi, * N. Couzon, T. Loiseau, C. Volkringer, A. El Kadib, S. Royer, J. Dhainaut. * Hierarchically Porous ZIF-67/Chitosan Beads with High Surface Area and Strengthened Mechanical Properties: Application to CO₂ Storage. *Materials Today Sustainability*, 22 (2023) 100394
- M. El Kadiri, T. El Assimi, P. Thébault, A. El Meziane, S. Royer, A. El Kadib, G. Gouhier, * M. Lahcini. * Bismuth Nanoparticles Supported on Biobased Chitosan as Sustainable Catalysts for the Selective Hydrogenation of Nitroarenes. *ACS Appl. Nano Mater.*, 6 (2023) 4017-4027
- S. Blilid, M. Boundor, N. Katir, M. El Achaby, M. Lahcini, JP Majoral, M. Bousmina, A. El Kadib. * Expanding chitosan reticular chemistry using multifunctional and thermally-stable phosphorus-containing dendrimers. *Macromolecules*, 56 (2023) 1223-1235
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- E. Boutrouia, T. El Assimi, Mr. Raihane, R. Beniazza, H. Ben Youcef, Mr. Khouloud, Mr. Hassen V. Baouab, A. El Kadib, Mr. Lahcini. * Polymethyl methacrylate-g-carboxy-methylcellulose as an amphiphilic coating material for slow-release fertilizer. *Prog. Org. Coat.*, 172 (2022) 107102
- A. Anouar, A. Grirrane, E. Alvarez, N. Katir, A. Firstly, H. Garcia, * A. El Kadib. * Nanosized copper stabilized on ternary P, N, S-doped graphene from chitosan shellfish waste: preparation and catalysis of single and double A₃-type amine coupling. *Materials Today Sustainability*, 18 (2022) 100109
- N. Hammi, S. Chen, A. Firstly, S. Royer, H. Garcia, * A. El Kadib. * Shaping MOF oxime oxidation catalysts as three-dimensional porous aerogels through structure-directing growth inside chitosan microspheres. *Green Chem.*, 24 (2022) 4533-4543
- N. Hammi, S. Chen, C. Michon, S. Royer, * A. El Kadib. * Cu nanoparticles embedded on reticular chitosan-derived N-doped carbon: Application to the catalytic hydrogenation of alkenes, alkynes and N-heteroarenes. *Mol. Catalysis*, 519 (2022) 112104
- A. Dra, K. Khallouk, K. Tanji, I. El Mrabet, Y. Fahoul, B. El Fathi, A. Arrahli, A. El Gaidoum, L. Mardi, A. Taleb, A. Chaouni, A. Kherbeche. Removal of Crystal Violet Dye from Aqueous Solution Using Oued Sebou Sediment (Fez-Morocco): Box-Behnken Optimization and

Germination Studies. Water, Air, & Soil Pollution DOI:<https://doi.org/10.1007/s11270-023-06110-4>

- A. El Gaidoumi, K. Tanji, A. Loqman, I. El Mrabet, A. Arrahli, A. Dra, Y. Fahoul, M. Zouheir, B. El Bali, A. Kherbeche. Cu(II) impregnated clay-derived HS zeolite: Synthesis, characterization and catalytic activity on catalytic wet peroxide oxidation (CWPO) of phenol. Journal of Coordination Chemistry DOI:<https://doi.org/10.1080/00958972.2022.2154156>
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- A. Ksakas, A. Arrahli, A. Dra, Y. Fahoul, M. Iboustaten, A. El Gaidoumi, K. Tanji, A. Kherbeche. Kinetic, equilibrium, and thermodynamic studies of heavy metal removal from aqueous solutions by natural material from Morocco. Euro-Mediterranean Journal for Environmental Integration DOI:<https://doi.org/10.1007/s41207-022-00298-3>
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- Essabbar, M., Bakkali, S., Saikouk, H. Intelligent IoT Platform for Precocious Detection of Late Blight and TYLCV Tomato Disease in Morocco, Lecture Notes in Networks and Systems, 2022, 454 LNNS, pp. 54-64

Events and activities

CLUB WE GREEN IN ACTION: » IMPROVE THE IFRANE NATIONAL PARK: LET'S OPEN OUR EYES! »



Saturday October 28, 2023; the “We Green” club of students from the Euromed University of Fez (UEMF) organized an awareness day for the benefit of its members through the visit of several environmental centers as well as a cleaning action in the national park from Ifrane.

As part of these social activities, the “We Green” club kicked off this day aimed at raising awareness among the general public regarding environmental issues with the main objective: To encourage reflection around environmental issues, create ecological habits through a cleaning action and an awareness of biodiversity issues through a visit to the Ifrane national park, its fish farming station in Ras El Mae and its cedar house. The day was marked in particular by a cleaning action in the forest of the Zerouka I water body of Ifrane with the aim of reducing the negative impact of waste and residues which affect the environment.

Note that Zerrouka I is a small, shallow drainable artificial fish pond. It is located on the Zerrouka wadi (or Zrouka), the main tributary of the Tizguite wadi. The dike is located approximately 300m from the source, so that the waters from it flow directly into it. The reservoir is limited by a concrete wall, at least on the west bank. The waters of the spring are also used to supply the city of Ifrane with drinking water.

At this body of water which is an integral part of the Oued Tizguite Ramsar Site; The vegetation is not very varied (around fifteen species with a wide geographical distribution) and is very limited in space, the edges of the lake being concreted and mowing is frequent.

It is a fairly protected trout body of water, somewhat interesting for birds. It is home to few winter residents (less than 400 birds), the population being mainly composed of divers: coots and crested coots, little grebes, pochards, tufts and nyrocas, with sometimes shovelers and/or mallards. Among the breeders, the Eurasian Coot (20-25 pairs), the Crested Coot (around 10 pairs) and the Little Grebe (5-8 pairs) are the most regular.

Finally, it should be noted that the Euromed University of Fez is a public utility, non-profit institution with an eco-campus meeting international standards which constitutes a pleasant and stimulating environment for its students coming from more than 40 nationalities.

UEMF winners are equipped with training on soft skills, study skills, life-skills and professional skills and this profile; based on several pillars; allows students to acquire numerous skills linked in particular to multilingualism, multiculturalism, innovation and entrepreneurship, the digital environment, international mobility, and sustainable development in addition to the pillar of social responsibility and eco-citizenship through which we instill in students the values of respect for the environment, sustainable development and civic responsibility.

<https://www.oujdacity.net/national-article-157654-fr/club-we-green-en-action-sublimez-le-parc-national-difrane-ouvrons-les-yeux.html>

<https://premiumtravelnews.com/2023/10/30/club-we-green-parc-national-difrane/>

Hiking Taza Region - Chaara Cave UEMF STUDENTS

<https://www.youtube.com/watch?app=desktop&v=WbgyU5oYeZY>

<https://www.youtube.com/watch?v=erDEg1GsDyc>

The “Practical Workshops” of the FEMG and the EEMGC Master GECE 1st year and GC 2nd year



As part of the practical illustration of the courses “Disturbed Natural Systems” & “Ecology and Sustainable Development” for the benefit of respectively the students of the 1st year of the Master “Environmental Engineering and Water Management” and the 2nd year of the civil engineering cycle, a field trip was carried out on January 29 and 30, 2020.

The first day was devoted to the study of the Moulay Bouselham lagoon (Merja Zerga), a wetland essential to the balance of ecosystems.

The different components of the biodiversity of this lagoon were reviewed, commented on and analyzed with systematic reference to the lessons taught. The rest of the day was devoted to visiting the archaeological site of “Lexus”, a city founded by the Phoenicians in the 12th century BC. BC and one of the oldest urban centers in the western Mediterranean. The Site Curator explained to the civil engineering students the techniques of construction, development, design and use of the components of this ancient Phoenician city.

The second day was devoted to visiting the Tangier Marina where the students were welcomed by the President of the SAPT (Société d’Aménagement du Port de Tangier-ville)

who indicated that the port of Tangier-ville is among large-scale projects contributing to establishing the city of the strait as a destination of choice for pleasure and cruise tourism on an international scale and in the Mediterranean basin in particular. A presentation of “Tanja Marina Bay” by the Marketing and Strategic Intelligence Director of SAPT was held, followed by a visit to the “marine” museum, as well as the presentation of the rehabilitation and enhancement program for the walls. antiques.

The students were also able to visit the Marina reconversion site, a project which perfectly materializes the slogan “Give the port back to the city, unite the port and the city”. Explanations were provided by the engineers responsible for carrying out the project and by the site divers. A fruitful student-engineer exchange then focused on the methodologies used in this reconversion.

Ultimately, a visit to the operational part of the Marina marina took place, detailing the technical aspects of its on-shore and off-shore components presented by the Port Director who also gave an overview of the history works, the developments carried out and the work in progress to return the marine domain to the Tangier population and make this city an essential destination for pleasure and cruise tourism in the Mediterranean basin.

<https://ueuromed.org/actualites/ateliers-workshops/les-practical-workshops-de-la-femg-et-de-leemgc-master-gege-1ere-0>

Canyoning at Ait Smail waterfall



A canyoning day for lovers of nature and great sensations. Activity reserved for non-beginners.

<https://ueuromed.org/evenements/activites-des-etudiants/canyoning-au-cascade-ait-smail?page=1>

2024: Euromed University of Fez at the heart of action for the SDGs

Cleaning action



A cleaning action in ZROUKA, located at the entrance to the city of IFRANE, thanks to this action, the passengers of the lake would no longer be exposed to an annoying and unpleasant sight of garbage scattered all along the way. Also, this campaign aims to reduce the negative impact of waste and residues that affect the environment and cause pollution.

https://www.linkedin.com/posts/club-we-green-uemf-946a45292_une-action-de-nettoyeag-%C3%A0-zrouka-situ%C3%A9-a-activity-7138633128520073216-v_sw?utm_source=share&utm_medium=member_desktop

Awareness of the protection of aquatic biodiversity



Ras El Mae Fish Farming Station was our second stopover. The main mission of Ras El Mae Fish Farming Station is to develop salmon farming to ensure the restocking of fishing grounds and environmental education and awareness of the protection of aquatic biodiversity with a rich program of excursions and workshops dedicated to the environment, its protection and the development of sport fishing carried out regularly, for the benefit of schoolchildren in order to promote awareness of the main ecological problems of fish, including overfishing, fishing methods that are harmful to the environment and habitat degradation.

https://www.linkedin.com/posts/club-we-green-uemf-946a45292_la-station-de-pisciculture-ras-el-ma-%C3%A9t%C3%A9-activity-7138628112249933825-HYJN?utm_source=share&utm_medium=member_desktop

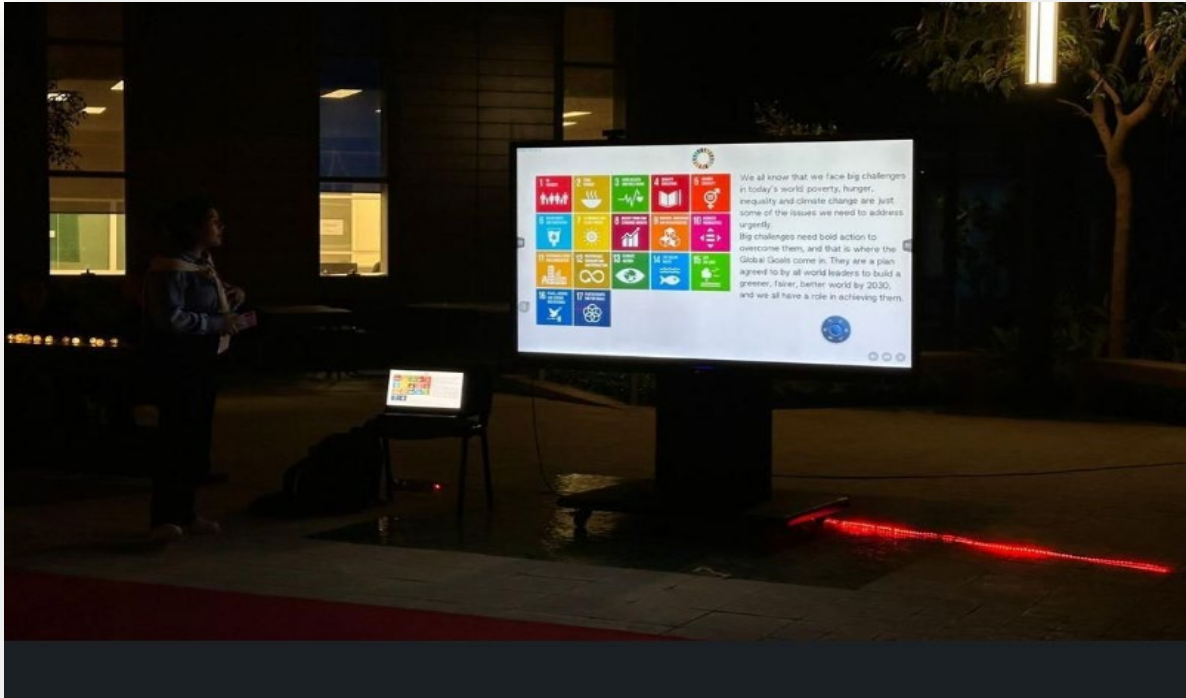
Visit to the Maison de la Cédraie: discovery of ecosystems



Visit the Maison de la Cédraie, located in the heart of the AZROU forest, is a center for discovering the ecosystems of the cedar forest, its management and its goods and services, it also plays the role of the cornerstone to raise awareness and educate tourists and residents about the vital role that the cedar forest represents for the ecological balance and for the future of Morocco.

<https://www.instagram.com/p/CzLqH6Zs-Jb/?igsh=MzRIODBiNWFIZA==>

Presentation of the Sustainable Development Goals (SDGs).



We present our first activity, with the aim of familiarizing ourselves with our dear WE GREEN members, through a presentation of the Sustainable Development Goals (SDGs).

https://www.linkedin.com/posts/club-we-green-uemf-946a45292_nous-pr%C3%A9sentons-notre-premi%C3%A8re-activit%C3%A9-activity-7117957803733843968-89BZ?utm_source=share&utm_medium=member_desktop

PLANETFLIX; Celebrates Sustainability



Delighted to share the success of the PLANETFILIX event, a sustainability-focused cinematic journey organized by the Global Shapers Community Fez in collaboration with the WE Green Club of the Euro-Mediterranean University of Fez. An inspiring fusion of thought-provoking documentaries, captivating discussions, and a vibrant community dedicated to shaping a more sustainable future. Grateful for the collaborative efforts that made this event a resounding success.

https://www.linkedin.com/posts/mohammed-o-441220129_planetflix-globalshapers-wegreenclub-activity-7132297857616764928-g0kU?utm_source=share&utm_medium=member_desktop

Recycling Activity



Creation of a “Christmas Tree” masterpiece by recycling several objects, namely: water bottles, cups, sticks, corks.

<https://www.instagram.com/reel/C1NLd3ysWRK/?igsh=MzRIODBiNWFIZA==>

“How to be the Coolest” training



Eco-responsibility within our community: The action took place in 2 essential parts: A theoretical part where we covered the essentials to know about how to be responsible, then a practical part where everyone was able to share a word to raise awareness among all those around us.

<https://www.instagram.com/reel/C4eKOH4MNZf/?igsh=MzRIODBiNWFIZA==>

Organizing a gardening activity



The UEMF Rotaract Club is organizing a gardening activity with the children of BAB KHOUKHA.

<https://www.instagram.com/reel/C1KwYwNsShy/?igsh=MzRIODBiNWFIZA%3D%3D>

Wahid BENKHADDA wins the Best Oral Communication Award at the ISMESH 2024 International Symposium



We are proud to announce that Mr. Wahid BENKHADDA, a fourth-year doctoral student, won the prestigious award for best oral communication at the ISMESH 2024 International Symposium. This distinction was awarded to him for his exceptional presentation during the event, which was held on May 7 and 8 at the Ecole Supérieure de Technologie in Fez.

Mr. BENKHADDA's participation in this symposium was part of his thesis project in the field of materials and environmental chemistry, in which he raises the issue of olive margins; a widespread problem at the regional, national level but also throughout the Mediterranean basin region.

We extend our most sincere congratulations to Mr. Wahid BENKHADDA for this well-deserved recognition which highlights the commitment of UEMF and its community to academic excellence and innovative research.

<https://ueuromed.org/actualites/cedoc/wahid-benkhadde-rommage-le-prix-de-la-meilleure-oral-communication-au-symposium>

THE Impact Ranking: 1st at the regional level in the category SDG 15: Life on Land

Rank	Name	Life on land	Overall
201–300	Abdelmalek Essaâdi University Morocco	55.2–64.6	58.8–64.4
301–400	Ibn Tofaïl University Morocco	45.8–55.1	69.9–75.7
401–600	Mohammed V University of Rabat Morocco	29.3–45.7	64.5–69.8
601+	Euromed University of Fez Morocco	2.0–29.1	64.5–69.8

Strengthening collaborations for sustainable agriculture



Euromed University of Fez hosted a U.S. delegation as part of the LeadAR program, a University of Arkansas project focused on training leaders in agriculture and sustainable economics. The visit, led by industry professionals and researchers, was welcomed by Prof. Salim Bounou, Vice President for Research and Partnerships, and provided an opportunity to explore synergies for sustainable agricultural development in Morocco.

Through this meeting, UEMF reaffirms its commitment to innovative solutions for a greener and more responsible future.

https://www.linkedin.com/posts/universit-euro-m-diterran-enne-de-f-s_sustainability-uemf-myuemf-activity-7248975557097402368-r0lb?utm_source=share&utm_medium=member_desktop

UEMF celebrates International Mountain Day differently



On March 1, 2024, the Euromed University of Fez organized an international symposium entitled “Restoring mountain ecosystems: the case of the Fez-Meknes region”, in collaboration with several partners, including the Institute of Legal and Political Sciences (ISJP) and the African Network for Sustainable Development (RA2D). The event, organized in response to the International Mountain Day, addressed the challenges of restoring mountain ecosystems, in line with the initiative of the United Nations Decade on Ecosystem Restoration (2021-2030).

Over two days, the conference brought together experts, researchers and field stakeholders to discuss ecological issues and sustainable development in the mountains through panels focusing on the social, economic and political challenges of this theme. The second day took place in the commune of Tazouta, with practical activities such as hiking, awareness-raising workshops and exhibitions of local products. This edition highlighted the importance of preserving mountain ecosystems while involving local populations and strengthening the solidarity economy.

<https://ueuromed.org/actualites/congres-et-colloques/luemf-celebre-la-journee-internationale-de-la-montagne-autrement>