



ENHANCING THE POTENTIAL OF FASTER'S CAPACITY BUILDING INITIATIVES

Lessons learnt and future prospects



ACKNOWLEDGEMENT

This conclusions document is promoted by FASTER project partners both from Tunisian research institutions INRGREF, AVFA, IRESA and European partners CREAF, Lund University, Vision and Europe for Business.

We take this opportunity to thank all the people involved in the project activities: experts, trainers, staff members and all course participants. We also thank all the host researchers of the mobility program and the participating students and researchers from INRGREF for taking the time to answer our questions and interviews. Without your precious collaboration, the creation of this product would not have been possible.

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PREFACE

Adaptation to climate change is a highly complex challenge. It poses critical questions to current water land and forest management approaches and the practices adopted by the agricultural sector. Innovative solutions and methodologies are needed to adapt society's changes to reduce its vulnerability to the impacts today and be aware of the risks it needs to face in the future.



Therefore, the FASTER project invested efforts in sharing and transferring knowledge through a set of capacity-building actions to strengthen research excellence and create collaborative environments for boosting results.

Face to face and virtual courses allowed to bring together researchers, PhD students and early career profiles from Tunisian and international research centres. These activities focused on fundamental research topics that can provide solutions to the most urgent climate change-induced challenges for the Tunisian agriculture sector: drought, loss of soil fertility, water quality and irrigation systems, crop varieties, and fishing stock preservation.

The training programs' broad spectrum of interest and the cross-cutting debates between participants and the trainers enhanced multidisciplinarity: the most recent research findings could be put on the table, and lessons learned were taken into account.

This is what adaptation needs: total awareness of the intertwining between specific aspects of the complex system of both natural and human-induced factors, acknowledging the crucial importance of preserving ecosystem functionalities and ensuring the wellbeing of society, especially women and youth living in rural environments.

Research excellence is a matter of generating innovative content and enabling the conditions for its development. Therefore, FASTER also focused on transferring skills and tools for accessing competitive international calls for funding, providing insights on writing project proposals, managing grant agreements, and building the needed partnerships. Key stakeholders were invited to depict the policy challenges research needs to answer to and contribute to enhancing the internationalisation and positioning of the research institutions engaged.

"Nothing ever becomes real until it is experienced."

The FASTER staff exchange program built bridges between people sharing the same goal: providing innovative answers to the challenges of dealing with climate change. It allowed all people involved to establish collaborative relations that hopefully will last far beyond the FASTER projects' end.

This is the legacy that FASTER Consortium wants to cherish in the hope innovative ideas may become consolidated stepping stones.

Thank you all for your trust

Sihem Jebari FASTER Project Coordinator



FASTER IN A NUTSHELL

Farmers' Adaptation and Sustainability in Tunisia through Excellence in Research **(FASTER)** is a Twinning Project funded by the European Commission (Directorate-General for Research and Innovation) through the Horizon 2020 funding programme. FASTER aims to reinforce the research and knowledge transfer capacity of INRGREF related to innovative land and water management for climate change adaptation and its implementation through Farm Advisory Systems (FAS).

FASTER has developed a sustainable framework for research capacity building, international networking, and FAS practice to achieve its mission.

The projects' consortium gathered seven European and Tunisian partners. **CREAF** and the **Lund University**, two European research institutes with consolidated scientific excellence on water, soil and forest management, engaged researchers and technicians of **INRGREF** (National Research Institute of rural engineering, Water and Forests) and **IRESA** (Institution for Agricultural Research and Higher Education) in knowledge sharing activities oriented at improving access to international competitive projects and latest developments in the field of innovative solutions for adaptation to climate change. **Europe for Business** introduced economic perspectives and provided tools for eLearning, while **Vision Communication** provided public awareness, dissemination of results, and training support. Additionally, **AVFA** (Tunisian Agriculture Extension and Training Agency) ensured the liaison between the projects' development and policymakers, as well as key stakeholders from the agriculture sector, fostering the integration of FASTER results into national policies.

INTRODUCTION

FASTER CAPACITY-BUILDING PILLAR

The FASTER methodology is built on the following interrelated pillars:

- · Capacity-building towards research excellence by training and staff mobility (WP3)
- Creating a living lab focused on transferring research to FAS, including training of trainers (WP4)
- Enhancing the sustainability of the achieved objectives (WP5)

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WP3		WP4		WP5	
Capacity building		Living FAS-lab	Sı	ustainability of excellence	
Cross-cutting training		• Creation of Local Living	•	Indicators of excellence	
activities		Summer schools	•	Institutional networking	
Research excellence		• Multi-stakeholder	•	New research	
training		platform		approaches	
Specialized training		• E-learning to FAS	•	Collaboration with	
program		technicians		government	
Mobility program		• Fact sheets and video		Job Bank	

The objective of the FASTER capacity-building pillar was to increase the development and build the capacity of INRGREF human resources and scientific staff on:

Adaptation to climate change in land and water management

Research skills, internationalisation, innovation, and leadership to improve research excellence, innovation capacity and scientific quality of the institution concerned.

tutorials

In the framework of the capacity-building pillar, FASTER has therefore organized targeted multidisciplinary training activities and capacity building on various cross-cutting key topics, at the heart of the European and international agenda and offered support to the identified Tunisian and international key stakeholders - as well as Tunisian project's partners -.

To reinforce research skills and tools to increase performance indicators, provide outputs for the achieved research, and obtain resources for excellent research enhanced internationalization and higher competitiveness, specific training activities were delivered.

Furthermore, specialized training contributed to improved research content in the field of the FASTER thematic areas such as adaptation to climate change and water and land management including innovative governance.

Additionally, a mobility program delivered 9 visits by INRGREF's staff to European centres allowed to further develop the necessary links to provide future research proposals, sharing of PhD student projects and co-authoring academic publications.

BASIC & CROSS-CUTTING MULTIDISCIPLINARY TRAININGS

SUMMARY OF THE TRAINING PROGRAM

The training program adopted a multidisciplinary approach and fostered capacity-building on various cross-cutting relevant topics at the heart of the European and international agenda. These include knowledge, processes, and the capacities' development of keyselected staff in understanding, managing, and operating at international standard levels.

OVERALL OBJECTIVES

The objective of the training was to inform, empower, and connect decision-makers and managers with researchers to create innovative collaborative environments. Indeed, policymakers and public administrators need more and more scientific input to produce evidence-based policymaking. In the same way, scientists need to raise awareness, better communicate, engage, and partner with policy-makers to deliver a tangible social impact and avoid ill-informed policies that might hinder research progress and the adoption of valuable research results. Policy-makers and researchers also need to coordinate with industries and markets to unlock business opportunities, products and services by designing responsive frameworks and open spaces of debate and knowledge exchange.

TRAINING TARGET

The training addressed a diversity of Tunisian actors, ranging from decision-makers, such as policymakers, high-level management staff from ministries, regional & local authorities; presidents and directors of research centres; national staff/contact points for international organisations (UN, EU) based in Tunisia, as well as private businesses organisations, senior researchers and young talents.



DATES

April 2nd to April 4th

AREAS OF TRAINING

The multidisciplinary specialized training program covered key aspects such as:

 Improving research skills and knowledge in adaptation to climate change, terrestrial ecology and water resources management

- Providing examples of new research tools to students and researchers for developing improved education, research, and scientific output
- Increasing networking, partnerships, scientific novelty, and publishing

CONCLUSIONS

The cross-cutting training enabled delivering crucial information and enabling participants to:

1. Benefit the most from international opportunities, knowledge, best practices and synergies.

2. Achieve goals while enhancing leadership, management and innovation capacities.

3. Strengthen the interconnection of internal and external coordination processes.

4. Advance cooperation among policy-makers, researchers, and industries with knowledge, capacities, and tools.

5. Get acquainted with all cross-cutting concepts also relevant to many EU and international funding opportunities.

The programme adopted an interactive format involving several real case scenarios, live simulations, group works, and feedback sessions. It allowed the gathering of relevant information such as expectations, key priorities and areas for synergies, and opportunities via direct contacts, remote situation analysis and questionnaires. Evaluation of the training activities revealed positive reception of the courses and paved the way for further collaborations.

CLICK AND DISCOVER RELATED CONTENT 1st Steering Committe \triangleright and trainings in Tunisia www.faster-H2020.eu **Basic & Cross-cutting Multidisciplinary Trainings** ADAPTATION TO CLIMATE CHANGE Tunis, 2-4 April, 2019 AGENDA FASTER holds a week of meetings, trainings and informative sessions Courses available on FASTER E-Learning Platform Click to download the 1st module **Capacity Building** presentations of these trainings

Enhancing the potential of FASTER's Capacity Building Initiatives | 7

GALLERY



RESEARCH EXCELLENCE TOOLS TRAINING

SUMMARY OF THE TRAINING PROGRAM

Improving research excellence, enhancing reputation, and achieving higher competitiveness in the EU and beyond through national and international funding opportunities require the strengthening of essential skills and tools to increase performance indicators, provide outputs for the achieved research, and obtain resources to conduct new excellent research. Tunisian partners received training in this sense for the different identified tools.

OVERALL OBJECTIVES

The main goal was to reinforce the research and knowledge transfer capacity of INRGREF and associated Tunisian partners concerning innovative land and water management adaptation measures to face climate change. Consequently, FASTER offered training for international application writing and management, communication, and publishing in international journals.

TRAINING TARGET

The courses' target was to prove the Tunisian partners with hands-on experience fostering concrete and practical results in application writing and publishing.



DATES

7-11 October 2019



The topics of the training were the following:

- Drafting international proposals,
- · Exploitation, dissemination, and scientific communication for EU funded projects,
- Financial and Legal management of European Projects, and
- How to write and publish Scientific Papers.

CONCLUSIONS

This project has received funding from the European Union's Hor research and innovation programme under grant agreement No

(S)

Evaluation of training activities revealed positive reception of the courses and paved the way for further collaborations. 82 % of the participants evaluated the overall organisation of the workshops as "very good" or "excellent".



GALLERY

















SPECIALIZED TRAINING PROGRAM

SUMMARY OF THE TRAINING PROGRAM

Students and young researchers from INRGREF and associated partners joined two specialized training programs within the FASTER project. The first specialized training program included adaptation to climate change about water, forest and landscape management in the Mediterranean, governance, and policy analysis for adaptation and the second specialized training included climate change effects of water & land management in the Mediterranean.



OVERALL OBJECTIVES

The overall objectives of the two specialized training programs were to reinforce the research and knowledge transfer capacity of INRGREF and associated Tunisian partners in governance and policy analysis for adaptation and climate change effects of water & land management in the Mediterranean.

The training targeted knowledge sharing and provided students and researchers with examples of new research tools to develop improved education, research, and scientific output as well as to increase networking and partnerships.

DATES

2-6 October 2020 and 22-26 March 2021.

AREAS OF TRAINING

The areas of training were:

- · Climate change effects on water management in the Mediterranean,
- · Water and forest management & climate change adaptation,
- Water management policy analysis,
- Innovative governance for adaptation,
- Design and evaluation of adaptation measures improving research skills and knowledge in adaptation to climate change,

- · Climate change effects on water management in the Mediterranean,
- Integrated water & land resources management,
- · Geographical information systems for landscape studies,
- Recharge and groundwater modelling, and
- Modelling of crop irrigation and salinity effects.

CONCLUSIONS

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Evaluations of the training programs were very positive, and the participants provided active feedback to lecturers during timeslots fostering discussion. The feedback from participants provided valuable knowledge to lecturers regarding local conditions to provide adaptation to climate change.

CLICK AND DISCOVER RELATED CONTENT

Specialized Training Program: a Milestone in FASTER Roadmap to Capacity Building

Courses available on FASTER E-Learning Platform



3rd module Innovative Governance





Click to download the presentations of the 1st Specialized Training



Click to download the presentations of the 2nd Specialized Training

MOBILITY PROGRAM

SUMMARY OF THE TRAINING PROGRAM

The FASTER mobility program was scheduled for about 9 visits to European centres by the Tunisian partner INRGREF´s staff. During the first project year of FASTER, 3 researchers and 2 PhD students visited the European partners. The outcome was, among other things, a published <u>paper</u> in an international journal.

The Covid 19 outbreak hampered the mobility program during the second year, and no mobilities could be performed. The Consortium created a contingency plan for the remaining mobilities within the project allowing online supervision of the remaining researchers and students in the mobility plan¹.

OVERALL OBJECTIVES

Short-term staff visits (from 1 week to 3 months) would take place under two different programs, depending on the visitors' experience. Senior INRGREF staff visits to European centres would be oriented to develop the necessary links to provide future research proposals, share PhD student projects, and co-author academic publications. Student and INRGREF staff visits European centres to enrich PhD projects, assist local training and develop future collaboration.

HOST INSTITUTIONS

CREAF

LUND

1161

CREAF, Barcelona University, Spain

Department of water resources engineering, Lund University, Sweden

1 Zemni, N., F. Bouksila, F. Slama, M. Persson, R. Berndtsson, and R. Bouhlila (2021) Evaluation of low-cost WET sensor to measure soil moisture and pore electrical conductivity, Arabian J. Geosci. (accept.).

Zemni, N., F. Bouksila, F. Slama, M. Persson, R. Berndtsson, and R. Bouhlila (2020) Evaluation of low-cost WET sensor to measure soil moisture and pore electrical conductivity, Paper number 77, Proc. 3rd Conf. Arabian Journal of Geosciences (CAJG), 2–5 Nov. 2020, Springer Nature.



FETHI BOUKSILA RESEARCHER FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"My visit to Lund University (April 15-24, 2019) was beneficial at all levels for me but also for the two PhD students who accompanied me. Discussions with colleagues from the Department of Water Resources Engineering, in particular with Prof. Ronny Berndtsson, Cinitia Uvo, and Magnus Person, allowed me to strengthen my scientific knowledge on water and soil resources management under climate change."

What is your feedback about this mobility program?

"The South-North visits of researchers make it possible and easier to exchange ideas on scientific topics as well as methodologies adopted to respond to common challenges. Also, face-to-face meetings are way better than virtual ones to consolidate scientific but also human relationships between researchers and therefore improve research collaboration."



CLICK AND DISCOVER RELATED CONTENT

First visits for the FASTER Mobility programme



MAIN ACHIEVEMENTS

Wrote a joint <u>article</u> on soil infiltration experiments and performance of the 5TE sensor: Submission of a second paper to the 3rd Conference of Arabian Journal of Geosciences (CAJG), 2-5 Nov. 2020 and then selected to the accepted to the Arabian Journal of Geosciences; Zemni, N., F. Bouksila, F. Slama, M. Persson, R. Berndtsson, and R. Bouhlila (2021) Evaluation of low-cost WET sensor to measure soil moisture and pore electrical conductivity, Arabian J. Geosci. (accept.)

FEEDBACK FROM THE HOST

"According to the plan established during Fethi's visit, we will continue to collaborate in joint publications and research applications. As well, we will collaborate through joint supervision of master and PhD students. I think the exchange has been very productive."



SANA BOUGUERRA PHD STUDENT FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"It was a wonderful experience. It was an amazing opportunity for me to learn new statistical skills. It was also good for my personal development. Being abroad helped me to adapt to new situations and different environments. Furthermore, this experience allowed me to open my mind to new cultures, people and to extend my professional network."

What is your feedback about this mobility program?

"The program was well organised, interesting and engaging. This exchange experience was one of the best decisions I made, and I encourage everyone to benefit from it, if able to do so."



CLICK AND DISCOVER RELATED CONTENT

First visits for the FASTER Mobility programme

MAIN ACHIEVEMENTS

Worked with Pr. Cintia Bertacchi Uvo on climate variability and trend for more than thirty years of measurement in the Rmel river basin located in the northeastern part of Tunisia. Planned an article related to the connection between precipitation trends and different climatic modes. Wrote a joint article on the spatiotemporal analysis of landscape patterns and their effect on soil loss in the Rmel river basin, Tunisia. Wrote a joint article on sediment production and control in Rmel river basin using InVEST Sediment Retention model.

FEEDBACK FROM THE HOST

"PhD students must experience different working environments and working conditions. Such experiences are important for the career development of future researchers."

Prof. Cintia Bertacchi Uvo, Lund University





NESRINE ZEMNI PHD STUDENT FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"My exchange experience has been everything that I have imagined and more. I have had the opportunity to meet high-qualified people, learn from them and discuss different approaches to my thesis Project. I have had the honour and the privilege to get to talk to and learn from an incredibly diverse group of people with such a broad set of scientific and cultural backgrounds. They have been so open and willing to share their knowledge with me."

What is your feedback about this mobility program?

"I think it is essential to put in place such kind of initiative, especially for students, as it gives you the chance to discover new places, cultures, and staff with different disciplines working on the same topics. I can say that it was an experience that I would highly recommend to anyone and that I would do again in a heartbeat."



CLICK AND DISCOVER RELATED CONTENT

First visits for the FASTER Mobility programme



MAIN ACHIEVEMENTS

 Analysed and discussed data on soil infiltration experiments performed at INRGREF with Prof. Magnus Persson
Wrote a joint <u>article</u> on soil infiltration experiments and performance of the 5TE sensor.
Zemni, N., F. Bouksila, F. Slama, M. Persson, R. Berndtsson, and R. Bouhlila (2021) Evaluation of low-cost WET sensor to measure soil moisture and pore electrical conductivity, **Arabian J. Geosci.** (accept.)



"Nesrine had a lot of data and an early version of a manuscript. She was also very active at our department, sharing work and social events with other PhD students. Mixing people with different backgrounds who share the same struggle (in this case finishing a PhD) is always a good idea since this broadens the ability to put your research into perspective."

Prof. Magnus Persson, Lund University



KAOUTHER BEN YAHIA RESEARCHER FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"The internship at CREAF allowed me to deal directly with the aspect of soil biota for the first time. Dr Enrique Doblas taught us how to measure soil moisture, bulk density, sieving, and sampling techniques to determine microorganisms, whether in the field or in the laboratory. Then we had the opportunity to make presentations. It was an experience that motivated me and inspired me to address nematodes in Tunisia."

What is your feedback about this mobility program?

"The Mobility program will allow us to exchange, collaborate and match perspectives. Indeed, we might launch another small project with our Spanish colleagues to study fauna in Tunisia. It will help us to publish, and publications are the goal of collaboration. Research visits outside our comfort area are primordial and are a crucial phase for consolidating any researcher's career. It is important to set up this type of initiative because this will allow us to maintain the collaboration and thus deepen our knowledge, learn new techniques and establish new professional relationships."



MAIN ACHIEVEMENTS



FEEDBACK FROM THE HOST

"I was impressed with the charm and curiosity of our visitors, who were always happy to collaborate, talk to the people we introduced to them, and present their research to our colleagues. This resulted in further collaboration, apart from sharing the data."

Dr Enrique Doblas, CREAF



MERIEM ZOUAOUI BOUTITI RESEARCHER FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"It was a beautiful and enriching experience. It gave us the chance to discover another world of researchers, meet them, and establish professional relationships. Moreover, during the internship, we were initiated to learn soil microorganism sampling and identification techniques."

What is your feedback about this mobility program?

"It is vital to put in place such type of initiative. Scientific exchanges, both experimental and analytical, between the two north and south shores of the Mediterranean are a great professional opportunity, especially to publish in journals with high impact factors. It is always desirable to collaborate with research institutions abroad to widen the spectrum of scientific exchanges."



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CLICK AND DISCOVER RELATED CONTENT

Two more visits in 2019 for the FASTER Mobility Programme

Mobilising Excellence: Interview Meriem Zouaoi Boutiti



MAIN ACHIEVEMENTS

Collaborated with Dr Enrique Doblas and Dr Pilar Andres on soil organisms at CREAF headquarters and its field laboratory in Can Balasc

FEEDBACK FROM THE HOST

"It is always great to start collaborations with peers, no matter their origin, but in this case, it was especially rewarding...the potential exchange of knowledge is greatly beneficial for both sides...we are talking about excellent researchers with a huge interest in collaborating outside their countries!"

Dr Enrique Doblas, CREAF



SONIA SABBAHI RESEARCHER FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"This experience is allowing me to improve my laboratory skills and international networking as well as reinforce the research transfer capacity related to innovative wastewater and its management for climate change adaptation. It has also motivated me to further collaborate on the methodology of work in water quality, environmental microbiology, wastewater, and sewage sludge agricultural reuse in developing countries and for writing and publishing other works together".

What is your feedback about this mobility program?

"The program is allowing us to exchange and collaborate with Lund University by forging contacts and is also opening the possibility of a potential partnership and a project to improve the actual situation here in my country. Moreover, it is an excellent preparatory phase for my researcher career and hopefully will continue to be by maintaining contact with colleagues for future collaboration."

MAIN OBJECTIVES

 Maintain contact with Lund University colleagues for further future collaboration mainly by publishing research articles.
Discuss methodology of work "In situ" to deeply analyze and explore my data and obtain usable and publishable outputs for my research.
Possible training at Lund University and visiting research laboratories in Sweden to try new tools and technologies.

FEEDBACK FROM THE HOST

"Sonia studies the presence of helminth ova and protozoan cysts in dried sewage sludge samples from wastewater treatment plants in Tunisia before the sludge land application of the sludge at pilot plots. All examined dried sewage sludge sample contents were below the World Health Organisation recommendations, and thus, the sludge can be reused in a spread on agricultural soils."





NIDHAL MARZOUGUI RESEARCHER FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"The project has allowed me to consult and discuss the work methodology by getting to know the methods of my discipline at the partner university. So this exchange experience helped me analyse and develop my professional skills, gain experience in my field of work, develop my networks and meet colleagues at Lund University. This mobility program offers different opportunities to strengthen our research institute's cooperation with Lund partner universities."

What is your feedback about this mobility program?

"Initiatives like this one are important because they initiate contact between INRGREF and LUND researchers, start collaboration between them which will eventually result in publications in international scientific journals. They reinforce the knowledge transfer capacity of INRGREF and LUND researcher's related to innovative water management and increase performance through reinforcing basic skills and tools."

Online (ongoing)

MAIN OBJECTIVES

Consult and discuss the work methodology.
Write a joint article on wastewater treatment using plant adsorbents.
Set up a joint project in the field of water quality.

FEEDBACK FROM THE HOST

"Nidhal researched treatment methods for wastewater. All the investigated treatments decontaminated both types of urban wastewater. The best treatment of raw urban wastewater was obtained with the Indian variety, whilst treated urban wastewater was found for the Egyptian variety. The Egyptian and Indian Moringa varieties were the most effective in treating the urban wastewater qualities tested."



KHAOULA KHEMIRI PHD STUDENT FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"During this experience, I have had the opportunity to acquire new skills, make new friends, gain a new perspective, and participate in stimulating discussions with experts in our field or complementary fields. Working together has also allowed us to meet potential future collaborators. Through the collaboration, we have come up with new ideas, developed and shared knowledge, and created stronger transversality and involvement of all teams."

What is your feedback about this mobility program?

"Research and collaboration between INRGREF and LUND provide access to specialised equipment, develop new ideas and exploit new funding sources. For me, working internationally is not a choice but a way of life because science is an international and global enterprise. This collaboration improves knowledge transfer between research institutions and allows combining expertise and resources from both entities."

MAIN OBJECTIVES

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I 🖗	Finish and present the two article proposals.	
	Meet potential future collaborators.	
	Combine expertise and resources to answer larger and more complex scientific questions and broaden the scope of our research.	

FEEDBACK FROM THE HOST

"The student is co-supervised by the LU team. Her work involves the effects of climate change and population increase. Her study investigates the effect of each of these factors for runoff from the important Tunisian Merguellil catchment. She used more than forty years of data, and the methodology was based on hydrological characterisation. Results show that hydrological change is much more critical upstream than downstream, associated with the influence of humans, who are responsible for about 78% of the variation in flow, whilst climate change contributes to 22%."





HEND ASKRI RESEARCHER FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"FASTER mobility program is allowing me to strengthen my abilities in water resource management and enhance the INRGREF capacity building. I could also work with Data analysis and use a modelling approach to predict citrus yield reductions under specific field conditions."

What is your feedback about this mobility program?

"These experiences are very interesting for advancing my field research on Managing salinity citrus under different bioclimatic stages. They are an opportunity to discuss with an expert a modelling approach using Artificial Neural Network (ANN) to find interactions between variables.

Moreover, maintaining a sustainable INRGREF-LU collaboration through the submission of a joint application would be great."

MAIN OBJECTIVES



FEEDBACK FROM THE HOST

"Hend is working on predicting the impact of irrigation water chloride content and salinity on citrus yield. The developed model evaluates the effects of different soil properties, water chemistry, variety, and citrus rootstock. Data were collected during one year from 6 young citrus orchards. The modelling approach involves an artificial neural network, provides guidance on the best rootstock cultivar in combination with different irrigation water qualities, and estimates yield losses and gains under different environmental conditions."





DALILA SOUGUIR RESEARCHER FROM INRGREF

What do you take away from this exchange experience? What have you learned from it?

"Interactions with researchers working in different water aspects have huge benefits when solving statistical problems and writing scientific articles. The online collaboration with our colleagues from Lund University is, obviously, beneficial for me. Their participation in the revision of my manuscript helped me write a great paper. I also valued their support and advice when selecting the journal to make sure my work is published in the appropriate journal that fits the publication goals."

What is your feedback about this mobility program?

"The exchange will strengthen the existing partnership, enhance the knowledge and the sharing of experiences in the water-quality area between both partners, and allow establishing a long, consolidated and successful collaboration with our Lund colleagues. Moreover, it gives us the ability to take advantage of our Lund colleagues' experience. Their comments and advice are an added value to improving my manuscript."

Online (ongoing)

MAIN OBJECTIVES

Build future collaboration through either participation in publications or much broader through bilateral collaboration,
Take advantage of our Lund colleagues' experience.
Exchange of laboratory experiences in the field of water quality as well as environmental assessment.

FEEDBACK FROM THE HOST

"Dalila researches the use of nonconventional waters in irrigation, resulting in gradual changes of soil and an accumulation of contaminants in soil, plants, and groundwater. Her research is focused on the use of a biotest-micronucleus testfor risk assessment and toxicity prediction. Through the online collaboration, she is interested in a joint publication. She has just started drafting an article on water quality, genotoxicity, and plant growth, for which she is gathering data from previous and separate experiments."

CONCLUSIONS

The mobility program was highly successful, and outstanding achievements were made despite the relatively short study visit periods. Indeed, we saw considerable interest from both students and researchers to participate in this program. The interest remained high even though the Covid situation forced us to adopt a contingency online training schedule.

IMPACT OF THE PILLAR

• Goals achieved

8

Senior INRGREF staff visits to European centres were oriented to develop the necessary links to provide future research proposals, share PhD student projects, and co-author academic publications. Student and INRGREF staff visits to European centres were organised to enrich PhD projects, assist with local training activities and develop future collaboration (see further published articles below).

• How many people participated in the training activities

During the first project year of FASTER, 3 researchers and 2 PhD students visited the European partners. During the second and third mobility programs, 6 researchers and PhD students were supervised online.

• How many articles were published after mobilities

The following articles have been published after mobilities so far: Zemni, N., F. Bouksila, M. Persson, F. Slama, R. Berndtsson, and R. Bouhlila (2019) <u>Laboratory</u> <u>calibration and field validation of soil water content and salinity measurements using the</u> <u>5TE sensor</u>, Sensors, 19, 5272; doi:10.3390/s19235272. (Impact factor: 3.7).

Zemni, N., F. Bouksila, F. Slama, M. Persson, R. Berndtsson, and R. Bouhlila (2021) Evaluation of low-cost WET sensor to measure soil moisture and pore electrical conductivity, Arabian J. Geosci. (accept.). (Impact factor: 1.3)

Khemiri, K., S. Jebari, R. Berndtsson, and K. Maalel (2021) <u>Is climate or humans responsible</u> <u>for discharge decrease in the Tunisian Merguellil Basin?</u> Water, (revision). (Impact factor: 3.0).

Besides these, a conference contribution led forward to publication in proceedings:

Zemni, N., F. Bouksila, F. Slama, M. Persson, R. Berndtsson, and R. Bouhlila (2020) Evaluation of low-cost WET sensor to measure soil moisture and pore electrical conductivity, Paper number 77, Proc. 3rd Conf. Arabian Journal of Geosciences (CAJG), 2–5 Nov. 2020, Springer Nature.

Thus, the Faster program has worked to produce new knowledge and is contributing to sustainable research buildup.

GALLERY



PUBLICATIONS



and Risks for the Future. First Mediterranean Assessment Report.

Contributions: S. Jebari and E. Doblas in Chapter 2 «Drivers of change» *Published: November 17, 2020*

	Spatiotemporal analysis of landscape patterns and its effect on soil loss in the Rmel river basin, Tunisia Authors: S. Bouguerra, S. Jebari, J. Tarhouni Published: September 16, 2020
	Water and Photosynthetic Rate Flows Under Drought Conditions in a Cork Oak (Quercus suber L.) Forest of Tunisia. Authors: M. Baraket, S. Fkiri, K. Nefzi, S. Jebari, A. Khaldi and Z. Nasr Published: February 15, 2020
	Toward Decision-Making Support: Valuation and Mapping of New Management Scenarios for Tunisian Cork Oak Forests. Authors: M. Khalfaoui, H. Daly-Hassen, B. Stiti, and S. Jebari Published: February 11, 2020
	Laboratory Calibration and Field Validation of Soil Water Content and Salinity Measurements Using the 5TE Sensor. Authors: N.Zemni, F.Bouksila, M.Persson, F.Slama, R.Berndtsson and R.Bouhlila Published: November 29, 2019
	An analysis of sediment production and control in Rmel river basin using InVEST Sediment Retention model. Authors: S.Bouguerra, S.Jebari and J.Tarhouni Published: October 01, 2019
	Hydraulic Traits Performances of Three Pine Species in Tunisia. Authors: S.Cherif, O.Ezzine, M.L. Khouja and Z.Nasr Published: August 15, 2019
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Published: July 23, 2019

CONCLUSIONS & LESSONS LEARNT

The impacts and achievements of the capacity-building pillar are substantial and include the following quantitative results



LESSONS LEARNT INCLUDE





Farmers' Adaptation and Sustainability in Tunisia through Excellence in Research

ENHANCING THE POTENTIAL OF FASTER'S CAPACITY BUILDING INITIATIVES

Lessons learnt and future prospects



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