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Deliverable D.5.4. Final report on the mobility programme with Tunisian universities on problems of agricultural production and environments

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Work Package: WP5 – Sustainability and Internationalization

Task: T. 5.3 – Mobility program with Tunisian universities on agricultural production and in hot arid environment in the light of climate change

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1. Overview of the activity

This report presents the final results of the mobility programme implemented under Task T.5.3 within WP5 of the MARE project.

The mobility programme was designed to strengthen transnational cooperation between Italian and Tunisian universities, with a specific focus on agricultural production and environmental challenges in semi-arid and arid environments under climate change. Within this framework, the initiative promotes a comparative and integrated approach to agro-environmental systems, leveraging the complementarities between the two contexts.

In particular, Tunisian partners provide direct exposure to hot arid agro-ecosystems and related environmental constraints, while Italian partners, led by UNIPI, contribute analytical approaches, methodological tools and strategies aimed at enhancing the sustainability and resilience of agricultural systems. This mutual exchange represents a key element in addressing shared challenges such as climate change adaptation, soil degradation and food security.

The implementation of the mobility programme was affected by a delayed start of the project activities. As a result, the initial phase of the project was primarily dedicated to coordination and preparatory activities, while the actual implementation of mobility actions was concentrated in a later stage.

In light of this context, the present deliverable is structured as a comprehensive final report, integrating both the preparatory phase and the implementation of the first mobility cycle, rather than presenting separate interim and final reports.

The development of the mobility programme can be articulated into two main, closely interconnected phases.

The first phase, of a preparatory nature, focused on the establishment of a solid coordination framework among partner institutions. This included the definition and alignment of training contents, the preliminary identification of key skills and competencies required to address agro-environmental challenges, and the organisational planning of mobility activities.

The second phase corresponded to the effective implementation of the mobility programme. This phase encompassed the delivery of training activities, the organisation of institutional and academic meetings, and the initiation of curriculum co-design processes, particularly with regard to the development of a joint MSc programme. These activities ensured the translation of preparatory work into concrete educational and cooperation outcomes.

2. Mobility activities

The mobility programme implemented under Task T.5.3 primarily consisted of outgoing academic staff mobility from the University of Pisa (UNIPI) to Tunisian partner institutions.

In particular, a total of three professors from UNIPI (Bibbiani, Saia and Riccioli) participated in the mobility activities, which took place in November 2025. The host institution was the University of Tunis El Manar (UTM), specifically the Faculty of Sciences of Tunis, which ensured the local coordination and the academic framework for the implementation of the programme.

The structure of the mobility programme was designed to integrate multiple and complementary components. In addition to the delivery of training activities, the programme included institutional and academic meetings aimed at strengthening cooperation between partner universities, as well as dedicated moments for curriculum development and co-design. This integrated approach allowed the mobility to generate not only immediate learning outcomes, but also longer-term strategic results in terms of academic collaboration and programme development.

It should be noted that the initial design of the mobility programme also included student mobility actions. However, the implementation of these activities was affected by specific eligibility constraints related to PNRR funding regulations. In particular, the students initially selected for mobility were already involved in co-supervision agreements (co-tutelle) with UNIPI and were therefore not eligible to receive additional financial support under the PNRR framework.

As a consequence, student mobility could not be implemented within the present reporting period. Nevertheless, the programme ensured effective student engagement through direct participation in the training activities delivered at UTM. This approach allowed the achievement of the intended learning and capacity-building objectives, mitigating the impact of the constraints and preserving the overall effectiveness of the mobility programme.

3. Activities implemented during the mobility period

The activities carried out during the mobility period combined teaching, institutional cooperation and curriculum development in a coherent and integrated framework.

From a training perspective, the mobility included the delivery of advanced modules addressing key thematic areas relevant to agro-environmental systems under climate change. These covered geospatial analysis and GIS applications for land planning, statistical methods for environmental and soil data, sustainable soil and land management practices, and economic evaluation tools for agricultural investments. The integration of theoretical lectures with practical exercises ensured a strong application-oriented approach and enhanced the effectiveness of the learning process.

In parallel, the mobility programme included a series of institutional and academic meetings involving representatives of the host university, including faculty members, department leadership and university governance. These meetings focused on identifying shared priorities related to climate change adaptation, food security and sustainable resource management, as well as on aligning training activities with societal and institutional needs.

A further important component of the mobility concerned the identification of skills and competencies required to address current agro-environmental challenges. This process was supported through direct interaction with academic staff and students, as well as through the observation of training activities. The results highlighted the need for an integrated skill set combining technical, environmental, economic and transversal competencies.

Finally, the mobility programme contributed to the initiation of curriculum co-design activities, particularly in relation to the development of a Joint MSc programme (SAFEGUARD). The pilot modules delivered during the mobility provided a concrete basis for structuring future joint educational pathways and strengthening the internationalisation of academic programmes.

4. Results

The implementation of the mobility programme generated significant results in terms of learning outcomes, institutional cooperation and strategic development.

Participants acquired advanced competencies in geospatial analysis, statistical modelling, sustainable agronomy and economic evaluation, all of which are essential for addressing the impacts of climate change on agricultural systems. The practical orientation of the training activities further enhanced the applicability of these competencies in real-world contexts.

At the institutional level, the programme contributed to strengthening cooperation between UNIPI and Tunisian partner universities, fostering the exchange of knowledge and the alignment of research and teaching priorities. The interactions developed during the mobility created a solid basis for future collaboration and joint initiatives.

A key outcome of the programme is represented by the advancement of the Joint MSc programme (SAFEGUARD), which reflects the strategic objective of WP5 to promote curriculum innovation and internationalisation. The pilot modules developed and tested during the mobility constitute a first concrete step towards the formalisation of this programme.

The evaluation of the mobility programme, based on post-mobility questionnaires completed by participating staff, confirms a very high level of satisfaction and effectiveness. All respondents reported full alignment between planned and delivered activities and complete achievement of the intended objectives. No critical issues were identified during the implementation phase.

The results of the programme can also be interpreted through a set of key performance indicators. Three academic mobilities were successfully implemented, four training modules were delivered, and multiple institutional meetings were organised. The programme achieved maximum satisfaction scores (5/5) across all evaluation criteria and ensured strong engagement of students through participation in training activities, despite the absence of funded student mobility.

Overall, these results confirm the high level of effectiveness, quality and strategic relevance of the mobility programme, notwithstanding the delayed start of activities.

5. Critical issues encountered or Conclusion and Suggestions

The mobility programme implemented under Task T.5.3 can be considered highly successful, both in terms of operational execution and strategic impact.

Despite the initial delay in project activation, the programme demonstrated strong adaptability, successfully translating preparatory activities into concrete outcomes. The integration of training delivery, skills identification, institutional cooperation and curriculum development proved to be a particularly effective approach, enabling the achievement of multiple objectives within a single coordinated framework.

The programme significantly contributed to capacity building by equipping participants with advanced interdisciplinary competencies aligned with the challenges of climate change and sustainable agricultural systems. At the same time, it strengthened transnational cooperation and laid the foundations for long-term collaboration between Italian and Tunisian institutions.

Looking forward, several recommendations can be formulated. From an operational perspective, earlier planning and improved administrative coordination are essential to ensure timely

implementation of mobility activities. From a strategic perspective, it is recommended to institutionalise the mobility programme as a recurring mechanism for capacity building and to further develop the Joint MSc programme. Expanding mobility opportunities to include students and additional staff will also enhance the overall impact of the initiative.

From a methodological point of view, maintaining a strong integration between training activities and skills demand analysis will be crucial to ensure continued alignment with evolving societal and environmental challenges.

6. Attachments

- ☐ Detail of the implemented Mobilities