

M.Sc. on Integrated Drylands Management

IMPROVING WATER PRODUCTIVITY IN DRYLAND AGRICULTURAL SYSTEMS
(2016 - 2017)

October 2-22, 2016

Institut des Régions Arides (IRA) Médenine (Tunisia)



UNITED NATIONS
UNIVERSITY
UNU-INWEH
Institute for Water,
Environment and Health



ICARDA
Science for Better Livelihoods in Dry Area



THE GLOBAL MECHANISM





PROGRAMME OVERVIEW

The Joint Master's Degree (MSc) Programme on Integrated Drylands Management brings together different expertise and scientific resources of the partner institutes to build advanced human capital, and generate and adapt global knowledge for local solutions in drylands. The programme provides young professionals and scientists an international perspective on integrated resources management approaches in drylands and allows them to gain practical experience in different dryland countries. Throughout the programme, a strong emphasis will be placed on multidisciplinary approaches.

The MSc Programme will offer two components:

- A short intensive course
- Field research leading to the development of a Master's thesis.

The three-week course and field work will focus on the international dimension of dryland management and a range of research methods, tools and approaches. An international team of selected experts from all partners and their networks will provide a balanced mix of lectures and seminars.

The six-month field and laboratory research will be conducted under the supervision of one of the programme partners. Upon completion of the MSc Programme, students will receive a Master's Degree from their home university and a certificate from UNU.

Typically, the graduates from the MSc Programme serve in government departments and agencies (e.g. those dealing with agriculture, forestry, natural resources management, and combating desertification), teaching positions in institutions of higher learning, research institutions and doctoral research programmes.

PROGRAMME SCHEDULE

This year the short intensive course will be held at **Institut des Régions Arides (IRA) Médenine (Tunisia)**

October 2-22, 2016

Course work at IRA

- Arrival in Médenine - Tunisie - Oct 2, 2016
- Course work at IRA: field trips practical exercises, seminars, group work
- Finalization of the research proposal

November 2016–October 2017

Field research and thesis preparation

- Data collection and analysis
- Submission of draft thesis to the supervisor

Late 2017 / Early 2018

Graduation

- Thesis Submission
- Thesis Defense



COURSE WORK

FIELD RESEARCH AND DISSERTATION

International experts from all partner organizations and their networks, representing different disciplines in drylands management, will facilitate a mixture of lectures, seminars, laboratory applications and field visits to the arid landscape in Tunisia.

The focus of the course work will be on research and practices for combating desertification, and will include inter and multi-disciplinary aspects such as climate change, integrated water and land management, land neutrality and economics aspects.

The lectures will further cover a wide range of disciplinary and inter-disciplinary subjects on:

- Degradation and development of arid ecosystems, including mainly aeolian desertification (status, process, mechanism, mitigation, monitoring and assessment, etc.);
- Dryland ecology (soil and water processes in typically dry ecosystems such as steppes, desert steppes, cold deserts, oases, etc.);
- Climate change (in cold and arid regions); and,
- Dryland economics (valuation, management and strategies for investment, monitoring and evaluation).

**Please note that in order to facilitate the visa application process for studying abroad in Tunisia, applicants must hold a passport with a validity of more than 6 months.*

As part of their application, students need to submit a research proposal and two letters of recommendation, one of which must be from their research supervisor, to the MSc Programme Committee for approval.

The student will need to demonstrate that the proposed field research involves in-situ field work and gives due consideration to community involvement. Partners will provide limited funds for students to carry out field research by involving them in ongoing research programmes.

In addition to a principal supervisor from their home university, the MSc Programme student will have an associate supervisor from the partner institute that will host his or her field research work.





ADMISSION REQUIREMENTS

Admission is based on the following criteria:

- Applicants must already be registered in a Master's degree programme at one of the Programme partner institutes and have completed their basic course work.
- Applicants registered in a Master's programme at an accredited university outside the Programme partners may be eligible to apply if they have completed their basic coursework, and can establish a link with a Programme partners for their field research and thesis work which will be undertaken jointly with their current supervisor. Such applicants should contact the interested Programme partner institute directly to explore options and arrangements.
- Applicants must demonstrate a proved competence in relevant research methodologies, laboratory and computer skills.
- Applicants must demonstrate proof of proficiency in English (oral and written).
- Applicants must submit a research proposal of 5 pages, whose priority aligns with that of programme partner who will host the proposed research.
- Working experience in dryland management is desirable.

TUITION FEE AND SCHOLARSHIPS

Tuition fee is US \$6000, including costs of course delivery, supervision, and examination. The fee does not include travel costs between the country of the student's origin and locations of the MSc Programme partners, and costs of living at the MSc Programme partners. Information on local food, accommodation, health insurance, and other logistical matters will be available from MSc Programme partners. The tuition fee will be waived for students who are Fellowship recipients.

A limited number of Fellowships will be provided to qualified candidates from developing countries on a competitive basis. These fellowships will cover the travel costs between the country of origin and IRA, CAREERI, ICARDA, and TU, as needed. Japanese students may only apply for TU fellowships.

During the course work in 2016, IRA will house the students with full boarding and lodging in a suitable accommodation in Médenine, Tunisia. During laboratory research work, TU will provide non-Japanese students with allowance for accommodation and meals in Tottori, Japan.

**No financial provisions, logistical assistance or housing facilities will be made available for family members of participants.*



FIELD COURSE SCHEDULE

Content Outline of the Three Week Schedule
October 2-22, 2016

Week 1 October 3-8

- Soil-water-plant relationship
- Photosynthesis and plant water relations
- Field soil moisture measurement and monitoring
- Computation and analysis of field water balance
- Soil nutrient availability and dynamics
- Water productivity concept and improvements
- Economics of water productivity

Field visit to an agriculture research station in Médenine (Saturday)

Week 2 October 10-15

- Irrigation systems (surface and modern)
- Supplemental irrigation: definition, concept and application
- Water harvesting: definition, concept, components and methods
- Water quality and use of marginal-quality water resources (wastewater and saline water) in agriculture
- Salinity development and management in agriculture lands
- Ground water management in dry areas

Field visit to water harvesting sites (Saturday)

Week 3 October 17-21

- Soil and water conservation and land management: Concept, practices and challenges

- Application of GIS and remote sensing in water and land problems solving
- Conservation agriculture in dry lands systems
- Climate change and sustainable drylands management
- Rangeland rehabilitation and monitoring
- Land degradation, desertification and the post 2015 development era (Sustainable Development Goals)

22 October

Course evaluation and departure

Notes

- Trainers will be from IRA and its associate offices, university faculty and senior scientists from national institutions and experts from participating organizations
- There will be excursion tours on Saturdays, October 8 and 15
- Saturdays field visits will be day long with lunch served in the field
- Third week is devoted to multidisciplinary topics and IRA scientists along with global experts will be lecturing to cover that
- There will be a mix of interactive learning sessions, quizzes and group presentations to evaluate the trainees
- Trainees shall do assessment of the course, give feedback and recommendations, and evaluate trainers at the end of the course
- Trainees, in addition to those of the MSc Program, will be invited from other programs and regions where IRA operates



HOW TO APPLY

The following supporting documents* must be submitted together with the completed and signed application form (application form available at <http://inweh.unu.edu/msc-drylands>)

1. For applicants registered with a Programme partner, a letter of nomination from your supervisor/university where you are registered certifying completion of basic course work;
2. For applicants registered at an accredited university outside the Programme partners, a letter of nomination from your supervisor university where you are registered certifying completion of basic course work and clarifying the link between your university and one of the MSc Programme partners for joint supervision of research and thesis work;
3. A certified copy of academic transcripts for each institution attended;
4. An original, detailed MSc research proposal of 5 pages clearly outlining the problem statement, literature review, research question, methodology, expected results, workplan, and timetable;
5. Two (2) original supporting letters of reference, one (1) of which must be from your current supervisor;
6. Evidence of English proficiency (e.g., TOEFL score, English certificate, etc.), where English is not your first language.

**Documents which are not originally in English must be accompanied by an official English translation.*

The deadline for application submissions is June 30, 2016.

Incomplete applications will not be considered.

Please send your fully completed application form and supporting materials by email, fax, or post marked to:

Dr. Nidhi Nagabhatla

MSc Programme Committee

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The Joint Master's Degree (MSc) Programme on Integrated Drylands Management is offered jointly through the partnership between the United Nations University (UNU), Institut des Régions Arides (IRA) [Institut National Agronomique de Tunisie (INAT)], Cold and Arid Regions Environmental and Engineering Research Institute (CAREERI), the International Center for Agricultural Research in the Dry Areas (ICARDA), Tottori University (TU), the Global Mechanism (GM) of the United Nations Convention to Combat Desertification (UNCCD), and the International Center for Advanced Mediterranean Agronomic Studies (CIHEAM) - Mediterranean Agronomic Institute - Bari



CONTACT US

For inquiry about the programme, please contact persons listed below:

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REFLECTIONS OF 2015

I think China needs capacity for managing drylands and land degradation issues. During the Masters in Integrated Drylands Management field course training, I learned a lot from different professors on various topics e.g. desertification, soil and water conservation...etc. The most impressed knowledge I got is about the difference between output and outcome during drylands management and knowledge to connect the science and society. Based on the overall learning from this course, I am thinking about to study GIS and RS as my major during my Ph.D. degree. Finally, I have to say that I received really wonderful friendship during this course. We helped each other and exchange our thoughts during the course which made us know more about different cultures. I hope I can meet everyone in the near future.

Chen Xiang, China

I think China still needs more efforts to manage drylands and land degradation issues. One third of the land in China is drylands and land degradation is severe. In my opinion researchers and government should work together to improve the environment. During the 3-week course at CAREERI, I learned about topics like waste water management, gender equality, sanitation, soil salinization, issues in Africa and so on. And I made my first English presentation. Through the program I got an opportunity to visit Arid Land Research Center, Tottori University, Japan. I do not want miss stating that I met scholars from different parts of the world during the program and we are now very good friends. Also, I have learned much from the professors and the expert from UNU-INWEH, not only about the research, but also about the thinking. Sometimes I only focus on my issues and I never see around. What about other people? What are they thinking? What are their problems? The program has broadened my vision. A big thank you- UNU-INWEH.

Ma Tingting, China

In Tunisia about the half the territory is under dry and semi dry climate and degradation of agricultural lands is estimated at about 20.000 ha/year. Short term focused economic development models and the lack of awareness is causing the threat of desertification; therefor strengthening capacity for managing dry lands and land degradation issues needs absolute attention. This course taught me about their challenges and experiences to combat desertification. The possibility of exchanging experiences and success stories .I learned a lot and read articles of the lecturers who delivered the course, especially research of Dr Nagabhatla using remote sensing tools in agriculture and environment sectors. The key skill that I have developed the is how to communicate my work.

Fajr Fradi, Tunisia

I strongly think that Kenya needs capacity development on managing drylands and land degradation. Of a total area of about 581,309 km², about 18% of land has some agricultural potential, while the rest is arid and semi-arid with low production potential. Mostly drylands is left underutilized or mismanaged. To tackle the problem of food insecurity in the region sustainable and integrated management of drylands is crucial. I now see things differently compared to before attending the training program. My key lesson-connect theoretical learnings with practical applications. I now try to seek solutions to farmers' problems through my academic learning. I am currently working on my thesis supported under the same programme and from the knowledge I received in China; I have focused more on teaching farmers in the Kenyan drylands on water harvesting technologies and efficient use of water resources.

Hudson W. Shiraku, Kenya

Tunisia is a developing country that needs to preserve and well manage its limited resources and challenge of desertification. Capacity development for addressing these management concerns remains crucial. Monitoring and evaluation activities must increase their focus on outcomes by shifting towards better measurement of performance and more systematic monitoring. Such activities must be inspired by an organizational culture of learning, transparency and accountability. In this program, I learned that land degradation is an international issue; it's not just a biophysical process but a combination of human-induced process that can impact the future of food security. My master's thesis proposal deals with investigating-'Soils in semi-arid and arid areas in Tunisia are known to have low organic matter levels, a low fertility and a high exposure to degradation, desertification and pollution. We seek to enhance soil organic matter and crop productivity using direct application of olive mill waste water. At CAREERI, I observed how the similar issues and solutions (spreading organic residues) while using the opportunity to exchange views and ideas with the experts. I'm grateful to the UNU-INWEH for providing me an opportunity to gain scientific knowledges, improve my social skills and learn about other cultures.

Mariem Hazoug, Tunisia