Transforming agricultural Research & higher education to enhance graduate employability

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Our vision – An Agricultural R & HE System Coherent, Open, Interactive, Producer of Knowledge & Innovation, and Creator of Wealth and Employment for an Efficient, Sustainable, Resilient and Inclusive Agriculture

Tunis, June 15th 2019
Outline of the presentation

- Highlights on the Agricultural Research and Higher Education System (ARHES) of Tunisia
- The strategy of the Institution of Agricultural Research and Higher Education (IRESA) to reform agricultural research and higher education
- Projects/Activities for improving quality of education and employment opportunities for graduates
1897: The Breeding laboratory
Currently: the Veterinary Research Institute of Tunisia (IRVT)

1898: The Colonial School of Agriculture
Currently the National Institute of Agronomy of Tunisia (INAT)

1913: The Botanical Service of Tunisia
Currently the National Institute of Agronomic Research of Tunisia (INRAT)

1924: Oceanographic Station of Salambo
Currently the National Institute of Science and Technology of the Sea (INSTM)

Tunisian agricultural R&HE: More than a Century

23 institutions of R&HE

- 06 Research Institutions
- 04 Research centers
- 11 HE institutions
- 02 Development centers
The system of agricultural R&HE system (23)

Figures & Facts

Fields of Research (07)
- 29% Crop production
- 20% Natural ressources
- 17% Animal Production & Health
- 9% Forestry
- 9% Biotechnologies
- 9% Rural Economy
- 9% Fishery & Aquaculture

Scientific Production
- 800 publications (12% total national)
- 0.8 publications/Researcher/Year
- 220 Improved varieties (130 cereals)
- 46 Patents (6 international)

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<tr>
<th>Institution</th>
<th>Year</th>
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<tbody>
<tr>
<td>National Institute of Agronomy of Tunisia (INAT)</td>
<td>1898</td>
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<tr>
<td>Higher School of Food science of Tunis</td>
<td>1980</td>
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<td>Higher Institute of Agriculture of Chott-Mariem</td>
<td>1975</td>
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<td>Higher School of Agriculture-Mograne</td>
<td>1983</td>
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<td>Higher School of Mateur</td>
<td>1984</td>
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<td>Higher School of Agriculture of Kef</td>
<td>1983</td>
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<td>Higher School of Engineering of Medjez El Bab</td>
<td>1976</td>
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<tr>
<td>Higher Institute of Sylvo-Pastoral of Tabarka</td>
<td>1983</td>
</tr>
<tr>
<td>Higher Institute of Fishery and Aquaculture of Bizerte</td>
<td></td>
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<tr>
<td>Higher Institute of Preparatory studies of Soukra</td>
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<tr>
<td>National School of Veterinary Medicine</td>
<td>1974</td>
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### (08) Fields of Education

- ✔ Crop Production and Environmental Sciences
- ✔ Animal Production
- ✔ Crop Protection
- ✔ Agricultural engineering, water and Forestry
- ✔ Agricultural Economics
- ✔ Agri-Food Industry
- ✔ Fishery & Aquaculture
- ✔ Veterinary medicine
The Agricultural Higher Education in Numbers

2018-2019: 3640 students (70% Women)

- Ingénieur: 20%
- Licence appliquée: 16%
- Master: 7%
- Doctorat: 7%
- Médecine vétérinaire: 42%

Faculty: 415

- 13% Professeurs
- 24% Maître de conférences
- 34% Maîtres assistants
- 11% Assistants
- 18% Hospitale
- 11% Universitaire

Average number/year of undergraduate & graduate students (about 1200)

- 600 Engineers in Agronomy
- 300 Technicians (Bachelors)
- 200 Master students
- 100 PhD
- 90 Doctors in veterinary
Graduate Studies

- **Masters:** 10 MR & 06 MPRO

**Graduate schools (03)**

- Agricultural Sciences & Technics and Environment (INAT)
- Agronomy and Environment (ISACM)
- Life Sciences and Environment (ESA-Kef)

✔ PhD in Agri-Food Industry (ESIAT)
E-learning

2008: MODECO
(Ecotourisme)

2012: VAGDRA
Food valorization and sustainable management of animal resources

2014: DEMETER
Sustainable Territorial development

2015: MOOC ECOTOURISME
(1st MOOC in Africa)

Partners:
- Université virtuelle de Tunis (UVT)
- Agence Universitaire de la francophonie (AUF)

- Plateforme de gestion des stages SEMSEM
- Plateforme Moodle

Plus de 100 cours scénarisés et numérisés
Institution of Agricultural Research & Higher Education (IRESA)

WHAT IS IRESA?
The Institution of Agricultural Research & Higher Education (IRESA)

- Founded in 1990
- Ensures the **scientific and academic coordination** between (23) institutions
- Under the **supervision** of Ministry of Agriculture, Hydraulic Resources and Fishery

**MISSIONS**
- **Promote** agricultural research and **link** research to higher education and extension
- **Plan** research programs in different agriculture-related fields to address the country’s needs, **follow-up** and **evaluation** of these programs
- **Ensure** that research & HE institutions meet the needs of country’s agriculture and development
IRESA’s Organizational Chart

President

General Secretary

Directorate of Corporate Services

Directorate of Technologies of Information Treatment & Communication

S/D Management Control

Council of Agricultural Research & High Education

Directorate of Higher Education

Directorate of Planification, Monitoring and Evaluation of Research Programs

Directorate of Innovation, transfer and linkage between Research & Extension

S/D International Cooperation

Directorate of Planification, Monitoring and Evaluation of Research Programs

Directorate of Innovation, transfer and linkage between Research & Extension
Tunisian agriculture: Figures & Facts

- 10% of GDP
- 16% Employment
- 10% Investment
- 10% GDP
- 9% import
- 10% export
- 10% export
- 9% import
- 10% investment
- 10% GDP
- 10% employment
- 10% agriculture

Agricultural Area
(10.5 Mha)

- Arable Land: 48%
- Forest and Pasture: 52%

516,000 farmers
(75% less than 10 hectares)
Global challenges facing the world: Agriculture

- Food security
- Scarcity and degradation of natural resources (soil, water and biodiversity)
- Climate changes

Vulnerability, resilience, sustainability... of production systems

- Environmental and sustainable agricultural development: Major issues to be addressed and incorporated in agricultural education and research

“There is no security on an empty stomach” (Norman Borlaug)

Based on IPCC Scenario A1B, Average of 21 GCMs (1980/99 to 2080/99)
A **strategic diagnostic** conducted by Iresa and its institutions...

05 major problems identified:

1. Commitment to the system
2. Coherence of the system
3. Valorization of research’s results
4. Employability of graduates
5. Efficacy of support services

Iresa, developing a new strategy of agricultural research and Higher Education 2030
Vision
Missions - Values
Orientations
Objectives
Initiatives
Projects
Conceptual
Action Plans
Operational
Ongoing Projects/Activities to improve quality of research and higher education and employment opportunities for graduates
Formulation of Research Priorities in agriculture 2030

IDRs
Orientations R
Outputs R
Programs R
Besoins R

Challenge

Problem 1  Problem 2  Problem 3  Problem n

Topic 1  Topic 2  Topic 3  Topic n

Impact pathway
A participatory method for identifying problems & constraints to agricultural development

Problem identification by farmers in workshops

Matrix of problems families & prioritization

Research programs 06)

P1. Sustainable production systems in the context of degraded NR & CC

P2. Sustainable management of fish farming systems & fisheries resources

P3. Exploitation and promoting natural resources under the context of CC

P4. Sustainable management of forest & rangeland resources

P5. Agriculture politic and inclusive promotion of rural world

P6. Food industry value chain & social innovations
Improving the quality of higher education (1/4)

Commission Qualité de l’Enseignement Supérieur Agricole (CQUESA) at IRESA

Lettre d’information

Evaluation en ligne des cours par les étudiants

En 2006, la CNE a réalisé pour la première fois une évaluation externe de quatre établissements d'enseignement supérieur.

- Implementation of QMS in agricultural education (ISO9001V2015)
- Institutional self-assessment and quality audits (with collaboration of AUF; IRESA-AUF Framework Agreement signed in 2017)
- Accreditation of HE programs (by 2023)
Improving the quality of higher education (3/4)

- Capacity development (training the trainers)
  - Active learning methods
  - Soft skills (ECO-C certification)
Digitalization in agricultural higher education

'A digital farm is more efficient and sustainable……'

New Master PRO « Informatique appliquée à l’agronomie » (Institut Supérieur d’Informatique & Ecole Supérieure d’Agriculture du Kef) (25 students)

Project « Réseau International de campus numériques en Agrobiosciences »
Improving Employment Opportunities for graduates (1/3)

Curricula design based on competences and learning outcomes (Curricula alignment)

A participatory approach: Analysis of job markets and employers’ requirements to plan and develop appropriate programs


Relation avec la profession

Professionnels, Enseignants, Chercheurs, Structures, Organismes gouvernementaux, ONG, Associations (ATFI: Membre du COPIL).
Improving Employment Opportunities for graduates (2/3)

- **Learning outcomes** are statements specifying what student will learn or be able to do as a result of a learning activity.

- Learning outcomes refer to knowledge, skills and attitudes.

(American Association of Law Libraries: http://www.aallnet.org)
Curricula focusing on specific technical knowledge (content)
Teacher-centered approach
Transfer of knowledge

Curricula focusing on abilities of students to solve problems relevant to societal needs (outcome)
Student-centered approach
Development of learning outcomes and competences
Thank you for your attention