The Institution of Agricultural Research and Higher Education of Tunisia

Meeting the challenges and making changes

Prof Elies HAMZA
Outline

- Share some facts about the Tunisian agriculture and environmental situation.

- Outline the Tunisian agricultural higher education.

- Discuss major issues and challenges higher education institutions of agriculture face to develop their curricula to address the Tunisian agriculture needs.
Agriculture plays a foreground role in the Tunisian economy, accounting for 12% of the GDP and providing jobs for 16% of the country’s workforce.

It contributes by 11% to exportations and 14% to investments.

Agriculture ensures the country food safety based primarily on the national agriculture production and is the principal activity in several regions.
Main indicators of Agriculture

- Total land: 10.5 millions hectares
  - Arable land: 5 millions hectares
  - Forests and rangelands: 5 millions hectares
  - Irrigated area: 400,000 hectares
- 66 % of the cropped area receives less than 400 mm/year of rainfall
- Agricultural areas are characterized by land fragmentation and dominance (80%) of small sized farms (≤ 20 ha)
Agricultural Higher Education
Institution of Agricultural Research & Higher Education (IRESA)

Ministry of Agriculture

Ministry of Higher Education & Scientific Research

IRESA

2 Regional branches

4 Reg. Research Centers

11 institutions of Higher Education

6 Institutions of Research

384 Researchers

435 Faculties

34LR 13UR
11 institutions on Agricultural Higher Education

<table>
<thead>
<tr>
<th>Institute/School</th>
<th>Year of creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Institute of Agronomy of Tunisia (INAT)</td>
<td>1970 (ECAT:1898)</td>
</tr>
<tr>
<td>Higher School of Food Industry of Tunis (ESIAT)</td>
<td>1980</td>
</tr>
<tr>
<td>Higher Institute of Preparatory Studies in Biology-Geology of Soukra (ISEP-Soukra)</td>
<td>2004</td>
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<tr>
<td>Higher School of Agriculture of Mateur (ESA Mateur)</td>
<td>1984</td>
</tr>
<tr>
<td>Higher Institute of Fisheries and Aquaculture of Bizerte (ISPAB)</td>
<td>2003</td>
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<tr>
<td>Higher School of Agriculture of Mograne (ESA Mograne)</td>
<td>1983</td>
</tr>
<tr>
<td>National School of Veterinary Medicine of Sidi-Thabet (ENMV)</td>
<td>1974</td>
</tr>
<tr>
<td>Higher Shool of Engineering and Rural Equipement of Medjez el Bab (ESIER)</td>
<td>1976</td>
</tr>
<tr>
<td>Higher School of Agriculture of Kef (ESAK)</td>
<td>1983</td>
</tr>
<tr>
<td>Institute of Forestry, Tabarka (ISPT)</td>
<td>2004</td>
</tr>
<tr>
<td>Higher Institute of Agriculture of Chott-Mariem (ISA-CM)</td>
<td>1975</td>
</tr>
</tbody>
</table>

- IRESA, through its direction of Pedagogical affairs, ensures the scientific and academic coordination between these institutions.
- **Joint supervision** with the Ministry of Higher Education and Scientific Research
Number of enrolled students (academic year: 2014-15)

<table>
<thead>
<tr>
<th>Cycle de formation</th>
<th>Effectif</th>
<th>Pourcentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Préparatoire</td>
<td>464</td>
<td>9%</td>
</tr>
<tr>
<td>Médecine vétérinaire</td>
<td>388</td>
<td>8%</td>
</tr>
<tr>
<td>Ingénieur</td>
<td>2073</td>
<td>40%</td>
</tr>
<tr>
<td>Licence</td>
<td>1147</td>
<td>22%</td>
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<tr>
<td>Mastère</td>
<td>367</td>
<td>7%</td>
</tr>
<tr>
<td>Doctorat</td>
<td>701</td>
<td>14%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5140</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Number students graduated in 2013-14

<table>
<thead>
<tr>
<th>Graduates</th>
<th>Number</th>
<th>Pourcentage</th>
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</thead>
<tbody>
<tr>
<td>Ingineers</td>
<td>616</td>
<td>41%</td>
</tr>
<tr>
<td>Licence</td>
<td>515</td>
<td>34%</td>
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<tr>
<td>Masters</td>
<td>237</td>
<td>16%</td>
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<tr>
<td>Veterinaries</td>
<td>80</td>
<td>5%</td>
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<tr>
<td>PhD</td>
<td>48</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1496</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Faculty (435)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Effectif</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Professeurs</td>
<td>74</td>
<td>17%</td>
</tr>
<tr>
<td>Maître de conférences</td>
<td>54</td>
<td>12%</td>
</tr>
<tr>
<td>Maître assistants</td>
<td>90</td>
<td>21%</td>
</tr>
<tr>
<td>Assistants</td>
<td>93</td>
<td>21%</td>
</tr>
<tr>
<td>Hospitalo universitaires</td>
<td>45</td>
<td>10%</td>
</tr>
<tr>
<td>Autres</td>
<td>79</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>435</strong></td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td>Specialities</td>
<td></td>
<td></td>
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<tr>
<td>-------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Plant sciences</td>
<td></td>
<td></td>
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<tr>
<td>- Animal sciences</td>
<td></td>
<td></td>
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<tr>
<td>- Crop protection</td>
<td></td>
<td></td>
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<tr>
<td>- Agricultural engineering, water and Forestry</td>
<td></td>
<td></td>
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<tr>
<td>- Agricultural economics</td>
<td></td>
<td></td>
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<tr>
<td>- Food sciences</td>
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<tr>
<td>- Fisheries</td>
<td></td>
<td></td>
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<tr>
<td>- Horticulture &amp; Landscape</td>
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</tbody>
</table>
Meeting the challenges and making changes
Within a context of climate changes and depletion of natural resources

Challenges

• Producing enough food to feed the growing population (food security and safety)
• Conservation of natural resources to ensure sustainable productivity
  + Soil rebuilt and protection
  + Soil and water resources preservation and management
• Preservation and improvement small farmers’ livelihood
The next generation of agricultural leaders must be ready to meet the needs of our agricultural system.

There is no single approach to training and preparing these leaders.

A willingness to change has became imperative.
• What is the approach to be undertaken in modern agriculture?

• The Agronomy is the study of all the relationships between the natural environment and the living world within a socio-economic context.

• His practice involves an interdisciplinary education based on scientific knowledge, the core disciplines, economics, engineering, social engineering, law, IT.
The role of the agronomist is:

• 1- to study and predict the relationships and reactions of all agricultural systems, in the short and long terms

• 2- to identify the strategies to achieve a production on the farm, to prospect and develop value chains, to establish a regional or national policy and to quantify the risks associated with each strategy.

The research and development will therefore be an essential part of the activity of the agronomist.
However, the rapid evolution of research, the available technologies and the economic conditions prohibit the agronomist to apply recipes.

The agronomist must constantly adapt to changes.

His theoretical and practical education should enable him to:
- To have a scientific mind,
- To perform a diagnosis,
- To Take effective and innovative decisions
ENGINEER OR "MANAGER"?

There are no typical career paths for an agronomist. But usually there are two major ways:

- **Technical expertise** based on scientific knowledge

- Managerial expertise based on other skills than technical ones
What contents for training of the Agronomist
New generation of public and private actors

↓

Efficient ecological agriculture

Ensuring food security
Training offer
Capacity building on analysis of public policies, of economic exchanges and of approaches chains

Develop multidisciplinary approaches

Bringing the Higher Edu World with the Enterprise

Prepare and train for future jobs

The project management

Innovation Production and management
downstream Careers: logistics, processing, distribution

Specific Skills: Diagnostic of complex situations, international openness, interpersonal skills

Bringing the Higher Edu World with the Enterprise
Improving the methods, approaches and teaching tools
Facilitating access to information: ICT
E-Learning
Implement quality approaches applied to the educational process

Technical standards
Results of research and technology transfer
NR and energies Management
Drought tolerant crops and low water demanding crops.
  Integrated plant protection
Product quality and processing industries
Valorization of wastewater
Organization of chains
Product traceability
New educational concerns for sustainable development

Develop multidisciplinary and cross-cutting approaches
Spending from agricultural and rural development to territorial development
Intensive and / or family farming ?
Innovative production systems , resource management
Offering healthy and affordable products
Take into account the withdrawal of the State and the responsibility of professional organizations
Taking into account price volatility
Natural climate variability and climate change
Consumer behavior and structural dependency on external imports
Conclusion

- Implementation of innovative curriculum with strong employability
- Strengthening the entrepreneurial capacity of students
- Promoting multidisciplinary partnerships, mainly with the socio-economic environment
Thank you for your attention