

Cooperation for education in agriculture: CISA0_Unito and CLICHA project, a modern training approach to cope with the challenges of climate change and food security

D. De Meneghi^{1,2}, C. Semita^{3,2}, P. Barge, N. Giuggioli^{4,2}, L. Gasco^{4,2}, C. Peano^{4,2}, R. Fortina^{4,2}

¹ Dept. of Veterinary Science, ² CISA0_Unito, University of Turin, ³ Dept. of Earth Sciences, University of Turin, ⁴ Dept. of Agricultural, Forest and Food Sciences

A significant impact of climate change (CC) on the primary sector (agriculture, livestock breeding and fishery) is the threat to food security from decreasing crop yields, extinctions of breeds and varieties, and loss of habitats from extreme events (i.e. drought and inundations). The improvement of resilience in agriculture is a key feature to ensure the sustainability in food production, and at large the survival of mankind. The Mediterranean region has been identified as one of the most prominent CC hotspots: in this area, CC could further exacerbate already existing problems related to water scarcity, groundwater salinization and soil desertification, thus resulting in a decrease in land productivity, agricultural yields and rural income. Therefore, the national economies of the Mediterranean countries, especially the developing ones, would suffer not only from the direct impacts of CC, but also from the high costs of mitigation.

The CLICHA project (Climate Change in Agriculture) was designed upon a national priority (environmental protection) of a partner country, Tunisia; this is also a regional priority for the neighbouring countries. Amongst the many subjects that could be covered under the heading of environmental protection, the project consortium selected agriculture as it plays a vital role for the Tunisian economy. The strategic objective of EU-Tunisia relations involves the support to sustainable development – including sustainable agriculture - for reducing social and regional inequalities and improving the population's standard of living.

As it is not possible to cope with CC challenge and stimulate sustainable agriculture without a strong focus in education, the CLICHA consortium deemed it important to modernise the curricula of Agriculture and Animal Production courses offered by the Tunisian Higher Education Institutions (HEIs), so that students could be equipped with the necessary skills and knowledge to tackle this challenge under the specific local conditions.

CLICHA is an ERASMUS+ project (Key Action 2 - Cooperation for innovation and exchange of good practices - Capacity Building in Higher Education) which has embraced an interdisciplinary approach for this complex problem.

The wider objective of CLICHA project is to create qualified scientists who will contribute to the development of environmentally friend and sustainable agriculture, and will be readily absorbed by the labour market. These scientists could become the transformation factor for the whole society towards a more sustainable way of farming, production, consuming and living: to produce "enough safe and right food" for all.

The major objectives and outputs of CLICHA project are:

- a) production of new teaching material on "climate change, crop and animal/livestock production", paying particular attention to sustainable use of water resources;
- b) development of new/updated courses; an overall of 41 common curricular courses on the above subjects - including the Climate Change component - were evaluated and updated;
- c) use of modern learning/teaching materials & tools (provision of ICT equipment, e-learning platform, dynamic website, etc.);
- d) reinforcement of internationalization activities, partnership strengthening (conferences, common publications, teachers exchange);
- e) involvement of the private sector (enterprises, commercial companies, etc.) to be linked with research & academia (business fora);
- f) dissemination amongst stakeholders and general public (tv, news, social media, etc.), and third mission activities.

The project activities are developed by 10 Partners from 4 Countries:

-3 partners from Greece: P1 Agricultural University of Athens (AUA, EU project coordinator); P2 Creative Thinking Development (CRE.THI.DEV.); P3 National Centre for Scientific Research "Demokritos"

-5 partners from Tunisia: P4 University of Jendouba (UJ, Tunisian project coordinator); P5 University of Carthage (UCAR); P6 University of Sousse (US); P7 National Institute of Field Crops (INGC); P8 Centre of Adaptation to Climate Changes (CACCC);

-1 partner from Latvia: P9 Latvia University of Life Sciences & Technologies (LLU)

-1 partner from Italy: P10 CISA0_UNITO, Università degli Studi di Torino

Although CLICHA project targets directly the HEIs, the final impact is expected to be far wider.

Besides the Tunisian students and the teachers and technical staff of Tunisian and EU HEIs, the other target groups that will benefit the project's outputs are the local enterprises and the private sector.

Commercial and business companies will participate to the project events, and will be informed about the opportunities opened in North Africa on sustainable agriculture; they will also acquire and exchange knowledge from the HEIs and other businesses, initiating alliances with Academics and students. Professionals trained in HEIs who develop, lead, manage, teach, work in, and influence society's institutions, will be informed on the phenomenon of CC and will be trained on how reduce and/or overcome CC, thus contributing to a more climate-neutral and sustainable society.

The project has a 36 months duration: the activities started in October 2017, and will end by October 2020.