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in

Romagosa I. (ed.), Navarro M. (ed.), Heath S. (ed.), López-Francos A. (ed.).
Agricultural higher education in the 21st century : a global challenge in knowledge transfer to meet world demands for food security and sustainability

Zaragoza : CIHEAM

Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 113

2015

pages 205-215

Article available on line / Article disponible en ligne à l'adresse :

<http://om.ciheam.org/article.php?IDPDF=00007613>

To cite this article / Pour citer cet article

Romagosa I., Cerezo M. **An international cooperation model: CIHEAM-IAMZ training activities.** In : Romagosa I. (ed.), Navarro M. (ed.), Heath S. (ed.), López-Francos A. (ed.). *Agricultural higher education in the 21st century : a global challenge in knowledge transfer to meet world demands for food security and sustainability*. Zaragoza : CIHEAM, 2015. p. 205-215 (Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 113)



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An international cooperation model: CIHEAM-IAMZ training activities

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Abstract. Since its foundation in 1969, advanced training has been the essence of the activities conducted by the Mediterranean Agronomic Institute of Zaragoza (IAMZ). IAMZ fulfils its mission, as an axis of international cooperation within the scope of agriculture, food and the environment, through two complementary training programmes: degree-leading and short duration advanced postgraduate courses for professionals. They are both clear, effective instruments of international cooperation, based to a large extent on synergies established with Spanish and international institutions of excellence. We review the activities carried out at IAMZ over the last 25 years and make a critical analysis of the demand and the pros and cons of these training programmes.

Keywords. Postgraduate training – Master Programmes – Lifelong-Learning.

Un modèle de coopération internationale : les activités de formation du CIHEAM-IAMZ

Résumé. Depuis la fondation de cet établissement en 1969, la formation supérieure est au cœur des activités menées par l'Institut Agronomique Méditerranéen de Zaragoza (IAMZ). L'IAMZ accomplit sa mission, en tant qu'axe de la coopération internationale dans le domaine de l'agriculture, l'alimentation et l'environnement, à travers deux programmes de formation complémentaires : la formation diplômante et les cours postgradués approfondis de brève durée pour professionnels. Ces deux modalités constituent des instruments avérés et efficaces de coopération internationale, fondés sur une vaste base de synergies bâties avec des institutions d'excellence espagnoles et internationales. Nous passons en revue les activités menées par l'IAMZ sur les 25 dernières années et faisons une analyse critique de la demande, et des avantages et inconvénients de ces programmes de formation.

Mots-clés. Formation postgraduate – Programmes de Master – Apprentissage tout au long de la vie.

I – Introduction

CIHEAM is an intergovernmental organisation founded in 1962 upon the initiative of the Council of Europe and the Organisation for Economic Cooperation and Development (OECD), due to a great extent to the imagination, persistence and perseverance of Ramón Esteruelas, the Spanish Delegate at the OECD and first CIHEAM president from 1962 to 1983. The creation agreement was signed on 21 May 1962 by France, Italy, Greece, Portugal, Spain, Turkey and former Yugoslavia. CIHEAM's mission is to develop cooperation between Mediterranean countries through postgraduate training and promotion of cooperative research in the field of agriculture and natural resources. The Organisation currently has 13 member countries: Albania, Algeria, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Portugal, Spain, Tunisia and Turkey. The General Secretariat is in Paris (France) and activities are organised mainly in the four Mediterranean Agronomic Institutes in

Montpellier (France) (IAMM, created in 1962), Bari (Italy) (IAMB, 1962), Zaragoza (IAMZ, 1969) and Chania (Greece) (MAICH, 1983).

When designing the training programmes, CIHEAM aims to encourage international cooperation by offering complementary and specialised training from the four institutes. CIHEAM delivers, through the four Institutes, 20 Master programmes in an international and multicultural framework and offers a wide range of short duration specialised advanced training activities in fields such as “Food Production and Quality Management”, “Environment and Natural Resource Management”, “Economics, Management and Development Policies” and “Fisheries and Aquaculture”. The CIHEAM Governing Board, in accordance with its academic regulations and objectives, formally approves the yearly course catalogue. Besides this direct involvement in training, CIHEAM has signed agreements with a large number of higher education and research institutions from various countries, particularly in the Mediterranean. Agreements are also extended to the main international institutions active in the Mediterranean region within the scope of agriculture, food, environment and natural resources. Joint postgraduate training activities are organised with some of these institutions and studies and credits are mutually recognised.

The Mediterranean Agronomic Institute of Zaragoza is particularly active in postgraduate training. It is structured in five study areas: Animal Production (AP), Environmental Sciences (ES), Fisheries and Aquaculture (FA), Food Science, Technology & Marketing (FSTM) and Plant Production (PP). It is located on the research campus of Aula Dei, one of the oldest and most prestigious in Spain, also founded upon the initiative of CIHEAM's first president. IAMZ interacts closely with the other three institutions on campus: the Experimental Station of Aula Dei and the Pyrenean Institute of Ecology, both belonging to the Spanish National Research Centre (CSIC), and the Centre for Agro-food Research and Technology (CITA) of the Government of Aragon.

II – Training Programmes

Since its foundation in 1969, postgraduate training has represented the essence of IAMZ's activities (Fig. 1). In the last 25 years, IAMZ has received more than 36,000 applications to follow postgraduate courses from more than 150 countries. Approximately one out of every three has been selected, that is, more than 12,000 professionals from 135 countries, being 83% from CIHEAM member countries. Likewise, almost 12,000 guest lecturers have participated in IAMZ postgraduate training.

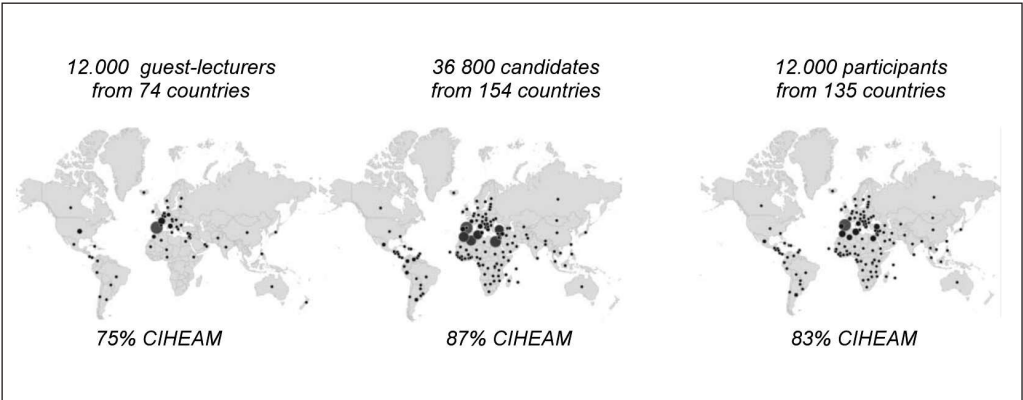


Fig. 1. Geographical origin of candidates, participants and guest lecturers in training programmes organised by IAMZ-CIHEAM in the last 25 years.

CIHEAM delivers two complementary postgraduate training programmes. The Master of Science programme has been running since the end of the 1970s. The life-long learning programme for professionals is based on advanced specialisation courses that last between one and two weeks. On average, IAMZ organises 12 of these courses per year, approximately 25% of which are delivered outside our Zaragoza premises.

The original training offered by the CIHEAM institutes has varied over the years. The progression of IAMZ has followed three general principles: (1) the natural evolution of its original vocation of agricultural production and the environment, incorporating fisheries and aquaculture; (2) agro-food marketing and food processing as a means to generate added value to the primary production and; (3) synergies sought with Spanish and international institutions in relevant topics for the Mediterranean.

The IAMZ does not have permanent teaching staff and bases its education activities on guest lecturers. Over 350 speakers are invited to IAMZ's courses every year; university lecturers (40%) researchers from public research centres (38%), senior business managers (10%), professionals from the public administrations (6%) and experts from international bodies (6%). The fact that lecturers come from a wide range of geographical regions and institutional bodies, gives an added impulse to the courses where participants meet different theories, methodologies and results.

1. The CIHEAM Master of Science

The CIHEAM Master of Science programme arises from a study entrusted to an international commission of experts in the mid 1970s by the Governing Board in order to revise the criteria followed in the awarding of CIHEAM diplomas and in particular to define the conditions for the creation of a new postgraduate diploma such as "*Magister Scientiae*". The objective was based on postgraduate education, endorsed by the Master of Science degree, at that time without official academic recognition in the majority of the Mediterranean countries, but with a long-standing tradition in the English-speaking education systems.

In 1977, the Governing Board decided that the diploma awarded by the Centre be called "CIHEAM Diploma of Advanced Studies" (*Diplôme de Hautes Études du CIHEAM*), with a level of Master of Science. In order to access the Master programmes, candidates may be of any nationality but should have a four-year university qualification from their country of origin that allows them access to official postgraduate studies. CIHEAM's objective is to provide postgraduate specialisation through initiation to research and to professional life, transmission of knowledge, development of critical understanding and capacity of analysis and assessment as well as the improvement of applied skills. In the same year, the conditions of the diploma were defined to correspond to a two-year higher postgraduate training programme consisting of a specialisation course in the first year and the preparation and defence of a thesis before an examining board in the second. At IAMZ the first CIHEAM Diploma of Advanced Studies of the Master programme was awarded in May 1981 in Animal Production. Since the academic year 1987-1988 the Master programmes have been developed biennially.

Since the Bologna Process for the convergence of European graduate and postgraduate studies, CIHEAM has adjusted its educational activities to the European Higher Education Area) by applying an analogous qualification and credit system to the European Credit Transfer System (ECTS). The CIHEAM Master of Science Degree currently awards 120 credits over two academic years, namely 30 weeks of full-time lectures each academic year and has introduced a diploma supplement also analogous to the European university system. IAMZ actively participates as a higher education centre of the Erasmus+ programme, for both incoming and outgoing students. Practically all the Master programmes have already been approved in the *ex ante* verification and *ex post* accreditation processes by the assessment body of the State or the Autonomous Community for the quality of university studies.

The IAMZ – CIHEAM strategy in the current educational context, marked to a large extent by the Bologna process, has focused on three complementary principles:

1. To achieve official recognition of the Master of Science Degree awarded by CIHEAM through IAMZ as equivalent to the official Spanish Master Degree. This official recognition was achieved in 2006, IAMZ being the first institution to appear in the University Degree National Registration Office of the Spanish Ministry of Education in the section “Other Centres of Higher Education”.
2. To seek more intense collaboration with various Spanish universities, establishing alliances to co-organise Master programmes in accordance with the principle of double qualifications. A number of IAMZ’s Master programmes are co-organised with the following institutions: the Autonomous University of Barcelona, the Universities of Alicante, Córdoba, Las Palmas de Gran Canaria, Lleida, Zaragoza and the Technical University of Valencia. However, these alliances have had to overcome certain difficulties due to strategic and structural differences between institutions.
3. To strengthen differentiating features, especially the international dimension of lecturers and participants and introduction to research as the main axes of the training activities. The excellence of some of our programmes has been recognised by external assessment agencies, as well as the high degree of internationalisation and superior educational value.

In Zaragoza, lecturers are delivered in English, French, or Spanish. Simultaneous translation is provided from English and French into Spanish. As participants should have knowledge of Spanish, an intensive language course is organised from July to October for those that require it. Knowledge of English and French is also valued as part of the documents distributed by lecturers could be in either. Exams may be taken in Spanish, French, or English.

In the last 25 years, approximately 2400 students from over 60 countries have followed Master studies at IAMZ, 77% of whom come from CIHEAM member countries (45% from non-EU countries, practically all with a scholarship, 47% from Spain and the remaining 8% from other CIHEAM countries belonging to the UE); 19% from Latin America and about 1-2% from non-CIHEAM Mediterranean countries, from other parts of the EU and the rest of the world (Fig 2). IAMZ awards a full scholarship covering tuition fees, travel, board and lodging to most selected students from non-EU CIHEAM member countries.

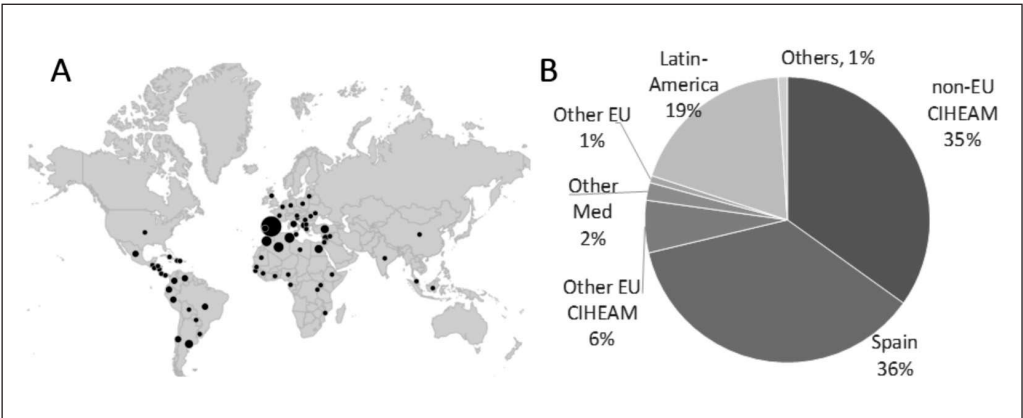


Fig. 2. Geographical Origin of the 2396 students from 64 countries registered in IAMZ-CIHEAM Master programmes in the last 25 years.

IAMZ currently offers nine official Master Degrees that are delivered every two years, seven of which are jointly organised with eight Spanish universities. Four of these Masters are delivered at IAMZ. IAMZ also participates in an Erasmus Mundus Master programme, with a further six non-Spanish higher education institutions.

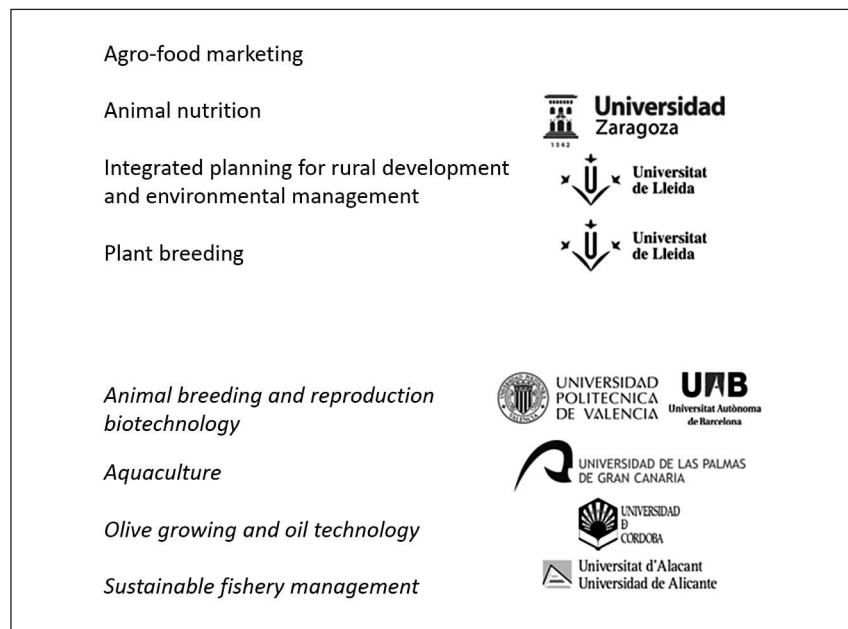


Fig. 3. Master programmes currently offered by IAMZ-CIHEAM alone or co-organised with other Spanish institutions. The first four are offered in Zaragoza and the second four at the co-organizing universities.

The CIHEAM Master programme is organised in two differentiated parts as far as structure and specific learning outcomes are concerned. During the first year (October-June), participants follow a postgraduate specialisation course (awarding 60 ECTS credits). The syllabus includes lectures, seminars, debates, practicals, technical visits, tutored work which aim to encourage dialogue and exchange of ideas between participants, lecturers and professionals of the sector. Training is given by highly qualified experts that are invited to participate for their renowned expertise in each of the topics. Concerning the internationalisation of the lecturers, as examples, over 50 lecturers take part in the Master in Plant Breeding, co-organised by CIHEAM and the University of Lleida. These professionals come from nine countries of the European Union, the United States, Israel and Tunisia. They belong to eight Spanish universities, twelve more from the European Union, two North American universities and a Tunisian university. There are also representatives from twelve public research bodies, five international plant-breeding companies and four international bodies. Thirty five lecturers take part in the Agro-food Marketing programme, 20 from six European Union countries; Spain (9), UK (5), France (2), Germany (1) Ireland (1) and Luxembourg (1), 13 from the USA, 1 from Morocco and 1 from Norway. 71% come from universities in 7 countries; 14% from public research bodies; 9% from firms and 6% from international organisations.

The second year of the Master programme takes place at accredited universities and research centres collaborating with IAMZ, generally in Spain but also elsewhere, under the scientific supervision of a renowned doctor. As in the first year, the collaboration established between IAMZ and numerous prestigious institutions in the various specialities for conducting the Master thesis, is a fundamental element of the programmes' success. Participants develop their training in an environment of team research, counting on excellent resources and expert advice. The experience they acquire during this period goes beyond practical knowledge and skills; they are immersed into real professional and research situations. As a result, more than half of the MSc graduates go on to do a PhD degree and two thirds publish part of their MSc Thesis in specialised, mostly international, journals.

The demand for places on our Master programmes has varied in recent years (Fig 4). The left of the figure illustrates the number of applications received in the last 25 years, both from CIHEAM EU-countries and CIHEAM member countries not belonging to the EU. In global terms there has been a general decline over the years in applications from the EU and an increase in applications from non-EU CIHEAM countries. This decline was more noticeable when the Master reached official recognition, with the increase number of Master degrees offered in Spain.

However, when analysing the three programmes that have not undergone substantial changes in structure (Plant Breeding, Rural Planning and Marketing), very interesting patterns emerge (Fig 4B). The number of EU candidates (mainly Spanish) seems to have recovered slightly in recent years, once the Bologna degrees have been fully implemented. At the same time, the demand from non-EU graduates is decreasing slightly, coinciding once again with the implementation of the Master degree in their own countries more recent than in the EU, in such a way that the ratio between candidates from one type of country or another has changed significantly in the last five years (triangles in Figure 4B).

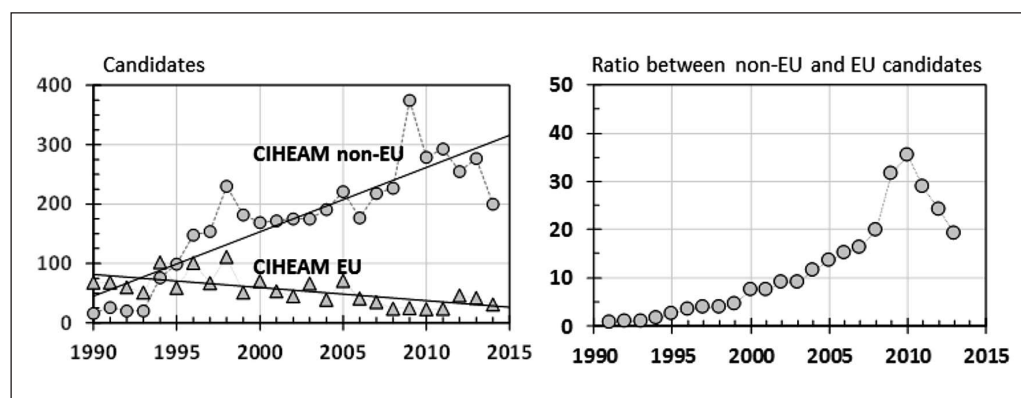


Fig. 4. (A) Number of applicants for IAMZ-CIHEAM Master programmes from non-EU CIHEAM countries (O) and from EU CIHEAM countries (Δ). (B) Evolution through time of the ratio between number of applications from non-EU CIHEAM and EU CIHEAM countries (Δ).

IAMZ and its partner universities share a longstanding institutional tradition as well as the conviction of the importance of the quality assessment and improvement processes. Such processes do present advantages and drawbacks for a collaborative framework such as IAMZ's in comparison with the university context.

IAMZ has a relatively simple administrative structure and is more flexible to design new programmes and update them, as it is not restricted to a pre-established faculty. As IAMZ does not have permanent teaching staff, highly qualified lecturers can be selected according to their expertise and the continuous assessment system enables IAMZ to react quickly to changes needed for certain training activities. Nevertheless, current quality regulations in the Spanish university system that IAMZ has to follow, despite its international nature, to keep official equivalence of the CIHEAM-IAMZ diplomas in the EU context, limits this IAMZ flexibility, as regulation requires that changes made in the programme to be re-evaluated by the corresponding assessment agency following a tedious and long procedure.

IAMZ dependence on external experts as guest lecturers from other institutions, requires, as compared to the university system, a greater logistical effort and is particularly challenging when coordinating teaching contents and monitoring and tutoring students.

The IAMZ partenariat model extent also to technical/research infrastructure needed to organise some of the laboratory and field practicals in the first part of the programme and to carry out the Master thesis research in the second. Considering the IAMZ philosophy of flexibility, own resources are restricted and synergy is searched with other institutions to be able to offer a greater possibility of applied specialisation to our students.

2. Programme of Advanced Specialised Courses for Professionals

IAMZ is particularly active in organising short (1-2 weeks) duration courses in a large scope of specific advanced agriculture and related sciences. They are aimed at professionals with experience related to the subject matter of the course and provide a high-level update of knowledge, complemented with the possibility of exchanging experiences in an international framework, both with the guest lecturing experts and the professionals attending the course. The offer of courses is updated each year, and they may be repeated several times if there is enough demand. Programmes of this type are not frequent in Spain.

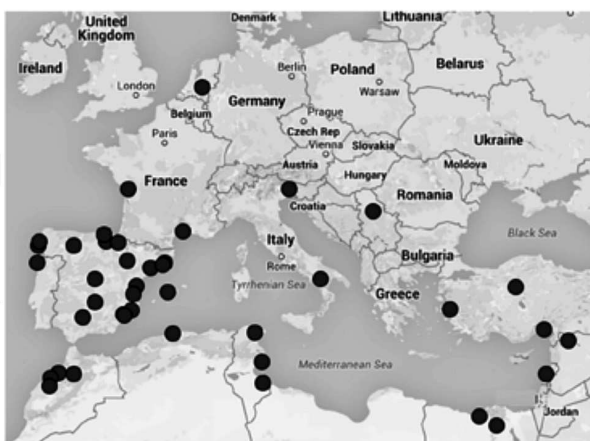
When a new course is proposed, an international group of experts in the subject participate in an *ad hoc* committee, which discusses upon the content and activities of the new programme and design the programme. This group of experts also proposes a panel of guest lecturers. The commission comprises between 5 and 7 university lecturers, researchers from public research bodies, administrators and professionals from private institutions, besides those responsible for IAMZ training and co-organising institutions. One of these members acts as the scientific director that coordinates the scientific aspects of the programme and supervises its delivery.

The total economic cost of a course is substantial, depending on whether it is held on the premises at Zaragoza or elsewhere, mainly because approximately 12 participants from non-EU CIHEAM member countries receive a full scholarship and the number of experts invited to participate in the *ad hoc* commission and to teach. It is worthy of mention that our guest lecturers do not receive high professional fees, their participation being considered as a contribution to international cooperation both on their behalf and that of their institutions.

In the last 25 years IAMZ has organised almost 350 courses, a significant number co-organised with national or international institutions, 23.2% of *ex situ* courses have been carried out, including some that have been organised in non-CIHEAM countries (Fig 5A). Such courses are organised in the five study areas, especially in Fisheries and Aquaculture, which was established as an independent study area 12 years ago (Fig 5B). We organise an average of 14 courses per year with an average of 27 students per course and up to 500 participants per year (Fig 5C).

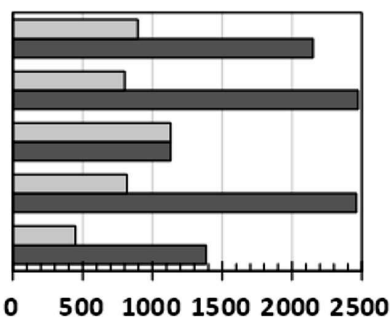
A

Place	Proportion
IAMZ	76.8%
Spain	13.1%
Other CIHEAM countries	8.2%
Other countries	2.0%



B

Plant Production (PP)
Animal Production (AP)
Fish & Aquaculture (F&A)
Environ. Sci. (Env)
Food Sci., Technol. & Marketing (FSTM)



□ 12 years ■ 25 years

C

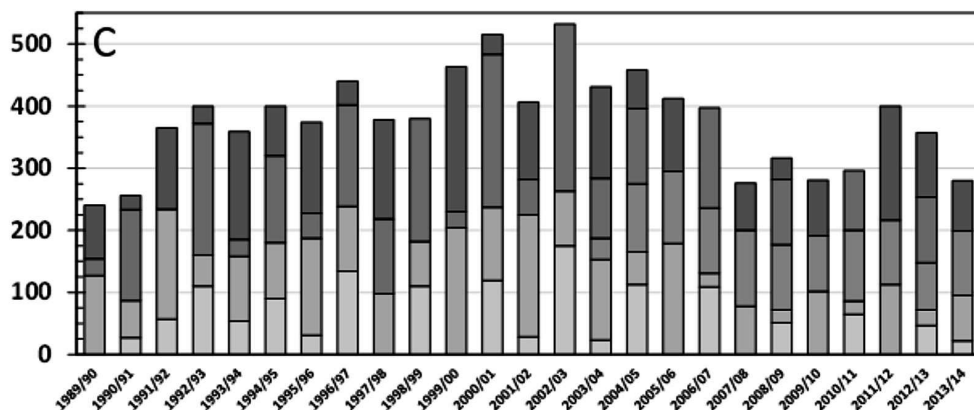


Fig. 5. Short duration advanced courses organised by IAMZ. Locations in which courses organised by IAMZ-CIHEAM have been carried out in the last 25 years (A), Number of participants in courses per study area (B) and years (C).

There is a large number of applications and participants, averaging about 1200 and 375 per year; 88% of the candidates come from CIHEAM member countries, the majority (71%) from non-EU CIHEAM countries. Demand from Spanish professionals is also substantial with 21% of total CIHEAM applications (Table 1). Overall success rate of these applications is 32%, varying very much according to country of origin.

Table 1. Number of candidates and participants in advanced courses per geographical origin in the last 25 years

Origin	Candidates		Participants		% Acceptance	
CIHEAM	25,822	88.1%	8,166	86.6%	32%	
non-EU	18,218	71%	4,214	52%	23%	
Spain	5,386	21%	2,826	35%	52%	
Other EU	2,218	9%	1,126	14%	51%	
Other Med	807	2.8%	252	2.7%	31%	
Other EU	466	1.6%	278	2.9%	60%	
non-EU	81	0.3%	35	0.4%	43%	
Latin-America	1,294	4.4%	501	5.3%	39%	
Others	828	2.8%	202	2.1%	24%	
Total	29,298 from 140 countries		9,43 from 130 countries		32%	

As there is a fixed number of places on every course, the relative interest of the CIHEAM-IAMZ course catalogue must be based on the (relative) number of applications received. Overall increased significantly in the first five years of the programme and has remained constant at a rate of around 3.5 candidates per place (Fig 6A). However, with the onset of the economic crisis, the number of self-supported candidates has decreased. In order to assess the relative interest of the various study areas, the number of applications per country and per area of study was analysed for the last 12 years, when the current IAMZ structure was established (Fig 6B). Overall demand was higher for Plant Production (PP) and Environmental Sciences (ES) whereas Fisheries and Aquaculture (FA) and Animal Production (AP) consistently showed lower demand, most probably due to their relatively smaller target audiences. Demand was more inconsistent for PP and ES (Fig 6B,C), which seem to be more mature disciplines compared to the others where some courses spark great interest, whereas others are much less demanded. This ratio is not uniformly distributed and the number of applications varies greatly from one course to another (Fig 6B,C).

Fig 7 is a biplot showing the relative interest of professionals of the various CIHEAM countries in the courses organised in the five CIHEAM study areas. We have used the data for the number of average applications organised per country and thematic discipline corresponding to the last 12 years, once the Fisheries & Aquaculture area had been formally established. It is noteworthy that this analysis has been carried out with country-standardised data. Therefore, rather than the absolute demand, this analysis can show the relative demand for advanced postgraduate training across the Mediterranean region. Analysing the magnitude of the vectors on the graph corresponding to each discipline, courses organised in Animal and Plant Production (AP and PV), are nearer the origin, which appears to illustrate uniform interest across the different CIHEAM countries. However, demand for FA, ES and FSTM courses vary more across countries. In particular, professionals from EU CIHEAM countries have a greater relative demand for FA, whereas non-EU CIHEAM professionals are relatively more interested in FSTM and ES. Four countries showed particular interest in some specific disciplines: French and Greek professionals have a small number of applications in absolute terms, but in relative terms they are more specifically interested in FA than FSTM, unlike Albania and Lebanon that show the opposite trend.

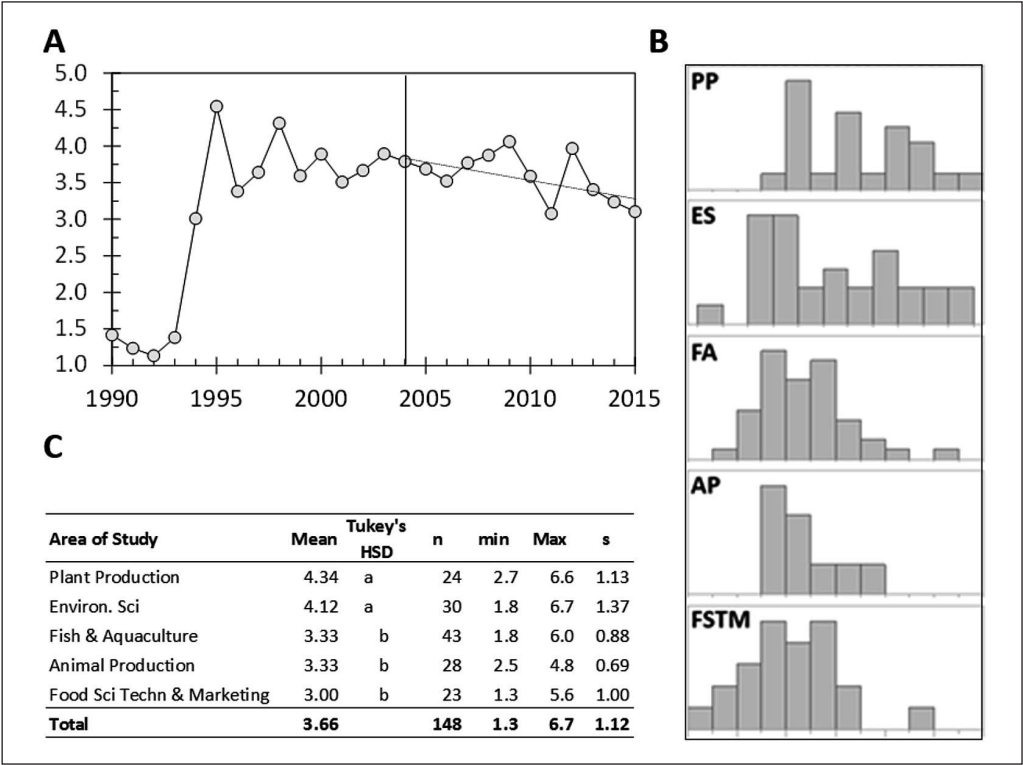


Fig. 6. Number of candidates per participant in advanced courses organised by study area in the 25 years (A). Distribution (B) and statistical comparison across study areas (C).

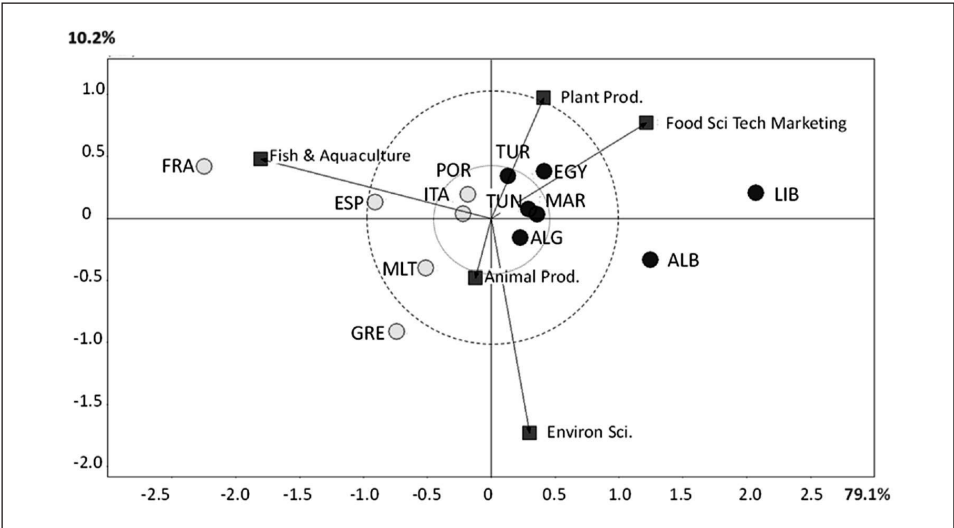


Fig. 7. Biplot of the number of applicants to advanced courses for professionals of the various CIHEAM countries in courses organised in the five IAMZ-CIHEAM study areas.

III – Conclusions

IAMZ's training system depends entirely on external lecturers and collaborating institutions. This is a strength as far as flexibility and diversity of topics is concerned, but dependence on external collaborations is also a weakness. Short duration advanced courses for professionals are an effective instrument of international cooperation, built on synergies with partner institutions, and better serve nowadays the original CIHEAM's mission of providing "Complementary Education". The large percentage of courses co-organised with international organisations, and the fact that many international institutions are seeking synergies for advanced training, shows that there is a large, unsatisfied demand for this type of advanced training. They arouse interest from both EU and Non-EU CIHEAM professionals and from elsewhere and, being of short duration, are particularly attractive to professionals from the private sector. They compete less with national higher education institutions. They are particularly well adapted to new training subject matters and tools and to IAMZ's flexible administrative system. However, particularly when compared with the CIHEAM Master of Science, the international cooperation returns of these short duration courses are lower. In one or two weeks participants do not identify themselves with the institution and do not build close cooperative links between research units and visiting trainees. They are relatively expensive, with higher costs per time unit than in the Masters. Logistically they are quite complex as many people are deployed for just a few days.