

CHAPTER III

Tools and training programmes for tomorrow's agricultural and agri-food practitioners in the Mediterranean countries: CIHEAM Contribution

Introduction

Over the past years, along with more macro-economic assistance programmes, mostly implemented on a bilateral basis, European Mediterranean countries, together with southern and eastern Mediterranean partners, have also promoted more co-operative endogenous development programs, which have included measures to support training, research and, therefore, to sustain human capital.

Moreover, human development became, at the beginning of the nineties, an important policy alternative in reaction to the heavy national resource distribution incurred under stabilisation and structural adjustment programmes.

Human development was meant as a tool to achieve “*adjustment programmes with a human face*”.

Consequently, it became more evident that the existence of a highly skilled and educated labour force would favour technology transfer and at the same time this force would itself promote innovative technical knowledge.

There are good reasons for considering new development trends in a common framework.

The Barcelona Declaration of 1995 has established this common framework in the building of an area of “*shared wealth*”.

Three major partnership areas were addressed by the said Declaration: policies and security issues, economic and financial co-operation and a social and cultural development.

The latter action focuses also on the development of human capital and in particular on the support of decentralised co-operative programmes.

The development of human and scientific capacity in the Mediterranean region has also, in the past thirty years, been a top priority for an international development organisation, namely the *International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)*.

In fact, CIHEAM, in pursuing its double role of *Donor* and *Scientific Partner*, has been an active promoter of human and social capital development in the Mediterranean region.

Examination of existing higher education programmes and the future needs in the emerging Mediterranean labour markets, especially concerning the agri-food sector, may result very valuable in designing new capacity building programmes.

Prevailing disparate institutional developments and the setting of a common framework must confront a crucial fact: labour markets and higher education institutions, application of the new information and communication technology (ICT), differ across Mediterranean countries.

This observation has led CIHEAM to examine comparative labour markets and advanced agri-food training programmes and institutions in its Mediterranean member states.

This comparative exercise was carried out at an international seminar, "*Advanced Training of Agricultural and Food Managers in the Countries of the Mediterranean Area*", held in Istanbul, Turkey, November 9-11, 1998 which more specifically addressed the problem of interpreting the "*Challenges to the management of knowledge on the eve of the third millennium*".

In this chapter the outcomes of this seminar will be extensively used to address problems and possible solutions for training tomorrow's agricultural and agri-food practitioners.

I. Conventional paradigms

Agriculture and related higher education and research institutions share the same conventional interpretation on how their contribution affects the economic development.

In the case of agriculture the prevailing view of its role in the economic development appears to be based on an incorrect interpretation of two important facts regarding this sector as economic development proceeds (E.Schuh, 1997).

These two important factors are respectively the declining agricultural share of a nation gross domestic product (GDP) and the reduced share of agricultural labour force as the economy develops.

On this matter, E. Schuh argues that policymakers and developers appear to conclude from these inevitable consequences of economic development that the way to promote economic development is to facilitate such long-term trends.

This is to concentrate on the symptoms or consequences of development, in contrast to understanding the underlying economic and technological forces at work.

However, when we turn the attention to research and technology transfer process in agriculture, it becomes apparent that agricultural technology, in contrast to manufacturing technology, cannot be readily transferred to developing economies, but must be adapted.

Adapting technologies and knowledge to the different agricultural production systems, in the specific case of the Mediterranean region, or

elsewhere in developing countries, requires strong investments in research and education, but also in holding a well-trained stock of human resources.

II. Non marketable public goods

Agriculture and its related higher education and research institutions, whether in developed or developing countries, are both promoting economic development even if their contribution to national wealth remains one of *“the best kept secrets.”*

In the case of agricultural research, for example, there is a consistent production of various outcomes, which are known as *“non marketable public goods”* such as knowledge, healthy food, environmental protection, etc.

Though considerably important matters, these outcomes are not quantitatively measurable in economic terms, and this in part explains why the general public does not commonly understand them.

Instead, what it is more accountable to general public and policy makers is the growth of food imports in developing countries or the increase in staple food stocks in developed countries.

This type of growth pattern, although deriving from general economic and/or population development, should advocate the cause of agriculture and related research and higher education institutions, but, instead, these contradictory outcomes in some cases contribute to diverting away national or international investments for agricultural research and related higher education.

Nevertheless, in the last three decades developing nations have invested considerable resources in their higher education systems including agriculture related programmes, often with the support of external aid agencies.

In most countries of Northern Africa and the Middle East in the last three decades enrolment ratios have respectively increased from 1 to 10

percent and from 8 to 16 percent. The European Mediterranean countries instead range from 26 to 41 percent.

As a result of their investments in higher education, Mediterranean countries have established a comprehensive infrastructure for advanced training.

However, limited financial resources have hampered the development of a strong continuing education system, particularly in the countries of the southern and eastern Mediterranean rims.

III. Is higher education in crisis?

Despite the clear importance of higher education for economic growth and social development, investment in the sector is in crisis in industrial as well as developing countries throughout the world. (The World Bank)

In all countries higher education is dependent on government funding. In a time of widespread fiscal constraints, industrial as well as developing countries are grappling with the challenge on how to preserve or improve the quality of higher education.

Increased competition of scarce public funds have reduced many governments' capacity to support further public expenditures which negatively affected agricultural public spending and related higher education teaching and research.

The decrease in resources has been particularly acute in Africa and in the Middle East.

According to World Bank data, in the last decade public expenditures per student for higher education in the Middle East and Northern Africa, declined from 3.200 US. \$ to 1.900 US \$.

The Bank's analyses by world regions, show that 66 percent of the lending for higher education in the past decade went to East and South

Asia, instead the Middle East and Northern Africa accounted together for 7.8 percent, slightly higher than Europe and Central Asia but lower than Africa and Latin America respectively.

Reportedly, an expected effect of the accomplishment of the Euro-Mediterranean free trade area by 2010 will be the one of reducing the flow of money from custom duties and levies in each respective national budget of non European Mediterranean countries.

There are some well-founded warnings that this reduced financial flow could negatively affect also higher education and in this particular case agricultural research.

In programming any future actions for networking and partnership between southern and European Mediterranean countries, in the field of agri-industrial higher education training and research, we do need to carefully evaluate these types of economic externalities, and shape new financial instruments, in order to make financial sustainability of agricultural higher education and research institutions a top priority.

IV. Non conventional paradigms

There is another aspect of economic development, which implies the consideration, in the specific case of agriculture, of the increased share of science and economics required to farm today in a sustainable way. This trend can be applicable to European and non-European Mediterranean countries.

This is the case of the so called *Alternative Agriculture* which represents not a single production system, but the combinations of systems and practices finely tuned to local ecological circumstances, replacing capital and energy inputs with "more information", as well as more trained labour and time and management skills per unit of production than conventional farming.

Flexibility and timing are accompanying practices towards careful soil preparation (minimum tillage) and judicious application of pesticides at critical stages.

Farming systems in the Mediterranean region are very specific and therefore require substantial scientific, economic and technological knowledge accumulation in order to be more efficient and produce extra food at low cost for the consumers.

In a such a context, even if conventional economic development trends confirm a lower share of the primary sector in a nation's GDP, we need to consider that successful economies are becoming "*knowledge societies*" and thus increasingly less materials and energy intensive.

These factors are being replaced with information and skill custom; tailored to specific situations and problems. Such an approach is revealing *technology adaptive, local and particularised*, depending more on organising information to specific human and environmental needs. (B.Rich, 1994).

In this context it is critically important that training and research programmes are well tuned to the evolving demands of the economy.

V. Social and information capital

The emerging notion of social capital extends the conventional understanding of "co-operation" or collaboration and provides a link with the economic concept of "capital", pertinently indicating the investment or growth potential of groups' abilities to work jointly.

The latter concept identifies also the structure created from collaborative effort as capital.

Well functioning partnership, consortia and networks are in and themselves "*a form of social capital*" (J.E. Fountain, 1997).

How and what can we define for social capital? Like “physical capital and human capital- tools and training that enhance individual productivity- “social capital” refers to features of social organisation, such as networks, norms and trust, that facilitate co-ordination and co-operation for mutual benefit” (J.E. Fountain, 1997).

However, the featuring of networks is also meant to provide decision-makers with important information, which cannot be replaced only by using Internet.

In fact, collaborative networks are performing the critical function of screening for accuracy, importance and implications.

Although open access to information, principally through the use of Internet is an important asset for networks, the derived information *capital* is not a replacement for social capital.

It is evident that social capital increases the ability to build and use information capital because trustful relationships increase information flows and bring added value to information.

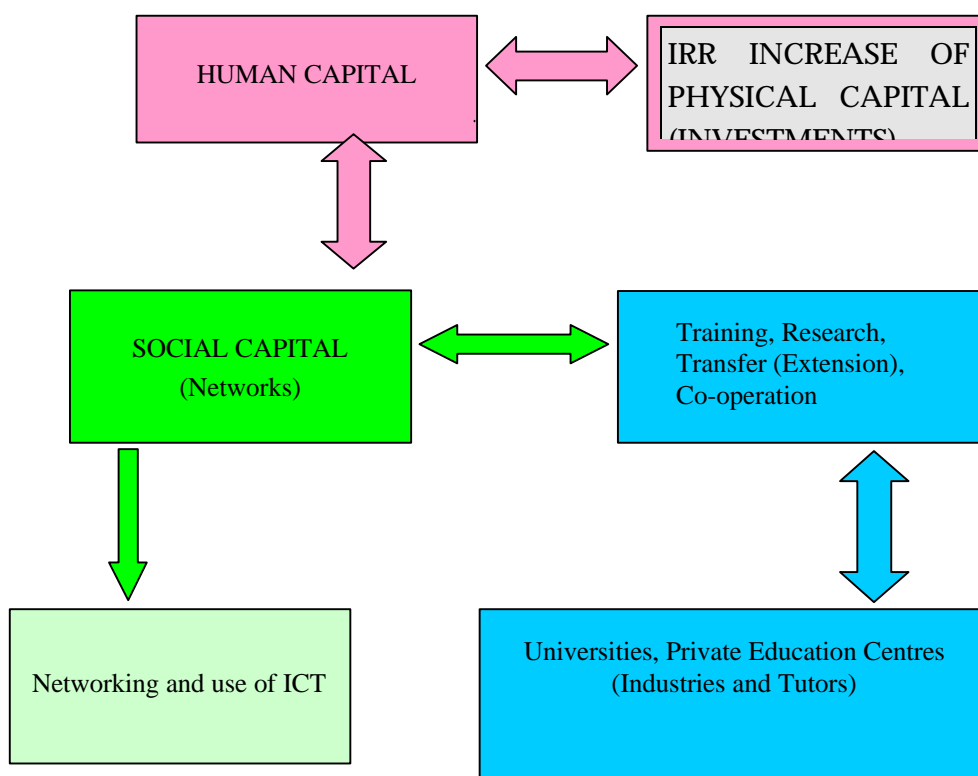
Reportedly, academic literature is raising the question whether the explosive growth of Internet use and information technologies would really make distance and time constraints virtually meaningless.

However, the research evidence, especially on industry networks, is that learning and information sharing is not regardless of the geographic proximity, but is actually an important component of networks.

For this reason, geographic regions that include highly adaptive networks have been also described as “*learning regions*”.

Referring to the specific case of the Mediterranean area, we could also apply the definition of learning region, and in order to enhance education and training at all levels and to make the network of libraries and information services available throughout the region we must promote not only investments in hardware components, but more on software and electronically supported institutional building.

III-1 Social and information capital interaction scheme



Source: CIHEAM

*IRR: Internal Rate of Revenue

VI. Case study: CIHEAM's Regional Action Programme (RAP)

There is a lack of shared vision between Mediterranean policy partners on the direction and implications of the many factors impinging on the development of a true regional programme in areas such as agriculture and the management of renewable natural resources, and no formal agreement on how can we be more fully integrated into decision making and operational mechanisms of the process.

However, as the pace of technological change has intensified, as natural resources have become more scarce, and as information technologies have made linkages among geographically dispersed actors commonplace, the predominant centralised form of economic and scientific co-operation has been changing.

Actors in collaborative networks show an efficient form of collective learning. They learn of and about new technologies, opportunities and challenges more quickly because of the strong interaction within the network.

Based on latter assumption, the recent initiative of CIHEAM and the European Commission to design and finance jointly a four-year (1998-2002) *Regional Action Programme* (RAP), is directed at building a sound and decentralised regional co-operation in the agricultural sector on training, promotion of research and communication of scientific and technical information in the context of economic transition.

This programme not only relies on a sound institutional partnership, moving away from core institutional funding into programme core sponsorship, but also encourages the support of networks of learning and innovation.

This new RAP, which is also the result of a fruitful collaboration between CIHEAM and the European Commission in a previous four year programme (1993-1997), has involved CIHEAM, through its four sub-centres located in Spain, France, Italy and Greece, in successfully developing training programmes which address subjects relevant to Non Community Mediterranean Countries (NCMC).

In fact, this programme through a series of short courses, trainee mobility programmes and co-operative research has helped to provide skills to trainees and enabled them to participate effectively and integrate into national management of renewable natural resources and agricultural and agri-industrial activities.

The fundamental objective of the RAP will be attained through the creation of four partnership programmes on joint regional activities covering themes such as Water and Irrigation management, Rain-fed agriculture, Food and Agricultural Policy and Utilisation and Conservation of Renewable Natural Resources.

However, the implementation of the RAP will involve two distinct phases. The first one (1998-2000) will consist in supporting post graduate training through 12 short courses per year, by promoting and financing co-operative research which will capitalise on eight currently existing thematic networks. It will also favour mobility of trainees (16 scholarships per year), the preparation of seminars, both for policy makers and science related actors, the organisation of studies such as the use of biotechnology or on the aspects concerning disease free plants legislation in the Mediterranean region, and some logistic support measures aiming at the purchasing of laboratory consumable goods.

The second phase (2000-2002) will be characterised by actions aiming at the support of training and mobility as in the first phase, but also at launching network research projects, studies and training on the effects of the Euro- Mediterranean free trade zone and at managing a performant

communication system to improve the access and flow of information between Mediterranean private and public stakeholders.

Activities will be geared to assisting in the creation of a Mediterranean sphere of joint actions on political, administrative and economic issues on these themes, through improved partnership between countries of the Northern, Southern and Eastern littorals.

However, the indigenous capacity for training and research is a necessary but not sufficient condition for higher education to contribute to growth. (The World Bank).

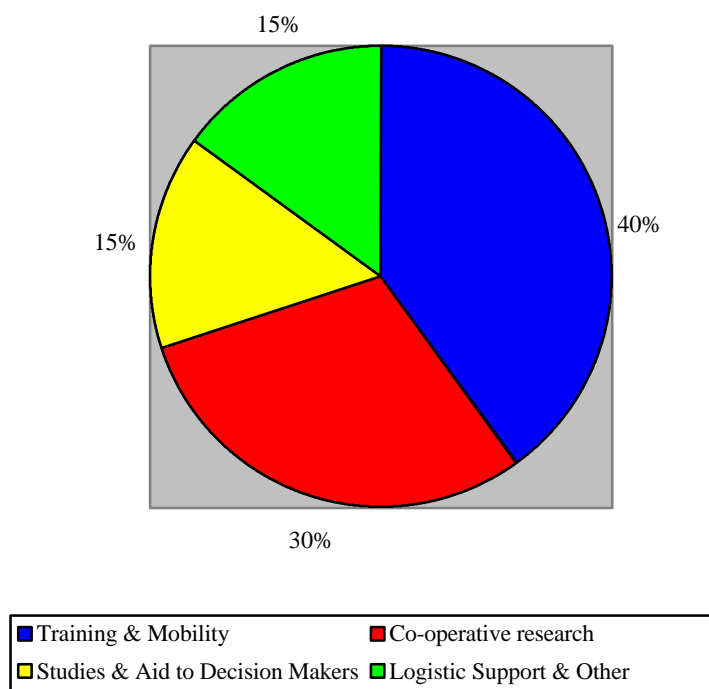
Through the implementing of the RAP, CIHEAM will concur in complementing such a mechanism by promoting a better use of the scientific and technical potential of tertiary institutions.

Such mechanisms include close links with industry in advanced training courses, co-operative research programmes, consultancies, and continuing education programs.

The implementation of this programme will also mean adapting existing CIHEAM activities to agreed regional priorities, fostering capitalisation on infrastructural investments which already exist in the region and enhancing any possible action favouring the improvement of South-South co-operation.

Furthermore, measures to enhance national capacity building will include specific aid on policy and to decision-makers in order to enlighten policy issues concerning the establishment of the Euro-Mediterranean free trade zone by 2010.

III-2. Budget Allocation



Budget allocation percentages show an important component of the RAP on training, mobility and co-operative research; in fact, as whole, they represent 70 percent of the total budget.

The financing of this programme amounts at 10 million ECU's, of which, 6 million have been provided by the European Commission et the remaining 4 million by CIHEAM.

A series of impacts or results are expected through the different phases of the programme. The creation of these RAP's for selected themes, will result in a better understanding of regional planning and implementation

of collaborative continuing education and research networks; in the increasingly efficient south-south and north-south Mediterranean regional co-operation and information exchanges; and on the improvement of the modalities of economic transition through better understanding and co-ordination of regional economies and compatible marketing of agricultural products.

Bearing in mind that the Mediterranean economic environment is affected by scarce financial resources, which is also limiting the formation of human capital, by the modest size of labour markets and the difficulty to take advantage of economies of scale, the only way to maintain a cost-effective training and research programmes may be to organise them on a regional basis.

A. Adapting training programmes to tomorrow's needs

According to a World Bank study, graduate unemployment in developing countries rose sharply during the 1980s and continues to rise. This reflects principally the sluggish growth of aggregate demand for highly skilled labour and the diminished role of the public sector as the main employer of university graduates.

It is commonly agreed that in general higher education and training systems in most Mediterranean countries are centrally managed and are therefore facing some difficulties in adapting training programmes to labour market changes.

Lower responsiveness to adopt or to adapt programmes and training is also linked to the fact that current labour markets, mostly in public employment, are influenced by mechanisms which rely on specific job functions linked to the university degree and seniority.

In other words the system is still driven by the *duality* “*university degree-job career*”, instead of shifting to the new concept of “*knowledge- job career*”.

This job development patterns are more typical of the civil service rather than the modern enterprise.

A recent study of the Institut de la Méditerranée¹², France, shows that in the emerging Mediterranean countries, compared to other emerging countries, there is an increasing number of students in social and human sciences.

Despite a relative exception for Jordan and Algeria, in Morocco for example, law and social and economic science students represent more than 60 percent of university enrolments.

In Egypt about 70 percent of university students are enrolled in human and economic sciences studies of which only 23 percent in accounting and management programmes.

Almost all Mediterranean countries show low rates of student enrolment for technological and science subjects; in the United Kingdom the social sciences account for 44% of enrolment, in Germany 40%, in Italy 58%, and in Spain 54 %.

Reportedly, the expected demand increase for engineers and scientist, due to a fast and global technological transfer, may not be met by the short supply of scientists and engineers in the Mediterranean region, which will negatively affect the region development patterns.

Indeed, today there are only 0,5 scientists and high tech experts every 1000 habitants in Tunisia and 0,8 in Egypt, compared to 2,3 and 1,6 in the Korea and China respectively.

It is evident from these data that the gap existing in the Mediterranean region concerning science and technology and the emerging sector of services should be inverted or at least reduced.

¹² La Méditerranée aux portes de l'an 2000 sous la direction de Jean-Louis Reiffers Editions ECONOMICA, 1997

Teaching and training programmes as well as continuing education should be more consistent with those changes in labour markets and therefore include knowledge from high tech sectors (like EDP, telecommunication, etc) and to develop also knowledge on self empowerment and problem solving.

B. Advanced training for agricultural and food managers

In a world where continuing education becomes an important asset for national economic development, and where obtaining a university degree does not empower the person for a pre determined professional career, it becomes necessary to rethink our strategies and to design new training programmes which will eventually integrate different disciplines that today are not necessarily linked together.

In fact, there is clear evidence that agricultural practitioners or agricultural entrepreneurs will require a more inter disciplinary knowledge in order to carry out their work. They will need to couple advanced technical knowledge and management, but also to include problem solving approaches and use of modern information and communication in order to improve their networking activities.

However, it is also necessary to have Universities that are more open to these changes, which reflect the actual economic context, and that can foster the flow of information and collaboration with the business communities.

As economic and technological changes demand the Institutional actors to be more adaptable or flexible, an inter-governmental organisation, namely CIHEAM, with its double role as *Donor* and *Scientific partner* must also englobe these changes and provide and adapt new training inputs.

There are also a number of questions arising from this new economic context which involve the activities of CIHEAM in the field of continuing education and its complementarity to national programmes.

These questions refer in particular to how new technologies and knowledge will be integrated into the training process; what role could be played by agri industrial business communities, particularly as regards new training systems, what type of network co-operation should be established among development, financial and scientific institutional actors.

To analyse and provide some answers to these questions CIHEAM has organised an international seminar on “*Advanced training of agricultural and food managers in the countries of the Mediterranean area*”, which gathered together about seventy experts from the Mediterranean countries reflecting a diversity of economic and institutional contexts, such as representatives from universities, international development and financial institutions, leading business operators in the field of agri-industry, agricultural managers from public and private sectors and representatives of the Mediterranean farming community.

The seminar which lasted two and half days enabled the participants to provide analysis and answers to a set of question around four major topics and organised through five round tables, each animated by a facilitator.

These four major topics were centred on 1) *new job descriptions and new professions*, 2) *future training operators and new programmes*, 3) *new pedagogical approaches: tools and methods*, 4) *new forms of co-operation: networks*, and constituted a framework where a series of questions have been addressed and to which all participants contributed to the answers.

Pertinently, the analysis of the answers to the first topic reveals that, the future outlook for professions in the agri-food sector shows a move towards an increase in demand for project or financial managers with a sound knowledge of agri-industry investment policies, project financing, as well as for specialists in marketing and also innovation processes and science based extension agents.

The required professional skills will focus more on relationship and communication abilities, technical competence and capability to analyse complex situations and solve them using network activities.

With reference to the second topic there was a clear emergence of a request to adapt training programmes to user's needs coupled with flexibility, multi-disciplinarity and to integrating theory and practice better.

In fact, the new programmes should well combine academic and professional skills, public and private institutions inputs and reach a substantial degree of international and inter-regional co-operation.

The outcomes regarding the new pedagogical approaches have revealed the emergence of an extended use of modern information and communication technologies (ICT) as a tool to support network activities and institutional building, to tailor customer programmes using a multi sources expertise and to reduce cost of teaching per trainer.

Apart from the relevant use of ICT in formulating the new programmes, there is also the necessity to change pedagogical approaches, which should move more towards tutorship and counselling rather than the conventional academic trainer, and also foster practical training (learning by doing) and associating group interactive learning tools.

An important component of the updating process for any training activity is the aspect of co-operative. Among the Mediterranean partners there is a clear need to establish educational consortia between private and public institutions in order to link training activities and research to speed up technological changes and increase the effects of training and research on innovation. Through co-operative actions there could be established, for example, an observatory on labour markets in the field of agronomic sciences and agro-industry to plan training programmes better.

However, besides the willingness and necessity to co-operate in order to reach better economies of scale and institutional complementarities,

there are also some constraints which are linked to the limited human and financial resources in the south and in the east of the Mediterranean area, to institutional and individual inertia, and to difficulties in co-ordination.

VII. Future perspectives

The major outcomes of the seminar will contribute in designing new development patterns for CIHEAM and also for national or international institutions involved in the governance of co-operative and regional continuing education programmes.

These new patterns will require CIHEAM to build a mid term work plan which will include new learning tools and programmes, to adapt supply of tools and training programmes to the emerging demand and to continue to serve as a catalyst for the Mediterranean region.

However, all participants at the seminars stressed the strong emergence of ICT and the expected advantages of application of new information and communication technologies to structure learning systems.

Considering this new working context and the increasing need to couple economy of scale with the widespread diffusion of knowledge, a Mediterranean "Virtual University" (MVU) could be envisaged to face these new challenges.

Based on the previous concept of learning regions the MVU could be a concrete tool in the creation of common regional continuing education programmes between the two rims.

Furthermore, the MVU could capitalise on existing institutional and expert networks fostered by CIHEAM, in order to produce a pilot programme for distance learning, or CD-ROM's to support short courses within a continuing education framework or even supporting the distant tutoring of doctorates and research theses.

Any new action or training programme, whether with conventional or distance tools, should consider, basically, two working schemes.

In fact, addressing the typical university and post graduate training will mean adapting to a strong demand for long courses stated by degrees such as Masters or PhD; instead any specialised training, within a continuing education framework, will require a strong correlation with labour markets.

Nevertheless, combining the two systems will not prevent an institution such as CIHEAM from working alongside national systems and will not reduce complementarity and flexibility, which are both needed to face quick technological changes.

However, the new working environment will involve operating more, with the co-operation of four CIHEAM training institutes, within an open institutional and expert network and to constantly screen and evaluate the pertinence of the training programmes.

In recalling these perspective remarks from Mr. Jean-Claude Flamant, President of CIHEAM Scientific Advisory Committee, it is worth pointing out the three attitudes actors will have to adopt to face the future.

These are listed as passive, anticipatory or pro-active.

Any pro-active actions refer to the actor as initiator of changes in his economic and human environment.

However, in a world where the future is very uncertain and where all the dynamic is towards globalisation, it is commonly agreed that only by using *locally specific resources*, will actors be pro-active in building their future.

Translating this pro-active attitude to CIHEAM, we shall consider the latter as an active partner for the Mediterranean actors and as a *specific resource* for this region of the world.