

THE HIGHER AGRICULTURAL EDUCATION AND TRAINING PROGRAMS IN LEBANON

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The agricultural sector in Lebanon has suffered more than any other productive sector during the fifteen years of war (1975 - 1990). Almost, all agricultural services especially research and extension were paralysed, depriving farmers of any reliable support and governmental guidance. The agricultural products started to lose their quality and ability to compete with other products in the region, which had always been an accessible market for the Lebanese commodities. However, during this critical period of insecurity and economic stress, higher agricultural education has witnessed remarkable achievements. While the already existing institutes have maintained their regular programs, three new faculties of agriculture were established.

For the setting of a new strategy for agricultural development in Lebanon and for rehabilitation of the most deteriorating sub-sectors, namely administration, research and extension, the interaction and coordination among the different higher agricultural education institutes remain essential.

The Faculty of Agricultural Sciences (FAS) at the Lebanese University was independently able to contribute to some needs of the agricultural sector in Lebanon. Other faculties of agriculture have also had their share of contribution.

This review will present the status of higher agricultural education in Lebanon while stressing the role of FAS in the general agricultural development. Guidelines for an improved contribution of the higher educational institutes to the needs of the Lebanese agriculture and the rural communities are presented and discussed in the light of national, regional and international trends.

Status of the agricultural institutions

Higher agricultural education

Four different universities are presently responsible for the higher agricultural education in Lebanon. Like in most other developing countries, the core of their educational programs is of a general agriculture nature (Hoffmann, 1991). All faculties of agriculture offer a primary university degree of either a Bachelor of Sciences (B.Sc.) in Agri-

Abstract

During the 17 years of civil unrest in Lebanon, agricultural education witnessed remarkable achievements through the establishment of new faculties of agriculture. These faculties provide their students with a general agricultural education with the exception of the Faculty of Agricultural Sciences of the Lebanese University which offers specialization options for the graduating class. This situation necessitates a reorganization and diversification of curricula to respond to the national agricultural needs and to avoid unnecessary educational competition. During the last four years the Faculty of Agricultural Sciences has organized several programs of students exchange with schools of agriculture in France and with the Mediterranean Agronomic Institutes in Italy, Spain, France and Greece. Besides, it has organized in 1992 short term training courses for farmers, university students, extension agents and local and regional trainers. There is also a pressing need for the public agricultural institutions to recruit good quality and multidisciplinary personnel. The transfer of information system determining the relationship between the researchers and the farmers through the development and extension agents is in need for rehabilitation and reorganization. With the changes and new trends in the agricultural development in the world, national programs of the region are now pressed to establish common strategies and develop regional networks.

Résumé

Au cours des 17 ans d'insécurité au Liban, l'enseignement agricole a connu des réalisations notables grâce à la fondation de nouvelles facultés d'agronomie. Les quatre facultés dispensent un enseignement en agronomie générale à l'exception de la Faculté d'Agronomie de l'Université Libanaise qui assure un enseignement spécialisé en dernière année. Cette situation nécessite une réorganisation des programmes et une diversification des spécialités pour mieux répondre aux exigences du secteur agricole et éviter une compétition inutile. Les établissements publics éprouvent un besoin pressant de recruter un personnel qualifié et pluridisciplinaire. A cela s'ajoutent les besoins de réhabilitation du système national d'échange d'informations entre agriculteurs et chercheurs par l'intermédiaire des agents de développement et de vulgarisation agricole. La Faculté d'Agronomie a depuis quatre ans organisé plusieurs programmes d'échange d'étudiants avec des écoles d'agronomie en France et les Instituts Agronomiques Méditerranéens en Italie, Espagne et Grèce. De plus, elle a organisé en 1992 des programmes de formation de courte durée destinés aux agriculteurs, étudiants, agents de vulgarisation et formateurs locaux et régionaux. Pour faire face aux changements et aux orientations récentes en agriculture dans le monde, les programmes nationaux ont besoin, plus que jamais, d'élaborer une stratégie commune et développer les réseaux régionaux.

culture or a "Diploma of Ingénieur Agronome" (DIA) with limited specialization options. Some universities have higher degrees foreseen in their constitutions. However, only the Faculty of Agricultural and Food Sciences of the American University of Beirut offers an M.Sc. degree.

Faculty of Agricultural and Food Sciences (FAFS)

The Faculty of Agricultural and Food Sciences (FAFS) of the American University of Beirut (AUB) was established in 1952 which makes it the oldest in Lebanon. The faculty offers a four year program ending with a B.Sc. in Agricultural Sciences together with a "Diploma of Ingénieur Agricole" and a three years program ending with a B.Sc. in Nutrition and Dietetics. The FAFS offers also a further degree of M.Sc. in nine different specializations which requires both courses and research work (AUB Catalogue, 1992-93).

The FAFS follows the American educational system and courses are offered in English. The FAFS has its own Agricultural Research and Educational Center (AREC) in the Be-

ka'a valley for practical training in animal and crop production, machinery use, and farm management.

Faculty of Agricultural Sciences (FAS)

The Faculty of Agricultural Sciences (FAS) of the Lebanese University was founded in 1974. However, it was only in 1985 that the FAS started its activities and the first graduating promotion was in 1990. The Faculty's five years educational program is organized according to a modified French educational system with semesters and credit hours. Teaching is conducted in French, English and few courses are taught in Arabic. The FAS offers a degree of "Diplôme d'Ingénieur Agronome" based on a program of study divided into three modules. The first module is of two years where students follow courses mainly in basic sciences and communication skills. The second one is of two years in which courses are oriented to general agricultural sciences and practices. The third module is of one specialized year where studies and research are focused on one major discipline (Hamz, 1987). This fifth year of study, before graduation, is conduct-

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ed in collaboration with european higher agricultural institutes mainly in France, where Lebanese students follow a full year program like their fellow colleagues of the host institute (FAS Catalogue, 1992-93). Upon completion of the year with regular exams and final research project defense, grades of students are forwarded to FAS for further evaluation and consequent graduation from the Lebanese University. This special fifth year program has been financed by the French Government and the International Center for Advanced Mediterranean Agronomic Studies (ICAMAS) through two special agreements allowing FAS to obtain 86 French scholarships (schools of Paris, Montpellier, Bordeaux, Angers, Rennes, Dijon, Toulouse...) and 24 ICAMAS scholarships in its Mediterranean Agronomic Institutes of Bari (Italy), Zaragoza (Spain), Chania (Greece) and Montpellier (France).

Besides the possibility of sending graduate students to Europe (2/3 of the batch), FAS is offering in 1992-93 and for the first time the third module in Plant Protection (1/3 of the batch) that will entirely take place in Lebanon. Fourteen students are now taking courses and will do their final research projects in cooperation with the Agricultural Research Institute (ARI), some private enterprises and the International Center for Agricultural Research in the Dry Areas (ICARDA).

Being part of a public university, the FAS is the only faculty of agriculture where students are exempted from any tuition fees. Students get their practical training by either spending one to two months per year on productive farms or at research institutes. FAS admits yearly around 50 students among which thirty reach the graduating year. Full time faculty members are now 17, part timers are 49 while laboratory assistants are fifteen.

Graduates of FAS are involved mainly in the private sector or work on their own. Few of them join the public sector and still fewer travel abroad for graduate and post-graduate studies.

Ecole Supérieure des Ingénieurs Agronomes Méditerranéens (ESIAM)

The "Ecole Supérieure des Ingénieurs Agronomes Méditerranéens" (ESIAM) of the Saint Joseph University is a private school, established in 1979, and lead by the order of Jesuit Fathers.

ESIAM follows completely the French yearly system of courses, and the teaching language is French. The students receive 2 years of basic sciences courses followed by 3 years in agricultural sciences to get a degree of "Diplôme d'Ingénieur Agronome" oriented to one discipline. Having no full-time faculty members ESIAM relies mainly on part-time professors from other institutes and instructors from the private sector. ESIAM has no specific research center and it graduates around 10 agricultural engineers yearly.

Faculté des Sciences Agronomiques (FSA)

The "Faculté des Sciences Agronomiques" (FSA) of the "Saint Esprit" University was established in 1988 (FSA Catalogue, 1991-1992). Like ESIAM, it is a private faculty and follows the french educational system with courses taught in french. The Diploma of "Ingénieur Agronome" is obtained after two years of basic sciences followed by three years of agricultural sciences. Until now, FSA relies mainly on part-time instructors and has no agricultural research center. The first batch of engineers will graduate in September 1993.

Discussion

FAFS has the special feature of having an Agricultural Research and Educational Center. Students of FAS were able to utilize AREC facilities between 1986 and 1990. However, like in many other developing countries (Hoffmann, 1991), the majority of the university first degree holders from the four faculties of agriculture in Lebanon lack practical experience of farm work and management or in dealing with rural life and the aspiration of its people. This is especially true since AREC remains an experimental station where feasibility of production is not set as a priority. With the present curricula of the agricultural faculties in Lebanon, most agricultural first degree graduates would then have a general agricultural education with some limited specialization options. The FAS provides exceptionally further options at that level through its special fifth year program conducted abroad. The areas of specializations in all other faculties, however, remain the "classical" ones such as Crop Production and Protection, Irrigation, Soil and Mechanization, Animal Science, and Food Technology. Agricultural engineers graduating every year saturate the lebanese employment market, whereas certain crucial sectors of the Lebanese agriculture such as fisheries, forestry, environmental sciences and veterinary medicine remain ignored in the curricula of these faculties. This situation raises an urgent necessity for a reorganization of curricula in order to respond to the national needs and to avoid unnecessary educational competition!

Governmental institutions

Several governmental institutions are involved either directly or indirectly in the

higher agricultural education in Lebanon. The public sector provides direct financial, material and human support for university research projects, and has been an important recruiter of agricultural graduates.

Ministry of Agriculture

During the fifteen years of civil disturbances in Lebanon, most activities of the Ministry of Agriculture were paralysed. The actual situation reveals that among the 154 specialized personnel and agricultural engineers required to occupy the higher positions in the ministry, only 112 are now available and are characterized by an unbalanced age distribution where senior aged staff are dominating (table 1).

In the last couple of years, however, the Ministry has started resuming its activities. The main efforts in this respect were the initiation of the collaborative project with FAO-UNDP (FAO - LEB/90/001), aiming at the "Preparation of the Rehabilitation of the Ministry of Agriculture", which includes the recruitment of new personnel and the organization of an on-job training for the already existing staff. The project also foresees the development of systems to provide farmers with technical advice and services.

Agricultural Research Institute (ARI)

Agricultural research in Lebanon is officially conducted through ARI. This Institute was established in 1957. By 1974, ARI has had 53 full-time researchers in various fields and had gained credibility and good reputation in the region. At the moment, however, the number of remaining researchers at ARI is only 17 with an average age of 55 years (ARI Consultation, 1992). In spite of its limited active staff members, ARI has recently resumed its activities and is again providing direct extension services to the farmers.

National Council for Scientific Research (NCSR)

The major role of the NCSR is to establish the scientific research strategy and provide funds for research projects. NCSR was responsible for financing a large number of research projects in the various fields of agriculture and other sciences during the pre-civil war period. The contribution of NCSR, however, is now limited to few research projects executed in association with ARI and the various faculties of agriculture.

Table 1* Age distribution of the personnel in the Ministry of Agriculture.

Age	Number	%
< 35	09	08
35-50	45	40
> 50	58	52
Total	112	100

* Data from the project "Preparation of the Rehabilitation of the Ministry of Agriculture" FAO-UNDP/LEB/90/001.

Private sector

With the free market system of the Lebanese economy, the private enterprises have greatly influenced the agricultural sector in the country. The flourishing of the private agricultural sector had both its advantages and disadvantages. One should recognize that the Lebanese market was steadily supplied with agricultural material and equipments. Moreover, the private sector has become a major absorbent of university graduates and often seeks contact with the faculties of agriculture mainly through testing the companies products before commercialization. On the other hand, the private sector has had access to farmers. Enterprises played the role neglected by the Ministry of Agriculture: they acted as extension agents, suppliers of farm inputs, collectors and traders of farm outputs, and organizers of agricultural credits. Such a full control on the agricultural activities gave the private sector room for some monopoly and abuse!

International organizations

The International Center for Agricultural Research in the Dry Areas (ICARDA)

ICARDA is located in Aleppo, Syria. Its main contribution in Lebanon is through its research station located at Terbol (Beka'a), where new varieties of cereals, legumes and forages are screened, tested and increased. ICARDA also conducts some research projects and training programs in cooperation with Lebanese partners, mainly ARI, FAFS and FAS.

The Food and Agriculture Organization of the United Nations (FAO)

FAO has always had projects that contributed to the development of various agricultural fields in Lebanon. During 1991-1992 FAO's contribution was basically through the Rehabilitation of the Ministry of Agriculture Project, ARI's Food Control Project, and many Technical Cooperation Programs (TCP) carried in response to urgent needs for training, provision of scientific equipments and assistance to small farm holders.

International cooperation

A number of European countries are supporting higher agricultural education in Lebanon. Short-term and long-term training courses are regularly offered mainly by France, Italy, Germany and the Netherlands. ICAMAS has also a direct contribution by providing yearly scholarship programs for fresh graduates and M.Sc. holders selected from different faculties of agriculture in Lebanon and the technical governmental staff.

Analysis of the deficiencies and needs

The present status of the faculties of agriculture in Lebanon and that of the private and



public institutions influencing higher agricultural education, reveals several deficiencies in the system that could be highlighted in four points of interest.

Policy and developmental strategy

As stated by Maalouf (1988), the presence of a strong governmental policy is crucial for higher agricultural education.

The policy framework is a determining factor for the goals of the higher education, structure and orientation of its institutions, and the management of its resources. The policy framework also defines the relationship among faculties of agriculture and their relationship with the concerned partners.

Due to the lack of governmental agricultural development policy and research strategy in Lebanon, organizational relationships and linkages among the various faculties and institutions remain missing. As a result, the effectiveness of agricultural research is greatly reduced. Presently, agricultural research efforts in Lebanon are spread across ARI, FAFS and FAS and are faced with the major constraints of inadequate integration and coordination of activities (ARI Consultation, 1992).

Another aspect resulting from the absence of a governmental agricultural policy, is the "waste" of human resources represented by the agricultural graduates. Since 1980, chances of a governmental employment for these graduates is almost nil; not only because of the economic stringencies but also because of an obvious lack of interest and an underestimation of the importance of the agricultural sector among the policy makers. Low wages and salaries, low rate of new recruitments, and the reduced maintenance of infrastructure and equipments, greatly contributed to the limitation of the government credibility rendering it less attractive to agricultural graduates.

Most of the agricultural first degree holders are thus employed by the private sector, consisting primarily of pesticides and seed companies with few remaining agro-industries. Graduates are employed mainly as salesmen and few may undergo limited research on company commodities and products. Other graduates work privately on their own or leave for the Gulf countries seeking a better job opportunity. Some graduates, however, leave for further higher education, provided they could obtain the required financial support. Unfortunately,

many of these graduates never come back and constitute a major loss to the agricultural development in Lebanon.

Coordination among Faculties of Agriculture

The interaction between the different faculties of agriculture in Lebanon remains minimal. Limited cooperation, between FAS and FAFS is expressed through the previous common use of AREC facilities and the exchange of professors for some courses. Unofficial exchange of professors also occurs when faculty members of FAS offer teaching in ESIAM and FSA. However, students do not interact and hardly any exchange of information or dissemination of research results from one faculty to the other is noted. Curricula are prepared and modified without any consideration of other faculties' curricula and are rarely updated according to market requirements. In spite of the limited resources of the various faculties of agriculture, the common usage of laboratory equipment and facilities is still missing even though most of them are located within the same geographical area.

Extension service

A key function of the institutions of higher agricultural education is the development of human resources and the supply of public services to the rural community (FAO Consultation, 1991). It is therefore essential that the faculties of agriculture play an increasing role in extension and training, especially that in the absence of the governmental extension service, the commercial private sector has taken over this responsibility without control.

Information transfer from farmers

This interaction is almost completely missing. Since institutions for higher agricultural education in Lebanon undertake little extension activities, farmers' problems and needs are seldom brought to the attention of the concerned scientists.

Besides, in the absence of active cooperatives and farmers' syndicates, individual farmers hardly have a chance of being heard.

Accordingly, they lose their power as a lobbying body against neglect and abuse.

Current contribution of the Faculty of Agricultural Sciences (FAS)

FAS has played a noticeable role in response to the needs of the agricultural sector through the diversity of its specialization options and the special training courses offered to lebanese and regional agriculturists.

Diversity of specialization

By the end of the academic year 1992-1993, FAS would have graduated four batches of

Table 2 *Distribution of fields of specialization chosen by FAS graduating students between 1989-1990 and 1992-1993.*

Specialization	Number of students	%
Animal Science	32	29
Plant Production	29	26
Plant Protection	17	15
Irrigation & Mechanization	12	11
Food Technology	08	07
Rural Development	05	05
Agr. Economics & Management	04	04
Renewable Natural Resources	02	02
Landscaping	01	01
Total	110	100

agricultural engineers making up a total of 110 students. These graduates have all followed the special fellowship program (section 2.1.2) and hence received at the undergraduate level, a wide range of specialization options. The choice of the host institute and the specialization was decided upon, after consultation among faculty members and with the public administration.

The choices made by the students were concentrated mostly on two fields of specializations: animal science and plant production (**table 2**).

However, a wide sub-disciplinary range of options were available within these two disciplines including genetics, new production and protection technologies, biotechnology, sustainable agriculture, integrated pest management, ecology and environment.

Other agricultural disciplines such as renewable resources and landscaping attract fewer students. Other fields of specialization like aquaculture, forestry, farm management, agriculture extension, agriculture credits and cooperatives towards which students should be oriented, still deserve more attention.

The outreach program of the FAS remain an "exceptional opportunity" for the undergraduate students to pursue one whole year both in research and applied agricultural practices in a reputable european school of agriculture. The long-term strategy of FAS aims at maintaining this opportunity while developing its completely independent fifth year program. The policy's plan is to develop every year a new specialization field in accordance with the available facilities and resources and in response to the needs of the market and the national developmental strategy.

Year of training programs

In the year 1992, and after several years of dormancy, the agricultural sector witnessed a turmoil of activities. Five regional and national training courses and workshops were conducted between May and September 1992, supported mainly by FAO and ICARDA.

Training was offered to farmers, techni-

cians, university students, agricultural engineers as well as extension agents.

Training for farmers

Between May and June 1992, two short term workshops for the lebanese farmers were organized jointly by FAS, ARI and ICARDA.

The workshops, financed by ICARDA and held in the Beka'a valley, were of 3 days duration. Around seventy farmers from different agricultural regions growing cereal and legume crops participated in these workshops. Farmers were introduced to ICARDA's new innovations and practical experience in dry land farm management. They were exposed to the newest cereal and legume varieties, and got information as to their yield potential, adaptation and environmental requirements. Farmers were also informed as to where, when and how such varieties could be bought from the Lebanese government.

An important aspect of these workshops was not only the spread of information to farmers, but also the interaction among farmers coming from the north and south of Lebanon and the Beka'a region.

Farmers realized that they have common problems which they discussed among themselves and with the specialists in the workshops. They also were able to express collectively their needs and demands from the government and its agricultural institutions.

Through these workshops, policy makers at ARI, lecturers and workshop organizers were also able to learn from the farmers' local experience.

Training for University students

The missing interaction between the faculties of agriculture in Lebanon has been also partly tackled through the training course organized by FAS and ICARDA for university students in the field of legume improvement. The course was offered in September 1992 and supported by ICARDA. In this course, and for the first time, 18 fresh graduates from FAS, FAFS, ESIAM and FSA came together in a common activity, where they interacted over one week at the scientific and social level. Together, they attended lectures, discussed, prepared and present-

ed their knowledge on special topics in legume improvement. Lecturers and researchers coming from ICARDA, FAFS, FAS and ARI also shared their knowledge and experience.

Training for extension agents

The FAS has also assisted in the reactivation of the national system of agricultural extension whether through training of already existing personnel or through motivating young agricultural graduates. A one-week national workshop on agriculture extension was held in June 1992 and sponsored by FAO. The workshop was organized by FAS, the FAO Rehabilitation Project of the Ministry of Agriculture and the Human Resources Institutions and Agrarian Reform Division of FAO. The 21 participants had the opportunity to attend and discuss the role of the extension agent in various fields of agriculture, namely crop production and protection, animal husbandry and health, food technology and agroindustries. The relationship between the extensionist and research, and the role of extension in sustainable agriculture were also discussed. In addition, participants visited farmers where round table discussions were held together with cooperative representatives and researchers. What farmers expect from the extensionists and the methodology to be followed were on top of the debates.

Training for trainers

The FAS has triggered the interaction between researchers and agricultural engineers at a regional level. Twenty four engineers, senior technicians and researchers from Egypt, Tunisia, Syria and Lebanon representing faculties of agriculture, research centers, regional projects and private institutions were brought together in a regional workshop on "Management of Soil, Water and Agricultural Inputs". This workshop was organized during May 1992 jointly by FAS, ARI, the Land and Water Division of the FAO and the FAO-Near East Regional Office (RNEA) and was co-sponsored by FAO headquarters and RNEA. It aimed at introducing new concepts and technologies on the proper, safe and efficient use of land, water and agrochemicals. The workshop was also meant to familiarize participants with recent developments in irrigation, fertigation and chemigation techniques, integrated agriculture and principles of farming systems. Such topics were fully discussed among participants, experts from FAO and Lebanese consultants who strongly interacted and exchanged experience in view of the regional common resources of soil, water and agricultural inputs.

Guidelines and perspectives

The diversity of specialization options in the agricultural education and the efficient transfer of knowledge are urgent current national needs. Complementarity and coordi-

nation among the already established faculties of agriculture and their integration in the national system is a necessary but "delicate" issue. To achieve this objective, the assistance of a higher organizational body is needed. Two governmental councils could be seen as potential candidates:

— the "Higher Council of Agriculture" which consists of representatives of the private and public agricultural institutions (education, production, marketing, cooperatives, etc..)

— the newly founded "Ministry of Higher Education and Culture", which is responsible for organizing and coordinating the higher private and public educational institutions.

To overcome the actual chaotic status and the weak linkages among the different actors in the agriculture knowledge transfer system, all partners whether research, extension, education or private business (figure 1) should modify their methodol-

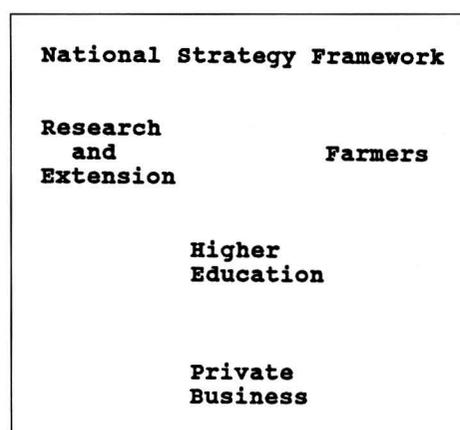


Figure 1 - Suggested diagram for an integrated scheme agriculture.

ogy to fit into a new integrated system which falls within the framework of the national developmental strategy (Hamz, 1992; Kharrat, 1992).

Looking ahead...

In the nineties, the world has experienced major shifts in the trends of agricultural production, market organization, science and technology leading to an increase in the gap between the developed and our developing countries.

The year 1992 has witnessed four major events which affect agriculture in the world whether directly or indirectly:

- The conference of Rio de Janeiro on the future of the earth which yielded an international environmental policy,
- The world food policy announced after the International Conference on Nutrition held in Rome,
- The European approval of the "Maas-tricht Chart" of the Economic European Community,
- The GATT negotiations inducing risks for

a new trade war!

These world developments should create a further incentive if not an urge in the developing countries to adopt new agricultural policies both at the national and the regional levels. We strongly believe that without such new policies, survival within the world's agriculture systems remains an illusion. The difficulties and constraints encountering national programs necessitate, more than ever before, the establishment of a common strategy and a regional network in cooperation with the international organizations.

Establishment of networks in agricultural production and system sustainability, environmental protection, food security and market policies, in addition to regional M.Sc. and Ph.D. programs and regular training courses are priorities in our region.

Individual agricultural institutions, represented by their staff or faculty members often fail to see a more global view of the present agricultural situation at the national or regional level. They tend to occupy and satisfy themselves with teaching, learning new technologies and undergoing research, the outcome of which often remains within the gates of their institutions. They tend to forget that their primary duty as higher agricultural educators is to serve the rural community which in turn feeds the world. However, this increasing gap between our farmers and the international development might lead to their gradual disappearance, with serious consequences on the food security situation and on the social stability of the developing countries. ●

References

- ARI Consultation, 1992, *Development of a Research Strategy for the Lebanese Agricultural Sector*. Study prepared by the Agricultural Research Institute and ISNAR, October 1992.
- AUB Catalogue, 1992-1993, American University of Beirut Catalogue. Section on the Faculty of Agricultural and Food Sciences, 338 pp.
- FAO Consultation, 1991, *Expert Consultation on Strategy Options for Higher Education in Agriculture*, Final Report. FAO, Rome, Italy, December 16-20, 1991, 46 pp.
- FAS Catalogue, 1992-1993, *Catalogue of the Faculty of Agricultural Sciences - Lebanese University*, 23 pp.
- FSA Catalogue, 1991-1992, *Catalogue of the "Faculté des Sciences Agronomiques"*, Saint Esprit University, 15 pp.
- HAMZE M., 1987, *La Formation Agronomique au Liban. Options Méditerranéennes*. Serie Etudes, CIHEAM, November, 1987 :89-93.
- HAMZE M., 1992, *Agriculture in Lebanon: Status and Perspectives; Role of the Public and Private Sectors in Reactivating Agricultural Extension*. Paper presented at the FAO Workshop on "Agricultural Extension in Lebanon - Status and Perspectives", Beirut, Lebanon, June 1-5, 1992, 17 pp.
- HOFFMAN H., 1991, *Higher Education in Agriculture: Status, Issues and Ideas for Future Development. Discussion paper presented at the Expert Consultation on Strategy Options for Higher Education in Agriculture*, FAO, Rome, Italy, December 16-20, 1991, 112 pp.
- KHARRAT A., 1992, *Review of Training Programs for Extension Personnel Applied in the Arab Countries*. Paper presented at the FAO Workshop on "Agricultural Extension in Lebanon - Status and Perspectives", Beirut, Lebanon, June 1-5, 1992, 59 pp.
- MAALOUF W., 1988, *Views on Strategies for Higher Agricultural Education in Support of Agricultural and Rural Development*. Paper presented at the USAID Conference on the "Future Role of the Agricultural University". Washington DC., USA, October 2-8, 1988, 16 pp.