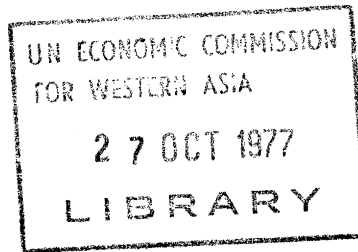




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Relevance of Agricultural Research in ECWA
Region to Agricultural Problems

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Technology Transfer and Change:
The Arab Middle East
October 9 -14, 1977

Relevance of Agricultural Research in ECWA
Region to Agricultural Problems

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The necessity to accelerate the rate of agricultural development has been increasingly recognized throughout the world. Such necessity is becoming an urgent demand to meet present and future food shortage in certain areas such as ECWA region. It is well recognized that food demands in the countries of ECWA region are increasing at a rate which is twice that of agricultural development. Such is the case, the reliance of these countries on imports to meet food demands is increasing, and will increase in the future unless drastic and effective measures are taken to accelerate the rate of agricultural development in the region.

The potential contribution of research to agricultural development and its impact on technology have been well recognized, particularly, in the last decade. This could be illustrated in several disciplines. Of particular interest to ECWA region we can point out to the historic break-through in the production of wheat that took place during the last ten years. This break-through has been accomplished based on the development through research to produce new varieties highly responsive to irrigation and fertilizers. Important lessons have been learned and plant research techniques developed that can result in more rapid progress with other cereals and it is hoped with other food crops. In the field of irrigation, several new techniques have been developed and tested with the ultimate goal of minimizing the loss of irrigation water and maximizing crop yield per unit of irrigation water.

To assess the contribution of research to agricultural development in ECWA region, it is interesting, first, to review and summarize the research and development efforts through the last decade, second, to evaluate the outputs in the light of present and future need. It is imperative to point out that the following summary of research and development efforts can not be inclusive due to several reasons foremost among which is the lack of documentation and dissemination of information in the region.

Research institutes and organizations at country level.

1. Jordan:
Ministry of Agriculture:

Department of Agricultural Research was established in 1958. Several affiliated specialized research stations: Deir Alla, wadi yabis, Fara'a Irbed, Jubeiha, shobak, wadi Doly, Ramtha and Uarash.

Research activities include production and management of field crops, fruit trees and vegetables under irrigated and rainfed conditions.

Two stations for sheep breeding - El fogage and El Khanasry - mainly for improved local sheep strains, in cooperation with ACSAD.

University of Jordan : College of Agriculture Research programmes along previous guide lines.

2. United Arab Emirates:-

Ministry of Agriculture and Fisheries:
several newly established research centers and stations at El ein, Ras El- Khimah, El sharkah and El- Fogirah Main activities include trials on vegetable production under natural or greenhouse conditions, nurseries, fruit trees production (mango, ,palms and citrus) and irrigation trials, using trickle irrigation technique.

Joint project with FAO (7 experts) on soil and water management for studies on underground water and salt water intrusion, trickle irrigation, soil analysis and salinity.

3. Bahrain:

Ministry of commerce and Agriculture - Agriculture Directorate.

Limited agricultural production. Studies on citrus and vegetable production.

4. Saudi Arabia:

Ministry of Agriculture and water
Department of Agricultural Research and Development:

- 1- Qatif Experimental station: (Eastern province) was established in 1963 as a pilot experimental farm through joint agreement between the Government of Saudi Arabia and UN Special Fund. Objectives of research programme include modernizing agriculture by establishing new cultivation techniques, introducing most productive varieties of Crops. Major activities include trials on manure and fertilizer requirements, time of planting, windbreaks irrigation, seed production, and cooperation with FAO and Cimmyt to evaluate wheat varieties.
- 2- Hofuf Agricultural and Animal Production Research Centre: Joint Saudi Arabian - German cooperation to study the reuse of saline water for irrigation, methods of irrigation, soil and water properties.

Since 1970 an agreement of cooperation with the University college of North Wales, Bangor, to study farm mechanization, crop and forage production, fertilizer trials, cattle and sheep production, dairy production, sheep breeding, water management, reclamation of saline desert soils and personnel training.

Universities:

Universities; Mainly academic activities. Main research activities at college of Agriculture Regadh university.

5. Syrian Arab Republic:

Ministry of Agriculture and Agrarian Reform.

- A. Soils Division: Departments of soil survey, soil reclamation and water requirements, soil fertility and Plant nutrition and laboratories of soil, water and plant analysis.

Main activities concentrated on completion of Syria's soil map, fertilizer trials on nitrogen and phosphorus, role of organic fertilizers, water requirements and effect of Ca CO_3 and gypsum.

- B. **Agricultural Research Division:** Six affiliated regional offices and 8 regional research stations. Main centre at Damascus includes five departments.
plant pathology - field crops - fruit trees - vegetables and food technology.

Universities:

Engaged mainly in academic activities. Limited research activities due to shortage of teaching staff. Research carried out by staff members on topics similar to those mentioned above.

6. Republic of Iraq :

Organization and structure of research institutes and centers have been changed a number of times. Available informations indicate the following:

Organization of Scientific Research - Ministry of Higher Education and scientific Research:

The organization is comprised of 8 centers and institutes. Among the major Agricultural institutes are the following:

1- **Natural Resources Institute:**

Was founded in 1959 . Eight Laboratories for ecology, climatology, soils, land reclamation, water requirements, fertilizers, geology and central chemistry laboratory.

2- **Agricultural Research Center:**

Was founded in 1969. Experiments on particular applied problems e.g. sterility of sunflower and rice, drought resistant wheat varieties and some fertility problems.

3- **Palm and Dates Research Center:**

Was founded 1968 to carry out research and technical investigations of dates production, processing and related industry. labor training and consultancy services. studies on chemical and biochemical composition and nutritional value.

4- Scientific Documentation center:

Was founded 1971 to survey and compile research activities carried out by universities, research centers, agricultural and industrial firms. Also to disseminate informations among these institutes.

Supreme Council for Agricultural Research Include several specialized research organizations in the various agricultural disciplines. Each organization is comprised of a number of divisions.

Ministry of Agriculture and Agrarian Reform:
Three major divisions for water resources, crop production and animal production.

Institute of Animal Breeding Research:
Was established according to agreement between the Ministry of Agriculture and UN special Fund. Main research activities include selection, breeding of sheep and cattle, artificial insimination, pøltery, animal nutrition, range management and forage production under irrigated sgstem.

Universities:

Research activities include numerous diversified topics covering various aspects of agricultural production and development .

7. Oman:

Joint FAO programme for surveying and studing water resources in the Last two years. Limited soil survey studies. Studies on rain water harvesting. Fertilizer and irrigation trials.

Four experimental centers Ramis, Wadi Al Qriat, sahar and slalah. Three pilot farms and two extension service Centers.

Vegetables and field crop trials , fruit trees production and management .

Cattle improvement and breeding at slalah.

8. Qatar:

Main activities on soil and water resources. Survey of under ground water resources for quantity and quality. Priliminavy soil survey studies. Limited irrigation and fertilizer studies. Survey of range species sheep improvement programme under - way

9. Kuwait:

Ministry of public works:

Agriculture Administration

Animal Breeding and Production Division:

Breeding, improvement of local strains, cattle and milk production sheep meat and poltery production.

Plant production Division:

Trials on vegetables and fruit trees production. Varieties resistant to heat and salinity. Stock trials. Fertilizer and irrigation trials.

Vegetable production center (El Ameria) in cooperation with FAO. Vegetable production under greenhouses, plastic mulshing and natural conditions. Hydroponics and irrigation tridls. soil and water division:

Water resources survey; movement of under ground water, salt water intrusion sea water desalinization. Reuse of sweage water. irrigation techniques and water requirements. Soil mulching soil and plant analysis.

Experimental Farm:

Production of vegetables under sandy soil conditions with irrigation trials.

Kuwait Sciontific Research Institute:

Studies on ecology, animal nutrition, chemistry, biochemistry and soils.

10. Lebanon:

Research activities in Lebanon, prior to the beginning of hostilities, were conducted by the Organization of Scientific Agricultural Research and universities.

Organization of Scientific Agricultural Research (Tal Amarah) started its activities in 1952. In 1964 became an independent organization with five main departments horticulture - crop production - soils - irrigation and breeding.

The Organization has affiliated stations: El Fanar, Trebel, El Abdah, Kofrdan, Nabaah, Soar and Zogertah. Research activities include soil surveying, soil chemistry, fertilizer trials, water requirements, methods of irrigation, soil management, dry farming, crop and fruit trees varieties, entomology, plant pathology, animal and dairy production, biochemistry and vaccines production.

Universities:

Research activities were related to soil mineralogy, soil nutrients, dairy production and processing, development of new crops and varieties, plant pest control, economic and sociological aspects of agriculture and food processing.

11. Arab Republic of Yemen

Ministry of Agriculture

Published information are limited. Research efforts to develop available water resources. Variety trials on field crops and vegetables. Basic fertilizer trials. Fruit production and marketing.

12. Democratic Yemen Republic :

Published, informations are limited

Arab Organizations in the Regions :

The Arab center for the Studies of Arid Zones and Dry Lands(ACSAD) :

As a regional Center , ACSAD has been engaged since 1971 in Scientific and applied studies in relation to the recent problems of aridity and dryness in the Arab World , such as :

- Water resources and utilization
- Soil classification and fertility
- Soil- Water relationship and conservation
- Fruit trees and field crop production and rotation
- Sheep-pasture and range mangement
- Desertification , soil degradation and watershed management.

At the same time the Center is engaged in training of specialists and technical personnel for the protection , culture and exploitation of natural resources and environmental factors in the Arab World.

Documentation , exchange of information , and dissemination, extension and cooperation with other institutions (National, regional and International) are some of main duties of the Center.

Arab organization for Agricultural Development

Numerous feasibility studies for agriculture development projects to be excuted in the various countries of the region studies on specific agricultural problems facing Arab Countries. These investigations are carried out by teams of experts formed according to subject of investigation .

International organizations acting in ECWA region. Activities of several organizations related to agricultural research and development efforts will be cited in the following section dealing with evaluation of research efforts in ECWA region.

EVALUATION OF AGRICULTURAL RESEARCH AND DEVELOPMENT
EFFORTS IN ECWA REGION OVER THE PAST DECADE

To evaluate the efforts and outputs of agricultural research and developements over the past decade one has to bear in mind priorities and needs facing agricultural developments during that period of time . These priorities could be summarized in the following points :

1. Proper land and water use for agricultural purposes were and continue to be among the most important factors contributing to the efficient exploitation of both resources. Surveys of and evaluation of soil and water resources both in quantity and quality are imperative to acceleration of agricultural production.
2. Investigations of environmental factors limiting agricultural production in the région including :
 - a. Amounts , destribution and reliability of rainfall.
 - b. Soil factors, i.e. carbonates and gypsum contents, limited supply of nutrients , salinity hazards.
 - c. Evapotranspiration and water balance.
3. Rational use of irrigation water , including minimizing losses in conveyance , efficient drainage systems and study of water requirements of crops under local conditions.
4. Breeding and selection of high yielding crop and vegetable varieties , as well as , genetic factors conducive to resistance of various , stress conditions such as drought , salinity and heat. Range management and development.
5. Breeding and improvement to animal strains , animal nutrition studies and other factors conducive to acceleration of animal production.
6. Proper agronomic techniques and mechanization suitable for environmental , social and ^{economical} conditions of the region.

With these priorities and needs in mind we can proceed to evaluate agricultural research and development effort in the regions according to the following criteria.

Scope and Scale :

Scope and scale of research efforts are quite variable among the countries of the region. In few countries, scope and scale of research efforts encompass almost all disciplines of agricultural research. Research institutes in these countries are numerous and diversified. In other countries research efforts did not start until few years back with limited scope of research efforts.

Soil and Water :

In view of priorities and needs of agricultural developments in the region , we find that research efforts to assess and develop soil and water resources in the region are limited , with the exception of efforts by organization like ACSAD * and FAO ** , as well as , efforts by three or four countries. Even in these countries there are several resources and aspects that need to be investigated and developed. For most among which are:

- Underground water resources -
- quantity , quality , recharge , salt water intrusion and proper management.
- Soil and water conservation practices
- rainwater harvesting and storage , plant cover and water shed management

* Natural resources maps of the Arab World (Soil , water , plant and water)

** Soil map of the World 1:1.000.000

- Efficient land and water use - to maximize returns per unit of water under different ecological conditions.

Environmental Factors

Studies on environmental factors limiting agricultural production were concentrated mainly on soil factors, with agro-meteorological studies receiving minor attention. Research investigations of soil factors are duplicated in several countries of the region without coordination or exchange of experiences. Investigations are carried out to tackle separate aspects and angles without being based on comprehensive programmes which could lead to the proper management and development of calcareous and gypsis soils dominating large areas of the region.

Expansion of water logging and salinity problems in the region are not caused by lack of knowledge, technical and scientific research. In fact, there are hundreds of papers that have been published and several seminars and conferences have been held. Several organizations have contributed to research efforts. However the expansion of these problems is attributed mainly to lack of pilot projects for proper designing, management and maintenance of salt affected soils with regard to the dominating environmental factors in the ecosystems of the regions. One example that could be cited of such projects is El Mosyeb project in Iraq.

Plant and animal production :

Review of research efforts for the past decade in the region points out that most common topics of investigations were related to variety trials for field and vegetable crops. Comprehensive plant breeding programmes for high - yielding and stress resistant varieties were offered by ACSAD, ICARDA, ICRISAT and CIMMIT. Such programmes are highly successful and fruitful.

Other common topics include basic agricultural practices including date of sowing , spacing , major fertilizer requirements and testing of pesticides.

The scale and scope of research efforts devoted to mechanization and range management were of much smaller magnitude despite the importance of these disciplines to acceleration of food production.

Animal production investigations are mostly in the form of local strain improvement projects. Other aspect of animal production receiving minimum efforts.

Planning :

The greater majority of research efforts were in the form of separate trials conducted in one aspect or another of a single discipline of agricultural research. Planning of investigations was attributed mostly to individual investigator with team efforts rarely encountered . even within the same institute.

Lack of coordination is quite evident not only among institutes of a given country but also among departments of the same institute.

Even in countries with greater research facilities , research planning is carried out by several authorities affiliated to several bodies with the inevitable results of non-comprehensive planning , lack of coordination duplication and inefficiency of efforts spent.

Techniques used:

Techniques used in Agricultural developments are widely variable . In the last few years highly expensive modern techniques have been introduced particularly in high income countries. Of the region, i.e. sea water desalinization, hydroponics, air conditioned greenhouses, trickle irrigation...etc. Such techniques , however , are not necessarily suitable for the environmental, social and economical conditions of the region . However, such techniques are being introduced and appraised in several countries of ECWA region.

Personnel and training:

Lack of staff members and specialists is a common feature of almost all research institutes and organizations at the national level . The number of qualified personnel needed varies according to country , field of study and nature of the institute . The problem , at country level , could be attributed to a number of factors including lack of enough institutions. Lack of facilities for graduate studies , and what is called " brain drain" that is immigration of qualified personnel to the developed countries .

Another feature which is even more striking is the lack of skilled technicians. This problem is quite common throughout the region . Skilled technicians play an important role in the implementation of research and development programmes . It is no wonder that such problem should have significant bearings on

agricultural development and progress of technology in the region.

Proposals for possible integration of research programmes with actual needs of the area.

The continuation of separate and non-coordinated research efforts on the national and institutional level will never lead to the integration of research programmes with the pressing needs and demands of the region. It is quite obvious that none of the countries of the region can afford the time, expenses, technology, provision of qualified personnel and technicians to solve all problems facing agricultural development in its domain. It is clear also that ^{there are many problems which are common to more than} ~~that~~/one country of the region i.e. salinity and water logging development of calcareous and gypsic soils, development of underground water resources, mechanization and range management , just to name a few Duplication of efforts in these countries would be at least a waste of energy , funds and time .

To remedy such problems , it is imperative to plan regional research programmes and pilot projects that could serve all countries with relevant problems. Such programmes could pool research funds , personnel and facilities , It would also help in unifying methodology and techniques relative to a given problem , hence, findings, of these programmes could be assessed and properly implemented throughout the region. Time and efforts could be saved and properly invested . Duplication and in-efficiency of research planning could

- be avoided .
2. Priorities is a key word that should play a major role in planning of research and development efforts in the region. To assign priorities to research problems to be tackled , according to its relevance and importance to acceleration of food production , would certainly lead to speedy and efficient attainment of goals set for agricultural development in the region.
 3. More emphases should be put on inter-disciplinary research programmes which integrate and correlate effects of all relevant fields influencing a given problem. An excellent example of these programmes is the investigation of various environmental and management factors influencing grains production under rainfed conditions. Such study have been very fruitful in Bulgaria where it lead to the identification of most important factors governing production, as well as , assigning most suitable areas for the production of grains.
 4. Greater attention should be given to laying down of short and long term programmes for training of specialists and technicians, particularly, in field which are in great need for staff and personnel such as mechanization, water technology and maintenance of equipments and instruments.
 5. Documentation and dissemination of informations and research findings are two of the most important elements that are evidently lacking in the region. As previously mentioned there are many problems

that are common to several countries of the region if not all of them , therefore , dissemination of research findings will help a great deal in avoiding duplication of efforts. It will help , also , in better coordination of research activities.

6. Research efforts at the national level should be given greater financial support. In many countries of the region funds allocated for research activities are far below the 1% of national income level . This would certainly impair the function and contribution of research,activities to agriculture development in the region.

7. An overall strategy for agricultural development in the region is badly needed . Such strategy would clarify and help to outline future development plans. It would lead to proper exploitation of the relative advantages of each of the countries of the region relevant to certain aspects of agricultural development , hence , agricultural production in the region would be geared to progress not on national basis only but also on regional basis . This achievement would certainly have great bearings on meeting the demands and needs of the region.

R E F E R E N C E S

1. ACSAD . Annual Report 1971 - 1976 (In Arabic) .
2. ACSAD . Report on Agricultural Development in Gulf Countries 1977) (In Arabic)
3. American University of Beirut . Annual Reports.
4. Arab Organization for Agricultural Developoment . Special reports 1974 - 1977 (In Arabic).
5. Calcareous Soils : Report of the FAO / UNDP regional seminar on reclamation and Management of calcareous soils. Soils Bulletin FAO 21 . 1973.
6. CIMMYT Annual Reports 1972 - 1976 .
7. Foundation of Scientific Research , Ministry of Higher Education , Iraq Research centers and Institutes Inception , programmes and Actirities 1973 (In Arabic)
8. Hofuf Agricultural Research Centre Reports . Saudi Arabia - 1969 - 1972
9. Ministry of Agriculture. Jordan. Division of Research and Extension service. Annual Reports of Rescarch Departments. (In Arabic)
10. Ministry of Agriculture and Agrarian Reform . Syria Bulletin on Agricultrual Research Division . Bulletin 113 1976 (In Arabic).
11. Ministry of Agriculture and Water - Saudi Arabia , University college of North Wales U.K. Joint Agricultural Rescarch Deve-lopment project Hofuf Publications 1- 90 - 1972 - 1976.
12. Prognosis of salinity and Alkalinity . Report of the Expert consultation on prognosis of . salinity and alkalinity - Soils Bulletin FAO 31. 1976.
13. Qutif Experimental station Technical Annual Reports 1969-1972

