

المنظمة العربية للتنمية الزراعية



المؤتمر الدولي للتنمية الزراعية المستدامة والبيئة في الوطن العربي

عمان - المملكة الأردنية الهاشمية
14-16 أكتوبر 2003

التوصيات وأوراق العمل



تحت رعاية

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إنعقد بالمملكة الأردنية الهاشمية خلال الفترة 14-16 أكتوبر 2003

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نظمت المنظمة العربية للتنمية الزراعية هذا المؤتمر بالتعاون مع :

- وزارة الزراعة بالمملكة الأردنية الهاشمية.
- وزارة البيئة بالمملكة الأردنية الهاشمية.
- البنك الإسلامي للتنمية .
- مجلس الوزراء العرب المسؤولين عن شؤون البيئة .
- برنامج الأمم المتحدة للبيئة .
- منظمة الارصاد الجوية العالمية .
- منظمة الأمم المتحدة للأغذية والزراعة.
- المركز العربي لدراسات المناطق الجافة والأراضي القاحلة .

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الجلسة الثامنة
التنمية المستدامة للمراعي
ومكافحة التصحر

The Efforts and Achievements of the Egyptian Ministry of Agriculture of Realize Sound and Sustainable Agriculture in Egypt

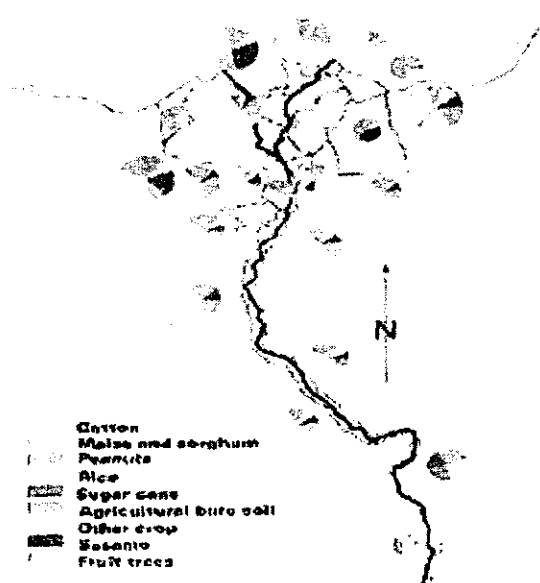
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Introduction

The Government of Egypt places great importance on the agricultural sector recognizing its significant role in the national economy. It accounts for about 20 percent of the Gross Domestic Product (GDP) and about 34 percent of the total employment. The agricultural sector contributes to the overall food needs of the country and provides the domestic industry with agricultural raw materials. It promotes industrial development through expanding the market for industrial goods such as pesticides, chemical fertilizers, equipment and machines. In addition, agriculture helps in financing economic and social development through the net capital outflow from agriculture to other sectors of the economy.

The Egyptian Ministry of Agriculture (MOA) developed a strategy for agricultural development in Egypt in the 1990s to further deepen the agricultural economic policy reform programme which was already initiated by the sector, to take into consideration local, regional and international economic, social and political changes and to outline a sector development programme for this decade within the context of the National Development Plan.



Future Prospects of Agricultural Development in Egypt :

In the context of National Strategy for Socio-economic Development in Egypt up to 2017, the Ministry of Agriculture and Land Reclamation has prepared a strategy for agricultural development for the period 1997/98 (The commencement of the Fourth Five-Year-Plan) up to 2016/2017. The preparation stage includes also the full designing of agricultural programmes and projects scheduled to be implemented through the Fourth Agricultural Five Year Plan 1997/98-2001/2002.

The pillars of this strategy are as following :

- * Increasing the annual rate of growth of agricultural production to 4.1 %.
- * Sustaining the increase in cereals production which amounts recently to 18 million tons yearly through the contrivance of high yielding varieties, national campaigns, and setting optional floor price for targeted crops so as to be consistent with border price and maintain rice acreage around 900 thousand feddans a year.
- * Substantiate Cotton Price Stabilization Fund with the purpose of raising production of this major crop to meet the requirements of domestic mills on the one hand and fulfill export objectives on the other. The Cotton Fund also safeguards cotton producers against the risk of price fluctuation arising from economic liberalization policy application. This goes side by side with setting floor price consistent with border price and such proposed floor price must be announced broadly prior planting season. Ministry of Agriculture and Land Reclamation will give every support possible to this strategic crop to achieve the highest level of productivity and restore its privileged position in the world market too.
- * Increasing edible oil crops production to substitute imports through the expansion of sunflower, soybeans and canyola areas and setting acceptable optional floor price of such crops.
- * Increasing sugar production through the expansion of sugar-beet crop, which proved to be promising in several governorates. More beet-sugar factories are planned to be established in Fayoum governorate and Nubaria Zone.
- * Upgrading horticultural crops marketing efficiency, whose production amounts recently to 21 million tons yearly, through pursuing improved post harvest treatment, establishment of vegetables& fruits stock of exchange,

and functioning the comparative advantages in production and exports in light of WTO and EUR & USA partnerships with Egypt.

- * Maintaining restrictions on excessive use of pesticides and chemical fertilizers in line with giving more room to biological integrated pest management to minimize cost of production, upgrade quality to survive severe competition in the world markets and keep environment safe.
- * Placing more emphasis on irrigation water-use efficiency and agricultural soil improvement and maintenance projects. The Executive Authority for Land Improvement Projects assumes to perform extra services such as agricultural gypsum addition, deep plowing, laser land leveling and tile drainage services.
- * Increasing animal production protein from its numerous sources to maintain self-sufficiency of poultry meat, dairy products and eggs and raise self-sufficiency in red meat. These objectives could be attained through the revival and development of Veal Production Project, upgrade veterinarian services, up level productivity of endogenous cattle (buffalo, cows and sheep) through adoption of efficient breeding and genetic improvement programmes. Likewise, fish resource development projects exert many efforts to achieve sustainable development of resources kept in the Nile and its tributaries, seas, lakes and fish farms.
- * Supporting agricultural researches, marketing extension, mobilize woman role in agricultural and rural development and develop agricultural cooperative legislations to cope with the new trends of privatization, liberalization and economic reform programmes.
- * Developing the credit policies pursued by the The Principal Bank for Development and Agricultural Credit (PBDAC) to play an active and constructive role in agricultural sector through extending more credit facilities and services to all agricultural rural activities. The Bank also assumes to create and encourage saving awareness among rural population and its units are planned to work on economic basis through restructuring and reorganizing themselves down to the village bank level.
- * Creation of conducive environment for Egyptian, Arab and Foreign investors to launch initiatives in agricultural production, post harvest, marketing and export projects.

- * Maintaining the system of letting the recently graduated youth to own some reclaimed land in the framework of Mubarak National Project to alleviate unemployment problem. The rest of reclaimed land will be allocated for small farmers investors.
- * Keeping proceeding in New Land Reclamation Programmes on the area of 3.4 million feddans of the land ranked on top of priorities envisaged by Master Plan of Land Resources. Those targeted lands are located in Upper Egypt and Oases (New Valley governorate), East and North of Suez Canal, and in National South Valley Development Programme aiming at creation of new integrated communities to alleviate living conditions in dense populous areas in Delta and in old Valley strip.

Ensuring People's Participation and Human Development :

The agricultural extension service is considered the cornerstone for promoting agricultural productivity. Research and services are aimed at developing human resources throughout Egypt. The main objectives involve the development of agricultural extension programmes that are timely and meet the needs of a growing Egypt amidst a changing global environment.

A major focus of the programme deals with decentralizing planning and implementation of extension programmes for rural development of field crops, horticulture, and the production of animals, poultry and fish in order to make local programmes more accessible and meaningful to farmers.



Sustainable Utilization of Plant Genetic Resources :

In Egypt, 2112 species and 153 infraspecific epithets (subspecies, variety, forma) of native and naturalized vascular plants are distributed over a vast area compromising a wide ecological variation. Egypt is the home of the wild relatives of some important food crops and many pastoral and medicinal plants.

Activities of the National Plant Genetic Resources Unit :

In January 1995 a "National Plant Genetic Resources Unit in Egypt" (NPGRU/E) was established within Agricultural Research Centre (ARC). A genebank is under construction and a director was appointed. The NPGRU/E worked out a National Strategy Plan regarding the activities with PGR. This plan was presented and discussed during an organized national workshop, which was held in March 1995.

During the last 4 years the following activities have been finalized or started :

- * National strategies and working plans have been worked out and discussed.
- * The NPGRU has been assigned as a focal point for all matters related to PGR.
- * Contact with concerned regional and international institutions has been made and intensified.
- * On the job, training and several training opportunities abroad have been given to NPGRU staff.
- * A National Plant Genetic Resources Committee has been established in December 1995. The committee met 8 times during the last 2 and half years. Important issues have been discussed and several actions have been taken.
- * Country report on plant genetic resources activities in Egypt has been prepared and submitted to FAO and other organizations.
- * The NPGRU was giving technical advice to members of the national network.
- * Working manuals for germplasm collection, processing, conservation, evaluation and data documentation were prepared.
- * Several national and international workshops on plant genetic resource activities were prepared and conducted in Egypt.

- * A plant genetic resources station in El-Sheikh Zuwayid at the North East Coast of Egypt has been established (Desert Research Center, MOA).

Sustainable Plant Nutrition to Increase Food Production :

To reduce the amount of chemical fertilizers applied to crops, biofertilizers have been produced and applied to legume crops and cereals. This practice will enhance the quality of the crops and reduce the amounts and costs of mineral fertilizers.

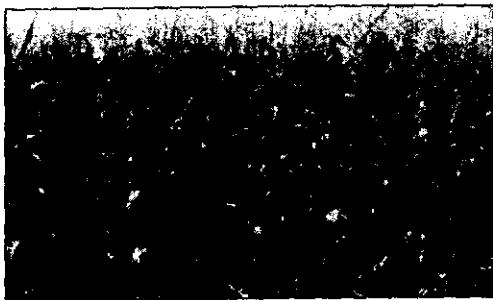
Compost production is promoted among farmers to reduce the amount of chemical fertilizers and to re-add the nutrients uptakes by plants compost to improve the soil characteristics conditions.

Ministry of Agriculture (MOA) has realized the importance of organic farming of vegetables, fruits and some crops. Organic farming ensures:

- * Suitable and healthy food for human consumption.
- * Environmentally friendly practice.
- * Conservation of soil fertility.
- * Enhance exports to external markets.
- * Absence of using pesticides, which has an adverse effects on environment and human and animal health.
- * High price than conventionally produced products.

MOA is taking necessary steps to issue a decree outlining the rules and procedures of organic farming.

A number of certifying agents are starting now to register, inspect and certify organic products. Total area producing organic products is about 10.000 feddan.



Sustainable Utilization of Animal Genetic Resources :

- * Increasing propagation rates and effective conservation of genetic materials of native origin.
- * Utilization of farm byproducts in animal nutrition to increase animal feed resource potential.
- * Selection and conservation of genetic resources of exotic nature used in genetic improvement activities.
- * Increasing palatability and nutritive values of poor quality roughages by chemical and biological means.
- * Increasing efficiency and range of the national germ-plasm and embryo bank.
- * Incorporation of agro industry by products for animal nutrition.
- * Establishment of nucleus herds and flocks of native animal species "cow, buffaloes, camels, sheep, goats, poultry" and application of genetic improvement techniques to ameliorate production.
- * Acquisition of time utilities to make available feed during crucial periods of feed shortage.



Land Conservation and Rehabilitation :

- * The study of salinization using different thematic data and satellite's images shows that the highly saline area located in the North of Nile Delta, has increased. However, areas where tile drainage system was introduced have been improved.

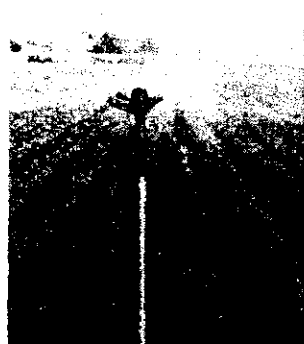
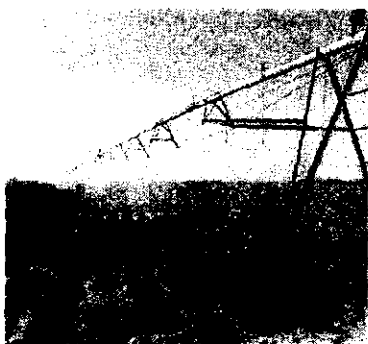
- * A number of projects can be given to show the Egyptian efforts such as Toshki project to cultivate 540.000 feddan in Upper Egypt, Salam Canal that will add six hundred thousands newly reclaimed feddan in Sinai.
- * Overgrazing in the North Western Coastal zone of Egypt is controlled and cultivation of 1.5 million of seedlings in the area suffering from the desertification will minimize its effect.
- * Treated sewage water has been channelled into desert and has been planted with trees for production of wood. These forests were established in 19 locations throughout the country, with a total area of about 3500 feddan. The establishment of these forests will have positive impact on environment and agriculture resources.
- * The national action programme to combat desertification for achievement of sustainable development in effected areas. This programme highlights the necessary national mechanisms to manage the irrigated lands, rainfed lands and range lands. In all cases, it is important to define the measurements to prevent degradation of fertile lands, rehabilitate lands that have been exposed to slight degradation and reclaim lands that are extensively degraded.
- * Plans of the Egyptian Government aim to reclaim 150.000 acre annually.
- * More than 20 nurseries for cultivating different species of trees were established.
- * Many of the desertification processes menace the arable land that represent only 4 % of the Egyptian land. Remote sensing was used as the main tool in this study to monitor and evaluate different desertification processes. Convention of farmland to non-agricultural uses considerable losses: multi-temporal aerial photographs and satellite images made it possible to find out the annual rate of urban encroachment that ranges from 5 to 30 %.>



Water for Sustainable Food Production and Rural Development :

Under the limited water resources, and due to the increase in population as well as the need for more lands to be added to the present area, efficient use of irrigation water is enhanced through :

- * The rice area must be rationalized and musn't exceed one million feddan per year. Promoting the use of early maturing varieties (120-130 days) will consume less water per feddan (7500 m³/feddan). This will save about 5.5 B. m³/year.
- * Improvement of irrigation efficiency or reducing the amount of applied water to the fields.
- * The area of sugarcane must be controlled or no increase in sugarcane area. In addition, improvement of irrigation efficiency by better water management will save much water. At the same time, modern irrigation technology could be used for such crop in order to reduce the applied water.
- * Using drip irrigation for the total area of orchards instead of surface irrigation. In addition, a part of water requirements for this area could be supplied from shallow underground water.
- * The use of drip irrigation in the half of the total vegetable area (1.2 million feddan) will reduce the amount of total water delivered to such crops.
- * Water saving under this policy will reach about 10.7 B. m³/year. This amount of water could be delivered to new areas for the increase in croplands.



Establishing Enabling Mechanisms for Environmental Applications of Biotechnology

*** Activities of the Agricultural Genetic Engineering Research Institute, ARC:**

The original establishment of the Agricultural Genetic Engineering Research Institute (AGERI) in ARC (1989) was the result of a commitment of expertise in agricultural biotechnology. At the time of its genesis, AGERI was named the National Agricultural Genetic Engineering Laboratory (NAGEL). The rapid progress of its activities during its first three years encouraged MOA to authorize the foundation of AGERI, representing phase two of the national goal for excellence in genetic engineering and biotechnology.

The institute adopts recently developed technologies available worldwide and applies them to existing problems in Egyptian agriculture.

The activities of AGERI insure sustainable biotechnology in Egypt by training the next generation of high caliber scientists. Their dedication is for the production of a widening array of elite crop cultivars and biotechnology - based products. Products that are tailored to Egyptian agriculture's requirements are introduced.



Rural Energy Transition to Enhance Productivity :

Activities of the Agricultural Engineering Research Institute, ARC :

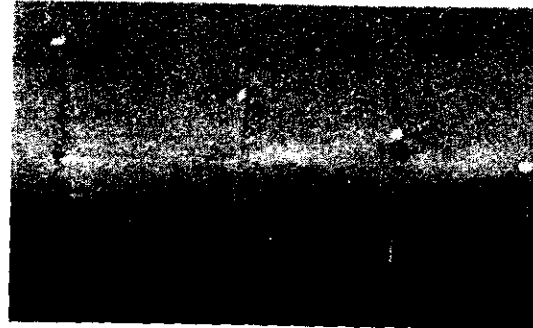
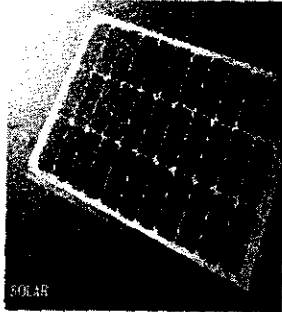
Research studies :

- * Solar energy collection, storage and utilization in grain drying.
- * Thermal control in greenhouses.
- * Evaluation of irrigation pumping by solar energy.
- * A study on the operation of an ultra-low-volume spray by solar photo voltaic cells.
- * Environmental control in hydroponic culture.
- * Designing an instrument for measuring the power requirements to operate different agricultural equipment.
- * Utilization of solar energy in drying agricultural crops.
- * Designing and testing of a solar cooling system.
- * Using solar energy for cooling agricultural products.
- * Rationalization of energy consumed in dairy industries.
- * A study on biogas production technology and design for municipal solid biowaste.
- * Improving the utilization of wind energy for water lifting at n. w coast of Egypt.

Applications:

- * Energy utilization in operating farm tractors using gear-up, throttle-down principles for light loads that saved energy and fuel consumption as well as helped in environment protection.
- * Utilization of plastic houses as field solar dryers for paddy before delivered to milling factories and for drying corn and maize crop.
- * Use of pull meter dynamometer and 3-point hitch dynamometers to measure draft for trailed 8or mounted form machinery.
- * Use of cotton stalks to produce biomass that are used as nontraditional energy sources. Brickets are produced by using choppers to cut and chop from residues (especially cotton stalks) to be used to produce energy,

helping in getting rid of cotton worms and minimizing the use of pesticides to environment protection and conservation.



Enhancing Safety and Developing International Mechanism for Cooperation

Activities of the National Biosafety Committee, MOA :

Egypt has established a national biosafety system that comprises a National Biosafety Committee (NBC) and a number of Institutional Biosafety Committees (IBCs).

The NBC is the official body responsible for ensuring that biotechnology continues to be safe and facilitating access to modern biotechnology generated abroad. The scope of the NBC activities and/or responsibilities include:

- * Formulating, implementing and updating safety codes.
- * Risk assessment and license issuance.
- * Providing training and technical advice.
- * Reporting annually to governmental authorities.
- * Coordinating with national and international organizations.

Every organization actively involved in genetic engineering research is mandated to establish its own Institutional Biosafety Committee (IBC). The IBC is responsible for the following:

- * To establish a programme for inspection.
- * The assessment of facilities, practices and procedures.
- * To assemble a set of oriented guidelines that comply with NBC guidelines.

- * To review periodically r-DNA research conducted in the institute.
- * To adopt emergency plans covering accidental spills and personal contamination.
- * To review periodically containment measures.
- * To monitor changes in IPR.
- * To report annually to the NBC.

The IBC assigns one of its members as Biological Safety Officer (BSO) that should follow-up and report to the IBC that all biosafety measures are being applied and enforcing approved policies and regulations in this institute.

Up to December 2000, NBC had issued 34 permits for releasing GM plants to the bio-containment and 23 permits were released to open field.

These permits cover the following crops: tomato, sugar cane, cotton, maize, squash, melon, cantaloupe, banana, wheat, cucumber and potato.

Integrated Pest Management in Agriculture :

Before the 1992s, plant protection policy was based on calendar applications of chemical pesticides. The government of Egypt has recognized Integrated Pest Management (IPM) as a valuable component of a sustainable agricultural system. Our national IPM policy is simply based on the reduction of dependence on agricultural pesticides and enhancement of cultural practices, combined with proved biological and alternative control technologies.

A plant protection-coordinating steering committee for the recognition and evaluation of IPM components was established in the MOA.

The introduction of the IPM system and the adequate application of its components resulted in the achievement of one of the best cotton strategies in the world. It simply consists of: pesticide treatments based on the scouting results; use of pheromone traps as application of pesticides with effective and efficient equipment; use of detergents and oils against sucking pests; encouraging the build up of beneficial enemies; and early planting, crop eradication and burning, gin sanitation, and seed heat treatment.

In other economic crops, where pesticide use is high, IPM technologies have been partially developed. In general, crop protection activities are moving consistently with the IPM training and dissemination efforts. The technology delivery system in IPM issues is practiced through the interaction of MOA extension staff with professionals of crop research institutes. At present special

attention in the policy instruments is to engage farmers' participation and cooperation in the total production system approach to IPM.

Our future national development strategy for IPM will focus on the efficient utilization of natural enemies; new and innovative approaches through molecular biology in the critical identification of pest strains; development of induced resistance plant varieties through biotechnology techniques; employment of bio-rational products; calculation of heat accumulation units through the determination of degree day units (DDU) system to predict pest behaviour during crop growth and development stages; the establishment of a centralized, computerized IPM website; and the assessment of pesticide risks and benefits are examples of pest management areas which merit priority attention for research and implementation support.

Activities of the Plant Protection Research Institute, ARC :

- * Minimizing the side effects of insecticide applications on beneficial insects including natural enemies, honey bees and silkworm.
- * Using sex pheromones and light traps for monitoring the population density of most pest insect species, hence, the infestation levels including the cotton leaf worm, pink bollworm and black cutworm.
- * Using plant extracts, mineral & natural oils, bacterium formulations and other conventional methods for controlling different species of mites.

Mass breeding & production for the most famous parasite *Trichogramma* sp. for controlling sugar-cane pest and citrus leaf miner in addition to using spider mite predators for controlling different species of mites (pest mites).

- * Preparing a manual for all insect pests involved in Egyptian Plant Quarantine from 1936-1988 and modifying the species lists attached to the Central Administration for Plant Quarantine in 1999 for the first time since 1967.



The Agricultural Economic Policy Reform Programme :

Studies on the impacts of the agricultural economic policy reform programme on agricultural development in Egypt have shown that Egyptian farmers have been highly responsive to agricultural research findings, agricultural extension, technology transfer and price incentives and that the agricultural economic policy reform programme has significant positive impacts on the agricultural sector performance. Such impacts are :

- * The cultivated area increased from 6.2 million feddan in 1982 to 8.1 million feddan in 2002 and the cropped area increased from 11.2 million feddan in 1982 to 14.35 million feddan in 2002. It is targeted to reclaim about 150 thousand feddan yearly.
- * The value of livestock and fish production increased from LE. 2.3 billion in 1982 to LE. 30 billion in 2001.
- * The value of plant production increased from LE. 3.5 billion in 1982 to LE. 44.7 billion in 2001.
- * The total value of agricultural production increased from LE. 5.8 billion in 1982 to LE. 74.7 billion in 2001 and the agricultural income increased from LE. 4.1 billion in 1982 to LE. 53.6 billion in 2001.
- * The total production of the main strategic food crops has tangibly increased. The total production of cereals increased from 8.5 million tons in 1982 to 19.3 million tons in 2002. Wheat production increased from 2 million tons in 1982 to 6.6 million tons in 2002. Maize production increased from 3.3 million tons in 1982 to 5.7 million tons in 2002. Rice production increased from 2.4 million tons in 1982 to 6.1 million tons in 2002.
- * The total production of vegetables increased from 8 million tons in 1982 to 14.4 million tons in 2002 and the total production of fruits increased from 2.6 million tons in 1982 to 6.9 million tons in 2002.
- * The total production of sugar cane increased from 0.65 million tons in 1982 to 16 million tons in 2002. Sugar imports decreased to about 0.42 million tons in 2001.
- * In 2002 the yield of cotton increased to 8.2 kantars per feddan.
- * Yields of strategic food crops have increased. Yield of wheat increased from 1.5 tons per feddan in 1982 to 2.7 tons per feddan in 2002. Yield of

maize increased from 1.7 tons per feddan to 3.4 tons per feddan in 2002. Yield of rice increased from 2.4 tons per feddan to 4 tons per feddan In 2002. Yield of sugar cane increased from 34.4 tons per feddan to 49.5 tons per feddan in 2002.

- * Egypt occupies the first rank in the world with regard to the yield of Sugar cane, rice, peanut and sesame.
- * Credit facilities available to the agricultural sector increased from LE.1.2 billion in 1982 to LE. 11 billion, in 1998.
- * Investments in the agricultural sector increased from LE. 393 million in 1982/1983 to LE. 8.0 billion, in 1998.
- * Self-sufficiency ratios of food crops have increased. There's self sufficiency of rice, fruits, vegetables, dairy products, poultry, eggs and fish.
- * Self sufficiency ratio of wheat increased from 25 % in 1982 to 55 % in 1998 and our wheat imports decreased from 6 million tons in 1982 to 5.5 million tons in 1998. In spite of the increase of population and increase of wheat total consumption from 8 million tons in 1982 to 11.5 million tons in 1998. As a result of that Egypt was selected for the first time to chair the International Wheat Council during 1994/1995 session.
- * There is a surplus for export of several crops. In 2001, our exports of cotton amounted to about 81.6 thousand tons. Exports of rice amounted to about 0.65 million tons. Exports of potatoes amounted to about 0.18 million tons. Exports of citrus amounted to about 0.07 million tons.
- * Food gap in Egypt is narrowing. compared to food gap projected in the early 1980's (26 million tons).
- * Net incomes of the farmers have improved by about 25 %.
- * The average annual rate of growth of agricultural production increased from 2.6 % in the 1980's to 3.6 % in 1990's.
- * A comprehensive system of granting permits was established to regulate export, re-export, and import of wildlife species listed in the Appendices of the Convention and Resolutions of the Conferences of the parties.
- * Egypt has also extended application of the penalties stated under article 84 of the Law of Environment; number 4 for the year 1994.
- * The Ministerial Decree number 1150 for the year 1999 issued by the

Egyptian Ministry of Agriculture was issued to cover any violation set by the above law.

- * The Ministerial Decree number 1374 for the year 2001 issued by the Egyptian Ministry of Agriculture was issued to regulate and to control the establishment of wildlife animal farms in Egypt.
- * Scientific Committees including wildlife experts, governmental officials and university professors were formed to carry out scientific survey for wildlife species in Egypt.
- * In the present time, fish production is an activity that employs more than 1.1 million persons and supports the life of about 6 million. Most, if not all, of this fishing population lives in areas where no other activities are available. Cities such as El Mataryah, Edku, Rashied, El Burg and Damyitta depend on fish production as a principal or sometimes a single source of income.
- * This increase in production resulted in raising the per capita per annum from a total of 6.5 kilograms in the early eighties to a present figure of 11.2 kilograms from the local production or a total of 13.2 kilograms if the imported fish is added.
- * The fisheries activities of Egypt (capture and culture) have witnessed a fast and remarkable development during the last few decades. The overall production reached in 1999 more than double that of the early eighties. Fish production for 1982 was not more than 222 thousand tons while a total production of 649 thousand tons was reported in 1999. The total market value of this production was more than 4.2 billion pounds.
- * The value of agricultural exports increased from LE. 471 million in 1982 to LE. 2.0 billion, in 1998.
- * The total landed catch of the Egyptian marine fisheries in 1999 summed up to 172.34 thousand tons. Marine fisheries of Egypt are of two origins; Mediterranean and Red Sea.
- * The total recorded landed catch of inland water fisheries summed up to about 192 thousand tons in 1999. The inland water fisheries include the fisheries of the four Delta lakes, two coastal hypersaline depressions, the three lakes of El Fayum, Nile system and Lake Naser and Suez Canal with its two lakes.
- * In 1999, about 64 thousand tons of fish were recorded as the catch of the

Nile and its branches. The fishing fleet of the Nile consists of 14300 boats all of it are oaring boats. The number of licensed fishermen working in the Nile is about 24 thousand. Excluding what can be considered as accidental fishermen, more than 120 thousand persons depends on the river fisheries to earn their living.

- * A total annual production of 2821 tons was recorded in 1999. The fishing fleet includes 749 boats and about 4 thousand fishermen.
- * General Authority for Fish Resources Development (GAFRD) has allocated 27.9 million pounds for this target.
- * In 2001 a project of restocking the river in Upper Egypt has started. The project was initiated by the GAFRD in collaboration with the Agriculture Policy Reform Programme and financed through the US AID programme. The project will extend for four years and involve stoking the Nile south of the delta to Aswan with Nile tilapia.
- * Extensive studies conducted the water quality of agriculture drainage water revealed that this water is suitable for aquaculture. This was especially proven better after the application of the current agriculture pest control policy. This depends greatly on biological control and the use of target selective pesticides. Industrial pollution with toxic and cumulative residues is not at a dangerous level and is generally reported in known drainage canals in some areas. This is expected to decline with the present policy of Ministry of Environment.
- * The subject of improving production by the use of the limited resources of water available in the country is a matter of general interest and it must be decided through transparency.

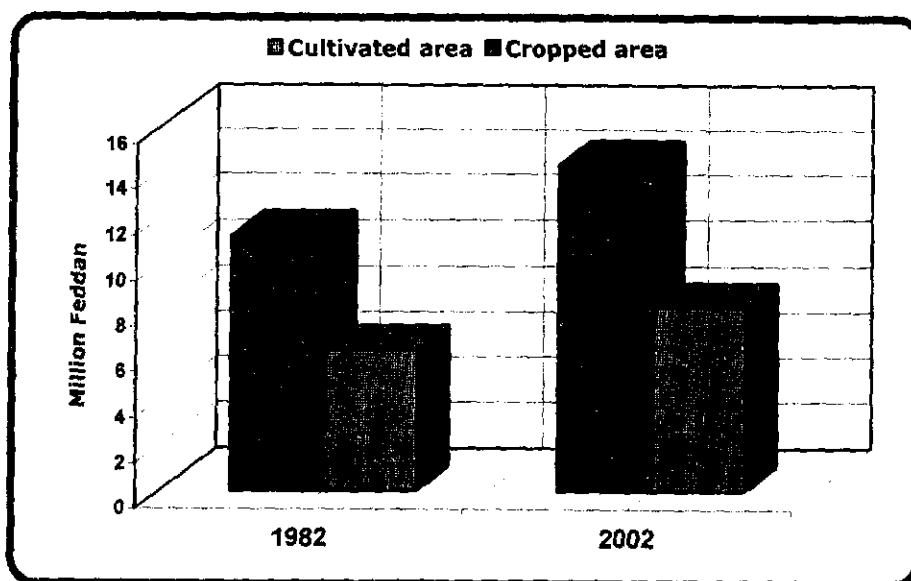


Figure No. (1): Comparison between the cultivated area and the cropped area in 1982 and 2002.

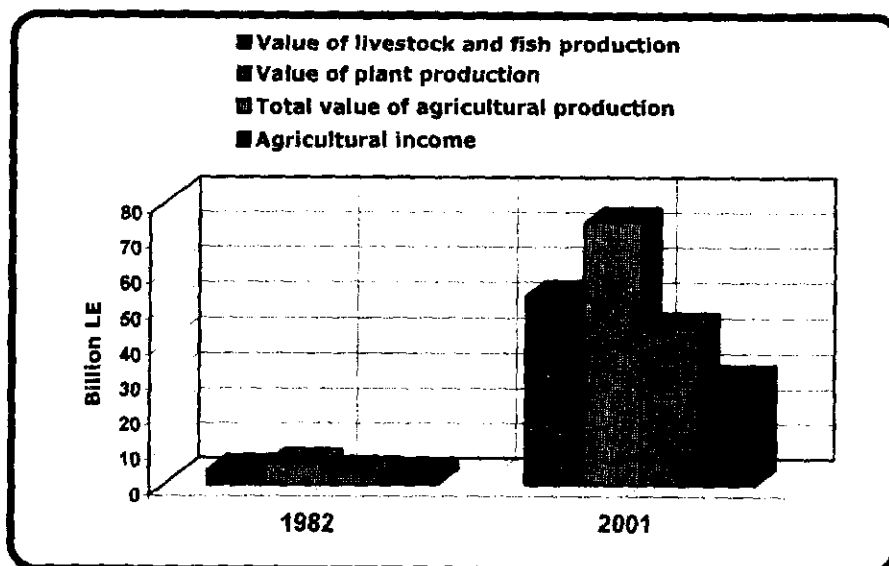


Figure No. (2): Comparison between the values of livestock, fish, plant production, total value of agricultural production and the agricultural income in 1982 and 2001.

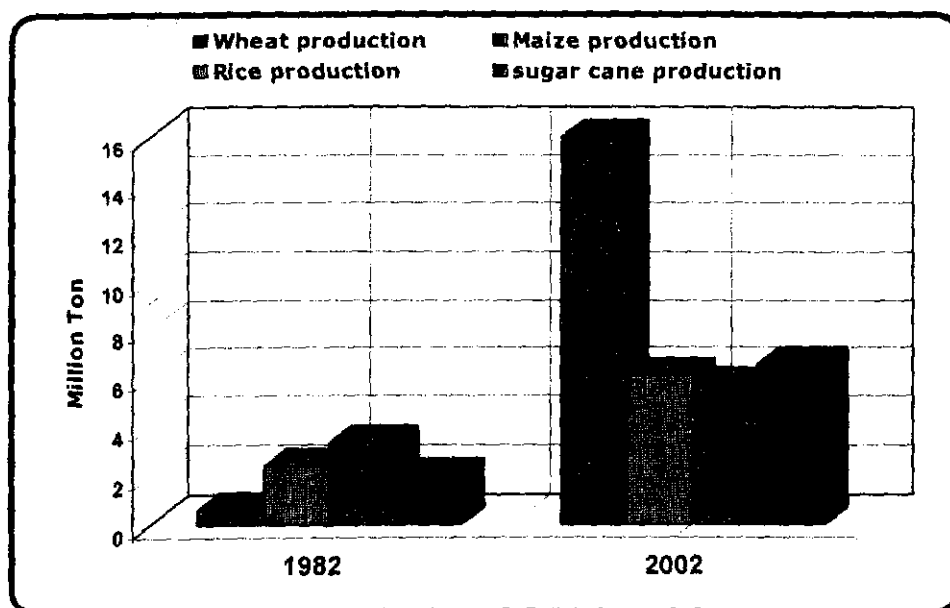


Figure No. (3): Comparison between the production of the main crops (wheat, maize, rice and sugar cane) in 1982 and 2002.

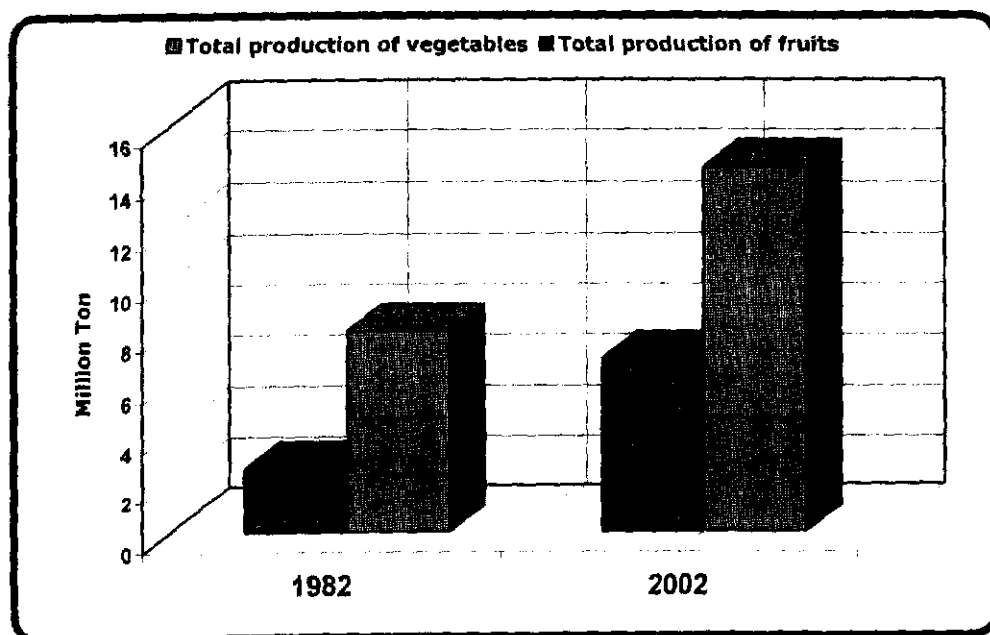


Figure No. (4) : Comparison between the total production of vegetables and fruits in 1982 and 2002.

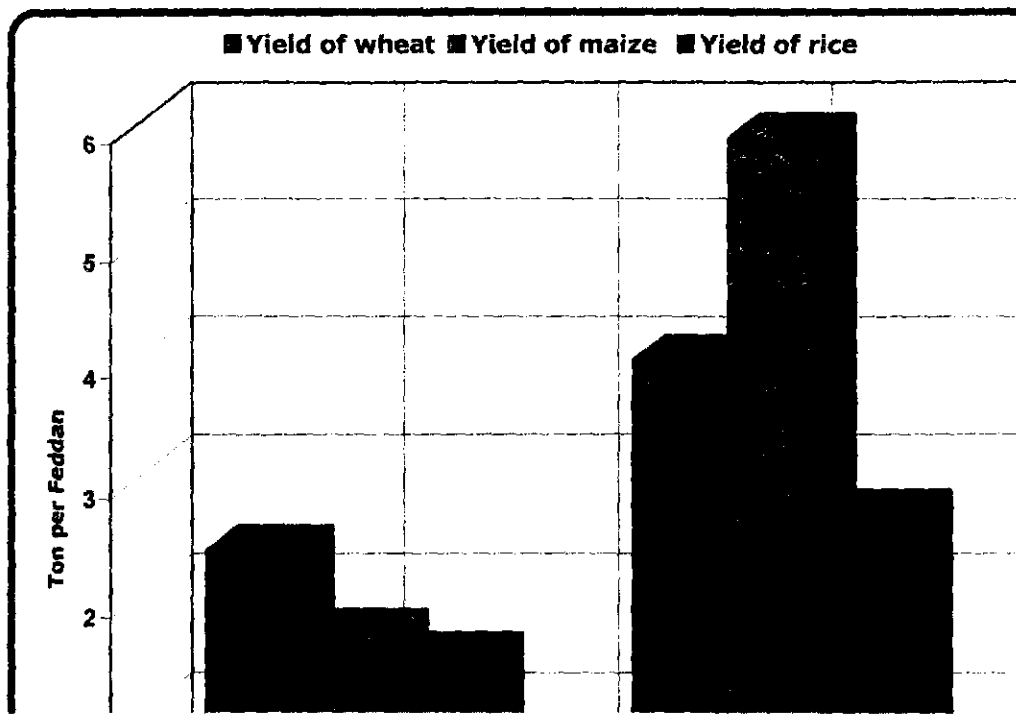


Figure No. (5): Comparison between the yield of the main cereals (wheat, maize and rice) in 1982 and 2002.

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