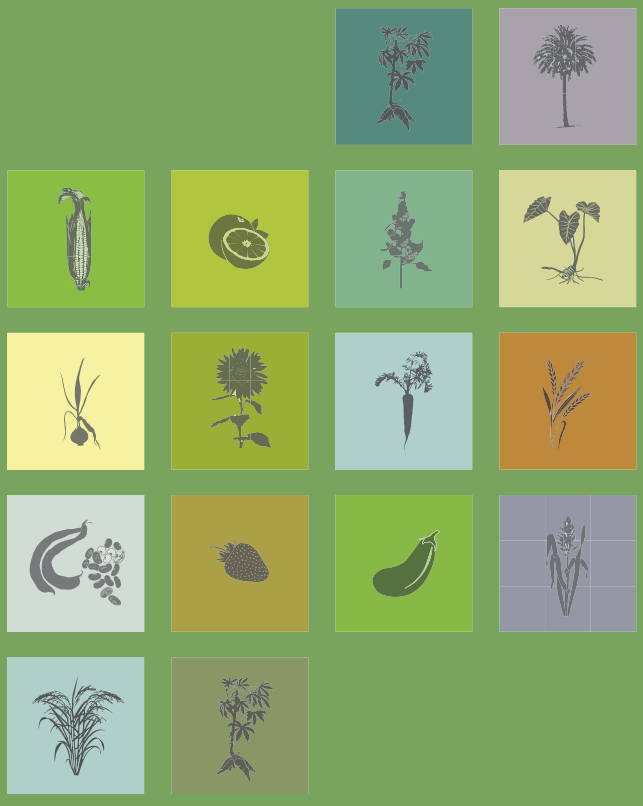
COUNTRY REPORT ON THE STATE OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

ARAB REPUBLIC OF EGYPT



Arab Republic of Egypt
Ministry of Agriculture and
Land Reclamation
National Gene Bank and
Genetic Resources

Second Report on the State of Plant Genetic Resources in the Arab Republic of Egypt

March 2007

Note by FAO

This Country Report has been prepared by the national authorities in the context of the preparatory process for the Second Report on the State of World's Plant Genetic Resources for Food and Agriculture.

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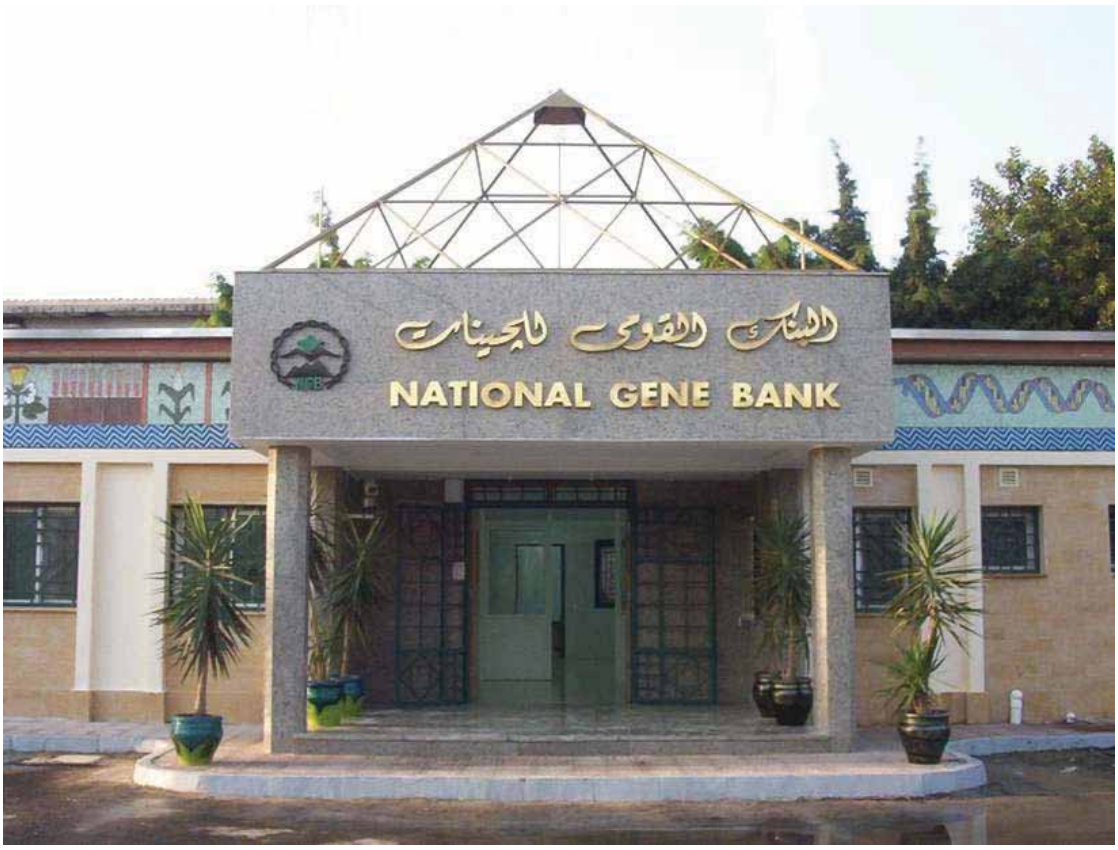
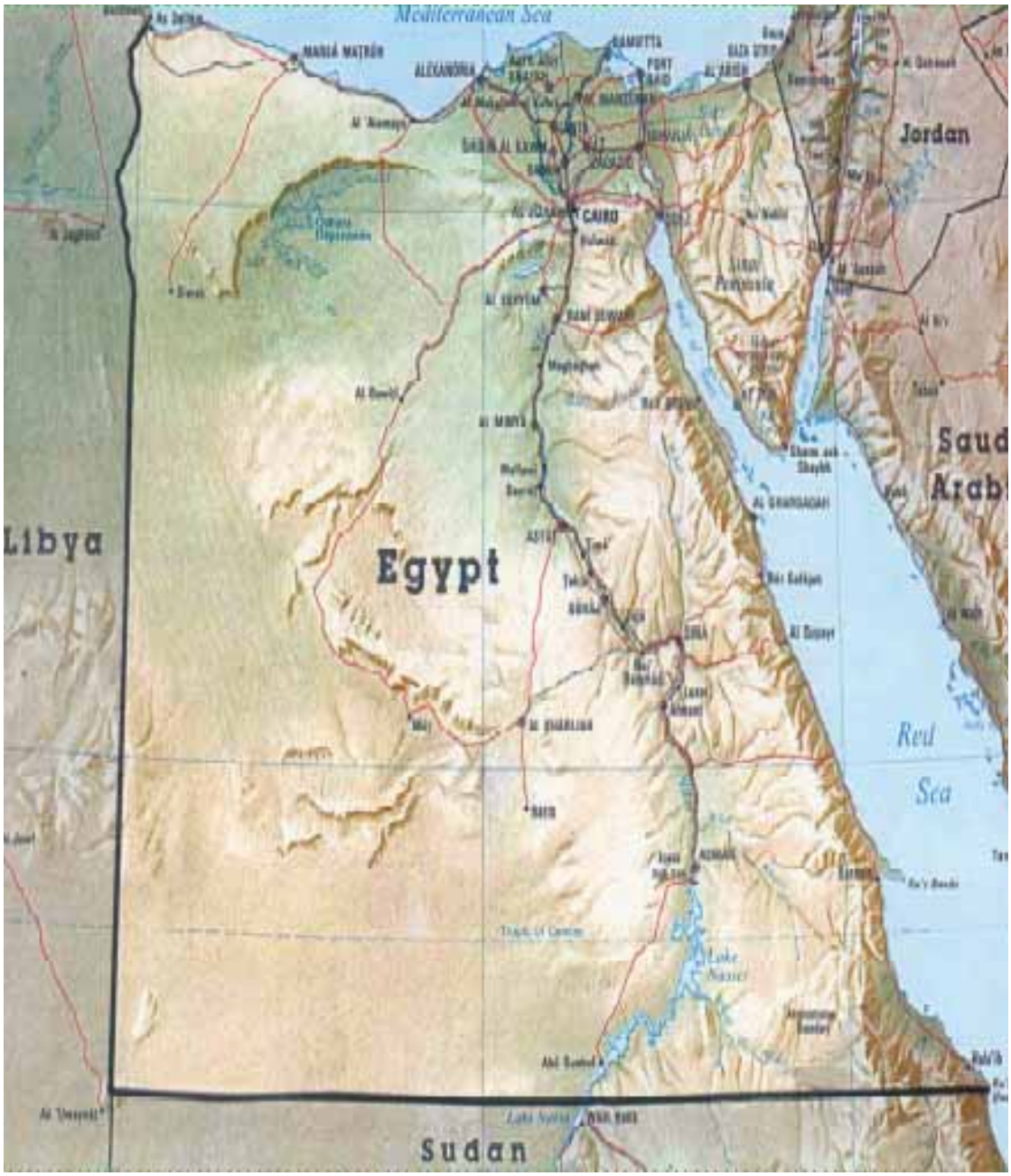


Our *Past* is
Our *Present*
and *Future*

NGB


Mediterranean Sea
Jordan
CAIRO
Libya
Egypt
Red
Sea
Sudan

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EXECUTIVE SUMMARY

- The Egyptian agriculture is facing many challenges, first of all, the limited cultivated area and water supply to provide food for the growing population which exceeded 75 millions in 2006 and secondly to eliminate poverty of the agriculture population by increasing the national agricultural production.
- The Ministry of Agriculture and Land Reclamation in Egypt activated the already existed Plant Genetic Resources Programme since 1994. According to the Ministerial Decree No. 1920 of 2003, the National Gene Bank was established to be officially responsible for the conservation and maintenance of plant, animal as well as the micro-organisms genetic resources in the Agricultural Sector in Egypt.
- The activities of the National Gene Bank represent an emergency tool for safeguarding endangered plant genetic resources, to deploy and make available these valuable genetic resources to both public and private breeding and research entities and programmes.
- It is worthy to note here that Egypt has been a signatory to the Convention on Biological Diversity CBD on June 1992 and ratified it on June 1994, and to the International Treaty on Plant Genetic Resources for Food and Agriculture since August 2002 and was ratified in 2004. Treaty sets guidelines for the process of collecting, identifying, evaluating, maintaining and documenting the plant genetic resources. It also defines national obligations for the sustainable use of those resources by each contracting party.
- The National Gene Bank of Egypt was assigned to collect, identify, regenerate, evaluate, conserve and document the plant, animal and microorganism genetic resources in the Agricultural Sector in Egypt.
- The National Gene Bank of Egypt was opened on the sixth of October 2004 to be responsible for the *ex situ* conservation programme in Egypt and, to be the focal point regarding the coordination between breeding programmes in both public and private sectors, seed supply system and genetic resource programme.
- MALR appointed the NGB to prepare the Second National Report on the Plant Genetic Resources to be included in the Global Plan of Action of the FAO.
- The President of the NGB was selected to represent the Near East Region in the Governing Body of the Plant Genetic Resources for Food and Agriculture, PGRFA Treaty.
- There are Four Major Departments related to the NGB activities and 11 Supporting Sections, Labs in addition to the other facilities.
- The cold storage facilities of the NGB contains more than 30 thousand accessions (end of 2006) from the genera and species collected from breeding and research institutions, seed companies, farmers, individuals, international research centers, and from collecting missions.
- During the last two years, 13 thousand genetic resources were identified and characterized, 16 thousand accessions were regenerated.
- More than 8 thousand genetic resources were evaluated. The evaluation of these genetic resources include field, molecular, cytological, chemical, and biochemical evaluation.
- The NGB has documented more than 30 thousand genetic resources in its database.
- The design of cold storage facilities was planned to contain approximately 200 thousand accessions in short, medium (active collection), and long (base collection) storage.
- The NGB cold stores have 335 m^3 of cold storage capacity which can include up to 200 000 accessions. These are divided among three cold stores for short, medium (active collection) and for long term storage (core collection).
- In addition to monetary savings from the national budget through completing building up and operating the cold stores in 9 months instead of 5 years with too much less cost (4.6% from estimated cost stated by the international sponsoring organizations), saving the variability and viability of the national genetic resources stocks which was more urgent and critical.
- In addition to the cold stores, 2 modern greenhouses were built and 5 acre field for regeneration was allocated.

INTRODUCTION AND HISTORICAL BACKGROUND

Egypt lies between latitudes 22° and 32° to the North of the equator and between longitudes 24° and 37° to the East of Greenwich line. Egypt has a total area of about 1 002 000 sq.km. of which only 4%of the total area, is populated. Egyptian regions are rich in wild plants and landraces which survived for hundreds of years. These landraces and wild relatives are widely adapted to the biotic and abiotic stresses and harsh conditions prevailing in the new reclaimed lands.

The Egyptian agriculture is facing many challenges, first of all, the limited cultivated area and water supply to provide food for the growing population which exceeded 75 millions in 2006 and to eliminate poverty in the agriculture population by increasing the national agricultural production.

Under the prevailing pressures including desertification, deforestation, erosion, climate changes and the overuse of pesticides and other agrochemicals, many genetic resources are disappearing at unprecedented rate. Furthermore in the past 50 years new uniform crop varieties have replaced many hundreds if not thousands of local varieties and landraces over large areas of production. These new varieties are selected from the same gene pool resulting in the increasing of vulnerability to pests, diseases and the prevailing abiotic stress conditions.

This report is the outcome of three workshops held to coordinate between the activities of the National Genetic Resources Programme as represented by the National Gene Bank and Breeding Programmes representatives from the Agricultural Research Center (ARC) Universities, and other research agencies, Private Sector companies in addition to Seed Supply System entities from public and private institutions.

The expected results from this report are:

- Improve Egypt's ability to make decisions about plant genetic resources;
- Build stronger partnerships among stakeholders in plant genetic resources management within Egypt;
- Increase understanding by Egyptian stakeholders about the status of their plant genetic resources;
- Increase Egypt's ability to monitor changes in its plant genetic resources over time;
- Improve the quality of information about plant genetic resources status and dynamics;
- Improve the access to and sharing of information about plant genetic resources; and
- Enhance Egypt's capacity to meet international reporting obligations.

CHAPTER 1

THE STATE OF DIVERSITY

Egypt farmers have used genetic variation to select and develop new types and forms from the cultivated plant species since thousands of years. Many plant species and types were known and have been utilized along this long period of time. The history of plant domestication provides ample evidence that biodiversity is the humanity's best defense against poverty, food insecurity and threats to natural resources. The utilization of biological diversity remains the best way to secure the future food needs and to drive the economic and social development of the world's rapidly growing human population.

Despite of the fact that the Egyptian agriculture is very intensive system and use more than 450 thousand tons of true seeds from different field crops and more than 5 000 tons of vegetables seeds excluding the seed of vegetatively propagated crops, some Egyptian farmers still use the seeds of old local varieties, seeds in many places in Egypt which are considered a very rich biodiversity source.

It is worthy to note here that Egypt has been a signatory to the Convention on Biological Diversity CBD on June 1992 and ratified it on June 1994, and to the International Treaty on Plant Genetic Resources for Food and Agriculture since August 2002 which was ratified in 2004. Treaty sets guidelines for the process of collecting, identifying, evaluating, maintaining and documenting the plant genetic resources. It also defines national obligations for the sustainable use of those resources by each contracting party.

As a top priority, MALR focuses on preserving the national genetic resources and making them available for sustainable agricultural development without compromising biodiversity and biosafety requirements.

MALR activated the already existed Plant Genetic Resources Programme since 1994. According to the Ministerial Decree No. 1920 of 2003, the National Gene Bank was established to be responsible for the conservation and maintenance of plant, animal as well as micro-organisms genetic resources in the Agricultural Sector in Egypt. The NGB was opened in the 6th of October 2004. It has short, medium and long range cold storage facilities.

MALR has appointed the NGB to be the Focal Point and to represent the Ministry in the International Organizations related to the genetic resources.

The report of Developing Information Sharing Mechanism on the implementation of the Global Plan of Action on the National Plant Genetic Resources for Food and Agriculture, NPGRFA depended on a list of indicators and stakeholders reporting formats and promoting information exchange and strengthening stakeholder cooperation and thereby contributes to enhancing the capacity of Egyptian Programme.

The main objectives of this approach are to:

- Promote understanding of PGRFA status and dynamics.
- Allow meaningful analysis of gaps and national priorities.
- Improve decision-making on and planning of available resources.
- Increase visibility of on-going efforts.
- Improve Egypt's capacity to manage PGRFA information and to meet international reporting requirements.

CHAPTER 2

THE STATE OF *IN SITU* MANAGEMENT

To insure that the National Programme benefits directly from this mechanism and the widest possible participation of the National Stakeholders in Egypt, three workshops were held and organized by the NGB from the stakeholders representing breeding programmes, seed supply companies and farmers, and the plant genetic resources programme, NGB.

Under the convention of biological diversity, CBD concerning *in situ* conservation, a programme for *in situ* conservation including wild and wild relatives of plant genetic resources has been established. Under the law No. 102 of 1983 concerning the protected areas, twenty four protectorates representing about 10% of the total area of Egypt were identified. The following table shows the number of plant species in 14 protected areas which contain plant genetic resources:

TABLE 1

The number of plant species and the nature of the protected areas of Egypt

Recent Assessment of Plant Biodiversity of the Protected Areas of Egypt			
No.	**Name of protected area**	**Type of protected area**	**No. of plant species**
1	Abu Glum	Waterland (Marine, Lakes & Riverine)	25
2	Ras Mohammed	Waterland (Marine, Lakes & Riverine)	53
3	Taba	Desert (Highlands, Valleys & Plains)	87
4	Nabq	Waterland (Marine, Lakes & Riverine)	40
5	Wadi Allaqi	Desert (Highlands, Valleys & Plains)	98
6	Siwa	Desert (Highlands, Valleys & Plains)	52
7	Elba	Desert (Highlands, Valleys & Plains)	381
8	Ahrash	Waterland (Marine, Lakes & Riverine)	12
9	Ashtoum El-Gamil	Waterland (Marine, Lakes & Riverine)	6
10	Burullus	Waterland (Marine, Lakes & Riverine)	192
11	Zaraneek	Waterland (Marine, Lakes & Riverine)	152
12	Omayed	Desert (Highlands, Valleys & Plains)	150
13	Wadi El-Rayan	Waterland (Marine, Lakes & Riverine)	38
14	Wadi El-Gimal	Desert (Highlands, Valleys & Plains)	92
Total			**1 378**

Source: Ministry of State for Environmental Affairs, 2006

The above mentioned *in situ* conservation sites are mainly managed by technical experts.

Much more efforts are needed in the future to protect plant genetic diversity in different areas, especially at the Northern Coast, in Oases, Sinai, and in other remote areas.

CHAPTER 3

THE STATE OF *EX SITU* MANAGEMENT

3.1 The National Gene Bank and Genetic Resources of Egypt

The National Gene Bank of Egypt was opened on the sixth of October 2004 to be responsible for the *ex situ* conservation programme and to be the focal point regarding the coordination of breeding programmes in both public and private sectors, seed supply system, and genetic resource programme.

National Gene Bank Organization:

There are four major departments related to the NGB activities, they are:

- Field Crops.
- Horticultural Crops.
- Animal Genetic Resources.
- Agriculture-relatedmicro-organisms.

The National Gene Bank Organization also comprises the following sections, labs, and facilities:

1. The Genetic resources conservation section
2. Seed Viability Testing and Regeneration Section.
3. Genetic Resources Evaluation Section.
4. Documentation and Information Section.
5. Taxonomy Section.
6. Chemical Analysis Lab.
7. Molecular Genetics Lab.
8. Tissue Culture Lab.
9. Cytogenetics Lab.
10. NGB Farm.
11. Green houses.
12. NGB Herbarium
13. Small Botanical Garden

The cold storage facilities of the NGB contains more than 30 thousand accessions (end of 2006) from the following genera and species

TABLE 2
Number of Genera and Species in the NGB

Crop	Genra	Species
Field Crops	48	111
Vegetables	45	56
Medicinal	133	173
Wild	141	227
Trees & Shrubs	45	63
Total	**412**	**630**

Source: NGB, 2006

These accessions are collected from breeding and research institutions, seed companies, farmers, individuals, international research centers, and from collecting missions.

During the last two years 30 thousand genetic resources were identified and characterized, 16 thousand accessions were regenerated.

The NGB has documented more than 30 thousand genetic resources on its database.

More than 8 thousand genetic resources were evaluated. The evaluation of these genetic resources included field, molecular, cytological, chemical, and biochemical evaluation.

The design of cold storage facilities was planned to contain approximately 200 thousand accessions in short, medium (active collection), and long (base collection) storage.

All the information obtained during field and lab evaluation are distributed among the concerned parties.

In addition to conserving accessions of true seeds the NGB has tissue culture storage facility.

TABLE 3

The Planned Cold Storage Capacity

Storage Type	True seeds accessions	Tissue Culture
Short Period Storage 3-5 Years	78 710	1 225
Medium Period Storage 5-7 Years	127 450	2 450
Long Period Storage 7-10 Years	169 680	2 450

Source: NGB, 2004

3.2 Botanical Gardens

In addition to the establishment of the NGB as the *ex situ* major conservation facility, there are several botanical gardens which were established during the last 120 years. These botanical gardens belong and are supervised by the Ministry of Agriculture and Land Reclamation.

TABLE 4

List of Botanical Gardens in Egypt

No.	Name of Botanical Garden	Present Area (Feddan)*	Date of Estab.	No. of F.	No. of G.	No. of Species
1	Ain Shams Univ., Fac. of Sci.	3	1 953	114	750	1 200
2	Alex. Univ. Fac. of Sci.	2	1 942			500
3	Cairo Univ., Fac. of Agr.	15	1 947	31	64	80
4	Orman B.G., Giza	28	1 873	90	520	600
5	Zohryia, Gezera, Giza	8	1 868	57	143	442
6	Quba Palace, Cairo	124	1 960	72		551
7	Zoo Garden, Giza	80	1 890	68	208	342
8	Manial Balace, Giza			61	150	239
9	Agriculture Museum, Dokky, Giza		1 937	32	73	94
10	Azbakyia Garden	10	1 867	41	83	800
11	Antoniadis Garden, Alex.	45	1 860			62
12	Al-Nozha Garden, Alex.		300 BC.			
13	Rose Garden, Alex.	5	1928			
14	Aswan Garden	17	1928	59	97	371

* Feddan= 4 200 m^2

Source: MALR, 2006

Several herbaria of dried native plants (specimen) can be found in Egypt. The Department of Botany of the Faculty of Science, Cairo University, Ain Shams University and in the Agriculture Museum, where MALR is maintaining a very big collection among other herbaria in Egypt. The herbarium serves as a reference for the identification of the several groups of native germplasm.

It is worthy to note that the property of the different accessions of genetic resources in the NGB is respected under the rules of the intellectual property rights.

3.3 Other Organizations Participating in the Information Sharing Mechanism

3.3.1 The Central Administration For Seed Testing and Certification (CASC)

The Ministry of Agriculture had the initiative in implementing market – economy policy in the agricultural sector, and seed production activities were separated from the Central Administration for Seed Certification (CASC) the agency responsible for seed quality control, seed legislation and state policy enforcing agency, this to fulfill the Ministry planning to withdraw gradually from seed production and to be responsible for control, legislation, indicative policy setting activities.

The CASC includes directorates and offices for the following activities: Seed and Seedling Field Inspection – Control Plot Testing – Seed Viability Testing – Seed Health Testing – Checking and Rechecking – Arbitration – Seed and Seedling Certification – Seed Import and Export Control – Market Control and Seed Legislation Enforcement – Extension and Training – Licensing – Variety and Breeder's Rights – Variety Testing.

Co-operation Projects and Investments – in addition to a Seed Certification Directorate in each governorate.

CASC is the technical secretariat of Variety Registration and Crop Seed Committees, in Addition other specialized councils and their Sub–committees, (e.g. Seed and Cotton Councils).

The supportive organization of CASC consists of five General Directorates namely: Field Inspection, Seed Certification, Cotton Gins and Oil Mills, Seed Testing and Certification in Governorates, and Measures and Seed Sector Development.

In addition to the five general directorates on the central level, there are 22 seed certification directorates in governorates which perform all activities in the head office, seed testing stations which cover all the geographical regions of Egypt, field inspection sections in all governorates, and two locations for field quality control plot testing (pre – and post – control).

CASC is playing an efficient role in training public and private farm's staff, applying seed extension methodologies, participating in seed international organizations, and applying the international seed certification norms, aiming to provide high quality seed to the national agriculture and safeguard the potential of the Egyptian agriculture through applying seed quality measures and enforcing the legislative framework on both, local, and imported seed supplies.

CASC is the designated seed certification authority and performs seed lab and field testing for certified seed and lab testing for the uncertified seed.

The following table shows the number of seed trading, production, seed processing, potato grading stations, and potato cold stores in Egypt, 2006:

TABLE 5

Seed Trading, Production, Seed Processing, Potato Grading Stations, and Potato Cold Stores in Egypt,2006

Activity	No. of Licenses
Seed Trading Companies & Outlets	11 675
Seed Production Companies	178
Seed Processing Plants	68
Potato Grading Stations	23
Potato Cold Stores	**102**

Source: CASC, 2006

The largest seed producing companies are listed in table 6.

TABLE 6

List of largest Seed Production Companies in Egypt

No.	Company Name	Post Address	Responsible Person	Telephone
1	National Seed Company Cereals, and Vegetable Seeds	15 EL Hassan St. Dokki - Cairo P.O Box 316 Dokki - Cairo	Dr. Essam Gheith	3370307 3375998
2	EL Ahram Beverages Company Barley	3 Thrwat St. - Bein El Sarayah Giza - Cairo	Eng. Ashraf Mostafa Kamal	3370055 3312300 3482215
3	Misr Hytech Int. Seed Company Cereals, Legumes, Vegetable Seeds	2 Nageeb Mahfouz from Abbas El Akkad St. Nasr City - Cairo	Eng. Hisham Mostafa Farag	2755041 2755042 2755043
4	Ismail Taher Haraz Vegetable Seeds	13 a Ahmed Maher St. Bab El khalk - Cairo	Eng. Abdel Latif Haraz	3528799 5110458
5	Suez Canal Commercial Development Company Vegetable Seeds	15 El Giza St. Giza - Cairo B.O Box 196 Orman	Eng. Mohamed Fathi	5729136 5729108
6	Int. Company for Investment and Commerce	El Nour St. (Bein El Ganain) Assuit	Eng. Gamal El Dein Yousif Mohamed	088 - 333517
7	Tanta Agrarian Reform Dept. Cereals	Aziz Fahmy St. - Tanta	Eng. Mostafa Aly Sodany	
8	El Fouly Agr. Company Cereals	Shawany St. - Talah - El Menia	Eng. Mohamed Khairy Fouly	
9	Agro - Food Limited Potato , Vegetable Seeds , Garlic	3 Kambeiz St. from Mosaddak Dokki - Cairo	Eng. Salah Hegazy	3484252
10	General Co- Op. for Potato Producers Potato Seeds	101a El Kasr El Eini St. Cairo	Eng. Hassan Mohamed - El Bakoury	3541339 3544713
11	El Safa National Company for Commerce and Agr. Develop. Cereals and Potato Seeds	Heneida Commercial Center Tower No. 1 The Sixth of October - Giza	Eng. Mohamed Ibrahim Farag	011 - 355001
12	El Mabrouk Seed Company Potato Seeds	Semouha - Doctors Building - Alexandria	Eng. Mohamed Kenawy	
13	Nile for Storage and Crop Handling - Company Cereals & Vegetable Seeds	55 B - Cournish El Nile - Gold Towers - Maadi Cairo	Dr. Mahmoud Sidky Dr. Ahmed Salim	3646615 3643745
14	Developed Group for Investment (Idea Group) Maize and vegetable Seeds	9 Ibrahim El Oraby , New Nozha Cairo		2990346
15	Misr Pioneer Seed Company Cereals , Maize Fodder, Vegetable Seeds	9 Army Forces Buildings , Nasr City - Cairo	Eng. Mostafa Gamal	4181492 4181636
16	Agroseed Damanhour - Seed Company Maize, Cereals and legume Seeds	1 Ismail El Habrouk St. . Damanhour	Dr. AdeelAly Rady	045 - 310100 045 - 313439
17	Delta for Seed Production and Agricultural Development Cereals and Legume Seeds	43 Adel Baki St. El Hasana El Mansoura	Dr. El Said Hassanien	050 - 797180
18	Agr. Co-Op for Seed Production, Handling and Marketing Cereals	El Awkaf Building,El Temehy El Mansoura	Salah Mohamed El Newehy	050 - 360985
19	Agricultural Service Company for Seed Production and Distribution Cereals	El Maragh,Sohag	Ibrahim Said Hanafy	
20	Imparato Egypt Potato Seeds	Km #59 Alexandria -Abo El Matameur Road - Behera	Hosam Salah Badawy	03 - 5865528
21	Kafr El Dawar Common Co-op. Cereals	El Islam St. Kafr El Dawar - Behera	Galal Abd El Aziz	
22	El Zahraa for Agr.Inputs Cereals	El Hamedia -Minia El Kamh - Sharkia	Sherif Agrama	055-660038 2725562
23	Technical Office for Agr. Materials Vegetable Seeds	26 El Dokki St. - Giza	Hatem Hussien El Shamy	3497127 3358101
24	High Seed Company Cereals	Shabas Omeir - Qafin - KFS	Aiman El Said Rady	047-412106 047-412377
25	Arab Seed Company Cereals	10 Saad Zaghloul St. Assiut	Ahmed Mohamed Zein	088-346615
26	Daltex Company for Agr. Potato and Vegetable Seeds	12th Area, 4th Neighborhoad 6 of October- Giza	Taha Fahmy El Etreby	3044424 3050505
27	The Egyptian Agr. Company for Seed Production - EGASEED Maize, Cereals, Legume and Vegetable Seeds	18 El Refae Square from Mosaddak St. - Dokki - Cairo	Aly Hassan Hemida	3494119 3351152

No.	Company Name	Post Address	Responsible Person	Telephone
28	Egyptian Company for Seeds,Oils and Chemicals - Shaban El Korma Vegetable and Ornamental Seeds	45 El Gomhoria St. Opera Square, Cairo	Mohamed Shaban El Korma	3918714 3915276
29	El Shalma for Seed Production and Trade Company Potato and Cereals	Zawiet Salem, Abo El Matamere Behera	Khalid Zaki	045-402920
30	Fine - Seeds International Maize, Cereals and Vegetable Seeds	20 Abul Mawahib Square Mohandessin - Cairo	Eng. Ahmed Yassin Hashim	3055995
31	Extra - Enter Seed Company Maize, Cereals	El Takwa St. ,Abo Korkas El Menia	Abdel Rahman Zaki	086-481155
32	Commercial Company for Agr. Development and Seed Production Vegetable Seeds and Cereals	El Kordi St. ,El Ameria Alexandria	Mohamed Atwa	03-4480680
33	Central Co-Op for Agrarian Reform-El Menia Cereals and Legume Seeds	Ragheb St. El Menia	Abul Saoud El Sherif	086-323608 086-322276
34	United Company for Seed Production and Distribution Maize, Cereals	14 El Khodary St. from 6th of October, El Menia	Aly Shady	086-320402
35	Seed Production and Marketing Co-op Cereals and Legume Seeds	Abo Nour El Dien-Belkas Dakahlia	Ibrahim Ismail Awad	
36	El Fouad for Seed Production and Distribution Maize, Cereals and Vegetable Seeds	6th Area , 3rd Neighboard Building No. 19 - 6 of October - Giza	Dr. Ahmed Fouad	086 - 750540
37	Pure Seed Company Maize, Cereals medical and aromatic Seeds	82 Mahmoud Abdel Razik St. El Menia	Hammad El Tony	
38	Kamal Kamel Khalifa Harb Company Potato	El Moahda Road, Ezbet Shoeir, Damanhour	Mohamed Ahmed Hamad	045 - 313750
39	Eastern Company for Seed Production Cereals	Bahnabay - Zagazik	Mohamed shafik	
40	Danton for Seeds and Agr. Services Cereals , Maize, Potato and Vegetable Seeds	Units 9and 21 , New Nubaria	WassimGhali shnoda	2416036 2484603
41	Mallawi Common Co - op Cereals	El Erphani St. Mallawi	Fathalla Khafagi	086 - 652116
42	Mohamed Farid Gaara Vegetable Seeds	74 Ahmed Maher St. Bab El Khalk Cairo	Mohamed Abo Khatwa	5113643
43	International and Food Supplies Chipse Potato Seeds	28 Mosaddak St. Dokki, Cairo	Mamdouh El Saied	46193 36194
44	Tanta for Linseed and Oil Company Linseed	Meit Hebeish El Bahria Tanta	Mohamed Khalil Kandele	040-332484 040 - 334871
45	Abul Fadl Agr. Consultancies Company Cereals and Vegetable Seeds	Resthouse No. 6 -Nubaseed Area Nubaria	Ahmed Abul Fadl	040 - 346852 045 - 633064
46	Dar El Salam Import and Export Company Maize	Taha Hussein St.Maghagha Menia	Hagag Abdel Azim	086 - 551944 2516618
47	United Company for Seed Production and Distribution and Agr. Input Cereals	Agrarian Tower ,KFS	Dr. Youssef Salli	047 - 230211
48	Sinai Fresh for Investment and Agr. Development Potato, Cereals and Vegetable Seeds	239 El Horria St. Foreigners District,Ismailia	Said Ali El Sammak	064 - 341256 064 - 341255
49	El Nile Seed Company Maize, Cereals	29 El Zahraa St. Dokki - Cairo	Dr. Mamdouh Younis	3365158 3365159
50	Fekry Said Saleh Potato Seeds	Abul Gheit - El Quanater Road Kaluobia	Fouad Seliman El Abd	4770594 2219663
51	General Agr. Co-Op for Rice and Cereal Producers Cereals	132 El Tahrir St. Dokki -Cairo	Said Aly El Shamy	3371062
52	Agri - Tech Company for Agr. Development Cereals , and Vegetable Seeds	Building No. 70 -Neighborhood No. 1 New Salhia	Ahmed Wadie Sadik	055 - 972156
53	El Salam Company for Agr. Development Potato Seeds	Shendeid -Eitai El Baroud El Behera	Ahmed El Saadani	

No.	Company Name	Post Address	Responsible Person	Telephone
54	Agr. Products and Research Centre El Azhar University - Assuit Cereals	El Azhar University - Assuit	Dr. Farghali Galal Younis	
55	Egyptian Agencies Store (Sharibac) Potato	3 Menshat El Kataba Kasr El Neil - Cairo	Magdi Murad Ibrahim	3921839 3921988
56	Man Trade (Mohamed Ashraf Noah) Cereals, Legumes	18, Abdel Latif El Sofani St. Sedi Gaber - Alexandria	Mona Abdel Moneim Hashim	03/540195 5411486
57	Mervat Mohamed Mansour Cereals, Legumes and onion	Moot, El Dakhla, New Valley	Hamdy Abdalla Mohamed	
58	Sandoz for Seed Prod. Cereals, Crop and vegetable Seed	Osman Buildings behin El Mansoura Staduim	Saad Mahmoud Elmetwally	050/311908
59	El Ghaish for Seed and Pesticides Trade F. Crop Seeds	23 July St. Bassion Gharbia Governorate	Imad Shebl	040/741396 040/345583
60	El Watany for Cotton and Agr. Development Cereals and Legumes	98 El Tahrir St. Dokki	Adel Hussein	3368437 3368432
61	Islamic Co. for Plant Protection Cereals and Crop Seeds	272 El Gomhoria St. Hosh Eissa, Behera	Ahmed Mohamed Homeid	045/702093
62	El Manbar for Agr. Cereals, Crop and Vegetable Seeds	El Sharkawy Farm, Kafer El Ziatt Gharbia	Mohamed Fathi el Sheikh	040/565248 040/319729
63	Nuba Seed F. Crop and Vegetable Seeds	KM # 75 - Dessert Road Nubaria	Magdi Aly Ibrahim	045/639208 045/639018
64	El Egeizy for Industry Potato, F. Crop and Vegetable Seeds	El Sadat City, 708 Third Neighbrhood - El Menoufia	Mohamed Ibrahim Ahmed	049/600730 5702645
65	Mekka for Trade (Ismail El Bamby Sons) F. Crop and Vegetable Seeds	5 Ahmed Maher St. Bab El khalk Cairo	Abdel Ghafar Ismail El Said	3958084 5129324
66	Seed Prod. Unit Faculity of Agr. Alex. F. Crop	Abeis Exp. Farm, Alex	Dr. Amein El Said Aly	03/5709558
67	El Ahram for Land Reclamation Vegetable Seeds Potato and Peanuts.	New Salhia, El Sharkia	Helmy Sayed Abdel Halim	016/201063 201062
68	International Center for Agencies	69 Shehab St., El-Mohandseen - Giza	Kamel Saied El Sayed	3453172 3453173
69	Flour Egypt Trade & Marketing Company	90 El Gomhoria St., El Sawsan Tower, El Mansoura	Aly Ezzat Gaafar	050-217141 050-217142
70	El-Shaimaa for Export & Import	KM # 58 – Agricultural Road – Damanhour - Behera	Abdellah Mostafa El Mesarea	045-346147
71	Nahdet Masr for Agricultural Industrying (Essa – before)	70 Gamet El Dewal El Arabia St. – Mohandseen - Giza	Mahmoud Samy Abdel Meged	048-385413 048-384778
72	Sama for Import & Export Company (Amin Aboul Fath)	Agricultural Road – Kafr El Zayiat - Gharbia	Mostafa Kamel Ashosh	040-451797
73	Abdel Aziz Fahim Morshed Company	Daraib Aqaria St. – Kom Hamada - Behera	Mohamed Abdel Meged El Nahhas	045-681347
74	General United for Horticultural Crops Producers & Exporters	MALR Building – 3rd Roof – Dokki - Giza	Zakaria Mohamed Ahmed	3371034 3613455
75	Doarf for Import & Export Company	47 Soltan Housaein St. Bab Sharq – Alex.	Mohamed Hasan Gouda	03-4832505 03-4481214
76	Vegetables & Fruits Marketing Co-op – Ismailia	64 Slah Salem St. – Qaraaly Tower - Ismailia	Yahia Hasan Khattab	064-336920 064-357829
77	Maba for Import & Export Company Mokhtar Abo Basha	Monshaet Mehana – Demotoh Kom Hamada - Behera	Mohamed Atef Mohamed Zaky	045-682222 045-681095
78	International Company for Agricultural Crops	79 Ek Gaysh St. - Elmansoura	Mohamed Talaat El Kelany	050-311170 050-312355
79	El Mansoura for Agriculture Development Company	El Qods El Shareef St. Ahmed Maher St. El Mansoura	Ramadan Ahmed Mosa	050-212469
80	El Safa for Import & Export Company Ahmed El Qahwagy Co.	Negela Way – Kafr Zayat – Kafr Bolen Kom Hamada - Behera	Rezk Fathy El Sharkawy	03-4840205 045-674095
81	El alamia for Agriculture Development Company (Farm Frits Masr)	Industrial Location A2 – 10th ramadn City El Sharkia	Ibrahem Ez El Regal	015-362967 015-362956
82	Masr Embex for Import & Export Company	49 Tawfeek Buildings – Nasr City	El Saied Awad Ibrahem	2625306 2637118
83	El Sharkia for Modern Seeds & Agriculture Co.	Megawara 1 – Block 1 – New Salhia – Sharkia	Fathy Yosuf Fathy	
84	Nana for Cooling Company Ahmed Abdalla Nana	Agricultural Road – Etay - Behera	Kareem Ibrahem Esa Nana	045-683100 045-680242

No.	Company Name	Post Address	Responsible Person	Telephone
85	Maamonia for Import & Export Company	5 Oraby St. – Manshyah – Alexandria	Mohamed Abellah Yaqout	03-4825745 03-4820791
86	El Masria for Crops Producing, Marketing & Exporting (Amibak)	346 Faysal St. – Haram - Giza	Sheref ShamseDin	5830281 2, 3, 4
87	Faraena for Seed Producing & Agriculture Development Company	Abo Tawkel-Bahr St. Gomhoria St. Mansoura	Ibrahem Ismail Awad	050-220013 050-220014
88	Cotton,	MALR Building – 4th Roof – Dokki - Giza	Abel Aziz Yones Soliman	3493746
89	Nile Agriculture Development Company	1 Khofo St. Esbates – Haram (5th roof)	Mohamed Taha Mahmoud	3840437
90	Faraena for Seed Producing (New Seed)	Nahdah – Fangary 3 – Amria – Alexandria	Atef Abdallah Mohamed	3466225 012-3455166
91	Gold Seed Company	Wageeh Abazah St. Menia El Qamh - Sharkia	Ghareeb Hamdy Shehata	055-667356
92	El Fath for Trade & Export Company	Dima Way–Abo Elghar–Kafr Elzayat - Gharbia	Khaled Mahmoud Abdel Aal	012-3428647
93	Friend Co. (Asdekaa Company for Farms›	Nazlet Aly – Gohaina - Sohag	Mohamed Ahmed Abdel Rahem	093-760660 093-771809
94	Agency 2000 for Agriculture Development	Lobnan Tower – Galaa St. Aga - Dakahlia	Ashraf Mohamed Saied	050-447157 050-452442
95	El Masria Company for Seed & Oil Ibrahem El Hosaeiny	Rasheedy St. Menia El Qamh - Sharkia	Salah Mostafa El Gendy	050-87211= 055-661397
96	International Nature for Import & Export Company	23 Khaled ebn El Waled St. Haram - Giza	Mohamed Ahmed Fadel	3841657 084-700841
97	Rehan for Seed Producing Company (Waeil Rehan)	Abo Ziadah – Desok – Kafr El Sheikh	Saif Ahmed Abdel Khaleq	047-568591 047-554802
98	Masr for Agriculture Development Company (Ismail Ezaby Co.)	Ahmed Maher Building No.2 – Bab El Khalk Cairo	Melad Naeem Tawfeek	5109038 2054244
99	Agricultural North Delta (Alpha Seed)	No. 8 Awqaf Buildings – A Way	Dr. Mohamed Harfoush	047-234867 047-230599
100	Marwa Seed for Agricultural Crops	Ekhlas St. Monshaet Abbas – Seedy Salem	Ragab Mohamed Metawea	040-372241 074-722801
101	Masr High Quality Company for Seed Producing	Ahmed Maher St. Manfalot - Assuit	Zainab Gomaa Metwaly Sayed	
102	Gold Land Company (Ard El Zahab)	18 Safa We Marwa St. El Salam Location Zakazik - Sharkia	Hasan Ahmed Mohamed Hasan	055-292496 055-235329
103	North Saied Company for Agricultural Developing & Production	346 Faysal St. Haram - Giza	Maher Hasan Saqr	5878254 5878246, 915
104	Engineers Company for Seed Production	Tafahna ElAshraf – Meet Ghamr - Dakahlia	Mostafa Goda Omar	050-875634
105	El Wady Company for Seed Production & Agricultural Developing	Building 4 Neqabat – Remaia Sq.– Haram -Giza	Mohamed Aly Abo Aly	3847512
106	El Badr Company for Agricultural Services & Seed Production	6 Masaken Delta St. Zagazig - Sharkia	Mohamed Fetoh Aly	055-234828 055-610724
107	Green Valley Seed Company	4 Mahmoud Abdel Aziz St. Ard El Lewaa-Giza	Hesham Mostafa Farag	4198450 4198460
108	El Shark Company for Seed Production & Distribution	Berlant St. – New Assara – Ezbet El Nakhl	El Sayed Hussien Abdel Fattah	2803143 4916048
109	Delta El Wady Company for Agricultural Crops Seed Production & Marketing	17 Hasan Abdellah – Kafr Shokr - Qalubia	Ahmed mamdouh Abdel Maksoud	013-510481
110	Mohamed Abdallah El Deeb Company for Seed Production	El Amriah – Mahalet Kattour Way - Gharbia	Adel Aly Baiomy Shalaby	040-2062212 040-2060333
111	Atomic Power Agency (Plant Research Section)	Anshas – Belbees - Sharkiah	Dr. Abdel Shafy Ibrhem Ragab	
112	Qudsy Sayed (Nebal Hasan Ahmed)	39 Masged St. Monshaet Sadat - Zagazig	Mohamed Ahmed Lotfy Rashed	055-2350248
113	El Arabia Company for Agricultural Developing	10 Ahmed Maher Sq. Babel Khalk - Cairo	Fawzy Maarouf Abozeed	5124122 5118591
114	El Faraena Company for International Marketing & Trade	40 El Horyiah Way St. - Alexandria	Yahia Mohamed Attyia	03-4862511 03-4868313
115	Agricultural Central Co-op - Assuit	Zeraein Building – Mohafza St. - Assuit	Abdel Rahem Darwesh	088-332739 088-337263
116	National Sonak Company for Trade	Agricultural Road – East of Shobra - Damanhor	Mostafa Mohamed Mostafa	045-344765 045-340733
117	Toskka Company for Seed Production & Trade	Mohandsy El Ray Buildings – Bani Souif	Ahmed Ibrahem Ismail	082-601338

No.	Company Name	Post Address	Responsible Person	Telephone
118	Agricultural El Mohamdes Company For Seed Production	Kafr Saad El Balad – Sror Zidan House- Demiat	Yousuf Mostafa Al Fanagily	050-2150439
119	Alex Get for Export & Import (Mostafa Behery)	Agricultural Road – Behind Kobry Etay	Gamal Bakr El Deeb	045-432551
120	El Tayseer Company For Import & Export	Building No. 32 – Rabaa Object - Nasr City	Gamal El Sayed Aashour	4143734 4140125
121	Al Amal Company for Seed Production	Galaa St. Abo Gensho – Abshway - Faium	Badawy Mohamed Aly Abo Hef	084-711021 084-710865
122	Anba Magar	KM # 92 Desert Road – Wady Natron	Dr. Nabil Sobhy Farag	048-600471 048-600472
123	Sanabel Company Seed Production Espex Seed	Attyia - Minia	Reda Mostafa Abdel Zaher	086-388574
124	Agricultural Co-op for Crops Production & Marketing - Gharbia	Al Oksor Tower Building – Gomhoria Sq. - Tanta	Mostafa Abo Rayia Kotry	040-3331597 040-3407656
125	Kasen Green Company for Agricultural Development	16 Abdel Aziz St. Attaba Sq. - Cairo	El Sayed Kamel Khalifa Harb	3343045 3347903
126	North & South Company for Agricultural Services & Development	25 A Fayrouz Tower - Obour Buildings Salah Salem Road	Abdel Hamed Abdel Aziz	4032833
127	El Amana Company (Magdy Mansour Saleh)	Dayer Nahya St. Shobra Abakhoum – Quisna Menofyia	Magdy Mansour Saleh	048-539825 048-538336
128	Abdel Raouf Hamada Company & Co	Agricultural Road – Shabour – Kom Hamada	Mamdouh Shoura	045-615325
129	Ekhwan Farghal Company For Trade	41 Eid St. Industrial Location – Mehala Kobra	Yaser Abdel Hakeem Ammar	040-2440868 040-2235582
130	Modern Egypt Company for Agricultural Development	Idariah Building – New Bani Seoif	Mohamed Ehab El Refaiy	082-2245376
131	Yaser Mashhout Ahmed Arafa (Arafa for Supplies)	Etrees – Imbaba - Giza	Abdel hay Abdel Meged Anbar	8761192
132	Reyadah Arabia for Seed Industry & Production (Asco)	23 Ebn Batota St. Second Section - Mansoura	Mohamed Safwat Yosuf Al Ghar	050-2331371
133	Al Amir for Trade & Distribution (Green Hand)	Shobra Rees – Shobra Kheet - Behera	Abdel Monsef Abdel Maksoud Edrees	045-5380005
134	El Motaheda Company for Agricultural Production	3 Seef El Islam St. Shobra Kheet - Behera	Ibrahem Abdel Salam	045-3800869
135	El Shaimaa for Import & Export (Laila Haggag & Co)	KM # 58 Agricultural Road – Damanhour Behera	Waiel Farouk Tawfik	045-3346847
136	Samira Semary Tawfik (Mon Trade)	7 Hamadan St. Morad St. Giza Sq. - Giza	Reyad Seleem Hanna	5725349
137	El Alamiah Company for Trade & (Ahmed El Naggar)	KM # 92 Agricultural Road – Zebeda Tawfekia – Etay Baroud	Yaser Maghawry Badredin	045-3432961
138	King Seed Company for Agricultural Seed Production	Farrag Tower – Gamal Eldin Afghany St. Mansoura	Abdel Razik Metwaly Bashar	050-2358535
139	Al Ahlyia Company for Agricultural Supplies & Productions	Nosa El Gheet – Aga - Daqahlia	Ahmed Mamon Mansour Ebid	050-6450561
140	Al Masriah Company for Seed &	54 Mosadak St. Dokky - Giza	Samy Mohamed Shenawy	7622286 7492010
141	Amana Seed (Madeha Abdel Moaty & Co)	Kafr El Masharka Sedy Salem – Kafr El Shekh	Mohamed Mohamed Yahia Ahmed	047-2704143
142	Modern Company for Seed Producing & Marketing (Modern Seed)	Zeen El Abedeen St. Ahd Gedeed St. Samalot	Saleh Ahmed Sayed	086-7710811 086-7700440
143	Egyptian Agriculture Agency	9 Gamaa St. – Behind Horticulture Reserachs	Aly Salem Mostafa	5686373 5731138
144	Agro Alex Company	Negela – Kom Hamada - Behera	Salem Saied Salem Seleia	045-3770092 045-3770399
145	Quality Seed Production Section Onion Research Inst. - ARC	9 Gamaa St. Onion Research Inst. - ARC	Dr. Ahmed Kamal Kafoury	5680409
146	Shema Seed (Reda Sabry) for Seed Production	Building # 19 Obour Buildings - Mansoura	Ramadan Ahmed Mosa	050-2212469 050-2346138
147	Dina Company for Agricultural Investments	KM # 80 Desert Road – Dina Lands	Magdy Farag Abdel Wahed	048-2600991 992 , 993
148	(El Araby Seed) El Sayed El Badawy Sons Company – Deer Shama	23 July St. Sherbeen - Dakahlia	Mevat El Sayed El Badawy	050-770300
149	Middle Egypt Company for Seed Production (Pure Seed)	5 Abo El Fetouh St. Mermah Location Bani Souif	Mostafa Shaker Hemeda	0122150483
150	Amana Company for Agricultural Development (Gomaa Behwashy & Co)	Kafr El Eis – Kobry Tawfikia - Etay	Gomaa Mohamed Hasan	045-5615632

No.	Company Name	Post Address	Responsible Person	Telephone
151	Sengenta Agro Company	4 Yanboa St. Dokky - Giza	Hosam Din Hanafy Mahmoud	7607851
152	Agricultural Development Company for Export & Import (Agro Land)	1 Shahid Hamdy Hamdy Abo El Seoud	Mohamed Ezzat Abdel Hady	5861271
153	Ahram Company for Seed Production (Abo Zaid El Holehly)	Teraa St. Shobra Rees – Shobra Kheet Center Behera	Salah Mohamed Ahmed ElArif	045-3804957
154	Aal Shama Company for Seed Trade (Khaled Shama & Co)	Building 3 1 – Ahmed Maher Buildings Bab El Khalk - Cairo	Hanafy Nour Din Hanafy	5113737
155	Agro Food Company for Animal Production	3 Ghazaly St. – Mosadak St. Dokky - Giza	Hashim Mohamed AbdelRazik	045-2350189
156	Ever Green Company for Foods Industries	Dima Abo El Ghar Road– Kafr Zayat - Gharbia	Ahmed Ibrahem Mohamed Taha	040-2570342
157	El Shaimaa Company for Import & Export (El Sayed El Mesarea)	Building # 14 - Aseed City - Sammoha	Mamdouh El Sayed El Mesarea	012-2432786
158	Seed Productions Quality Project	1 Nady El Said – Dokky Vegetables Research Institute	Dr. Salah Din Mohamden	3363359
159	Agricultural Reclamation Co-op	Behind Agricultural Museum - Dokky - Giza	Abdel Fattah Afifi Mohamed	3372751
160	El Baraka Seed Company for Seed Production	Bany Ahmed Village Gharbia - Minia	Salah Din Ahmed Mohamed	086-2201341
161	Libra Seed Company	El Kateba Village – Belbees - Sharkia	Ibrahem Mohamed Saad Hashem	055-2880115 055-2880116
162	Agricultural Productions Center	Faculty of Agr., Assuit Univ. – Field Section	Safwat Shahen Mohamed	088-2924462 088-2411649
163	H A Company (Soltan Farm)	35 Ahrar St. Dokky	Rizk Abdel Maksoud Mohamed	02-7607644
164	Shanan Seed (Yaser Shanan & Co)	Lewaa Ahmed Zomor St. Nahia - Giza	Saeid Abdel naby Ibrahem	03-3260002
165	El Alamia Company for Agricultural Development & Land Reclamation	KM # 90 Desert Road – Nobaria - Behera	Kamal El Sayed Gaber	012-2285222
166	Agricultural Co-op for Potatoes, Vegetables & Fruits Production & Marketing	Agricultural Road – Kafr Zayat - Gharbia	Ramzy Fawzy Amr	040-2546764
167	El Mostakbal Company for Seed (Ibrahem Awad)	Abo Nour Din Village – Belkas - Dakahlia	Ibrahem Ismaiel Awad	050-2220014 010-5204906
168	El Marwa Company for Agricultural Crops Cooling & Freezing	KM # 94 Agricultural Road – Zebeda - Etay	Mohamed El Sayed Shanshory	045-3432961
169	El Khateeb Company for Seed Production & Trade	Village # 4 – 10 000 - Nobaria	Mahmoud Abdel Wahhab Mosa	045-2371655
170	Central Co-op for Agricultural Reclamation	Mohamed Hemeed St. Awqaf Buildings Bani Sewif	Maher Mohamed Abdallah	082-2317379
171	Rania Mohamed Kamal (El Fayrouz for Seed Trade)	Serawa – Ashmoun - Menofia	Khaled Abdel Hakem Kamal	012-1023627
172	Onest Seed (Magdy Mansour Saleh)	2nd Building - 7th Section - 6th Location 6th October City	Mohamdy Mansour Saleh	048-2538336
173	El Watania for Agricultural Development (Abdel Hamed Mohamed Qandeel)	Serseka Village – Kom Hamada - Behera	Abdel Hamed Mohamed Qandeel	045-3688785
174	El Behous Company for Agricultural Development	Khatatba – Agricultural Research Co-op Land	Khaled Hasan Khaled	010-1580261
175	El Shark for Seed Importing & Distribution (Aly Hasan Mansour)	Badrawy St. – Gesr St. – Qebaa City - Cairo	Ahmed Abdel Tawwab Ahmed	6972791 6986125
178	Central Administration for Seed Production (CASP) « Under Privatization Programme « - CASP Produces 100% of Cotton seed, of all Cereals,25.50% Legume Seeds used in the Egyptian Agriculture. Cotton , Cereals , Legume , Oil and Onion Seeds	8 Gamaa El Kahera St. Giza - Cairo	Eng. Roshdy Hassib	5694060 5725986

Source: CASC, 2006

CASC is the technical secretariat for the seed council, the advisory body on seed related issues, and participates in all technical seed committee activities, where CASC offers advise, prepares studies and recommendations and performs the follow – up of recommendations of such bodies.

In addition to technical secretariat to the Agricultural Crop Variety Registration Committee, CASC has established variety register and maintains the national list of registered varieties.

3.3.2 The Central Administration for Seed Production (CASP)

CASP administers and advises ARC on requirements for foundation class seeds, plans, supervises and contracts with seed growers to multiply targeted other certified seed classes, CASP also coordinates seed conditioning among seed conditioning facilities to minimize mechanical contamination of seeds and to avoid the excessive seed transportation costs. CASP is head quartered in Giza, with offices in the governorates.

The quantities of the major field crop certified seeds from different sources (CASP & Seed Companies) are shown in the following table:

TABLE 7
Distributed Certified Seed Quantities from Major Field Crops, 2005

Crop	Distributed Quantity (ton)
Wheat	64 272
Rice	28 438
Faba bean	2493
Maize	17 843
Sorghum	594
Soy bean	177
Cotton	20 069
Berseem Clover	339

Source: CASC, 2006

3.3.3 Seed Companies

Seed production companies are specializing mainly in seed of hybrid maize, sorghum, sorghum x sudan grass forages, sunflower, some kinds of vegetable seeds, and seeds of berseem clover and alfalfa. Seed producing firms include special units have been established within the ARC to deal with the breeder and foundation seed classes in self – pollinated crop varieties and hybrids. A recent list of largest seed production companies is shown in Table 6. Seed companies also include seed import, export, and trade.

Seed Imports and Exports are shown in table 8.

TABLE 8
Seed Imports and Exports 2001: 2005 (ton)

Seed imports					
Crop	**2001**	**2002**	**2003**	**2004**	**2005**
Field Crops	1 495	1 518	1 223	1 682	1 689
Vegetables	291	303	262	280	219
Seed exports					
Crop	**2001**	**2002**	**2003**	**2004**	**2005**
Field Crops	11 225	12 511	7208	12 851	11 598
Vegetables	650	447	1013	712	681

Source: CASC, 2006

3.4 Breeding Programmes

The Agricultural Research Center (ARC):

ARC has 17 research institutes, Labs and support organizations. It has the primary responsibility for crop improvement research, cultivar development, and testing throughout the country. The ARC manages through special units the production of Breeder and Basic seed classes. ARC acquired six seed conditioning lines which are intended mainly for the conditioning of basic seed, but are also used to condition certified seeds on a charge per weight basis. ARC has a network of 10 Regional Research Stations with 37 specialized Stations, and 21 experimental units for crop experimentation on the village level nationwide .

ARC is supervising and leading 6 field crops Breeding Programmes on the national level, namely:

1. National Programme for Cereal Crops
2. National Programme for Fibre Crops
3. National Programme for Oil and Onion Crops
4. National Programme for Legume and Fodder Crops
5. National Programme for Sugar Crops
6. National Programme for Horticultural Crops

There are some very limited plant breeding activities in the National Research Center (NRC), agricultural colleges and on a some what larger scale in seed companies specially for hybrids since 1988, 308 varieties from 28 field crops, and 629 varieties from 32 vegetable crops, have been registered under the supervision of the ARC. Variety registration includes the variety testing for not less than 3 years for variety identification (DUS), and variety performance (VCU) before release. The majority of field crops varieties and to a lesser extent vegetable varieties have been developed by the ARC Research Institutes. The number of registered varieties is shown in Table No. 9 :

TABLE 9:
Numbers of Registered Varieties 1988-2006

	Crop	88/1998			1999			2000			2001			2002			2003			2004			2005			2006			Total		
		Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.
1	Alfalfa	5	1	6																				1					5	2	7
2	Barley																														
	6 Rows	5		5							2		2																7		7
	2 Rows	2		2																									2		2
3	Berseem	9		9																			1		1				10		10
4	Chickpea	2		2																						1		1	3		3
5	Cotton	13		13	1		1																2		2				16		16
6	Broad bean	12		12				2		2				2		2							1		1	1		1	18		18
7	Flax(lineseed)	2		2	2		2																			2		2	6		6
8	Lentil	3		3																									3		3
9	Maize																														
	White lines	13		13																									13		13
	Yellow lines	13		13																											
	Single W. Hyb.	7	2	9		2	2		2	2		1	1	5	1	6								1	1	1	1	2	13	10	23
	Single Y. Hyb.	7	2	9		1	1		1	1		2	2					1	1					1	1		1	1	7	9	16
	Double W. Hyb	2	4	6																									2	4	6
	Double Y. Hyb		3	3																										3	3
	3 Way. W. Hyb	6	6	12								2	2	5		5											1	1	11	8	19
	3 Way. Y. Hyb	2	2	4							5	2	7											2	2				7	6	13
10	Millet	2		2																									2		2
	Total	**105**	**20**	**125**	**3**	**3**	**6**	**2**	**3**	**5**	**7**	**7**	**14**	**12**	**1**	**13**		**1**	**1**				**4**	**4**	**8**	**5**	**3**	**8**	**125**	**42**	**167**

Source: CASC, 2007

	Crop	88/1998			1999			2000			2001			2002			2003			2004			2005			2006			Total		
		Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.
	Previous	**105**	**20**	**125**	**3**	**3**	**6**	**2**	**3**	**5**	**7**	**7**	**14**	**12**	**1**	**13**		**1**	**1**				**4**	**4**	**8**	**5**	**3**	**8**	**125**	**42**	**167**
11	Rice	8		8	3		3													1		1	2		2				14		14
12	Sorghum	5	5	10		1	1	2		2								1	1					1	1				7	8	15
13	Sorghum X Sudangrass	5	3	8																							1	1	5	4	9
14	Sudangrass	1		1																									1		1
15	Soybean	6		6																									6		6
16	Sunflower		7	7		1	1																2		2				2	8	10
17	Wheat																														
	Soft	16		16	7		7				3		3				2		2	1		1							29		29
	Hard	3		3	1		1																						4		4
18	Sugar Cane	8		8													1		1										9		9
19	Sugar beet	19		19							3		3																22		22
20	Teosinte	1		1																									1		1
21	Sesame	1		1				5		5																			6		6
22	Peanut	1		1				2		2																			3		3
23	Onion	4		4																			2		2				6		6
24	F. cowpea	1		1																									1		1
25	Gouar	1		1																									1		1
26	Bonavist,lablab	1		1																									1		1
27	Munge bean	1		1																									1		1
28	Canola							1		1							1		1										2		2
		82	15	97	11	2	13	10		10	6		6				4	1	5	2		2	6	1	7		1	1	121	20	141
	Total	**187**	**35**	**222**	**14**	**5**	**19**	**12**	**3**	**15**	**13**	**7**	**20**	**12**	**1**	**13**	**4**	**2**	**6**	**2**		**2**	**10**	**5**	**15**	**5**	**4**	**9**	**246**	**62**	**308**

Crop		88/1998			1999			2000			2001			2002			2003			2004			2005			2006			Total		
		Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.	Gov.	Priv.	Tot.
1	Bean	3	13	16				1	3	4										0	4	4	0	3	3	0	1	1	4	24	28
2	Cucumber	8	32	40	0	3	3	0	7	7	0	17	17	0	8	8	0	7	7	0	13	13	0	4	4	1	4	5	9	63	72
3	Garlic	1	0	1																						2	0	2	3	0	3
4	Karcade (Rama)	1	0	1																									1	0	1
5	Sweet Potato	4	0	4																			6	0	6				10	0	10
6	Tomato	2	48	50	0	5	5	7	3	10	0	23	23	0	3	3				0	11	11	0	5	5	1	0	1	10	98	108
7	Squash	0	6	6	0	1	1	0	1	1	0	3	3	0	4	4	0	1	1	0	2	2	0	4	4				0	22	22
8	Peas	2	5	7							0	1	1							0	1	1							2	7	9
9	Cowpea	2	0	2	2	0	2				1	0	1																5	0	5
10	Watermelon	1	11	12	0	1	1	0	2	2	0	2	2	0	1	1	0	1	1	0	5	5	0	1	1				1	24	25
11	Melon	0	20	20	0	1	1				0	2	2	0	6	6				0	16	16	0	2	2				0	47	47
12	Cantaloupe	0	5	5	0	1	1	0	2	2	0	8	8							0	2	2	0	1	1	0	1	1	0	20	20
13	Radish	3	0	3																									3	0	3
14	Spinach	1	0	1																									1	0	1
15	Eggplant	0	14	14	0	3	3				0	1	1	0	2	2	0	1	1	0	3	3	0	5	5	0	1	1	0	30	30
16	Pepper	0	31	31	0	2	2	0	1	1	0	9	9	0	4	4				0	6	6	0	6	6	0	11	11	0	70	70
17	Potato	0	70	70	0	4	4				0	9	9	0	9	9	0	7	7	0	2	2	0	19	19	0	10	10	0	130	130
18	Artichocke	2	0	2																									2	0	2
19	Asparagus	2	0	2																									2	0	2
20	Strawberry	5	0	5																						0	1	1	1	1	2
21	Okra	1	0	1																									1	0	1
22	Lettuce	0	8	8																0	1	1				0	2	2	0	11	11
23	Cabbage	1	1	2																									1	1	2
24	Cauliflower	1	0	1																0	1	1							1	1	2
25	Carrot	0	8	8										0	1	1				0	1	1							0	10	10
26	Turnip	1	0	1																									1	0	1
27	Table beat	0	2	2																									0	2	2
28	Faba bean (Veg.)				2	0	2	2	0	2				2	0	2													6	0	6
29	Thyme										1	0	1																1	0	1
30	Camomile										1	0	1																1	0	1
31	Dill										1	0	1																1	0	1
32	Tar													1	0	1													1	0	1
	Total	**41**	**274**	**315**	**4**	**21**	**25**	**10**	**19**	**29**	**4**	**75**	**79**	**3**	**38**	**41**	**0**	**17**	**17**	**0**	**68**	**68**	**6**	**50**	**56**	**4**	**31**	**35**	**68**	**561**	**629**

CHAPTER 4

THE STATE OF USE

To improve and upgrade agricultural productivity, the Egyptian agriculture is relying on using the high yielding varieties (HYV) from different field and horticultural crops to meet the requirements of the large population of Egypt, the following table shows some examples from different field crops used in the Egyptian agriculture which developed mostly by the ARC and some seed companies.

TABLE 10

Examples from HYV of Field Crop Varieties developed by ARC & Seed Companies in Egypt

Crop	Release Varieties
Alfalfa	Nubaria1, Sewa1, Giza1, Ismailia1, Baladi1, Siriver
Barley - 6 raws	Giza125, Giza126, Giza123, Giza124, Giza129, Giza130, Giza131,
Barley - 2 raws	Giza127, Giza128
Berseem Clover	Giza6, Giza10, Gemmeiza1, Serwe, Sakha4, Hilali, Baladi1, Khadarawy Baladi, Fahl Baladi, Kahra
Chickpea	Giza195, Giza531
Cotton	Giza45 (Extra Long & Fine), Giza70(Isis) Extra Long, Giza76 Extra Long, Giza77 Extra Long, Giza84 Extra Long, Giza75 (Lotus) Long Staple, Giza81 Long Staple, Mobarak93 (Giza85) Long Staple, Giza86 Long Staple, Dandara Long Staple, Giza80 Long Staple, Giza83 Long Staple, Giza89 Long Staple, Giza87 Extra Long, Giza88 Extra Long, Giza 90, and (Long Staple) Giza 91
Sesame	Giza32, Taqah1, Taqah2, Taqah3, Tushka1, Shandawil3
Faba Bean	Giza674, Giza429, Giza643, Giza714, Giza716, Giza717, Giza461, Yousef El Seddik, Giza2 improved, Giza3 improved, Giza40, Giza843, Misr1, Sakha1, Nubaria1, Misr2, Sakha2
Peanut	Giza5, Giza6, Asmalia1
Flax - Linseed	Giza7, Giza8, Sakha1, Sakha2
Lentils	Giza370, Giza4, Giza51, Sinai1
Maize - White Single Crosses	Single Cross10, Single Cross9, Single Cross103, Giza122, Giza123, Watania4, Giza124, Giza129, Egaseed13 Bashair, Egas18 Nagah, MHTC-021W Hy Tech (2010), HYTECH 2030, 8 K 30 (HW 1268 X), X130 AW, 30 k 09 (S.C. x 1311 TW), 30 k 17 (S.C x 1351GW), 6 M 30 (PW 1268 Z), Gemiza 11, Gemiza 12, Gemiza 13, Gemiza 14, Gemiza 15, Fine Seeds 101, GZ 28 SC (W), MHTC-109W
Maize - Yellow Single Crosses	Giza151, Giza152, Giza153, Giza154, Giza155, Giza156, Giza161, Pioneer3062, Pioneer3080, Drakhma, HYTECH 3040, Shams (MHTC - 134 y), 30 M 84 (My 1267 X), SC 97 G 142, 30N11, MHTC-102Y
Maize - White Double Crosses	Hyb. 73120 – Fattah, Double Hybrid 204, Double Hybrid 215, Double Hybrid 217, Double DK 2771 – Gawaher, Taba
Maize - Yellow Double Crosses	Hediah DK – 2770, Amoun - Hyb 73115, Dahab - Hyb 124062
Maize - White Three-way Crosses	Hyb. 310, Neima - DK 2147, Hyb. 320, Hyb. 321, Hyb. 322, Watania1, Pioneer3057, Nefertiti3, Pioneer3052, Giza323, Giza324, Baraka, P30P09, Shorok (Eqaseed 301), Gemiza 311, Gemiza 314, Gemiza 325, Gemiza 326, Gemiza 317, MHTC-301W
Maize - Yellow Three-way Crosses	Giza351, Giza352, Sultan, Kareim, 9p 30 (AW 1287 X), Shorok (Eqaseed 301), Giza311, Giza314, Giza325, Giza326, Giza327, YT-0002, YT-0005
Millet	Shandawil1, Shandawil2
Rice	Giza181 - Long Grain, Giza175, Giza176, Giza177, Giza178, Sakha101, Sakha102, Yasmin Masry, Sakha103, Sakha104, Giza182, Giza 176, Hy 1, Black
Sorghum	Pioneer P. 8319, Hyb. - 858F, PGS - 320 (Meina), PGS - 17 (Horus), Hybrid1, Hybrid2, Giza15, Dorado, Giza113, Speed Feed SV – 10017, 840 F, Hyb. Shandaweel 6, Line Sterile 6, MHTGS 91018, MHTGS 03
Sorghum X Sudan Grass	Hyb.107, Hyb.402, Hyb.102, Hyb. – 407, SX 17 Fodder Hyb. Sorghum, Mabrouk 79, Baladi1, Hyb. SX 121 - Extra - Feed
Soybean	Giza21, Giza82, Giza35, Giza83, Giza22, Giza111
Sunflower	Hyb. G101, Hyb. 6480, Vidok - 3 way hyb., Euroflor - 3 way hyb., Pioneer Hyb. 6661, Hysun36, Hysun333, Hybrid MHTF 5001, Sakha 53, Giza 102
Bread Wheat	Giza162, Giza163, Giza164, Sakha92, Gemmeiza2, Giza165, Sahil1, Sids1, Sids2, Sids3, Sids4, Sids5, Sids6, Sids7, Sids8, Sids9, Sakha8, Sakha61, Sakha69, Giza167, Sakha93, Gemmeiiza5, Giza168, Gemmeiza7, Gemmeiza9, Giza 170, Gemmeiza 10, Sakha94, Sakha 69
Durum Wheat	Beni-Suif1, Sohag2, Sohag3, Beni-Suif3, Giza 85/37
Sugar Cane	Giza47, Giza96, Giza368, C9, Giza68, Giza393, Lola, Phil8013

Crop	Release Varieties
Sugar Beet	(Del 939) Monte Biance, Farida, Univers, Hilleshog poly 1, Nejma, Hilma, M. Oscor poly, Panther, Gazelle, Marathon, Toro, Beta poly4, Alexa, Kawemira, Top, Pleno, Ras poly, Sofie, Gloria, Dema Poly, Athos Poly, Teri
Mung bean	Kawmi1
Onion	Giza6 Improved, Giza20, Line1, Line1 Sterile, Giza white, Giza Balck

Source: CASC, 2006

Most of vegetable seeds used in the Egyptian Agriculture are exoticed and mostly imported from foreign companies specially the hybrid seeds.

There are some crop seeds locally multiplied depending on the old local varieties such as berseem clover, alfalfa, and many of the fodder crops specially in the remote areas.

CHAPTER 5

THE STATE OF NATIONAL PROGRAMMES, TRAINING AND LEGISLATION

5.1 National Programmes

5.1.1 The National Gene Bank and Genetic Resources of Egypt

The Ministry of Agriculture and Land Reclamation activated the already existed Plant Genetic Resources Programme since 1994. According to the Ministerial Decree No. 1920 of 2003, the National Gene Bank was established to be responsible for the conservation and maintenance of plant, animal as well as micro-organisms genetic resources in the Agricultural Sector.

As a top priority, MALR focuses on preserving the national genetic resources and making them available for sustainable agricultural development without compromising biodiversity and biosafety requirements.

Purpose:

- Conserve the national wealth of plant and animal genetic resources either in their natural habitat (*in situ*) or outside the natural habitat (*ex situ*);
- Improve the productivity of the agricultural crops by providing the required genetic resources which contain the stress tolerance gene markers and which suit the old and new reclaimed lands;
- Enhance the cooperation between the NGB and the other concerned institutions such as universities, research centers and private sector; and
- Support the international cooperation by the implementation of the treaties and regional and international conventions which regulate the maintenance and utilization of the genetic resources and biodiversity.

NGB Objectives and Strategy:

- Collecting and conserving plant and animal genetic resources, as well as microorganisms to protect these biological resources from erosion and extinction.
- Exchanging information concerning the genetic resources with the local and international gene banks.
- Identifying the core-collection of genetic resources which can be utilized in both public and private research and breeding programmes.
- Develop research plans for collection of genetic resources and assure the safety of these resources and to provide the different breeding programmes with the required genetic materials and relative information.
- Characterization of the collected genetic resources.
- Strengthen the international cooperation in the field of genetic resources.
- Enhancing public awareness of the genetic resources maintenance to protect the national resources against erosion and regulate the utilization of such resources.
- Participating in exploration missions intended for collecting the genetic resources from their native habitat.
- Participating in developing of testing, production and certification guidelines and regulations for new plant varieties and animal breeds;
- Facilitating the exchange of the genetic resources and implementation of the intellectual property legislations concerning the national genetic resources;
- Documenting the Egyptian genetic resources at the NGB database.

The Expected Benefits from the NGB

- Protection of the national heritage of plant and animal genetic resources from erosion and piracy.
- Maintenance of local plant varieties and animal breeds from extinction.
- Improvement of the productivity of the cultivated varieties to achieve the national food security throughout maintaining biodiversity and providing the agricultural system with outstanding genetic resources which tolerate the different prevailing environmental stresses (biotic and abiotic);
- Easy access to any required information data from the data base.
- Enhancing the international cooperation within the signed agreements which assure the fair benefit sharing and genetic material exchange.
- Implementing the intellectual property rights to protect the national genetic resources.

5.1.2 Other National Programmes:

The following Institutions are partially involved in plant genetic resources activities:

1. Agriculture Research Center (ARC), MALR is the main institution involved with PGR activities (collection, evaluation, conservation and improvement of crop varieties).
2. Desert Research Center (DRC), MALR (mainly involved with desert crop plants).
3. National Research Center (NRC), Ministry of Scientific Research (mainly involved with medicinal plants and with some of the field crops).
4. 17 agricultural faculties and 15 faculties of science of different Egyptian universities

5.2 Achievements of the NGB

5.2.1 Implementation of the National Agricultural Sustainable Development Plan

1. According to the visibility studies which were conducted by international donors, the cost of establishing a national facility for the conservation of the plant genetic resources was very high. Table 11 summarizes the estimated cost, implementation period and the cold storage capacity as planned in the two major studies of GEF-UNEP (1997) and GTZ (1999).

TABLE 11

The Estimated Cost and Implementation Period of the NGB and other studies

Project	Capacity	Estimated Investments L.E.	Implementation Period	Percentage of Foreign Investments	Implement Ratio
GEF-UNEP 1997	45 000	69 000 000	5 Years	6.5%	0.0
GTZ 1999	45 000	110 000 000	5 Years	4%	0.0
NGB 2003	200 000	4 610 000	9 month	100%	100 %

2. The previous studies designed their facilities for storage capacity of 105 m^3 of cold storage and for 45 000 accessions.
3. The NGB cold stores now have **335 m^3** cold storage capacity which can include up to **200 000 accessions**. These are divided among three cold stores for short, medium (active collection) and for long term storage (core collection).

TABLE 12
Capacity of NGB Cold Stores

- **Short Term (3-5 years)**

Cold Store	No. of Accessions	Tissue Culture Samples
+5°C	16 960	1 225
-5°C	24 250	
-20°C	37 500	
Total	**78 710**	**1 225**

- **Medium Term (7 years)**

Cold Store	No. of Accessions	Tissue Culture Samples
+5°C	31 125	2 450
-5°C	48 500	
-20°C	47 825	
Total	**127 450**	**2 450**

- **Long Term (10 years)**

Cold Store	No. of Accessions	Tissue Culture Samples
+5°C	45 830	2 450
-5°C	66 000	
-20°C	57 850	
Total	**169 680**	**2 450**

4. In addition to savings from the national budget through completing building up and operating the cold stores in 9 months instead of 5 years with much less cost, saving the variability and viability of the national genetic resources stocks were more urgent and critical. In addition to the cold stores, 2 modern greenhouses were built and 5 acre field for regeneration was allocated.
5. Once the NGB becomes functional, it will contribute in elevating the productivity of many crops by providing stress tolerant germplasm to breeding and research programmes.
6. Applying the intellectual property rights legislations will provide protection to the national genetic resources including wild relatives, landraces and local varieties and will help to retrieve the genetic resources from Egyptian origin from other foreign gene banks.

5.2.2 Establishing NGB Facilities

1. Under scientific and technical supervision of the NGB staff , consultants from Faculty of Engineering, Cairo University and the Engineering Dept. in the ARC the Cold Stores, Seed Viability Testing Lab and the seed accessions receiving area in the main building, in addition to, two greenhouses were constructed and operated in 9 months. The planning, implementation and monitoring were fully carried out by the national expertise of the NGB staff, consultants and the contracting companies.
2. The cold stores building and greenhouses were provided by alternative power supply, security and safety systems.
3. Tissue culture, cytogenetics, molecular biology and chemical analysis Labs were furnished, equipped and operated also in the 9 months period.
4. The NGB Database was constructed for plant and animal genetic resources in cooperation with the Central Lab for Agricultural Expert Systems (CLAES).

TABLE 13
Comparison between the NGB planned storage capacity and some other gene banks

Gene Bank	Capacity	Year of Establishment
NGB	200 000 (planned)	2004
Canada	97 000	1970
ICARDA	132 758	1977
CIMMYT	179 998	1973
ICRISAT	113 501	1973

5.2.3 The NGB Activities

Field Crops:

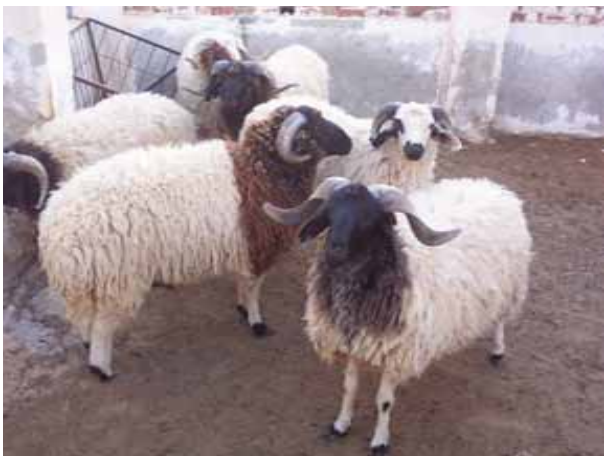
- More than 30 000 accessions were collected till the end of 2006.
- More than 16 000 accessions from the winter and summer crops were regenerated and 13 000 accessions were identified.
- More than 8000 genetic resources were evaluated.

Horticultural Crops:

- 80 citrus, 21 olive and 33 grape genetic resources were assessed and described.
- 12 banana varieties were collected.
- Assessment of ornamental plant species in the botanical gardens in Cairo and Alexandria.
- Identifying many medicinal, aromatic and neglected native species.
- Collecting of more than 5000 accessions of vegetable, aromatic and medicinal species.

Animal Genetic Resources:

- Collecting blood samples from Saidi buffalo as well as from Parki and Sohagi sheep for fingerprinting.
- Assessment of some local and native breeds of sheep, buffalo and cows.
- Conducting surveys concerning the national breeds nationwide.



Animal Genetic Resources
Assessed by NGB

Microbiology Genetic Resources:

- Furnishing and equipmenting the NGB Microorganisms Lab to be functional by mid 2007.

5.2.4 The NGB consists of the following sections and labs:

1. The Genetic resources conservation section:

a. True Seed conservation which includes:

- Temporary storage (+5 °C).
- Active collection – medium duration storage (-5 °C).
- Base and core collection – long duration storage (-20 °C).

NGB Genetic Resources Storage

b. Tissue culture conservation (for vegetatively propagated genetic resources)

c. Conservation in liquid nitrogen (-196 oC)

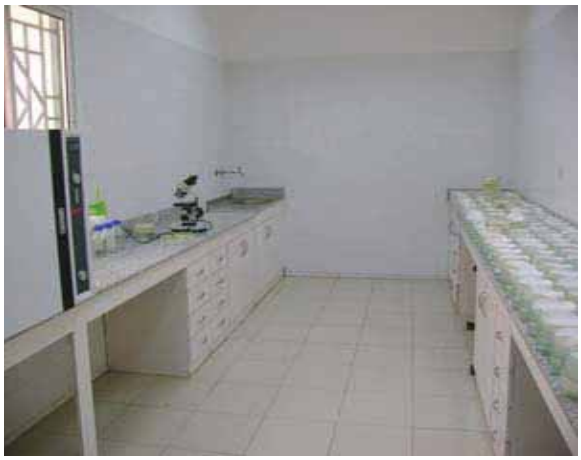
- Plant tissues for specific horticultural crops
- Animal cells and tissues

***d. In situ* conservation:**

- for some fruit crops, ornamental plants and palm trees
- Animal breeds

2. Seed Testing and Regeneration Section:

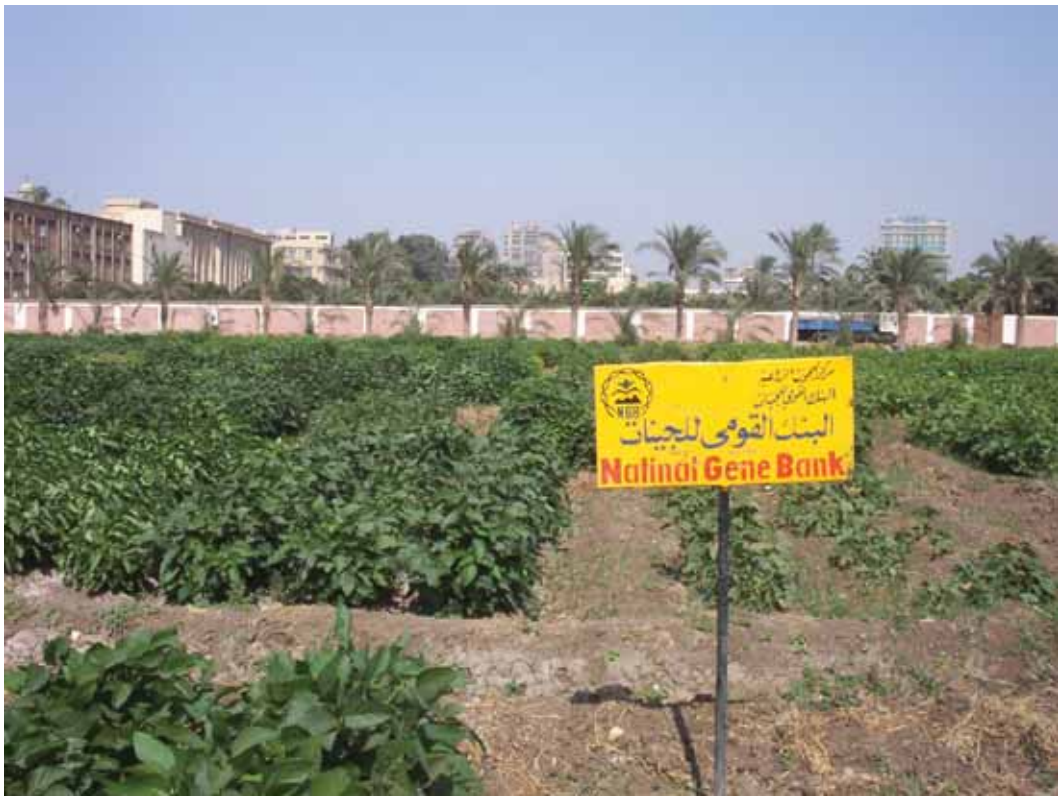
- Seed viability testing.
- Regeneration and maintenance of genetic resources.
- Preparation of seed samples for conservation.



NGB Seed Viability Test Lab

3. Evaluation Section:

- Evaluation of different environmental stresses.
- Evaluation of susceptibility to plant diseases and pests.



NGB Wheat Evaluation Field

NGB Soyabean Evaluation Field

4. Taxonomy Section:

- Collecting genetic resources throughout exploration missions.
- Protectorates (Protected Areas) and Environment.
- Assessment and collection of wild relative plants and participating in the study of utilization of such resources.
- Classification of the collected accessions.

5. Documentation and Information Section:

- Data base preparation for plant, animal and micro-organisms genetic resources according to the international norms.
- Provide the plant and animal breeders with the required basic information for the development of new plant varieties and animal breeds.

6. Chemical Analysis Lab:

- Assessment of technological and nutritive quality of the collected accessions.
- Active ingredients with economic importance.

NGB Chemical Analysis Lab

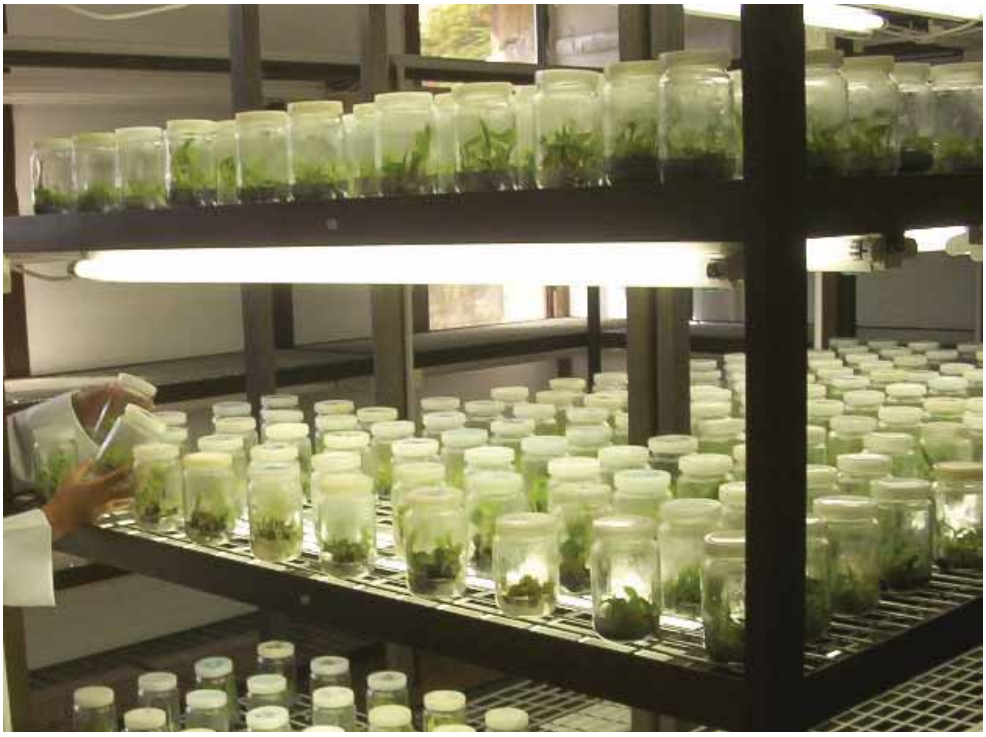
7. Molecular Genetics Lab:

- Fingerprinting and mapping of genetic resources.
- Identification of the gene markers responsible for stress tolerance and quality attributes.

NGB Molecular Biology Lab

8. Tissue Culture Lab:

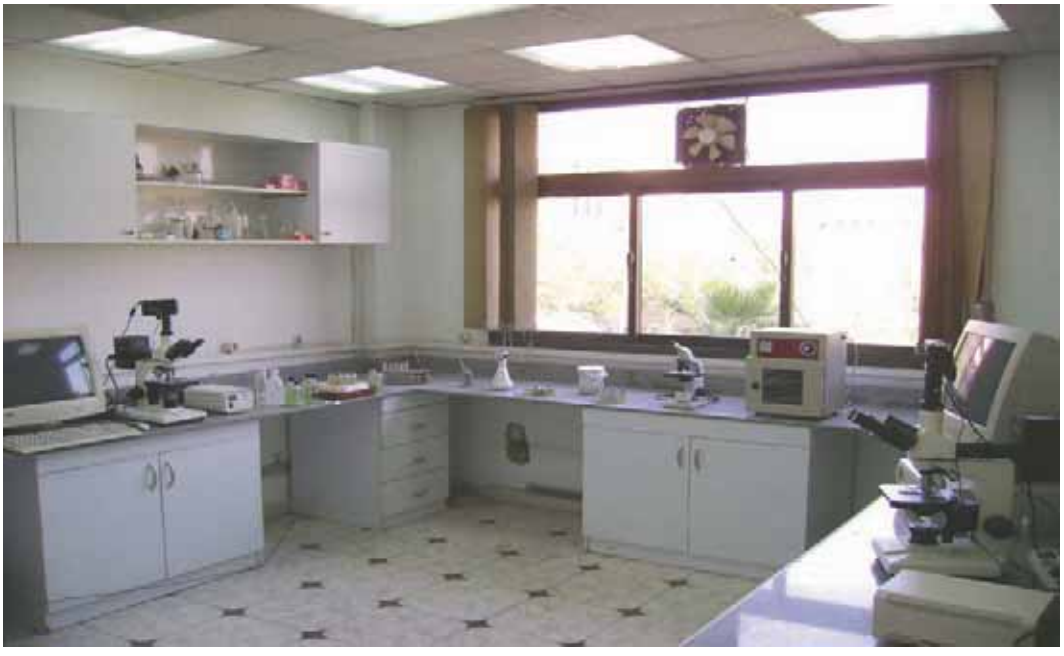
- To multiply and conserve vegetatively propagated genetic resources and conserving tissues from some specific crops.



NGB Tissue Culture Lab

9. Cytogenetics Lab:

- Study the different agronomic a morphological characteristics of the collected accessions to conclude the degree of genetic stability.
- Investigate the chromosomal maps of wild plants, animals and landraces which can be utilized in the different breeding programmes.



NGB Tissue Cytology Lab

10. NGB Farm:

- Regeneration of the genetic resources in the NGB farm.
- Conservation for some horticultural crops and plants that require special conditions.

NGB Identification Field

11. NGB Greenhouses:

- Regeneration of some horticultural crops and adaptation for the plants produced by the tissue cultural lab under specific condition.

NGB Greenhouses

12. Establishing NGB Herbarium.

13. Establishing Small Botanical Garden.

5.3 Training, Publications and Conferences

- The NGB is providing local and overseas training for its employees. 2 officers have got long term training in the IPK, Germany. Many other officers already are post graduate students for the MS's and PhD's degrees.
- During the three workshops which have been conducted in the NGB the stakeholders got training on the information sharing system of the GPA of the FAO.
- There is continuous training in the NGB regarding technical, scientific and database issues.
- The NGB is conducting training courses for university students and specialists from genetic resources programmes of other countries in the region.
- The NGB is organizing visits to genetic resources experts on the national, regional and international levels.
- There is monthly meeting for the NGB departments to present their achievement reports.
- The NGB is issuing a quarterly report for the activities of the period. This report is distributed among all the concerned agencies, in addition to annual report.
- The NGB is conducting genetic resources collection missions to the targeted rich areas in genetic resources (30 collecting missions were accomplished during the last period).
- The First Conference of the National Gene Bank was held in September 2005 with participation from genetic resources experts from the Ministry, Universities, Research Centers. The International Organizations (FAO, IPGRI, ICARDA) and from some countries (USA and Canada).
- The delegates and participants of the conference recommended the support and appreciation to the NGB activities to protect the national heritage of the genetic resources and biodiversity of Egypt.
- The Second Conference will be held at the end of 2007. It is planned to present the NGB activities, in addition to the research papers focusing on different departments activities and research work.

5.4 Legislative Frame Work

- The National Gene Bank is conducting its mandate within the following legislative framework:
- Law No. 53 of 1966 which governs the production, certification, import, distribution and registration of seeds. The government controls these activities in order to make sure that farmers are getting a good quality of seeds.
- Law No. 102 of 1983 concerning the establishment and management of natural protected areas (Protectorates).
- Law No. 82 of 2002 which regulate the intellectual property rights for plant varieties and local genetic resources utilization and protection (Chapter 4).
- Prime Minister Decree No. 1366 of 2003 executing the law no. 82 of 2002.
- Ministerial Decree No. 1920 of 2003 establishing the National Gene Bank of Egypt.
- Ministerial Decree No. 67 of 2005 nominating the heads of NGB departments.
- Ministerial Decree No. 335 of 2005 concerning the conservation of landraces and local varieties which are not qualified for registration and recording them in the NGB records.
- Ministerial Decree No. 862 of 2005 which regulate and assign the NGB to be the national agency responsible for implementation of the national programme for genetic resource.
- Ministerial Decree No. 1196 of 2005 about the role, regulations, and the formation of the National Campaign for collecting and maintaining the Egyptian genetic resources.
- Ministry of Agriculture and Land Reclamation, MALR has appointed the National Gene Bank as the National Focal Point and to represent MALR in the International Organizations concerning genetic resources and to represent the Ministry in implementing the Treaty of Plant Genetic Resources for Food and Agriculture, PGRFA, and to coordinate the activities of plant genetic resources, breeding programmes, and seed supply system in Egypt in preparing GPA report of Egypt.
- The NGB has prepared a protocol for genetic resources exchange to conserve genetic resources from research, breeding organizations and from individuals.

CHAPTER 6

THE STATE OF REGIONAL AND INTERNATIONAL COLLABORATION

Egypt has been a signatory to the Convention on Biological Diversity CBD on June 1992 and ratified it on June 1994, and to the International Treaty on Plant Genetic Resources for Food and Agriculture since August 2002 and was ratified in 2004. Treaty sets guidelines for the process of collecting, identifying, evaluating, maintaining and documenting the plant genetic resources. It also defines national obligations for the sustainable use of those resources by each contracting party.

The NGB represents Egypt in the International Center for Agricultural Research in Dry Areas, ICARDA and the International Plant Genetic Resources Institute, IPGRI.

Egypt is implementing the treaty of Plant Genetic Resources for Food and Agriculture, PGRFA which applies to 35 crops and 29 forages and assure the conservation and sustainable use of Plant Genetic Resources for Food and Agriculture, PGRFA and the fair and equitable sharing of benefits arising out of their use.

Egypt recognizes "*the sovereign rights of the State over its own plant genetic resources for food and agriculture*".

Egypt respects the Farmers' Rights in obtaining and using seeds from their own farms for cultivation for self pollinated crops.

The "Multilateral System for Access and Benefit-Sharing" shall be respected according to the Material Transfer Agreement (MTA) of FAO when it is finalized.

Efforts are paid to retrieve the genetic resources from Egyptian origin from other foreign gene banks and international research centers.

The NGB retained the genetic resources from Egyptian origin from the foreign gene banks to be added to the Egyptian collection in the NGB.

The President of the NGB Represents the Near East Region in the Government Body for the implementation of Plant Genetic Resources for Food and Agriculture, PGRFA Treaty.

MALR has appointed the President of the NGB as the Focal Point and Coordinator of the genetic resources, breeding, and seed supply systems in Egypt.

CHAPTER 7

ACCESS TO PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE, SHARING OF BENEFITS ARISING OUT OF THEIR USE, AND FARMERS' RIGHTS

Egypt is implementing the Treaty of Plant Genetic Resources for Food and Agriculture, PGRFA which applies to 35 crops and 29 forages and assure the conservation and sustainable use of Plant Genetic Resources for Food and Agriculture, PGRFA and the fair and equitable sharing of benefits rising out of their use.

Egypt recognizes "the sovereign rights of the State over its own plant genetic resources for food and agriculture".

Egypt respects the Farmers' Rights in obtaining and using seeds from their own farms for cultivation for self pollinated crops.

The "Multilateral System for Access and Benefit-Sharing" shall be respected according to the Material Transfer Agreement (MTA) of FAO when it is finalized.

CHAPTER 8

THE CONTRIBUTION OF PGRFA MANAGEMENT TO FOOD SECURITY AND SUSTAINABLE DEVELOPMENT

Egypt has a strong comparative advantage in the production of fruits and vegetables, cotton and wheat, is moderately competitive in several relatively low water consuming crops (maize, beans, potato, berseem clover, and oil seeds), and has a disadvantage in producing water intensive crops, such as rice and sugar cane.

Egypt is aiming to increase the growth rate of the agricultural sector in the coming five years plans from 3.8% to 4%.

Using High Yield Varieties, HYV and improved germplasm of plant genetic resources by farmers can contribute in achieving the national development plan.

Conservation and maintenance of genetic resources contribute in achieving the food security and help in alleviating poverty and improve the living of the community.

Closing Comment

The objectives of the CBD convention are "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies..."

Each member – country in the convention is required to "in accordance with its particular conditions and capabilities, develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity". The sovereign rights of member – countries over their natural resources are recognized as referred to in text "recognizing the sovereign rights of states over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation"

CONCLUSION

The role of biodiversity and the importance of its preservation is an outstanding issue for long-term food security, sustainable agriculture and rural development for present and future generations. In this interest genetic resources will be explored preserved, evaluated and made available for plant breeding and scientific purposes. The biological diversity as stated in the Convention on Biological Diversity – CBD encompasses all genes, species and ecosystems.

Egypt has been a signatory to the Convention on Biological Diversity CBD and the International Treaty on Plant Genetic Resources for Food and Agriculture. Treaty sets guidelines for the process of collecting, identifying, evaluating, maintaining and documenting the plant genetic resources. It also defines national obligations for the sustainable use of those resources by each contracting party.

The National Gene Bank of Egypt was assigned to collect, identify, regenerate, evaluate, conserve and document the plant, animal and microorganism genetic resources in the Agricultural Sector in Egypt.

The National Gene Bank of Egypt was opened on the sixth of October 2004 to be responsible for the *ex situ* conservation programme in Egypt and, to be the focal point regarding the coordination between breeding programmes in both public and private sectors, seed supply system and genetic resource programme.

MALR appointed the NGB to prepare the Second National Report on the Plant Genetic Resources to be included in the Global Plan of Action of the FAO.

SOURCES OF INFORMATION

- Breeding Field Crops
- Conservation of Genetic Resources.
- Establishment and management of field genebank.
- Flora of Egypt I
- Flora of Egypt II
- Flora of Egypt III
- Flora of Egypt IV
- Flora of Egypt, Check List
- Handbook of Conversation on Biological Diversity.
- International Rules for seed Testing
- National Information Sharing Mechanism on the Implementation of the Global Plan of Action
- Principals and Practices of Seed Storage.
- Rules for Testing seeds
- Species Nomenclature in GRIN Taxonomy
- UPOV - Plant Varity Test Guidelines
- The International Treaty on Plant Genetic Resources For and Agriculture.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NATIONAL GENE BANK

The National Gene Bank is The Meeting Point of Tomorrow

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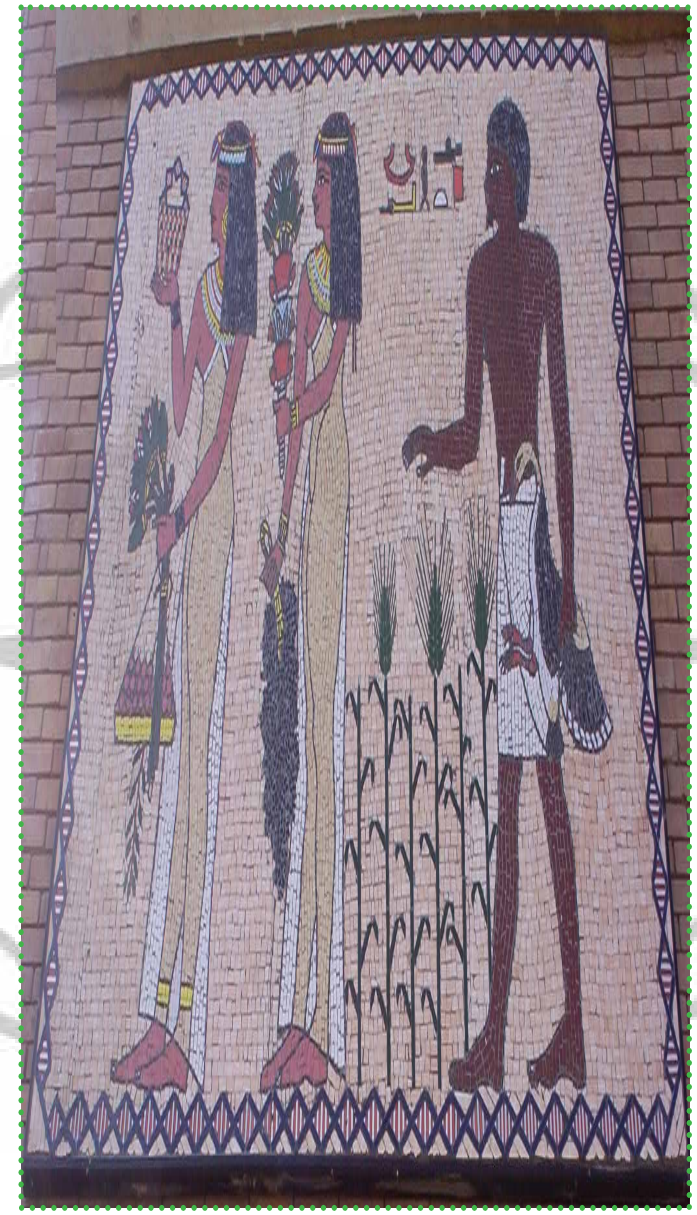

National Gene Bank

and Genetic Resources

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