



TC 1973

GENE BANK

TC 1973

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# የዕፀዋት ጄኔቱክ ሀብት ማዕከል

## መግቢያ

ኢትዮጵያ ልዩ ልዩ የተፈጥሮ ባሕርያትን የያዙ የእፀዋት ሀብት የተመላባት አገር ስትሆን፤ የነዚህ ዕፀዋት መሠረተ ምንጭ በመሆን በዓለም ውስጥ ከታወቁት ሰባት ማዕከላት አንዷ ናት ። ከዛሬ ሃምሳ ዓመታት ጀምሮ ልዩ ልዩ የዓለም ሣይንቲስቶች የሩሲያው ቫሲሎቭ፣ የአሜሪካው ሐርላንና እንዲሁም በተከታታይ ሌሎች ታላላቅ ሰዎችና ድርጅቶች ይህንኑ በመጠቀም በዚች አገር ውስጥ አንድ ማዕከል ቢቋቋም በዓለም ውስጥ በየጊዜው አስጊነቱ እየጨመረ ለሚሄደው የምግብ እጥረት ዓይነተኛ መፍትሔ መሆኑን ጭምር በየጊዜው ገልጠዋል ። ስለሆነም በተባበሩት መንግሥታት የምግብና የእርሻ ድርጅት አቀነ ባባሪነት በኅብረተሰብአዊት ኢትዮጵያና በምዕራብ ጀርመን መንግሥታት መካከል በተደረገው የቴክኒካል ተራድኦ ውል መሠረት ይህ ማዕከል በ፲፱፻፷፰ ዓ.ም. ተቋቋመ ። ለያዘው ዓላማና ተግባር የዚህ ዓይነቱ ተቅዋም በማዕከልነት ደረጃ ቢቋቋም በአፍሪካ ውስጥ የመጀመሪያ ጊዜ ነው ።

## የማዕከሉ ዋና ዋና ዓላማዎች የሚከተሉት ናቸው፤

- ፩. በአገሪቱ ውስጥ የሚገኘውን ለምርት፤ ለኢንዱስትሪና እንዲሁም ለህክምና አገልግሎት የሚውል የእፀዋት ጀርም ፕላዝምን (ንጥረ ዘር) በወቅቱ በመስብሰብ፤ ይህንኑ ለረጅም ጊዜ በማከማቸትና አስፈላጊውን ጥናት በማድረግ አብሮ የተያያዙትን የተፈጥሮ ባሕርያት በሚገባ ሥራ ላይ እንዲውሉ ማድረግ፤



፪. በተለይም የእርሻ ሰብልን በተፈጥሮ የበሽታ መከላከል፤ ምርትን ለማሻሻልና ልዩ ልዩ የአየርና የአፈር ተለዋዋጭ ሁኔታዎችን በመቋቋም በኩል የሚያስፈልጉት የተፈጥሮ ባሕርያት ለይቶ በማጥናት፤ ከእርሻ ባለሙያዎች ጋር በመተባበር እነዚህን ሥራ ላይ እንዲውሉ ማድረግ፤

፫. በአገሪቱ ውስጥ የሚገኙትን ሌሎች ከላይ የተጠቀሱትን ባሕርያት የያዙ የእፀዋት ዘሮች በተጨማሪ ከሌላ ዓለማት ከሚገኘው ቅርሳቅርስ ማሻሻልና ማበልጸግ።

ይህም ሲሆን ማዕከሉ ቅድሚያ የሚሰጠው በዚህ ረገድ ለአገሪቱ ልማት ግቦች መምታት አስተዋጽኦ በሚኖራቸው ተግባራት ላይ ለሚያተኩረው ሥራ ሲሆን፤ በተግባራዊ አካሉ ደግሞ በዓለም አቀፍ ደረጃ ከሚደረገው ከዚህ ዓይነተኛ ሥራ ጋር የተወሳሰበ ነው። ይህም ማለት በመጭው ጊዜያት ውስጥ ይህ ማዕከል ከዓለም ማዕከላት አንዱ በመባል ከአገሪቷና ከሌሎች ልዩ ልዩ ሀገራት በተሰበሰበው ልዩ ልዩ የዕፀዋት ሀብት ክምችትና በተለይም ለእርሻ ሰብል ማሻሻያ እንዲሁም ለኢንዱስትሪና ለሕክምና አገልግሎት የሚውሉ የዕፀዋት ባሕርያት ዋና ምንጭ ይሆናል። እንዲሁም አስካሁን ያለአገባብ ሲባ ክንና ሲወድም የቆየው ይህ ተፈጥሮ የለገሣቸው የዕፀዋት ቅርሳቅርስ በሚገባ ተጠብቆ በተቀዳሚነት ለአገሪቱ እንዲሁም ለሌሎች ክፍለ ዓለማት ልማት አገልግሎት ላይ ይውላል ማለት ነው።

ከላይ እንደተገለጸው ሁሉ የዚህ ማዕከል ለመጀመሪያ በኢትዮጵያ ውስጥ መቋቋም በአገሪቱ ብቻ ሳይሆን በአፍሪካ የአዝርዕት ልማት ታሪክ ውስጥ ዓይነተኛ ምዕራፍ የያዘ ሲሆን፤ በአሁኑ ጊዜ ኢትዮጵያ በምታካሂደው የትግል ዘመን ውስጥ ከተመሠረቱት ታሪካዊ ሥራዎች አንዱ ነው። በተጨማሪም የዚህ ማዕከል መቋቋም በአገሪቱ ለወደፊቱ የዓለም ልዩ ልዩ የዕፀዋት ጀርም ፕላዝም ክምችትና በዚህ በኩል በሚደረገው የምርምርና የጥናት ሥራ በዓለም ውስጥ ከፍተኛ ቦታ የመገናኛ ጅድግ በይበልጥ እንደሚያሻሽለው አይጠረጠርም።

## የማዕከሉ ዕቅድና የሥራ ቦታ

ከላይ የተዘረዘሩትን ዓላማዎች በተሟላ አኳኋን ለማስፈጸም እንዲቻል ለማዕከሉ ተግባር አስፈላጊ የሆኑትን ኤክስፐርቶች፣ መሣሪያዎች፣ መኪናዎች ወዘተ... በጀርመን ፌዴራል ሪፑብሊክ ዕርዳታ የተገኙ ሲሆን በተደረገው የዕርዳታ ውል ስምምነት አስፈላጊ የሆኑት ቁጣቂሶች በቅርብ እንደሚገኙ ተስፋ ተደርጓል።

የኢትዮጵያ መንግሥትም በበኩሉ አንድ ቋሚ ዲሬክተር፣ ማለትም በጠቅላላው የሚከተሉትን ሥራ የሚመራ የምርምር ኃላፊዎችን ረዳቶቻቸውንና ሌሎችንም ሠራተኞች እየሰጠ ሲሆን፤ ወደ ፊትም እንደየአስፈላጊነቱ እየታየ በማዕከሉ የሰው ኃይል ፍላጎት መሠረት እርዳታው እንደሚቀጥል ተስፋ ይደረጋል።

የማዕከሉ ኤክስፐርቶችና ተባባሪዎቻቸው ማዕከሉ ከተመሠረተ ጥቂት ጊዜ በኋላ በየክፍላቱ ሀገር እየተዘዋወሩ ልዩ ልዩ የእህል ዘሮችን በተለያየ ጊዜ በመሰብሰብ ላይ ይገኛሉ። እስካሁን በቁጥር ወደ 20,000 የሚጠጉ ልዩ ልዩ የእህል ዘሮች በማዕከሉ ተከማችተው ይገኛሉ። ይህ ቁጥር ከጊዜ ወደ ጊዜ እየጨመረ ይሄዳል። ዓላማው ማለትም የተሰበሰቡት የእህል ዘሮች ከተመዘገቡ በኋላ ለረጅም ጊዜ ሣይበላሹ ሊቆዩ ከሚችሉበት ማከማቻ ውስጥ ተቀምጠዋል። እነዚህም ጠባያቸውና ሊሰጡ የሚችሉትም ጥቅም በማጥናት የእህል ዘር ለሚያሻሽሉ ድርጅቶች ማቅረብና [ስለአጠቃቀማቸው ምክር ማበር ከት ነው፤ ጥናቱም ልዩ ልዩ የአየር ጠባይና ዓፈር ባለባቸው ሥፍራዎች ይካሄዳል።

የማዕከሉ ዋና የሥራ ቦታ አዲስ አበባ ውስጥ ሲሆን በተጨማሪም ለሥራው ማስፈጸሚያ የሚረዱትን ንዑስ ክፍሎች በደብረዘይት፣ ሆለታ፣ በናዝሬት እርሻ ምርምር ጣቢያዎችና በዓለማያ የእርሻ ኮሌጅ በቅርብ ጊዜ እንዲቋቋሙ የእቅዱ ጥናት ተጠናቋል። ይህም የሆነ



በት ምክንያት በእነዚህ ድርጅቶች ውስጥ በሥራ ሊሳተፉ የሚችሉ ምሁራን ስላሉና በተጠቀሱት ቦታዎች የተለያዩ የአየር ጠባይና የአፈር ዓይነቶች ስለሚገኙበት ነው ።

### **በማዕከሉ ውስጥ የሚገኙ ቁሳቁሶች**

ከላይ የተጠቀሱትን ዓላማዎችና እቅዶች ከግቡ ለማድረስ በተለይም የተሰበሰቡት የእህል ዘሮች ሣይበላሹ ለብዙ ጊዜ (50-100 ዓመት) እንዲቆዩ ለዚህ ሥራ ሆነ ተብሎ የተሠራ የማቀዝቀዣ ቤቶች መግዛት አስፈላጊ ስለሆነ ማዕከሉ በአሁኑ ጊዜ አንድ መጠኑ 75 ኪዩቢክ ሜትር የሆነ እስከ 25,000 ግማሽ ኪሎ የሆኑትን የእህል ዘሮች ለረዥም ጊዜ (50-100) ዓመታት ለማስቀመጥ የሚያስችልና በ20 ሴንቲ ግሬድ የሚሠራ የማቀዝቀዣ ቤት እንዲሁም መጠኑ 50 ሜትር ኪዩቢ የሆነና በቁጥር 15,000 እና መጠናቸው ግማሽ ኪሎ የሚሆኑ የእህል ዘሮች ለአጭር ጊዜ ማለት ከ10-20 ዓመታት ለማስቀመጥ የሚያስችልና በ4 ዲግሪ ሴንቲ ግሬድ የሚሠራ ማቀዝቀዣ ተገዝቶ በሥራ ላይ ውሏል ። ለወደፊትም ማለት በቅርብ ጊዜ ውስጥ ሁለት መጠናቸው 180 ሜትር ኪዩቢ የሆነ የማቀዝቀዣ ቤቶች ለመግዛት የመጀመሪያ የእቅድ ጥናት ተጠናቋል ።

እንዲሁም ለመስክና ለላቦራቶሪ ሥራዎች የሚያገለግሉ ልዩ እቃዎች ተገዝተው በሥራ ላይ ሲገኙ ወደፊትም እንደየአስፈላጊነታቸው ለመግዛት የአጭርና የረዥም ጊዜ እቅድ አለ ። በተጨማሪም ለመስክና ለቢሮ ሥራ የሚያገለግሉ ልዩ ልዩ ዓይነት ተሽከርካሪዎች ተገዝተው በሥራ ላይ ሲሆኑ፤ ሌሎችም ተሽከርካሪዎች ተገዝተው በቅርብ ለማዕከሉ ሥራ እንደሚውሉ ተስፋ አለን ።

### **የማዕከሉ ሥራ የሚያስገኘው ጥቅም**

ማዕከሉ አንዳንድ የሚፈለጉ ጠቃሚ ባሕርያት ያላቸው የልዩ ልዩ የእህል ዘር ዓይነቶች ለማግኘት እንደምንጭ ወይም እንደ ባንክ ሆኖ

ያገለግላል ። ይህ ተፈላጊ ባሕርያት ያላቸው የእህል ዓይነቶች (ንጥረ ዝርያ) መኖር የሀገራችንን የሰብል ምርትና የምግብነቱን ጥቅም ከፍ ለማድረግ ይረዳል ። ይህም ሀገራችን በሰብል በኩል ተደናቂና ታላቅ ውጤት እንድታገኝ ያስችላል ።

ማዕከሉ የዚህ ዓይነቱን ተመሳሳይ ሥራ በመሥራት በዓለም ከተ ቋቋሙት ጥቂት ድርጅቶች አንዱ በመሆኑ ሀገራችን በእህል ዘሮች ዓይነትና ብዛት የታወቀች ለመሆኗ ታላቅ ማረጋገጫ ነው ። በልዩ ልዩ ሀገር ያሉ የሳይንስ ሊቃውንት ከጊዜ ወደ ጊዜ ለጥናት ስለሚመጡ ፤ ሁኔታው ለአገሪቱ ምሁራን በዚህ ረገድ ቴክኖሎጂን ከውጭ ምሁራን ጋር የማወራረስ እድልን ይከፍታል ። የዚህ ዓይነቱ ጥናትና ምርምርም በአገሪቱ ውስጥ እንዲካሄድና እንዲስፋፋ ይረዳል ።

### መደምደሚያ

ለኢትዮጵያ የኤኮኖሚ ድጋፍ የሚሰጡ የሕዝቡንም የኑሮ ደረጃ ለማሻሻል ለሚረዱ የእህል ዘሮችና ለሌሎችም ተክሎች ማከማቻና ማጥኛ ማዕከሉ መቋቋሙ በእርግጥ አስፈላጊ ነው ። በአሁኑ ጊዜ በአገሪቱ ውስጥ የሚገኘውን የዕጽዋት ንጥረ ዘር ሀብት እንዳይጠፋ ለማድረግ እንዲሁም ከውጭ ሀገር አስመጥቶ ባለው ላይ ለመጨመርና የኢትዮጵያ የእርሻ ይዞታም በማዕከሉ የሥራ ውጤት ከፍተኛነትን ሊያገኝ እንዲችል የዚህ ማዕከል መኖር አስፈላጊ ሆኖ ስለተገኘ ይህ ማዕከል በ፲፱፻፷፰ ዓ. ም. ተቋቋመ ።

## *pgRC/ε Staff*

Melaku worede	—	Ph. D., Geneticist/Plant Breeder, Director
A.M. Abou-Zeid	—	Ph.D., Seed Physiologist, Project Manager
A.W. Krausz	—	Ph.D., Agronomist, Expert
*Abebe Demissie	—	B.Sc., Taxonomist, Asst. Res. Officer
Berhanu Hika	—	M.Sc., Breeder, Asst. Res. Officer
Brooke Abebe	—	B.Sc., Biologist, Asst. Res. Officer
*Endashaw Bekele	—	M.Sc., Ecologist, Asst. Res. Officer
*Mehari Zewdie	—	M.Sc., Seed Physiologist, Asst. Res. Officer
Maheteme Haile		
Giorgis	—	B.Sc., Biologist, Asst. Res. Officer
*Isaac Bekele	—	B.Sc., Documentalist, Asst. Res. Officer
*Abebe G/Markos	—	Field Assistant
Aberra W/Kirkos	—	Diploma in Public Adm., Adm. Assistant
Asheber Teshale	—	Diploma in Plant Science, Tech. Asst.
Wazaye Ejigu	—	Diploma in Plant Science, Tech. Asst.
Ethiopia Desalegn		Field Assistant
Mebrat Belay	—	Laboratory Assistant
*Isaac Genet	—	Field Assistant
Kassahun Tadesse	—	Diploma in Electricity, Asst. Electrician
Mulugeta T/Haimanot		Storekeeper
Taye Shewakena	—	Diploma in Electricity & Cold Store Technique, Refrigeration Technician and Chief Electrician
Tessema Tanto	—	Diploma in Plant Science, Tech. Assistant
Zewdnesh Mesfin	—	Diploma in Business, Executive Secretary
Zewoldie Hadgay	—	Driver
Yadegdigu Belay	—	Executive Secretary
Etalemayehu Mogus	—	Messenger
Woudie Dubale	—	Cleaner
Mulu Bekele	—	Cleaner
Nejuma Abdulahim	—	Diploma in Plant Science, Laboratory Asst.
Abselom Kassa	—	Guard
Berihun Ayele	—	»
Absera Fantabil	—	»
Guta Robi	—	»
Wanaw Gobeze	—	Gardner
*On Study Tour		



## Plant Genetic Resources Centre/Ethiopia Background

### INTRODUCTION

Ethiopia, with its wide range of agro-climatic conditions, is one of the centres for the domestication and diversification of several important crop plants. This was first recognized by Vavilov in the 1920's and later confirmed by various other scientists. Various concerned scientists have also indicated that the tremendous genetic diversity deserves much more attention than it has received so far. There are large relatively inaccessible areas that are still unexplored that could serve as important natural reservoirs of germplasm. Some of the areas like Yerer and Kereyu and many other highland regions of Ethiopia, ranging from 2600-4000m (8000-12000 ft) have been recognized as high crop diversity sources but have more or less been neglected by previous explorers.

The natural conservation of the germplasm of crop species in Ethiopia may also be attributed to the traditional farming system. The Ethiopian farmer has consciously or unconsciously been maintaining a highly heterogeneous population of seed stock for many generations. The primitive farming methods have hardly interfered with the continued co-existence of the various crop species and their wild progenitors. This situation may not continue as the farmer is now looking for new and improved seeds and is adopting modern farming practices. While this is one important step in yield improvement, it involves the risk of losing the rich source of germplasm already in existence. It is a paradox that agricultural development is responsible for the loss of potentially valuable genetic material. This can be resolved only through a systematic effort to conserve the genetic stock already in existence.

The importance of collection, preservation and systematic utilization of plant genetic resources was recognized by scientists perhaps half a century ago. It is only recently, however, that due attention has been given to the problem.



In 1972 a group of experts from various international institutions recommended that action be taken to conserve and utilize the world's dwindling reserve of crop germplasm. Among the few countries identified as important centres of genetic diversity, Ethiopia was accorded a high priority for the collection, conservation and utilization of crop germplasm. Plant breeders have already identified highly desirable genetic characteristics in the relatively few collections they have made in Ethiopia. These include high lysine contents in either sorghum or barley and rust resistance in wheat. Some barley lines that were collected a few years ago in Ethiopia were found to be the only source of resistance in the world to certain virus diseases. Other characters for which Ethiopian crops are believed to be important future gene sources in varietal improvement include earliness, tolerance to drought and adaptability to adverse weather and soil conditions.

It is this recognition that attracted the attention of national and international institutions and the subsequent realization of the need for the establishment of a genebank in Ethiopia.

#### Initiation of the Plant Genetic Resources Centre /Ethiopia(PGRC/E

The plant Genetic Resources was established in 1976 as a bilateral technical and economical development program between the Ethiopian Government and the Government of the Federal Republic of Germany. It was formed with the following major objectives :

- (1) to promote the collection, evaluation, documentation and scientific studies of the crop plant germplasm material.
- (2) to provide facilities for long term storage and maintenance in order to make available valuable germplasm to breeding programmes in the years to come.
- (3) to provide materials to be utilized in breeding programmes aimed at the development of high yielding, disease and pest resistant cultivars with other qualities required of important crops grown in Ethiopia.
- (4) to supplement the Ethiopian crop plant germplasm by crop plant germplasm of other countries through cooperation and exchange of materials.

### **Organization**

The plant Genetic Resources Centre/Ethiopia (PGRC/E) is attached to the National Institute of Agricultural Research for budgetary and administrative purposes. It receives its guidelines from the PGRC/E Council which is composed of representatives from various professionally related institutions.

The staff of the Centre is composed of a growing number of research and supportive national staff and foreign experts (including short-term consultants).

### **Activities**

The main operational activities of the Plant Genetic Resources centre include five major phases :

- (1) collection of germplasm
- (2) conservation-maintenance
- (3) evaluation and documentation
- (4) biosystematic studies
- (5) the exploitation of genetic variability

With only two years of effective period of operation, the PGRC/E has yet to claim major accomplishments in regards to these activities. The main involvement so far has been in the area of collection and conservation, carried out on the basis of some well defined priority of action.

For the collection, priority has been based on the economic importance, social importance and the degree to which genetic erosion in endangering the varieties and or new crops are endangered by natural disasters. So far some 15,000 samples of the major cereals and pulses have been collected mainly from the Central and Northern Highlands and the South and South Eastern parts of Ethiopia. An additional accession of about 5,200 sorghum samples collected and maintained by the Ethiopian Sorghum Improvement Programme was handed over to the PGRC/E recently.

### **Staff Training**

The training component will continue to be part and parcel of the manpower development programme of the PGRC/E, so as to insure the continuity of the activities. Training at high, medium, and low levels in relevant areas was given and is still being given with the fund provided from the West German Foundation for International Development (DSE) or from other West German Institutions.



### Resources and Facilities

The Centre is located in Addis Ababa on a 3 hectare site. The new laboratory-office building was built at a cost of just over half a million Ethiopian Birr. Of this amount of money, the German Agency for Technical Cooperation (GTZ) contributed three hundred fifty thousand Ethiopian Birr while the rest of the cost plus the other facilities of the Centre include.

- (1) cold stores for long and medium-term storage. The longterm storage has a capacity of 25,000 half kg units of seed samples. The medium storage can accommodate about 15,000 half kg units of seed samples. Two additional cold stores with a capacity of 180m<sup>3</sup> will be installed in the next few weeks.
- (2) seed drying - with a capacity of drying about 500 samples of seed at a time.
- (3) field machinery- one tractor with all accessories, combine harvester, planter, and other accessories.
- (4) laboratory facilities-for seed testing, for seed physiology, seed processing, and other facilities for research work.
- (5) greenhouse and lath house and miscellaneous items will be installed at the end of this year.
- (6) vehicles - both for field and office use. Six additional field vehicles are ordered for immediate purchase.
- (7) collection and camping equipment - sufficient for three teams. Additional collection and camping have been ordered.
- (8) photo laboratory - complete photographic facilities have been purchased.
- (9) facilities for documentation and herbarium- all facilities required for documentation and herbarium will be purchased in the nearfuture.

### Establishment of National and International Relationship

Cooperative work with appropriate organizations all over the world, in particular with the network of genetic resources centres will continue.

tribute at large in the salvaging of existing germplasm resources as well as their conservation and effective utilization in the future. With this in mind, the Centre is establishing a network of relationships with various national and international organizations vizaviz :

- (1) National Crop Improvement Conference (IAR)
- (2) The Ethiopian Sorghum Improvement Project, Nazareth (AAU)
- (3) The College of Agriculture at Alemaya, Harar (AAU)
- (4) The Central Experimentation, Debre Zeit (AAU)
- (5) Scientific Phytopathological Laboratory, Ambo
- (6) N.I. Vavilov Institute of Plant Industry, USSR
- (7) Akademie der Wissenschaften der DDR
- (8) Braunschweig Genebank, West Germany
- (9) International Institute of Tropical Agriculture, (IITA) Ibadan, Nigeria
- (10) International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), India
- (11) Kyoto University, Japan
- (12) Germplasm Laboratory, Bari, Italy
- (13) International Board of Plant Genetic Resources (IBPGR), FAO, Rome
- (14) International Maize and Wheat Improvement Centre (CIMMYT), Mexico
- (15) Interamerican Institute of Agricultural Sciences (ITACA) Turrialba, Costa Rica
- (16) Germplasm Resources Laboratory, USDA Agricultural Research Centre, Beltsville, Maryland, USA
- (17) The All Vavilovian Plant Industry, Leningrad, USSR
- (18) Agricultural Research and Introduction, Izmir, Turkey

In summary, the future involvement of the PGRC/E will be an expansion of the exploration, collection, conservation, and effective utilization of the germplasm resources both within and without the country. Its future programme is also aimed at developing the necessary scientific and supportive staff and improving facilities for training and research in relevant areas.

The PGRC/E is to cater primarily as a nucleus for the above mentioned activities in Ethiopia. In years to come it will play leading role as a regional base for genetic conservation in Eastern Africa and neighbouring regions.