UZBEKISTAN:

COUNTRY REPORT TO THE FAO INTERNATIONAL TECHNICAL CONFERENCE ON PLANT GENETIC RESOURCES

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Note by FAO

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CHAPTER 1
Introductory Characteristics of the Republic of Uzbekistan and its Agriculture

Uzbekistan is situated at the famous from ancient times the Great Silk Way from the Far East to Europe. This is a Central Asian country, it doesn't border upon sea. Territory of Uzbekistan is 447,000 sq. km. Almost 3/5 of the territory is steppe, desert, semi-desert and mountains, the rest of its part is fertile valleys among two main rivers - Amu Dary and Syr Daria. On the east and south-east the Republic borders on Kirghizia and Tajikistan, on the west and south-west-- with Turkmenistan, on the south and small distance among the Amu Daria - with Afghanistan, on the north and north-east - with Kazakhstan. The west and the north-west are plains, belonging to Touran lowland. There are places here, lying lower than the ocean level. From the east and south-east the plain lands are bordered with high mountain belt of the Pamirs-Altai and Tien Shan, some plains of which are higher than 5 km. In Touran plain within the Republic the vastest sand deserts the Kara-Kum and the Kizil-Kum are situated.

Natural conditions of Uzbekistan - remoteness from large water tracts, high sun standing, accessibility intrusion of cold air mass from the north and west one - from the west caused its peculiar climate. Climate of the Republic is sharply continental. The specific peculiarity is regime of atmospheric sediments. Maximum amount of sediments occurs in May-April, them comes hot dry period till October. Great evaporation of moisture, exceeding the amount of the sediments, causes low relative moisture of air. For the summer period soil is dried up to a meter depth and only in spring it is moistured again till full moisture capacity. At plain territories and low foothills a small number of seadimets fall (for example, in places, situated to the south of the Aral Sea - less than 100 mm per year, in Tashkent 350 mm). Summer is hot, winter is mild. Temperature of January is from -6° C on the north, till 2° C on the south. Average temperatures of July constitute on the north (near the Aral Sea) 26° C and on the south (near the border with Afghanistan) 31.5° C. There are days, when temperature of air on the south is almost 50° C, and sands surface 80° C.

Uzbekistan is the most populous from the four Central Asian republics. It comes the third among the former republic of the USSR (almost 7% of the population). From total number (23 million people), 60% lives in the country, about a half of them are people not older than 19 years old. The biggest part of the population is of Uzbek nationality - about 17%.

Uzbekistan is the largest producer of agricultural products, which constitute about 40% of its net material products. Till 1995 the main crop of the republic has been cotton, which had been sowed at the area approximately 2 million ha and constituted almost half of all value of agricultural production of cotton and second - on its export. From 1995 with the view of gaining grain independence increase of sowing of grain crops has been planned. In 1995 grain crops were sowed at the area of 1.2 million ha, 400,000 ha of them are bogar lands. For production of grain crops in 1996 year 1.3 million ha will be stipulated at watering and 0.5 million ha at bofar. Uzbekistan is also a large producer of fruits and vegetables. During the last years agriculture grew fast with regard for expanding of irrigation and reduction of blowing water into the Aral Sear, that caused severe ecological circumstances.

Industrial production (33% of net material product) is based mainly on processing of agricultural raw material.

Produce of light industry constitutes approximately 40% of total volume of production, processing of agricultural product - 13%, heavy industry - 41%, the rest falls on fuel and energy complex. Uzbekistan is rich in natural resources; gold, oil, gas, coal, silver, copper.

Uzbekistan, possessing restricted water resources has numerous and quick-growing population, concentrated in populous oases and recently established irrigative regions. Economics of the republic is mainly directed towards agriculture. But there are possibilities for development of new regions of agriculture and water resources are sued practically to the full extent, and in the near future the sector will gire a part of earth and water resources with other branches of national economy.

Process of reforms, as a whole, already began and today it is dimmed, mainly, at solution of issues of entrusting manufacturers with greater freedom, gradual liberalization of prices, gradual and further full liquidation of system of state order, establishment of flexible system of marketing etc.

Present reforms cause reorganization of structure of production and consumption, that is necessary for effectiveness and productivity of agricultural sector.

Uzbekistan possesses more than 4 million ha of irrigative lands and 213 of them are taken by cotton and grain crops. Vegetables, fruit crops, kenaf, tobacco, bean and cucurbitaceous crops.

Seed growing is carried out by own resources. State and private structures are occupied by them. Large-scale foreign investments is the field of seed growing are not available, but in 1995 activity of the World Bank and private foreign firms speeded up greatly. Tendency of development of branches, connected with intensification of cotton growing and grain production have become obvious from gaining independence by the republic.

Uzbekistan was in a number of ancient civilizations, widely used wheat in agriculture. Rearrangement of production of agricultural crops not only deprived the republic of grain independence, but branched also historical traditions of grain production. Measures on establishment of a system of selective seed structure of grain and cereals are developing in the republic with the view of rehabilitation of grain independence.

CHAPTER 2
Information about Uzbekistan's Genetic Fund

Uzbekistan's flora is characterized by rich biological variety, more than 4,000 wild vascular plants species grow here.

The south regions of mountain and hill part of the republic, where a great number of arboreal-shrubbery and grassy plants, including even the elements of subtropical flora (*Ficus carica L., Zizyphus jujuba Mill. Diospyrus lotus L., Punicagranatum L.*) can be specially mentioned. While appraising Uzbek unique flora N.I. Vavilov (1926, 1931) attributed it to one of the 6 possible origin centers of many modern cultured plants. For example, one of the possible origin centers of the cultured onion (*A. cepa L.*) is the mountain Central Asia. This widely used species has its nearest relatives just here (4 from 5 wild species: *Allium oshaninii, A. vavilovii, A. prae-mixtum, A. pskemense*). Exactly these wild species are of great importance in enrichment of cultured species with natural genetic material. In all the sort *Allium L.* in Uzbekistan is represented by no less than 110 wild species.

It is worth to mention the species *A. longicuspis* - the only wild forefather of *A. sativum* (garlic). At pre-sent alive collection of Middle Asian onion wild species is made in the Botanic Institute (Tashkent). It consists of 500 samples and about 80 species. About 1/3 of all sort species grows all over the territory of Uzbekistan.

The project was sponsored by the International Science Foundation, it is necessary to continue these collection investigations (including Middle Asian onion and garlic sorts) with the obligatory outside help. One more example of unique genetic diversity is the growth as wild species *Vitis vinifera*, *Pistacia vera* and others. Evaluating the natural flora originality of the republic it should be noted, that the percentage of endemic here is 25%.

This phenomenon is based on the availability of a series of superpolymorpfic sorts, such as *Astragalus* (400 species), *Cousinia* (150 species), *Artemisia* (90 species), etc. Uzbekistan as an integral part of the Middle Asia is the most powerful centre of the sort *Tulipa* (about 40 species) formation.

The species *Tulipa greigii T.*, with its largest flowers, which well known to the European collectioners, grow here in the wild state. In 20-30 years of the 20th century 10,000 of bulbs of the most decorative tulips were taken out from Uzbekistan. They served as a genetic basis for the famous Holland sorts.

There is also a specific group of relic endemic plants, which are nearly to disappear from the face of the earth (*Ostrrowskkia magnifica, Callispepla aegacanthoides; Otostegia bucharica, Spirostegia bucharica* and etc.). In the coming decade, we risk to lose these unique species and together with them - the genetic information, which the nature puts at the beginning of Neogene and even of Paleogene.

On account of many reasons a general sanitary state of plantations deteriorates and regular picking of the best fruits results in less valuable specimen preservation in the forests, i.e. the genofund is worsening. In particular for the last decade the nut-tree areas cut from 3,000 ha to 0.5 ha, and the number of nut-trees, apple-trees and pear-trees decreased significantly in these woods.

During the last years the state of tough woody is also worsening in view of the fact that rivers' discharges are regulated in no proper ways, this resulted in the flash flood absence of flood-lands and increase of salt content in subsoil waters and soils.

Some valuable wild plant species cause alarm: they remain in nature as a single specimen and if the urgent measures are not to be taken these genotypes will be completely lost. There are species (4 species which have already disappeared and we can see them only in herbarium materials (for example, *Pypus asiameida*).

Below there is a list of wild plants species, which were grouped according to their economic properties and which present the genetic fund of the plant resources of Uzbekistan.

I. Wild relatives of some food plants

More than 30 wild species grow in Uzbekistan's flora. They are sued in the economy and by inhabitants. They are namely:

1. Sivers' apple-tree (*Malus sieversii* (Ledeb.) M. Roem). Forms natural plantations in the northern mountain regions of Uzbekistan.
2. Turkmen pear-tree (*Pyris turkomanica Malux.*). Grows as an individual.
3. Korzhinskyi pear-tree (*Pyrus Korschinskyi* Litv.). Grows as an individual.

4. Walnut (*Juglans regia* L.). Forms natural plantations in the mountain regions.
5. Almonds common (*Amygdalus communis* L.). It is not found as a wild species.
6. Zisyphis (*Zisyphus jujuba* M.Pop.). Forms the impenetrable plantations in the south mountain regions of Uzbekistan.
7. Alycha (*Prunus divaricata* Ledeb). Forms powerful plantations in the mountains.
8. Fig-tree common (*Ficus carica* L.). Some natural plantations have been found.
9. Persimmon caucasian (*Diospyrus lotus* L.)
10. Pomegranate common (*Punica granatum* L.) Grows as a single in the natural conditions in the south of the republic.
11. Pistachio-tree (*Pistacia vera* L.). There are fragmentary plantations in the mountains.
12. Hawthorn pontium (*Grataegus pontica* C. Koch.) Forms the powerful plantations in the lower zone of the mountains.
13. Barberries oblong (*Berberis oblonga* Schneid). Forms powerful plantations in the mountain regions.
14. Blackberry bus, rasberries (*Ribus caesius* L.). Forms powerful plantations in the mountains.
15. Sumach (*Rhus coriaria* L.). Single specimens can be found in the mountain regions.
16. Onion pskemskyi (*Allium pskemense* B. Fedtsch.). Single specimens can be found in the mountain regions.
17. Rye wild (*Secale sylvestre* hast.) Can't be found in the wild state.
18. Barley bulbous (*Hordeum bulbosum* Torn.). Forms powerful monodominant groups in the mountain zone.
19. Oats (*Avena sativa* L.).

II. Officinal plants (herbs)

There are more than 500 species of herbs in the Uzbekistan flora. About 30 species are used in the scientific and fold medicine.

20. Sweetbrier canine (*Rosa canina* L.). Widely distributed species, which is stocked by the state.

21. Victor's Ungernia (*Ungernia victoris* Vved.). Narrow-local endem with scanty stocks.

22. Hippophy (*Hippophae rhamnoides* D.). Widely distributed species in the north mountain regions.

23. St. -John's-wort (*Hypericum perforatum* L.). Widely distributed species, which is stocked by the state.

24. Lagochilis (*Lagochilus inebrians* Bunge). Fragmentarily distributed species, which was previously stocked by the state.

25. Inula (*Inuba grandis* Schrenk). Widely distributed species with unlimited stocks.

26. Nettle dioecious (*Urtica* L.). Widely distributed and stocked species.

27. Liquorice bare (*Glycyrrhiza glabra* L.) Widely distributed and stocked species. During the last 30 years is being investigated in the Botanical Institute, there is an alive collection of 12 forms.

28. Soap root (*Allochrusa gypsophiloides* (Gegel) Schrenk.). Widely distributed, well known previously stocked.

29. Melissa officinal (Melissa officinalis L.). Widely distributed stocked species.

III. Volatile oil-bearing plants

There are 400 species of them in Uzbekistan. The most widely distributed plants are the following:

30. Origanae (*Origanum tytthathum* Gostsch). Widely distributed, stocked species.

31. Bounium persian (*Bunium persicum* (Boiss). B. Fedtsch.). Widely distributed, stocked species.

32. Ziziphora pedicle (*Ziziphora pedicellata* Pazil etVued.). Widely distributed, stocked species.

33. Mediasia (*Mediasia macrophylla* (Regel et Schmalh.) M. Pimen.) Widely distributed species, great stocks are used in the fold medicine.

34. Absinth bitter (*Alrtermisia absinthium* L.). Widely distributed, stocked species.

35. Juniper zeravshanskyi (*Juniperus zerawschanica* Kom.). It dominates in the plant cover of the mountains and contains high per cent of oil.

IV. Dye-stuff plants

36. Some species of *Barberries* (Barberis sp.) Widely distributed, stocked species.

37. Madder officinal (*Rubia Tinctorium* L.). the species are not stocked.

V. Fodder plants

According to a plenty of species a special place is occupied by the representatives of the following families:

38. Haloxylon leafless (*Haloxylon aphyllum* (Minkw.) Jijin). The natural plantations are nearly destroyed.

39. Haloxylon white (*Halaxylon persicum* Bunge ex Boiss.). The natural plantations are nearly destroyed.

40. Winterfat (*Ceratoides patena* (J.F. Gmel.) Revea et Holmgren). Widely used as a Phyto-land-reclamation agent in deserts.

41. Salsola oriental (*Salsola orientalis* S.G. Gmel.). One of the widely distributed pasturable desert species.

42. Halotampus (*Halothamnus subaphyllus* (C.A.) Botsch.). Widely distributed pasturable species.

43. Absint (*Artemisia turanica* H. Krassch.). The dominant in desert pastures.

44. Alfalfa Tyanshanyiskaya (*Medicago tianschanica* Vass.). Widely distributed pasturable mountain plant.

45. Sea kale (*Cramber Kotschyana* Biss.) The dominant of the hill pastures.

46. Sweet clover (*Melilotus Officinalis* (L.) Pall.). The dominant of the hill pastures.

47. Pea mouse (*Vicia Cracca* L.). Widely distributed pasturable species.

48. Sainfoin (*Onobrychis chorassanica* Bunge). Widely distributed pasturable species.

VI. Ornamental plants

Uzbekistan's flora is characterized by the plenty of ornamental plants species. Among them a special place is occupied by the bulbous and rootlike plants, which are the relatives of some beautiful sorts of tulip and other plants.

49. Greig' s tulip (*Tulipa greigii* Regel). This is an endem. It is registered in the "Red Book of Uzbekistan".

50. Foster's tulip (*Tulipa fosteriana* Jrving). An endem. It is registered in the "Red book of Uzbekistan". It should be noted that more than 20 species of tulips are registered in the "Red Book of Uzbekistan".

51. Eremuris (*Eremurus robustus* Regel). It is registered in the "Red Book of Uzbekistan."

52. Pink uzbekistanskaya (*Dianthus uzbekistanicums* Lincz.) An endem. It is registered in the "Red Book of Uzbekistan".

53. Saffron Korolkova (*Crocus korolkovii* Regel et Schmalh.) It is registered in the "Red book of the Uzbekistan."

54. Juno magnificent (*Juno magnifica* (Vved.). An endem. It is registered in the "Red Book of Uzbekistan."

55. Ostrovskiya magestic (*Ostrowskia magnifica* (Regel) Vved). It is registered in the "Red Bood of Uzbekistan."

56. Eduard's petilium (*Petilium eduardii* (Regel) Vved.) It is registered in the "Red Bood of Uzbekistan."

57. Peony steppe (*Paeonia hybrida* Pall.). It is registered in the "Red Bood of Uzbekistan."

58. Anemone (*Anemone protracta* (Ulbr.) Uzbekistan.). It is registered in the "Red Bood of Uzbekistan."

The fact should be mentioned that the coefficient of usage of the plant resources by the State is 2-3 times less than by the inhabitants of countryside. So, we have a great potential of officinal. spicy-flavoring, volatile oils bearing wild species of plants and it is necessary to investigate and collect it additionally in order to make it to work for the welfare of mankind. On the other hand, we are the witnesses of real threat of the genetic erosion, which can be explained by the absence of thought over, national programme for the rational usage of the plant resources. A special group of specialists at a government level should work, which might control and have the objective information about all botanical objective in its disposal.

Uzbekistan together with other Central Asian republics' territories is the motherland and the centre of varieties selection of many cultures. Among them are the varieties of soft wheat, carrot, onion, garlic, persimmon, pomegranate, peach, apricot, grapes, melon, watermelon, tomato, rice, etc. In general nowadays 35 varieties f winter wheat, 40 varieties of melons, more than 100 of fruit-berries, 10 varieties of oil producing crops, 15 varieties of cereals and leguminous plants are in use.

The inhabitants highly appreciate these varieties for their high quality and good suitability to the local conditions. The old varieties of wheat, haricot and fruit-berries are still in use in the far mountain settlements. The preservation of these aboriginal varieties, which are an integral part of the national programme of the genetic resources usage.

Local varieties of the cultured plants

Plant	No. of varieties
Onion	5
Carrot	3
Cucumber	1
Water melon	3
Melon	48
Pumpkin	2
Capsicum	15
Garlic	2
Turnip	2
Radish	1
Garden radish	1
Grapes	32
Apricot	20
Peach	18
Apple-tree	5
Quince	3
Plum	5
Pear	7
Pomegranate	8
Fig-tree	3
Jujube	1
Flax	2
Sesame	2

Plant	No. of varieties
Peanut	5
Wheat	2
Barley	1
Alfalfa	2
Sorghum	3
Melissa	1
Harricot	3

CHAPTER 3
Activities in the Field of Preservation of the Genetic Resources of Plants at the National Level

3.1 PRESERVATION OF GENETIC RESOURCES OF PLANTS

We have in Uzbekistan: national collection of genetic resources of agricultural plants and their wild relatives, which are concentrated at the Uzbek scientific research institute of the plant growing; the collections of wild flora in the botanical gardens of the academy of sciences and its Karalalpak brach; the Tashkent State University: arboretum on the salty and non-irrigated soils of the experimental station in the Golodnays Steppe; a collection of valuable varieties of poplar at the experimental forest station in Kokand, arboretum park of the Uzbek scientific research institute for the forestry.

We also have collection material on vegetables, melons and potato; on cereals, leguminous plants, food and oil-bearing crops - in the Uzbek scientific-production union for cereals; on fruit-berries and grapes in the scientific-production union for gardening by name of the Shreder; on cotton - in the scientific research union " Biolog", in the scientific-research institute of Genetics of the Academy of Sciences; in the Uzbek Scientific Research Institute of Selection and Seeds Farming by name of G.S. Zytsev; on the fibber crops - at the Uzbek Experimental Station for the Fibre Crops; on rice - in the Uzbek Rice Scientific-research Institute of the Agricultural Sciences Academy.

The Uzbek Scientific Research Institute of Plant Growing keeps and studies the basic part of the genetic resources of plants. The institute was founded in 1924 by the academician N.I. Vavilov to mobilize the plant resources of Uzbekistan for the national economy needs. The current activity of genetic bank is financed by the state budget of the republic of Uzbekistan (the State Committee for Science and Technics). The national collection represents 101 agricultural cultures and their wild relatives about 50,000 samples in number, it is the collection of world-wide diversity of agricultural cultures. The preserved samples are unique, though they have no duplicates.

The collection creation of world-wide diversity of cotton in the republic was begun in the 20 years of this century at the institute of Experimental Plant

Biology of the scientific-production union "Biolog" and at the Tashkent State University. At present the scientific - production union " Biolog's" collection is the most various and richest, it represents samples of wild species, forms and sorts of almost all continents, genetic centers and world regions, where cotton is grown, including our country. This unique world diversity of the Central Asia and Europe genofund is the national riches of the republic.

Every year, the collection is replenished average 507 samples of wild representatives from 10-15 to 100-150 samples and 4-10 synthetic forms from the quarantine inspection by means of seeds exchange due to the personal contacts with foreign scientists, synthetic forms selection by the intergenomic hybridization and experimental polyploidy, which combine valuable properties of 2-4 species, and during scientific business trips and expeditions to the genetic centers of species diversity of Asia, Africa, America; cotton to Mexico, Peru, China, India, etc. Although the Australian species are not completely represented in it.

In 1976, in the environs of Mexico the joint station for the interspecies hybrids study was established by the All-Union Institute of Plant Growing with an active participation of A.A. Abdullaev and others. This station is still the genetic source of valuable synthetic forms of the Mexican cotton.

Today there are more than 1,000 varieties samples of 30 species from 37, which were found in nature. Among them are: American - 16 wild and cultured; Australian - 6 wild; African-Asian - wild and cultured (2) + 6.

Except cotton the most important material for study are melons, vegetables, fruits, grapes, cereals and leguminous plants.

The collection is used every year in such way: fruits - 50 samples, grapes - 30, vegetables - 40, cereals -250, cotton - 50, oil-bearing plants -25 etc. The majority of users are the selectionists.

The ratio between import and export collection material is approximately 1:0.9. The main sources of the received samples are the collection of genetic resources of plants from Russia, Turkmenistan, Kazakhstan, Kirghistan and Tajikistan.

Plant diversity of the republic is represented in the collection satisfactory. We can not support it in accordance with the recommended standards because of money lack.

Expedition service and samples collection carry out according to the 5-10 years plan. Samples collection by agricultural crops in the definite regions of the Central Asia is envisaged by the plan. Specialists from abroad take part in the expeditions.

There are materials in the collection, which have potential value for the selection.

Potentially valuable material of different years reproduction and origin of the same species or sort sample, which are not now used, is kept in the depositories. Nevertheless, we save it and think its further keeping is advisable as it has the definite scientific and practical value.

There is no national depository in the Republic of Uzbekistan. Collection samples (seeds) are kept under conditions which do not meet the requirements of the world standards. The seeds are in paper packages, which are put in tin boxes, they are kept under the room, unregulated temperature and air humidity.

Alive collection of wild and culture forms and species of cotton is kept under the hothouse conditions. The collection is reproduced by means of seeds bedding out under the field conditions or vegetation vessels by shorten daylight with the help of vegetation "houses". In winter they are kept in the hothouse. The hothouse is of primitive type, which does not suit for the tropical or subtropical cultures growing and cotton belongs to this group of plants. This hampers not only new species introduction but their biological peculiarities reveal and receipt of valuable posterity.

There is no basic collection because the national depositery is absent.

There is no duplicate collection in other genetic banks, though a part of samples is kept in All-Union Institute f Plant Growing (Russia) in its national depository, but we have no access to it.

New material is registered, put in quarantine and evaluated for the first time. Seeds, which lose their germination quickly, are not treated because of necessary materials and conditions absence.

The absence of corresponding conditions for the seeds keeping and plants growing causes damage to the genofund collection owing to different extreme situations, caused by weather-climatic conditions.

For the material genetic purity at the population level by means of resowing, self-fertilization the following conditions are necessary first of all; the construction of modern depository and hothouses, which meet all international standards, equipped with all necessary outfits for forming regulated and controlled diet, humidity, temperature, daylight, supplied with computer system control and highly trained specialists.

Institute's employees on the whole manage with their work well. The material is not kept for other genetic banks. We advice to create in Uzbekistan the genetic bank of subtropical, citric plants, nut-trees, berries sand officinal cultures, to replenish the collection material with the cultures which are already in the collection.

We are ready to cooperate with other foreign genetic banks in order to replenish and to study the genetic resources of plants in our region. Hence Uzbekistan is an integral part of the genetic centre for cultured plants origin and has rich genetic resources of wild and cultured plants we consider the organization of the national depository here as an expedient action because all central Asian region will be supplied.

3.2 DOCUMENTATION

There are no complete basic data. We have only the list of samples registration and cards catalogue. They are supplied with passport data, descriptions and estimation data.

15% samples have a complete set of documents. The information is represented in the form of card catalogue.

The institute has no joint communication network for data base exchange with other genetic banks.

Computers absence does not allow to keep account at the present day level. The documentation about genetic resources of plants is not duplicated.

3.3 GENETIC RESOURCES OF PANTS EVALUATION AND DESCRIPTION

Genetic resources of plants evaluation and description of collection samples are carried out be the international catalogue CMEA - for some cultures, for others by VIR classifiers, which are nearly the same as the international catalogue of CMEA.

The whole collection is evaluated at the place, where the genetic bank is situated. The evaluation includes: agrochemical, biochemical (the content of basic chemical components in the fruits and plants is defined), technological (the suitability to the food and technical processing), physiological (drought, cold and hot resistance etc.), immunological (disease and pest resistance).

More detailed description and genetic identification of the samples are carried out by the investigation results of botanic, economic and biological indications: by morphology, anatomy, embriology, cytology, cariology, genetic analysis and selection data.

Versatile (at the level of cell, tissue, organism) study of the collection material is of great importance, as it promotes to reveal more completely the biological peculiarities of different taxons, renew the collection fund and work out more effective methods for their practical use.

The receipt of data concerning the regenerating sample geneology and the most effective data usage for the fundamental investigations (evolution, phylogeny) and the practical selection is of extreme importance.

Fundamental investigations data for genofund samples are published in the periodic catalogues, monograms, booklets and articles. Cotton samples characteristics is done not only by the result of our investigations but borrowed from different literature sources and by the results of joint studies with the collection users.

Samples evaluation results are published partially. The users give scanty information to the genetic bank. The supply to the genetic bank with information is one of the conditions for the sample delivery to the user. The institute supplies the genetic bank with the information and takes the samples from it. Systematic evaluation of the collection samples is an effective measure both from financial and practical point of view. The international and regional cooperation will contribute to receive the best results and the leading role in it should play JPGRIN, FAO.

3.4 REGENERATION

The samples regeneration is carried out taking into account the biological peculiarities and duration of seeds germination preservation by the cultures, which are kept at the usual conditions. Cross-pollinated cultures are regenerated unsatisfactorily because there are not enough areas for the space isolation ensure and also short-daylight cultures because of equipment and finances absence. The mechanical barriers are used in scanty quantities. The regeneration methods allow to preserve the genetic integrity of the initial sample. The regenerating samples are bedded out in the enough quantity (from 25 to 50 gr.). After new regeneration is received and the typicalness of sample identification is defined the old seeds are used for the economic purposes. The user can receive the complete and accurate information about regeneration history of the sample.

3.5 THE GENETIC RESOURCES OF FORESTS

There is no national programme for the study the spreading of age-old forest species, the activities in this direction are limited by forest-planting and the afforestations documentation, which represent different eco-geographical zones. The genetic resources of forests expose to risk, caused by their state worsening and areas cutting due to the genetic and other factors influence. There is no national programme on the forests genetic resources information. The preservation of the basic forests genetic resources - the primary task. There is no genetic bank of forest species, which are of great social and economic importance. Its formation is necessary first of all because we must preserve valuable genofund of forest species and exchange the material with other countries.

CHAPTER 4
Use of Genetic Resources of Plant (GRR) Inside a Country

As a result of complex agrobiological study both local and introduction samples, sources of economically valuable features, which are used in selection are determined. Strain samples obtained by the most valuable features are put in production.

The purpose of data use on GRR characteristics is the enrichment of genetic potential of existing grades, development of new adaptive, productive, complex-stable grades, providing fulfilment of demand of the republic in food, raw materials for processing industry, export of agricultural products. From the point of view genetic collection of cotton in our country is very important in connection with necessity of development of grades, adaptive to extreme conditions of northern zones of cotton sowing and stable to diseases and pests.

Collection of cotton, grain , grainbean and oil crops are often used at national projects.

4.1 LIST OF CROPS IN ORDER OF THEIR DEMAND INSIDE A COUNTRY

Cotton

Only 4 types of cotton are used by humanity from all variety of types and forms.

Different sorts and types of American varieties - *G. Hirsutum, G. Barbadense* are used mainly with scientific purposes, in practical selection and industry. Among polymorphic varieties subtypes mexicanum, punctatum and others are used. Use wild Mexican type of cultivated sort of cotton *G. Hirsutum* as a donor of stability to verticillesis wilt in selection allowed in difficult years for cotton-growing o Uzbekistan (60th, 70th) to create groups of Tashkent varieties, which provided 5th sortchange not only in our republic, but in a number of cotton sowing republics of CIS, that saved the Republic from wilt and provided obtaining of high yields of raw cotton for a long period of time. During the last 3 years for development of new synthetic forms and

improvement of existing sorts varieties of *G. Hirsutum, G. Barbadense* etc. were used.

Wheat - *Triticum aestivum, T. Durum, T. Turanium*
Barley - *Hordeum vulgare, H. Disticum Triticale*
Potato - *Solanum tuberosum, H. Distichum*
Pea nut - *Arachis hypogea*
Saflor - *Carthamus tinctorius*
Staevia - *Stevia Rebaudiana* Bertoni
Sugar been - *Beta vulgaris*
Forages - *Medicago sativa, Rea mays* and etc.

By the said types of crops 3-5% of samples are available, by cotton 10-15%. Today in projects the following collections are not fully used: bast crops, oil and rubber - bearing and medicinal herbs, ethereal - oil, pulse crops and feed. In connection with necessity of provision of population with valuable food and developing branches of industry with raw materials the said varieties will be used more frequently. These crops were used more often, for example, pulse crops (green gram, bean, oil flax). Farmers have direct access to genetic resources of the country and use sowing material alongside with state structures.

4.2 PROGRAM ON CROPS IMPROVEMENT AND SEEDS DISTRIBUTION

Main tasks of national programs on selection are the following:

1) development of new sorts of intensive type;

2) improvement of existing sorts;

3) development of heterosis hybrids.

Adaption of imported hermoplasm is executed due to involving it to hybridization with local ancient sorts. The same is direct selection on development of sorts, stable to diseases, pests and stress factors of medium in correlation with main economically valuable features.

The final aim of selective programs is increase of volume and quality of product and improvement of situation with food in the country and improvement of export opportunities. Quality and quantity of scientific selection in the country meet national requirements, but deterrents of selective

works are the absence of a law of the Republic about selective achievements, a law of seeds and low payment of selector's labor.

Restricted number of selectors work on some important crops of the republic, such as fruit, grape, pulse crops, oil crops.
Developing farming in the Republic has free access to results of selection alongside with state and collective farms.

Farmers do not participate in selection and evaluation of sorts. All improved sorts of agricultural crops are also available for farmers and other persons. Restraining factor in seedgrowing by different cross-pollinated crops are difficulties with provision of space isolation. National programs of GRR use-systems on seed-growing of forest types are not available. Actions in the direction are restricted by frame-works of republican complex program "Forest". Application and distribution of seed material of forest types are carried out in case of necessity, mainly, by laying-in of forest seeds by forestries in existing forests and seedings. Programs on transfer of forest seed growing for selection basic and forest-seed regionalization are necessary for improvement of GRR use.

4.3 BENEFITS OF APPLICATION

Materials for foreign users are not preserved in the genetic bank of UzNIIR. Exchange of collection materials with foreign partners is carried out on the basis of mutual agreements. Local and foreign GRR are used as starting material for selection. On the basis of study and use of the collection more than 500 sorts of different crops were developed, as well as new non-traditional culture of stevia, sweet pepper, khurma, lemon, amarant were put into production.

Supply of starting material to foreign institutions is carried out on non-currency basis as exchange and in order of scientific cooperation.

Country of origin has not benefit from application of foreign GRR.

4.4 IMPROVEMENT AND USE OF GRR

Living and seed collections of wild growing rare types of main crops with involving of the most wild types of local sorts have been developed. Interaction between national systems of preservation of GRR and a system of selection is unsatisfactory because of financial and organizational difficulties. Insufficiency of staff, absence of material incentives of resources and mutually beneficial partnership between the said systems also hamper good application of GRR.
The largest value of GRR is that they are the source of starting material for selection. Local forms of crops: cucurbitaceous, rice (divzra), grape, nuts (almond), kernellfruits (apricot, peach), cored fruits (pear), as well as spices (zira, coriander, basil), sorgo, lucerne and others are of primary importance.

The possess biological properties, which introductory samples are not possess and have high adaptation to local conditions. Their valuability will increase in future. It is necessary to improve links with other genetic banks. Coordination of work at the international level and cooperation with leading institutions of the world are necessary by some of the most important basic issues,such as drought-resistancy, salt-resistancy. Computerization is necessary for improvement of GRR application, which will promote access to data base on GRR and its effective application.

It is necessary to develop world, unified standard documentation on description and registration of collection material of genetic fund of crops. Herewith contact of scientists on international scale and help of specialists on systematics are necessary.

Scientific expeditions should be held systematically on centres of origin and variability of cultural plants and their wild relatives for enrichment of genetic fund.

It is necessary to set up international fiscal fund for preservation and enrichment of genetic resources of the Republic.

International and regional programs of cooperation in development of scientific researches and staff training of genetic resources of plants shall be developed and realized. Construction of Central Asian regional warehouse of genetic resources on the basis of UzNII of plant growing is necessary to execute.

With regard for situation, availability of unique, rich genetic fund of world variability of cotton and pulse crops of GRR and importance of the crops for

economics of countries of Central Asian region, regional institutes on cotton and pulse crops shall be established.

CHAPTER 5
National Tasks, Programs and Legislation

National program on GRR is not available. GRR of the republic are concentrated in different scientific institutions, including in system of AS RUz, AAS RUz, Ministry of Agriculture, Ministry of Forestry, Ministry of Higher Education. Scientific researches on GRR are financed through scientific councils of SSTP as a constituent part of investigations on problems of agriculture. National programs on preservation and appplication of GRR of forest are not available. Development of such program is necessary on the basis of a republican program "forest" as a unique, complex, financed state system.

Special council of GRR has been established at the Committee for science and technology RUz, which coordinates activity on GRR.

Today national program of the republic on GRR is being prepared. The existing collections on GRR are not prohibited by the republican legislation. It is necessary to develop legal status of GRR. Now the SCST finances activity on GRR through STS. We highly appreciate activity on GRR (more than 90% of crops sorts cultivated in the republic were developed on the basis of GRR).

5.1 STAFF TRAINING

Specialists, having a good command of bases of genetics, systematics, botanics and agronomics are necessary for work on GRR; there are high-skilled personnel in the republic for working up national program. For work on GRR specialists are being trained in TashSU, SamSU, NukkusSU and other higher educational institutions of the republic. Strictly specialized specialists for work on GRR are not being trained. But, at SPA "Biolog", UzNII of plant growing and other scientific institutions specialists on different directions of GRR may be trained, but as a whole it is also necessary to train staff for Uzbekistan in countries, which train the said specialists. Uzbekistan has the opportunity to train the said specialists at research institutions and higher educational institutions.

Today because of low salary of research workers high labor turnover is being observed, which negatively influences on the effectiveness of work on GRR.

Representatives of agriculture also have possibility to receive knowledge on GRR. Political leaders of a country realize necessity of a program on GRR and work on its working up is being carried out.

Man and women have equal possibilities on participation in training programs at all levels. All ethnical groups of the country participate in the programs. Policy gives equal possibilities for training to all groups. Labour turnover, reducing benefit from investments to staff training, is connected with low labour payment. Solution of the problem - increase of labor payment of research workers.

5.2 NATIONAL LEGISLATION

Bills of health do not influence on import and export on GRR. There were no cases of materials failure. Quarantine inspection is carried out in time. Rules admit exchange with foreign countries of materials *in vitro*, but now institute does not possess a laboratory of biotechnology for acceptance and reproduction in culture.

We consider it necessary to make quarantine rules more brutal with the purpose of hampering import of quarantine objects. Many quarantine objects (Colorado beetle, California subor do) were imported into the country because of imperfect system of quarantine service.

National laws do not restrict raising of imported GRR. The government stimulates farmers preserve traditional sorts. With the purpose annually regional and national fairs and exhibitions of showing and sale of old local valuable original sorts are held. For example, exhibitions and fairs on local sorts of a melon (kovun saili).

Seed material by order of farms is distributed by the Ministry of Agriculture Ruz. Farmers can buy seeds in specialized shops. Seeds of form sorts may be and are sold as sowing materials. Scientific and technical achievements of scientists of the Republic of Uzbekistan today have restricted legal protection.

Legal basis on regulating of legal relations in the field of genetic resources of the Republic of Uzbekistan is at the stage of development. In accordance with the law today organization-normative base on development of collections on deposition is being created.

Now project of legal act about legal regulating of relations in the field of selection achievements; "Temporary situation in selective achievements of the Republic of Uzbekistan", has been approved at departments and directed to international convention.

This legal act will be adopted in 1995 by the Cabinet of Ministers with the period of validity till confirmation of legislative act. In accordance with the temporary regulations legal prohibition of selective achievements will be carried out in the Republic of Uzbekistan (new sorts of plants and freeds of animals), which will meet the conditions of protection ability (novelty, distinguishing features, stability, uniformity), as well as selective achievements, which will be tested on utility, but will not possess criterion of preservation ability.

We need in training of specialists on legal aspects in the field of GRR. Policy, developed in the former USSR remains in the republic. Export of GRR is permitted by ASRUz and AASRUz. Export of GRR does not depend on political units and relations with other states. Foreign expeditions are being held on the bases of agreement between ASRUz and AASRUz and corresponding organizations of countries, performing expedition meetings.

Other aspects of policy

The state stimulates cultivation of new improved sorts, seeds of the sorts are evaluated for 20% high than the usual ones. There are no other incentives yet. Specialists on GRR participate in development of main projects on development of agriculture in the republic. Members of Scientific Council carry out approbation and examination of projects from the point of view of their influence on preservation and application of GRR are not performed.

CHAPTER 6
International Cooperation

The Republic of Uzbekistan is interested in development of all aspects and support of international agreements, promoting execution of exchange of genetic resources of plants. In that connection, the Republic of Uzbekistan declared independence and became sovereign on September 1, 1991, at the moment of writing of the report:

- experience of work with the Conference of the UNO on environment and development is not available, "Agenda 21" has not been signed yet;
- Convention of Biological Variability was signed by the government of the Republic of Uzbekistan and sent to oly Madjlis (parliament) of the Republic of Uzbekistan for approval;
- the Republic of Uzbekistan begins to work with International Institute on Genetic Resources of Plants (Rome);
- experience of work with consultative group on international agricultural researches is not available;
- there are scientific contacts with International Institute of Rice (The Philippines), Central Institute of Cotton (India), Texas Genetic Collection of Cotton (College Station, USA), Institute of Plant Genetics and Selection of Cultural Plants (Germany), ALL-Union Research Institute of Plant Growing (Sankt-Peterburg, Russia).

The Republic of Uzbekistan is not a member of FAO Commission. Once the International FAO Fund is set up, Uzbekistan will be one of the first consumers. The Fund should help post-soviet states in development of genetic resources of plants.

Joint programs with FAO are not available.

At the moment of the report writing there is not contribution of Centres of Consultative Group on international agricultural researches (KGMSNZ).

Help of centres of KGMSHI has not been received yet by the Republic. National staff are not being trained in KGMSHI centres. Uzbekistan would like to receive the following help of KGMSHI: improvement of quarantine service of seed growing; improvement of conditions of conservation of genetic resources; organization of expeditions; training of specialists in KMCSHI

centres; improvement of information exchange by registration of GRR; development of program on genetic resources of plants.

Main functions of the International Institute on Genetic Resources of Plants (MIGRR) in the next ten years, in our opinion, will be as follows: provision of information as catalogues on different types of plants, help in establishment of national legislation on genetic resources of plants, rendering consultative help.

At the moment of writing of the report the Government of the republic does not collaborate with the regional centre.

There are bilateral agreements with countries of Central Asia region and Kazakhstan (CES), within the framework whereof agreements on mutual application and exchange of selective materials of crops were signed (of 24.06.92, 12-13.11.93, 18-21.1994).

Intergovernmental links with India on scientific and technical cooperation is going on within the framework whereof exchange of cotton GRR is stipulated.

There are no agreements with private companies.

There is cooperation between institutes of the Academy of Sciences of the Republic of Uzbekistan, Academy of Agricultural Sciences of the Republic of Uzbekistan and different Academies of sciences of some CIS member states. List is enclosed.

Cooperation with research organizations of several CIS member states

Republic of Uzbekistan	Partner	Field of joint activity
Botanic Garden of Asruz	Central Botanic Garden of Ukraine	Introduction of flora of Central Asia
Uzbek Research Institute of Cotton-Growing of Academy of Agricultural Sciences RUz	Ukrainian Research Institute of Irrigated Farming	Provision of GRR for development of ultramature sorts of cotton, sugar-beet
Uzbek Research Institute of Vegetable and Cucurbitaceous Crops and Potato Asruz	Ukrainian Institute of Vegetable Growing	Exchange and use of GRR for development of new crops of vegetable crops

Republic of Uzbekistan	Partner	Field of joint activity
Uzbek Research Institute of Plants Protection Asruz	Ukrainian Research Institute of Plants	New technologies of cereals supplies protection at storage
Uzbek Research Institute of Plant Growing	Ukrainian Academy of Agricultural Sciences All-Union Research Institute of Plant Growing	Obtaining of new sorts, exchange of cultures
Uzbek Research Institute of Horticulture and Viticulture ASRUz	Ukrainian Research Institute of Irrigated Farming, IIR	Development of new sorts, exchange of cultures
Institute of Chemistry of Vegetables ASRUz	Institute of botany AS of Kazakhstan, Pola Alpine botanic garden of Kalsky branch of ASRF	

CHAPTER 7
Needs

- Development of national program on GRR in order to coordinate and improve the activity of those institutions which are connected with GRR with the view to rational use and improvement of their status.
- To give official status at the legislation of the Republic to the national program on GRR.
- Establishment of common genetic bank on the basis of Uzbek research institute of plant growing (UzNIIR) on the basis of international standards.
- To improve procedure of documentation and standardization arrangement, as well as material and technological basis of institutions.
- To carry out collection and additional inspection of national GRR on the territory of the territory of the Republic of Uzbekistan.
- To train high-qualified personnel.

Possibilities:

- Organization of international expeditions on GRR collection.
- Exchange of GRR with foreign countries.
- Training personnel on systematics, genetics, selection together with foreign countries.

CHAPTER 8
Conclusions

- To set up a regional program on GRR for countries of Central Asia.
- In connection with disastrous situation of the Aral sea, danger of disappearance of GRR, extreme measures are to be taken there on conservation of GRR on the territory.

APPENDIX 1
Members of Scientific and Coordination Council on Genetic Resources of Plants

1. Abdoukarimov Abdousatter Abdoukarimovich, Director of the Institute of Genetics AS RUz, scientific coordinator
2. Ashourmetov Azadbek Ashourmetovich, Director of the Institute of Botanics AS RUz, Doctor of biological sciences
3. Bretov Utkem Pratovich, Department Head of the Institute of Botanics AS RUz, Doctor of Biological Sciences
4. Khasanov Furkat Uribaevish, laboratory head of the Institute of Botanics AS RUz, Doctor of biological sciences.
5. Belolipov Igor Vladimirovich, Faculty head of TSU, Doctor of biological sciences, professor.
6. Abdullaev Abdoumavlyan Abdoullaevich, laboratory head of SPA "Biolog", corresponding member of AS RUz.
7. Koubanov Ghani Kourbanovich, laboratory head of the Institute of Botanics, Doctor of biological sciences.
8. Baimetov Karim Isaevich
9. Egamberdiev Abdisamat Eghamberdievich, Director of UzNII of Selection and seed science of cotton.
10. Kaiimov Abdoukhalil Kayumovich, Director of UzNIILH.
11. Uzakov Yuldash Fazilovich, Director of UzNII of plant growing, professor
12. Kouzibaev Shoukhrat Sattarovich, Head of Amalgamation of seed science Minselkhoz RUz
13. Abzalov Miratkam Fouzailovich, professor of SPA "Biolog" AS RUz
14. Sharipov Asatoulla Khikmatovich, Director of Botanic Garden
15. Mousaev Djura Azimbaevich, academician of AS Ruz, Department head of the Institute of Plant Genetics
16. Chepko Vadim Stepanovich, Department head of the State Patent Office
17. Najimov Ulugbek Kadirovich, Tashkent State University