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PGR TERMINAL REPORT

December 31, 1996

**Submitted to the
U.S. Agency for International Development
Mission to India**

A Report of Contract 386-0513-C-00-2007-00

Plant Genetic Resources (PGR) Project

with the

National Bureau of Plant Genetic Resources

as the Implementing Agency

by

Winrock International

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INTRODUCTION

This is the final report of the Management Support Services (MSS) Contract. It summarizes data on project activities under the PGR/MSS contract for five years since work under the contract was initiated in January 1992. All prior quarterly reports (total 18) have details of the progress during the quarter, cumulative or other data for the entire period and the work plans for the next quarter. All earlier reports also included data on activities such as technical assistance, U S training, collaborative research and joint exploration under the Participating Agency Service Agreement (PASA) between USAID and the U S Department of Agriculture, Office for International Cooperation and Development (USDA-OICD). The reports also included information on the progress in the construction of Gene Bank and Headquarters building complex under the host country contract. This final terminal report, however, will summarize the activities under the Winrock Management Support Services Contract. These include

- 1 Procurement and supply of a broad range of imported scientific equipment and their installation/supervision at consignee institutions
- 2 Procurement, supply and installation of indigenously available computer equipment and accessories
- 3 Erection/fabrication and commissioning of greenhouse/screenhouses on a turnkey basis at specified locations
- 4 Limited amount of specialized U S training
- 5 Support for in-country training/workshops
- 6 Coordination of project implementation activities and technical advisory support to USAID/ICAR and NBPGR for achievement of project objectives

National Bureau of Plant Genetic Resources (NBPGR)

The NBPGR was established in 1976 by the Indian Council of Agricultural Research (ICAR), at Pusa Campus, New Delhi. The Institute has been vested with the responsibility to plan, undertake and coordinate activities and services related to plant genetic resources including collection, exchange, quarantine, evaluation, documentation, conservation and utilization. Besides its Headquarters at the Pusa Campus and Experimental Farm at the Issapur village near Delhi, the Institute has 12 regional stations/exploration base centers/quarantine stations/ satellite stations located in diverse agro-climatic zones of the country. NBPGR is the nodal organization for developing, operating and coordinating the Indian Plant Genetic Resource System. The system comprises base collections of germplasm of different crops kept under long term storage at NBPGR headquarters and a network of over 30 National Active Germplasm Sites located throughout the country. These sites are responsible for evaluation, multiplication and medium term storage of the germplasm.

The NBPGR is administered by the Crop Sciences Division of the Indian Council of Agricultural Research (ICAR), and is under the direct administrative control of Director. The organizational chart of the Bureau (Annex 1) shows the details of Committees, Divisions, Regional Stations/Base centers, All India Coordinated Research Projects and Administration Units under the overall control of the Director.

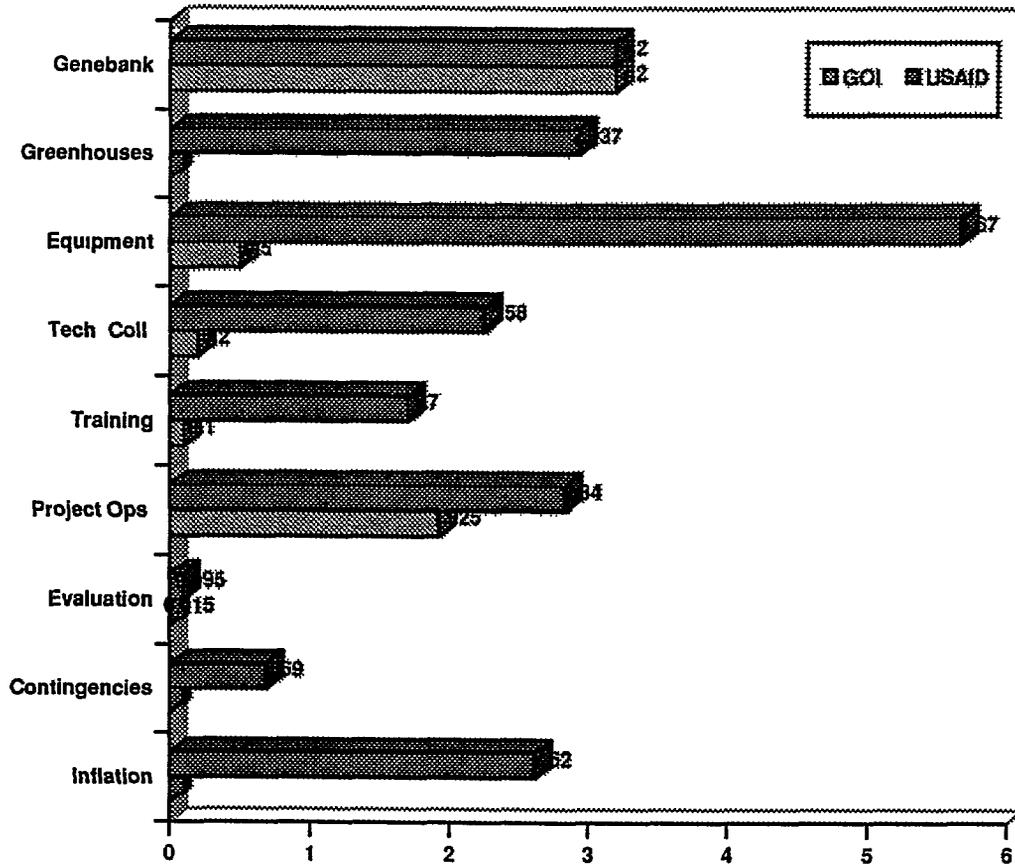
The Bureau has a Management Committee to provide guidelines for its activities and periodically review its programs and achievements. Besides, required direction and assessment of the progress is made by the Staff Research Council and Committee of the Heads of Division.

Five Germplasm Advisory Committees are functional since 1991. These guide and advise the Bureau on PGR activities including exploration and collection, exchange, conservation, management and utilization of germplasm in specific crops.

Initially, the PGR project was managed directly by the Agricultural Research and Education (AGRE) office of USAID. However, in order to accelerate the pace of implementation and to establish long-term linkages between the National Plant Germplasm System of USDA and the NBPGR, USAID signed in February 1990 a Participating Agency Service Agreement (PASA) with the USDA-OICD. USAID also awarded a three-year Management Support Services (MSS) contract to Winrock International in January 1992 to provide technical support, oversight and control for the design, specifications and construction of plant quarantine facilities, procurement and installation of scientific equipment and limited US and in-country training of Indian scientists.

Initially the project was to run for seven years until September 1995 with total project support of \$23.95 million, of which USAID was to contribute \$14.70 million and the GOI \$9.25 million in Rupee equivalent. However, after a mid-term review and evaluation of the project in June 1993, USAID provided additional \$4.00 million, raising its contribution to \$18.70 million. USAID also extended the life of PASA with USDA-OICD up to March 31, 1997, Winrock MSS contract initially up to September 30, 1996 and subsequently up to December 31, 1996. The PGR project was extended up to September 30, 1997. The initial budget allocation for various project activities is shown in Fig. 1. These budget allocations have been modified by shifting funds from one line item to the other, depending on the need.

**Fig. 1 Funding for the PGR Project
(in million of Dollars)**



GOI Funding = \$M 9.25

USAID Funding = \$M 18.70

Total Funding = \$M 27.95

Project Purpose

The project purpose is to assist the GOI in establishing a fully functional infrastructure of physical facilities, trained administrative and technical staff and equipment. The ultimate goal is to have in India a National Plant Germplasm Resources system which manages all aspects of plant germplasm exploration, collection, evaluation and preservation to conserve India's rich plant genetic diversity and to enhance India's role as a major global and regional partner in the international efforts of plant genetic resource conservation and utilization.

The National Gene Bank facility in New Delhi has a capacity to store up to 800,000 accessions at -20°C. In addition, the Cryo bank has the capacity to preserve a quarter million samples of small seeded crops in liquid nitrogen (-196°C). The National Plant Tissue Culture Repository (NPTCR) and the National Centre on DNA finger printing will further enhance the scope and scientific capability of the Indian plant genetic resources system.

The MSS Contract

The MSS Contract was initially approved for a three year period beginning January 1, 1992 with a total contract budget of \$6,819,183. It was incrementally funded. Later through contract amendments additional funds were added and contract extended up to December 31, 1996. The contract budget as of December 1996 is shown in Table 2.

Table 2 Contract # 386-0513-C-00-2007-00 • MSS Contract Budget

SI	Line Item	Budget Amount *
I	Salaries	708,114
II	Fringe Benefits	215,793
III	Allowances	140,512
IV	Training	83,278
V	Travel	95,198
VI	Per Diem	51,882
VII	Transportation	41,526
VIII	Non-expendable Equipment	5,166,560
IX	Other Direct Costs	480,308
X	Sub-contracts	2,976,950
XI	Indirect Costs	1,140,824
	Total Costs (\$)	11,100,945
	* Contract budget per Amendment No 6	

Besides coordination and technical advisory support to USAID/ICAR and NBPGR in the implementation of the project, the contract's Scope of Work (SOW) included i) procurement, supply and installation of imported scientific equipment and locally available computer system, ii) fabrication and commissioning of four greenhouse/screenhouse facilities and iii) support for limited US and in-country training of NBPGR scientists. The work accomplished under each of the above categories is summarized in the following pages.

The contract expenditure as well as various annexes are included to provide additional details.

EQUIPMENT PROCUREMENT

I. Procurement and Supply of a Broad Range of Imported Scientific Equipment and their Installation/Supervision at Consignee Institutions

Procurement, supply and installation of imported scientific equipment was one of the major tasks under the contract. The procurement process commenced with the receipt of request from NBPGR/USAID on February 12, 1992. The list included eight items of equipment (Tranche I). Another list comprising 35 items (Tranche II) was received on June 17, 1992 and the procurement of these items was initiated soon thereafter. Services of Dr. Robert P. Kahn were used as a Consultant for drafting equipment specifications, reviewing competitive bids and for the selection of final vendor. The details of Tranche I and II are provided in Tables 3 and 4 respectively.

Table 3 **TRANCHE I EQUIPMENT**

PGR #	ITEM	QUANTITY
1	ULTRA CENTRIFUGE	2
2	MICRO SPECTROPHOTO METER	1
3	GLASSWARE WASHER	4
4	MOISTURE TESTER	19
5	ELISA READER	3
6	PIPETTING MACHINE	2
7	MECHANICAL HOMOGENIZER	2
8	CONTINUOUS SEED BLOWER	11
	TOTAL	44

Table 4

TRANCHE II EQUIPMENT

PGR #	ITEM	QUANTITY
9	SEED DRYING CABINETS	18
10	BAR CODE PRINTER AND SCANNER	1
11	MICROSCOPE, TRINOCULAR	1
12	FREEZE DRYER	1
13	TEMPERATURE GRADIENT PLATE	1
14	VACUUM HEAD SEED PLANTER	1
15	SPECTROPHOTO METER, DIODE ARRAY	1
16	MICRO BALANCE	1
17	PHOTO DOCUMENTATION	1
18	MICROSCOPE, STEREO W/CAMERA ATTACH	1
19	MICROSCOPE, COMPOUND, TRINOCULAR	1
20	FIELD DATA RECORDER	23
21	CAMERA	14
22	DEEP FREEZER	3
23	SPECTROPHOTO METER	2
24	DENSITY GRADIENT FRACTIONATOR	2
25	BALANCE, ANALYTICAL	1
26	ELISA INSTRUMENT KIT	2
27	NITROCELLULOSE MEMBRANE	2
28	LABORATORY JACKS	2
29	MAGNETIC STIRRING BARS	2
30	DIALYSIS TUBES	2
31	PARAFILM WITH DISPENSER	2
32	MULTI MAGNESTIR	2
33	STIRRER, MICRO-PROCESS CONTROLLED	2
34	DIGITAL APPENDORF PIPETTOR	1
35	ELECTROPHORESIS SYSTEM	2
36	MB DISPENSERS	12
37	MULTI GAS DETECTOR	1
38	AMBIENT AIR ANALYZER	1
39	DIGITAL POLARIMETER	1
40	GAS CHROMATOGRAPH	1
41	ROTARY EVAPORATOR	1
42	SCANNING CALORIMETER	1
43	FREEZER, PROGRAMMABLE	1
44	INCUBATOR SHAKER, GYRATOR	1
	TOTAL	109

While the procurement of equipment under Tranche I and II was in progress, Winrock International received from NBPGR/USAID a third list of equipment (Tranche III) on March 3, 1993. This list (Table 5) comprised of 39 items of equipment. From the review of equipment under Tranche I, II and III, it became obvious that there were not enough funds in the contract to procure all the items requested. Further, there was some duplication in equipment under Tranche II and III. It was also noted that while the equipment in Tranche I and II were essentially building independent and could

be installed in the NBPGR's existing labs, but those under Tranche III were basically building dependent and needed to be installed only in the new Gene Bank building, which was under construction. The procurement and delivery of this equipment was to be arranged keeping in view the completion of the new Gene Bank building

Table 5 **TRANCHE III EQUIPMENT - List 1**

PGR #	ITEM	QUANTITY
45	AUTO ANALYZER	1
46	BENCH TOP STERILIZER	1
47	COLOR GRAPHIC PLOTTER	1
48	COLD STORAGE MODULE (FOR MID-TERM)	2
49	COLD STORAGE MODULE (FOR LONG-TERM)	10
50	COPENHAGEN TANKS	2
51	CRYOSTAT	1
52	CRYOVAT (CRYO CONTAINERS)	2
53	CRYOSTAR FREEZER	1
54	CRYO MICROTOME	1
55	PRINTER	1
56	GAS CHROMATOGRAPH (HP-5890)	1
57	HIGH SPEED REFRIGERATION CENTRIFUGE	2
58	HPLC WATER ASSOCIATES	1
59	HPLC INSTRUMENTS	1
60	ICE FLAKES MACHINE	3
61	LYOPHILIZER	1
62	MILLIPORE WATER PURIFYING SYSTEM	1
63	MICRO COMPUTER AND PRINTER	1
64	AUTOMATIC POLARIMETER	1
65	ROTARY EVAPORATOR	1
	contd 2/-	

Table 5

TRANCHE III EQUIPMENT - List 1 (contd.)

PGR #	ITEM	QUANTITY
66	SEED DRYER	3
67	SEED DRYING CABINET	21
68	SOFT X-RAY PLANT	2
69	STEREO BINOCULAR MICROSCOPE	20
70	STORAGE MODULE (FOR MED-TERM)	2
71	WALK-IN ROOM GERMINATOR	3
72	TRANSMISSION ELECTRON MICROSCOPE	2
73	ULTRA MICROTOME WITH ACCESSORIES	1
74	ULTRA SOUND AND COMPUTER VISION	1
75	VACUUM FUMIGATION PLANT - 1000 CAP	3
76	VACUUM FUMIGATION PLANT - 500 CAP	1
77	VAPOR HEAT TREATMENT PLANT	1
	TOTAL	96

TRANCHE III EQUIPMENT - List 2

PGR #	ITEM	QUANTITY
78	CENTRAL COMPUTER SYSTEM	1
79	PROTOTYPE COMPUTER SYSTEM	1
80	MICRO COMPUTERS WITH ACCESSORIES	13
81	SOFTWARE FOR NBPGR HEADQUARTERS	
82	LIQUID NITROGEN STORAGE VATS	10
83	CRYOPRESERVATION SYSTEM	6
	TOTAL	31

Subsequently, in series of meetings jointly with NBPGR and USAID, the decisions were made to drop equipment items which were either too expensive or of lower priority or both

A consolidated list of equipment finally procured and supplied to NBPGR and other collaborating institutions is given in Table 6

STATUS OF EQUIPMENT DELIVERED (Contd.)

PGR #	EQUIPMENT	DIVISION	# OF UNITS	DATE DELIVERED	TOTAL COST
IRANCHIE II					
9	SEED DRYING CABINETS (18 units)	CON/NBPGR - DELHI NBPGR - AKOLA NBPGR - SHILLONG NBPGR - JODHPUR NBPGR - HYDERABAD OIL SEEDS - HYDERABAD COTTON - NAGPUR IGRI - JHANSI MILLETS - BANGALORE MAIZE - NEW DELHI CIRRI - CUTTACK PULSES - KANPUR WHEAT - KARNAL RAPSEED - BIHARIPUR GROUNDNUT - JUNAGADH VEGETABLE - VARANASI	3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	JAN 1 1995 } JUN 6 1995 } NOV 27 1995 } NOV 8 1995 } MAY 9 1995 } MAY 22 1995 } JUN 7 1995 } MAY 15 1995 } JUN 12 1995 } MAR 21 1995 } NOV 25 1995 } JUL 19 1995 } MAR 24 1995 } APR 1 1995 } NOV 8 1995 } JUL 20 1995 }	203,833.41
12	FREEZE DRYER	NIPIR/NBPGR - DELHI	1	SEP 2 1994	49,083.00
13	TEMP GRADIENT PLATE	CON/NBPGR - DELHI	1	OCT 8 1993	21,123.00
14	VACUUM HEAD SEED PLANTER	CON/NBPGR - DELHI	1	MAY 10 1993	7,996.00
15	SPECTROPHOTOMETER	CON/NBPGR - DELHI	1	AUG 17 1993	42,000.00
16	MICRO BALANCE	CON/NBPGR - DELHI	1	NOV 18 1993	12,634.00
17	PHOTO DOCUMENTATION	CON/NBPGR - DELHI	1	MAY 10 1993	14,616.00
20	FIELD DATA RECORDER (23 units) [Delhi = 6 Polycorders [Delhi = 11 Polycorders [Delhi = 2 GPS] [Other centers = Polycorder + GPS]	LXP/NBPGR - DELHI NBPGR - BHOWALI NBPGR - SHIMLA NBPGR - RANCHI NBPGR - CUTTACK NBPGR - SHILLONG NBPGR - JODHPUR NBPGR - AKOLA NBPGR - TRICHUR NBPGR - HYDERABAD	[6+1+2] [2+1] [2+1] [1+1] [1+1] [2+1] [2+1] [2+1] [2+1] [1+1]	JUL 29 1994 } NOV 10 1994 } NOV 15 1994 } DEC 10 1994 } DEC 12 1994 } DEC 15 1994 } JAN 5 1995 } JAN 8 1995 } FEB 10 1995 } NOV 6 1994 }	113,217.00
21	CAMERA (14 units) (Note All 14 units were distributed thru NBPGR to respective locations personally by the Head of Exploration Division NBPGR - New Delhi)	LXP/NBPGR - DELHI NBPGR - BHOWALI NBPGR - SHIMLA NBPGR - RANCHI NBPGR - CUTTACK NBPGR - SHILLONG NBPGR - JODHPUR NBPGR - AKOLA NBPGR - TRICHUR NBPGR - HYDERABAD	5 1 1 1 1 1 1 1 1 1	MAR 24 1995 } } } } } } } } } }	37,176.00

STATUS OF EQUIPMENT DELIVERED (Contd.)

PGR #	EQUIPMENT	DIVISION	# OF UNITS	DATE DELIVERED	TOTAL COST
IRANCHIL II					
22	DEEP FREEZER (3 units)	PQ/NBPGR - DELHI NBPGR - HYDERABAD NBPGR - BHOWALI	1 1 1	OCT 8 1993 } OCT 25 1993 } DEC 25 1993 }	61 341 00
23	SPECTROPHOTOMETER (2 units) TRACEKELNA CLEANING	PQ/NBPGR - DELHI NBPGR - HYDERABAD NBPGR - BHOWALI	1 1	JUL 28 1994 } SEPT 1994 } SEPT 1994 }	63 820 00
25	BALANCE, ANALYTICAL (2 units)	PQ/NBPGR - DELHI NBPGR - HYDERABAD	1 1	MAY 31 1993 } DLC 4 1993 }	3 827 00
26	ELISA INSTRUMENT KIT	NBPGR - BHOWALI	1	SEPT 2 1994	(see PGR-5)
27	NITROCELLULOSE MEMBRANE	PQ/NBPGR - DELHI	2	MAY 10 1993	895 00
28	LABORATORY JACKS	PQ/NBPGR - DELHI	2	MAY 10 1993	892 00
29	MAGNETIC STIRRING BARS	PQ/NBPGR - DELHI	2	MAY 10 1993	443 00
30	DIALYSIS TUBES	PQ/NBPGR - DELHI	2	MAY 10 1993	548 00
31	PARAFILM WITH DISPENSER	PQ/NBPGR - DELHI	2	MAY 10 1993	588 00
32	MULTI MAGNETIC STIR	PQ/NBPGR - DELHI NBPGR - HYDERABAD	1 1	OCT 8 1993 } OCT 25 1993 }	3 531 00
33	STIRRER MICRO-PROCESS	PQ/NBPGR - DELHI NBPGR - HYDERABAD	1 1	OCT 8 1993 } OCT 25 1993 }	654 00
34	DIGITAL APPENDORF PIPETTERS	PQ/NBPGR - DELHI	1	JUL 9 1993	5 064 00
35	ELECTROPHORESIS SYSTEM	NIPTCR/NBPGR - DELHI PQ/NBPGR - DELHI	1 1	SEPT 2 1994 } }	25 438 00
35-A	ELECTROPHORESIS ACCESSORIES	NIPTCR/NBPGR - DELHI	1	MAR 2 1996	4 066 00
36	MB - DISPENSER (8 units)	PQ/NBPGR - DELHI NBPGR - HYDERABAD	4 4	OCT 6 1994 } OCT 10 1994 }	15 770 00
37	MULTIGAS DETECTOR	PQ/NBPGR - DELHI	1	MAY 29 1993	13 439 00
38	AMBIENT AIR ANALYSER	PQ/NBPGR - DELHI	1	MAY 10 1993	28 893 00
39	DIGITAL POLARIMETER	LVAL/NBPGR - DELHI	1	JAN 21 1994	23 334 00
40	GAS CHROMATOGRAPHY	LVAL/NBPGR - DELHI	1	AUG 17 1993	40 077 00
41	ROTARY EVAPORATOR	LVAL/NBPGR - DELHI	1	NOV 11 1993	6 492 00
42	SCANNING CALORIMETER	NIPTCR/NBPGR - DELHI	1	APR 15 1994	58 758 00
42-A	GRAPHICS PLOTTER	NIPTCR/NBPGR - DELHI	1	SEPT 2 1994	
42-B	COMPUTER (Local Purchase)	NIPTCR/NBPGR - DELHI	1	AUG 1994	1 862 26
43	FREEZER PROGRAMMABLE COMPUTER (Local Purchase)	NIPTCR/NBPGR - DELHI NIPTCR/NBPGR - DELHI	1 1	JUL 11 1994 } AUG 1994 }	19 705 00 2 829 23
44	INCUBATOR SHAKER	NIPTCR/NBPGR - DELHI	1	MAY 31 1993	16 187 00
TOTAL			83		900 131 90

STATUS OF EQUIPMENT DELIVERED (Contd.)

PGR #	EQUIPMENT	DIVISION	# OF UNITS	DATE DELIVERED	TOTAL COST
IRANCHI - III					
60	ICE FLAKES MACHINE	EVAL/NBPGR - DELHI	1	JUN 2 1994	4 075 00
61	LYPHOLIZER	NIPICR/NBPGR - DELHI	1	JUL 28 1995	52 747 00
62	WATER PURIFYING SYSTEM	NIPICR/NBPGR - DELHI	1	JUL 11 1994	20 125 00
68	SOFT X-RAY PLANT	EVAL/NBPGR - DELHI NBPGR - HYDERABAD	1 1	OC1 10 1994	52,355 60
75	FUMIGATION PLANT - 1000 cap	CON/NBPGR - DELHI NBPGR - HYDERABAD	1 1	OCT 10 1994	147 800 48
75-A	BREATHING APPARATUS	CON/NBPGR - DELHI			5 944 12
79	PROTOTYPE COMPUTER SYSTEM (Local Purchase)	NBPGR - DELHI	1	JUN 1 1994	57 248 63
79-A	COMPUTER SYSTEM and ACCESSORIES (Local Purchase)	NBPGR - DELHI	10	DEC 2 1996	38 430 00
82	CYRO TANK	NBPGR - DELHI	1	MAY 25 1996	
83	CRYOPRESERVATION SYSTEM	NBPGR - DELHI	1	MAY 25 1996	210,361 00
83-A	CRYO ACCESSORIES	NBPGR - DELHI		DLC 26 1996	21,321 00
84	CONSUMABLE ITEMS (CHEMICALS)	NBPGR - DELHI		MAR 6 1995	13 122 06
48	12 LTS AND 1 MTS MODULES	NBPGR - DELHI	12 + 1	APR 8 1996	2 942 354 75
49	11 MTS MODULES	ICAR - SHILLONG	1	JUN 6 1996	
		CRRI - CUTTACK	1	MAY 8 1996	
		IGIRI - JHANSI	1	AUG 27 1996	
		PULSES - KANPUR	1	APR 25 1996	
		COTTON - NAGPUR	1	JUN 18 1996	
		WHEAT - KARNAL	1	APR 24 1996	
		MILK IS - BANGALORI	1	APR 30 1996	
		GROUNDNUT - JUNAGADH	1	MAY 4 1996	
		VIGETABLE - VARANASI	1	APR 25 1996	
		OIL SEEDS - HYDERABAD	1	MAY 4 1996	
		IGKV - RAIPUR	1	DEC 3 1996	
		TOTAL	31		3 565 884 64

STATUS OF EQUIPMENT (Contd.)

PGR #	EQUIPMENT	DIVISION	# OF UNITS	DATE DELIVERED	TOTAL COST
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MISCELLANEOUS EQUIPMENT & FREIGHT

	OFFICE EQUIPMENT AND OTHER NON-EXPENDABLE ITEMS (Locally Purchased)				34,962 00
	MISCELLANEOUS EQUIPMENT AND FREIGHT				201,431 38
		TOTAL			263,393 38

SUMMARY COST OF TRANCH 1, 11, 11 & MISC EQUIPMENT

	TOTAL COST
TRANCHE I	564,335 00
TRANCHE II	900,131 90
TRANCHE III	3,565,884 64
MISC EQUIPMENT & FREIGHT	<u>236,393 38</u>
TOTAL.	5,266,744 92

II. Procurement, Supply and Installation of Indigenously available Computers and Accessories

A A RDBMS prototype computer system (Tranche III - PGR/79) was procured locally in March 1994 from Digital Equipment (I) Ltd. at a total cost of \$57,248 63 The system comprised of the following

- 80486 central computer running UNIX and connected to two 80496SX computers and two dumb terminals
 - Laser Printer
 - Network Hardware
 - On-Line UPS supporting all hardware except laser printer
 - Software
 - Installation
 - Maintenance Three years on-site, all hardware (including printer and UPS) and software
 - Training

The system was installed in the old building of NBPGR in June 1994 It has since been used for the development of software for the new germplasm data system. Apple Technologies (APTECH) have provided consulting services to NBPGR in the development of software The prototype computer system will be shifted to the Gene Bank building when the Computer Division is moved from the old building to the new building

B During the July-September 1996 quarter, an additional computer system (Tranche III - PGR/79-A) was procured locally from Alphabetic Pvt Ltd. at a total cost of \$38,430 The system comprised of the following

- | | |
|---------------------------|--------|
| • Work stations (100 MHZ) | 10 nos |
| • 500 VA offline UPS | 10 nos |
| • HP Deskjet 200 Printers | 10 nos |
| • Software - WINDOWS 95 | 2 nos |
| OFFICE 95 | 2 nos |
| CORAL DRAW | 1 no |
| VISUAL BASIC | 1 no |
| POWER BUILDER DESKTOP | 1 no |

Two computers were installed in NBPGR's old building in December 1996 The remaining eight are being installed in the new Gene Bank Building complex. This new computer equipment

will supplement the computer system (UNIX server, a LAN server, three work stations and a fiber optic link to the main system) already provided to NBPGR by ICAR separately under the IRIS NET Project with World Bank funding

C Office equipment and other non-expendable commodities

During the course MSS contract operation Winrock International purchased some office equipment, vehicle and several other non-expendable commodities. These have been used in support of the PGR Project from January 1, 1992 through December 31, 1996. A consolidated list of these items including their price is shown in Annex 2 and is also reflected in Table 6 under Office Equipment. These items are in the process of transfer to the NBPGR.

Winrock International also had in its inventory 74 items of office equipment and furniture (Annex 3). In June 1992 these items were transferred from MSS/ARP to MSS/PGR by USAID and Winrock International was allowed to use these items in its New Delhi office at 7 Poorvi Marg, Vasant Vihar in support of the PGR Project. This equipment is also in the process of transfer to the NBPGR.

III. Fabrication, Erection and Commissioning of Greenhouses/Screenhouses on a turn-key basis at Specified Locations

Winrock negotiated a fixed price subcontract to design, construct and commission four quarantine greenhouse facilities, one each at Delhi, Hyderabad, Kanpur and Bhowali. The design of the greenhouse complexes was largely based on the conceptual design prepared by Drs David R Mears and Robert P Kahn in March 1991. The subcontract was awarded to Sharp & Son, Inc on July 3, 1993 for fabrication, erection and commissioning of three greenhouse facilities at Delhi, Hyderabad and Bhowali at a total price of \$2,186,211. The subcontract was amended in March 1994 to include a quarantine greenhouse facility at the Indian Institute of Pulses Research, Kanpur at a cost of \$790,739. There was a slippage of nearly nine months in awarding the subcontract to Sharp & Son, Inc for the fourth facility, primarily due to the GOI decision of changing the original location from Port Blair in the Adaman Islands to Kanpur in Uttar Pradesh, and the time required for technical review and price negotiations. The construction blue prints for all the four locations were reviewed and approved by Winrock International with technical input from Mr Tom Manning, Engineer at Rutgers University, USA and Dr Robert P Kahn, Quarantine Specialist.

The subcontractor started site preparation in Kanpur in May 1994 and followed it up at Delhi, Hyderabad and Bhowali in that order. The procurement of greenhouse components/ supplies was

completed by the subcontractor during April-June quarter and the greenhouse components arrived India in September 1994 and after clearance through Indian Customs, transshipped to various project sites. The subcontractor also provided time-lines for completion of all the four facilities by end of May 1995. This schedule is shown in Annex 4.

The fabrication and erection activity commenced in October-December 1994 quarter in Delhi, Hyderabad and Kanpur and continued until May 1995.

In June 1995 the facilities were pre-inspected and several deficiencies were identified for correction by the subcontractor. The major being cracks in the concrete slabs and grading errors. In August 1995 Dr. David R. Mears also inspected the 'as built' facilities and made several useful recommendations aimed at improving the functionality of the greenhouses. The subcontractor provided a revised schedule (Annex 5) for rectification of deficiencies and completion of all the four facilities by November 1995.

Progress in completion of the final phase of construction was, however, slow. The facilities were again jointly inspected by the representatives of Winrock International, USAID, NBPGR and Sharp & Son, Inc. during February-March 1995. It was found that considerable work still remained to be completed. Lack of sufficient progress and with no evidence of any acceleration in the pace of construction/rectification, Winrock International terminated the subcontract with Sharp & Son, Inc. on March 15, 1996 and awarded the contract to Sharp Distribution, Inc. to rectify the deficiencies and complete all unfinished work.

Sharp Distribution, Inc. provided a schedule (Annex 6) which called for completion of all the four facilities by May 15, 1996. The facilities at Delhi, Hyderabad and Kanpur were reported to be complete by July 15, 1996 while work was continuing at Bhowali site. NBPGR/USAID had the four facilities again inspected and evaluated by Dr. David R. Mears from July 20 to August 9, 1996 for their functionality and biological security. During this evaluation a number of deficiencies were identified and the contractor was asked to rectify them expeditiously.

In September 1996 contractor personnel, namely, Dave George, Sr. (Greenhouse Expert), Terry Jensen (Electrical Engineer), David Patrick (Structural Engineer) and Jeremy George (Electrician) came to India and started the rectification of deficiencies. All the rectification work was completed by October 15, 1996 and the four greenhouse facilities were finally inspected, performance tested and handed over to NBPGR as follows:

Delhi	October 29, 1996
Hyderabad	October 30, 1996
Kanpur	November 2, 1996
Bhowali	November 4, 1996

A complete set of 'as-built' drawings has been provided to NBPGR for all the four facilities. A brief description of the quarantine greenhouse facilities built at Delhi, Hyderabad, Kanpur and Bhowali is provided in Annex 7a, 7b, 7c and 7d.

A set of maintenance and construction tools and spare parts has also been handed over to the four greenhouse sites to facilitate preventive maintenance and warranty servicing. A consolidated list of these items is provided in Annex 8.

Winrock International has also made arrangements for the services of a skilled technician, who will visit all the four project sites at least once a month to assist NBPGR technicians in preventative maintenance and warranty servicing during the first several months of the greenhouse operation. This has been done to minimize the problems that may be encountered during the first few months of operation of the greenhouse equipment.

SHORT-TERM U S TRAINING

There was a limited provision in the contract to support participation by NBPGR/ICAR scientists in conferences abroad and for short-term U S training. During the course of MSS operation, Winrock International arranged following short-term training/study tours for the NBPGR/ICAR and other GOI officials:

- 1 Mr D K. Reddy, Director, Department of Agricultural Research and Education (DARE), GOI and Dr Jarnail Singh, Senior Scientist, ICAR went to U S in February 1993 for two weeks to familiarize with the working of National Plant Germplasm System there.
- 2 Dr R K. Khetrapal, Senior Scientist in the Division of Plant Quarantine, NBPGR participated in the *XVI International Symposium on Virus and Virus Diseases of Temperate Fruit Crops* in Rome, Italy from June 27 - July 2, 1994. Following the conference, he visited laboratories of the Station de Pathologie Vegetable, INRA, Centre de Recherche de Bordeaux in France and Horticultural Research International, East Malling, Kent, England from July 3-13, 1994 and discussed research collaboration on fruit trees virus diseases.

3 Dr Bhag Mal, Assistant Director-General, Project Implementation Unit, NBPGR participated in the *IX International Conference on Jojoba* and its Uses at Catamarca, Argentina, during September 25-29, 1994

4 Dr A. Mazumdar, Senior Scientist, Division of Plant Quarantine, NBPGR attended the *International Conference on Seed Pathology* at Copenhagen, Denmark during June 7-13, 1995

5 A five member team consisting of

Dr K.P S Chandel, Director, NBPGR

Mr R R Jha, Under Secretary, Department of Economic Affairs (DEA), GOI

Mr K K Mithal, Under Secretary, Department of Agricultural Research & Education (DARE), Ministry of Agriculture, GOI

Mr S P Barnwal, Superintendent Engineer, Central Public Works Department (CPWD)

Mr R S Kaushal, Senior Architect, CPWD

Visited the National Seed Storage Laboratory (NSSL) at Fort Collins and the USDA Laboratory at Beltsville, Maryland, USA, and assessed internal furnishing and computer networking needs of the new Gene Bank and Headquarters building

This short study tour was organized by Winrock International from November 25 to December 5, 1995 Dr Chandel's trip was supported from funds under USDA/PASA where as Winrock International contract funds were utilized for the other four officials

All other project related short and long term trainings have been organized through PASA under USDA/OICD

In-Country Training

NBPGR organized a number of training workshops on various aspects of plant exploration, conservation, evaluation, exchange, documentation and information management. The technical aspect of workshops was handled by NBPGR senior scientists, where as the logistic support (accommodation and local transport) was provided by Winrock International Delhi Office. The following training courses were accordingly supported by Winrock International.

- 1 **Exploration, Evaluation & Maintenance of Plant Genetic Resources**
September 5 - 24, 1994 30 participants

- 2 ***In-vitro* and Cryopreservation Technology for Gene Bank**
October 10 - 29, 1994 14 participants

- 3 ***Ex-situ*, Conservation of Plant Genetic Resources on Medium
and Long-term Storage of Seeds**
November 8 - 23, 1994 20 participants

- 4 **Advanced Computer Course on Plant Genetic Resources-
Documentation and Information Management**
December 12 - 24, 1994 16 participants

- 5 **Exchange and Quarantine of Plant Genetic Resources**
January 10 - 25, 1995 20 participants

- 6 **Evaluation & Management of Genetic Resources of Vegetable Crops**
February 7 - 21, 1995 20 participants

- 7 **Techniques in Germplasm Conservation**
February 13 - 23, 1996 25 participants

- 8 **Collection, Evaluation, Maintenance & Storage of Lesser Known
Indigenous Tropical Fruits**
February 26-March 8, 1996 20 participants

- 9 **Biochemical & Molecular Techniques for Characterization
and Classification of Plant Genetic Resources**
March 12 - 22, 1996 12 participants

Training Seminar - Greenhouse Operation & Maintenance

A four-day training seminar on the operation and maintenance of greenhouses was conducted by Sharp Distribution, Inc from March 27 -30, 1996 at NBPGR, New Delhi. Twenty-five scientists/technicians from NBPGR and other collaborating institutions participated. Mr David L George, Sr and Mr Terry Jensen provided the training

Indo-American Hybrid Seeds Training Workshop

Indo-American Hybrid Seeds provided a ten-day training on **Plant Raising Techniques in Controlled Environment** to ten NBPGR scientists/technicians at their facility in Bangalore. This training was conducted from March 6 - 16, 1996. The training course was attended by scientists/technicians from Delhi, Hyderabad, Bhowali and Kanpur where quarantine greenhouse facilities have been established.

Coordination of Project Implementation Activities and Technical Advisory Support to USAID/ICAR and NBPGR for Attainment of Project Objectives

Dr Harold E Kauffman, India Coordinator and other technical staff in Winrock International/ Delhi backed by Dr Avtar Kaul, Dr Colin McClung (period 1992-1993), and Ron Hubbard from Winrock International Headquarters provided technical advisory services to USAID/ICAR and NBPGR for the implementation of project activities. All project activities were monitored and their progress reported on a quarterly basis.

All the 18 quarterly reports submitted earlier by Winrock International included not only the activities under the Winrock International/MSS Contract but also those under USDA/PASA (technical assistance, U S training, collaborative research and joint exploration) and the construction status of Gene Bank building complex under the host country contract.

Winrock also provided specialized expert services of local consultants to NBPGR to meet its specific requirements. These included:

- 1 Mr Kishore Bhargava (Computer Consultant) Provided technical support for maintaining computer equipment and E-mail communication network at Winrock International/ Delhi office and procurement of computer system for NBPGR
- 2 International Computers Indian Manufacture Ltd. Developed conducting and cabling plans for computer net working in NBPGR's new Gene Bank building complex.

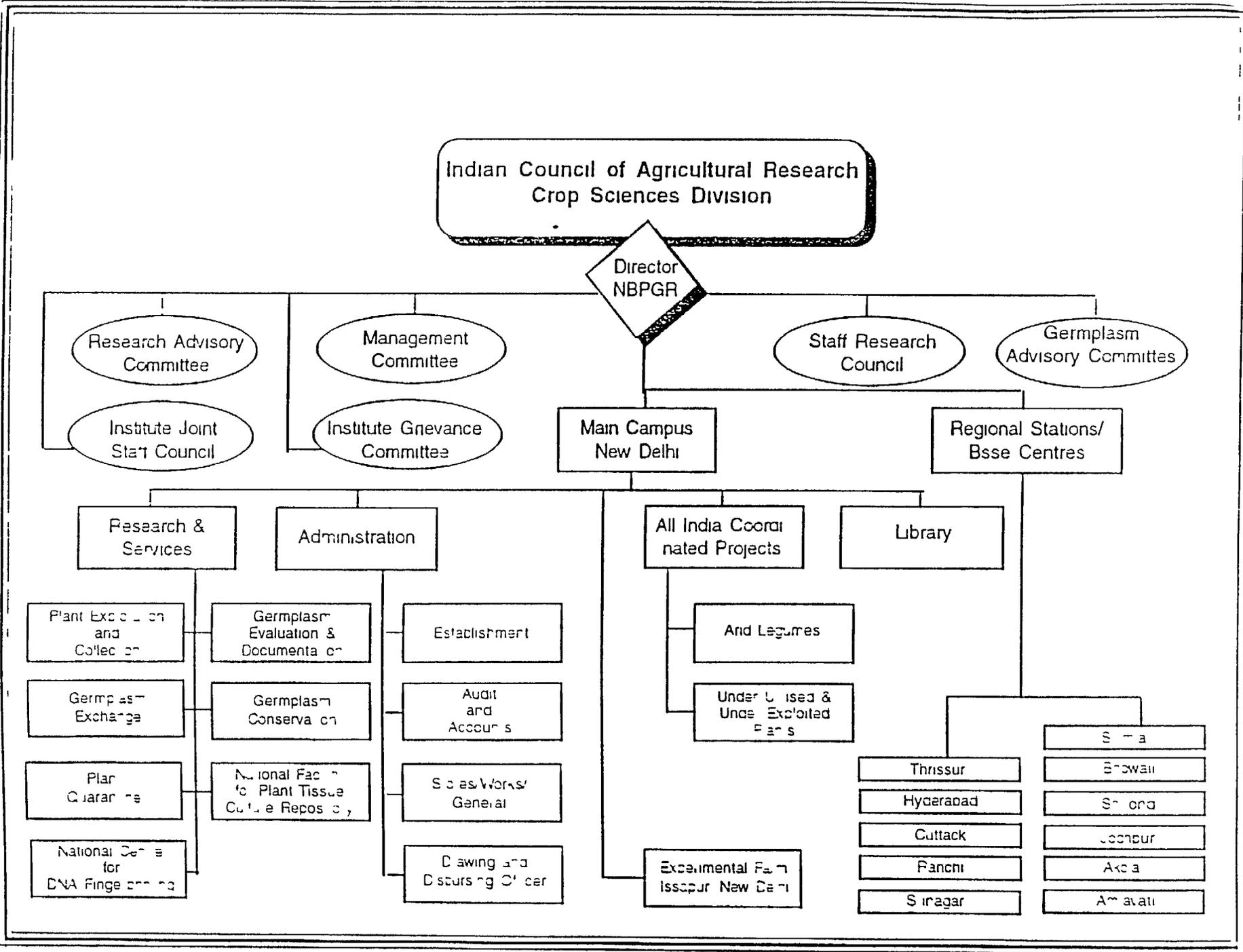
- 3 Ms Louise Sperling (Biodiversity Expert) Outlined strategies for on-farm biodiversity conservation at three agro-ecological regions in the country
- 4 Ms Laura Hess Designed and wrote an attractive, high quality brochure about the PGR project
- 5 Mr Srinivas Murty (System Analyst, APTECH) Provided technical support to NBPGR computer team for the development of data base design on prototyping computer system.
- 6 Mr V B Deshpande (Civil Engineer) Provided technical support in checking the construction quality of the Gene Bank building complex and for rectification of flooring defects in four quarantine greenhouse complexes
- 7 Mr C K. Sharma (Electrical Engineer) Provided information on national electric codes and specifications for step-down transformers from 415 V, 3-phase, 50 cycle to 220 volt, 3-phase, 50 cycle
- 8 Mr Vinod Arora (Landscaping Expert) Provided landscape design and planting plan for the new Gene Bank building complex

PROJECT EXPENDITURE DECEMBER 31, 1996

MSS Expenditure as of December 31, 1996

Serial	Line Item	Expenditures
I	Salaries	700,910 86
II	Fringe Benefits	209,094 47
III	Allowances	140,512 25
IV	Training	87,903 35
V	Travel	100,923 50
VI	Per Diem	57,542 01
VII	Transportation	41,525 22
VIII	Non-expendable Equipment	5,266,744 92
IX	Other Direct Costs	441,454 34
X	Sub-contracts	2,923,526 26
XI	Indirect Costs	1,130,807 82

ANNEXES



Funded Office Equipment and other Non-Expendable Commodities

Annex 2

DESCRIPTION / MODEL	SERIAL #	QTY	UNIT COST		TOTAL COST		ACQUISITION DATE
			\$	RS	\$	RS	
NOTICE BOARD		1		950 00		950 00	March 23 1993
CAR AMBASSDOR	III 6 EII	1		227 437 00		227 437 00	APRIL 30 1992
CEILING FANS		2		1 085 00		2 177 00	April 1 1994
DESK LAMP		1		500 00		500 00	DEC 2 1992
FAX CANON T 301	III1200	1		63 000 00		63 000 00	AUGUST 10 1992
LAMP SHADL		1		294 00		294 00	JULY 31 1992
MULTIPLE PLUG/PROTECTOR		1	40 53			40 53	DEC 7 1992
MODEM MULTITECH 224 EII	224 EII	1		8 835 00		8 835 00	JULY 28 1993
COMPUTERS SX 486 WITH MONITOR WITH MOUSE	480167 4801	2		70 469 00		140,938 00	AUG 17 1993
	6h 580						
	SK-636						
Printer Laserzet III	321JC3391	1		145 200 00		145 500 00	August 4 1992
Printer Trays	92297B & C	2	63 00		126 00		Sept 23 1992
Printer Lasrzet III P		1		31100		31100	June 16 1993
STABILIZERS	SCVS 1100	2		4 900 00		9 800 00	JUNE 3 1992
	SCVS 500	1		3 900 00		3 900 00	JUNE 3 1992
STABLIZER	SCVS 2500	1		6 200 00		6 200 00	MARCH 3 1993
STABLIZER	SCVS 2500	1		6 200 00		6 200 00	JAN 5 1994
TRANSFORMER	592	2		2 475 00		4 950 00	MAY 28 1992
TRANSFORMLR		1		1 035 00		1 035 00	MAY 28 1992
TELEPHONE SYSTEM 512(MAIN + 8 EXTENSIONS)		9		71 500 00		71 500 00	APRIL 15 1994
TELEPHONE INSTRUMENT		1		800		800	AUGUST 4 1996
UPS (SPSS)		2		13 807 50		27 615 00	OCT 7 1993
		1		24 675 00		24 675 00	OCT 7 1993
VACUUM CLEANER EUROCLAN MITFY V	447124	1		3 990 00		3 990 00	SEPT 11 1992
WATER PURIFIER AQUAGUARD SL 1000	80631	1		3 820 00		3 820 00	SEPT 11 1992
XEROX MACHINE	2901144144	1		168 184 00		168 184 00	AUGUST 5 1992
TAL (NON INP PROPRIETY)	RS COMPONENTS COMPONENT			960 356 50		953 400 00	
			103 53		166 53		

Cont Page 2/

IN ADDITION TO ABOVE THE FOLLOWING ITEMS WERE PURCHASED AND LOCATED AS PER THE DETAILS BELOW

ONE FAX MACHINE FOR NBPGR USE	48 060 00	48 060 00
TWO STABILIZERS AT NBPGR DELHI FOR GREENHOUSE	5 497 50	10 995 00
Total amount as above	53 557 50	59 055 00
Total Inventory amount in \$	A	166 53
Total Inventory amount in (Rs)	B	1 012 455 00
(Equivalent in \$)	C	34 795 47
Total inventory amount in \$	D = A + C	34 962 00

Note: The telephone system 206 - Item # 64 (Annex 3) and the telephone system 512 - main with 8 extensions (Annex 2) became obsolete and were returned to the vendor. An upgraded telephone system was procured from funds of RECOMM Project. The PGR Project personnel were allowed the use of upgraded system in support of PGR Project to offset the earlier investment.

Office Equipment & Furniture
(Transferred from MSS/ARP to MSS/PGR in June 1992)

Sl	Description	Qty	Unit Cost		Total Cost		Acquisition Date
			\$	Rs	\$	Rs	
1	Book Shelves	5		1,350 00		6 750 00	MAY 27, 1986
2	Book Shelves	4		1,450 00		5,800 00	MAY 4, 1989
3	Board - wipe & clean	1		1,240 00		1,240 00	JUN 22 1989
4	Notice Board	1		450 00		450 00	JUN 29, 1989
5	Cash Box	1		750 00		750 00	MAR 18, 1986
6	Chair - Executive	5		2,150 00		10,750 00	MAY 27, 1986
7	Chair - Secretary	1		1,450 00		1,450 00	MAY 27, 1986
8	Chair - Computer	1		1,450 00		1,450 00	MAY 27, 1986
9	Chair - Visitors	8		625 00		5,000 00	MAY 27, 1986
10	Chair - Executive	2		2,600 00		5 200 00	MAY 4, 1989
11	Chair - Conference	8		850 00		6,800 00	MAY 4, 1989
12	Chair - Visitors	7		850 00		5,950 00	MAY 4, 1989
13	Chair - Computer	1		1,050 00		1,050 00	MAY 21, 1989
14	Chair - Receptionist	1		1,250 00		1,250 00	MAY 21, 1989
15	Desk	3		2,650 00		7,950 00	MAY 27, 1986
16	Desk - Executive.	3		4,100 00		12,300 00	MAY 27, 1986
17	Desk - Side	2		975 00		1,950 00	MAY 27 1986
18	Desk - Executive	2		5,500 00		11,000 00	MAY 4, 1989
19	Filing Cabinet (4 drws)	2		2,250 00		4,500 00	FEB 28, 1986
20	Filing Cabinet (2 drws)	1		2,115 00		2,115 00	SEPT 22, 1986
21	Filing Cabinet (4 drws)	1		3,466 80		3,466 80	NOV 1, 1988
22	Ladder - Aluminum	1		1,000 00		1,000 00	JUN 18 1989
23	Mail Box (wooden)	1		580 00		580 00	JUL 13 1987
24	Side - Pedestal	1		900 00		900 00	MAY 27 1986
25	Sofa - single seater	2		2 000 00		4 000 00	MAY 4 1986
26	Sofa - 3 seater	2		4 500 00		9 000 00	MAY 4 1986
27	Table - Coffee	1		650 00		650 00	MAY 27 1986
28	Table - Computer	2		1 200 00		2 400 00	JUL 28 1986
29	Table - Computer	2		3 850 00		7 700 00	MAY 21 1989
30	Table - Xerox	1		2,500 00		2,500 00	JUL 28, 1986
31	Table - Conference	1		3,500 00		3,500 00	MAY 4, 1986
32	Table - Coffee	1		1 250 00		1 250 00	MAY 4 1986
33	Table - Printer	1		1,300 00		1,300 00	MAY 21, 1989
34	Table - Side	1		280 00		280 00	JUN 26 1989

Sl	Description	Qty	Unit Cost		Total Cost		Acquisition Date
			\$	Rs	\$	Rs	
35	Airconditioners	6		5 100 00		30 600 00	JAN 1986
36	Calculators (Casio)	1		1 054 00		1 054 00	JUN 11 1986
37	Calculators (Scientific)	20		350 00		7 800 00	MAR 27 1990
38	Diesel Van (Isuzu) *	1	10,992 00		10,992 00		JUN 9 1989
39	Fan - Table	4		610 00		2,440 00	JUL 2, 1987
40	Micro Computer (Wang)	1	5,050 00		5,050 00		JUN 28, 1986
41	Micro Computer (Zenith)	2	1,374 55		2,749 00		JUL 9, 1987
42	Monitor (Andec)	1	165 71		165 71		JUL 9, 1987
43	Micro Cassette Transcriber	1	244 46		244 46		FEB 27 1986
44	Micro Computer w/Monitor	1	2,669 00		2,669 00		APR 1, 1989
45	Andec Monitor	1	300 00		300 00		APR 1, 1989
46	Printer	1	449 00		449 00		JUL 9, 1987
47	Printer	1	795 00		795 00		JUN 28, 1986
48	Printer (Epson LQ)	1	694 50		694 50		MAY 7, 1987
49	Postal Scale	1	13 16		13 16		DEC 13 1988
50	Printer Device	1		1,625 00		1,625 00	JUN 5 1989
51	Refrigerator (Westinghouse)	1		7,920 00		7,920 00	JAN 1986
52	Room Heaters	3		475 00		1,425 00	DEC 4, 1986
53	Room Heaters	4		485 00		1,740 00	DEC 6, 1986
54	Stabilizer SCVS 500	1		2,195 00		2,195 00	JUL 9, 1986
55	Stabilizer SCVS 500	1		2,195 00		2,195 00	APR 17, 1987
56	Stabilizer SCVS 2500	1		3,295 00		3 295 00	JUL 9, 1986
57	Stabilizer SCVS 500	1		3,019 00		3,019 00	MAR 16, 1988
58	Stapler (HD 3D)	1		750 00		750 00	JUN 29, 1990
59	Smoke Alarm	4	11 00		48 47		MAY 9, 1989
60	Transformer	2		250 00		500 00	APR 11 1986
61	Transformer	1		350 00		350 00	JUN 1, 1986
62	Typewriter (IBM Selectric)	1	1,854 00		1 854 00		OCT 4, 1989
63	Typewriter (IBM Selectric)	1	1,172 00		1,172 00		JUN 23 1986
64	Telephone system 206 (1 main + 6 extns)	7		27,495 00		27 495 00	MAY 9 1989
65	Telephone system 103 (1 main + 2 extns)	3		7 970 00		7,970 00	MAY 20 1989
66	Telex machine	1		23 043 00		23 043 00	APR 28 1989
67	UPS (106 Telephone system)	1		7,500 00		7 500 00	MAY 24 1989
68	UPS (3 EM)	1		34,314 00		34,314 00	JUN 19 1989
69	Van Jack w/o Rod *	1		150 00		150 00	OCT 8 1989
70	Weighing machine	1		470 00		470 00	APR 16 1986
71	Wang PC Keyboard	1	280 00		280 00		OCT 4 1988
72	Wall Clock	1		230 00		230 00	AUG 9 1989
73	Water Filter	1		854 00		854 00	MAY 13 1989
74	Xerox Machine	1	8,650 00		8,650 00		JUN 23 1986
TOTAL					36,126 30	301,165 80	

* Note Diesel van (Item # 38) and Van Jack (Item # 69) were handed over to U S Embassy (AID) New Delhi for subsequent sale to the State Trading Corporation (STC), New Delhi

QUARANTINE GREENHOUSE
PROCUREMENT, SHIPPING & CONSTRUCTION SCHEDULE

Item	1993					1994					1995														
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
DESIGN AND APPROVAL	[Redacted]																								
SIGN CONTRACT	[M] (Delhi Hyderabad Bhowali)					[M] (Kanpur)																			
PREPARE DRAWINGS	XX XXXXXXXXXXXXXXXX																								
PRELIMINARY APPROVAL	XX																								
FINALIZE DRAWINGS	XXXXXXX																								
REVISE DRAWINGS	XX																								
FINAL APPROVAL	[M]																								
OBTAIN NMIC/CI DCs	[M]																								
PROCUREMENT	[Redacted]																								
ORDER MATERIAL	XXXXXXXXXXXXX																								
ASSEMBLE MATERIAL	XXXXXXXXXX																								
SHIP MATERIAL	XXXXXXXXXX																								
OCEAN TRANSIT TIME	XXXXXXXXXXXXX																								
CLEAR CUSTOMS	XXXXXXXXXXXXX																								
LOCAL TRANSIT	XXXXXXXXXXXXX																								
KANPUR CONSTRUCTION	[Redacted]																								
SITE PREPARATION	XXXXXXXXXX																								
FOUNDATION	XX XXXX																								
ERECT STEEL	XXXXXXXXXXXXX																								
INSTALL EQUIPMENT	XXXXXXXXXX																								
ELECTRICAL & PLUMBING	XXXXXX																								
FINISH & TEST	XXXXXX																								
COMMISSION	XX																								
HYDRABAD CONSTRUCTION	[Redacted]																								
SITE PREPARATION	XX XXXX																								
FOUNDATION	XX XXXX																								
ERECT STEEL	XXXXXXXXXXXXX																								
INSTALL EQUIPMENT	XXXXXXXXXX																								
ELECTRICAL & PLUMBING	XX XXXX																								
FINISH & TEST	XXXXXX																								
COMMISSION	XX																								
DELHI CONSTRUCTION	[Redacted]																								
SITE PREPARATION	XX XXXX																								
FOUNDATION	XXXXXXXXXX																								
ERECT STEEL	XXXXXXXXXXXXX																								
INSTALL EQUIPMENT	XXXXXX																								
ELECTRICAL & PLUMBING	XXXXXX																								
FINISH & TEST	XXXXXXXXXXXXX																								
COMMISSION	XX																								
BHOWALI CONSTRUCTION	[Redacted]																								
SITE PREPARATION	XXX																								
FOUNDATION	XXXXXXXXXX																								
ERECT STEEL	XXXXXXXXXXXXX																								
INSTALL EQUIPMENT	XXXXXXXXXX																								
ELECTRICAL & PLUMBING	XXXXXX																								
FINISH & TEST	XXXXXXXXXXXXX																								
COMMISSION	XX																								

[M] = Milestone [Activity Completed]

SHARP'S PROPOSED SCHEDULE FOR COMPLETION
OF GREENHOUSE CONSTRUCTION (30 Sept 1995)

TASK NAME	Duration (Days)	Start	Finish	Aug. 20 95	Aug. 27 95	Sep 03 95	Sep 10 95	Sep 17 95	Sep 24 95	Oct 01 95	Oct 08 95	Oct 15 95	Oct 22 95	Oct 29 95	Nov 05 95
				SMTWTFPS	SMTWTFPS	SMTWTFPS	SMTWTFPS	SMTWTFPS	SMTWTFPS	SMTWTFPS	SMTWTFPS	SMTWTFPS	SMTWTFPS	SMTWTFPS	SMTWTFPS
NBPGR/WINROCK TASK	28 d	25Aug95	21Sep95												
Water to Tanks	7 d	01Sep95	07Sep95		XX	XXXXXX									
O.K. Retaining Walls	1 d	25Aug95	25Aug95	X											
Temp Electrical	21 d	01Sep95	21Sep95		XX	XXXXXXXX	XXXXXXXX	XXXXXX							
RCV Transformers	1 d	15Sep95	15Sep95					X							
CONTAINER SHIPMENT	24 d	25Aug95	17Sep95												
Container Arrival	1 d	25Aug95	25Aug95	X											
Clear Customs	10 d	08Sep95	17Sep95				XX	XXXXXX	X						
BHOWALI	81 d	25Aug95	13Nov95												
Foundation	1 d	25Aug95	25Aug95	X											
Steel Erection	10 d	25Aug95	03Sep95	XX	XXXXXX	X									
Install Covering	10 d	22Sep95	01Oct95						XX	XXXXXX	X				
Equipment Install	30 d	2.Sep95	21Oct95						XX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	X	
Electrical Install	35 d	22Sep95	26Oct95						XX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXX	
Erect Retaining Wall	1 d	22Sep95	22Sep95						X						
Plumbing Install	35 d	22Sep95	26Oct95						XX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXX	
Material Arrives	1 d	18Sep95	18Sep95					X							X
Final Inspection	1 d	05Nov95	05Nov95												
Finish & Test	3 d	11Nov95	11Nov95										XXXXXX		
DI LHI	44 d	22Sep95	04Nov95												
Electrical	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Apron Removal	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Concrete Finish	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Erect Retaining Wall	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Plumbing	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Material Arrives	1 d	2.Sep95	22Sep95					X							
Final Inspection	1 d	01Nov95	01Nov95											X	
Finish & Test	3 d	0.Nov95	04Nov95											XXX	
HYDRABAD	39 d	30Sep95	07Nov95												
Water Tank	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Plumbing	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Apron Removal	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Erect Retaining Wall	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Plumbing	14 d	18Oct95	31Oct95										XXXX	XXXXXX	XXX
Material Arrives	1 d	2.Sep95	22Sep95					X							
Final Inspection	1 d	01Nov95	01Nov95											X	
Finish & Test	3 d	02Nov95	04Nov95											XXX	
KANIUR	82 d	21Aug95	10Nov95												
Material Arrives	1 d	0Sep95	10Nov95						XXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
Plumbing	14 d	0Sep95	03Oct95						XXXX	XXXXXX	XXX				
Apron Removal	44 d	21Aug95	03Oct95	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXX	XXX		XXXXXXXX		
Concrete Finish	44 d	21Aug95	03Oct95	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXX	XXX		XXXXXXXX	XXXXXXXX	
Final Inspection	1 d	04Nov95	10Nov95											X	XXXXXXXX
Finish & Test	3 d	10Nov95	10Nov95												XXX
WINROCK INSPECTION	5 d	01Nov95	05Nov95											XXXX	X
- DLLHI	1 d	01Nov95	01Nov95											X	
- HYDERABAD	1 d	02Nov95	02Nov95											X	
- KANIUR	1 d	04Nov95	04Nov95											X	
- BHOWALI	1 d	05Nov95	05Oct95											X	
TRAINING - Scientific Staff	3 d	06Nov95	09Nov95												XXX
COMMISSIONING - Delhi	1 d	05Nov95	05Nov95												X

----- original schedule
 XXXXXX actual

NBPGR WORK SCHEDULE JOB COMPLETION

LOCATION	MARCH 41	WORK DESCRIPTION	MATERIAL ORDERED FROM USA	INDIAN COMPLETION DATE	
	MPMO IIPM No			FOR MATERIAL	DATE
DELHI	1	SEAL WATER TANK	TANK LINER & FITTINGS	18 April	29 April
	2A	GRADE CORRECTION IN GHISE COMPLEX			
	2B	FINE FINISH OF FLOORS IN HEADHOUSE	(SUB-CONTRACTOR)		10 April
	3	DRAIN ELBOWS			31 March
	4	SEALING WITH SILICONE CAULK	SILICONE SEALER	10 April	29 April
	5	CORRECT PLUMBING			31 March
	6A	PROVIDE STANDARD TOILET FITTINGS	(SUB-CONTRACTOR)		
	6B	PROVIDE CERAMIC FLOORING			
	6C	PROVIDE VENTILATION SYSTEM			
	6D	PROVIDE SEPTIC SYSTEM			
	7	PROVIDE BENCH SUPPORT			
	8	FIRMLY FIX WASH BASIN			
	9	PROVIDE DRAINAGE CHANNEL	(SUB-CONTRACTOR)		10 April
	10	ADJUST BENCH SIZES			31 March
	11	ADJUST DOORS & SCREENS FOR SEAL	FOAM GASKETING	10 April	29 April
12	COMMITAL INCINERATOR	(SUB-CONTRACTOR)		10 April	
13	INSTALL ELECTRIC METER			31 March	
14	REMOVE TEMPORARY STRUCTURES				
15	INSTALL PANELS IN HEADHOUSE OFFICES				
HYDERABAD	1	SEAL WATER TANK	TANK LINER & FITTINGS	22 April	22 April
	2A	GRADE CORRECTION IN GHISE COMPLEX			
	2B	FINE FINISH OF FLOORS IN HEADHOUSE	(SUB-CONTRACTOR)		15 April
	3	DRAIN ELBOWS			22 April
	4	SEALING WITH SILICONE CAULK	SILICONE SEALER	10 April	
	5	CORRECT PLUMBING			
	6A	PROVIDE STANDARD TOILET FITTINGS	(SUB-CONTRACTOR)		"
	6B	PROVIDE CERAMIC FLOORING			
	6C	PROVIDE VENTILATION SYSTEM			
	6D	PROVIDE SEPTIC SYSTEM			
	7	PROVIDE BENCH SUPPORT			
	8	FIRMLY FIX WASH BASIN			
	9	PROVIDE DRAINAGE CHANNEL	(SUB-CONTRACTOR)		15 April
	10	ADJUST BENCH SIZES			22 April
11	ADJUST DOORS & SCREENS FOR SEAL	FOAM GASKETING	10 April	22 April	
12	INSTALL ELECTRIC METER			22 April	
13	REMOVE TEMPORARY STRUCTURES				
14	INSTALL PANELS IN HEADHOUSE OFFICES				
KANPUR	1	SEAL WATER TANK	TANK LINER & FITTINGS	18 April	5 May
	2A	GRADE CORRECTION IN GHISE COMPLEX			12 April
	2B	FINE FINISH OF FLOORS IN HEADHOUSE	(SUB-CONTRACTOR)		
	3	DRAIN ELBOWS			
	4	SEALING WITH SILICONE CAULK	SILICONE SEALER	10 April	5 May
	5	CORRECT PLUMBING			12 April
	6A	PROVIDE STANDARD TOILET FITTINGS	(SUB-CONTRACTOR)		
	6B	PROVIDE CERAMIC FLOORING			
	6C	PROVIDE VENTILATION SYSTEM			
	6D	PROVIDE SEPTIC SYSTEM			
	7	PROVIDE BENCH SUPPORT			
	8	FIRMLY FIX WASH BASIN			
	9	ADJUST BENCH SIZES			
10	ADJUST DOORS & SCREENS FOR SEAL	FOAM GASKETING	10 April	5 May	
11	INSTALL ELECTRIC METER			12 April	
12	CLEAN UP SITE DIBRIS				
13	INSTALL PANELS IN HEADHOUSE OFFICES				
BHOWALI	1	INSTALL ALL ELECTRIC			30 April
	2	INSTALL ALL PLUMBING	(SUB-CONTRACTOR)		10 May
	3	FABRICATE & INSTALL WATER TANK	TANK LINER & FITTINGS	18 April	
	4	INSTALL KOOK PILL & TANK			15 April
	5	SLAB ALL COMPARTMENTS	SILICONE GASKETS	10 April	15 May
	6	CORRECTLY INSTALL FIBERGLASS			15 April
	7	BUILD RETAINING WALL	(SUB-CONTRACTOR)		1 May
	8	PREPARE WALKWAYS	(SUB-CONTRACTOR)		
	9	ASSEMBLE BENCHES W/ADDITIONAL SUPPORT			
	10	REPAIR FLOOR CRACKS			15 May
	11	COMPLETE ALL CONSTRUCTION			

Annex 7a

Plant Quarantine Greenhouse Facility at NBPGR, Pusa Campus, New Delhi (Cost US\$915,607)

The facility consists of

- 1 - 100 ft by 60 ft Greenhouse Complex (GC) including
 - 10 - Quarantine compartments each of 150 sq ft
 - 1 - Virus Indexing compartment of 1000 sq ft
 - 1 - Plant Propagation compartment of 2000 sq ft

Greenhouse Complex is constructed of galvanized steel tubing covered with polycarbonate. The following systems are included in the Greenhouse Complex

- Evaporative cooling system including fans, pads, pumps and distribution system
- Heating system utilizing electric unit heaters
- Mechanical cooling (A/C) for designated five quarantine compartments
- HEPA filter system for designated five quarantine compartments
- Fog cooling system for virus indexing compartment
- Mist propagation system for plant propagation compartment
- Irrigation system (Hose bibs) provided for all areas
- Temperature control system for all areas
- Steel benches provided for all areas
- Mechanical shade system in all areas except manual shade system in quarantine compartments. All shade systems are of single curtain type
- Heat therapy compartment with misting system in one quarantine compartment
- Sink for virus indexing compartment
- High intensity lighting system in one quarantine compartment
- Day length control system in virus indexing compartment and plant propagation compartment
- Screening system utilizing stainless steel screen at all inlets and outlets to greenhouses
- Foundation system for structure
- Concrete slab floors for all areas
- Floor drains for all areas

Doors and locks for all areas

Electrical panels and wiring of all compartments

4 - 30 ft by 100 ft Growing Out Greenhouses (GH-GO)

Growing out greenhouses are constructed of galvanized steel tubing covered with fiberglass

Growing out greenhouses include the following systems

Evaporative cooling system including fans, pads, pumps and distribution system

Heating system utilizing electric unit heaters

Irrigation system (Hose bibs) provided

Temperature control system

Steel benches provided for all GH-GO with concrete floors

Screening system utilizing stainless steel screen at all inlets and outlets to greenhouses

Foundation system

Concrete slab floor for two GH-GO

Floor drains for all GH-GO with concrete slab floor

Doors and locks

Electric panels and wiring of all components

1 - 40 ft by 60 ft Head house

Head house is constructed of steel frame with corrugated steel covering Head house includes the following systems

3 Media storage bins

Steel benches

Office room

Store

2 toilets

Sink in mini lab

Floor drains

Foundation system

Concrete slab floor partly covered with vinyl sheets

Doors and locks

Windows and skylights

General lighting

Electrical panels and wiring of all components

Soil stabilizer

Main electrical switch gear equipment for entire facility

Main water filtration/pumping system for entire facility

All connecting corridors between head house, greenhouse complex and growing out greenhouses

Connecting corridors are constructed of galvanized steel frame and fiberglass roof, and fiberglass or screened walls. Corridors to include the following

Concrete slab floors

Screened walls in corridor connecting head house to greenhouse complex

General lighting as required

1 Incinerator including the following

Concrete slab

Oil tank and piping

Electrical connection

1 Soak pit and related drainage piping from the toilets

1 Water tower including the following

Concrete slab

Piping to head house

1 set of maintenance tools, spares and 'as-built' drawings

Annex 7b

Plant Quarantine Greenhouse Facility at NBPGR, Hyderabad

(Cost. US\$656,817)

The facility consists of

- 1 - 100 ft by 30 ft Greenhouse Complex (GC) including
 - 6 - Quarantine compartments each of 150 sq ft
 - 1 - Virus Indexing compartment of 600 sq ft
 - 1 - Plant Propagation compartment of 1200 sq ft

Greenhouse Complex is constructed of galvanized steel tubing covered with polycarbonate. The following systems are included in the Greenhouse Complex

- Evaporative cooling system including fans, pads, pumps and distribution system
- Heating system utilizing electric unit heaters
- Mechanical cooling (A/C) for designated three quarantine compartments
- HEPA filter system for designated quarantine compartments
- Fog cooling system for virus indexing compartment
- Mist propagation system for plant propagation compartment
- Irrigation system (Hose bibs) provided for all areas
- Temperature control system for all areas
- Steel benches provided for all areas
- Mechanical shade system in all areas except manual shade system in quarantine compartments. All shade systems are of single curtain type
- Heat therapy compartment with misting system in one quarantine compartment
- Sink for virus indexing compartment
- Day length control system in virus indexing compartment and plant propagation compartment
- Screening system utilizing stainless steel screen at all inlets and outlets to greenhouses
- Foundation system for structure
- Concrete slab floors for all areas
- Floor drains for all areas
- Doors and locks for all areas
- Electrical panels and wiring of all compartments

- 2 - 30 ft by 100 ft Growing Out Greenhouses (GH-GO)

Growing out greenhouses are constructed of galvanized steel tubing covered with fiberglass

Growing out greenhouses include the following systems

- Evaporative cooling system including fans, pads, pumps and distribution system
- Heating system utilizing electric unit heaters
- Irrigation system (Hose bibs) provided
- Temperature control system
- Steel benches provided for one GH-GO with concrete floor
- Screening system utilizing stainless steel screen at all inlets and outlets to greenhouses
- Foundation system
- Concrete slab floor for one GH-GO
- Floor drains for GH-GO with concrete slab floor
- Doors and locks
- Electric panels and wiring of all components

1 - 40 ft by 60 ft Head house

Head house is constructed of steel frame with corrugated steel covering Head house includes the following systems

- 3 Media storage bins
 - Steel benches
 - 2 toilets
 - Sink in mini lab
 - Floor drains
 - Foundation system
 - Concrete slab floor
 - Doors and locks
 - Windows and skylights
 - General lighting
 - Electrical panels and wiring of all components
 - Soil stabilizer
 - Main electrical switch gear equipment for entire facility
 - Main water filtration/pumping system for entire facility
- All connecting corridors between head house, greenhouse complex and growing out greenhouses

Connecting corridors are constructed of galvanized steel frame and fiberglass roof, and fiberglass or screened walls. Corridors to include the following

- Concrete slab floors

- Screened walls in corridor connecting head house to greenhouse complex

- General lighting as required

1 Soak pit and related drainage piping from the toilets

1 Water tower including the following

- Concrete slab

- Piping to head house

1 set of maintenance tools, spares and 'as-built' drawings

Annex 7c

Plant Quarantine Greenhouse Facility at Indian Institute of Pulses Research, Kanpur (Cost US\$790,739)

The facility consists of

- 1 - 100 ft by 60 ft Greenhouse Complex (GC) including
 - 10 - Quarantine compartments each of 150 sq ft
 - 1 - Virus Indexing compartment of 1000 sq ft
 - 1 - Plant Propagation compartment of 2000 sq ft

Greenhouse Complex is constructed of galvanized steel tubing covered with polycarbonate

The following systems are included in the Greenhouse Complex.

- Evaporative cooling system including fans, pads, pumps and distribution system
- Heating system utilizing electric unit heaters
- Mechanical cooling (A/C) for designated five quarantine compartments
- HEPA filter system for designated quarantine compartments
- Fog cooling system for virus indexing compartment
- Mist propagation system for plant propagation compartment
- Irrigation system (Hose bibs) provided for all areas
- Temperature control system for all areas
- Steel benches provided for all areas
- Mechanical shade system in all areas except manual shade system in quarantine compartments All shade systems are of single curtain type
- Heat therapy compartment with misting system in one quarantine compartment
- Sink for virus indexing compartment
- High intensity lighting system in one quarantine compartment
- Day length control system in virus indexing compartment and plant propagation compartment
- Screening system utilizing stainless steel screen at all inlets and outlets to greenhouses
- Foundation system for structure
- Concrete slab floors for all areas
- Floor drains for all areas
- Doors and locks for all areas

Electrical panels and wiring of all compartments

2 - 30 ft by 100 ft Growing Out Greenhouses (GH-GO)

Growing out greenhouses are constructed of galvanized steel tubing covered with fiberglass

Growing out greenhouses include the following systems

Evaporative cooling system including fans, pads, pumps and distribution system

Heating system utilizing electric unit heaters

Irrigation system (Hose bibs) provided

Temperature control system

Steel benches provided for GH-GO with concrete floor

Screening system utilizing stainless steel screen at all inlets and outlets to greenhouses

Foundation system

Concrete slab floor for one GH-GO

Floor drains for GH-GO with concrete slab floor

Doors and locks

Electric panels and wiring of all components

1 - 40 ft by 60 ft Head house

Head house is constructed of steel frame with corrugated steel covering Head house includes the following systems

3 Media storage bins

Steel benches

Office room

Store

2 toilets

Sink in mini lab

Floor drains

Foundation system

Concrete slab floor partly covered with vinyl sheets

Doors and locks

Windows and skylights

General lighting

Electrical panels and wiring of all components

Soil stabilizer

Main electrical switch gear equipment for entire facility

Main water filtration/pumping system for entire facility

All connecting corridors between head house, greenhouse complex and growing out greenhouses

Connecting corridors are constructed of galvanized steel frame and fiberglass roof, and fiberglass or screened walls. Corridors to include the following

- Concrete slab floors

- Screened walls in corridor connecting head house to greenhouse complex

- General lighting as required

1 Soak pit and related drainage piping from the toilets

1 Water tower including the following

- Concrete slab

- Piping to head house

1 set of maintenance tools, spares and 'as-built' drawings

**Plant Quarantine Greenhouse Facility at NBPGR, Bhowali
(Cost US\$613,787)**

The facility consists of

- 1 - 80 ft by 40 ft Greenhouse Complex (GC) including
 - 4 - Quarantine compartments each of 150 sq ft
 - 1 - Virus Indexing compartment of 800 sq ft
 - 1 - Plant Propagation compartment of 1600 sq ft

Greenhouse Complex is constructed of galvanized steel tubing covered with polycarbonate

The following systems are included in the Greenhouse Complex

- Evaporative cooling system including fans, pads, pumps and distribution system
- Heating system utilizing gas heaters
- Evaporative cooling (A/C) for designated three quarantine compartments
- Fog cooling system for virus indexing compartment
- Mist propagation system for plant propagation compartment
- Irrigation system (Hose bibs) provided for all areas
- Temperature control system for all areas
- Steel benches provided for all areas
- Mechanical shade system in all areas except manual shade system in quarantine compartments All shade systems are of single curtain type
- Heat therapy compartment with misting system in one quarantine compartment
- Sink for virus indexing compartment
- Day length control system in virus indexing compartment and plant propagation compartment
- Screening system utilizing stainless steel screen at all inlets and outlets to greenhouses
- Foundation system for structure
- Concrete slab floors for all areas
- Floor drains for all areas
- Doors and locks for all areas
- Electrical panels and wiring of all compartments

1 - 30 ft by 100 ft Growing Out Greenhouse (GH-GO)

Growing out greenhouse is constructed of galvanized steel tubing covered with fiberglass

Growing out greenhouse includes the following systems

Evaporative cooling system including fans, pads, pumps and distribution system

Heating system utilizing gas unit heaters

Irrigation system (Hose bibs) provided

Temperature control system

Steel benches provided for GH-GO

Screening system utilizing stainless steel screen at all inlets and outlets to greenhouse

Foundation system

Concrete slab floor for GH-GO

Floor drains for GH-GO

Doors and locks

Electric panels and wiring of all components

1 - 30 ft by 100 ft Screen house

Screen house is constructed of galvanized steel frame with fiberglass/screen covering Screen house includes the following systems

Concrete slab floor

Foundation system

Irrigation system

Sink

Floor drains

1 - 40 ft by 60 ft Head house

Head house is constructed of steel frame with corrugated steel covering Head house includes the following systems

3 Media storage bins

Steel benches

Office room

Store

2 toilets

Sink in mini lab

Floor drains
Foundation system
Concrete slab floor
Doors and locks
Windows and skylights
General lighting
Electrical panels and wiring of all components
Soil stabilizer
Main electrical switch gear equipment for entire facility
Main water filtration/pumping system for entire facility

1 Soak pit and related drainage piping from the toilets

1 Water tower including the following

Concrete slab

Piping to head house

1 set of maintenance tools, spares and 'as-built' drawings

Annex 8

GREENHOUSE MAINTENANCE TOOLS & SPARE PARTS

SI	Description	Quantity
Maintenance Tools Inventory		
1	Screw Shooter	4
2	Screw Driver Set	4
3	Socket Wrench Set	4
4	Pliers Set	4
5	Hammer	4
6	Combination Wrench Set	4
7	Hacksaw	4
Construction Tools Inventory		
8	Screw Shooters	2
9	Generator Set	3
10	Sawzall Reciprocating Saw	1
11	1/2" Drill Motor	1
12	3/8" Drill Motor	2
13	Jigsaw	1
14	Circular Saws - 7" Blade	2
15	Electrical Wire Puller	1
16	EMT Conduit Bender	1
17	Cut Off Saw	1
Spare Parts Inventory		
18	1/2" Motor for Acme Exhaust Fan	4
19	1 HP Motor for Acme Exhaust Fan	4
20	Motor & Linkage Kits for Inlet Shutters	8
21	Sump Pump for Kool-Cell System	4
22	24" x 4" Acme Kool-Cell Pads	8

23	36" x 4" Acme Kool-Cell Pads	8
24	60" x 6" Acme Kool-Cell Pads	4
25	5 KW Electric Unit Heater Motor	2
26	7 5 KW Electric Unit Heater Motor	1
27	10 KW Electric Unit Heater Motor	1
28	15 KW Electric Unit Heater Motor	1
29	Transformer Assembly for Step 50 Controller	2
30	Relays for Step 50 Controller	6
31	Relay sockets for Step 50 Controller	6
32	Main circuit boards for Step 50 Controller	2
33	Aspirator for Step 50 Controller	4
34	Aspirator module for Step 50 Controller	4
35	Override switch panel for Step 50	1
36	Time delay relay for Step 50	6
37	Snap limit switch for Wadsworth shade system	2
38	Limit switch actuator for Wadsworth shade system	2
39	Set spare fuses for main panels	1
40	Set electrical circuit breakers	1
41	Lot Fiberglass panels	1
42	Lot Polycarbonate panels	2
43	Lot Structural steel tubing	1
44	Lot Electrical conduit	1
45	Lot Miscellaneous electrical items - switches, boxes, wiring	1
46	Lot Miscellaneous fasteners - screw, bolts, etc	1
Additional Greenhouse Spares		
47	Silicone Sealant Tubes	48
48	Wet and Dry Vacuum Cleaner	3
49	Set of Measuring Tools	4
	(Multi Meter, Air Velocity Meter & Thermo/Hygro Meter)	
*		
*		
*		

Greenhouse Spares for NBPGR, New Delhi

Sl	Description	Quantity
1	Multi Meter	1
2	Air Velocity Meter	1
3	Thermo/Hygro Meter	1
4	Vacuum Cleaner	1
5	Shutter Motor	2
6	Motor Fan - single speed	2
7	Sump Pump	1
8	MBC	4
9	Box Switch	7
10	Cover	7
11	Switch	4
12	Cleaner (Cool Pad)	1
13	Sealant Tube	12 (pack)
14	Motor - two speed	1
15	Relay	3
16	Fuse	4+2 (man)
17	Motor AC	1
18	Motor Heater	3
19	Spar's Step 50	1 (pack box)
20	Anti Algal. Tabs	1 (bucket)
21	Pah Sulfied	2
22	Connector	1
23	Flood Light with accessories	1 set
24	Foam closure for polycarbonate sheets	2 boxes
25	Cool cell pads	1 box

Greenhouse Spares for NBPGR, Hyderabad

Sl	Description	Quantity
1	Tap	1
2	Switch	4
3	Relay	2
4	Box Switch	7
5	Cover Switch	6
6	Meter T/H	1
7	Multi Meter	1
8	Air Velocity Meter	1
9	M.B C	1
10	Cleaner (Cool pad disinfectant)	
11	Shutter Motor	2
12	Silicone Sealant	12tubes (packed)
13	Single speed fan motor	2
14	Sump Pump	1
15	Anti algal. Tabs	1 (bucket)
16	Vacuum Cleaner	1

Greenhouse Spares for IIPR, Kanpur

Sl	Description	Quantity
1	Switch	4
2	MCB	1
3	Meter Hygro/Thermo	1
4	Multi Meter	1
5	Air Velocity Meter	1
6	Cover Switch Box	3 + 2
7	Liquid (Cool Cell Pads disinfectant)	
8	Box Switch	6
9	Motor - two speed	1
10	Motor - single speed	2
11	Shutter Motor	2
12	Sump Pump	1
13	Tape	1
14	Algae Tabs	1pack (bucket)
15	Vacuum cleaner	1

Greenhouse Spares for NBPGR, BHOWALI

Sl	Description	Quantity
1	Multi Meter	1
2	Hygro/Thermo Meter	1
3	Air Velocity Meter	1
4	Tape	1
5	Two speed Motor	1
6	Single speed Motor	2
7	Switch	3
8	MCB	1
9	Cover	3
10	Box (Elec) Switch	6
11	Cleaner (Cool Pad water disinfectant liquid)	
12	Motor for Window	2

**NUMBER OF GERMPLASM ACCESSIONS STORED
IN LONG-TERM / MEDIUM-TERM STORAGE**

BASE COLLECTIONS IN NATIONAL GENE BANK AT NBPGR
(as of December 31, 1996)

Crop Groups	No of Accessions
LONG-TERM STORAGE (- 20 degrees C)	
Cereals	64 988
Pseudo-cereals	763
Millets and Minor Millets	16 270
Oilseeds	24,707
Pulses	26,542
Fibre Crops	4,690
Forage Crops	24
Vegetables and Spices	8,646
Medicinal and A P	216
Narcotics	778
Released Varieties	949
Duplicate safety samples	8,749
TOTAL	157,322

**STATUS OF IN-VITRO CONSERVATION PROGRAM AT THE
NATIONAL FACILITY FOR PLANT TISSUE CULTURE REPOSITORY**

Crop	No of Accessions in culture	Storage Temperature Degrees C	Optimum Sub-culture Interval (months)
Allium sativum	85	25, 10	16-18
Allium species	14	25, 10	12-20
Ipomoea batatas	260	25	12
Dioscorea species	41	25	12
Zingiber spp	120	25	12
Curcuma spp	24	25	8
Musa spp	250	25	12-24
Citrus aurantifolia	1	25	10
Vitis spp	3	25	12
Blackberry	4	25	6-10
Strawberry	2	25	6-10
Raspberry	1	25	6
Piper spp	6	25	10-12
Rauvolfia serpentina	5	15, 25	15-22
R. canescens	1	25	20
Saussurea lappa	1	4	13
Tylophora indica	2	10	12
Pterorhiza kurroo	1	10	16
Gentiana kurroo	1	4	11
Pogostemon patchouli	2	25	10
Colcus forskohlii	7	25	18
Podophyllum hexandrum	1	25	3
Other medicinal and aromatic plants	8	25	4-10