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PGR QUARTERLY REPORT NO. 7

September 30, 1993

**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**

by

Winrock International

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INTRODUCTION

Biodiversity and Plant Genetic Resources in India: Biodiversity is the foundation on which modern agriculture is built, as well as the source of many medicinal and industrial products. India is an important center of origin and diversity for nearly 160 domesticated plant species of economic importance. These include major crops such as rice, cotton, sugarcane, cucumber, millet, eggplant, mango, and oranges and a wide range of medicinal and industrial crops.

During the past three decades, India has made great strides towards modernizing agriculture. They have established or strengthened 25 institutes to undertake basic and applied research on major crops, and 18 national networks of coordinated programs to test and adapt crop technology for the multitude of diverse growing conditions throughout the country. Twenty six agricultural universities have been established to conduct teaching, research, and extension education in various states. With this foundation of public institutions (Annexure 7) and an expanding private sector, India has made good use of plant biodiversity to improve yields and overall production of major food crops. The doubling of rice and wheat production and major increases in many other crops is a testimony to their success.

Biodiversity of plant species in India, however, is being threatened. The wide spread growing of a relatively few new crop varieties is replacing thousands of genetically diverse, traditional or land race varieties. The over exploitation of natural resources due to increasing demands from a growing population for more agricultural and industrial products, is also causing concern. Action to conserve biodiversity, therefore, is required to ensure the availability of food, fiber, and industrial products needed by India in the future.

The Plant Genetic Resources (PGR) project: The PGR project, a joint effort between the Government of India and the Government of the United States, is addressing these issues. The project is being implemented by the National Bureau of Plant Genetic Resources of the Indian Council of Agricultural Research (ICAR). The project with a total outlay of \$23.95 million is jointly funded by USAID and the GOI. The U.S. Department of Agriculture, Office of International Cooperation and Development (USDA, OICD) and the Winrock

International (WI) assist NBPGR in the implementation of various project activities. The revised allocation of funds for various project activities as of September 30, 1993 is shown in Fig. 1.

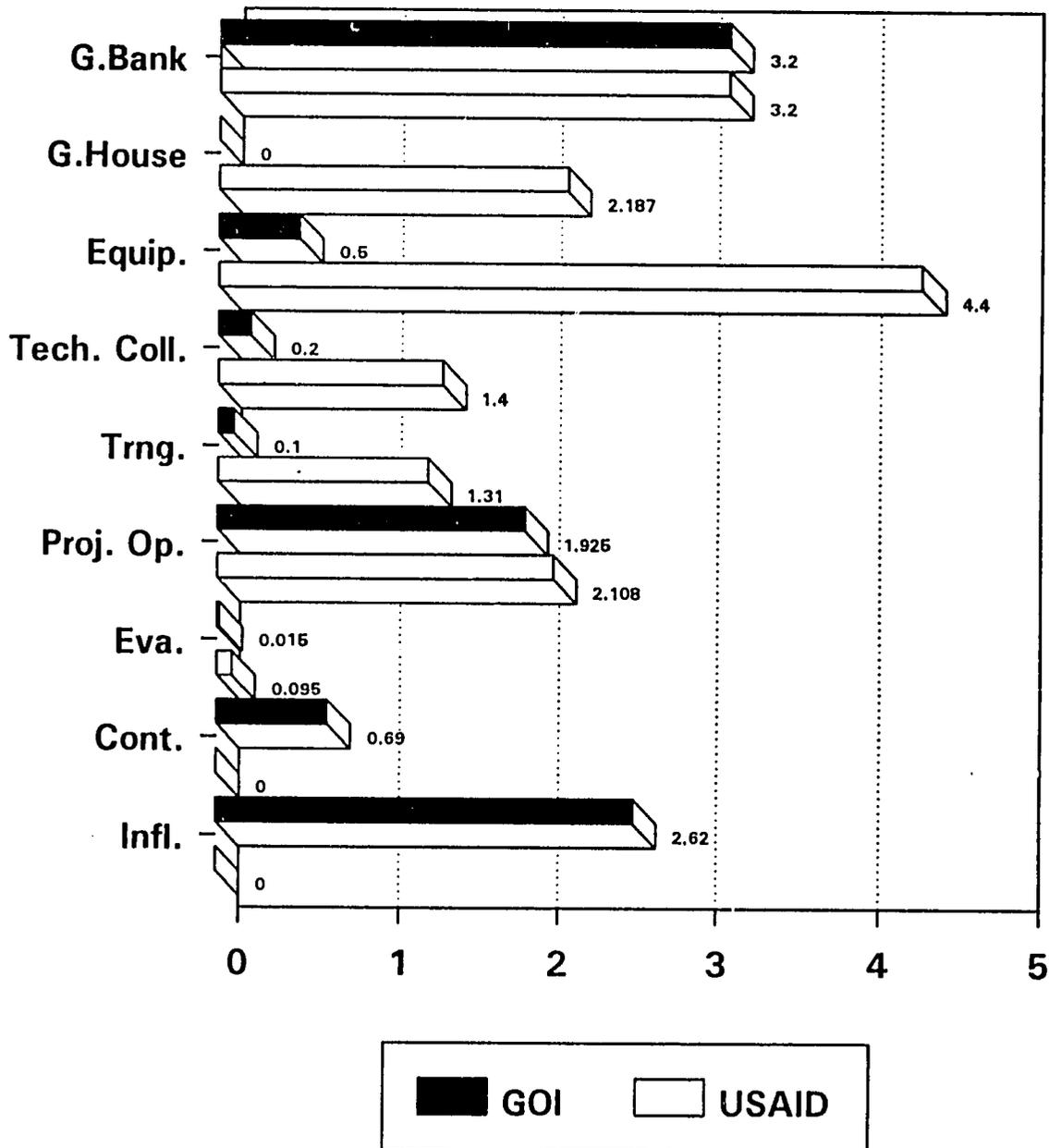
The specific goal of the project is to assist the GOI in establishing a comprehensive National Plant Genetic Resources system which effectively and efficiently coordinates all aspects of plant germplasm exploration, collection, evaluation, conservation, and sustainable use. The project will also increase India's role as a major global and regional partner in the international efforts of plant genetic resource conservation and utilization.

A four person team of experts which conducted the mid-term evaluation of the project was very satisfied with the progress made in the project during the past year (1992). However, due to serious delays which occurred in the early years of the project (1988-1991), the team recommended that, with the concurrence of the GOI and USAID, the PGR project be extended a minimum of two years.

Therefore, with this, the seventh quarterly report, we have adjusted the time lines for major activities to show the work to be done not only during the current phase of the contract (1992-1994) but also that projected for the two year operational phase (1995-1996) Fig. 2. The final approval for funding the two year extension rests with USAID. This report focuses on the progress during July-September, 1993 and lists plans for the October-December, 1993 quarter.

Fig.1

FUNDING FOR THE PGR PROJECT (in millions of dollars)



GOI Funding \$M 9.25
 USAID Funding \$M 14.70
 Total Funding \$M 23.95

FIG. 2 TIME LINE FOR PROJECT ACTIVITIES FROM 1992 TO COMPLETION

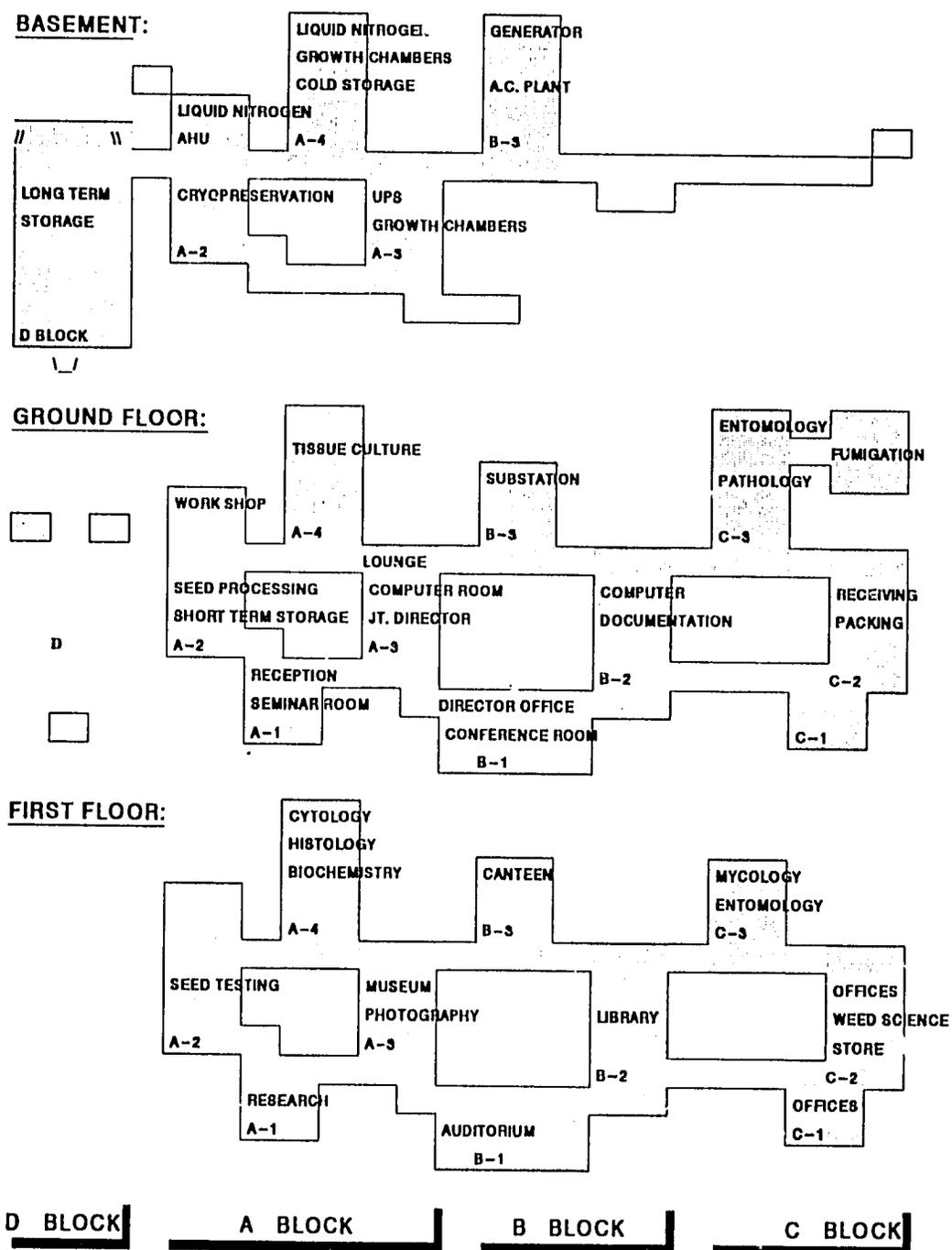
ACTIVITY	PROJECT MANAGE- MENT	CONSTRUCTION/PROCUREMENT PHASE												OPERATIONAL PHASE														
		1992				1993				1994				1995					1996									
		(quarters)				(quarters)				(quarters)				(quarters)					(quarters)									
1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th					
AGREEMENTS : PASA PASA Extension PASA Extension #2 (proposed) MSS MSS extension (proposed)	USDA USDA WI	XXX	XXX	X																								
GENE BANK : Construction & bid documents Bidding and approval Award contact Construction Furnishing/landscaping Testing and commissioning Transfer/expand program Accelerate germplasm transfer	CPWD NBPGR/AID CPWD CPWD CPWD/WI CPWD NBPGR NBPGR	XXX	X																									
GREENHOUSES : Prequalification & RFP Contract negotiations Develop blueprints Proforma invoice/NMIC Fabrication/site preparation Shipping/clear customs Erection Commissioning & training Expanding use	WI WI/CNTRCT CNTRCT CNTRCT CNTRCT/WI CNTRCT/WI CNTRCT/WI CNTRCT/WI			XX	XX																							
EQUIPMENT : Tranche I Tranche II Tranche III (Bldg dependent) Full utilization	WI WI WI WI	XX	XXX	XXX	XXX	XXX	XXX	X																				
DATA MANAGEMENT: Procure prototype computer Develop system Procure central system Install/develop system Develop national network Develop regional/global network	WI/USDA CNTRCT/WI WI/USDA CNTRCT/WI CNTRCT/WI CNTRCT/WI							XXX	XXX																			
TECHNICAL ASSISTANCE:	USDA/WI	X						X	XX	XX	XX	XX	X	X	X	X	X	X	X	X								
TRAINING:	USDA	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX								
JOINT EXPLORATION :	USDA	XXX	X	XX		XX	XX						XXX	XXX			XXX											
COLLABORATIVE RES. :	USDA			XX	XX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX								

USDA – U.S. Department of Agriculture
 WI – Winrock International
 CPWD – Central Public Works Department
 CNTRCT/ WI – Contractor/Winrock International

PROJECT COMPONENTS

GENE BANK:

SCHEMATIC DRAWING OF THE GENE BANK, NBPGR

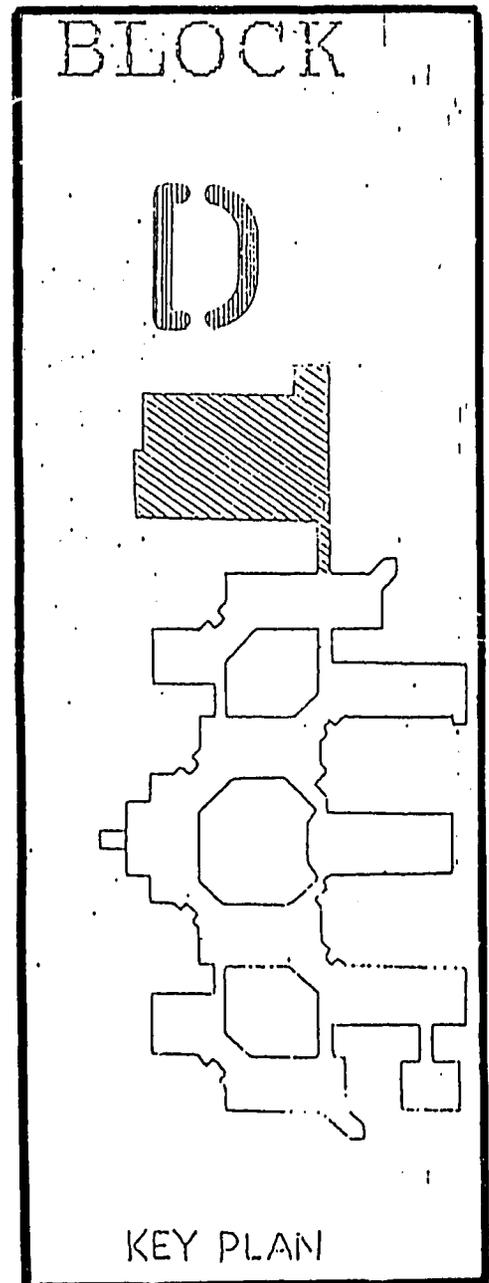


Activities During the Period: The overall construction of the Gene Bank and headquarters building is proceeding as per the original schedule (Fig. 3). The entire building complex consists of four blocks. The schedule of completion of each of the four blocs which are designated as D, A, B and C in the masterplan is shown in Annexure 2.

CPWD Progress:

Block D :

This will house underground Gene Bank, work already completed includes raft foundation, columns, walls, waterproofing from external side, staircases, laying of lean concrete over raft for flooring base internal brick work and sumps. The R.C.C. roof has been casted. Parapet wall has also been completed. Internal finishing work is in progress.



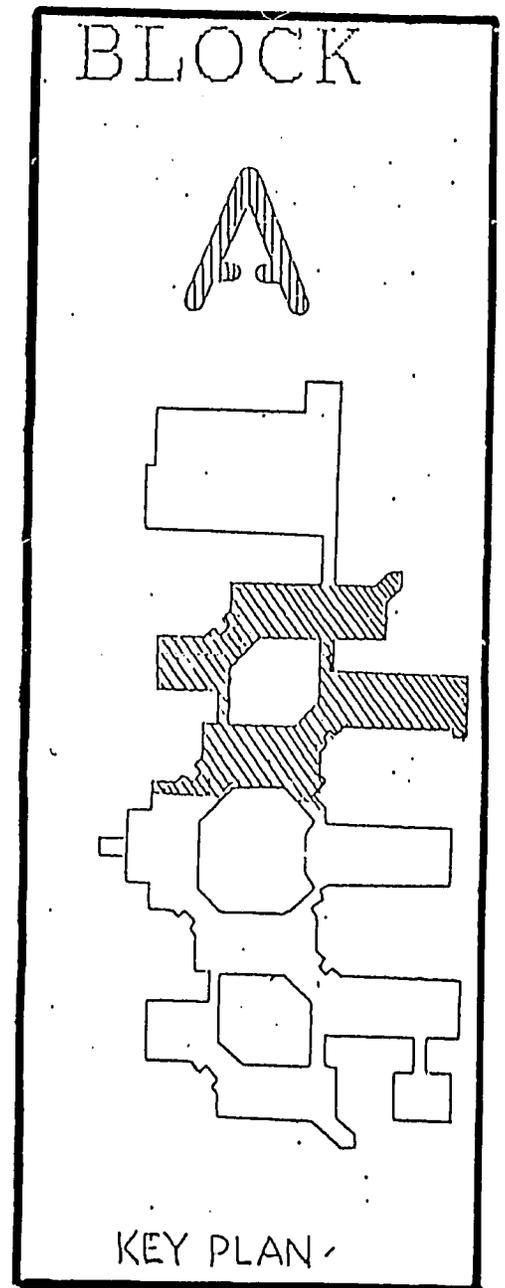
Block A :

It will be consisting of three parts :

Part I - R.C.C. structure has been completed for basement. Ground floor, first floor terrace slab is likely to be completed by October 20, 1993. Brick work at ground floor is completed.

Part II - R.C.C. structure of basement of ground floor has been completed. R.C.C. columns at first floor level are in progress. Terrace slab is likely to be completed by November 15, 1993. Brick work at ground floor is in progress.

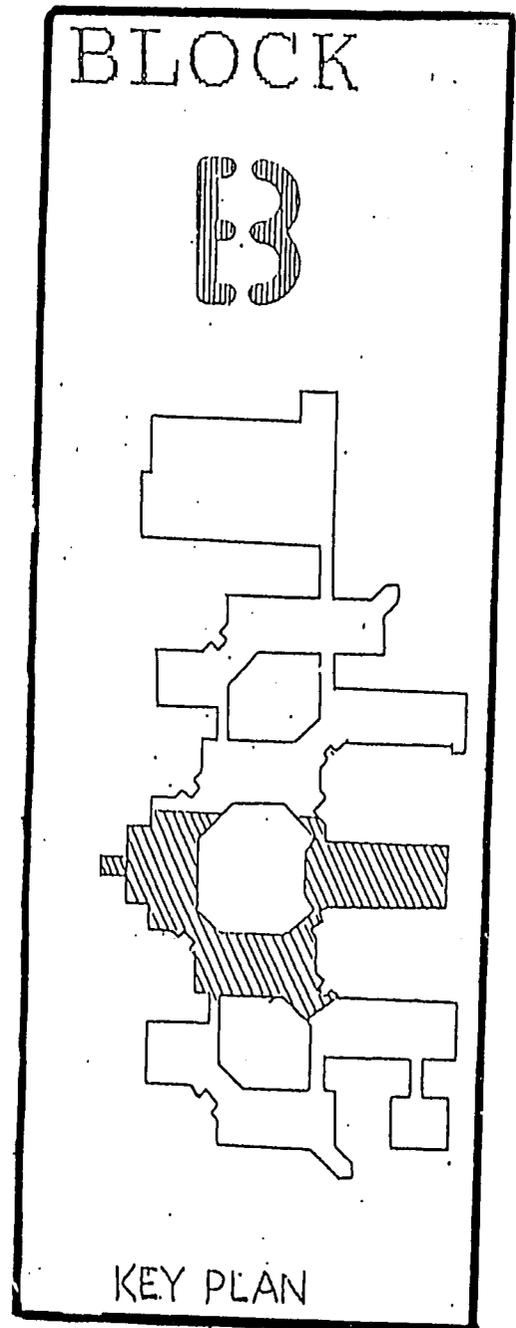
Part III - R.C.C. structure for basement is completed. External water proofing has been completed. Slab is likely to be completed by November 30, 1993. In addition to the above, there is some portion attached with Part I that has been completed upto level of R.C.C. columns at the first floor.



Block B :

Part I - R.C.C. raft has been completed.
R.C.C. wall and columns in progress.

Parts II and III - All the columns have been completed. Fifty per cent of columns are completed upto ground floor slab level. The foundation work in link corridor between Block 'B' and 'C' is in progress. The water proofing has been completed on base.



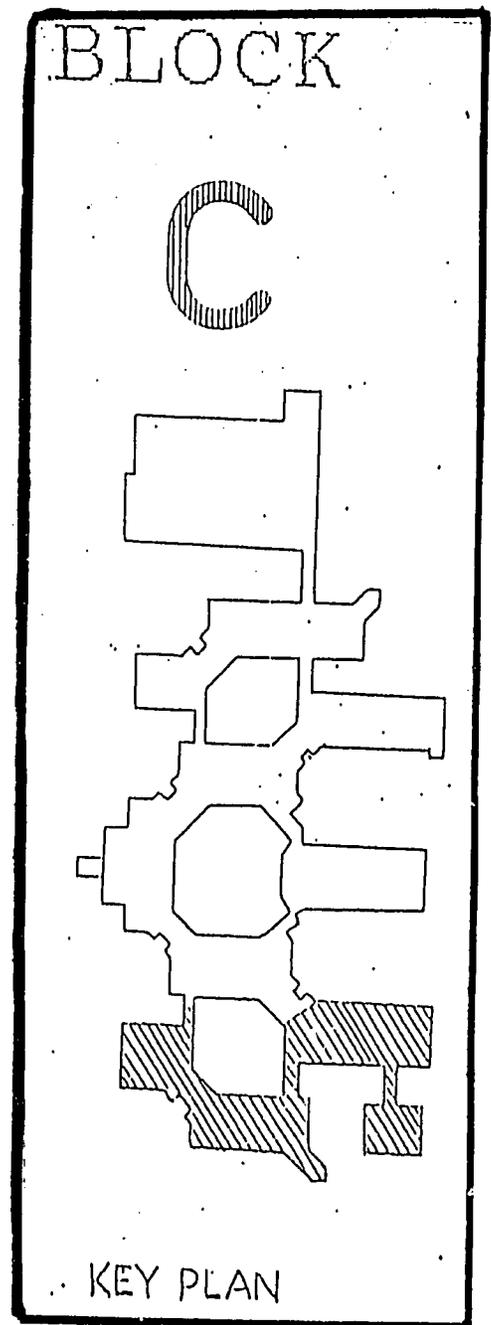
Block C :

There is small basement housing underground corridor and air handling unit (A.H.U.). The ground floor consists of three parts and will house administrative offices.

Part I - Part of basement, raft and walls completed. The excavation for other part is to be taken up.

Part II - Foundation work completed. Columns upto ground floor roof level completed.

Part III - Foundation work has been completed. Columns upto ground floor roof level completed.



The officials from NBPGR, CPWD, USAID and WI met regularly to review the progress. Barring unforeseen delays, the building construction should be completed by December, 1994.

QUARANTINE GREENHOUSE FACILITIES

Activities During the Period: The schedule of activities relating to fabrication, erection, testing, and commissioning of the three quarantine greenhouses has been modified, and is presented in Fig. 4. The subcontract with M/s. Sharp and Sons Inc. of U.S.A. for supply and erection of three greenhouse complexes on turn-key basis one each at Delhi, Hyderabad and Bhowali was signed on July 3, 1993.

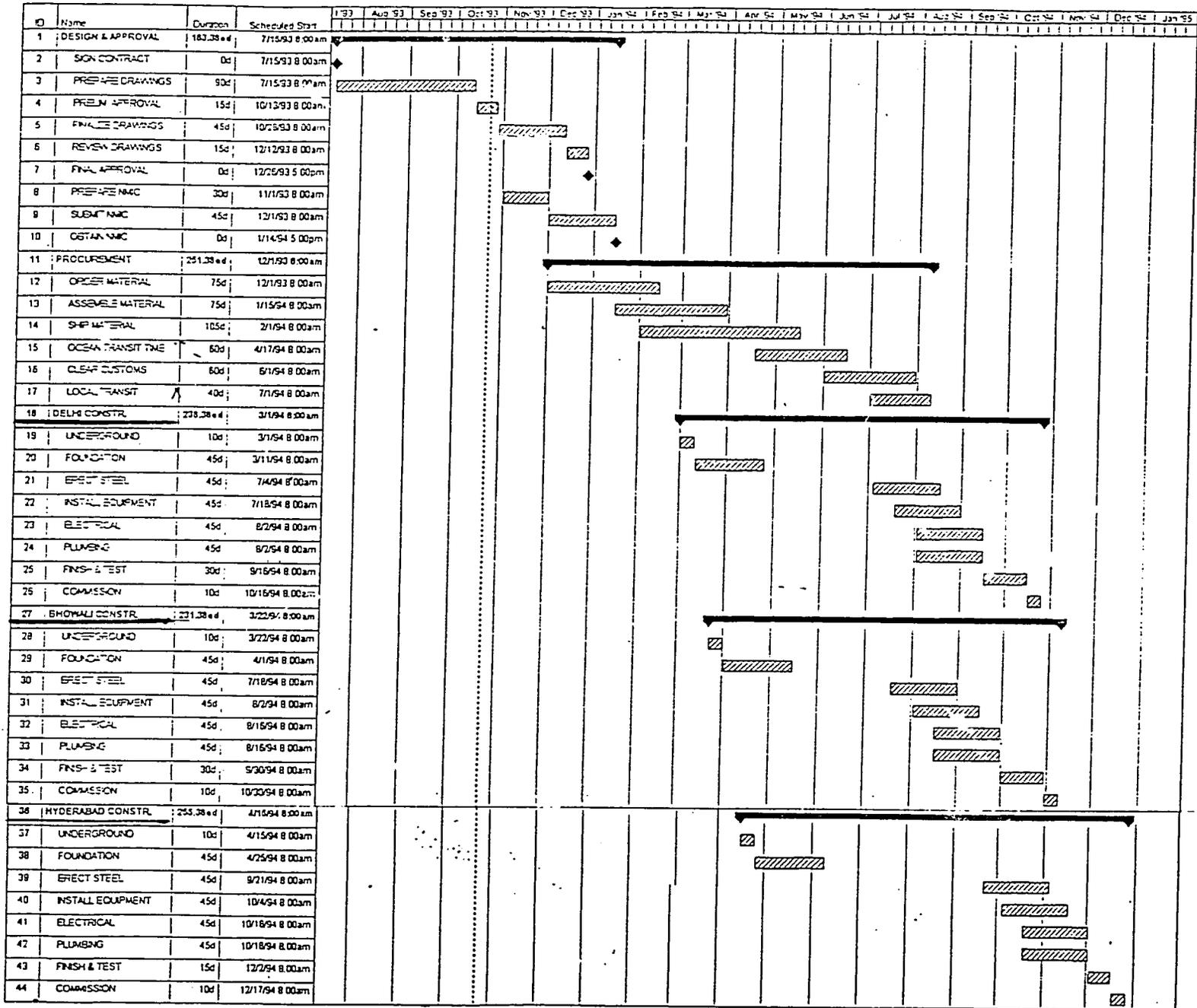
Construction blueprints were drawn up by Sharp for the Delhi and Hyderabad sites. Blueprints for the Bhowali site must await the site visit of engineers from Sharp in October when the specific layout of the facility will be determined.

The Government of India decided to build the fourth quarantine greenhouse facility in Kanpur rather than Port Blair. Plans will be drawn up in October after engineers from Sharp visit Kanpur in October. Construction schedule for Kanpur facility will be integrated with other sites soon after the award of the contract for the fourth site.

Plans for Next Quarter:

- * Approve final drawings for the greenhouses at Delhi and Hyderabad.
- * Have a preconstruction meeting with Sharp and all concerned agencies/ sub-contractors and visit all four sites
- * Develop final specs and drawings for the facilities at Bhowali and Kanpur.
- * Prepare schedule for the construction of facilities at Kanpur.
- * Obtain proforma invoices for imported greenhouse components.
- * Assist NBPGR in the preparation of application for NMICs and CDECs.
- * Fabricate and assemble greenhouse components.

FIG. 4 TIME LINE FOR CONSTRUCTION OF QUARANTINE GREENHOUSE FACILITIES



EQUIPMENT PROCUREMENT

Time lines for the procurement of the three Tranches of equipment appear in Figs. 5 and 6 respectively. Both indicate the 23 major steps involved in the procurement process.

Fig. 5 highlights the projected schedule for Tranche I and II and also slippage so far in key procurement activities in both Tranches.

It is evident from the analysis that delays have occurred in areas pertaining to approval of performance specifications, vendors providing the proforma invoices, orders placed with the suppliers, delivery of the consignment to India and the within India transportation of the consignment to the user center.

Based on experience, estimated time frames were allotted to each activity. However due to the large number of items in Tranche I and II, and several instances where each unit of a particular item were being consigned to different centers, the specs needed to be fine tuned to the requirement of each. Also details provided in the basic specs were outdated and needed verification and to be updated to changed models of a brand.

An average slippage of 2.5 months was observed in this activity. This delay not only reflected in the other key areas of the procurement procedure but in some instances progressed upto 3 to 4 months.

In-country deliveries were delayed due to the All India Truckers strike which prevented movement of all consignments by road during August 2-10 and September 1-13, 1993. Though actual movement was paralysed on the dates indicated the cumulative effect is reflected in shipments from the clearing agents warehouse to the concerned centers being suspended for a week before and after the actual days that the trucks went off the road. As a result a total of 22 days in August and nearly the entire month of September were not available to transport PGR consignments by road.

Keeping in view the slippage of Tranche I and II and also the completion of the new Gene Bank Building currently under construction a revised schedule for Tranche III has been projected in Fig. 6.

Activities During the Period:

Tranche I Equipment: Of the seven items to be procured in this Tranche, 6 items comprising 40 units have arrived into the country and are in various stages of being transported to the centers. Reasons for the delay in transporting the consignments are attributed to the All India Truckers strike in the months of August and September 1993. The sole item pending procurement is the Elisa Reader (3 units) which has been delayed due to the processing of the Not Manufactured in India Certificate (NMIC).

The financial status of items in this Tranche is translated as :

Items delivered	\$535,080
Item NMIC pending	\$ 69,117
Estimated total cost of Tranche I equipment	\$604,197

Tranche 2 Equipment: Considerable progress has been achieved in the procurement of items under Tranche II (Table 2). A total of 36 items comprising 110 units are in various stages of procurement.

The physical status of equipment under this tranche is as follows:

Of the 36 items, specs are being prepared for 2 items comprising 2 units. Items which are in the bidding process number 9 comprising 74 units. NMIC/pass book entry is awaited for 4 items comprising 5 units. Four items comprising 4 units are currently in the Warehouse, U.S.A. and are expected to arrive in India during the month of October 1993. And finally 17 items comprising 27 units have been delivered to NBPGR, New Delhi and other affiliated centers.

The 9 items which are currently going through the bidding stage are estimated to arrive into India sometime during the months of December 1993 - January 1994.

The financial status of each category is as follows:

Specs being developed	\$ 80,600
Items being bid	\$ 613,826
NMIC/Pass Book	\$ 218,757
Warehouse, U.S.A.	\$ 80,600
Delivered to Centers	\$ 242,012
Estimated total cost of Tranche II equipment	\$1,235,795

Tranche III Equipment : Under Tranche III (Table 3) a total of 39 items comprising 135 units have been cleared through DARE/USAID. A prioritized listing of equipment for procurement has been provided by NBPGR and specifications for them are being prepared.

The X-Ray system has been sourced and the Vacuum fumigation plants have been put up for bids.

The purchase order has also been issued for the supply of the prototyping computer system with software to enable NBPGR to commence developing the data base to be utilized in the new Gene Bank. The system is expected to be delivered to NBPGR sometime during the month of November 1993. Guide lines to prepare the site for the computer has been provided by the vendor to NBPGR.

It has also been brought to the notice of NBPGR that the equipment under this category being treated as building-dependent need to be further grouped into sub-categories namely,

equipment which will be housed in the present complex.

equipment which may be procured and installed temporarily in the existing complex and which may be shifted once the new building is ready to accept equipment.

and finally equipment which will be installed only in the new building and therefore whose procurement needs to be timed with the completion of construction activity of the Gene Bank.

Plans for Next Quarter:

Tranche I

- * Procure and ship the remaining item
- * Install equipment in NBPGR and affiliated centers

Tranche II

- * Complete specification of remaining item
- * Receive equipment in U.S. Warehouse
- * Ship items in warehouse to India
- * Install equipment in NBPGR

Tranche III

- * Prepare specs of prioritized items
- * Prepare site in NBPGR to receive prototype computer
- * Initiated selection of database designer

TABLE 1 – TRANCHE I EQUIPMENT

SER NO.	EQUIPMENT	NOS.	DELIVERY POINT (NBPGR)	IN-STALL	STATUS
1	ULTRACENTRIFUGE	1	NEW DELHI	YES	DELIVERED
		1	HYDERABAD	YES	DELIVERED
2	MICROSPECTROPHOTOMETER	1	DROPPED	-	DROPPED
3	AUTOMATIC GLASSWARE WASHER	4	NEW DELHI	NO	DELIVERED
4	AUTOMATIC MOISTURE TESTER	19	NEW DELHI	NO	DELIVERED
5	ELISA INSTRUMENTATION KIT	2	NEW DELHI	YES	NMIC DUE
		1	HYDERABAD	YES	"
6	PIPETTING MACHINE	2	NEW DELHI	NO	DELIVERED
7	MECHANICAL HOMOGENIZER	2	NEW DELHI	NO	DELIVERED
8	CONTINUOUS SEED BLOWER	11	NEW DELHI	NO	DELIVERED
TOTAL		44			

Specs : Specifications being developed
Bid : The items is in the Bidding process (USA)
NMIC : 'Not Manufactured in India Certificate' pending
P.O. Issued : Purchase Order Issued
P.Book Entry : The Pass Book Entry is awaited
Warehouse : In Warehouse, USA – ready for shipment
Delivered : Delivered to NBPGR

TABLE 2 – TRANCHE II EQUIPMENT

SER NO.	EQUIPMENT	NOS.	DELIVERY POINT (NBPGR)	IN-STALL	STATUS
9	SEED DRYING CABINETS	16	NEW DELHI	NO	BID
10	BAR CODE PRINTER & SCANNER	1	"	"	SPECS
11	MICROSCOPE, TRINOCULAR	1	"	YES	BID
12	FREEZE DRYER	1	"	"	NMIC DUE
13	TEMPERATURE GRADIENT PLATE	1	"	"	DELIVERED
14	VACUUM HEAD SEED PLANTER	1	"	NO	DELIVERED
15	SPECTROPHOTOMETER, DIODE ARRAY	1	"	YES	DELIVERED
16	MICRO BALANCE	1	"	YES	WAREHOUSE
17	PHOTODOCUMENTATION SYSTEM	1	"	"	DELIVERED
18	MICROSCOPE, STEREO WITH CAMERA ATTACHMENTS	1	"	"	INFO PGR
19	MICROSCOPE, COMPOUND, TRINOCULAR	1	"	"	BID
20	FIELD DATA RECORDER	23	"	"	"
21	CAMERA	14	"	NO	"
22	DEEP FREEZER	2	"	YES	DELIVERED
	DEEP FREEZER	1	"	"	WAREHOUSE
23	SPECTROPHOTOMETER	2	"	"	NMIC DUE
24	DENSITY GRADIENT FRACTIONATOR	2	"	"	BID
25	BALANCE, ANALYTICAL	2	BHOWALI	NO	DELIVERED
26	ELISA INSTRUMENTATION KIT	1	NEW DELHI	YES	NMIC DUE
27	NITROCELLULOSE MEMBRANE	2	"	NO	DELIVERED
28	LABORATORY JACKS	2	"	"	DELIVERED
29	MAGNETIC STIRRING BARS	2	"	"	DELIVERED
30	DIALYSIS TUBES	2	"	"	DELIVERED
31	PARAFILM WITH DISPENSER	2	"	"	DELIVERED
32	MULTI MAGNESTIR	2	"	"	DELIVERED
33	STIRRER, MICRO-PROCESSOR CONTROLLED	2	"	"	DELIVERED
34	DIGITAL APPENDORF PIPETTORS	1	"	"	DELIVERED
35	ELECTROPHORESIS SYSTEM	2	"	YES	BID
36	MB – DISPENSER	12	"	NO	BID
37	MULTIGAS DETECTOR	1	"	"	DELIVERED
38	AMBIENT AIR ANALYSER	1	"	YES	DELIVERED
39	DIGITAL POLARIMETER	1	"	"	WAREHOUSE
40	GAS CHROMATOGRAPH	1	"	"	DELIVERED
41	ROTARY EVAPORATOR	1	"	"	WAREHOUSE
42	SCANNING CALORIMETER	1	"	"	NMIC DUE
43	FREEZER, PROGRAMMABLE	1	"	"	BID
44	INCUBATOR SHAKER, GYRATORY	1	"	"	DELIVERED
	TOTAL	110			

TABLE 3 - TRANCHE III EQUIPMENT
LIST 1

SER. NO.	EQUIPMENT	NOS.	DELIVERY POINT (NBPGR)	STATUS
45	AUTO ANALYSER	1	NEW DELHI	SPECS
46	BENCH TOP AGAR STERLIZER	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	CRYOSTATE	1	"	"
52	CARYOVAT (CARYO CONTAINERS)	2	"	INFO PGR
53	CRYOSTARFREEZER	1	"	SPECS
54	CRYOMICROTOME	1	"	"
55	PRINTER	1	"	"
56	GAS CHROMATOGRAPH (HP-5890)	1	"	"
57	HIGHSPEED REFRIG. CENTRIFUGE	2	"	INFO PGR
58	HPLC WATER ASSOCIATES	1	"	SPECS
59	HPTLC INSTRUMENT	1	"	"
60	ICE FLASKES MACHINE	3	"	INFO PGR
61	LYPHOLIZER	1	"	SPECS
62	MILLIPORE WATER PURIFYING SYSTEM	1	"	INFO PGR
63	MICRO COMPUTER AND PRINTER	1	"	SPECS
64	AUTOMATIC POLARIMETER	1	"	"
65	ROTARY EVAPORATOR	1	"	"
66	SEED DRYER	3	"	"
67	SEED DRYING CABINET	21	"	"
68	SOFT X-RAY PLANT	2	"	P.O. ISSUED
69	STEREO BINOCULAR MICROSCOPE	20	"	SPECS
70	STORAGE MODULE (for MED.TERM)	2	"	"
71	WALK-IN ROOM GERMINATOR	3	"	"
72	TRANSMISSION ELECTRON MICROSCOPE	2	"	"
73	UTLRA MICROTOME WITH ACCESSORIES	1	"	INFO PGR
74	ULTRASOUND & COMPUTER VISION	1	"	SPECS
75	VACCUM FUMIGATION PLANT - 1000 capacity	3	"	BID
76	VACCUM FUMIGATION PLANT - 500 capacity	1	"	SPECS
77	VAPOUR HEAT TREATMENT PLANT	1	"	"
	TOTAL	96		

LIST 2

78	CENTRAL COMPUTER SYSTEM	1	NEW DELHI	SPECS
79	PROTOTYPE COMPUTER SYSTEM	1	"	P.O. ISSUED
80	MICROCOMPUTERS WITH ACCESSORIES	2	"	P.O. ISSUED
	MICROCOMPUTERS WITH ACCESSORIES	11	"	SPECS
81	SOFTWARES FOR NBPGR HEADQUARTERS		"	P.O. ISSUED
82	LIQUID NITROGEN STORAGE VATS (CRYOTANKS)	10	"	SPECS
83	CRYOPRESERVATION STORAGE SYSTEMS	6	"	SPECS
	TOTAL	31		

TRAINING

Most training activities of the PGR project are handled by the Office of International Cooperation and Development (OICD) under the Participating Agency Service Agreement (PASA) with the U.S. Department of Agriculture (USDA). By the end of September, 1993 a total of 70 Indian scientists visited U.S. for training/study tours.

Activities During the Period: No new training was scheduled for the period July-September quarter but six scientists completed training which was initiated in the previous quarter.

TECHNICAL ASSISTANCE

Although no formal visits of U.S. scientists took place during the quarter, many informal interchanges took place on a wide range of subjects.

Plans for the next Quarter: Plans call for the visit of Drs. Steve Eberhart and Bill George in December 1993 to review and discuss technical aspects of the Gene Bank construction in order to suggest minor changes, if any, to make the building more efficient and functional besides reviewing the construction progress of the remaining building which is coming up at a fast pace. Drs. Norman James and Carol Wilson are also programmed to visit NBPGR in December 1993 in order to finalize the training and technical assistance plans for 1994.

JOINT EXPLORATION

Activities During the Quarter: No joint exploration was planned for July-September, 1993 quarter. Three joint explorations have been conducted under the PGR project earlier. One more joint exploration for collection of *Citrus spp.* is to be undertaken in India in early 1994.

COLLABORATIVE RESEARCH

Activities During the Period: Three NBPGR scientists completed their collaborative research activities in the U.S. during the quarter and returned to India on September 15, 1993 to continue the remaining part of their research work in their respective laboratories.

The three areas in which collaborative research was undertaken are:

1. Studies of egg plant taxonomy and evolution.
2. Use of random amplified polymorphic DNA (RAPDs) for characterization of *Musa* germplasm diversity and stability.
3. Physiological and chemical attributes of deterioration in Soybean seeds with and without the enzyme Lipoxygenase.

The fourth collaborative project "Efficient Detection of Viruses and Therapeutic Treatment Relevant to *Citrus* and *Prunus* Budwoods" will be initiated from November 1, 1993.

Plans for Next Quarter:

- * Initiate the fourth collaborative research program.
- * Continue work on the three completed collaborative research projects initiated in March 1993.
- * Develop plans for two to three new areas for collaborative research.

DATA MANAGEMENT SYSTEM

Activities during the Period: ICIM Limited, New Delhi provides consulting services for the development and installation of a computer system for the the headquarters and Gene Bank. They gathered information on needs for the system and developed specifications for the contractors. They supervised the installation of conduits in the floors and walls of Block A and developed plans for the remaining parts of the building.

Procurement was nearly completed on the prototype computer which will be used to develop the software and programs for the germplasm in the Gene Bank and the national genetic resources system.

The data management system will play a key role in establishing and strengthening the national genetic resources system. Appropriate computer network connections will facilitate communications between NBPGR and the 29 National Crop Research Institutions, 17 All India Crop Improvement Programs and the 26 State Agricultural Universities (Annexure 7) which use the germplasm.

Activities during the next Quarter:

- * specification development
- * monitoring, coordination, and technical supervision of construction activities.

FINANCIAL PROGRESS

Activities During the Period: The status of project expenditure is shown in Tables 4 and 5.

**TABLE 4. India Plant Genetic Resources (PGR) Project
Contract No. 386-0513-C-00-2007-00
MSS Expenditure as of 30 September 1993**

Line Item	Budget Amount	July-Sept. Quarter	Inception To Date	Variance Budgeted Vs. Inception
I. Salaries	502,773	55,213	286,783	215,990
II. Fringe benefits	165,353	16,180	77,217	88,136
III. Allowances	113,633	4,397	62,719	50,914
IV. Training	144,301	0	10,753	133,548
V. Travel	69,477	5,489	32,700	36,777
VI. Per Diem	55,142	4,344	15,907	39,235
VII. Transportation	24,207	753	21,142	3,065
VIII. Non-Exp. Equip.	4,000,000	211,132	763,027	3,236,973
IX. Other Direct Costs	246,111	26,278	123,259	122,852
X. Subcontracts	2,187,000	109,310	109,310	2,077,690
XI. Indirect Costs	798,186	81,016	310,780	487,406
Total Costs (\$)	8,306,183	514,112	1,813,597	6,492,586

TABLE 5. India Plant Genetic Resources (PGR) Project**Total Project Expenditure as of 30 September 1993 (USAID Share)**

Element	Earmark	Committed	Cum. Exp. 30 June '93	July-Sept Quarter	Total 1/ 30 Sept. '93
10 TA	1,220,975	1,220,975	824,030	0	824,030
20 Training	896,732	896,732	835,304	61,428	896,732
MSS 2/	144,301	144,301	10,753	0	10,753
30 In-Count. Trng.	110,000	110,000	14,437	2,139	16,576
40 Commodities					
MSS	4,000,000	4,000,000	551,895	211,132	763,027
LC	400,000	400,000	188,284	0	188,284
50 Construction					
MSS	2,187,000	2,187,000	0	109,310	109,310
LC	3,200,000	3,200,000	1,200,000	0	1,200,000
60 Other Direct Costs					
MSS	1,974,882	1,974,882	736,777	193,730	930,507
LC	130,000	100,000	47,430	851	48,281
Evaluation	74,659	74,659	0	58,440	58,440
Total Costs (\$)	14,338,549	14,308,549	4,408,910	637,030	5,045,940

Note : 1/ Figures include actual expenditure plus estimated accruals.

2/ Components under the Winrock MSS Contract.

MANAGEMENT OPERATIONS

Activities During the Period: The U.S. Coordinator of the MSS, Dr. A. Colin M^cClung resigned from the project and was replaced by Dr. Avtar Kaul. The Winrock U.S. Office for the PGR project was shifted from Arlington to the Winrock Headquarters at Arkansas.

Dr. Harold E. Kauffman visited a number of the regional stations and cooperating crop research institutions during the period. Dr. Surjan Singh accompanied USAID officials to several sites where the quarantine greenhouses will be constructed (Hyderabad and Bhowali) and to Bangalore to observe leading private and public greenhouse users.

MID-TERM EVALUATION

The mid-term evaluation report of the PGR project by a four person team (Dr. Peter Van Schaik , Dr. K.O. Rachie, Dr. J.S. Kanwar and Dr. N.G.P. Rao) was completed July 15, 1993. The major recommendations of the team are as follows:

- * That USAID extend the PGR Project a minimum of two years, including extension of Winrock International's contract for technical assistance and management services, and USDA-OICD's PASA for training , collaborative collection and research.
- * That USAID and ICAR agree to proceed with construction of the fourth Greenhouse-Screenhouse-Quarantine facilities preferably at Port Blair.
- * That NBPGR, with technical assistance from Winrock International help design the interior spaces for its new facilities so that installation can take place in a timely manner when laboratories and offices are ready.

- * That NBPGR develop specific protocols and procedures for collection, evaluation and documentation for all crops in the system and that crop advisory committee be strengthened.
- * That action be expedited to procure, deliver, and install medium-term seed storage units and related seed handling equipment at all locations where such facilities are needed and can be accommodated.
- * That proposals for several more collaborative explorations and research projects be developed and funded particularly for medicinal crops and under-utilized crops.
- * That USAID and GOI begin discussions at an early date to provide needed financial resources for the completion of already committed and essential facilities as well as for operational needs beyond the LOP.

ANNEXURE 1

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

BASE COLLECTIONS IN NATIONAL GENE BANK AT NBPGR (as of 30 September 1993)

Crop Groups	No. of Accessions
LONG-TERM STORAGE (- 20 degrees C.)	
Cereals	51,182
Pulses	26,159
Milletts and Minor Milletts	14,599
Oilseeds	15,647
Vegetables	5,482
Fibre Crops	3,212
Narcotics	790
Medicinal & A.P.	179
Pseudo-cereals	736
Improved Varieties	904
TOTAL	119,890
MEDIUM-TERM STORAGE (4 degrees C.)	
Voucher Specimens of Exotics	20,760
Ref. samples of indigenous collection	36,137
GRAND TOTAL	176,787

**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	55	10, 4	16-18
Allium species	9	10	12-14
Ipomoea batatas	230	25, 18	12-16
Dioscorea species	28	25	12
Zingiber officinale	97	25	12
Curcuma species	3	25	8
Musa spp.	195	25, 15	12-22
Citrus aurantifolia	2	25	10
Piper species	6	25	10-12
Rauvolfia serpentina	4	15	15
R. canescen	1	25	15
Saussurea lappa	1	4	13
Tylophora indica	1	10	12
Picorrhiza kurroa	1	10	16
Gentiana kurroa	1	4	11
Pogostemon palshouli	2	25	9-10
Coleus forskohlii	7	25	18

**CROP RESEARCH INSTITUTIONS ACTIVELY WORKING
IN THE NATIONAL GENETIC RESEARCH NETWORK**

1. **IARI** Indian Agricultural Research Institute, Pusa, New Delhi - 110 012
2. **CRRI** Central Rice Research Institute, Cuttack - 753 005 (Orissa)
3. **ISSR** Indian Institute of Sugarcane Research, Lucknow - 226 002 (Uttar Pradesh)
4. **SBI** Sugarcane Breeding Institute, Coimbatore - 641 007 (Tamil Nadu)
5. **CICR** Central Institute for Cotton Research, Panjari Farm, Wardha Road, Nagpur - 440 001 (Maharashtra)
6. **JARI** Jute Agricultural Research Institute, Barrackpore - 743 101 (West Bengal)
7. **CTRI** Central Tobacco Research Institute, Rajahmundry - 533 105 (Andhra Pradesh)
8. **CPCRI** Central Plantation Crops Research Institute, Post Kudlu, Kasaragod - 670 124 (Kerala)
9. **IIHR** Indian Institute of Horticultural Research, 225 Upper Palace Orchards, Bangalore - 560 080 (Karnataka)
10. **CIHNP** Central Institute of Horticulture for Northern Plains, B-217 Indira Nagar, Lucknow - 226 016 (U.P.)
11. **CPRI** Central Potato Research Institute, Shimla - 171 001 (Himachal Pradesh)
12. **CTCRI** Central Tuber Crops Research Institute, Sreekariyam, Trivandrum - 695 017 (Kerala)
13. **CSSRI** Central Soil Salinity Research Institute, Karnal - 132 001 (Haryana)
14. **CAZRI** Central Arid Zone Research Institute, Jodhpur - 342 003 (Rajasthan)
15. **CRIDA** Central Research Institute for Dryland Agriculture, Saidabad, Hyderabad - 500 659 (Andhra Pradesh)
16. **ICAR-RCNEHR** ICAR Research Complex for North-Eastern Hills Region, Shillong - 793 003 (Meghalaya)
17. **VPKAS** Vivekananda Parvatiya Krishi Anusandhan Shala, Almora - 263 601 (Uttar Pradesh)
18. **CARIANGI** Central Agricultural Research Institute for Andaman & Nicobar Group of Islands, Port Blair - 744 101
19. **IGFRI** Indian Grassland & Fodder Research Institute, Gwalior-Jhansi Road, Jhansi - 284 003 (Uttar Pradesh)
20. **NBPGR** National Bureau of Plant Genetic Resources, FCI Building, Pusa, New Delhi - 110 012
21. **NRC (Soya)** National Research Centre for Soybean, Bhawerkua Farm, Khandwa Road, Indore - 452 001 (M.P.)
22. **NRC (Groundnut)** National Research Centre for Groundnut, Timbawadi P.O. Jungadh - 362 015 (Gujarat)
23. **NRC (Citrus)** National Research Centre for Citrus, Central Research Station of the IIHR
National Bureau of Soil Survey & Land-Use Planning, Amravati Road, Nagpur - 440 006 (Maharashtra)
24. **NRC (Spices)** National Research Centre for Spices, Calicut - 673 012 (Kerala)
25. **DO** Directorate of Oilseed, Rajendranagar, Hyderabad - 500 030 (Andhra Pradesh)
26. **DRR** Directorate of Rice Research, Rajendranagar, Hyderabad - 500 030 (Andhra Pradesh)
27. **DP** Directorate of Pulses (ICAR), Kalyanpur, Kanpur - 208 024 (Uttar Pradesh)
28. **WPD** Wheat Project Directorate, I.A.R.I., Pusa, New Delhi - 110 012
29. **PD (Vegetable)** Project Directorate on Vegetables, Division of Vegetable Crops, I.A.R.I. Pusa, New Delhi - 110 012

**ALL INDIA COORDINATED CROP IMPROVEMENT NETWORKS
THAT PARTICIPATE IN NATIONAL GENETIC RESOURCE SYSTEM**

<u>Sl.No.</u>	<u>Crop</u>	<u>No. of Stations/Institutions</u>
1.	Rice	52
2.	Wheat	34
3.	Maize	25
4.	Barley	15
5.	Sorghum	18
6.	Millets	37
7.	Pulses	26
8.	Soybean	17
9.	Groundnut	23
10.	Sesamum	12
11.	Rapeseed and Mustard	16
12.	Sunflower	5
13.	Niger	5
14.	Linseed	9
15.	Castor and Minor Oilseed	2
16.	Cotton	32
17.	Jute and Allied Fibers	10

**AGRICULTURAL UNIVERSITIES WITH
ACTIVE PROGRAMS IN THE NATIONAL GENETIC RESOURCES NETWORK**

1. Andhra Pradesh Agricultural University, Rajendranagar, Hyderabad - 500 030 (Andhra Pradesh)
2. Assam Agricultural University, Jorhat - 785 013 (Assam)
3. Rajendra Agricultural University, Veterinary College Campus, Patna - 800 014 (Bihar)
4. Gujarat Agricultural University, Sardar Krishi Nagar, Dist. Banaskantha - 385 506 (Gujarat)
5. Haryana Agricultural University, Hisar - 125 001 (Haryana)
6. Himachal Pradesh Krishi Vishwa Vidyalaya, Palampur - 176 062 (Himachal Pradesh)
7. Dr. Y.S. Parmar University of Horticulture and Forestry, Dachghat, Solan (Himachal Pradesh)
8. University of Agricultural Sciences, Post Bag No. 2477, Bangalore - 560 065 (Karnataka)
9. University of Agricultural Sciences, Krishinagar, Dharwar (Karnataka)
10. Jawaharlal Nehru Krishi Vishwa Vidyalaya Jabalpur - 482 004 (Madhya Pradesh)
11. Kerala Agricultural University, Mannuthy - 680 651 (Kerala)
12. Konkan Krishi Vidyapeeth, Dapoi - 415 712, Dist. Ratnagiri (Maharashtra)
13. Mahatma Phule Krishi Vidyapeeth, Rahuri - 431 712 (Maharashtra)
14. Marathwada Agricultural University, Parbhani - 431 401 (Maharashtra)
15. Punjab Rao Krishi Vidyapeeth, Krishnagar, Akola - 444 104 (Maharashtra)
16. Orissa University of Agriculture and Technology, Bhubaneswar - 751 003 (Orissa)
17. Punjab Agricultural University, Ludhiana - 140 001 (Punjab)
18. Sukhadia University, Udaipur - 313 001 (Rajasthan)
19. Tamil Nadu Agricultural University, Coimbatore - 641 003 (Tamil Nadu)
20. Chandra Shekhar Azad University of Agriculture & Technology, Kanpur - 208 002 (Uttar Pradesh)
21. G.B. Pant University of Agriculture and Technology, Pantnagar - 263 145 (Uttar Pradesh)
22. Narendra Dev University of Agriculture and Technology, Faizabad - 224 001 (Uttar Pradesh)
23. Bidhan Chandra Krishi Vishwa Vidyalaya, Haringhana, P.O. Mohanpur, Nadia - 741 252 (West Bengal)
24. Birsa Agricultural University, Kanke, Ranchi - 834 006 (Bihar)
25. S.K. University of Agricultural Sciences, 45-B/B Gandinagar, Jammu Tawi - 180 004 (Jammu & Kashmir)
26. Indira Gandhi Krishi Vishwa Vidyalaya, Raipur (Madhya Pradesh)