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PROJECT ASSISTANCE COMPLETION REPORT

AGRICULTURAL RESEARCH PROJECT

(386-0470)

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I. INTRODUCTION

Given its importance in India's economy, the agricultural sector must provide not only for the improvement in per capita food supplies, but also for a major impetus to overall employment generation and income growth. Thus far, the GOI has been able to set ambitious but feasible production growth rates. It's strategy for food production and rural employment combines efforts to consolidate and spread the agricultural production gains of the "green revolution" with targeted rural development programs aimed at raising household incomes above the poverty line. However, to sustain its agricultural growth, the GOI must continue to strengthen its agricultural research for technology generation and transfer. USAID reviewed the major GOI agricultural and rural development programs to determine those areas where U.S. technical expertise and financial assistance were likely to have the greatest impact and found that the greatest contribution could be made in the fields of agricultural research and education. It was for this reason that USAID initiated the Agricultural Research Project (ARP) in June 1983.

II. PROJECT GOAL AND PURPOSE

The overall project goal was to increase agricultural productivity, production, employment and income. The purpose was to strengthen the capability of the Indian agricultural research system to conduct research on priority problems in certain key functional scientific areas. This was to be accomplished by building institutional research capacity through collaborative assistance with designated U.S. land grant universities, the U.S. Department of Agriculture and other agricultural organizations, and by assisting in the development and transfer of agricultural technology through collaborative research between Indian and U.S. scientists with cooperation and support from their respective participating institutions.

A USAID funded final evaluation was completed in May 1992. The evaluation team concluded that while the overall goal was unrealistic and impossible to attain during ARP's life span, the purpose had been achieved. However, since the agricultural research capability was improved, it follows that the results of that research should have a positive effect on productivity, employment and income. The project paper noted two measures of goal achievement, one being selected crop yields and the other an expanded, applied knowledge base. While there has been insufficient time to determine the status of the former goal, the latter was achieved. As the team noted: "There is no question that the ARP has made a significant contribution to the research capability of all sub-projects and pre-projects in which it has invested. The team found universal agreement that the training and technical exchange opportunities, the assistance provided by U.S. consultants in planning and implementation, and the provision of previously unavailable equipment, have provided the stimulus and means for productive research."

The project paper identified the following components to be funded as necessary to the effective implementation of the ARP: 1) additional staff and staff training, 2) scientific contribution of U.S. consultants, and 3) procurement and installation of laboratory and field equipment. Equally essential elements were to be funded by the GOI contribution in the areas of existing and additional staff, facilities and recurring project costs.

III. PROJECT HISTORY

The initial length of the ARP was seven years; however, it was extended to nine years with a project completion date of June 30, 1992. The project had a total project funding of $28 million ($20 million in grant funds contributed by AID and $8 million contributed by the GOI).

The ARP was designed to respond to the need for collaborative research in selected areas as expressed by the GOI. In the ARP project paper, two sub-projects were identified: 1) Soybean Processing and Utilization (SPU), and 2) Post Harvest Technology of Fruits & Vegetables (PHTFV), with provision made for the consideration of collaboration on additional sub-projects. As such, the ARP project has served as an umbrella under which a series of sub-projects were developed. Selected priority areas served as the basis for sub-project selection by mutual agreement between the GOI and USAID. From a rather extensive list of priority agricultural projects proposed by the Indian Council of Agricultural Research (ICAR), a total of sixteen were identified to receive financial support - nine as sub-projects and seven as pre-projects. (See Attachment 'A' for list of sub and pre-projects.) Approval for each of these sub-projects was provided on the basis of review and recommendation by the Indo-U.S. Subcommission on Agriculture. This Subcommission meets annually to determine issues of mutual interest between the two countries regarding agricultural research, education and development; hence, it has played a significant role in the programs of the ARP.

An interim evaluation of the project was conducted in 1988. While the team noted that the original project design and concept were sound, and the project's purpose appropriate and possible to

achieve, it was critical of many of the delays in program development and made a number of recommendations regarding those delays, as well recommendations regarding the review and fund allocation process for sub-projects and the use of U.S. consultants. The team identified two major bottlenecks which were impeding implementation of the project: 1) an exceedingly long time was required to procure equipment from the U.S., and 2) a lack of adequate staffing and support was found in the Project Implementation Unit (PIU), which functions within ICAR and co-ordinates all the technical and administrative needs of the ARP.

IV. PROJECT STATUS AND ACCOMPLISHMENTS

The final evaluation team noted, "After forty plus years of (AID) involvement in the development of the agricultural research system in India, the ARP project can be considered the cap on this endeavor for USAID. The ARP's purpose has been accomplished. Nine sub-projects had been completed and seven pre-projects had been given a good start. The GOI had more than exceeded its committed contribution of $8 million and had shown its commitment to the continuity of the research by including all project components in its five-year plan beginning 1992."

Immediately after the interim review, USAID and ICAR prepared an action plan to incorporate the recommended actions which were deemed acceptable and advisable. The final evaluation team found ample evidence that delays and problems experienced in the early stages of the ARP had since been overcome. All the planned visits to India by U.S. consultants had materialized, all the Indian scientists scheduled for training in the U.S. had returned and all planned equipment had been delivered and installed. In addition, procedural changes, including increasing the level of authority of the PIU coordinator, had been implemented. Finally, timely and

appropriate reviews of budgets had permitted reallocation of funds including the funding of six additional pre-project activities in 1990.

A. Component Activities

Additional staff and staff training: Tremendous strides were made in the training of Indian scientists in the various agricultural fields associated with the ARP sub-projects. More than 300 scientists (1200 person months) attended training courses of various lengths in the U.S. The Indian scientists have benefited from direct contact with other professional scientists at U.S. locations where teaching and research activities were conducted in scientific disciplines directly associated with their own areas of interest. A successful aspect of the training component has been the in-country use of trained personnel, both Indian and American. Upon returning from the U.S., Indian scientists often organized and conducted a short course for local scientists covering a condensed version of the course the trainee had attended abroad. When possible, this short course was timed to coincide with the visits of U.S. consultants who would attend and provide additional input. In this manner, for every U.S. trained scientist, there were another 15-20 who received a direct training benefit.

Scientific contribution of U.S. consultants: A total of 114 U.S. consultants (115 person months) came to India during the nine-year project. These scientists interacted with hundreds of agricultural professionals including teachers and researchers. They taught courses and seminars and demonstrated the proper use of modern equipment while serving as mentors to their Indian colleagues. This interaction resulted in promoting collaborative research and strengthening the linkages between Indian and U. S. agricultural

institutions. One of the major achievements of this activity was that, while non-existent prior to the ARP, forestry faculty were established at 14 Indian universities directly resulting from the U.S. scientists' visits and contributions.

Procurement and installation of laboratory and field equipment:

Considerable state-of-the art laboratory and field equipment was imported from the U.S. and elsewhere to provide Indian research scientists the opportunity to conduct agricultural research at the cutting edge of their scientific specialities. All of the planned equipment purchases were received, installed and are in operation at existing laboratories. Equipment items ranged from relatively simple standard measuring devices used in forestry field research to fully automated, computer monitored weather stations and highly sophisticated analytical laboratory equipment. The final evaluation team noted that the ability to include a major equipment component has contributed significantly to the research capabilities and accomplishments of various scientists and institutions.

GOI components: Research capability is an area where highly visible improvements have been made with the ICAR having significantly contributed to facilities and staffing. Five new laboratories were built and one remodeled for various sub-projects. In staffing, the ICAR approved a total of 423 positions, including 199 scientists and 224 technicians and support staff. Although not all positions were filled by the project assistance completion date, no critical positions were left vacant.

B. Sub and Pre-Projects

The research results, research products and, beyond that, the possible commercialization of any of the developed products vary from program to program. The sub-projects with the greatest commercial potential are Soybean Processing and Utilization (SPU)

with several processes and products developed; Post Harvest Technology (PHT), with several promising techniques and products; intra-cellular Blood Protista (IBP), with one commercially produced vaccine; and the Conversion of Biodegradable Animal Wastes (CBAW) for animal feed with processes for recovering animal feed ingredients from slaughterhouses, as well as poultry and fisheries operations.

Each sub-project was to have a life span of up to five years and all nine were completed before the project termination. Seven pre-projects did not reach full implementation. In 1990, one of these, the Plant Genetic Resources pre-project, evolved into a separate USAID funded project with an increased scope and major infrastructure contributions by the GOI. The other six pre-projects were given limited funding with the understanding that activities would be confined to project planning, project design and some training and equipment procurement. The planned purpose of enhancing the future research capability of associated institutions and formulating project designs and research plans in those priority areas was thus met.

Because of the wide range of sub-projects and pre-projects, some having been completed in the course of the project, and others having time and resources only for start-up activities, it is difficult to make a concise assessment of progress. In some sub-projects, such as PHT and SPU, the impact has been significant, with an improved research infrastructure, capability and accomplishments, technology transfer and some commercial utilization. In others, such as IBP, Embryo Transplant Technology (ETT), CBAW, Agrometeorology (AGROMET), and Agroforestry (AGROFOR), the research capability level of Indian institutions and scientists has certainly been improved and scientific information output has been enhanced considerably.

Two additional sub-projects dealt with program management. One, The Project Implementation Unit (PIU), underwent organizational changes and significant improvement after the interim evaluation found that it was not adequately meeting the needs of the ARP. The other, Management Support Services (MSS), improved the management of the sub-projects in terms of procurement of equipment, consultant, and training logistics.

V. LESSONS LEARNED

1. To a considerable extent, the success of the ARP is due to the fact that all sub-projects were in areas of research in which the ICAR had strong interest. Consequently, ICAR had ready ideas for start-up activities in need of infrastructure investment. Many of the priority projects formed an important part of the coordinated all-India network of research. Thus, sustainability of the ARP programs is much more ensured. Moreover, the GOI has committed funding for all ARP programs, virtually assuring sustainability. Recognizing the priority host country needs and integrating projects and programs into a pre-existing infrastructure is certainly one of the best ways to ensure success, replicability and sustainability of a project.

2. The work of the Management Support Services (MSS) provided by the contractor has served the project very well, and implementation would have been much more lengthy had it not been in existence. Given the scope of the procurement, training, and consultant activities, in addition to the various research facilities and institutions located across the country, USAID was unable to manage the project itself. When projects require such large amounts of procurement, training and consultancy services or management expertise, it would be best to factor in an MSS component to be run by a contractor from the outset.

3. An 'umbrella-type' project offers flexibility and assured funding for sub-projects (although it still requires the same scrutiny of sub-projects as if they were stand alone projects). Since all sub and pre-projects were selected by mutual agreement between the GOI and USAID from subject areas previously identified as high priority areas within the Indian system, implementation was smoother than it might have been without such pre-planning.

4. As in many USAID projects, training was a vital ARP component, offering long term benefits. In this case, the scientist-to-scientist contact was exceptionally important and successful. Intensive interaction between Indian and U.S. counterparts seems to promote a greater involvement in the training process, involvement which extends well beyond attending the training course itself.

VI. MISSION FOLLOW-UP ACTIONS

The GOI has committed itself to continued support for the project by including all components of the project in its Eighth Five-Year Plan. Therefore, no USAID commitments for further participation or follow-up actions have been made.

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Attachment 'A'

LIST OF SUB-PROJECTS AND PRE-PROJECTS

1. Soybean Processing and Utilization (SPU)
2. Post Harvest Techology of Fruits and Vegetables (PVT-FV)
3. Project Implementation Unit (PIU)
4. Conversion of Biodegradable Animal Wastes (CBAW)
5. Intra-cellular Blood Protista (IBP)
6. Embryo Transfer Technology (ETT)
7. Forestry Faculty Training (FFT)
8. *Plant Genetic Research (PGR)
9. Agro-forestry Research (AGFOR)
10. Agro-meteorological Research (AGMET
11. *Farm Equipment Manufacturing Technology Centers (FEMTC)
12. *On Farm Water Management (OFWM)
13. *Protected Cultivation and Greenhouses (PCGH)
14. *Tissue Culture (TC)
15. *Integrated Pest Management
16. *Animal Genetic Resource Conservation (AGRC)

*Pre-project activity

Attachment 'B'

SPECIAL COVENANTS

Section 5.1 Evaluations

An evaluation program satisfactory to A.I.D. will be established as part of the project. The evaluation program will consist of annual reviews of subprojects and in-depth impact evaluations to be conducted at the project's mid-point and an impact evaluation at the end of the project.

STATUS: Both a mid term and a final evaluation were done.

Section 5.2 Training

Except as the parties may otherwise agree to in writing, the Grantee agrees to make all reasonable efforts to assure that professional staff receiving training under this project are retained, following completion of training, in service with the Grantee on applicable subproject activities for the period of time provided for by the Government of India in its standard bonding requirement for such persons receiving training.

STATUS: This has been monitored and all trainees have returned to India per GOI bonding procedures.

Attachment C

PLANNED VERSUS ACTUAL OUTPUTS

PLANNED OUTPUT	INDICATORS	ACTUAL OUTPUT
Develop new agricultural technologies in collaboration with U.S. institutions to address key constraints to increased agricultural production and utilization in approximately 6 selected areas.	1. Research problems identified, research program organized and subproject approval procedures in place.	1. Under each sub-project, research agenda have been identified and data is being generated. The Project Implementation Unit (PIU) which has been established has approved the subprojects.
	2. Three subprojects with 25 major components in progress.	2. 10 subprojects and 6 pre-project activities has been completed.
	3. Five research areas defined more generally and four research areas noted.	3. Same as output No. 1
	4. ICAR administrative machinery in place to organize and supervise research subprojects as implemented.	4. The administrative machinery of ICAR has been strengthened. This is evidenced by the number of new research initiatives and new structure in place i.e. Project Implementation Unit which Coordinates research.

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