

PROJECT APPRAISAL REPORT (PAR)

PD-AAD-091-A1

1. PROJECT NO. 386-11-660-22	2. PAR FOR PERIOD: 1/1/70 TO 12/31/71	3. COUNTRY INDIA	4. PAR SERIAL NO. FY :225
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5. PROJECT TITLE

SCIENCE EDUCATION IMPROVEMENT

6. PROJECT DURATION: Began FY 64 Ends FY 75	7. DATE LATEST PROP 6/11/71	8. DATE LATEST PIP -	9. DATE PRIOR PAR 4/24/70
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10. U.S. FUNDING	a. Cumulative Obligation Thru Prior FY: \$ 3,535,000	b. Current FY Estimated Budget: \$ 480,000	c. Estimated Budget to completion After Current FY: \$ 365,000
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11. KEY ACTION AGENTS (Contractor, Participating Agency or Voluntary Agency)

a. NAME NATIONAL SCIENCE FOUNDATION	b. CONTRACT, PASA OR VOL. AG. NO. PASA - 3486
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I. NEW ACTIONS PROPOSED AND REQUESTED AS A RESULT OF THIS EVALUATION

A. ACTION (X)			B. LIST OF ACTIONS	C. PROPOSED ACTION COMPLETION DATE
USAID	AID/W	HOST		
X <sup>1</sup>	X <sup>3</sup>	X <sup>2</sup>	Contractor should accelerate the phase out school/college/polytechnic-level Summer Institute support, and concentrate on assisting key Central and State Educational Agencies that are implementing discrete elementary, college and university SEI Programs.	December 31, 1971
X <sup>1</sup>		X <sup>2</sup>	Contractor should increase efforts to improve capacities of key Educational Agencies, e.g. UGC, NCSE, NCERT, BNC to plan, administer and evaluate SEI Programs.	December 31, 1972
X <sup>1</sup>		X <sup>2</sup>	Contractor should increase efforts to improve liaison between COSIP/UL field projects and their institutional sponsor-UGC.	December 31, 1972
		X <sup>1</sup>	Contractor/USAID should encourage the MOE to plan and regularize the Binational Conferences and follow-up mini-conferences after completion of the fourth and final NSF assisted conferences in CY 1973.	December 31, 1972
X <sup>1</sup>	X <sup>2</sup>	X <sup>3</sup>	Contractor, USAID, NSF/W, AID/W and GOI should explore block grant concept for continuing U.S. scientific collaboration after FY 1975.	December 31, 1972

D. REPLANNING REQUIRES  
 REVISED OR NEW:  PROP  PIP  PRO AG  PIO/T  PIO/C  PIO/P

E. DATE OF MISSION REVIEW

PROJECT MANAGER: TYPED NAME, SIGNED INITIALS AND DATE  
 Joseph M. Loudis

MISSION DIRECTOR: TYPED NAME, SIGNED INITIALS AND DATE  
 Howard E. Houston

**II. PERFORMANCE OF KEY INPUTS AND ACTION AGENTS**

A. INPUT OR ACTION AGENT CONTRACTOR, PARTICIPATING AGENCY OR VOLUNTARY AGENCY	B. PERFORMANCE AGAINST PLAN							C. IMPORTANCE FOR ACHIEVING PROJECT PURPOSE (X)					
	UNSATISFACTORY		SATISFACTORY			OUT-STANDING		LOW	MEDIUM			HIGH	
	1	2	3	4	5	6	7		1	2	3		4
1. National Science Foundation													
2. a. SSI Program Assistance							X						X
3. b. SEI Institutional Development			X								X		

Comment on key factors determining rating

a. During the period under review, India's traditional education system was effectively seeded with modern curricula and teaching materials and with innovative teaching and demonstration techniques. Introduced by highly qualified US scientists these NSF inputs induced Indian educators to demand greater GOI support for curriculum reform at all education levels. The GOI responded by authorizing/funding key central and state educational agencies to undertake indigenous SEI programs on a national scale. b. Beginning CY 1971, the NSF focused on helping these agencies plan, supervise and evaluate their SEI programs on a continuous basis. As of 12/31/71 NSF efforts to improve institutional planning/management have been only moderately successful. The UGC and NCSE have strengthened planning capacities but continue to rely on NSF for supervision and evaluation inputs.

4. PARTICIPANT TRAINING				X							X		
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Comment on key factors determining rating

Participant training has been primarily for specialists rather than for long-term academic training. Training has been particularly effective for key administrators/supervisors and subject matter specialists heading up Summer Insts. School level, COSIP and UL seminars, workshops and teacher retraining courses. There continues to be however, considerable need for training high and middle-level administrators/supervisors and managers who are assigned to central and state educational agencies that are now implementing indigenous SEI programs.

Comment on key factors determining rating

Procurement of commodities has been timely and has supported project needs.

6. COOPERATING COUNTRY	a. PERSONNEL				X								X	
	b. OTHER GOI/MOE Edn. Agencies *NCERT not included in this rating (see below)			X									X	

Comment on key factors determining rating

Local leadership in SSI, COSIP/University Leadership and BMC projects have been outstanding. GOI efforts to improve UGC/NCSE/NCERT's capacity to plan, supervise and coordinate their SEI programs have met with less success. UGC has improved overall capacity to plan and initiate SEI programs but requires further assistance to improve supervising, evaluating and follow-up procedures. NCSE has thus far remained an unregistered quasi-government agency with limited potential for becoming a viable institution. In addition NCSE continues to lack depth in administration and supervision. While NSF has helped the Chief Administrator and NAPSSES members to improve project planning, NCSE's institutional involvement is so ad-hoc that planning, implementation and coordination of projects remain for the most part isolated exercises.

\*NCERT-In general, NSF has found NCERT leadership non-cooperative and evasive in accepting responsibility for planning and executing SEI programs.

7. OTHER DONORS	United Nations			X								X		
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(See Next Page for Comments on Other Donors)

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II. 7. Continued: Comment on key factors determining rating of Other Donors Assists NCERT in developing institutional/school level SSI programs. The UN has provided up to 20 full time curriculum specialists and \$7 million worth of commodities to NCERT's school science programs. Materials are also being produced indigenously. These, for the most part, have not been widely distributed or extensively used. In general, NCERT has failed to galvanize leadership for secondary school programs whether in cooperation with NSF or UN projects. They have developed acceptable materials but these were produced in a vacuum without developing an in-service training structure or teacher training capacity. The State Institutes for Science Education (SISE) were given gifts of equipment from UNESCO without training teachers how to use the equipment.

### III. KEY OUTPUT INDICATORS AND TARGETS

A. QUANTITATIVE INDICATORS FOR MAJOR OUTPUTS		TARGETS (Percentage/Rate/Amount)					END OF PROJECT
		CUMU- LATIVE PRIOR FY	CURRENT FY 71		FY 72	FY 73	
			TO DATE	TO END			
<u>Staff Trained</u>							
Specialists-SSI Programs: 55	PLANNED	50	40	-	20	20	150
Supervisors-COSIP/UL " " : 15	ACTUAL PERFORM- ANCE	42	35				
Administrators-UGC/NCSE/ BMC : 7	REPLANNED						
<u>Program Implemented</u>							
SSIs : 891	PLANNED	700	215	-	14	14	957
COSIP/UL Programs : 12	ACTUAL PERFORM- ANCE	696	209				
RCE/Mysore : 1	REPLANNED						
BMC/Bombay : 1							
<u>Materials Prepared</u>							
SSIs : 50	PLANNED	60	20	-	6	6	98
COSIP/UL Programs : 7	ACTUAL PERFORM- ANCE	50	13				
RCE/Mysore : 2	REPLANNED						
BMC/Bombay : 4							
<u>Supplementary Projects</u>							
Sc. Binational Conferences: 4	PLANNED	4	3	-	3	1	7
Entrepreneurship Training: 1	ACTUAL PERFORM- ANCE	1	2				
Super-8 Projectors : 1	REPLANNED						
Library Dev. Project : 1							
B. QUALITATIVE INDICATORS FOR MAJOR OUTPUTS	COMMENT: Over 200 school/college polytechnic level teacher retraining courses held each summer without foreign aid. UGC has granted Rs.35 million to key college/university research and development programs that are being currently assisted by NSF long and short-term consultants.						
1. Continuous Teacher Training and Curriculum Development Programs.							
2. Continuous Curriculum Materials Production.	COMMENT: NSF consultants have directly assisted in the production of indigenous curriculum/text books itemized on pp5-6 of this PAR.						
3. Continuous Conferences Planned.	COMMENT: The MOE/NSF and USAID will cooperatively engage in planning future Binational Conferences and indigenous follow-up Conferences after direct US support for these conferences phases out in CY 1973.						

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IV. PROJECT PURPOSE

A. 1. Statement of purpose as currently envisaged.

2. Same as in PROP?  YES  NO

Develop self-sustaining state and national capacities to improve science curricula at all levels.

B. 1. Conditions which will exist when above purpose is achieved.	2. Evidence to date of progress toward these conditions.
<p>I. Key Central, State and Municipal educational agencies (UGC, NCSE, NCERT) have trained staffs for maintaining curricula research and improvement programs.</p> <p>II. NCSE, UGC and NCERT continue to implement SEI programs on a permanent basis.</p>	<p>I. <u>Staff Trained</u></p> <p>NCSE - (5) Executive Secy; Dy. Chief Admn; and 3 National Advisory Panel counterparts to NSF-Physicist, chemist, biologist-- (7) Directors/Principals MOE Engineering Institutes and Universities.</p> <p>UGC - (2) Jt.Edn.Secy; Addl.Secy.(Science) (8) Professors/Adms.of UL/COSIP</p> <p>NCERT - (1) Education Officer, BMC/Bombay (23)</p> <p>II. <u>Programs Implemented</u></p> <p>NCSE/NSF: <u>Teacher Training</u></p> <p>(54) Short-courses BSc/MSc (COSIP Teacher Trainers - 15 Math; 14 Chem; 11 Bio; 14 phys--.</p> <p style="text-align: right;">Contd.... p-5</p>

V. PROGRAMMING GOAL

A. Statement of Programming Goal

Improve the quality of science education in India.

B. Will the achievement of the project purpose make a significant contribution to the programming goal, given the magnitude of the national problem? Cite evidence.

Yes, the NSF effectively helped key GOI agencies initiate indigenous science improvement programs at all education levels. The demonstrations induced the GOI to further support and expand these programs using key education institutions as implementing agents. During the period under review, NCSE/UGC/NCERT organized and funded the following science education improvement programs: (without direct NSF/USAID consultant or commodity support)

NCSE/UGC - 1970 56 summer institutes for 1887 BSc/MSc teachers  
1971 56 summer institutes for 1954 BSc/MSc teachers  
NCSE/MOE - 1970 30 and 9 summer institutes for 1350 polytech and 405 eng. teachers  
1971 27 and 10 summer institutes for 1080 polytech and 450 eng. teachers  
1971 1 Long-term entrepreneurship training course-Graduate Engrs-IIT/Delhi

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#### IV. PROJECT PURPOSE

B. 1. Conditions which will exist when above purpose is achieved.

II. NCSE, UGC AND NCERT continue to implement SEI programs on a permanent basis.

2. Evidence to date of progress toward these conditions

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#### II. Program Implemented (Contd...)

- (31) short courses polytech/engineering teacher trainers - 17 polytech; 14 engg.
- (11) workshops/MOE Bureau of Tech.Edn. 7 polytech; 4 engg.
- (7) 2 Short Courses; 5 Special Workshops-ACS Chemistry
- (4) Seminar Workshops for elementary teacher trainers, BMC/Bombay

#### Curriculum Research and Development

- (7) Curriculum development seminars/workshops UL grantees-2 chem; 2 biosci; 3 phys.
- (4) Curriculum development seminars/workshops BMC elementary schools
- (5) Curriculum development evaluation seminars/workshops-3 polytech; 2 engg.
- (1) Entrepreneurship Trg. Course IIT/Delhi

#### Bipational Conferences

- (3) Chemistry/Physics/Biology involving NCSE/NCERT/UGC plus 38 US curriculum specialists

#### Super-8 Project

- (10) Indigenously developed prototype super-8 projectors being field tested in U.S. and Indian universities.

#### Library Development Project

Implementation replanned for FY 1972. OWP provides 1.6 million rupee grant for polytech, college and university libraries.

UGC/NSF

#### Teacher Training

- \* (112) Summer training institutes BSc/MSc teachers-28 math; 28 phys; 26 chem; 27 biosci.

#### Curriculum Research and Development

- (52) 12 University Leadership(UL) plus 40 College Science Improvement(COSIP) grants. NSF assistance limited to 4 math; 3 phys; 3 chem; 2 biosci.

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II. NCSE, UGC and NCERT continue to implement SEI programs on a permanent basis.

NCERT/NSF

II. Program Implemented (contd...)

Teacher Training

(1) School-level Courses-Earth Science Teachers  
\*(125) Insts. for school-level science teachers

Curriculum Development

RCE/Mysore - full time NSF consultant to train 2 curriculum specialists implement Physics Handbook project.

UGC/Bombay - full time NSF consultant to train 3 elementary specialists-UGC Elementary Curriculum Development Project.

III. Improved Materials Prepared

a. NCSE

Publications

Indian Journal Chemical Education-Quarterly  
Science Resource Letter-Monthly  
Manual-VTUM Experimental Kits

\*\*Bombay Elementary Texts:

Grade I - Teachers Book (English)  
Grade II - Pupils Book (Gujarati)  
Grade II - Teachers Book (Marathi)  
Modern Math - Elem. Teacher (English)  
Grade I - Modern Math (English)  
Grade II - Modern Math (English)

b. UGC

COSIP/UL Newsletter (Chemistry)-Punjab, Osmania, Poona Universities  
5-Monographs (Math)

Bangalore COSIP Program

General Chemistry Text-IIT/K

Biology Lab Experiments/Teachers Manuals -

Micro/Molecular Bio; Plant Physiology, Biochemistry  
Madurai Univ/Leadership Project

Bioscience Text - Indian adaptation BSCS-Yellow version

c. NCERT

Revised Chem Text for Maharashtra School-level teachers

Translated CHEM into Gujarati

Developed 1-9 Science Materials (UNESCO)

\*\*Regional College of Education, Mysore

Developed Class 9-10 Physics Teaching Handbook for 20 secondary state schools

\* Unassisted by NSF/USAID

\*\* Published with direct NSF consultant assistance.