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**Report No. 11472**

**PROJECT COMPLETION REPORT**

**PAPUA NEW GUINEA**

**SECONDARY EDUCATION PROJECT  
(LOAN 2395-PNG)**

**DECEMBER 22, 1992**

**Population and Human Resources Division  
Country Department III  
East Asia and Pacific Regional Office**

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### CURRENCY EQUIVALENTS

Currency Unit = Kina (K)

At Appraisal, April 1983

K 1.00 = US\$1.20

US\$1.00 = K 0.83

	<u>Average Annual Exchange Rates to US\$1.00</u>					
<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
K 0.94	1.01	0.96	0.88	0.83	0.86	0.95

### FISCAL YEAR OF BORROWER

January 1 - December 31

### ABBREVIATIONS

ADT	- Advanced Diploma in Teaching
ADU	- Advanced Diploma Unit
BEd	- Bachelor of Education
CODE	- College of Distance Education
CU (CDD)	- Curriculum Unit (now Curriculum Development Department)
DFP	- Department of Finance and Planning
DWS	- Department of Works and Supply
GTC	- Goroka Teachers College, UPNG
HSSP	- High School Support Program
MSU	- Measurement Services Unit, NDOE
NDOE	- National Department of Education
NHS	- National high school
NPEP	- National Public Expenditure Plan
PCR	- Project Completion Report
PDOE	- Provincial Division of Education
PHS	- Provincial high school
PIU	- Project Implementation Unit
PMC	- Project Management Committee
PNG	- Papua New Guinea
REU	- Research and Evaluation Unit, NDOE
SAR	- Staff Appraisal Report
TSC	- Teaching Service Commission
UPNG	- University of Papua New Guinea

THE WORLD BANK  
Washington, D.C. 20433  
U.S.A.

Office of Director-General  
Operations Evaluation

December 22, 1992

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Project Completion Report on Papua New Guinea  
Secondary Education Project (Loan 2395-PNG)

Attached is a copy of the report entitled "Project Completion Report on Papua New Guinea Secondary Education Project (Loan 2395-PNG)" prepared by the East Asia and Pacific Regional Office, including Part II contributed by the Borrower. The report provides a satisfactory assessment of project achievements.

The projected expansion of middle- and high-level manpower was achieved although 18 rather than 23 provincial high schools were constructed due to scarcity of government funding and unplanned private expansion of educational capacity. Quality improvement through curriculum development and support services was also secured although the problems encountered in textbook supply and teacher training have highlighted institutional weaknesses which will require remedy in follow-up projects.

Thus, the project outcome can be considered satisfactory even though institutional development goals were partially realized. Because of doubts about the timely availability of textbooks, properly trained teachers and maintenance budgets, the sustainability of the project is not fully assured.

No audit of the project is planned.



Attachment

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PROJECT COMPLETION REPORT

PAPUA NEW GUINEA

SECONDARY EDUCATION PROJECT (LOAN 2395-PNG)

Preface

This is the Project Completion Report (PCR) for the Secondary Education Project in Papua New Guinea, for which Loan 2395-PNG in the amount of US\$49.3 million equivalent was approved on March 27, 1984. The Loan was closed on December 31, 1990, one year behind schedule. It was fully disbursed, and the last disbursement was on December 3, 1990.

The PCR was jointly prepared by the Population and Human Resources Division, Country Department III, of the East Asia and Pacific Regional Office (Preface, Evaluation Summary, Parts I and III) and the Borrower (Part II).

Preparation of this PCR began during a mission to Papua New Guinea in July 1991, and is based, inter alia, on the Staff Appraisal Report, the Loan Agreement, supervision reports, correspondence between the Bank and the Borrower, the project files of the Bank and the Borrower, internal Bank memoranda and information provided to the final mission.





PROJECT COMPLETION REPORT

PAPUA NEW GUINEA

SECONDARY EDUCATION PROJECT (LOAN 2395-PNG)

Evaluation Summary

Objectives

i. The main objective of the Project was to assist Papua New Guinea to develop qualified national manpower at the middle and higher levels, by increasing the output and improving the effectiveness of secondary education. These objectives were to be achieved primarily through: implementation of strengthened subsector policies and evaluation; provision of appropriate instructional materials and upgrading of the teaching force; and expansion of school places and upgrading of existing facilities (para. 3.1).

Implementation Experience

ii. The Project was generally well-implemented with a one-year delay in the closing date to allow completion of the educational materials component. During the extra year, the Project also continued to fund ongoing school construction and several project activities that have now entered the recurrent budget (para. 5.1). Construction of six high schools was dropped during implementation and, as a result and in spite of the extra year, the final project cost reached only US\$70.9 million as compared to the estimated cost of US\$78.5 million. The US\$49.3 million Loan financed 70 percent of the total instead of 63 percent as originally expected (para. 5.3). The Project Implementation Unit had the full support of the National Department of Education and was adequately staffed, housed and supplied. A Project Management Committee met regularly and provided valuable guidance to the Unit and to other agencies implementing project activities (para. 9.1).

iii. The major project components for which implementation was the least smooth were the educational materials component and the Advanced Diploma in Teaching program. The former was mainly due to weak management in the Curriculum Development Department (paras. 5.6 - 5.12) while the latter was due to inadequate preparation of the program during appraisal with the result that numerous adjustments had to be made during implementation (paras. 5.14 - 5.18). The main problem that arose during implementation, however, was when a new Government decided to emphasize the productive sectors at the expense of human resources. This naturally led to financial problems for this Project and for education in general (para. 10.1).

Results

iv. During implementation, the quantitative objective of increasing the output of secondary education was met, although this was not entirely attributable to the Project. Effectiveness of secondary education was also improved quantitatively although how much the quantitative inputs contributed

to qualitative improvement is harder to measure. Nevertheless, enrollment expansion at both the lower (provincial) and upper (national) secondary levels took place as planned (paras. 6.2 and 6.3), textbooks and educational materials were developed and distributed to the high schools in the numbers envisaged (para. 6.7), the Advanced Diploma in Teaching program was firmly established (para. 5.18), in-service training was provided for teachers at foreign and local universities (para. 6.27), new inspectors were appointed and housed (para. 6.28), provincial high schools were constructed in nearly the numbers planned (para. 6.30), national high schools were upgraded and expanded (paras. 6.31 and 6.33) and the very popular grants for school facilities maintenance, ancillary staff, library books and science equipment (paras. 5.19, 5.21, 6.16 and 6.34) were forwarded every year directly to the schools.

### Sustainability

v. The provincial and national high schools constructed under the Project have entered the Government's regular school system and are being sustained as part of that system. The National Department of Education is committed to continuing its support of the Advanced Diploma in Teaching program. Once the Government makes a final decision on a textbook replacement policy, textbooks will automatically be supplied in adequate numbers to the schools; meanwhile a large textbook component is being included in the proposed Education Development Project. The most visible of the components under this Project that are continuing to be funded under the recurrent budget for education, are the grants to the schools (para. iv). These are so popular with the schools and the parents that they are likely to remain a part of the recurrent budget for the foreseeable future (para. 7.1).

### Findings and Lessons Learned

- vi. Lessons learned include the following (paras. 8.2 and 9.2):
- (a) programs being newly established with project funding should be closely examined at their conception and all variables that may come into play should be taken into account, especially, in the case of PNG, incentives for people to participate;
  - (b) attention must be paid at appraisal to project evaluation and monitoring to make sure systems are in place that will provide useful data; in this regard, more educators should participate in supervision of projects to look specifically at educational issues;
  - (c) counterparts to expatriate staff involved in project implementation should always be appointed in order to build up local expertise;
  - (d) the provinces cannot be expected to budget large sums of money for education even when national matching funds are available;
  - (e) systems should be put into place to improve delivery of textbooks and educational materials, to ensure that the materials provided remain in the schools and to protect them from wear and tear;

- (f) book development should be carefully thought out in advance;
- (g) schools unable to complete necessary paperwork to take advantage of benefits being offered should be assisted to do so; and
- (h) a separate study should be made of how to utilize fully, existing post-secondary facilities rather than depending on increasing the number of grade 12 graduates to do so.



PROJECT COMPLETION REPORT

PAPUA NEW GUINEA

SECONDARY EDUCATION PROJECT (LOAN 2395-PNG)

PART I. Project Review from the Bank's Perspective

1. Project Identity

Project name: Secondary Education Project  
Loan number: Loan 2395-PNG  
RVP unit: East Asia and Pacific Regional Office,  
Country Department III  
Country: Papua New Guinea (PNG)  
Sector: Education  
Subsector: Secondary education

2. Project Background

2.1 Sector Development Objectives. The major aims of Papua New Guinea's development strategy and programs in the 1980s were: (i) to achieve financial self-sufficiency through developing the natural resource base; and (ii) to improve the quality of rural life. An important objective of the Government in meeting these aims was to raise the skill level of national manpower to replace expensive expatriates, who then accounted for over half of the higher level manpower in the formal sector. Weaknesses in the education system were a major constraint to achievement of this objective; these included: poor average quality of primary and lower secondary education, low participation rates in secondary education and poor cost-effectiveness at post-primary levels. The Government was addressing these problems through a comprehensive development program for primary education.<sup>1/</sup> As the next step, emphasis needed to be given to strengthening secondary education, which supplies national manpower for higher education and formal employment.

2.2 Policy Context. The Government gave priority to strengthening its education and training system in order to overcome the shortage of qualified national manpower. The main objectives of its strategy for formal education included the reduction of (i) disparities (by location and sex) in access, (ii) inefficiencies attributable to low student progression rates, and (iii) significant variations in unit costs among levels. Priority was to be given to continuing development of primary education and to development of secondary education. At these levels, emphasis was to be given to improving quality and cost-effectiveness, and to expanding enrollments on an equitable basis. Owing to budgetary constraints and concern for overall demand,

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<sup>1/</sup> The Primary Education Project, assisted by Loan 1934/Credit 1087-PNG of 1981, supported this effort and strengthened educational planning in general. (See Project Completion Report No. 8968 dated August 21, 1990; and Part III, Table 1.)

expansion of secondary school places was, however, to continue at a modest pace. At the post-secondary level, emphasis was to be given to more effective use of resources. No expansion was then envisaged in the near term. Emphasis was also to be given to developing nonformal education and training programs, focusing on basic education and rural skills.

### 3. Project Objectives and Description

3.1 Project Objectives. The main objective of the Project was to assist PNG to develop qualified national manpower at the middle and higher levels, by increasing the output and improving the effectiveness of secondary education. These objectives were to be achieved primarily through: study and implementation of strengthened subsector policies and introduction of improved evaluation practices; provision of appropriate instructional materials and upgrading of the national teaching force; and expansion of the number of school places on an equitable basis and upgrading of existing facilities.

3.2 Project Components. The Project included civil works, equipment, materials, furniture, staff, staff-upgrading and technical assistance to:

#### Policies and Evaluation

- (a) study and implement enrollment expansion and cost-control policies designed to improve the match between supply of secondary school graduates and demand for manpower, and increase the cost-effectiveness of secondary education; and
- (b) strengthen the National Department of Education's (NDOE) Measurement Services Unit (MSU) to support improvements in educational planning;<sup>2/</sup>

#### Development of Materials and Upgrading of Teachers

- (a) strengthen the NDOE Curriculum Unit (later Curriculum Development Department (CDD)) and provide materials coordinators for the national high schools (NHS - grades 10 to 12) to prepare and provide curriculum-related textbooks and other learning materials for provincial high school (PHS - grades 7 - 10) and NHS students, respectively; and
- (b) introduce a revised program of preservice and expanded in-service training for national teachers to improve their subject matter knowledge, and provide additional inspectors and school administration staff to strengthen support for teachers; and

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<sup>2/</sup> The Staff Appraisal Report (SAR) mistakenly assigns the monitoring and evaluation responsibility to the MSU which is actually responsible for testing. Monitoring and evaluation are the responsibility of NDOE's Research and Evaluation Unit (REU).

### Expansion and Upgrading of Secondary Schools

- (a) provide approximately 4,500 new student places in PHSs to be located primarily in provinces with below average enrollment ratios to reduce inequities in the distribution of school places and to support planned expansion;
- (b) expand existing NHSs to support a planned increase in enrollments of about 400 students; and
- (c) upgrade physical facilities at existing PHSs and NHSs on the basis of need, and provide additional science equipment at PHSs to complement planned improvements in the quality of materials and teaching.

#### 4. Project Design and Organization

4.1 The Project was very thoroughly prepared in 1982 and 1983 by the NDOE and was generally well-designed and appropriate in scope and scale for its time and place. The conceptual basis was clear with its emphasis on increasing output from the secondary system and improving the system's effectiveness, and the Project aimed to do just that. The in-service teacher training component (paras. 5.14-18) under which the Advanced Diploma in Teaching (ADT) program was developed, was the one major component not clearly thought out at appraisal.

4.2 It was recognized at appraisal that there was a risk that provincial commitment to the high school support program (HSSP) under which the PHSs were to be constructed, would be inadequate in spite of the high level of demand for schooling at this level. Therefore 50 percent of the construction costs were to be provided by the national government along with financing of all incremental teacher salaries for the new PHSs. What was not foreseen was that many of the disadvantaged provinces where the schools were to be constructed, would not be able to come up with their 50 percent share of the budgets for this construction, much less to furnish and equip the schools upon their completion. Thus the national government was forced at various points throughout the life of the project to increase its share of funding (up to 100 percent in some cases) of the total cost of the PHSs (para. 5.20). The new PHSs also had to be furnished and equipped by the NDOE.

4.3 The NDOE also realized that the Provincial Divisions of Education (PDOEs) probably did not have the organizational capacity to distribute the various grant funds and the new educational materials, both aimed at improving educational quality, to the individual schools. Provisions were made in the project design to overcome this weakness in the short term, at least, by arranging to forward the grants and materials directly from the NDOE to the schools, bypassing the PDOEs altogether (paras. 5.8, 5.19, 5.21 6.16 and 6.34).

4.4 During the project implementation period, four provinces along with five churches established PHSs throughout PNG that were additional to those being provided under the Project's PHS expansion component. The NDOE

apparently has no way to control this kind of expansion. This led to faster than planned enrollment increases and resulted in a major revision of the Project in 1988, when six PHSs scheduled to commence construction under the Project, were dropped (para. 6.30). The main reasons for this revision in the project design were that enrollment projections for 1988 had already been reached and government budgets were more constrained than usual. In any case, this was in line with the Bank's view by that time, as outlined in its draft report on the Costs and Financing of Education in PNG (green cover, June 25, 1987), that in view of the then current and prospective budgetary constraints in the country, enrollments could not continue to expand at all levels. The report recommended that the Government give priority to primary education as the most cost-effective type and curtail the expansion of lower secondary education until an analysis could be made of the employment patterns of grade 10 leavers. (Although the Government subsequently refused to discuss this report at the green cover stage with the Bank so that it was never officially published, the report continues to influence thinking on educational matters in PNG.)

4.5 Weaknesses also continued in the CDD which was responsible for the Project's instructional materials component. These shortcomings were not apparent at the time of appraisal of the Secondary Project but have since been pointed out in the PCR for the Primary Education Project (Part III, Table 1). (See footnote 1.) Delays in supply of all the planned textbooks and instructional materials have resulted although in the end, all quantitative goals will be met (para. 6.7). As mentioned, the innovative (for PNG) in-service ADT program for PHS teachers also was not clearly thought out at appraisal and proved to be much more complicated and time-consuming to establish than envisaged (paras. 6.18 - 6.26).

4.6 Organizationally, the strong role taken by the NDOE in managing project implementation, the establishment of a very effective project implementing unit in the NDOE and the willingness of the national government to provide additional financing when the provinces were unable to pay their share of project costs, contributed most to the Project's success.

## 5. Project Implementation

5.1 The Project was implemented over a period of about 6½ years from Loan Agreement signing on July 25, 1984, to the date of the final disbursement, December 3, 1990, although actual implementation had begun well before the Loan Agreement was finally signed. Implementation thus officially took one year longer than planned. In 1989, the closing date was extended from December 31, 1989, to December 31, 1990, in order to allow completion of the instructional materials component and to provide an additional year of funding for construction of the PHSs, the ADT program and the various grants aimed at improving educational quality (Part III, Table 2). This money became available when the estimated total project cost decreased as a result of dropping the six PHSs (paras. 4.4 and 6.30). Also in order to use the extra loan funds and avoid any cancellation, the loan funding share of the total project cost was increased from 63 percent to 70 percent at the same time.



5.2 Disbursements were slightly slower than planned (Part III, Table 3) due to delays in both the instructional materials component and in construction of the PHSs, the latter caused by the inability of the provinces to meet their share of the costs and by budget cuts in the middle of the implementation period which caused staffing constraints in the Department of Works and Supply (DWS) which was implementing the component (para. 5.20).

5.3 The Project was estimated at appraisal to cost about US\$78.5 million. Final actual costs reached only US\$70.9 million as a result of dropping the six PHSs, which reduced costs by about US\$10 million. An additional US\$2.5 million was then needed to cover the cost of the remaining PHS program, materials development, the ADT program and the various grants during the extra implementation year (Part III, Table 5A). As it turned out, the Loan covered 70 percent of the total project costs instead of 63 percent envisaged at appraisal, with the Government and various church agencies picking up the remaining 25 percent and 5 percent of the costs, respectively (Part III, Table 5B).

5.4 The risks outlined in the SAR included the risk, as mentioned in para. 4.2 above, that provincial commitment to the building program would be inadequate; that there would be delays in acquiring building sites for the new PHSs; and that individual distance assignments in the in-service training for PHS teachers would be ineffective. In fact, there were only a few delays due to site problems. The risks of inadequate provincial commitment and ineffectiveness of the distance assignments in the ADT program turned out to be very real, however, and for the ADT still have not been adequately resolved (paras. 6.24-6.26).

5.5 Policies and Evaluation. The Government's policy to expand secondary student places was implemented during the project period through the project components, especially the addition of places at the PHSs and NHSs (para. 6.2). In addition, a study of longer-term expansion requirements for upper secondary education took place as planned, and the Government has attempted to appoint more local teachers to the PHSs and NHSs rather than expatriate teachers in an effort to control recurrent costs. The monitoring and evaluation work under the project was undertaken by NDOE's Research and Evaluation Unit (REU) which was provided with two additional staff.<sup>3/</sup> It was also expected that the PDOEs and the NHSs would be responsible for the regular monitoring of subsector performance.

5.6 Development of Materials. The PHS materials program was implemented by NDOE's Curriculum Unit (which later became the Curriculum Development Department (CDD)). Four CDD staff posts for writers of textbooks were supported under the Project including two for English and one each for science and social science. At appraisal, the CDD had adequate capacity in mathematics, although later it became necessary to hire a mathematics writer, also then supported under the Project.

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<sup>3/</sup> Two testing officers were also provided to the MSU.

5.7 A decision was taken during project design to use commercial publishers for these materials, as the NDOE printshop lacked the capacity for the quality and print runs required, and direct arrangements with overseas printers would have required additional expertise in layout, etc., within the CDD. Use of foreign publishers undeniably increased costs, however, and caused difficulties when the CDD was unable to meet contracted deadlines. This arrangement did give the CDD access to production expertise and to pictures to illustrate the books and other materials. It also improved the prospects for sustainability (para. 7.1).

5.8 Once the PHS materials had been produced, it was necessary to ensure distribution, most of which had to be done by air freight, a costly business in PNG. The officers in charge of distribution did an excellent job in difficult circumstances. They were assisted in their task by inspectors and others. In most cases, materials were sent to centrally-located PHSs and surrounding schools then arranged collection of their own materials from the central school.

5.9 For the English textbooks, a decision was made in 1983 to adapt an existing Singaporean English text. As this was an adaptation rather than an entirely new book, it freed a significant amount of money for purchase of additional English graded readers. In mathematics, when the Project commenced, books had already been prepared for grades 7 and 8 and project funds were used to complete the series for grades 9 and 10. However, in 1988 a decision was made to abandon this set of books and instead to adapt an Australian series of math books. New books were therefore prepared by the CDD for all four grades, causing the original grades 9 and 10 books to have a very short life span.

5.10 Slippages also occurred in the production of the adapted science book manuscripts, partly because the writers were called upon to perform other tasks in the CDD. In addition, the agreement with the overseas publisher for these books set over-ambitious target dates and compensation had to be paid by the NDOE for failure to adhere to the schedules. Also despite the intentions set out in the SAR, none of the science books was trialled in the schools.

5.11 The social science books encountered the greatest difficulties with resulting delays in their production when it proved more difficult than anticipated to secure qualified writers. In addition, the CDD lacked clearance procedures for the manuscripts to ensure their appropriateness, with the result that some completed and edited manuscripts were rejected outright. Difficulties were compounded by the introduction of a new "Philosophy of Education", personality clashes among key players and a restructuring of the CDD, all during the project implementation period.

5.12 Under the NHS materials component, one materials coordinator had already commenced his duties at the time of preparation of the SAR, and two teachers were recruited in 1986 as materials coordinators from existing NHS staff. These officers covered English (at Passam NHS) and science (at Aiyura NHS). The component had barely gotten underway, however, when it was afflicted by staffing instability and in the end all the officers were relocated to the CDD in Port Moresby, a move that was prompted by an extension

in 1987 of the CDD's work to include Grades 11 and 12. Problems in development of the NHS materials were subsequently compounded by the CDD policy of recruiting only generalist officers able to work at any level, from primary to senior secondary. By 1988, none of the officers recruited under this component of the Project was working exclusively on NHS materials.

5.13 Upgrading of Teachers. It was planned that under the Project, 300 Goroka Teachers College (GTC) and University of Papua New Guinea (UPNG) graduates would receive preservice training as PHS and NHS teachers (Part III, Table 4D). Provision was made to send 200 graduates of the two-year GTC program for PHS teachers, on for another year of training at UPNG to upgrade their subject matter knowledge before they started teaching. At the end of the year, which was the first year of UPNG's Bachelor of Education (BEd) course, they would receive an advanced diploma in education. Results were disappointing (para. 6.17) apparently due to a lack of sufficient incentives for the graduating teachers. They preferred to go immediately to work because of the significantly higher salaries they would receive compared to the allowances/tuition, etc. they would be paid as UPNG students. In addition, there was little promotion of the course at GTC and UPNG and no guarantee that a student might be funded in future to complete his or her BEd. Provision was also made to send 100 UPNG graduates with degrees in fields other than education to the one-year diploma program at UPNG to train them to become teachers in both PHSs and NHSs. Results again were disappointing (para. 6.17), as incentives paid were low and the graduates could usually find higher paying, more prestigious jobs than teaching with quicker opportunities for promotion, better working conditions and less actual work.

5.14 Through the Project's in-service teacher training component, an Advanced Diploma Unit (ADU) was established at the GTC. This Unit launched and operated the ADT program. The ADU originally consisted of four long-term staff in the core subjects who developed materials and taught during the residential sessions. This was later changed to 10 shorter-term positions when the program was expanded during the project implementation period to include upgrading in all 13 subjects in the PHS curriculum.

5.15 The SAR envisaged that trainees would undertake three months of residential training during their two-year course, by attending GTC twice a year. During the mid-year residential in July, it was expected that their regular school duties would be undertaken by preservice GTC students during their teaching practice periods at the schools. This proved difficult to organize, however, and the teachers' duties in general had to be undertaken by colleagues. Some school authorities were supportive while others resented the ADT teachers leaving for the residential sessions. The end-of-year residential in November was also unpopular as it took trainees away from their families over the Christmas period. These have both contributed to the program's low enrollments (para. 6.19).

5.16 The major cause of low enrollments, however, is apparently the lack of incentives. Teachers who complete the program do not automatically receive salary increases and the diploma is not very prestigious when compared to a degree. To rectify this, the ADU pushed for an NDOE/Teaching Service Commission (TSC) requirement that all teachers with a two-year preservice

diploma, would be required to gain a third year of training, that is, the ADT, to be eligible for promotion. The NDOE agreed to this, stipulating that the requirement would come into force from 1996. However, the TSC has been ambivalent about the move which has meant that a TSC order has not yet been issued requiring the third year of training for promotion eligibility.

5.17 A further cause of low enrollment in some subjects has been confusion about eligibility to take a course, as some teachers are teaching subjects in the PHSs for which they have not been trained. It would seem obvious that if teachers are actually teaching the subject and need help, they should be encouraged to attend the program, especially if they have no prior training. However, this causes a wide range of abilities and backgrounds within intakes, and the resulting high drop-out rate (para. 6.20) may have come from the pitching of some components at too high a level. This has been particularly the case in science, especially during the period in which ADT science graduates were granted credit points at UPNG (para. 6.24). A further difficulty arose from the fact that early materials were not conceived within a framework of distance education. The course designers saw the residential sessions as the main period for teaching and learning, and only as the Project proceeded did they reorient the materials to put the emphasis on distance education.

5.18 A series of three workshops were organized in 1988 and 1989 to deal with these and other problems in an effort to make the program more effective. These workshops were major events, attended by personnel from all relevant parts of PNG's education system. Detailed recommendations for improvement of the program resulted and were put into effect including only one residential period a year (commencing at the beginning of November and concluding just before Christmas) and focusing the ADT primarily on subject-matter upgrading as envisaged at appraisal, rather than on receiving credit toward UPNG's BEd program or on professional matters. It has now also been decided that the ADU will in future cease to exist as an autonomous entity, its staff will be merged with others in the in-service department of the GTC, and its resources will become part of a common funding pool. It will be a challenge for the authorities to achieve the best of all worlds within the new framework.

5.19 As planned, additional school inspectors were appointed, trained and provided with furnished houses, also equipped with simple office furniture. Funds were also provided to the PHSs and NHSs to recruit one or two additional ancillary staff to further ease the burden on teachers and allow them more time for classroom and ADT assignment preparation. It was also hoped by the appraisal team that this action among others would somehow help decrease the teacher attrition rate. Ancillary staff allocations were based on K250 per class and were mailed directly to the schools. Each school had to show how this money was spent each year before the next year's allocation was forwarded.

5.20 Expansion and Upgrading of Secondary Schools. In order to redress inequities in the provision of lower secondary school places, PHSs were constructed under the Project in disadvantaged provinces. Some of the schools were already under construction under the HSSP when the Project began and were then completed under the Project. Other schools were completely constructed

under the Project and still others were only started and were still under construction at the Closing Date. The provinces were expected to fund 50 percent of the cost of construction of the PHSs from their own budgets. During implementation, however, several provinces were unable to come up with their shares, forcing the NDOE to fund a higher proportion of the costs, up to as high as 100 percent in the case of some provinces (para. 4.2). The NDOE had to furnish and equip the schools as well. This funding problem led to delays in construction as did minor site problems and violence at some school sites. Budgetary constraints also affected the functioning of the national DWS which was responsible for managing the design and construction of the PHSs, and for several years during the implementation period it seemed to lack adequate manpower. The DWS was also responsible for construction of the additional facilities needed at the NHSs to accommodate the planned increase in enrollments.

5.21 Existing PHSs were upgraded under the Project through facilities maintenance grants. The size of the grants were determined using a formula based on the age and size of the PHSs. This provided the oldest and largest schools with the largest grants which then decreased down to nothing at all for the newest schools. As happened with the grants for ancillary staff (para. 5.19), checks were mailed each year directly from the NDOE to the schools. The government PHSs were encouraged to match these grants from their own funds while the church PHSs were required to match the grants. Each school had to show what it had done with each year's grant before the following year's checks would be sent out, although if a school desired, it could save the grants over the years for larger maintenance projects. Funds were also provided for upgrading at the NHSs which the SAR took to mean bettering the condition of their communal, workshop and laboratory spaces by refurbishing and possibly remodeling. This work was also managed by the national DWS. Also under the upgrading component, science and laboratory equipment was provided to the PHSs in the form of biology, chemistry and physics kits and, in the later years of the Project, direct grants to allow the schools to maintain the equipment items in adequate numbers.

## 6. Project Results

6.1 The results of the Project are summarized in Part III, Tables 4 and 6. During the implementation period the quantitative objective of increasing the output of secondary education was met, although some of this increase is not attributable to the Project (paras. 4.4 and 6.2). Effectiveness of secondary education was also improved quantitatively although how much the quantitative inputs contributed to qualitative improvement is harder to measure.

6.2 Policies and evaluation. Enrollment expansion took place as planned; indeed the Government had planned that secondary expansion at the PHSs would only be enough to maintain the enrollment ratio at this age level at 13 percent as it was in 1984 at the start of the project (Part III, Table 6A). In fact, by the original completion date in 1988, the ratio already stood at 15 percent where it remained in 1990. As mentioned in para. 4.4, this was due in part to provincial governments and various church agencies taking matters into their own hands in several cases and establishing

their own schools at the PHS level. It was also expected that the force-out rate for students leaving grade 8 would decrease from about 21 percent in 1984 to 17 percent in 1988. In fact, and in spite of the Bank's requirement that there be no grade 8 to 9 force-out in the PHSs constructed under the Project, the country's overall rate has apparently remained about the same throughout the project implementation period and continues at about 21 percent today. The number of PHS graduates has reached about 10,000 per year as expected.

6.3 NHS enrollments have also reached the modest numbers expected having climbed from 1,600 in 1984 to about 2,000 in 1990. This has increased Grade 12 graduates from about 800 to 1,000 a year. One of the aims for arranging this increase was to raise the utilization of existing post-secondary institutions in PNG. There has not been any observable effect on such utilization, however, and many of these institutions continue to have excess capacity.

6.4 The study of longer-term expansion requirements for upper secondary education, made five main recommendations and was widely circulated in the Government (Part III, Table 6B). Several of the recommendations have been or are to be implemented including curriculum revision, localization of teaching staff, higher base-level salaries for teachers and future enrollment expansion. Also as recommended, the preliminary year formerly held at PNG's universities for students who could then enter after Grade 10, has been eliminated and entering students must now have completed Grade 12.

6.5 The number of expatriate teachers in both the PHSs and NHSs has, in fact, declined over the project period as planned although it is not clear if this change has contributed to cost-control of recurrent costs in secondary education. In the PHSs, the percent of national teachers rose from about 76 percent in 1984 to 90 percent in 1990, while in the NHSs the percentage of national teachers rose from 11 percent to 44 percent over the same period. Although unit costs appear to have been declining as a result, not enough hard data is available to indicate conclusively that this is in fact, the case.

6.6 Monitoring and evaluation did take place under the Project although not quite as envisaged. Most of this work was undertaken by the REU although it had been expected that the PDOEs and the NHSs would be responsible for the regular monitoring of subsector performance. The latter apparently did not happen on any regular basis, however. Unit costs were not monitored by either group as expected (para. 6.5) and it was impossible to measure student achievement due to the kinds of examinations administered at the secondary level in PNG. These tests are "norm-referenced", that is, graded on a curve, rather than "criterion-referenced", which would allow comparisons of student achievement from year to year. Part III, Table 6A, shows the items that were monitored over the years by the REU.

6.7 Development of Materials and Upgrading of Teachers. The PHS materials program is one of the most important components of the Project. The materials are very visible and have done much to support the curriculum and to orient it more firmly to PNG society. Specifically, under the Project:

- (a) about 440,000 core subject books (24 titles) had been produced by the end of 1990 compared to the 450,000 envisaged in the SAR (Part III, Table 4A)). Another 169,000 (11 titles) were still in the pipeline. It is expected that the latter will be delivered by the end of 1992;
- (b) in addition to the textbooks, about 211,000 English readers, 3,000 supplementary mathematics books, 22,000 supplementary science books, 13,000 supplementary social science books and 17,000 non-core subject books were distributed for a total of about 266,000, exceeding the 250,000 planned at appraisal; and
- (c) other materials distributed included wall charts, protractors, calculators and sports kits.

6.8 The English core subject books were among the most successful even though there were some weaknesses in quality. The books contain many components unrelated to the life of PNG students which they do not really understand, caused partly because the books were an adaptation of existing foreign books.

6.9 More serious is the fact that the English books are widely reported to be used as substitutes for the syllabus. In the case of weak teachers, the fact that the book can be heavily relied upon may be an asset, for in this case lessons are probably better than they would be otherwise. However, it has also been reported that some teachers who in other circumstances would have looked around for alternative materials, no longer do so. Insofar as this is true, the books may have had a constraining effect which would depress standards at the top end.

6.10 Nevertheless, English teachers in general spoke positively about the English textbooks and the English readers in the "book flood". They reported that students eagerly sought out many of the book flood titles and undertook extensive reading in their spare time. Hard evidence is not available on the academic outcomes, but it may be assumed that learning was improved.

6.11 Little evaluation has been conducted of the ways the materials have actually been used in the classroom, or of the impact of the books on academic performance.<sup>4/</sup> As mentioned above (para. 6.6), since the grade 10

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<sup>4/</sup> The books are only partly aimed at improving academic achievement, however. For example, the philosophy guiding the writers of the math books was that:

Education in the future should provide all grade 10 graduates with more problem solving and decision-making skills. They should be able to apply these skills to everyday situations and have a more positive attitude to life.

examinations are norm- rather than criterion-referenced, it is impossible to identify changes from year to year by looking at examination scores. Some criterion-referenced tests to compare students' performance using the old and new books would have been desirable.

6.12 A further problem, with implications for sustainability, concerns the life span of the books. Although some schools have covered the books in plastic to prolong their life, plastic is not easily available everywhere and without covers the books are beginning to fall apart after just three years of use. Of even greater concern, however, is that in many schools a large proportion of the books disappear even before they have a chance to fall apart. For example, in one school visited, by July 1991, only 30 of the 176 grade 7 science books issued in 1988 were still available, less than one class set. In another school, of 226 books issued, only 48 remained. These two cases are far from unusual.

6.13 Of course, from one angle the latter picture can be viewed positively, as it would appear that the books are considered worth having as valuable possessions. Further, if the books are being read, it may be argued that they are still contributing to development of the country. However, as the loss of the books may prevent effective classroom teaching, the whole purpose of the project component is defeated. This loss is due in large part to management deficiencies at the school level. Some schools do charge students for lost books, but such monies usually go into the general school account rather than to replace the lost books.

6.14 To help in tackling this issue, the NDOE urgently needs a clear policy on textbook replacement. Reports issued in 1987 (Carmelle Denning's 'Textbook Policy Review Study') and 1989 (Hugh Frame's report on primary school textbooks) address this matter although no action was taken in the NDOE until July 1991. At that time, a textbook policy was drafted for later discussion by the provincial Ministers of Education. Questions of responsibility for reprinting, restocking and payment still need to be resolved.

6.15 The main achievements in the NHS materials sub-component were in the early years of the project when some useful syllabus work in English and science was done. By 1989, the NHSs began teaching a common English program. In contrast to English and science, however, the social science officers found it difficult to develop revised syllabi for their subject, and little work was done in mathematics. In 1989, the REU prepared an initial evaluation study of the NHS project inputs. This study was based on documentation available within the NDOE and some interviews. More substantial evaluation has not yet been conducted.

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This seems to express a desire to reorient the curriculum rather than merely to achieve greater learning within the old curriculum. Similar aspirations were behind the strong effort to inject PNG relevance into the science, social science and English books.



6.16 Also during project implementation, grants totalling K 536,100 (slightly higher than the SAR estimate of K 511,700) for the purchase of library books were sent to the PHSs. In addition, similar grants totalling K 176,600 were sent to the four NHSs. Only two NHSs made full use of the opportunity to upgrade their libraries, however. The other two failed to provide satisfactory acquittals, with the result that their institutions were disqualified from further funding and total expenditure on this sub-component was well below the target figure of K 307,200.

6.17 Upgrading of Teachers. In the preservice training component, over the life of the Project only 47 GTC graduates out of the 200 expected, actually took advantage of the opportunity for immediate further study. Similarly, there was a disappointing response to the one-year diploma program at UPNG to train UPNG graduates in fields other than education, to become teachers in both PHSs and NHSs. Only 47 students completed this program out of the 100 expected.

6.18 During implementation, 406 teachers (for 146.5 staff years) participated in the in-service teacher training two-year part-correspondence/part-residential ADT courses. Of these teachers, only 121 had successfully completed their training by the end of the Project out of the 325 expected (Part III, Table 4b). Several additional teachers had not completed all their assignments but were expected to do so before November 1991.

6.19 Almost from the beginning the ADT program suffered from low enrollments and high drop-out rates. It was expected that 20 teachers would enroll in each intake for each subject. Early on, enrollments matched this target but later dropped, and by 1990, only 48 teachers enrolled for the four subjects offered.

6.20 The high drop-out rate is illustrated in the table below.

6.21 Due to these low enrollment and high drop-out rates, recurrent costs per student are so far high. In 1989, costs were estimated at K 14,549 per graduate, over four times the planned unit cost of K 3,433. However, this figure could be reduced if efforts to persuade deferred students to complete their studies are successful.

6.22 Although the ADT program has been the focus of some attention from the REU, it is difficult to make firm statements on its impact. Some headteachers have observed improvements in the subject knowledge, professional performance and self-confidence of their teachers. Also trainees have spoken positively about the program. Other headteachers and inspectors have been very critical, however.

6.23 Given the diversity of these views, it is unfortunate that a more thorough evaluation of the program has not been made. Considerable resources have been devoted to it, and the NDOE is committed to continuing their support. This commitment is very welcome for project sustainability, but in the absence of firm evidence on the cost-effectiveness of the program, it is not surprising that the decision to maintain program funding has attracted some criticism.

Drop-out Rates from the ADT Course

Intake	<u>Number attending residentials</u>				Total graduates
	1st	2nd	3rd	4th	
1	42	36	32	29	25
2	76	62	54	41	27
3	48	38	32	25	24
4	28	23	16	16	16
5	42	31	25	27	13
5 (home economics)	6 students took part in new format <u>/a</u>				2
6	40	34	28	25	14
7 (home economics)	11 students taking part in new format				-
8	54	49	-	-	-

/a Because of the special difficulties facing women trainees, particularly mothers, a special structure was arranged for home economics courses. These courses were operated on a regional basis in East New Britain and Morobe provinces. Instead of requiring the students to come to GTC for residential sessions, the lecturer travelled to the students. This model was employed for two intakes and then abandoned because of the high cost.

6.24 Several issues affecting the ADT remain unresolved. The issue of UPNG accreditation of the program toward the in-service BEd has been particularly vexed. Since 1985, English graduates of the program have been given 24 credit points, equivalent to a full year, and social science graduates have received 21 credit points. Professional studies also gain three credit points. Other courses receive no credit. (UPNG also gave science 12 credit points until the ADU decided to simplify the course and delink it from UPNG requirements.) There has been constant tension between the need to upgrade the teachers in the lower ability ranges and the need to meet UPNG expectations for the courses for which it allows credit. The proposal in the SAR was not adequately thought through, and credit arrangements have created more problems than they have solved.

6.25 Questions also remain on the use of tutors in the program. The recommendation that the ADU recruit tutors arose from a desire to improve support for the trainees at the school level, and to increase the amount of learning between residential sessions, especially now that the number and length of these sessions has been reduced. Tutors are not available, however, in all areas where needed and this matter needs to be examined carefully.

6.26 Finally, ambiguities persist on the financial side. Although the NDOE has agreed to continue funding the ADT for the next few years (NDOE's budget is completely separate from GTC/UPNG's), GTC is concerned that the commitment is vulnerable to budget cuts. From the NDOE side, the fact that

the ADT will cease to operate as an independent unit (para. 5.18) will make it difficult to keep track of precisely for what the NDOE funds are being spent.

6.27 Additional in-service training was provided for senior PHS teachers. It was planned that 25 such teachers would complete UPNG's two-year BEd course. In fact, by the closing date, 28 had completed the course and 4 had completed the first year (out of 39 who began these studies. The others either failed or withdrew). In addition, 25 PHS teachers participated in a new librarianship course at UPNG in 1990 and 9 participated in the first year of a new agriculture course at GTC also introduced in 1990. NHS teachers too were given in-service training. 10 staff years were provided for BEd training at UPNG. In the end, 12 teachers enrolled of whom 7 completed the one-year post-graduate diploma in education course and 3 received their BEds. Of the 8 scheduled for one-year training overseas, only 5 were sent of whom 2 received masters degrees and 3 diplomas. The reason for the lower than expected numbers in this case and the high drop-out rate from some of the programs seems to stem from poor selection procedures which failed to identify suitable candidates.

6.28 Six additional inspectors were appointed under the teacher support component of the Project as planned resulting in a full complement of one in each of the 20 provinces. Inspectors continue to inhabit the houses provided for them under the Project, although in some cases they are now community school inspectors, following the transfer of several of the PHS inspectors to other locations in the provinces. Nine inspectors were trained over the life of the Project in the two-year BEd program at UPNG of whom 5 graduated, 3 withdrew and 1 had completed the first year of his studies by the closing date.

6.29 In general, the system of providing funds to the PHSs and NHSs to hire ancillary staff worked very well and all but a few schools were able to acquit their grants each year in time to receive the following year's grant. This component was very popular although it cannot be shown to have helped in a decrease of teacher attrition rates as was expected (Part III, Table 6A). Nevertheless, it continues to be a part of PNG's recurrent education budget.

6.30 Expansion and Upgrading of Secondary Schools. The project component to expand the numbers of PHSs met its goal, with some help from outside sources, to redress provincial inequities in the provision of school places. Part III, Table 4C, shows the planned and actual numbers of PHSs constructed in the disadvantaged provinces. Six project schools were dropped in 1988 as mentioned in para. 4.4, an action which was in line with Bank thinking at the time, while one school was added at Tapini in Central Province. Also during the project implementation period, nine new PHSs (5 church agency and 4 provincial government) were constructed outside the Project <sup>5/</sup> and most provincial governments added new classrooms to existing schools. The result

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<sup>5/</sup> The Government apparently has little control over construction or siting of schools by the church agencies. The agency only has to demonstrate that it is capable of running a school and that it will abide by the Government's rules.

was that overall student enrollments increased from 44,000 at appraisal to 52,550 by 1990 (Part III, Table 6A). As planned, enrollment ratios in the disadvantaged provinces increased as shown in Part III, Table 4C. These ratios although higher, are still far from satisfactory, however, with some provinces not yet even reaching the average enrollment ratio in 1982 of 13 percent.

6.31 Also as planned at appraisal, the NHSs were increased in size to allow them each to enroll an additional 100 students, expected to increase overall enrollment at this level by 400. This did, in fact, happen (Part III, Table 6A). Sufficient facilities were constructed at all four to absorb the additional students, although at appraisal it was estimated that existing classrooms would be used while dormitories and staff houses would have to be constructed at each. The NDOE found though that the schools were unable (or unwilling) to schedule for the additional students using their existing space and therefore each NHS also constructed additional classrooms, science blocks, etc., to cater for the new students, all under the NHS "upgrading" component (para. 6.33).

6.32 The project component to upgrade existing provincial high schools was also very popular. At appraisal in 1984, 88 of the 110 PHSs then in the system (both government and church) were eligible for the facilities maintenance grants. This number increased to 100 out of 127 schools in 1988 as the schools aged, although the percentage of schools actually reached (about 80 percent in both cases) remained the same. The PIU feels that all schools in the system should have received these grants and that the amounts should have risen more than they did over the years. In fact, as the church schools were required to match the funds provided for maintenance and the PHSs were only encouraged to do so, the church schools had an advantage, although in some provinces matching funds were provided for the PHSs by the provincial governments.

6.33 Upgrading costs at the four NHSs exceeded estimated costs by almost 80 percent. The NDOE apparently interpreted upgrading to mean not only the refurbishing of existing facilities but also the building of new facilities at the NHSs, based on their estimate of the schools' needs, and in fact did so, including new classrooms, science blocks, dining hall-kitchens, dormitories and staff houses. Several existing buildings were also extended and some work was done on water systems. Existing facilities were, of course, also refurbished. Apparently the NDOE had planned this work from the beginning of the Project. This is a case where there was a certain amount of miscommunication between the Bank and the NDOE as to the scope of a component as outlined in the SAR.

6.34 Science and laboratory equipment was provided to all PHSs. This was another popular project component. In addition, toward the end of the Project, grants were sent to the country's 106 vocational centers to allow them to purchase much-needed home economics, agriculture, manual arts and commercial equipment for their classrooms. Again no evaluation has been done to determine the effect of the new equipment on the quality of science education at the PHSs, but interviews with teachers indicate that the equipment has allowed them to better demonstrate science experiments to their

classes. It was not clear, however, whether more experiments were actually conducted by the students themselves. Both the top-up grants for science equipment to the PHSs and the equipment grants to the vocational schools are continuing under the present education recurrent budget.

## 7. Project Sustainability

7.1 The PHSs and NHSs constructed or expanded under the Project have entered the Government's regular school system and are being sustained as part of that system. Schools under construction at the close of the Project have since been completed. The NDOE is also committed to continuing its support for the ADT program at GTC and so far is living up to that commitment. The merging of the ADU into the GTC (para. 5.18) and the possibility that a third year of training for PHS teachers will become required for promotion (para. 5.16) will also both help to prolong this commitment. Once the Government makes a final decision on a textbook replacement policy, textbooks will automatically be supplied in adequate numbers and, in fact, their further provision is a large component in the proposed Education Development Project for PNG. The provision of textbooks has been made easier by the contracts signed under this Project with overseas publishers for their publication (para. 5.7), which means that further print runs can be ordered directly from the publishers under the existing contracts. The most visible of the components under this Project that are continuing to be funded under the Government's recurrent budget for education are the grants to the PHSs and NHSs for maintenance, ancillary staff, science equipment and library books. These are so popular with school staff and students and with the parents that they are likely to remain a part of the recurrent budget for the foreseeable future unless serious budget cuts are demanded by forces outside the NDOE's control.

## 8. Bank Performance

8.1 The Bank performed reasonably well during the preparation and implementation of this Project, although it should have undertaken the project preparation work itself instead of assigning that task to Unesco. Unesco apparently did not reach agreement on the project components with the Government during its 1982 preparation mission to PNG, meaning that the Bank appraisal mission had to start over from the beginning. A single Bank architect who participated in the appraisal also undertook most of the supervision. This continuity is beneficial in many ways, but also meant that issues surrounding evaluation, monitoring, testing and the studies during the implementation period did not receive as much attention as they probably should have (Part III, Table 8).

8.2 Lessons learned. Several lessons were learned by the Bank during the course of implementing this Project and preparing the PCR as follows:

- (a) programs being newly established with project funding (such as the ADT and to a lesser degree, the preservice teacher training programs) should be closely examined at their conception and an attempt made to take into account all variables that may come into play, especially, in the case of PNG, incentives for people to

participate. This would not only provide a more accurate estimate of the costs, but would save endless discussion and disagreement over details during implementation. Bank staff simply must be completely realistic in the PNG context over the chances of success of any new program;

- (b) attention must be paid at appraisal to the methods of evaluation and monitoring of a project to make sure that systems are in place that will provide adequate and useful data over the life of the project to allow meaningful evaluation and monitoring;
- (c) more educators should participate in the actual supervision of education projects to look specifically at educational matters. (Even for educators, hardware issues are easier to deal with than softer ones.) This not only helps focus attention on important educational issues but helps the educators to understand the difficulties of actual implementation which should lead to more realistically-designed projects; and
- (d) the Bank must ensure that appropriate counterpart staff are appointed as assistants to expatriate implementation staff as necessary (para. 9.1), in order to build up project implementation expertise in the NDOE.

## 9. Borrower Performance

9.1 Except for two or three years during project implementation when budgets were very low for education in general, the Borrower performed very well indeed in implementation of the Project. NDOE management was steadily supportive, and the Project Implementation Unit (PIU) was adequately staffed, housed and supplied during the entire implementation period. Its place in the hierarchy of the NDOE was clear. It had a direct line of communication to an Assistant Secretary and the freedom from bureaucratic red tape (at least within the NDOE) to do the job. The NDOE recruited a very competent expatriate working in PNG to head the PIU, and he over the life of the Project, earned the trust and admiration of staff at all levels with whom he came in contact. One important step NDOE failed to take, however, was to appoint a satisfactory local counterpart to the Project Manager, in spite of his and the Bank's urging them to do so. This means that no experienced local staff are so far available to take over the coordination of project implementation in future. The Project Management Committee (PMC) met quarterly and provided valuable guidance to the NDOE/PIU and the DWS on policy and other matters as necessary. Consultants were recruited directly by the NDOE division or department that was going to use their services. The NDOE was also able to increase its funding share for construction of the PHSs when it became absolutely necessary, and by sending the grant checks directly to the schools, ensured that the funds ended up where they belonged, that is, in the hands of the headmasters and the parents' associations. This bypassing of the PDOEs didn't, however, contribute much to their learning to assist with project implementation.

9.2 Lessons learned. The Government, having learned in the past that many of the PDOEs are unable to adequately manage education in their provinces, under this Project made sure that funds intended for particular purposes at the PHSs were received in full by the schools and then spent for the assigned purposes. This was done as mentioned above, by forwarding checks directly to the schools. The Government also learned several additional lessons during the implementation of this Project:

- (a) the provinces, understandably, cannot be depended upon to budget large sums of money for their education systems even when matching funds are available from the national government;
- (b) the system for distribution of textbooks and educational materials to PHSs and primary schools should be improved to increase efficiency and decrease costs;
- (c) a system must be put into place to ensure that textbooks and educational materials distributed to the PHSs remain in the schools and are not unnecessarily lost to the system. Also a way of protecting the books to increase their life span should be established;
- (d) book development is a complicated process and much care needs to be taken by the CDD to ensure that (i) competent staff is in place, on time, and in the case of expatriates, for long enough periods to become familiar with PNG and its culture, (ii) decisions on which books to develop should be carefully considered so that newly developed textbooks are not then abandoned, (iii) care should also be taken that books to be adapted are suitable for PNG, (iv) target dates for submission of materials to overseas publishers should be realistic and (v) there should be well-defined clearance procedures within the CDD so that books being inappropriately prepared are quickly discovered;
- (e) PNG students are eager to read if appropriate materials are available;
- (f) a suitable textbook replacement policy should finally be decided upon;
- (g) if some schools are unable to prepare the minimal paperwork or undertake the actions necessary to allow them to receive benefits under education projects (in this case, the two NHSs who were unable to acquit their library book grants), they may have to be assisted to do so; and
- (h) the full utilization of post-secondary facilities should be the focus of a separate exercise that would look at all post-secondary institutions in the country to determine if some of them should be closed and others combined; the hope of fuller utilization should not be based merely on increasing the number of Grade 12 graduates.

## 10. Project Relationships

10.1 The Bank and the NDOE/PIU had and still have an excellent relationship with each other. Both groups also have a good relationship with the DWS, the GTC and the project schools. The problems during implementation came as a result of the relationship of the NDOE and the Bank with the Program Implementation Unit of the Department of Finance and Planning (DFP). Partway through the Project, in a time of budget constraints, the Government decided, on the recommendation of this Unit, to emphasize the productive sectors at the expense of the human resources sectors. The NDOE was unable to change this decision which led to the aborting of a proposed second primary education project after it had been appraised by the Bank in 1986, and to financial problems for this Project and for education in general.

## 11. Consulting Services

11.1 Very few consultants were actually employed under the Project except for those who undertook the study on secondary education and the PIU staff (Part III, Table 4D). Expatriate staff on long-term contracts played a major role, however, both in development of the ADT program and in the CDD where they were responsible for writing and/or adapting the textbooks. Expatriates also teach at the PHSs and NHSs. Many expatriates are recruited locally and in general they perform very well. Efforts are continually being made, however, to localize the staff of all these institutions. GTC has made a special effort to localize ADU staff and has been reasonably successful.

## 12. Project Documentation and Data

12.1 The Loan Agreement for this Project contained no special covenants (Part III, Table 7), a decision that was correct considering the relatively minor problems that surfaced during project implementation. The SAR along with the Working Papers provided a useful framework for project implementation, except that, as mentioned, more thoughtful detail would have been useful for implementing both the ADT program and for monitoring and evaluation. More data on the Project's physical implementation than was strictly necessary was made available to the completion mission although, also as mentioned (para. 6.1), data showing that quality improved as a result of the Project was not available.



## PART II. Project Review from the Borrower's Perspective

### 13. Introduction

13.1 The guidelines provided by the World Bank for improving the quality of education PCRs state that they are to be divided into three parts. Parts I and III are the responsibility of the World Bank while the Borrower is responsible for Part II. The discussion in Part II provides the views of the Borrower and presents an independent analysis of the lessons learned and should include a review of the performance of all parties during project implementation.

13.2 In PNG, The Secondary Education Project is more commonly referred to as Education III. The World Bank mission of July 1991, through a project completion brief, identified the major issues to be stressed and the information needed to illuminate the discussion of the issues in Part II. The Project Manager's report presented to the mission provided adequate data for Parts I and III.

13.3 This draft of Part II represents the efforts of the Principal REU Officer and the Project Manager; therefore, the analysis and discussion reflect their experience and interpretation of the data compiled over the project period. However, on many issues views from other key NDOE officers were obtained to provide as balanced a view as possible.

13.4 This report begins with a discussion of project preparation as negotiated between the concerned parties. Next, it focuses on the design and organization of the Project followed by the main implementation issues. The report concludes with a summary statement. Throughout the report, performance and lessons learnt at each stage of the Project are emphasized and the thrust of the main points is indicated by italic bold type.

### 14. Project Preparation

14.1 Lessons learnt from the Primary Education Project (called Education II), especially those related to the extensive consultation and negotiations needed among all parties, were used in preparing for Education III. The loan request presented to the Bank was prepared by a Review Committee and a Working Committee. The Working Committee was composed of senior NDOE officers assisted by UNESCO staff, and visited all the provinces, to identify subprojects with high provincial priority. The main components of the Project were derived after extensive consultations and negotiations between the national and provincial levels of government within PNG. However, failure to develop sufficiently detailed implementation plans at the project preparation stage has been found to be a major concern.

14.2 The need to have skilled level manpower to replace expatriates in the formal employment sector was paramount in project preparation. It was noted that despite the efforts made to develop middle and higher level manpower, effectiveness was hampered by weaknesses in policies for PHS and NHS

enrollment expansion and cost-control, and in subsector planning and evaluation; by insufficient support for the provision of appropriate instructional materials and for the upgrading of the national teaching force; by inequities in the provincial distribution of school places; and by inadequacies in existing facilities.

### Overview

14.3 The Education Act of 1970 states that national and provincial education plans should be developed. The main change since independence in 1975 has been a shift towards more local control or decentralization of education. However, experience over the years has shown that there is a general lack of planning capacity at the provincial and national levels which has resulted in poor coordination and inefficient use of education resources. At the national level, the Government has recognized the importance of human resource development as a stated policy.

14.4 The main mechanism used by government agencies to allocate development resources in the past has been the National Public Expenditure Plan (NPEP). However, the problem with NPEP was it failed to encourage multi-year or sectoral planning because of the criteria it used for funding. PNG's officially approved approaches to planning have altered substantially over time. A current example is the simultaneous endorsement of the Resource Management System and of Program Budgeting. The main concern with these approaches is to what extent they are compatible and can inter-relate and how educational planning should best link up with each. Although attempts have been made to develop improved strategies for planning, it has been difficult to reach consensus on a national education plan.

14.5 The NDOE Planning Unit's efforts to undertake medium-term planning for both primary and secondary education have been inadequate because they focus mainly on school buildings and staffing considerations rather than on strengthening sector effectiveness. In addition, qualified education manpower to carry out planning tasks is not available either at the national or provincial levels.

14.6 As there was no official education plan in place, the original Education III proposal drafted by the Government in 1982, organized the project into four sectors--PHS, NHS, College of External Studies <sup>6/</sup> and management and support services--and planned for implementation to begin in 1984 and run to 1988. The revised proposal covered all facets of lower and upper secondary education activities as well as new starts. After Education II, which was aimed at addressing the problems facing community schools, Education III's aim was to raise the number of students at the middle and upper levels of secondary education. To ensure successful implementation, Education III was built into the existing structure of the NDOE and its budget processes.

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<sup>6/</sup> Now the College of Distance Education (CODE).

14.7 The overall aim of Education III was to improve the effectiveness of secondary education so that national manpower could be developed. This aim was to be realized through strengthened implementation of policies and evaluation practices; provision of appropriate teaching materials and upgrading of the national teaching force; and expansion of school places and upgrading of existing facilities. The final project included capital works, equipment, materials, additional staff and staff upgrading.

14.8 The major elements of the Project included the following:

(a) Policies and Evaluation:

- (i) study and implement enrollment expansion and cost-control policies designed to improve the match between the supply of secondary school graduates and the demand for manpower and increase the cost-effectiveness of secondary education; and
- (ii) strengthen the NDOE's MSU to support improvement in education planning;

(b) Development of Materials and Upgrading of Teachers:

- (i) strengthen the NDOE CDD and provide materials coordinators for the NHSs, to prepare and provide curriculum related textbooks and other learning materials for PHS and NHS students, respectively; and
- (iii) introduce a revised program of preservice and expanded in-service training for national teachers to improve their subject matter knowledge, and provide additional inspectors and school administration staff to strengthen support for staff;

(c) Expansion and Upgrading of Secondary Schools:

- (i) provide approximately 4,500 new student places in PHSs to be located primarily in provinces with below average enrollment ratios to reduce inequalities in the distribution of school places and to support expansion;
- (ii) expand existing NHSs to support a planned increase in enrollment of about 400 students; and
- (iii) upgrade physical facilities at existing PHSs and NHSs on the basis of need, and provide additional science equipment at PHSs to complement planned improvement in the quality of materials and teaching; and

- (d) Preparation for Education IV: This was a Bank initiative and was aimed at having funds set aside to finance studies and other activities for the preparation of a future project that could be submitted to the Bank.

### Government Performance

14.9 Having learnt from the Education II Project, the Government went through extensive preparation for Education III. The Project was developed through liaison and consultation with the provinces and absorbed the interest and energy of many people including overseas consultants. Apart from setting up the Working Committee (para. 14.1), many meetings and conferences were held at all levels to discuss the Project. This resulted in many changes of emphasis as major problems of teacher frustration, teacher attrition and localization were recognized. The resultant subprojects were the ones the provinces claimed to have the highest priority.

### Lessons

14.10 Since independence in 1975, no real effort has been made to have a coordinated strategy for the education sector as a whole. Although several attempts have been made, these were unsuccessful because consensus has not been reached on a national component of an education plan and due to the lack of any line authority for the entire system. The situation whereby many different agents are involved in defining priorities, allocating resources and determining policies remains. If a nationwide education strategy and corresponding measures are to be agreed upon and implemented, there is need to introduce improved mechanisms for sector policy making, resource allocation and management. Further, the efforts of the national government, the provinces and the cooperating agencies must be coordinated, and they must be encouraged and mobilized to develop workable plans.

14.11 Many of the elements of the Resource Management System which requires the development of sets of projects and activities in relation to clear objectives that address peoples' needs and concerns, can help in planning. More recently, NDOE's move into Program Budgeting, which involves grouping the Department's tasks into operational categories, allocating budgetary funds and manpower to each specific operation, establishing targets and thereby measuring efficiency should also assist in planning. Resource Management and Program Budgeting approaches are compatible and even complementary, and their sensible implementation should benefit educational planning. What is required is a department policy on how the education sector should respond to conflicting planning systems.

14.12 The Planning Unit of NDOE, if it functions properly, should co-ordinate planning as well as collect data. However, so far, this potential is unrealized mainly because key positions in the Unit have never been filled. In addition, experienced manpower is limited within the Unit and efforts made to train appropriate manpower have not always been successful because officers trained for specific positions are often moved to other positions.

14.13 To ensure that the NDOE coordinates well with other line Departments in liaising with aid donors, a position of Coordinator of Overseas Aid was established to be attached to the DFP although located at the NDOE. This person was to maintain links with the DFP to help define and schedule types and levels of support. However, this position remained vacant throughout the

life of the Project and funding was later downgraded. Stronger efforts must be made to ensure an officer is recruited to fill this position due to the vital role it will play in coordination with aid donors.

#### 15. Implementation

15.1 The Project, originally planned for 4½ years with an additional year for final disbursements, was extended and implemented over a period of about 6½ years. The closing date originally set for 1989 was extended by 12 months due to delays in curriculum development and textbook production and to allow time to draw-down the Loan.

#### Government Performance

15.2 The unreliable data provided at the NDOE level has made it difficult to measure the impact of the Project. The system whereby schools forward data through provincial authorities without proper supervision and checking for accuracy has not been very effective. While education data are probably more reliable than those available to other sectors, many problems do exist. The main statistics on different sub-sectors suffer from problems of inaccurate school returns and administrative inertia in updating school returns, and from clerical errors.

15.3 However, the provision of annual Project Indicators Reports by the REU and the Project Manager's Quarterly Reports made it possible to monitor the progress made towards attainment of the Project's educational objectives. Data provided suggest that enrollment targets and graduation rates have been exceeded while grades 8 to 9 transition rates and student:teacher ratio targets have not been achieved. Female rates of retention have deteriorated slightly since 1981, and in some provinces the situation is serious.

15.4 Delays in the recruitment of key contract officers have resulted in vital tasks not being completed on time. In the case of textbook production, delays by Department of Personnel Management in approving contracts for curriculum writers resulted in slippages in textbook production. Further, the policy of awarding three-year contracts did not help matters because officers recruited did not have enough time to adjust to the PNG environment before their contracts expired.

15.5 Funds provided by the DFP were not always adequate to implement planned project activities and draw-down the Loan in 5½ years. This is why the closing date was extended by one year. Overall, although Education III fared well in the budget, its yearly allocation did not grow as anticipated and it was impossible to make provision for price increases and other contingencies as envisaged in the SAR. The problem was more serious in the early years of project implementation when manpower and expenditure ceilings were imposed by the DFP. The DFP treated project activities as recurrent rather than development activities resulting in budget cuts. Repeated calls for special consideration fell on deaf ears up until 1989, when DFP became aware of the problem of uncommitted loan funds associated with poorly implemented projects.

15.6 Due to design weaknesses some of the sub-projects were only partially successful. For the textbook development component, major problems were related to how effectively the CDD could develop appropriate books. Lack of clear direction by Senior Curriculum Officers and lack of funds for writing workshops also hampered textbook development. Furthermore, although the study conducted on textbook production highlighted the need to have a textbook replacement policy, the Department still does not have one. PNG also lacks capacity and managerial experience in the complex areas of book publishing in the quantities and to the quality required. To resolve this problem, the CDD on behalf of NDOE entered into joint publishing arrangements with Australian publishers.

15.7 For the ADT program, although funding commitments remained unchanged during the life of the Project, the overall success rate has not been impressive. The original plan did not allow for a Director due to an apparent oversight during project preparation. Schools and provinces developed negative attitudes because the course was disruptive to schools, especially when teachers left for the course in the middle of a busy school program. Furthermore, problems related to inappropriate distance study materials and many teachers' inability to do distance study assignments on top of their normal duties were reasons for the high attrition rates.

15.8 Shortcomings with the fellowship program included faults with the selection procedures. Fewer than the planned numbers of NHS and CODE officers were identified to undertake overseas studies and of those selected, not all were able to cope with the courses. This was evident at UPNG, where teachers and inspectors failed examinations, and overseas, where officers had to switch from degree to diploma courses.

15.9 With the capital works program, difficulties of land acquisition, a poor choice of some sites, inadequate national government funding and the inability of provincial governments to meet their 50 percent contributions towards construction costs were the main problems encountered. Slippages were also caused by delays in assessing tenders and awarding contracts. These shortcomings were difficult to put right but national government funding for new schools was increased from 50 to 100 percent which helped to speed up their construction.

15.10 The more successful sub-projects included the high schools grant-in-aid program which provided much needed support, especially in building maintenance, the purchase of library books and science equipment and the recruitment of ancillary staff. Schools appreciated this program because they received the grants directly and used the funds in the areas of most immediate need. However, funds available were rarely matched by provincial governments and maintenance funds were inadequate to solve problems at the older high schools.

15.11 Achievements were made in expanding the secondary school inspectorate, increasing upper secondary enrollments by 25 percent, creating new high school places in disadvantaged provinces, upgrading existing NHSs, and providing furniture and equipment to new high schools and textbooks,

English readers and science equipment to all schools. The greatest achievement is the continuation of the grant-in-aid program in 1991 and 1992 and the likelihood that it will become a permanent feature of the Department Support Program for the schools.

15.12 Funds were set aside to finance pre-investment studies or other activities preparatory to an eventual fourth project that could be submitted to the World Bank. These funds were used to conduct major studies on Upper Secondary Education and Non-Formal Education plus a short-term study on Textbook Production. However, severe budgetary restraints imposed on the NDOE by a new Government more interested in the development of the economic sector than in the neglect of social services, at that time put an end to future projects.

### Lessons

15.13 There is a great need to improve education data collection, compilation, storage and management and the retrieval system. NDOE's Planning Unit has been understaffed and this has resulted in the data collected and provided being unreliable at times. The current system of collecting data from schools through the provinces needs to include the checking of the data for accuracy. The use of high school inspectors or Senior Professional Assistants to perform this task should be investigated.

15.14 Department of Personnel Management recruitment procedures need to be carefully examined to ensure that urgently required contract officers are recruited without delay so they can complete their assigned tasks within the project period. Some textbook writers/developers arrived too late to really have an impact on textbook development because their terms of office did not take into consideration the time it takes to gain familiarity with PNG bureaucratic procedures and culture. Such specially recruited contract officers should not be placed in line positions. They should be supernumerary, extra positions established for the life of the project.

15.15 Funds appropriated by the DFP for the execution of the Project were not always adequate to facilitate its implementation or the drawing down of the Loan in six years as originally envisaged. This was one of the main reasons why it was necessary to extend the closing date by one year. Measures need to be taken to ensure that future projects are adequately funded to speed up disbursements and generate much needed revenue for the Government. The DFP should be made aware of the problems encountered when project activities are treated as recurrent activities when budget cuts are applied. The project design should have been more thorough and provided detailed implementation plans for the subprojects developed. The SAR and the working papers gave only a general outline of the aims and basic strategies and failed to provide detailed operational plans for individual subprojects. It seems that the complexity of some of the project activities were underestimated during project planning.

## 16. Summary

16.1 Education III aimed at developing qualified manpower at the middle and higher levels by increasing the number of grade 10 and grade 12 graduates and by improving the effectiveness of secondary education through the provision of textbooks, library books and science equipment, the upgrading of the teaching force, increased support for teachers through additional inspectors and ancillary staff and the upgrading of existing older schools.

16.2 The NDOE from the outset made every attempt to take into account the views of all relevant parties in the preparation of the Project including the Bank and the national and provincial governments. The main components of the Project were derived after extensive consultation and negotiations between the national and provincial levels of government within PNG.

16.3 Weaknesses in the development of detailed operational plans during project preparation were found later to be a major concern. This resulted in a number of problems encountered in the textbook development and teacher education subprojects. Further, difficulties of land acquisition, inadequate national government funding and the inability of the provincial governments to meet their 50 percent contributions towards construction costs are reasons why some of the subproject implementation was not so successful. NDOE resolved some of the problems while for others, due to government priorities and procedures at the time, very little was done.

16.4 The overall performance of the NDOE in project management and monitoring was more than satisfactory. The Bank's support for, and relationship with, the Government was good. The Project was managed and monitored well as the result of the strengthening of the project management team. The Project was fortunate that there were only a few changes in project management personnel throughout its life. The PMC was effective in dealing with administrative, financial and coordination problems. The Project Manager's Quarterly Reports and minutes and background papers of each PMC meeting, forwarded to the World Bank, became the main form of communication and allowed the Bank to monitor project progress.

16.5 The Project was implemented over a period of 6½ years from mid-1984 to the end of 1990. The closure of the Panguna Copper Mine in 1989 and the low prices for export commodities forced the Government to reduce its services and as a result, funds provided by the DFP were not adequate to implement the planned Project and draw down the Loan in 5½ years. Thus the level of funding available made it necessary to extend the closing date by one year to 1990.

16.6 The impact of Education III has been significant, especially in the provision of appropriate instructional materials, the upgrading of the teaching force and, even more so, in upgrading institutional facilities. Also important but not visible is the technical assistance given to education administration personnel both at the provincial and national levels.

16.7 Although the Government is aware of the need to develop a mechanism that fosters joint decision-making, consensus of direction and rational



funding, so far no such mechanism is in place. In 1990, the last year of the Project, NDOE began preparation to switch to Program Budgeting in 1991. The project activities for the 1990 budget were translated into a Program Budgeting format which was used in the 1991 budget preparations, and ensured that all of the activities returned to various NDOE Divisions after project completion were able to continue with adequate funds.

16.8 Finally, Education III after a slow hesitant start, gathered momentum until the end. The Project was a positive force in bringing about improvements in secondary education. A lot of people were happy about the Project. The schools gained a lot because they received grants directly and lots of textbooks and equipment; governments of disadvantaged provinces benefited because schools were built at little cost to them; NDOE gained by having standard designs for high school buildings revised and improved and the implementation of the HSSP and Education III capital works boosted performance. The Bank was also happy because most of the Project's objectives were met and its Loan was drawn-down within a reasonable period.

**PART III. Statistical Information**

**Table 1: RELATED BANK LOANS/CREDITS**

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<b>Loan/Credit Title</b>	<b>Purpose</b>	<b>Year of approval</b>	<b>Status</b>	<b>Comments</b>
<b>Primary Education Project (Credit 1087/ Loan 1934-PNG)</b>	To improve management of educational resources; assist the National Department of Education improve the quality of primary education; and help provinces increase the quality of and access to primary education.	1980	Closed on 12/31/88	In terms of quantitative outcomes, the Project exceeded its targets for increased pupil enrollments and localization of teacher training college staff. Enrollment disparities among provinces were reduced although pupil retention rates did not improve. Institution building took place in strengthening of curriculum/textbook development, examinations, and project monitoring and evaluation, although only a first step was taken toward institutionalizing educational planning. The Project was generally well implemented. Outstanding and emerging issues were to be addressed through longer-term Bank involvement in a Second Primary Education Project. This continuity was lost, however, when the Government decided not to seek further Bank assistance for the primary education subsector. PCR No. 8968 for the Project was issued by OED on August 30, 1990.

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Table 2: PROJECT TIMETABLE

Item	Date Planned	Date Revised	Date Actual
Identification (Executive Project Summary)/ <u>a</u>	06/18/82		06/18/82
Preparation / <u>b</u>	10-11/82		10-11/82
Appraisal Mission	5-6/83		04/83
Loan Negotiations	11/20/83		02/06/84
Board Approval	01/20/84		03/27/84
Loan Signature	04/84		07/25/84
Loan Effectiveness	10/25/84	11/28/84	11/28/84
Loan Completion	12/31/88		12/03/90
Loan Closing	12/31/89	12/31/90	12/31/90

/a Project Brief.

/b By UNESCO.

Comments

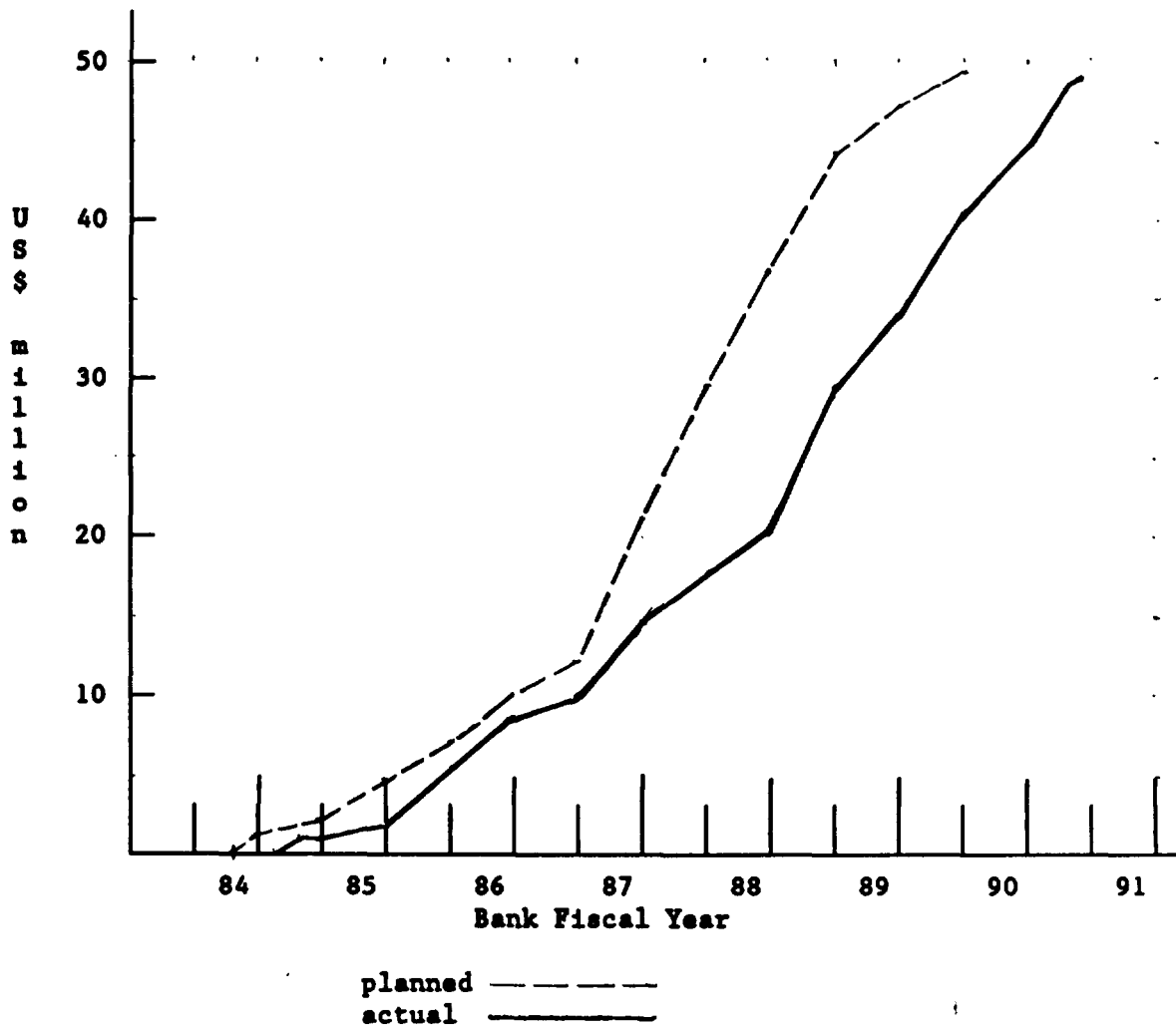
Appraisal of the Project actually took place about a month ahead of schedule although negotiations and Board presentation were subsequently both delayed. Negotiations were originally scheduled for November 1983 but were postponed when a post-appraisal mission became necessary and did not take place until late-October that year. Negotiations were then proposed by the Bank to begin mid-January 1984 to allow time for processing of the project documents before the revised Board presentation date in March 1984. Government officials were unable to come to Washington until February 1984, however. The revised Board date was met, nevertheless, but in the end, Loan signing which was expected by April 1984, actually occurred in late July, due to a delay in submission by the Government of the required external debt information. Similarly, although implementation was by then proceeding well and the first withdrawal application had already been submitted, Effectiveness was delayed by a month, again due to late arrival of the required documents, in this case, the signed legal opinion.

The Closing Date was postponed by one year when Completion was delayed following some delays in construction due to budget cuts during the project implementation period and to provide an additional year of funding for the various grants under the Project for quality improvement and for the ADT program. The Loan was finally fully disbursed about a month before the revised Closing Date.

**Table 3: LOAN DISBURSEMENTS**

**Cumulative Estimated and Actual Disbursements**  
(US\$ million)

	FY1984	1985	1986	1987	1988	1989	1990	1991
Appraisal estimate	0.1	4.9	9.9	21.2	37.0	47.3	49.3	49.3
Actual	-	2.5	8.3	14.9	20.4	34.0	44.9	49.3
Actual as % of estimate	0	51	84	70	55	72	91	100
Date of final disbursement	December 3, 1990							



**Table 4: PROJECT IMPLEMENTATION**  
**Table 4A: Provincial High School Textbook Development and Printing Schedule /a**

	1984		1985		1986		1987		1988		Total	1989		1990		Total																			
	Develop	Print	Develop	Print	Develop	Print	Develop	Print	Develop	Print		Develop	Print	Develop	Print	Number	Number																		
	P	A	P	A	P	A	P	A	P	A		P	A	P	A	of titles	of books																		
English	7A	7/B	-	-	10A	9/10	-	-	8A	-	7A	7	9A	-	10A	8/9	-	-	8/9A	10	-	-	-	-	-	-	-	-	-	-	4	70			
	7B	-	-	-	10B	-	-	-	8B	-	7B	-	9B	-	10B	-	-	-	8/9B	-	-	-	-	-	-	-	-	-	-	-	-				
	7C	-	-	-	10C	-	-	-	8C	-	7C	-	9C	-	10C	-	-	-	8/9C	-	-	-	-	-	-	-	-	-	-	-	-				
	7D	-	-	-	10D	-	-	-	8D	-	7D	-	9D	-	10D	-	-	-	8/9D	-	-	-	-	-	-	-	-	-	-	-	-				
Mathematics																																			
I	-	9A	-	-	9A	10A	-	-	10A	-	9A	9A	-	-	10A	10A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	60		
	-	9B	-	-	9B	10B	-	-	10B	-	9B	9B	-	-	10B	10B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	60	
II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8A	-	7A/b	-	9/10A	-	8A	-	-	-	-	-	-	-	4	60	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8B	-	7B	-	9/10B	-	8B	-	-	-	-	-	-	-	-	-	
Science	-	-	-	-	-	-	-	7-8	7	-	-	9-10	8	7-8	-	9	9-10	7	-	-	-	-	10	-	8	-	-	-	-	-	-	4	40		
Social Science	7A	7A	-	-	8A	-	-	8A	8A	-	9/10A	9/10A	-	7A	-	10C	9/10A	8A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	190
	7B	7B	-	-	8B	-	-	8B	8B	-	9/10B	9/10B	-	7B	-	9/10B	8B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	7C	-	-	-	-	-	8C	-	-	9C	-	7C	-	-	8C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	7D	-	-	-	-	-	8D	-	-	9D	-	7D	-	-	8D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Number of titles developed	6	8	-	-	8	4	-	-	7	5	-	9	7	-	-	4	-	-	30	28	-	3	-	-	-	4	-	-	-	-	-	-	-	-	
Number of titles printed	-	-	-	-	-	2	-	-	-	8	3	-	-	7	8	-	-	13	6	30	17	-	-	-	3	-	-	-	4	24/c	-	-	-	-	
Number of covers printed ('000)	-	-	-	-	-	30	-	-	120	50	-	-	105	145	-	-	195	115	450	310	-	-	-	60	-	-	-	70	-	-	-	-	440		

Note: P = planned; A = actual.

/a Number refers to grade level; letter refers to title (volume).

/b In addition, 20,000 copies of 7A "Modern Maths" were purchased by CDD.

/c Eleven titles (169,000 books) have yet to be printed. When printed, the total number of books supplied will be about 609,000. This does not include the additional copies of English, social science and mathematics books purchased in 1989 and 1990.

Table 4B: Enrollments and Graduates, Advanced Diploma in Teaching Course

Intake No.	Program Dates	English		Mathematics		Science		Social Science		Commerce		Home Economics		Agriculture		Total																		
		Commenced	Graduated	Commenced	Graduated	Commenced	Graduated	Commenced	Graduated	Commenced	Graduated	Commenced	Graduated	Commenced	Graduated	Commenced	Graduated																	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A																	
-	1/1984-85	40	-	40	-	-	-	-	-	-	-	-	-	-	-	-	40	-	40	-														
1	1/1985-86	-	21	-	10	-	-	-	-	60	21	60	15	-	-	-	60	42	60	25														
2	1/1986-87	-	19	-	9	-	18	-	4	75	19	75	13	-	20	-	75	76	75	27														
3	1/1987-88	-	17	-	4	75	13	75	5	-	-	-	18	-	15	-	75	48	75	24														
4	7/1987-88	-	-	-	-	-	-	-	12	-	7	-	-	-	-	-	-	28	-	16														
5	1/1988-89	75	9	75	4	-	5	-	2	-	12	-	4	-	-	-	75	42	75	13														
5A	7/1988-90	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	2	-	-	2														
6	1/1989-90	-	10	-	5	-	-	-	-	11	-	6	-	-	-	-	19	-	3	40	14													
	<b>Total</b>	<b>115</b>	<b>76</b>	<b>115</b>	<b>32</b>	<b>75</b>	<b>36</b>	<b>75</b>	<b>11</b>	<b>75</b>	<b>34</b>	<b>75</b>	<b>30</b>	<b>60</b>	<b>59</b>	<b>60</b>	<b>31</b>	<b>-</b>	<b>32</b>	<b>-</b>	<b>12</b>	<b>-</b>	<b>6</b>	<b>-</b>	<b>2</b>	<b>-</b>	<b>19</b>	<b>-</b>	<b>3</b>	<b>325</b>	<b>282</b>	<b>325</b>	<b>121</b>	
																																	(43% of intake)	
7	7/1989-90	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	11	-	-	-	-	22	-	-	-	-	-	-	-	-	-	-		
8	11/1989-90	-	8	-	-	-	11	-	-	-	13	-	-	7	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	31	-
9	11/1990-91	-	-	-	-	-	12	-	-	-	-	-	-	4	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	41	-
	Active as of 12/31/90	-	8	-	-	-	23	-	-	-	13	-	-	11	-	-	-	-	21	-	-	11	-	-	-	27	-	-	-	-	-	-	114	-

Note: P - Planned at appraisal.

A - Actual.

During intake 6, one student transferred from science to agriculture.

During intake 8, one student transferred from social science to English.

During intake 9, two students transferred from mathematics and one from agriculture all into commerce.

Home economics students in intakes 5A and 7 studied in their own provinces using an experimental format.

**Table 4C: New Provincial High Schools - Numbers by Province and Student Places**  
(1984-90) /a

Province	Enrollment ratios				Provincial high schools								Total new student places under project	
	1982	1988		1990	Completed		Fully constructed		Commenced		Total		Planned	Actual
	Actual	Planned	Actual	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual		
National Capital	29	25	28	36	1	1	-	-	-	-	1	1	80	565
Oro	12	14	14	15	-	-	1	1	-	-	1	1	320	264
Southern Highlands	9	10	11	12	-	-	1	1	1	1	2	2	400	518
Eastern Highlands	8	10	11	12	-	-	1	1	2	-	3	1	560	279
Simbu	11	13	16	19	1	1	-	-	-	-	1	1	160	119
Western Highlands	11	11	11	12	1	1	-	-	1	1/b	2	2	400	408
Enga	8	13	12	13	1	1	-	-	1	-/c	2	1	400	247
Morobe	10	10	13	14	1	1	-	1	2	-	3	2	480	532
Madang	11	11	13	13	1	1	-	-	1	-	2	1	480	387
West Sepik	12	14	14	14	1	1	-	-	-	-	1	1	240	216
East Sepik	10	13	12	12	1	1	1	-	1	1	3	2	560	290
Central	21	-	21	23	-	1	-	-	-	-	-	1	-	82
Commission areas /d	-	-	-	-	2	2	-	-	-	-	2	2	400	246
<b>Total PNG</b>	<b>13</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>10</b>	<b>11</b>	<b>4</b>	<b>4</b>	<b>9</b>	<b>3</b>	<b>23</b>	<b>18/e</b>	<b>4,480</b>	<b>4,153</b>

/a Table shows student places in government PHSs only. While a target for new places to be constructed at church agency schools was not available, it is estimated that an additional 100-200 student places have been provided at these schools.

/b Accomplished by blocking up PHSs at Hagen Park, Hagen High and Minj.

/c Kompiam enrolled its first students in 1990 but stage 1 construction was funded entirely by the provincial government.

/d Border and other specially designated areas for which PHSs are managed by the NDOE.

/e Six PHSs to be commenced under the project were dropped in 1989 while a PHS at Tapini in Central Province was added in 1984.

**Table 4D: Technical Assistance and Fellowships**

Components	Consultants' staff		Fellowships					
	months foreign		Number of candidates		Local		Overseas	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
						---- (staff months) ----		
<b>Policies and evaluation:</b>								
Study on secondary education	9	6	-	-	-	-	-	-
Evaluation (REU)	-	-	2	2	-	-	12	12
Measurement (MSU)	-	-	2	2	-	-	24	24
Subtotal	<u>9</u>	<u>6</u>	<u>4</u>	<u>4</u>	<u>=</u>	<u>=</u>	<u>36</u>	<u>36</u>
<b>Development of materials and upgrading of teachers:</b>								
PBS materials	-	-	2	8	-	54	48	75
College of Distance Education	-	-	6	5	-	24	72	60
<b>PBS teachers:</b>								
Preservice training	-	-	300	130	3,600	1,404	-	-
Inservice training	-	-	354/a	479/b	1,611/a	2,541/b	-	-
NES teachers inservice training	-	-	18	17	120	162	96	90
Subtotal	<u>=</u>	<u>=</u>	<u>680</u>	<u>639</u>	<u>5,331</u>	<u>4,185</u>	<u>216</u>	<u>225</u>
<b>Project management and preparation of future projects:</b>								
Management	60	84	-	-	-	-	-	-
Preparation	24	23	-	-	-	-	-	-
NDOE headquarters staff	-	-	-	1	-	-	-	24
Subtotal	<u>84</u>	<u>107</u>	<u>=</u>	<u>1</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>24</u>
<b>Total</b>	<u>93</u>	<u>113</u>	<u>684</u>	<u>642</u>	<u>5,331</u>	<u>4,185</u>	<u>252</u>	<u>285</u>

/a Including upgrading for 325 teachers and 4 inspectors and 25 teachers in the UNPG degree programs.  
/b 406 teachers were upgraded along with 9 inspectors and 39 teachers in the UPNG degree programs. In addition, 25 teachers took a librarianship course in 1990 for a total of 37 staffmonths.



**Table 5: PROJECT COSTS AND FINANCING**

**Table 5A: Project Costs**  
(US\$ million)

Item	Appraisal estimate /a			Actual		
	Local costs	Foreign exchange costs	Total	Local costs	Foreign exchange costs	Total
Policies and evaluation:						
Studies	0.3	0.7	1.0	0.1	0.2	0.3
Evaluation and monitoring	0.4	0.2	0.6	0.4	0.1	0.5
Subtotal	<u>0.7</u>	<u>0.9</u>	<u>1.6</u>	<u>0.5</u>	<u>0.3</u>	<u>0.8</u>
Development of materials and upgrading of teachers:						
Materials development	1.9	3.9	5.8	1.8	4.8	6.6
Teacher training and support	5.5	2.0	7.5	5.8	2.0	7.8
Subtotal	<u>7.4</u>	<u>5.9</u>	<u>13.3</u>	<u>7.6</u>	<u>6.8</u>	<u>14.4</u>
Expansion and upgrading of secondary schools:						
Expansion of provincial high schools:						
Civil works	32.9	18.3	51.2	19.9	21.7	41.6
Furniture	19.3	10.1	29.4	8.5	15.7	24.2
Equipment and materials	1.3	0.6	1.9	0.5	0.3	0.8
Salaries	0.1	0.8	0.9	0.1	1.3	1.4
Other incremental operating costs	11.6	6.6	18.2	9.9	4.2	14.1
Expansion of national high schools	0.6	0.2	0.8	0.9	0.2	1.1
Upgrading existing high schools	1.7	0.7	2.4	0.8	1.2	2.0
Subtotal	<u>40.2</u>	<u>22.8</u>	<u>63.0</u>	<u>24.3</u>	<u>30.5</u>	<u>54.8</u>
Project management and preparation of future projects						
	<u>0.3</u>	<u>0.2</u>	<u>0.5</u>	<u>0.6</u>	<u>0.2</u>	<u>0.8</u>
<b>Total Project Cost</b>	<b><u>48.6</u></b>	<b><u>29.8</u></b>	<b><u>78.4</u></b>	<b><u>33.0</u></b>	<b><u>37.8</u></b>	<b><u>70.8</u></b>
Front-end fee on Bank loan						
	-	0.1	0.1	-	0.1	0.1
<b>Total Financing Required</b>	<b><u>48.6</u></b>	<b><u>29.9</u></b>	<b><u>78.5</u></b>	<b><u>33.0</u></b>	<b><u>37.9</u></b>	<b><u>70.9</u></b>

/a Including contingencies.

**Table 5B. Project Financing**

Source	Planned (Loan Agreement)		Revised /a		Final		Comments
	Amount (US\$'000)	%	Amount (US\$'000)	%	Amount (US\$'000)	%	
<b>IBRD expenditure categories:</b>							
(1) Civil works	20,700	56	15,300	56/ 80	20,640	57	The percent of civil works expenditures to be financed was revised at the time of Loan reallocation to 56% for expenditures made before June 1, 1987, and 80% for expenditures made on or after that date.
(2) Equipment and materials	4,100	100/ 100/ 85	6,600	100/ 100/ 85	5,851	85	
(3) Consultants' services and training	2,900	100	3,100	100	5,180	100	
(4) Salaries for teaching and technical staff under contract [and salaries for administrative support staff under Part B(5) of the Project]	18,600	100	21,800	100	17,506	84	Wording in brackets was added at time of loan reallocation.
(5) Fee	123	-	123	-	123	100	
(6) Unallocated	2,877	-	2,377	-	-	-	
Subtotal	<u>49,300</u>	<u>63</u>	<u>49,300</u>	<u>77</u>	<u>49,300</u>	<u>70</u>	
Government	26,500	34	12,300	19	17,598	25	
Church agencies	2,700	3	2,400	4	3,997	5	
<b>Total Project Cost</b>	<u>78,500</u>	<u>100</u>	<u>64,000</u>	<u>100</u>	<u>70,895</u>	<u>100</u>	

/a May 4, 1988.

Table 6: PROJECT RESULTS

Table 6A: Direct Benefits

Indicators	Start of Project (1984)	Middle of Project (1988) /a		End of Project (1990)
		Projected	Actual	
<u>Provincial high schools /b</u>				
Enrollments:				
Total	44,000	49,400	51,260	52,550
Increase due to new government schools	-	2,500	n.a.	4,153
Increase due to increased promotion rates (grade 8 to 9) in existing schools	-	2,900	600±	600±
Enrollment ratio	13%	13%	15%	15%
Percent female, grades 7-10	36%	-	38%	39%
Examinations and graduates:				
Grade 8 to 9 force-out rate	21%	17%	22%	21%
Average score on grade 10 examination/c	n.a.	-	n.a.	n.a.
Grade 10 graduates	7,990	10,000	9,500±	10,140
Teachers:				
Student/teacher ratio	26	27	26	26
Supply of new national teachers	-	-	380	440
Deficit/surplus of national teachers	-	-	246	207
Expatriate teachers required as % of total	24%	13%	12%	10%
Attrition rate	8%	6%	10%/d	n.a.
Transfer rate	-	-	6%/d	n.a.
Textbooks:				
Number of textbooks distributed	-	450,000	310,000	440,000
Number of supplementary materials distributed	-	250,000	234,000	275,000
Recurrent cost per student (US\$)	550/e	490/e	n.a.	n.a.
<u>National high schools</u>				
Enrollment	1,600	2,000	1,814	1,968
Student/teacher ratio	17	20	18	19
National teachers as % of total	11%	30%	35%	44%
Recurrent costs per student (US\$)/e	2,000	-	n.a.	n.a.

Note: n.a. = not available.

/a Original completion date.

/b Does not include permitted schools outside the national education system or international schools.

/c Information not available as criterion-referenced examinations not administered at this level in PNG.

/d As of June 1985.

/e 1982 prices.

Table 6B: Studies

Studies	Purpose as defined at Appraisal	Status	Impact of study and remarks
Upper Secondary Education	To determine longer-term expansion requirements by reviewing the relationship between upper secondary education and middle and higher level employment to recommend appropriate expansion rates and future curriculum options	Completed 1985	The study made five recommendations and was widely circulated in the Government. Several of the recommendations including curriculum revision, localization of teaching staff, higher base-level salaries for teachers and future expansion have been or are to be implemented. The preliminary year at PNG's universities has also been eliminated.
<b>Selected evaluation studies planned:</b>			
Teacher attrition and inter-school transfer of teachers	To analyze current teacher policies, and to determine rates and causes of attrition and transfer; and propose possible solutions to reduce both	Completed 9/85	At least three of the recommendations of the study have been put into effect, including delegation of responsibility for teacher housing in some provinces to the schools themselves for their better maintenance, appointment of deputy assistant secretaries in some PDOEs to look after the PHSs and expansion of promotion opportunities. There has been no change in the appointment system, however, and a decision is still needed on whether to require a third year of training before teachers become eligible for promotion.
Student performance on the Grade 10 examination	To monitor and analyze student performance on the Grade 10 examination in relation to such variables as Grade 6 exam results, socio-economic characteristics, school agency, school location, staff transfer rate, staff experience, and school physical facilities	Not done	Type of examinations administered in PNG are not "criterion-referenced" and therefore are not comparable across years.
Impact of textbooks	To show the impact of textbooks on student performance and attitudes, and teachers' use of, and attitude toward, textbooks in secondary classrooms	To be undertaken in future	This study has not yet been undertaken although a report on the project's textbook development program was issued in 1986. The REU plans to undertake this study in future after the textbooks have been in the schools long enough to have had an impact.
New teachers	To determine the use and impact of new teachers who enter the system with increased subject knowledge and the availability and use of facilities such as laboratory equipment and libraries in relation to student achievement	Partially underway	A small study of science laboratories is underway in one PHS.
New inservice training programs	To show the impact of new inservice training programs for practicing secondary teachers on teacher subject mastery and on student performance	Underway	The ADT program had been monitored continuously by REU since its inception and various recommendations made by REU have been adopted by the program.
Student progression rates	To study student progression rates between Grade 8 and Grade 9, looking particularly at the relationship between Grade 6 examination scores and the probability of Grade 8 force-out	Not done	There is apparently little interest in this problem in the MDOE, although progression rates have increased slightly since the project began (Table 6A). Proposals are now being made to extend primary school through Grade 8 where force-out would then become automatic.
<b>Other evaluation studies undertaken (not defined at appraisal):</b>			
INSBED fellowship program	To determine how many of those in program return to teaching	Completed 1985	The study showed that most fellows were education administrators and that program was not full. Following the study, the SDU moved to fill the empty places.
Post-graduate diploma in education program at UPNG	To determine whether the program was preparing the fellows to teach	Completed 1986	The study concluded that the course being given was too academically oriented and not targeted toward teaching. Revisions in the course were recommended but, so far, have not been acted upon.
Impact of the Project on the NRS	To determine the effect of the Project inputs on the NRS	Completed 1990	The study showed that the capital works program was successful and that the ancillary staff grants were well used. However, it also showed that the schools were not monitoring the use of the funds received which were generally deposited into the schools' general accounts. The study recommended that separate accounts be set up for these funds and some schools have done so.
Major tracer study of Grade 10 leavers	To analyze employment patterns of Grade 10 leavers.	Underway	This study was suggested by the Bank based on the recommendations in its report on the costs and financing of education in PNG (green cover, June 25, 1987).

Table 7: STATUS OF COVENANTS

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Covenant	Subject	Deadline for Compliance	Status
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[The Loan Agreement for this Project  
had no special covenants]

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**Table 8: USE OF BANK RESOURCES**

**Table 8A: Staff Inputs  
(staffmonths)**

Activity	FY82	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	Total
Preappraisal	3.8	19.7/ <u>a</u>										23.5
Appraisal		32.8	26.6									59.4
Negotiations			5.3									5.3
Supervision			1.2	4.6	4.3	5.2	5.8	2.6	2.7	0.8		27.2
PCR										0.6		0.6
<b>Total</b>	<b>3.8</b>	<b>52.5</b>	<b>33.1</b>	<b>4.6</b>	<b>4.3</b>	<b>5.2</b>	<b>5.8</b>	<b>2.6</b>	<b>2.7</b>	<b>1.4</b>		<b>116.0</b>

/a Does not include UNESCO preparation mission.

**Table 8B: Mission Data**

Stage of Project Cycle	Month/year	No. of persons	Days in field	Specialization represented <u>/a</u>	Performance rating status <u>/b</u>	Types of problems
Through Appraisal:						
Identification	1-2/1982	2	24	ED(2)	-	-
Preparation (UNESCO)	10-11/1982	4	100	EG,ED,A,S	-	-
Appraisal	4/1983	6	125	EC(2),ED(2), A,OA	-	-
Appraisal through Board approval (post-appraisal mission)	10/1983	1	5	EC	-	-
Board approval through Effectiveness (first supervision mission)	7/1984	1	3	A	1	-
Supervision	3/1985	1	4	A	1	Financial
	5/1986	1	6	ED	2	Available funds
	6-7/1987	1	10	A	2	Available funds
	6/1988	1	10	A	2	Available funds
	5-6/1989	2	10	A,ED	1	Training progress
	3/1990	1	5	A	1	Training progress
	7/1991/ <u>c</u>	2	28	A,ED	-	-

/a EC = economist, ED = educator, A = architect, S = secretary, OA = operations assistant.

/b 1 = minor or no problems; 2 = moderate problems; 3 = major problems.

/c Completion mission.