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PROJECT PERFORMANCE AUDIT REPORT

PANAMA (FIRST) FISHERIES PROJECT

(LOAN 784-PAN)

June 29, 1979

Operations Evaluation Department

Project Peformance Audit Report

PANAMA (FIRST) FISHERIES PROJECT

(LOAN 784-PAN)

TABLE OF CONTENTS

Project Performance Audit Report

PANAMA (FIRST) FISHERIES PROJECT

(Loan 784-PAN)

PREFACE

This is a performance audit of the Fisheries Project in Panama, the first of two fisheries projects, for which Loan 784-PAN was approved in July 1971 in the sum of US$3.4 million. The loan accounts were closed in October 1977 after cancellation of an undisbursed balance of US$0.03 million.

The audit report consists of an audit memorandum prepared by the Operations Evaluation Department and a Project Completion Report (PCR) dated February 14, 1978. The PCR was prepared by the Latin America and the Caribbean Regional Office on the basis of a country visit in August 1976. The audit memorandum is based on a review of the President's Report (No. P-980) and the Appraisal Report (No. PA-94A), both of July 15, 1971, the Loan and Guarantee Agreements dated August 2, 1971 and the PCR; correspondence with the Borrower and internal Bank memoranda on project issues as contained in the Bank files have also been consulted and Bank staff associated with the project have been interviewed.

An OED mission visited Panama in December 1978. The mission held discussions with staff of the Ministry of Commerce and Industries, National Planning Office, the National Bank of Panama (BNP; the executing agency) and project participants. The information obtained during that mission was used to test the validity of some of the conclusions of the PCR and permitted discussion of some aspects not covered by the PCR. Particularly, detailed information on fishing effort and shrimp catches were obtained, analyzed and discussed.

A copy of the draft report was sent to the Borrower on April 24, 1979. The comments received (see Annex 5 to the PPAM) have been taken into account while preparing this final version. The suggested corrections and changes of the PPAM have been incorporated. In two instances the audit mission could not fully agree with Government comments and the difference in views has been footnoted.

The audit finds the PCR comprehensive and accurate with respect to the project's principal achievements and shortcomings. The memorandum further analyzes some issues where the audit mission did not fully agree with the PCR; particularly, on the project's appraisal analysis and rates of return calculation. Since this is one of the first Bank-assisted fisheries project to be completed and evaluated, some methodological comments have been incorporated, including some suggested by CPS.

The valuable assistance provided by the Government of Panama, BNP and their staff met during preparation of this report is gratefully acknowledged.

PROJECT PERFORMANCE AUDIT REPORT BASIC DATA SHEET

PANAMA (FIRST) FISHERIES PROJECT (LOAN (784-PAN)

KEY PROJECT DATA

Item	Appraisal Expectation	Actual or Current Estimate
Total Project Cost (US$ million)	5.350	5.420
Overrun (%)	-	1.3 /1
Loan Amount (US$ thousand)	3.400	-
Disbursed)	-	3.1
Cancelled) December 31, 1978	-	0.3
Repaid to)	-	0.8
Outstanding to)	-	2.6
Date for Completion of Physical Components	02/76	
Proportion Completed by Appraisal Target Date (%)	-	n.a.
Economic Rate of Return (%)	15-22	zero

OTHER PROJECT DATA

Item	Original Plan	Revisions	Actual or Current Estimate
First Mention in Files or Timetable	-	-	01/06/69
Government's Application	-	-	07/22/70
Board Approval	07.27/71	-	07/27/71
Loan Agreement Date	08/02/71	-	08/02/71
Effectiveness Date	11/01/71	12/01/71	12/01/71
Last Disbursement	-		10/04/77
Closing Date	08/30/76	06/30/77; 10/31/77	10/31/77
Borrower		Government of Panama	
Executing Agency		Banco Nacional de Panama	
Fiscal Year of Borrower		January 1 - December 31	
Follow-on Project Name		Second Fisheries	
Loan Number		1398-PAN	
Amount (US$ million)		7.5	
Agreement Date		April 1977	

MISSION DATA

Item	Month, Year	No. of Weeks	No. of Persons	Manweeks	Date of Report
Appraisal	01-02/71	3.5	3	10.5	07/15/71
Supervision I	12/71	1	2	2.0	12/18/71
Supervision II	07/72	1	1	1.0	07/13/72
Supervision III	11/72	1	1	1.0	11/30/72
Supervision IV	03-04/73	1.5	2	3.0	04/27/73
Supervision V	10/73	1.5	1	1.5	11/01/73
Supervision VI	04/74	1	1	1.0	05/10/74
Supervision VII	08-09/74	1.5	2	3.0	09/23/74
Supervision VIII	03/75	1.5	1	1.5	05/02/75
Supervision IX	08/75	1.5	1	1.5	09/18/75
Supervision X	01-02/76	2	2	4.0	03/08/76
Supervision XI Completion	08/76	2	3	5.0	09/28/76
Supervision XII	06/77	0.2	1	0.2	07/27/77
Total				24.7	

FOLLOW-ON PROJECTS

1. Fishing Port Project, supported by Loan 1114-PAN, for US$24 million, of May 27, 1975
2. Second Fisheries Project, supported by Loan 1398-PAN, for US$7.5 million, of April 28, 1977.

COUNTRY EXCHANGE RATE

Name of Currency (Abbreviation) Balboa B/.1

Exchange Rate: US$1 = B/.1

/1 Project was scaled down.

Project Performance Audit Report

PANAMA (FIRST) FISHERIES PROJECT

(Loan 784-PAN)

DISBURSEMENT TABLE
(US$ million, cumulative)

Period ending	Appraisal Estimate	Actual	Actual as % of Estimate
12/31/71	0.08	-	0
06/30/72	0.38	0.06	16
12/31/72	0.88	0.10	11
06/30/73	1.18	0.20	17
12/31/73	1.63	0.28	17
06/30/74	1.83	0.53	29
12/31/74	2.22	0.96	43
06/30/75	2.61	1.86	71
12/31/75	3.40	2.79	82
06/30/76	-	3.00	
12/31/76	-	3.25	
06/30/77	-	3.31	
10/31/77	-	3.37 /1	

/1 US$27,350.12 was cancelled.

Project Performance Audit Report

PANAMA (FIRST) FISHERIES PROJECT

(Loan 784-PAN)

HIGHLIGHTS

The Fisheries Project was the first fisheries project financed by the World Bank Group in Panama. It provided funds for building 40 vessels (shrimp trawlers) to replace obsolete crafts, for captain training and for preparing a feasibility study for a new fishing port.

Complex technical specifications and the limited number of shipbuilders with experience in shrimp trawler construction resulted in a two-year delay in having the first contract signed. Due to their delay inflation, permitted the construction of only 26 vessels, at a unit cost double as high as anticipated. As a consequence of high costs and low shrimp prices the anticipated replacement of old boats did not take place. The Government decided to add the project vessels to the existing fleet. This implied a substantial change in project concept, but without project reappraisal. After some delays, captain training was successfully carried out. The feasibility study was completed on time and permitted the Bank to finance port loan[1/].

The project has contributed to redistributing the currently substantial benefits of the shrimp sector among a larger number of individuals and has succeeded in checking the trend towards concentration of shrimp trawling in the hands of large companies and processors. As a result of inadequate appraisal analysis (a problem also reflected in the appraisal of the follow-on project), the project vessels have not incresed total shrimp catches but have contributed to a decrease in the average catch per vessel. The audit estimates the project's economic rate of return at zero, a rate which would only be achieved if at least 6 boats are taken out of operation by 1980.

The following points may be of special interest:

- Inadequate Bank supervision of tendering procedures (PPAM, paras. 23 to 26) and of vessel allocation to non-shipowners (PCR, para. 8.04);
- Factors to be considered when analyzing boat replacement and effects of fisheries projets on income distribution (PPAM, paras. 22 and 31-32, respectively);
- No serious delays in vessel construction occurred (PCR, para. 3.08); and
- Questions of profitability for investors in a case when fleet has already exceeded its optimum size (PCR, paras. 6.07 - 6.09).

1/ Loan 1114-PAN, for US$24 million, dated May 27,1975.

Project Performance Audit Memorandum

PANAMA FIRST FISHERIES PROJECT

(Loan 784-PAN)

I. PROJECT SUMMARY

1. The possibility of promoting a fisheries project was suggested by a reconnaissance mission (FAO/IBRD C.P.) in November 1968. In July 1969 the project was identified, and the final version of the preparation report was completed in July 1970. The project was appraised in February 1971, and approved in July of the same year. The Loan Agreement was signed in August and became effective in December 1971.

2. The project was designed to assist the Panamanian shrimp fishing industry by preventing a decline in the catch through the replacement of 40 obsolete vessels. Captains to operate project vessels were to be trained in basic navigation and the use of modern fishing gear. The project also provided funds for a consulting firm to study the feasibility of a new fishing port outside Panama City.

3. In March 1974, 27 months after the loan became effective, a contract for the building of ten vessels was signed. In 1975 ten additional units were built, and in 1976 the last six were completed, for a total of 26.

4. Delays in procurement resulted in fishing vessels being constructed during a period of exceptional international inflation. Unit costs of the project vessels averaged US$165,000 instead of US$81,000 estimated at appraisal, so that only 26 boats could be constructed out of the proceeds of the Loan, instead of the 40 units initially planned. All vessels were built by Construcciones Navales de Panama (CONAPAN), a local shipyard.

5. The oil crisis which caused inflationary increases in both construction and operating costs, also resulted in a world-wide economic recession that caused international demand for shrimps to drop and prices to fall in 1974. It became preferable for boat owners to continue operating old boats which were still marginally profitable, or, for those small owners who had financial resources, to rehabilitate them, rather than to invest in a new expensive boat which at that time would have been unable to finance the debt service out of its operations. In order to prevent further concentration of fleet ownership in the hands of processors and large companies, project management suggested reserving 26 boats for captains who had never owned a boat, but who were willing to take this opportunity to become self employed. The total number of shrimp fishing licenses has been limited to 238 since 1968, in order to avoid fleet overcapacity, but the Government issued another decree creating the additional 26 licenses under a special regime set up to enable individual captains to benefit from the project.

6. Prices of shrimps increased again in 1975, when most project boats started operating. The project boats have therefore been in operation for only about three years but so far appear to meet appraisal expectations both technically and financially. On the basis of actual initial results and of projections of future returns, their financial rate of return would be around 15%, within the range of initial estimates (14% to 20%).

7. After some delay, training in boat operations was provided to the project captains by an FAO shipmaster and was completed satisfactorily on September 30, 1976.

8. The feasibility study for a new fishing port was started in June 1971 by a consulting firm, Livesey and Henderson from the UK, and completed in March 1974. On the basis of its findings, a fishing port project was appraised by the Bank and a port loan (Loan 1114-PAN) of US$24 million was approved by the Bank in April 1975.

9. Technically and financially, Banco Nacional de Panama (National Bank of Panama, BNP) has managed the project well and provided sub-borrowers with adequate support services. The Bank helped BNP to set up a routine preventive maintenance program for the project boats by financing an initial stock of spare parts out of the loan proceeds. None of the subloans is in arrears and BNP is keeping sub-borrowers under close financial supervision.

10. The economic impact of the project on the shrimp fishing industry is, at this stage, difficult to assess because of uncertainties about future changes in shrimp prices, in the total catch and in the size of the national fleet. Moreover, all project boats have been operating for too short a time for accurate estimates to be made of their operating efficiency. However, the economic rate of return is likely to be quite substantially lower than the 15% to 22% range expected at appraisal. This is because the obsolete vessels which the project boats were supposed to replace remained in operation. Therefore, so far, averted losses may not be counted as a benefit. At appraisal the total catch capacity of the fleet was assumed to be around the maximum yield of the traditional shrimp grounds, so that the project boats were not expected to raise the national catch; and no overfishing would occur. In 1976, the construction of new trawlers was prohibited until 1980, when it is expected that natural retirement of old boats will have brought the shrimp fleet capacity back to the estimated maximum catch. Only then, by averting losses to the sector, would the project boats start yielding substantial economic benefits. On the basis of past trends and of the information available so far, the economic rate of return has been recalculated to be zero.

11. The follow up loan (Loan 1398-PAN, Second Fisheries Project) that was signed in April 1977 and became effective in November 1977 addresses the whole fisheries sector and its scope is therefore broader. It does include, however, a line of credit for the replacement of five old shrimp trawlers by five new vessels and the rehabilitation of 10 old wooden trawlers. Issuing of the above-mentioned 1976 decree freezing the construction of new trawlers until 1980 was a condition of negotiations and assurances were obtained that, from 1980 to 1985, construction or rehabilitation of shrimp trawlers would be limited to a maximum of 3,260 effective horsepower annually and according to regulations that would have to be acceptable to the Bank.

12. To summarize, this project has certainly checked the trend of concentration of the shrimp trawler fleet in the hands of large companies and processors and has contributed to redistributing the currently substantial benefits of the shrimp sector among a larger number of individuals. It has also successfully contributed to building up project management capabilities within BNP and training ship captains.

II. MAIN ISSUES

A. Inadequate Appraisal Analysis

13. The appraisal report stated that an increase in the fishing effort[1/] for shrimp would not result in a significant increase in the total catch. This means that the appraisal mission considered that with the number of licenses limited to 238 in 1968 by the Government of Panama, and with 229 vessels operating in 1970,[2/] a point close to the maximum sustainable yield [3/] had been reached for the species of shrimp trawled for in the traditional grounds. In order not to increase the effort, and thus prevent a drop in the total catch, the project would replace 40 old vessels with new ones to be built during the project period. There are two flaws in this reasoning:
(a) replacing old units would increase the fishing effort, since the new craft would have a larger fishing capacity due to better equipment and more days of fishing per year due to less breakdowns and repairs; and
(b) at the time of the appraisal no complete statistical data were available for all species. There were some figures regarding the catch of white shrimp, the main species in the fishery. Figures clearly showed

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1/ Fishing effort: estimated in vessels operating per year, or effective fishing days per year, or total HP of main engines operating per year, or HP per fishing day per year, all applied to the same fishery.

2/ This is the figure in the appraisal report. More recent Government figures put the number of operating vessels at 237 in 1970. See Annex 1.

3/ Maximum sustainable yield: catch level beyond which the total catch decreases.

the daily catch per vessel had dropped from 178 lb to 105 lb with 162 and 233 vessels licensed to operate, respectively (see Annex 1). [1/] These figures should have encouraged the appraisal to use the catch vs. fishing effort curve for analysis, similar to the one shown in Annex 4. This curve would have indicated that the number of craft or total fishing effort had already exceeded that needed for attaining maximum sustainable yields and that the point of declining total catch had been reached between 1960 and 1969. As a consequence the vessels financed under the project expanded an already overextended fleet and resulted in no additionality to the total shrimp catch, and in a decrease in the average catch per boat (cf. PCR, para. 6.05)[2/].

14. When the second project was appraised in mid-1976 some information was already available. The appraisal report supports the point raised above. It explicitly stated that "the total catching capacity of the operating shrimp fleet [was] in excess of available shrimp resources", that "the shrimp fleet [was then] operating beyond the level of maximum sustainable yields", and that "annual catch per vessel [had] dropped from 64,138 lbs. in 1970 to 42,951 lbs. in 1975". As a consequence, "most shrimp operations [were] marginally profitable or improfitable... as catches [were] low, while costs... [had] risen". The appraisal mission concluded that "the resumption of profitable operations [would] require a reduction in the number of boats operating".[3/].

15. Despite evidence that retirement of obsolete boats was practically nil during the implementation period of the first project, the appraisal report recommends financing of 5 new shrimp trawlers under the project. Furthermore, it states that "replacing obsolete vessels with new boats with equivalent horsepower" would result in "a zero [fleet] growth rate"[4/].

1/ At present 287 vessels are licensed to operate, and in 1977 the average catch amounted to 80 lb per fishing day.

2/ BNP has indicated its disagreement with this conclusion. BPN's analysis, however, is based on a number of vessels different from that obtained by the audit mission from official sources and reproduced in Annex 1.

3/ Quotations are from the Appraisal of Panama Second Fisheries Project, Report No. 1383-PAN, March 23, 1977, paras. 2.14 and 2.15, and Annex 1, para. 3. Emphasis added.

4/ Ibid. Also see para. 17 below. The Region notes that the appraisal assumed that the effective horsepower of the fleet would be reduced from 60,000 to 50,000 and that there would be zero growth from then on. In the audits view this would have entailed retirement of almost 20% of the fleet within a four year period. With the benefit of hindsight, three years later, it is evident that the fleet reduction has not taken place to the exent anticipated.

These recommendations as well as the conclusion are inconsistent with the facts discussed above[1/]. In addition, the funds allocated for repairs (or partial rebuilding) of 10 old wooden vessels would also increase the fishing effort.

16. Laws presently in force (Decree No. 58, of November 23, 1976) have frozen the number of licenses in Panama; the granting of permits to build new shrimp fishing vessels has been deferred to 1980 (Decree No. 13, of March 1, 1977). The 5 fishing crafts mentioned above would be in excess of the limits set by both decrees and could, therefore, not be granted a building permit unless a new decree is issued.

17. These constraints seem to have been properly acknowledged now. The PCR states that the construction of new trawlers should not be undertaken until the fleet capacity has been brought back to the level of the maximum sustainable yield of shrimp resources (para. 7.02). And BNP has indicated that the 5 shrimp trawlers will not be built and that only 4 vessels have been rebuilt; no additional rebuilding is anticipated.

B. Change in Project Design

18. The appraisal mission concluded that independent shrimpers owning 1 or 2 vessels had a pressing need for credit to replace their old and worn wooden crafts. Furthermore, there were no alternative sources of long-term credit, and the interest rates of the available short-term loans were substantially higher than the 9-10% annual rates charged by BNP. The appraisal report also stated that 35 of the 115 vessels operating in 1970 with 10 or more working years belonged to large shrimp companies and 80 had independent owners. Fifty percent of the latter, or 40, would want and could afford to become sub-borrowers under the fisheries project.

19. Between August 1971, when the loan became effective, and March 1974, when the first contract to build 10 vessels was signed, 22 applicants filed loan applications with BNP (PCR, para. 3.09). Sixteen of these owned from 1 to 6 vessels. Due to, among other reasons, a decline in the price of shrimp in 1974, an increase in operating costs (specially oil price) and a rise in the price of fishing craft, these owners abandoned their idea of participating in the program. They preferred to continue operating their old craft, which meant running a lesser risk to get about the same earnings.

1/ The Region disagrees and stresses their prudence in setting conditions for allowing new vessel construction. They note that the appraisal mission convinced Government to enact legislation prohibiting construction of new vessels and prohibiting issue of new licenses, until 1980, and regulating growth of the shrimp fleet thereafter. Moreover, the decision on actual new construction and replacement will only be taken in 1980.

20. Since the only interested potential sub-borrowers were captains who owned no vessels, BNP decided to accept their applications. Sixty-seven captains applied for the 26 craft which could be built under the project. Since these applicants were not replacing any vessels, the Government granted them 26 new special licenses. This meant that the project's original aim of replacing old units, in itself questionable, was not achieved, aggravating the shrimp fleet's overcapacity (para. 13). The project should have been fully reappraised when the proposed beneficiaries failed to come forward and it became evident that the project design had been implicitly amended, but it was not[1/].

21. To assume that 50% of the independent owners with vessels more than 10 years old would be interested in replacing their craft proved to be unrealistic even with the high and rising shrimp prices after 1974[2/]. The appraisal mission does not seem to have properly analyzed the economic rationale for vessel replacement. Most captain-owners are unwilling to replace their vessels when the amount they can get for the sale of their craft is trivial, or when the incomes are small and uncertain if old boats are used in other fishing activities or in coastal sailing, for which the craft was not originally designed. This resulted in a replacement rate significantly lower than the one envisaged at appraisal.

22. The economic life of a boat - and thus boat replacement - plays a major role in determining the optimal size of the fishing effort and the number of new boats required each year. Most Bank-assisted fishery projects include the replacement of old boats. CPS has suggested that the following variables ought to be taken into consideration when analyzing boat replacement requirements: (a) maintenance costs--there is evidence to suggest that a positive correlation exists between replacement rate and maintenance cost (the lower the maintenance cost, the lower the boat replacement rate); (b) down payment for new boats--there is evidence from this project to suggest that a negative correlation exists between the required amount for down payment and the replacement rate (the higher the down payment required to purchase the new boats, the lower the replacement rate of old boats); (c) complexity of new vessel operations--there is also evidence from this Project to suggest that the replacement rate is affected by the complexities in adopting the new technology (the more complex the technology is, the more reluctant the boat owners will be to adopt it, and, therefore, the owners will be willing to keep their old boats in operation); (d) licensing requirements for old and new boats favor old boats for which little or no restrictions are imposed; and (e) the vertical integration of catch with landing and processing (improvements in shrimp processing may create enough incentive for these processing plants to acquire new boats; this factor is relatively independent of the efficiency of new boats).

1/ There is no evidence that the Bank supported the idea, but it accepted it.

2/ BNP disagrees with this conclusion. It states that such assumption was indeed realistic at appraisal time, and that it was the 1974 price drop which made it unrealistic.

C. Procurement Problems

23. Project execution was delayed. As a consequence, only 26 units of the 40 anticipated at appraisal could be financed, and each of these at a much higher cost than anticipated (PCR, para. 3.03). One of the main causes of this delay was inadequate Bank supervision of tendering procedures. The bidding for building the first 10 vessels was closed on January 31, 1973 (twelve months after effectiveness), as originally planned. Only 3 firms (from Colombia, Austria and Mexico) out of the 15 firms (11 countries) which had been prequalified entered the bidding. The Austrian and Mexican firms were disqualified for not complying with the national regulations for bidding. Since only one firm remained, these regulations required that the bidding be declared void (PCR, para. 3.05).

24. The factors leading to such limited interest in bidding are a matter of controversy. The Bank thinks the technical specifications for the first bidding were extremely detailed and complex, which discouraged prospectives shipbuilders from participating in the bidding (cf. PCR, para 3.06). In the Bank's view, shared by Panamanian shipbuilders interviewed by the mission, the technical specifications for the second bid were far simpler, but this view is challenged by BNP, which stated that only minor amendments were introduced to the bid documents. This is probably correct, because only 3 firms (from Brazil, Mexico and Panama (submitted tenders in December 1973. CONAPAN (Construcciones Navales de Panama, S.A.) submitted the lowest bid, at US$148,375 per vessel, and was awarded the contract for the 10 first units.

25. The audit mission wants to raise another factor which may explain the little interest shown by shipbuilders. The proposed ships were rather small and specialized. Due to poor expertise, shipbuilding companies not duly qualified to build the type of vessel required were nevertheless pre-qualified. Actually, only 4 of the 11 shipbuilders who requested tender documents came from countries engaged in shrimp fishing, and were thus familiar with this special type of craft and, likewise, duly qualified to draw up technical specifications on short notice and at competitive prices. The three firms which finally participated in the bidding are located in countries where important shrimp fisheries are under exploitation. Two shipbuilders from Peru who participated successfully in the bidding for purse seiners under in the second project did not submit bids; their insufficient experience in shrimp fishing in shallow waters, together with previous commitments which kept them fully occupied at the time, contributed to their lack of interest.

26. To avoid delays in future fishing projects due to insufficient or overly detailed specifications and unsatisfactory prequalification procedures, the Bank should acquire expertise in the naval architecture field to assist the borrowers in drafting and revising technical data and specifications, in the prequalification of shipbuilders experienced in the construction of specialized vessels and in evaluating bids.[1/].

1/ Due to the Bank's limited involvement in fisheries projects a full time employment of a naval architect seems not justified, but employment of a consultant appears warranted whenever construction of new boats is considered under a project.

D. Project Justification

27. According to the appraisal report the project was meant to "provide critical assistance to Panama's shrimp fishing industry by preventing a decline in the catch of a substantial part of the existing fleet and by increasing the industry's efficiency." In reaching this objective the project had a rather limited success. The captain's training program and the port feasibility study indeed contributed to a more efficient fishing industry. But the main component, i.e. rehabilitation of part of the shrimp fishing fleet to prevent a reduction in output failed (para. 13).

28. The project's economic rate of return as recalculated by the audit mission is at best zero without shadow pricing labor. However, this rate would only be achieved if at least 6 boats are taken out of operation by 1980. Only then the fleet's capacity will be brought back to the level when fishing would not exceed the maximum sustainable yield. Since boat owners undertake great efforts to keep their vessels afloat, the reduction of the fleet by six crafts will depend on accidental losses, a rather speculative view. In view of the project's doubtful economic returns and the fleet's overcapacity, the financing of additional boats under the follow-on project seems unwarranted.

29. The audit has reservations about the financial rate of return (FRR) calculated in the PCR. This is based on a 183 lb catch of shrimp tails per fishing day (in terms of total shrimp species) over the 16-year life of the project beginning in 1976. The average catch reached 192 lb per fishing day in 1976, and 173 lb in 1977 with 229 and 215 fishing days per boat for the two years (see Annex 2). These revised figures increase the average catch per vessel for 1977, from 33,880 lb as shown in the PCR to 37,222 lb. For 1978 and subsequent years the PCR assumes that the vessels will reduce fishing by four days every year, starting with 216 days in 1977,1/ but maintaining the quantity of shrimp caught per fishing day. However, daily catches per day show a marked downward trend. As a consequence, the volume of 183 lbs. of daily catch per vessel assumed in the PCR cannot be maintained. Considering the present fisheries management, it reflects the maximum possible level of expectable catch per day, and not a long term average. The PCR's projection regarding the number of fishing days per vessel per year is correct.

30. Based on the revised data available, it can be stated that the FRR will be around 15% compared to the PCR's estimate of 17%.

E. Income Distribution

31. The PCR makes an interesting attempt to analyze this issue. CPS has offered some comments on the analysis of income distribution effects of fishery projects. First, the fact that licenses are better

1/ 204 days in 1980.

distributed--in a strict sense, that there are more boat owners "with" the project than "without" the project--is not a sufficient condition for better distribution of the existing rent from the resource. A license, in most cases, only provides the right of access to existing rent but does not determine appropriations of rent flows from the resource. The pattern of rent appropriations will depend on the marginal efficiency of the additional unit of fishing effort (again on the quality of the fishing effort); the appropriations of rent by new units, compared with the set of existing units, will vary accordingly with the marginal efficiency of each unit of effort. Therefore, the project might have contributed to a more uneven distribution of benefits. Second, a distinction must be made between independent boat owners and factory-boat owners. On the one hand, the boat is the only asset of the former but only part of the larger assets of the latter. On the other hand, the independent owner gets only the catch benefits - and these are valued at the price paid by the factories, if there is no other marketing channel -, while the factory gets the full benefits of all throughput. And third, after this distinction has been made, one will have to assess how the efficiency of the last unit of effort is distributed across existing vessels. In some cases, it will not pay a fully vertically integrated company to increase its effort, while it might be profitable for an independent boat owner to acquire an extra unit of effort.

32. Another comment may be added on this subject. Since total catch has not increased, the project has reduced the catch of each individual boat. Therefore, many boat owners must have ended up with a post-project income lower than the one they enjoyed before it. Most certainly, the oldest boats will be affected the most. If these belonged to large boat owners or to factories, income distribution may have been improved, but it would have worsened if they belonged to captains owning only one or two boats each.

ANNEX 1

REPUBLIC OF PANAMA. FISHING EFFORT, DAILY CATCH PER VESSEL, AND TOTAL LANDINGS OF WHITE SHRIMP

(1960-1977)

Year	Operating Vessels 1/	Fishing Effort 2/ (fishing days)	Daily Catch per vessel	Total landings 3/ (Thousand lb.)	HP in Operation
1960	162	26,500	178	4,068.1	-
1961	161	26,700	165	4,625.0	-
1962	158	30,300	160	4,558.1	-
1963	153	31,000	116	3,462.8	-
1964	181	40,400	131	5,033.6	-
1965	194	41,700	123	4,990.9	39,750
1966	199	45,000	112	5,238.7	42,530
1967	218	44,300	114	5,447.8	47,060
1968	233	42,900	105	4,346.4	47,820
1969	233	40,200	105	4,248.3	51,770
1970	237	38,100	110	4,359.1	51,482
1971	222	33,500	121	4,240.2	48,531
1972	218	37,500	149	5,119.7	47,868
1973	239	40,400	132	5,143.8	55,295
1974	240	40,100	105	3,841.2	59,480
1975	232	46,030	81	3,720.4	63,400
1976	240	49,861	93	4,637.5	(65,520)
1977	256	50,765	80	4,072.4	(69,888)

SOURCE - Ministry of Commerce and Industries, Official Statistics.

1/ Monthly average

2/ Days in which fleet is away from port

3/ Weight of white shrimp tails

PANAMA SHRIMP FISHERY : FLEETS OPERATION RESULTS

ITEM	Total Fleet			Project Fleet		
	1975	1976	1977	1975	1976	1977
Total catch (lbs)	4,948,462	5,311,972	5,235,336	602,583	1,139,512	967,765
White shrimp (lbs)	1,687,536	2,103,414	1,851,098	217,795	498,150	376,380
Pink shrimp (lbs)	1,511,801	1,421,437	1,319,642	230,849	387,836	356,369
Sea bob (lbs)	978,648	1,259,230	1,642,634	96,475	207,408	203,408
Others (lbs)	770,477	527,891	421,962	57,464	46,118	31,608
Vessels (N°)	232	240	256	17	26	26
Trips (N°)	4,331	4,356	4,564	203	428	361
Fishing days (N°)	48,423	53,430	50,765	3,567	5,950	5,602
Fishing days/boat	209	223	198	210	229	215
Catch/boat (lbs)	21,330	22,133	20,451	(35,446)	(43,827)	37,222
Catch/trip (lbs)	1,143	1,219	1,147	2,968	2,662	2,681
Catch/fishing day (lbs)	102	99	103	169	192	173
White shrimp/f.d. (lbs)	35	39	36	61	84	67
Trip length	11	12	11	18	14	16

SOURCES : Project Unit, BNP
Official Statistics, Ministry of Commerce and Industries.

PROJECT SHIMPERS ANNUAL NET INCOME

JULY 1°, 1977- JUNE 30, 1978

Name of Vessel	Number of Trips (1)	Days Fishing (2)	Total Income (3)	Operation and Administrative Costs (4)	Interest (5)	Depreciation (6)	3-4+5 (7)	Taxes (8)	Net income 7-8+6 (9)	9-5 (10)
Ubarraga	15	231	106,589	112,235	15,806	8,250	10,160	2,032	16,378	572
Tubamana	15	250	117,215	105,492	14,293	8,363	26,016	2,615	31,764	17,471
Ponca	14	196	97,058	94,976	14,357	8,250	16,439	2,615	22,074	7,717
Pocorosa	13	223	84,556	97,330	16,478	8,250	3,704	741	11,213	- 5,265
Comagre	14	220	95,922	109,134	17,967	8,250	4,755	245	12,760	- 5,207
Cémaco	15	230	103,512	105,902	15,336	8,250	12,946	1,665	19,531	4,195
Quibían	16	239	81,160	106,932	17,257	8,250	- 8,515	-	- 265	-17,522
Carata	15	220	70,111	102,776	17,548	8,250	-15,117	-	- 6,867	-24,415
Maritus	14	222	118,056	101,311	13,055	8,250	29,800	2,615	35,435	22,380
Chigore	15	214	103,684	92,084	15,011	8,258	26,611	2,615	32,254	17,243
Topogre	13	210	92,738	92,460	15,961	8,274	16,239	2,615	21,898	5,937
Tumaco	15	212	79,582	115,817	17,233	8,250	-19,002	-	-10,752	-27,985
Secativa	14	226	93,727	103,973	16,330	8,250	6,084	555	13,779	- 2,551
Tatanagua	18	249	137,948	108,438	11,690	8,250	41.200	2,615	46,835	35,145
Dabaiba	14	219	98,052	93,435	13,912	8,250	18,529	2,615	24,164	10,252
Guaniaga	15	208	69,885	85,702	13,611	8,250	- 2,206	-	6,044	- 7,567
Chinina	16	255	135,048	109,500	13,057	8,250	38,605	2,615	44,240	31,183
Pocore	14	212	114,633	104,649	16,409	8,250	26,393	2,615	32,028	15,619
Bulaba	14	230	98,149	110,062	15,627	8,250	3,714	743	11,221	- 4,406
Buque-Buque	14	210	113,732	110,772	19,069	8,250	22,029	2,615	27,664	8,595
Biru	15	206	119,094	107,504	14,657	8,250	26,247	5,249	29,248	14,591
Abibeiba	16	246	95,566	103,020	14,276	8,250	6,822	1,364	13,708	- 568
Chepauri	15	239	108,715	139,809	17,274	8,250	-13,820	-	- 5,570	-22,844
Guaturo	15	265	113,938	112,760	14,461	8,352	15,639	3,128	20,863	6,402
Corobari	14	210	88,061	122,913	16,464	8,332	-16,296	-	7,964	- 8,500
Carabaro	13	215	91,769	94,284	18,556	8,250	16,041	3,208	21,083	2,527
Totals	381	5,857								

SOURCE : Barreto y Asociados, Periodical Reports.

(4) Depreciation and taxes are included.

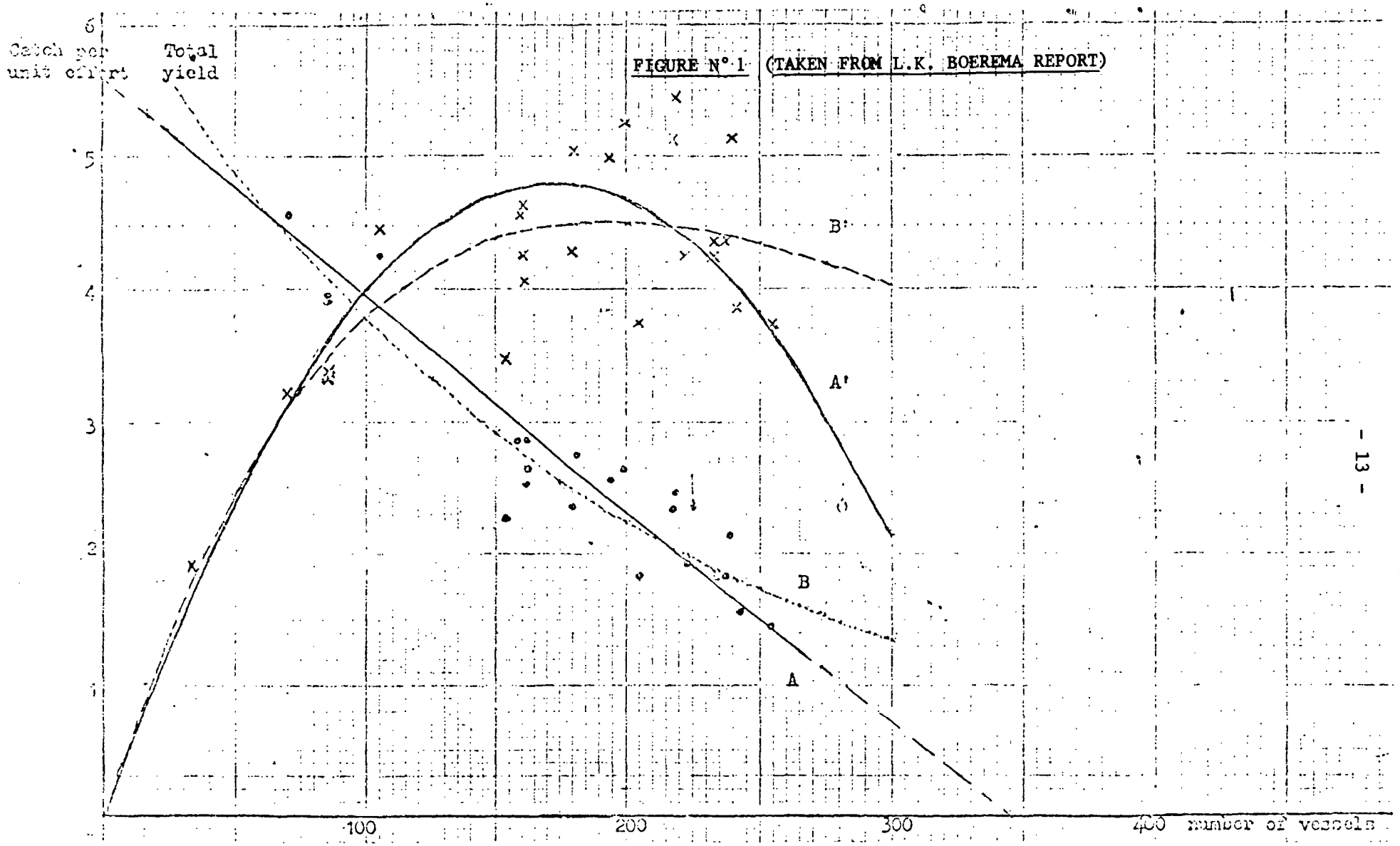

FIGURE N° 1 (TAKEN FROM L.K. BOEREMA REPORT)

Relationship between fishing effort (total number of boats fishing) and catch per unit of effort of white shrimp (catch per boat per year, tails only, scale in units of 10 000 lb), and the derived yield curve (scale in units of 1 million pounds).
Two hypotheses were used: a) that the relationship between number of boats and catch per boat is rectilinear (line A, and the corresponding yield curve A'); and b) that the relationship between number of boats and the logarithm of the catch per boat is rectilinear (curved line B, and the corresponding yield curve B'). Actual observations on catch per unit effort indicated by ..., on total catch by xxx.
Line A: $Y = 5.5752 - 0.62X$ Line B: $\log Y = 4.302 - 0.0022X$

ANNEX 5

National Bank of Panama

Mr. Shiv S. Kapur
Director
Operations Evaluation Department
The World Bank

Dear Mr. Kapur:

Thank you for your letter of April 24, 1979. Our comments to various points of the report are listed below:

13. (a) If the country had not had a satisfactory fleet replacement program, the shrimp industry would have been seriously affected over five years in terms of catch (loss of vessels for various reasons);

(b) The conclusion reached is not acceptable, since according to Annex No. 2 to the Report, the number of vessels was reduced by a total of 15 over a five-year period (1970-1975), so that when 17 vessels entered into operation in 1975 those 15 were replaced.

14. We have the following comment to make: National Bank of Panama has so far rebuilt 4 shrimp boats, and we do not expect to rehabilitate any more. The building of the 5 shrimp boats will not take place.

15. See comment to Point 14.

16. See comment to Point 14.

17. I believe this statement requires a much more careful and thorough study than [was possible during] the time spent by the OED mission in Panama. For vessels of this type the cost would be not less than $300,000 per unit, and I do not really think that the fidel and cabezón resource carries a market price [high enough] to justify the use of this type of vessel. Not to mention the difficulty in managing this type of shrimp.

20. We reaffirm that this project has at no time contributed to the overfishing mentioned in this point; we shall simply quote the following figures, based on Annex No. 2 of OED's report:

	1974	1975	1976	1977
Vessels	215	215	231(+)	240
Project vessels	0	17	9	0
Other vessels	0	0	0	16
Total	215	232	240	256

(+) Assuming the loss of one vessel in 1976

From this table, we see that in 1975, 232 vessels were in operation, including 17 provided under the Fisheries Project. In 1974, 215 vessels were in operation, and in 1976, with the 26 project shrimp boats, a total of 240 vessels were operating in our Pacific waters, which we may compare to the number of licenses issued for 1968. Looking at Point 13 of the report, we see that the number of licenses increased by only two. In this way, the number of vessels in our fishing fleet has gradually been increasing even though the World Bank/Banco Central Program has not launched a single vessel into operation since 1976. Thus the only conclusion we reach is that at no time did Loan 784-PAN between the World Bank and National Bank of Panama led to overfishing, but rather helped maintain average daily catch at current levels (see Annex No. 2), which clearly reflects the efficiency of the 26-vessel fleet as compared with the national fleet.

21. The "unrealistic conclusion" mentioned in this point seems to relate to the situation in 1974 and not to the time of the study, so I do not feel this was an "unrealistic conclusion".

22. Before arriving at a conclusion, I would like to explain the two most important parts of the documentation relating to tendering for vessels. The first part contains all government regulations on bidding, as established in our Financial Laws (Código Fiscal). These regulations must be followed to the letter, i.e. there is no room for personal interpretation. The second part includes the specifications or characteristics of the vessels desired, e.g. length, breadth of beam, depth of hold, engine, propeller, kind of hull, etc. We would like to point out that Point 22 mentions that the Australian and Mexican firms were disqualified for not complying with the specifications, however, the fact is that they were disqualified for not complying with government regulations and the bid that was not disqualified was not accepted because one of the regulations states that bid proceedings must be declared void when only one bid remains.

23. Point 23 states that the technical specifications for the first tender were extremely detailed and complex, which we do not accept, because it implies that the second set of specifications was simpler. Actually,

the changes were insignificant, in fact the same bid was used almost in its entirety. I take this opportunity to inform you that the World Bank sent a memorandum stating that the first set of specifications were very complex. The bidding document was supported and explained to the World Bank staff in Washington by our Naval Architect/Fisheries Project Adviser, at which meeting minor changes were introduced to the document.

24. This point indicates that some carelessness and haste was involved in issuing the call for bids, citing as an example the three Peruvian firms which participated in the bidding for the 10 purse seiners but did not, for the reasons mentioned above, take part in the bidding for the shrimp boats. In our opinion this conclusion has been arrived at too easily. I would like to let you know what happened in the case of the Peruvian shipbuilders. It is necessary to know what was going on in Peru at the time of our bid proceedings: all the country's shipbuilders were committed to the Republic of Cuba on different projects, and let me mention the three firms that submitted bids under Loan 1398-PAN. Picsa was in process of building 20 tuna boats (300-1,000 tons). Insa was involved in the construction of 20 shrimp boats with refrigerator tunnel, and Metal Empresa was also building 20 vessels. As you will understand, none of these shipbuilders was interested in participating in the bidding for the 26 shrimp boats because none of them had the required capacity available.

25. No comment.

26. Our conclusion on this Point is the same as for Point 20, namely that the Central Bank's Fisheries Project has not contributed to overfishing in Panama.

27. See Point 14.

The foregoing represents our comments on your Department's report. Before closing we should like to suggest that the time allowed for these evaluation missions be longer than the brief period allowed in the case of Loan 784-PAN.

Thank you for your attention to these comments, we are available for any further clarification.

Sincerely

/s/ Alberto Barrios I.
Director, Fisheries Project

PROJECT COMPLETION REPORT

PANAMA FISHERIES PROJECT

(Loan 784-PAN)

I. BACKGROUND

1.01 Over the period 1969-76 the Panamanian fisheries sector accounted for about 4% of GDP. The shrimp industry, which contributed about a third of total fisheries output value, employed about 1,200 people and represented about 11% of the value of exports, excluding petroleum products.

1.02 Over two decades, total recorded shrimp landings (para 5.04) have been fluctuating between 5,000 and 7,000 m tons, estimated to be around the maximum yield for the species caught in traditional grounds, close to the shore. More than 80% of the catch is exported exclusively to the US, accounting for about 5% of total US shrimp imports. Prices received by fishermen are therefore directly related to fluctuations on the US market.

1.03 Demand for shrimps in developed countries is growing rapidly but the world supply has grown little since 1970 (Table 1). Real prices of shrimps (Table 1) have been increasing by 3% to 4% per year since 1969 (3.3% if deflated by the index of international inflation) and are expected to continue to increase at the same rate.

II. PREPARATION AND APPRAISAL

Origin

2.01 The first reference in Bank files to a possible project in the Panamanian fisheries sector appears in a report dated January 1969 by a November 1968 FAO/CP reconnaissance mission. This report identified the lack of proper unloading and boat servicing facilities as the main bottleneck to further development of the industry, and the main focus of early identification and preparation efforts was essentially the feasibility of a new fishing port project.

2.02 An FAO/CP identification/preparation mission was sent to Panama in July 1969, which confirmed the possibility of a project which would include financing of a feasibility study for a new fishing port and a credit scheme limited to the replacement of obsolete fishing vessels. A follow-up project would consist of the construction of the fishing port. The draft preparation report was sent by FAO/CP to the Bank in February 1970, reviewed and commented upon in March/April. The final version was forwarded by FAO/CP to the Bank and to the Government at the end of July 1970.

2.03 Most Bank correspondence during 1969 and 1970 relates to the drafting of terms of reference for a consulting firm to carry out the feasibility study for the new fishing port and, later, to the selection of the consulting firm (paras 3.21 and 3.22).

Project Formulation

2.04 The project was appraised in January-February 1971. Discussions up to negotiations centered around three main points: (a) BNP's ability to manage and finance the project, given its past frequent changes in management, poor operating performance, loan recovery problems and tight liquidity position following heavy lending to Government in 1968; (b) the need to exempt project boats from a law prohibiting the import of vessels to fish in Panamanian waters; and (c) the need to obtain an assurance from the Government that individual vessel owners would be given a fair and first chance to receive funds from the project in order to prevent further concentration of the fleet in the hands of shrimp processors and large companies.

2.05 At a meeting on June 21, 1971, the Loan Committee agreed that the Loan would be made to the Government but that BNP would manage it as a trust fund. This position was changed during negotiations (July 1971) when it was agreed that BNP would be the borrower, with Government guarantee, provided that BNP would commit itself to improving staffing, organization and procedures of its Industrial Credit Department and to taking steps to improve the bank's overall organization and operations. Agreement was reached on procurement of vessels (ICB, by lots of 10) and on the possibility of financing the Captains' Training Program as part of a new UNDP/FAO Fisheries Development Program.

2.06 The Board approved the Loan on July 27, 1971. Some questions were raised during the presentation regarding the extent of Panamanian control over its territorial waters, the ecological impact of a possible new Panama canal, and the necessity to standardize boat design and to hire a naval architect. The matter of giving preference to small shipowners was emphasized by the staff and one of the Executive Directors.

2.07 The Loan to BNP (US$3.4 million) was signed on August 2, 1971. It is repayable in 12 years, including five years' grace, and it carries an interest of 7-1/4% and a commitment charge of 3/4 of 1% on undisbursed balances.

Targets and Goals

2.08 The project was to "provide critical assistance to Panama's shrimp fishing industry by preventing a decline in the catch of a substantial part of the existing fleet and by increasing the industry's efficiency." Over a four-year investment period, the project would:

(a) provide credit to fishermen to replace about 40 old wooden vessels with modern steel shrimp trawlers equipped with modern fishing gear;

(b) provide technical assistance services to design and assist in procurement and construction supervision of the shrimp trawlers and to train shrimp fishermen in basic navigation and in the use of modern fishing gear; and

(c) finance the feasibility study for a new fishing port outside Panama City.

2.09 The Loan was to finance the foreign exchange component (64% of total project costs of US$5.4 million). BNP was responsible for carrying out Part A of the project (design and construction of shrimp trawlers and provision of credit to sub-borrowers) and the Government for carrying out the fishermen training program and the port feasibility study through the Ministry of Commerce and Industry.

III. IMPLEMENTATION

Effectiveness and Start-up

3.01 There was little delay in making the loan effective (one month) but time consuming prequalification procedures, the need to re-draw specifications after the failure of the first bidding, and the difficulty of attracting qualified bidders delayed the award of the contract for the first 10 boats until March 1974, i.e., more than two years after the loan had become effective. By that time, vessel construction costs had increased considerably from US$81,000 per boat as estimated at appraisal (January-February 1971) to US$146,000. They were to further increase to US$175,000 for the 10 following boats and to US$180,000 for the last six, even though they were built according to appraisal specifications.

Mid-Course Revisions

3.02 This cost escalation led to two changes in the Loan Agreement. The first change, dated January 31, 1974, permitted more lenient credit terms to sub-borrowers who were "independent operators" (captains owning and operating their trawlers). It extended the repayment period from eight years (Schedule 5, C of the Loan Agreement) to 10 years, including one year of grace, and reduced the beneficiary's contribution from 10% to 5% of the construction costs. The second change, dated April 17, 1975, reallocated US$650,000 from Categories II and III (technical assistance services and unallocated) to construction and equipment of shrimp trawlers (Category I).

3.03 Even then, only 26 out of the 40 boats initially envisaged could be constructed out of the project funds. Although much delayed by UNDP's inability to locate a training officer (para 3.16), the captains' training program was satisfactorily completed in September 1976. The port feasibility study was completed in March 1974 and led to a port Loan (1114-PAN), approved by the Bank on April 22, 1975. The port is under construction and completion is expected in 1979.

A. Construction of Shrimp Trawlers

Procurement

3.04 As stipulated in the Loan Agreement, the trawlers were procured through International Competitive Bidding. Prequalification of shipyards was initiated in March 1972. Twenty firms submitted prequalification documents and 15 were prequalified from 11 countries, including a firm from Panama. The list of prequalified contractors was finalized in August 1972.

3.05 Bids were invited in November 1972. The 15 prequalified firms bought bidding documents but only three were able to submit their offers on time, by January 31, 1973: one firm from Colombia, one from Austria and one from Mexico. The latter two were disqualified, however, for not complying with the conditions set up in the bidding documents. Since only the Colombian shipyard complied, the bid was declared void for lack of competition. The three offers ranged from US$135,000 to US$180,000 per boat.

3.06 After discussions with the Bank, BNP agreed that specifications and bidding documents were too detailed and inflexible and tended to discourage participation of shipyards. Simplified specifications were sent to the Bank in July 1973 and new tenders were finally invited in September 1973. Eleven prequalified firms bought documents, and, again, three submitted offers. At opening on December 13, 1973, proposals were as follows:

(a) Ferjaro, S.A. (Brazil) - up to 10 boats, at US$248,900 each;

(b) Astilleros Imesa, S.A. (Mexico) - four lots of 10 boats at US$169,985 to US$196,778 each boat; and

(c) Construcciones Navales de Panama, S.A. (Panama) (CONAPAN) - 10 boats at US$148,375 each.

The contract for the first 10 boats was thus awarded to CONAPAN in March 1974.

3.07 Bid envelopes for a second lot of boats were opened on June 14, 1974. However, only one proposal, from CONAPAN, had been received and the bidding was declared void. Given the lack of interest from other shipyards, the Bank allowed BNP to negotiate contracts directly with CONAPAN for the construction of the remaining boats. BNP signed two successive contracts: the first on October 14, 1974 for 10 boats at US$175,000 each and three boats at US$180,000 each; and the second in April 1975 for the remaining three boats, at US$180,000 each. The unit cost to sub-borrowers was averaged out at US$165,000 per boat (para 4.05).

3.08 There were no serious delays in boat construction, which required from seven to 12 months per boat. The first boat was delivered in October 1974 and the last in May 1976 (Annex 1).

Sub-borrowers

3.09 After the loan became effective, but before the first contract was awarded in 1974, 22 boat owners expressed their interest in acquiring a total of 55 boats. The distribution of applicants was as follows:

	No. of Boats Requested	No. of Applicants
Shrimp Processing Plants	26	3
Independent Owners:		
Large owners /1	10	3
Small owners /2	19	16
Total	55	22

/1 With six boats or more.
/2 With less than six boats (none had four or five).

However, by the time the construction contracts were awarded, the cost of the boats had more than doubled and operating costs, particularly fuel and labor, had also increased considerably, due to the energy crisis and subsequent high inflation rates. At the same time, the recession in the US caused a sharp decrease in shrimp prices in 1974 relatively to their 1973 levels (Table 2). As a result of this squeeze in profits and of uncertainty about future shrimp prices, the small shipowners who had applied became unwilling to assume such a large debt and, for those who could still afford immediately to put up a cash contribution of 5% to 10% of the cost of a new boat, it appeared safer and more advantageous in the short- and medium-term to keep on operating or renovating their existing vessel. The following figures show that, in 1976, the prices at which costs and earnings would break even were about the same for old vessels as for new vessels, if depreciation of new vessels is not taken into consideration, and substantially higher for new vessels if depreciation or debt service are added to the costs:

	Wooden Boat, Over 16 yrs., 200 hp	Project Steel Boat, 240 hp (First Year)
Annual catch, lb	36,400	45,150
Operating costs	54,170	68,140
Depreciation (5% per year)	-	8,250
Total costs	54,170	76,390
Break even price of shrimps:		
- without depreciation	1.49	1.51
- with depreciation		1.69
- without depreciation, with interest		1.77

Source: Project boats Accounts and Appraisal Report - Second Fisheries Project.

These figures demonstrate a definite advantage for the retention of old vessels, if the price of shrimps falls to levels which are about the same as the shrimp prices were in 1974 if expressed in 1976 terms. This was true then even if the owner had to spend some amount of money to renovate part of the boat in order to keep it at sea. In 1976, for some US$15,000 to US$20,000, a wooden hull could be rehabilitated and winches, tanks, mast and rigging replaced, and for US$25,000 to US$30,000, a new 200 hp engine could be purchased and installed. The inclusion of depreciation over 10 years of a new hull plus tanks and fishing superstructure or a new engine would only have raised the break-even price of shrimps for old boats to US$1.55 to US$1.60 per pound, assuming that the annual catch would remain constant at 36,400 lb.

3.10 The change in the Loan Agreement, allowing independent operators to contribute only 5% of investment costs (besides initial working capital) and extending the loan maturity (para 3.02) was not sufficient to overcome their reluctance. Instead, they preferred to continue operating the old vessels or/and use their funds to overhaul and renovate them once more. Consequently, in September 1974, very few small owners were still interested in purchasing a project boat from Banco Nacional de Panama. On the other hand, two processing plants persistently maintained their requests for 26 boats. However, to allocate the project boats to them was somewhat in contradiction with the declared project goal of giving priority to small independent owners. Furthermore, such action would not be consistent either with Panama's determination to prevent concentration of the fleet in the hands of a few. Besides, large processors and companies did appear to have sufficient resources of their own or other credit sources to replace their old vessels (para 5.02). As a matter of fact, applying processors have been able to finance nine boats out of other funds, as did the large independent owners for 10 boats. But among these small owners who applied, only one did purchase a new boat (in 1973) with non-project funds.

3.11 Since the only potential sub-borrowers who were still interested in a new boat and who would be acceptable as small shipowners were captains operating boats they did not own, the project unit decided to consider their applications. A total of 67 captains applied for the 26 project boats.

While the Bank was sympathetic to increasing the number of captain-owners, it did not consciously support an increase in fleet capacity in the hands of non-shipowners. Since they did not own fishing licenses already, the beneficiaries selected were awarded special licenses under a special arrangement established for that purpose. A major consequence of this decision was that the 26 project boats were added to the existing fleet instead of replacing old trawlers.

3.12 The first 16 boats were awarded to the most competent of the applying captains. Then, as only 10 more boats could be financed out of project funds, BNP encouraged the remaining applicants to form associations of captains. One of them would operate the boat and receive appropriate remuneration for it, while the others would continue to work for their current employers, and they would all share the profits. One cooperative and nine companies were thus awarded the 10 remaining boats. The type of company set up, however (Sociedad Anonima, which is a form of limited responsibility company), is not entirely satisfactory since there is no guarantee that control is or will remain in the hands of captains. As a matter of fact, there are no captains among the shareholders of three of the companies, only among members of the Board of Directors. A closer look at these companies and a few restrictive conditions to Bank acceptance of them as sub-borrowers is recommended during the supervision of the follow-up project (para 7.01) if this type of sub-borrower is not ruled out entirely. A list of sub-borrowers is provided in Annex 1.

B. Captains' Training Program

3.13 The purpose of this component was to train the project trawler captains in modern navigational equipment (echo sounder), operational safety at sea, coastal navigation and preventive maintenance of the machinery. It was designed, not only to increase the project captains' efficiency in traditional fishing grounds, but also to allow them to fish in less well-known areas, farther out to sea, for deep sea species (Fidel, Cabezon). At the time, UNDP/FAO had an ongoing research program to locate and evaluate these resources. The inclusion of navigation and the use of echo sounders in the curriculum was aimed at providing interested project captains with the opportunity of exploiting such resources.

3.14 The training was to take place at least three months before the boats were to be delivered to the sub-borrowers (the first three boats were delivered in October 1974 and the last one in May 1976). UNDP agreed to make the research boat "Canopus" and its captain available for training, using a curriculum agreed upon by the Bank, and a contract between UNDP and the Panamanian Government to that effect was signed in June 1972, to be initiated when the boats would be ready for delivery. However, the requirements of the FAO/UNDP research program constantly delayed implementation of the course and ultimately prevented it altogether. In December 1975, a contract was signed between UNDP and BNP for the provision of another expert for six months,

starting January 15, 1976. The training, under Captain J. Gueran, from FAO, started in April 1976 and was completed at the end of September 1976. Captains were trained on their own trawlers during a total of nine commercial fishing trips and 60 hours of classroom instruction. Instruction was given to two captains at the same time, with each trip averaging eight days. From discussions with the training officer and from his reports, it appears that:

(a) courses in navigation were well received by the captains although they were of doubtful use in traditional fishing grounds which are always in sight of the coast and well known to fishermen. Project captains rarely go farther away as deeper sea shrimp varieties, although abundant, are of much lower commercial value; and

(b) priority should be given to teaching and enforcing safety regulations and routine maintenance of the boats.

3.15 The training officer found that the captains were not familiar with basic safety regulations on board and international procedures for avoiding collisions. He also identified a need for an updated Spanish version of international regulations on these matters, which would enable the responsible authorities to enforce those regulations. The Port Authority should distribute specific instructions to captains who should be required to be familiar with them in order to obtain captains licenses. There is also need for inspectors to enforce regulations on navigation. For instance, in 1976, many project boats did not show mandatory lights while they were trawling at night. Besides being a danger to the many vessels that constantly go in and out of Panamanian territorial waters, they were also probably not eligible to make claims on the insurance they are required to carry, since the insurance contract expressly states that no claim will be accepted for damages incurred because of inadequate lights.

3.16 Consequently, there is a great need for a national program that would define safety rules applicable in Panama, create an adequate inspection service to enforce them, reform the conditions for obtaining a captain's license, and provide instruction to captains and crews of the Panamanian fishing fleet. Without this action, the provision of training to project boats captains in safety rules and practices has a somewhat limited impact. Following receipt of the training officer's final report, however, the project director made sure that all the project boats had all proper lights installed or replaced.

3.17 The training expert also reported that captains were unconcerned about routine maintenance practices. He therefore recommended that the subject be emphasized in future training and that the project unit carry out periodic inspections to ensure that such practices are followed. He further suggested that compliance with staff recommendations be made mandatory. The July 1976 Bank supervision mission made similar suggestions and BNP has since then made arrangements for a private workshop to carry out these inspections and provide maintenance and minor repair services (para 4.07). On the whole, the training

program has been a success in spite of lengthy delays and has been well in line with what was envisaged at appraisal.

C. Fishing Port Feasibility Study

3.18 Before Loan 784-PAN was signed, the Bank had already assisted the Government to prepare procedures for hiring and detailed terms of reference for a consulting firm to carry out a feasibility study of a new fishing port. The firm Livesey and Henderson, from the UK, was thus selected in accordance with Bank Guidelines and was able to start the study in June 1971, about two months before loan signature. A first phase of general studies was completed in October 1971 with the recommendation that the port be located at Punta Vacamonte, one of two sites thoroughly studied. The Government requested the firm to carry out supplementary studies on a third site, which delayed the detailed feasibility study. Finally, in August 1972 a Government-appointed Evaluation Committee concurred with Livesey and Henderson on the proposed site of Punta Vacamonte. The second phase of the study was completed at the end of 1973 and the final draft was presented to the Government in March 1974.

3.19 On this basis, a fishing port project was appraised by the Bank and a port Loan (1114-PAN) of US$24 million was approved on April 22, 1975. Construction is proceeding and completion is expected on schedule in 1979.

D. Costs, Financing and Disbursements

Total Project Costs

3.20 Actual costs and appraisal estimates are presented below:

	Total Cost (US$ '000)		% Foreign Exchange		Total Foreign Exchange US$ '000)	
	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual
Shrimp Trawlers						
Construction	3,240	4,316	65	58	2,100	2,516
Fishing gear	200	108	100	90	200	100
Spare parts	-	69	-	100	-	69
Sub-total	3,440	4,493	67	60	2,300	2,685
Technical Assistance						
Naval architect	70	12	86	-	60	-
Fishing operations training officer	50	29	80	99	40	28
Sub-total	120	41	67	68	100	28
Fishing Port Feasibility Study						
Consultants	550	577	75	69	400	398
Contingency						
Price (13%)	456	-	81	-	370	-
Physical (10%)	344	-	67	-	230	-
Permanent Working Capital	440 /1	333 /2	-	-	-	-
Total Project Costs	5,350	5,444	64	57	3,400	3,111

/1 Fuel, food and supplies necessary for initial operations, and the value of a shrimp fishing license.

/2 First year insurance premium (US$7,837 per boat) and fuel, food and supplies necessary for initial operations.

3.21 A considerable increase in construction costs took place between 1970 and 1975. Actual costs of the 26 vessels were: 10 trawlers at US$146,000 each, 10 trawlers at US$175,000 each, and 6 trawlers at US$180,000 each, compared with US$81,000 expected at appraisal. A breakdown in these costs is presented in Table 3. The average unit cost of project trawlers more than doubled (+122%) between 1970 and April 1975, the date on which the last

contract was signed with the shipyard. Between 1970 and 1975, the wholesale price index in Panama increased from 100 to 202 and the index of international inflation from 100 to 192. These considerable cost increases are therefore mostly the consequences of world inflation and the impact of the oil crisis on the cost of steel and steel products. Another important contributing factor was the increase in labor costs. A revision of the labor code in 1972 reinforced the power of the unions and increased social charges and benefits by about 80%. Moreover, base wages for qualified labor have increased by about half between 1970 and 1976.

3.22 Costs of project administration to BNP are estimated at around US$54,000 per year, including salaries (US$50,000) and other expenditures (US$4,000).

Financing

3.23 Financing was shared by the Bank, BNP, the Government and the sub-borrowers in the following amounts:

	Bank	BNP	Government	Sub-borrowers	Total
			(US$ '000)		
Category I					
Shrimp trawlers	2,900	1,152	-	264 /2	4,316 /1
Fishing gear	-	108 /3	-	-	108
Spare parts	46	23	-	-	69
Working capital	-	333 /4	-	-	333
Sub-total	2,946	1,616	-	264	4,826
Category II					
Naval architect	-	12 /5	-	-	12
Fishing operations training program	27	-	2	-	29
Fishing port feasibility study	398	-	179	-	577
Sub-total	425	12	181	-	618
Total	3,371	1,628	181	264	5,444

/1 BNP audited project accounts only show a total cost of US$4,290,000.
/2 5% of construction costs for 20 sub-borrowers and 10% for six sub-borrowers, US$230,000 of which were actually financed by BNP through short term loans.
/3 Financed through short-term loans (12% interest rate): fishing gear: US$4,163 per boat.
/4 Including first year insurance premium (US$7,837 per boat) and working capital for initial operations.
/5 Includes travel to Miami by the fleet supervisor to obtain price quotations on parts.

A comparison of actual financing with that expected at appraisal is given below:

	Appraisal %	Actual %
Bank	64	62
BNP	17	30
Government	3	3
Beneficiaries	16	5
	100	100

Because of the cost increases and lack of resources of the beneficiaries selected, BNP had to finance more than its original share of construction costs and most requirements in initial working capital. In addition, many captains borrowed from BNP at commercial terms (short term, 12% interest) to finance their own equity.

Disbursements

3.24 The actual and estimated schedules of disbursements are presented in Annex 2, Table 1. A more detailed breakdown by categories is presented in Annex 2, Table 2.

IV. INSTITUTIONAL DEVELOPMENT AND PERFORMANCE

4.01 In 1970 BNP hired a firm of consultants (Peat, Marwick and Mitchell) to advise on the reorganization of the Industrial Credit Department. Their recommendations were implemented in 1971. In addition, prior to the promulgation of Law 20 of 1975, by which BNP became a fully autonomous state entity, another firm (Arthur D. Little and Co.) was contracted to make recommendations on top management structure.

4.02 Regarding BNP's financial position, in 1976 a vigorous action reduced the proportion of the portfolio in arrears from previous levels of 12% to 8%. The debt/equity ratio, however, deteriorated between 1971 and 1975. These matters were discussed at length during appraisal and negotiations of the Second Livestock and Second Fisheries Development Projects (Loans 1397-PAN and 1398-PAN) and will not therefore be repeated here.

4.03 The Project Unit was set up, as envisaged in the appraisal report, as part of the Department of Industrial Credit. The project director was, at the same time, Director of Municipalities under BNP's Division of Assistance to Local Governments. He is assisted by a full-time deputy director. Other full-time personnel include a fleet supervisor and an accounts clerk. Additional administrative functions appropriate to project activities are carried out by other personnel of the Industrial Banking Division as and when required.

A naval architect was contracted to design and supervise the construction of project trawlers. In addition, a Fisheries Project Committee, with representatives of BNP, the Directorate of Marine Resources, the Fishermen's Association and independent fishermen, provided advice on boat specifications and evaluation of bids.

4.04 Generally, the executing agency had the power needed to implement the project up to the point of financing the construction and initial operation of the new fleet. The Project Unit has implemented the technical and financial aspects of the project well; it keeps sub-borrowers under tight control and it is genuinely concerned with providing beneficiaries with adequate support services.

Credit

4.05 All sub-borrowers received long-term loans from BNP to finance 90 to 95% of the construction cost of their vessels. Each subloan carries a 9.5% annual interest and for "independent operators" (a captain owning the trawler he operates), is repayable in 10 years, including one year of grace. For other operators, the subloan is repayable in eight years, as originally stated in the Loan Agreement. Although the unit price to sub-borrowers of the boats initially varied according to the date of the various construction contracts, BNP proposed to average out the cost of the entire lot to US$165,000 per boat. All sub-borrowers accepted a revision of their contracts accordingly.

4.06 In 1976, the debt service record of the sub-borrowers has been excellent. However, only interest had to be paid since most still were within the grace period in 1976 and early 1977. To this date, few data are available on 1977 operations, but it appears that unfavorable ecological conditions in 1976 and 1977 have resulted in noticeable decreases in the 1977 average catch per project boat (para 6.03). This might substantially tighten the sub-borrowers' liquidity position. In addition, cash flow projections (Annex 3, Table 2) show that their financial condition may become critical from years three to 10, particularly if real prices of shrimps increase at less than 3% per year or if costs increase by more than the inflation rate. BNP is very aware of this and has strongly encouraged the beneficiaries to establish reserves in fixed term savings accounts out of the money earned in the first two years. At the end of 1976, 10 owners had about US$10,700 each in such accounts and two had about US$5,500. In addition, the project director closely monitors their checking account balances. If this action is not pursued, it is likely that the repayment period will have to be extended once more.

Boat Maintenance

4.07 The Project Unit does not have sufficient staff to supervise routine preventive maintenance operations of the fleet, but the fleet supervisor sees to it that the boats are brought to the shipyard at least twice a year for inspection and major maintenance works, as required for insurance purposes. Routine maintenance practices and works, however, are neglected by the captains, and this could rapidly reduce the operating efficiency of the fleet. The Project Unit was made aware of this during supervision and a preventive boat maintenance program was set up at the end of 1976 under which the boats

would be regularly inspected and minor repairs and maintenance services would be performed. Its operation started in January 1977. BNP has selected a private mechanic with nine years previous experience with the local Caterpillar representative. The workshop, located on the shrimp landing jetty, belongs to him. His staff of seven includes, besides himself, three mechanics, an electrician, a carpenter and an occasionally contracted refrigeration specialist. Participation in the program is voluntary since there is a charge of about US$120 per month per boat, not including the cost of spare parts, and 16 captains have enrolled. Their boats are inspected after each trip and minor repairs are performed immediately. A report is sent to BNP after each visit and BNP sees to it that the boats do not leave the harbor before repairs are made.

4.08 The Bank financed 67% of the cost of an initial stock of spare parts (total cost: US$69,000), which belongs to BNP, to facilitate the work of the maintenance workshop by ensuring their immediate availability. For the enrolled boats, the system seems to work well. However, 10 captains have chosen to keep their former mechanics and those boats are not inspected regularly. For BNP's own protection, the Bank suggested to the project director that the private workshop be commissioned to perform compulsory inspection and checks on all boats, even when it does not itself perform the repairs. The matter should be followed up during supervision of the Second Fisheries Project, since the shrimp trawlers to be built or rehabilitated under this project will also have to receive proper maintenance.

Accounting, Monitoring and Evaluation

4.09 The keeping of project boat accounts has been entrusted to a firm of public accountants, Barreto y Asociados, at a monthly fee to the boat owners of US$80. Their work consists of keeping records for the captains, helping them in certain legal procedures (social security, taxes, license renewal, and the like), and producing financial statements every six months. Consequently, they produced balanced sheets and profit and loss accounts for each boat as of December 31, 1975, June 30, 1976 and December 31, 1976 in addition to statistics on catches. Unfortunately, they were produced in the conventional form, which is not adequate to reflect shrimp trawlers' operations and does not allow meaningful cost accounting.

4.10 The financial statements produced, although drawn up by this local accounting firm, were not audited either by an independent firm of public accountants or by the independent auditors of the Comptroller General's office. The figures used for the mission's cost calculations are therefore subject to reservations.

4.11 The accounting firm was to collect US$31,200 in total fees in 1977 for keeping the individual books of account for the 26 trawlers, a figure judged to be high. Accordingly, after a discussion on the matter between the project director and trawler captains at a meeting of fishing captains, it was agreed that meaningful management accounting was more important than bookkeeping and the suggestion that the BNP project administration unit could be

organized to keep such accounting records at less cost was favorably received. Some fee would be charged to the captains, and the accounts could be audited by BNP internal auditors. Properly stated, they would be of great help to the captains to understand their financial situation and to BNP itself for project monitoring and evaluation purposes. This transfer had not been made yet by June 1977 but the mission was assured that it would take place in early 1978 at BNP's new headquarters, when the accounting unit for the Second Fisheries Project would be set up.

Insurance

4.12 There is a condition in each loan agreement that the sub-borrowers should take an all-risk insurance policy to cover any contingency that might occur in connection with the vessel to be insured. A local company (Compania Internacional de Seguros S.A.) was selected on behalf of BNP by Asesora Tefi, S.A., local brokers, who receive a 7% commission. The annual premium was agreed at 4.75% of US$165,000 for each trawler, i.e., US$7,837 p.a., with the insured assuming the first US$1,000 of loss. Although lower than current rates for new steel trawlers (around 5.25% quoted by one company), it is higher than the premium that could be obtained from pool marine insurance for the 26 boats. During supervision, the Bank recommended that such a possibility be reviewed or that BNP carry its own self-insurance pool for the whole fleet. The matter was discussed by the project director with the broker, and the insurance company proposed to concede the boat owners a 30% participation in annual profits retroactively to January 1976. At the end of 1976, about US$12,000 was returned to the captains, reducing the actual premium from US$7,837 to US$7,373, i.e., from 4.75% to 4.47%, but this is still probably substantially higher than possible rates under pool marine insurance (estimated at 2.8% by the appraisal team).

Progress Reporting

4.13 Quarterly progress reports were received up to June 1976 when the Project was almost completed and more than 95% of the funds disbursed. Only payments for 5% of the value of a few boats were still due to the shipyard under the performance guarantee scheme and the spare parts for the maintenance program still had to be purchased. Quarterly progress reports included tabulated information on key procurement and construction dates, sector data on shrimp landings and prices, and disbursements. Separate reports by the Ministry of Industry and Commerce on the port feasibility study and by the naval architect on the status of construction of each vessel were attached to every report. In addition, two annual reports on boat operating accounts for 1975 and 1976 were sent, the latter was received in early 1977. The training officer submitted a final report at the end of September 1976. Technical and financial reporting was adequate, but none of these reports included any analysis of current economic conditions in the sector.

Auditing

4.14 The Loan Agreement and the Guarantee Agreement required project accounts of BNP and, for the captains' training program and the port feasibility study, the Ministry of Industry and Commerce, to be audited every year. Auditing of BNP's project accounts was carried out by the General Comptroller of the Republic (Contraloria General de la Republica) within the framework of its general annual auditing of BNP and reports were sent to the Bank regularly and on schedule. Audit reports of project accounts of the Ministry of Commerce and Industry for the port feasibility study, however, were never received and the files do not show evidence that they were ever claimed. Since Bank funds for that purpose were channelled through BNP, they were subject to auditing of BNP's accounts. According to the Port Authority, however, the Ministry of Commerce and Industry spent US$178,917 in local expenditures, in addition to the Bank-financed consulting fees of US$398,387 (para. 3.23).

V. PRODUCTION AND SOCIAL IMPACT

Changes in the Shrimp Trawler Fleet

5.01 Out of the 229 shrimp trawlers in operation at the end of 1970, about half (113) were wooden trawlers over 10 years old, kept in operation at high cost (operating, maintenance, frequent replacement of hull, keel and rudder pieces, frequent caulking of the hull planks; and replacement of the main engine, brine tanks and auxiliary equipment) (Table 4). Since 1968, the number of shrimp fishing licenses had been limited to 238 1/ but the appraisal mission estimated that the total catch would decline if an estimated 40 boats were not renewed. To that effect, the project made financing available, particularly to small shipowners who were to receive preference (Schedule 5,B of the Loan Agreement).

5.02 Since the beginning of 1971, 73 new boats have been constructed, including 26 under this project (Table 5). The number of ordinary licenses for shrimp vessels of more than 20 tons gross is still legally limited to 238. However, additional special permits have been issued to 26 project beneficiaries and to eight other fishermen. The 26 new boats financed through this project have been granted special licenses so that they were, in effect, added to the existing fleet (para 3.11). The remaining 39 new boats therefore may be considered as replacements for obsolete boats 2/: nine belong to processing plants, 13 to large companies, 16 to small companies and one to an individual, which indicates that, except for individual boat owners, alternative sources of financing were available. Many of the companies and some individuals are affiliated or in partnership with processing plants. Financing was

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1/ For trawlers over 20 tons gross.

2/ Direct replacement or indirect whenever the owner had purchased a license from another one who did not want to replace his boat. In 1976, ten ordinary licenses were not in use.

obtained from a few banks prior to 1975 (Banco Fiduciario, Banco Continental, Chase Manhattan) on rather stringent terms (three-year repayment period, no grace), mostly by processors and large companies. Smaller companies and owners financed their vessels mostly out of their own funds. It must be pointed out that many owners and most shareholders have other activities and do not operate their boats themselves. 1/

5.03 As a result, 78 of the 113 boats already considered obsolete at appraisal were still operating in 1976. Most now are 18 to 20 years old. Twenty-four belong to small owners (individuals or associations), and it can be assumed that they were part of the initial target group of the project (Table 6).

Impact of the Project on the Relation of Capacity of the Shrimp Trawler Fleet to Shrimp Resources

5.04 Since 1960, total shrimp landings have fluctuated between 5,000 metric tons and 7,000 metric tons per year (Table 7) and both appraisal reports of the first and second fisheries projects estimated that stocks in the traditional fishing ground were being fully exploited and that a further increase in fishing intensity would not significantly increase the total annual catch. These statistics are based on landings at processors' piers and do not take into account landings elsewhere for unrecorded direct sales on the domestic market, mostly to restaurants. In many countries where boats are not operated by their owners and the crew is paid on a share-of-catch basis, as in Panama, it may happen that some captains sell part of the catch while at sea for their own benefits. These uncertainties cause the financial and economic analysis of the project to be tentative although on the same basis as at appraisal. However, there does not seem to exist any other important incentive to directly sell on the domestic market or abroad. The currency is freely convertible and pegged to the dollar, no indirect tax is levied on the catch, and there is no official control of domestic or export prices. If a substantial increase in the catch of shrimps was possible from additional boats, this should have become apparent from the national catch statistics shown on Table 7, particularly between 1960 and 1975 when the total number of boats increased from 162 to 254 and yet, total landings remained around the same level throughout this period.

5.05 In the short term, the project as implemented has therefore contributed to some extent to the present over-capacity of the fleet. Table 7 shows that since the early 1960's, particularly since 1970, the average catch per boat has decreased substantially. The total national catch of the more highly priced species has been decreasing, which led the Government in 1977 to impose a complete ban on fishing for all shrimp species during the months of February and March of each year. However, over-capacity is also a result of non-enforcement of regulations limiting, not only the number of licenses, but also

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1/ Few data are available on the structure of boat ownership and its links with other activities.

the engine horsepower to 260 hp on new trawlers (since July 1972). Project boats have complied with horsepower regulations since they have 240 hp engines but practically all the other new boats constructed since 1973 have well over 300 hp, which allows them to trawl larger nets faster (Table 8).

5.06 The 26 project boats (10% of total number of vessels and 9% of total fleet horsepower) accounted for 8 to 10% of total national catch in 1976 and early 1977 (Table 9). They also seem to have performed better than the average boat in catching the high priced white and pink shrimp species (Table 10).

Social Benefits

5.07 Social benefits from the project are substantial since it gave to motivated captains the opportunity to increase their incomes and become independent entrepreneurs. A captain working as an employee on a trawler earns about US$7,000 to US$7,500 per year, while as a project beneficiary, he may earn as much as US$36,000 after his debt has been repaid. In the longer run, when obsolete boats are retired and when the new licensing regulations have been enforced, thus solving the present problems of fleet overcapacity, the project may have actually been instrumental in bringing about a more fair, more efficient structure of ownership of the shrimp trawler fleet. This depends, however, on how many other independent operators will replace their obsolete vessels after 1980.

5.08 In addition, the project created permanent employment for about 80 crewmen. Incremental employment in the shipyard attributed to the project may be estimated at about 350 man-months from March 1974 to January 1976. However, this does not include the additional employment created in the shipyards for the maintenance of an enlarged fleet.

VI. RATES OF RETURN

A. Financial Rate of Return

6.01 The appraisal report estimated the financial rate of return to be about 14% if prices and labor costs remained constant and 22% if prices and labor costs increased by 2% per year (the crew is paid on a share-of-catch basis).

6.02 Accounts are available for one full year of operation for 20 project trawlers (1976) and to some extent, for 1975 and 1977. Actual results and appraisal estimates for the first year of operation are shown in Table 11. Actual results have been drawn from unaudited financial statements prepared from the legal books kept for each trawler by the accounting firm, Barreto y Asociados.

6.03 Since beneficiaries did not own a trawler before, all financial costs and benefits may be considered as incremental with the exception of the captain's remuneration, which has been added to the operating costs. Real prices of shrimps have increased by 3% to 4% per year on average between 1970 and 1975 and have been assumed to continue to increase by 3% per annum, with concomitant increases in labor costs. The number of fishing days per year in 1976 was the same as projected at appraisal (240), but will be lower in the future (216) since shrimp fishing is now prohibited in February and March. Calculations, assumptions and sensitivity to various hypotheses are detailed in Annex 3. The most likely rate of return has been estimated at around 17%, very close to appraisal estimates under the price and cost increase assumption. It is clear that the immediate post construction operational experience has been quite satisfactory since net income of the first year after debt service, depreciation and tax is, in constant terms, 1.6 times the appraisal figure. However, analysis of the main contributing factors reveal that:

(a) At appraisal, the average annual catch per trawler was estimated at 69,600 lb, or 290 lb per fishing day. The average annual catch based on results of 3,567 fishing days in 1975 and 5,950 in 1976 was only 183 lb (Table 12), or about 44,000 lb per year (Table 13), only 63% of the original estimate. This reflects the general decrease in catch per boat in Panama, which, in turn, reflects an 11% increase in the total number of trawlers and the higher average horsepower of the new trawlers' engines, while the total national catch remained stable and even decreased. In 1977, the average catch per boat decreased substantially, to about 33,900 lb. Although no data are available yet either on the number of fishing days or on the total national catch in 1977, the latter is reported to have decreased by more than 25% from its 1976 level. This is believed to be because severe drought in 1976 and rising waters in the Bayano river dam reservoir have reduced fresh water flows to the brackish water areas where the shrimps breed and grow.

(b) The shortfall in the catch was more than offset by an increase in ex-vessel prices of shrimps, from US$0.77 per pound at appraisal to US$1.77 in 1975 and to US$2.58 per lb in 1976 (Table 13). Exceptionally high prices since 1976 following recovery from the recession in the US, early in the boats' operating life, inflated the actual rate of return relatively to what such return would have been in a more "normal" situation (sensitivity tests show a 14% rate of return if the 1976 price had been at US$2.05 per pound, in line with 1970-75 trends). Prices remained high in 1977, although they slightly decreased from their 1976 level to US$2.49 per lb.

(c) Actual gross earnings in 1970 constant terms are about 10% higher than appraisal estimates, but operating costs appear roughly similar. Trip expenses, however, account for a larger proportion of total operating costs (40% instead of 36%), because of large increases in fuel prices and labor costs. Ship's fixed expenses, such as maintenance, appear lower but they also should increase substantially during the coming years.

and the cash flow position are quite sensitive to the time spent at sea, which points up to the importance of a good preventive maintenance program that will reduce the number of days a trawler is immobilized for repairs.

B. Economic Rate of Return

6.04 Because of uncertainties concerning the basic statistics on the national catch (para 5.05) and the impossibility accurately to foresee future changes in the total fleet, and because data on the operations of the project boats are available only for a maximum of two years, it is still too early to assess the economic return of the project. The calculations described in Annex 4 and summarized below are based on the conservative assumptions that future changes in shrimp prices, total fleet catch and in the number of boats in operation will follow the same trends as recently recorded in official statistics. In addition, it is assumed that had the 26 project boats not been launched there would have been no reduction in the national catch up to and including 1979.

6.05 At appraisal, it was considered that the principal economic benefit of the project would be the incremental volume of shrimps which replacement trawlers would catch over the amount the old vessels would catch if they were kept in use for a longer period. This averted loss to the shrimp sector cannot now be accounted for as an incremental benefit since the project boats were added to an existing fleet which was already able fully to exploit the traditional fishing grounds. The same national catch has been redistributed among a larger number of boats, thereby increasing total fishing costs. Consequently, whereas all the project costs are incremental, there will be no incremental benefits to claim, until the total fleet capacity has decreased below the total maximum catch volume. According to a decree issued in 1976, no new trawler may be constructed until 1980, when it is expected that the natural retirement of old trawlers will have brought the fleet capacity back to the level of maximum sustainable yield (for detailed analysis, reference should be made to the appraisal report of the Second Fisheries Project). By 1980 the number of trawlers of over 15 years, and particularly over 20 years old, will be considerably greater than in 1976, and it is likely that the retirement rate will then increase substantially. However, given the very limited amount of credit available for boat construction since 1975, other than under the Second Fisheries Project, it is likely also that not all old boats will be replaced. The 26 project boats will start yielding economic benefits from the moment they avert a loss in the national total shrimp catch. Assumptions used in the phasing of project benefits from 1980 are detailed and justified in Annex 4.

6.06 On the basis of past trends in price increases and natural retirement of old boats, but depending on the efficiency of the boat maintenance program in keeping the project boats at sea for about 216 days per year, the economic rate of return may be estimated to vary between 3% and 7% if shadow prices are used.

However, if the real price of shrimps increases annually by more than 3% and if the rate of retirement of old boats after 1980 is faster than assumed earlier, the economic rate of return could be between 8% and 12%. Several sensitivity tests have been carried out and are summarized in Annex 4, Table 2. It is also conceivable that a sudden fall in shrimp prices, similar to that which occurred in 1974 could lead to a more rapid retirement of old boats between 1978 and the early 1980s. Finally, as pointed out previously (para 5.04), national statistics on catches are not accurate enough to state with certainty that the addition of the 26 project boats did not result in some additional catch since 1976. Any benefits which occur between 1976 and 1980 would considerably increase the economic return of the project. However, the economic rate of return of the project is likely to be quite substantially below the range of 15% to 22% expected at appraisal.

C. Other Economic Considerations

6.07 A special feature of the Panamanian shrimp industry appears to be that there is a finite, yet renewable, resource which is now being fully exploited by more boats than required. Since there is no economic return on additional boats once the fleet has reached its optimum size, one may wonder what rationale was used to justify the new entries. Unless a government issues and enforces regulations limiting the number of licenses, or charges high fees on their issuance, or collects substantial taxes on profits, newcomers will be interested in joining the fleet as long as operations are financially profitable. Financial profitability of a boat depends on the economic efficiency of the fleet as a whole and there will be new entries until the fleet becomes so overcapitalized that its economic return drops below acceptable levels. In the case of Panama, profits from the shrimp fishing industry are not substantially taxed, only very small fees are charged on the issuance of licenses and, although the number of licenses has been limited since 1968, only in 1976 did the Government revise them to allow better enforcement. It is therefore interesting to estimate what the economic rate of return of the shrimp fleet was at the end of 1976.

6.08 Even with the addition of the 26 project boats, the economic rate of return of the shrimp fleet as a whole still appears to be fairly substantial. With 263 trawlers in operation in 1976, the projected financial rate of return of a project boat remains at about 17% (para 6.03). Therefore, if the whole fleet were to be replaced today with trawlers similar to the project boats, its economic rate of return would be 17%, or about 19% if transfer payments were deducted from financial costs. In 1976, the average annual catch of a project boat (44,500 lb) was about equal to the national average catch per boat, so that the economic benefits of the fleet (the total national catch value) were about equal to 263 times the value of the annual catch of a project trawler. On the other hand, project boat horsepower (240 hp), is slightly lower than the fleet average (255 hp) which means lower investment and operating costs. Also, to keep the national catch constant over the years, the number of fishing days per boat would have to be maintained at 220 to 240 days per year, which would mean higher maintenance costs and more

frequent parts replacement. On the basis of these two considerations, the economic rate of return of a new shrimp fleet of 263 vessels with characteristics similar to the boats they would replace, would more likely be about 13% to 16%, still an acceptable return.

6.09 Government policy until 1976 therefore appears to have derived from a determination to allow as many persons as economically possible to benefit from a profitable sector of the economy, even if the economic optimum was sacrificed to considerations of equity, reduction of unemployment and underemployment (paras 5.07 and 5.08) and to the desire to promote the local shipbuilding industry. The project gave CONAPAN the opportunity to gain and test improved technical methods so that it now can compete efficiently with foreign shipyards for the construction of fishing boats. Since 1976, however, the Government has become aware that the fleet could become only marginally efficient if some measures were not taken to limit, or even reduce the total number of trawlers in operation. Licensing regulations were therefore revised to allow better enforcement, and the construction of new vessels has been prohibited until 1980. One may also suggest that if natural attrition of old vessels brings the fleet close to, or at its economic optimum, then a properly designed tax on the high profits of the remaining vessels or/and high fees on the issuance of licenses could provide the Government with a very efficient means of deterring newcomers from attempting to acquire a vessel.

VII. CHANGES IN REPEATER PROJECTS

7.01 A Second Fisheries Project was appraised in July/August 1976. The new Loan (1398-PAN) was signed on April 28, 1977 and became effective on November 14, 1977. The new project addresses the whole fisheries sector and its scope is therefore much broader than just the shrimp industry. It will provide credit for the replacement of five obsolete shrimp trawlers by five new boats and for the rehabilitation of 10 old boats, and for the construction of 10 purse seiners. It will also provide financing to shrimp processors to relocate their plants at the new fishing port at Punta Vacamonte (Loan 1114-PAN), where a shell structure is being constructed. The project also includes pilot schemes on fresh water fish farming and oyster farming.

Control on Fleet Capacity and Licensing

7.02 In spite of the shrimp fleet overcapacity at the time of appraisal (August 1976), financing of the construction and rehabilitation of shrimp trawlers was included under the second project because the analysis of the fleet age structure shows that an important number of trawlers owned by small fishermen will be soon over 20 years old and in need of urgent replacement or rehabilitation (Annex 4, Section B). However, the construction of new trawlers should not be undertaken until the fleet capacity has been brought back to the level of the maximum yield of shrimp resources. The appraisal mission estimated that if the construction of new vessels was prohibited in 1976, natural retirement of old vessels would cause the fleet capacity to decrease to that level by 1980 (for detailed calculations, reference should be made to the appraisal report of the Second Fisheries Project).

7.03 Discussions were held between the Bank and the Government to prohibit the construction of new trawlers until 1980 (para 4.04), and the issue of a decree to that effect was made a condition of negotiations of the new loan (Decree No. 13 of March 1, 1977). In addition, an assurance was obtained at negotiations that construction of new shrimp trawlers and rehabilitation of old wooden boats would not exceed a total of 3,260 effective horsepower annually over the period 1980-85 and that a program outlining how this restriction would be enforced and the industry regulated would be sent to the Bank by the end of 1980. Also, the Government enacted a new law (Law No. 58 of November 23, 1976) regulating issuance of shrimp fishing licenses; such a legislation was also a condition of negotiations. It applies to all vessels, including those under 20 tons gross. Under its provision, licenses are no longer transferable and are linked to a particular boat, not to an individual. This allows tighter control, both on the size of the fleet in operation (since holding "idle" licenses is no longer possible) and on its ownership.

Eligibility Criteria

7.04 Priority is to be given to small independent operators (Schedule 2 of the Loan Agreement). Eligibility criteria are the same as those for the First Project (para 8.02). Since the Bank also has to review all applications, it will be possible to closely supervise the choice of sub-borrowers and the state of the boats to be replaced.

Cost and Size of New Vessels

7.05 An attempt has been made to further reduce the construction and operating costs of the new trawlers by proposing a reduced length of 50 ft instead of 67 ft and for a similar horsepower (about 220 hp). Total cost is estimated at US$100,000 and their catch capacity is estimated at 50,600 lb for 216 fishing days per year, which is roughly the catch of the 26 trawlers built from Loan 784-PAN. If successful, this would not only increase rates of return on new trawlers and substantially improve the owners' cash flow position, but also small owners of obsolete boats should be able to afford investing in a new boat. Since the project is also providing credit for the rehabilitation of old vessels, a few other small shipowners will also be able to continue operations at an even lower capital cost.

Captains' Training Program

7.06 The training of captains in fishing operations will be extended to all fishing vessel captains. Also, more emphasis will be put on maintenance and safety procedures. In addition, the training officer will be responsible for the establishment of a system of skippers' licenses to be issued by the port master after a short course in the fundamentals of coastal navigation, modern navigational equipment, safety regulations and preventive maintenance of vessels. However, no mention is made of the need for the creation of a corps of inspectors to ensure that national and international fishing regulations are observed in Panamanian waters.

VIII. BANK PERFORMANCE

Appraisal

8.02 The appraisal report properly identified all the main issues, including the danger of fleet overcapacity. It states clearly that the purpose of the project is to replace obsolete vessels and the Loan Agreement provided the Bank with all the tools required to control and reject any applicant for subloans. Schedule 5 of the Loan Agreement listed among eligibility criteria for applicants to prove their holding of a valid shrimp fishing license and to report on "the age of the vessel to which the valid shrimp fishing license applies and that is to be replaced" (criteria ii) The same Schedule also provided that all subloan analyses would be reviewed by the Bank prior to making any decision and that the terms and conditions of every subloan would be subject to Bank approval.

8.03 The appraisal team must also be given credit for initiating a reversal in the tendency at that time to build large size, high horsepower vessels. At the time of appraisal, the most popular size of boat was 72 feet long, with a 300-hp engine, with newer boats becoming even larger (Table 8). The mission undertook an analysis of the most economical size and settled on a 67-foot vessel with an engine of about 240 hp. This type of analysis had not been previously undertaken by the Directorate of Marine Resources which, according to the mission leader, found it most interesting. It probably helped the Directorate later on to set up maximum horsepower for new boats at 260 hp (para 5.05). The second fisheries project is following up on this effort by proposing even smaller size vessels (para 7.04).

Supervision

8.04 It is impossible to find in the correspondence files and supervision reports any clear statement indicating that the Bank was ever aware that the vessels had been awarded to non-shipowners. However, verbal statements of the project officer who supervised the project at that time indicate that the Bank was aware of this situation but preferred it to a repetition of a case in Ecuador where Bank-financed boats had ended up in the hands of large or foreign companies. Also, all subloan analyses were reviewed and approved by the Bank but none included any reference to name and age of boats to be replaced, as required by the Loan Agreement, which indicates an implicit agreement to waive criteria (ii) of Schedule 5,B of the Loan Agreement.

IX. CONCLUSIONS

9.01 This project has certainly checked the trend of concentration of the shrimp trawlers fleet in the hands of large companies or processors and has contributed to redistributing the currently substantial benefits of the shrimp sector among a larger number of individuals. It has also successfully contributed to building up project management capabilities within BNP and

training ship captains. However, although it is difficult to predict the evolution of the Panamanian shrimp fleet, the performance of project boats and of shrimp prices, on the basis of the information available so far, it appears probable that the economic rate of return of the project will prove to have been considerably less than expected at appraisal.

9.02 Long delays in procurement, unexpected and especially unfavorable economic circumstances combined to make it, by all standards, a very difficult project to manage. The vessels unfortunately became ready for delivery at a time when, because of the oil crisis, depressed world demand for shrimps resulted in significant price decreases, while construction and operating costs doubled over a short period of time. It would have been very costly, if not impossible, given the lack of facilities in Panamanian shipyards, for BNP to hold those boats in order to wait for better prospects. One possible solution would have been to award them to large processors or companies for replacement of their old trawlers. The project would thus have been economically more viable but at the risk of using Bank funds to assist sub-borrowers who had sufficient resources of their own. On equity grounds, this would have also been in contradiction with the declared philosophies of both the project and the Government of favoring small shipowners and avoiding further concentration of the fleet in the hands of a few.

9.03 In spite of the change in the Loan Agreement extending the repayment period from eight to ten years and reducing beneficiaries' contribution from 10% to 5% for independent operators (para 3.02), interest from small boat owners does seem to have fallen rather sharply around 1974. Perhaps even more lenient terms regarding their financial contribution, grace and repayment periods than were offered would have helped in that respect.

9.04 Technically and financially, however, the project has been fairly successful so far. It has contributed to build within BNP's Industrial Credit Department project management capabilities that will be useful in implementing follow-up projects and it has given an important impetus to the local shipbuilding industry.

9.05 Socially, with the exception of a few unclear sub-borrowing "companies," it has given a few hard-working captains access to entrepreneurship and created employment for some 80 crew members. Also, at least in the short term, it could be argued that the project contributed to distributing wealth within the fisheries sector among a larger number of fishermen. Even with the present reduced average catch per boat, shipowners with the new project boats may earn an income (before debt service) of some US$30,000, while, according to appraisal estimates of the Second Fisheries Project, owners of old unrehabilitated vessels would earn about US$20,000 per year.

February 14, 1978

Table 1

PANAMA

FISHERIES PROJECT (LOAN 784-PAN)

World Shrimp Prices and Landings - 1960-77

Year	Wholesale prices New York a/	US Landings	World Landings
	(US cents/lb)	(Thousand metric tons)	
1960	61	113	482
1961	82	79	521
1962	91	87	574
1963	70	109	622
1864	68	96	700
1965	70	110	690
1966	93	108	720
1967	87	140	780
1968	94	132	810
1969	103	144	840
1970	105	126	978
1971	121	129	1,043
1972	154	126	1,103
1973	200	104	1,253
1974	165	105	1,318
1975	237	94	1,258
1976	323	n.a.	n.a.
1977 b/	327	n.a.	n.a.

a/ Raw, headless, 31-40 count.
b/ Average January-May

Source: World Bank Commodities Division

December 2, 1977

Table 2

PANAMA

Loan 784-PAN

Average Ex-vessel Prices of Shrimps, per Species, 1970-76 a/

(US$ per lb.)

Specie	1970 (Appraisal)	1973	1974	1975	1976
White shrimps	1.33	2.18	2.37	2.72	3.84
Pink shrimps	0.58	1.37	0.88	1.49	2.35
Sea bobs ("Titi")	0.24	0.43	0.34	0.45	0.63
Other b/	0.30	0.65	0.60	0.80	1.09
All species c/ Current prices	0.61	1.47	1.17	1.60	2.41
Inflation index d/	100.0	126.3	164.5	187.6	202.2
Real prices	0.61	1.16	0.71	0.85	1.19

a/ Average of monthly prices weighted by monthly national catches.
b/ Zebra, Carabali and, mostly since 1975, deeper sea species ("Fidel" and "Cabezon").
c/ Average of annual prices of the various species, weighted by their annual catch.
d/ Wholesale Price Index - International Financial Statistics.
e/ Estimate.

Source: Appraisal Report and Directorate of Marine Resources, Ministry of Commerce and Industry

December 2, 1977

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Investment Costs of A Project Shrimp Trawler

(US$)

	Appraisal Estimate	Actual 1st lot of 10	Actual 2nd lot of 10	Actual Last 6	Weighted Average	Foreign Exch. %	Foreign Exch. US$
Steel Plates and Steel Products 1/	12,960	28,000	30,000	30,000	28,100	100	28,100
Engine	16,200	20,000	22,000	23,000	21,500	100	21,500
Shafting, Steering and Such	4,860	7,000	7,500	8,000	7,400	100	7,400
Auxiliary Machinery 2/	14,580	19,500	20,000	20,000	19,800	100	19,800
Electronics	2,430	3,800	4,000	4,000	3,900	100	3,900
Paint 3/	1,620	4,500	5,000	5,000	4,800	100	4,800
Wood	1,620	4,000	5,000	5,500	4,700	100	4,700
Outfitting	-	5,600	7,000	8,000	6,700	80	5,300
Labor	14,580	26,000	30,000	31,000	28,700	-	-
Engineering, Insurance, Other	-	2,000	2,500	2,500	2,300	-	-
Overhead 4/	-	10,600	15,000	15,000	13,300	-	-
Profit	12,150	18,000	27,000	28,000	23,800	-	-
Total Cost	81,000	146,000	175,000	180,000	165,000	58 5/	95,500

1/ Includes acetylene and oxygen for welding.
2/ Includes refrigeration equipment.
3/ Includes sand blasting.
4/ Includes depreciation of equipment, use of yard, warranty.
5/ Compared with the appraisal estimate of 67%.

	% of Each Category in Total Costs					% Increase in Costs: From Appraisal to Last Six Boats Jan. 1971 to April 1975 (%)	% Increase in Costs: From Appraisal Cost to Average Cost
Steel Plates and Steel Products	16	17	17	17	17	131	117
Engine	20	14	13	13	13	42	33
Shafting, Steering and Such	6	5	4	5	5	65	52
Auxiliary Machinery	18	13	12	11	12	37	36
Electronics	3	3	2	2	2.5	60	60
Paint	2	3	3	3	3	209	196
Wood	2	3	3	3	3	240	190
Outfitting	-	4	4	4	4	n.a.	n.a.
Labor	18	18	17	17	17	113	97
Engineering, Insurance, Other	-	1	1	1	1	n.a.	n.a.
Overhead	-	7	9	8	8	n.a.	n.a.
Profit	15	12	15	16	14.5	130	96
Total	100	100	100	100	100	122	104

Source: BNP, Project Unit

December 2, 1977

Table 3

Table 4

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Age of the Shrimp Trawler Fleet - 1970 and 1976 (end of year)
(over 20 tons gross)

	1970		1976	
	Number	%	Number	%
Over 20 Years Old	2	1	4	1
Over 15 to 20 Years	2	1	76	29
Over 10 to 15 Years	109	48	55	21
Over 5 to 10 Years	46	20	55	21
Up to 5 years	70	30	73	28
Total	229	100	263	100

Source: Ministry of Commerce and Industry

December 2, 1977

Table 5

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Ownership of Vessels Constructed From 1971 to 1976

(vessels over 20 tons gross)

	No. of Boats	No. of Owners
Processing Plants	9	2
Independent Owners:		
Large Companies 1/	13	3
Small Companies	16	15
Individuals 2/	9	9
Project Boats 3/	26	26
Total	73	55

1/ Owning, respectively, six, nine and 27 licenses.
2/ Two owners have two licenses each and the other seven have one license each.
3/ Nine limited liability companies, one cooperative and 16 independent operators.

Source: Directorate of Marine Resources, Ministry of Commerce and Industry.

December 2, 1977

Table 4

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Age of the Shrimp Trawler Fleet - 1970 and 1976 (end of year)
(over 20 tons gross)

	1970		1976	
	Number	%	Number	%
Over 20 Years Old	2	1	4	1
Over 15 to 20 Years	2	1	76	29
Over 10 to 15 Years	109	48	55	21
Over 5 to 10 Years	46	20	55	21
Up to 5 years	70	30	73	28
Total	229	100	263	100

Source: Ministry of Commerce and Industry

December 2, 1977

Table 5

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Ownership of Vessels Constructed From 1971 to 1976

(vessels over 20 tons gross)

	No. of Boats	No. of Owners
Processing Plants	9	2
Independent Owners:		
Large Companies 1/	13	3
Small Companies	16	15
Individuals 2/	9	9
Project Boats 3/	26	26
Total	73	55

1/ Owning, respectively, six, nine and 27 licenses.
2/ Two owners have two licenses each and the other seven have one license each.
3/ Nine limited liability companies, one cooperative and 16 independent operators.

Source: Directorate of Marine Resources, Ministry of Commerce and Industry.

December 2, 1977

Table 6

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Ownership of Vessels over 15 Years Old in 1976
(over 20 tons gross)

	No. of Boats 1/	No. of Owners
Processing Plants	18	4
Large Owners 2/		
Companies	32	6
Individuals	5	1
Small Owners 3/		
Companies	9	8
Individuals	16	12
Total	80	31

1/ Constructed in 1960 and before.
2/ With five licenses or more.
3/ With one to three licenses.

Source: Directorate of Marine Resources, Ministry of Commerce and Industry.

December 2, 1977

Table 7

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Average Number of Shrimp Trawlers, National Catch and Average Catch per Trawler, 1960-76

Year	Average No. of Boats (over 20 tons gross)	National Catch (m tons) All Species	Average Catch Per Boat (Pounds) All Species	Average Catch Per Boat (Pounds) White Shrimp
1960	162	4,809	65,446	25,110
1961	161	5,496	75,255	28,726
1962	158	6,025	84,076	28,847
1963	153	5,584	80,455	22,632
1964	181	7,056	85,937	27,826
1965	194	5,852	66,512	25,725
1966	199	5,643	62,531	26,325
1967	218	6,442	65,168	24,989
1968	233	6,001	56,799	18,653
1969	233	5,653	53,501	18,232
1970	237	6,895	64,138	18,393
1971	222	6,342	63,029	19,101
1972	218	5,281	53,400	20,400
1973	239	5,564 1/	51,322	21,521
1974	242	5,285 2/	48,146	15,871
1975	254	4,952 3/	42,981	14,647
1976	262	5,312 4/	44,698	17,632

1/ Including 362 m tons of "Fidel" and "Cabezón" deeper sea species (180 to 200 fathoms), whose catch started that year.
2/ Including 297 m tons of "Fidel" and "Cabezón".
3/ Including 611 m tons of "Fidel" and "Cabezón".
4/ Including 310 m tons of "Fidel" and "Cabezón".

Source: Directorate of Marine Resources, Ministry of Commerce and Industry.

December 2, 1977

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Shrimp Trawler Fleet at the end of 1976 - Number of Vessels, Annual Gross Tonnage and Horsepower, by Year of Construction

(Vessels over 20 Tons Gross)

Year of Construction	Number of Vessels (Total:263)	Annual Tonnage		Horsepower	
		Total	Av.per Vessel	Total	Av.per Vessel
1948	1	45.9	45.9	180	180
1951	1	64.5	64.5	220	220
1955	2	102.8	51.4	297	148
1956	10	550.5	55.0	1,735	173
1957	34	3,303.8	97.2	6,337	186
1958	25	1,476.7	59.1	4,488	180
1959	5	257.5	51.5	1,058	212
1960	2	112.0	56.0	410	205
1961	3	176.5	59.0	495	165
1962	5	238.2	47.6	950	190
1963	10	576.8	57.7	1,988	199
1964	19	1,223.6	64.4	4,696	247
1965	18	1,202.4	66.8	3,392	188
1966	14	1,247.8	89.1	4,265	305
1967	21	1,833.7	87.3	7,015	334
1968	6	536.9	89.5	2,255	376
1969	10	1,079.1	107.9	3,616	362
1970	4	402.1	100.5	1,445	361
1971	5	562.2	112.4	1,790	358
1972	7	882.9	126.1	2,645	378
1973	17	1,860.4	109.4	6,025	354
1974 1/	21	2,361.0	112.4	5,860	279
1975 2/	17	1,870.0	110.0	4,080	240
1976 2/	6	660.0	110.0	1,440	240

1/ Including three project boats of 110 tons gross and 240 hp each.
2/ All project boats.

Source: Ministry of Commerce and Industry - Directorate of Marine Resources.

December 2, 1977

PANAMA - FISHERIES PROJECT

LOAN 714-PAN

Catch of Project Boats as Compared with National Catch (per specie)
(in lb)

	No. of Project Boats in Operation	All Species: Catch of Project Boats (lb)	All Species: National Catch	All Species: % Project Catch in Nat. Catch	White Shrimps: Project Boats	White Shrimps: National Catch	White Shrimps: %	Pink Shrimps: Project Boats	Pink Shrimps: National Catch	Pink Shrimps: %	Sea bob (Titi): Project Boats	Sea bob (Titi): National Catch	Sea bob (Titi): %	Other: Project Boats	Other: National Catch	Other: %
1975																
January	3	5,242	663,400	1.0	3,093	216 371	1.4	1,451	165,027	1.0	880	83,307	1.0	-	[illegible]	-
February	5	[illegible]	483.121	2.3	-	12 115	-	3,698	201.555	1.8	-	3,297	-	7,260	[illegible]	[illegible]
March	[illegible]	7,005	235.990	2.9	489	15 564	3.1	4.894	109,050	4.4	-	229	-	1.622	[illegible]	[illegible]
April	10	[illegible]	771,175	4.8	27,454	527 673	5.2	683	42,180	1.6	8,652	161.534	5.3	-	[illegible]	-
May	12	[illegible]	1,276,639	4.4	27,221	433 394	5.6	22.633	575.599	3.9	5,995	181,381	3.3	599	[illegible]	[illegible]
June	13	68,693	1,227,366	5.6	23,139	439 987	5.2	33,603	503.324	6.7	11.616	233,349	5.0	325	[illegible]	[illegible]
July	[illegible]	71,035	1,236,306	5.5	17,981	436 505	4.1	47,515	514,954	9.2	5,469	304,870	1.8	[illegible]	[illegible]	-
August	[illegible]	65,888	1,037,238	6.3	23,062	389.212	5.9	28,592	320,727	8.9	13,202	244,094	5.4	[illegible]	[illegible]	[illegible]
September	17	73,609	914.511	8.0	17,559	299.030	5.9	24.565	267,431	9.2	6,521	151.948	4.3	[illegible]	[illegible]	[illegible]
October	17	76,110	1,041.704	7.3	20,828	254 168	7.3	32,485	291.215	11.1	13,158	[illegible]	6.2	9,679	[illegible]	[illegible]
November	17	81,572	[illegible]	6.4	19,255	251 901	7.6	17,909	150,247	11.9	12,504	245.614	5.1	[illegible]	[illegible]	[illegible]
December	17	[illegible]	[illegible]	6.7	37,714	366 637	10.3	12,821	190,739	6.7	15.478	[illegible]	5.4	[illegible]	[illegible]	[illegible]
Total 1975		[illegible]	[illegible]	5.5	217,775	[illegible]	5.8	230,849	3,332,648	6.9	96,475	2,161,216	4.5	[illegible]	[illegible]	[illegible]
1976																
January	[illegible]	[illegible]	693,829	9.5	36,280	336,035	10.8	20,947	142,958	14.7	8,620	121,436	7.1	[illegible]	93,399	1.3
February	[illegible]	[illegible]	321,100	9.1	349	12.296	3.0	25,764	142,576	18.1	1.776	13.512	13.1	[illegible]	152,816	1.0
March	[illegible]	[illegible]	267,020	11.4	-	12.574	-	30,325	213,602	14.2	-	4,059	-	[illegible]	36,765	...
April	[illegible]	[illegible]	1,269.269	9.6	70,907	606 658	11.7	4,125	84,531	4.9	44,783	480.594	9.3	[illegible]	97.486	2.0
May	[illegible]	[illegible]	1,540,875	11.5	75,363	671,870	11.2	57,938	416,758	13.9	36,278	334,923	10.8	[illegible]	117.324	6.5
June	[illegible]	[illegible]	1,456,409	9.0	60,312	620 354	9.7	43,232	404,845	10.7	22,671	315,812	7.2	[illegible]	115,398	[illegible]
July	26	111,668	1,207,960	9.2	65,406	558 377	11.7	13,720	219,362	6.2	31,429	347,071	9.1	1,113	83,150	1.3
August	26	140,828	1,245,727	11.3	49,487	438 446	11.3	81,258	462,256	17.6	9,993	264,688	4.0	90	80,337	0.1
September	26	108,800	968,704	11.2	41,745	367 108	11.4	44,776	301,537	14.8	13,523	157,459	8.6	8,756	142,600	6.1
October	26	79,582	847,625	9.4	34,865	326 466	10.7	22,792	264,486	8.6	7,197	183,349	3.9	14,728	73,324	20.0
November	26	76,688	898,843	8.5	33,097	328 646	10.1	19,395	201,817	9.6	23,094	309,445	7.5	3,102	58,944	5.3
December	26	64.230	993,413	6.5	30,339	358 357	8.5	23,564	279,071	8.4	8,114	243,751	3.3	2,183	112.234	1.9
Total 1976		1,139,512	11,710,774	9.7	498,150	4,637 187	10.7	387,836	3,133,699	12.4	207,408	2,776,100	7.5	46,118	1,163.788	[illegible]
1977																
January	26		530,869			282 337			100,630			87,988			59,914	
February	26		-			-			-			-			-	
March	26		-			-			-			-			-	2.0
April	26		1,380,944			540 713			402,508			367,109			70,614	
May	26		975.322			449 558			186,351			261,376			78,022	
Total Jan-May		240,152	2.887,135	8.3	102,970	1,272 608	8.1	72,991	689,489	10.5	59,770	716,473	8.3	4,421	208.555	2.0
June	26	91,581			38,219			33,262			20,090			10		
July	26	135,390			35,288			65,525			32,070			2,507		
August	26	106,370			30,443			54,048			17,744			4,135		
September	26	100,726			36,346			28,062			26,256			10,062		
October	26	83,709			37,481			29,878			15,266			1,084		
November	26	61,401			23,244			29,464			4,902			3,791		
December	26	61,576			29,596			13,543			12,053			6,384		
Total 1977		880,905	n.a.		333,587	n.a.		326,773	n.a.		188,151	n.a.		32,394	n.a.	

Source: Boat Accounts (Barreto y Asociados) and statistics from the Directorate of Marine Resources, Ministry of Commerce and Industry.

January 28, 1978

Table [illegible]

Table 10

PANAMA

FISHERIES PROJECT (Loan 784-PAN)

Composition of Project Boats' Catch and of National Catch (per specie)

(%)

Species	National Catch		Project Boats		
	At Appraisal (1970)	1976	Appraisal Estimate	1976	1977
White	28	39	40	41	38
Pink	17	27	28	36	37
Sea bobs	53	24	32	17	21
Other	2	10	...	6	4
	100	100	100	100	100

Source: Boat Accounts (Barreto y Asociados) and Directorate of Marine Resources, Ministry of Commerce and Industry.

December 2, 1977

PANAMA - FISHERIES PROJECT

Table 11

LOAN 784-PAN

Average Annual Earnings and Costs of a 67 ft.-Shrimp Trawler, 240 hp, Steel
Appraisal Estimate and Actual (1976)

	Appraisal Estimate (1970) (First Year)	Actual (1976) a/ At 1976 Prices	Actual (1976) a/ At 1970 b/ Prices	In constant 1970 prices % change	% Costs to Earnings Appraisal Estimate	% Costs to Earnings Actual
1. Gross Earnings						
Catch (lb)	69,600	45,146	45,146	-35		
Price (US$ per lb)	0.77	2.62	1.30	+69		
Gross Earnings	53,700	118,280	58,690	+9	100	100
2. Operating Costs						
(a) Trip Expenses						
Crew	9,500	21,600	10,690	+12	18	18
Food	1,800	2,170	1,080	-40	3	2
Fuel and Lubricants	7,900	21,400	10,590	+34	15	18
Miscellaneous (materials, etc.)	300	1,950	970	+223	...	2
Sub-total	19,500	47,120	23,330	+20	36	40
(b) Ship's Expenses						
Repairs and Maintenance	6,500	6,190	3,070	-53	12	5
Fishing Gear	3,500	2,840	1,410	-60	7	2
Dinghy, Watchman; docking fees	300	1,130	560	+87	1	1
Insurance	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	/
Licenses and Legal Expenses	300	690	340	+13	...	1
Overhead	1,200	2,330	1,150	-4	2	2
Sub-total	14,100	21,020	10,400	-26	26	18
(c) Total Operating Costs	33,600	68,140	33,730	...	62	58
3. Net Operating Income	20,100	50,140	24,960	+24	37	42
4. Depreciation c/	4,860	8,250	4,080	-16	9	7
5. Debt Service (long-term loan only) Interest	7,505	13,550	6,710	-11	14	11
6. Tax d/	500	4,680	2,320	+364	1	4
7. Net Income After Debt Service, Depreciation and Tax	7,235	23,660	11,860	+63	13	20
8. Cash Income (before depreciation) After Debt Service and Tax	12,095	31,910	15,940	+31	22	27

a/ Based on accounts of 20 boats in operation during all of 1976. 17 started operations during 1975 and three during 1974.
b/ 1970 = 100
1976 = 202 (wholesale price index).
c/ 5% per year over 20 years.
d/ Calculated on net operating income, minus depreciation and interest.
... = below 1%

Source: Appraisal Report and Boat Accounts (Barreto y Asociados)
December 2, 1977

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Project Boats - Average Catch per Fishing Day - Appraisal Estimate and Actual

Species	Catch per Fishing Day (lb) Appraisal	Actual[1/]
White	116	75
Pink	81	65
Titi (Sea-bob)	92	32
Other	-	11
Total	290	183

1/ Based on a total of 3,567 fishing days in 1975 and 5,950 fishing days in 1976. No data are available yet on the number of fishing days in 1977.

Source: Project boat accounts (Barreto y Asociados).

December 2, 1977

Table 13

PANAMA

FISHERIES PROJECT (Loan 784-PAN)

Completion Report

26 Project Boats

Estimate of First-Year Average Annual Catch per Boat and Average Ex-Vessel Prices Received

Specie	Annual Catch per boat			Average Price Received by the 26 project boats			
	Appraisal	Actual (Avg.1975-76) a/	1977	Appraisal	1975 (US$ per lb)	1976	1977
White	27,840	18,000	12,830	1.33	2.71	3.84	4.04
Pink	19,488	15,600	12,570	0.58	1.49	2.35	2.15
Titi	22,200	7,680	7,235	0.24	0.45	0.63	0.59
Other	72	2,640	1,245	0.30	0.80	1.09	1.12
	69,600	43,920	33,880	0.77	1.77	2.58	2.49

a/ Based on 240 fishing days per year and 183 lb. per fishing day (table 12), average performance of the 26 project boats over 3,567 fishing days in 1975 and 5,950 fishing days in 1976.

Source: Appraisal Report and Project boat accounts (Barreto y Asociados)

January 31, 1978

PANAMA - FISHERIES PROJECT

LOAN 784-PAN

Sub-borrowers

Owners	Boat	Delivery Date (to sub-borrowers)
1. Cooperativa Pesquera del Chorrillo	Ubarraga	Oct. 16, 1974
2. Luis Muñoz and Conrado Muñoz	Ponca	Oct. 21, 1974
3. Marcos Kasavilas	Tubamana	Oct. 25, 1974
4. Flor del Mar, S. A.	Pocorosa	Feb. 17, 1975
5. Eduardo D. Girón	Comagre	Feb. 17, 1975
6. Cecilio Valdes S.	Careta	Feb. 17, 1975
7. Alonso Rivera	Quibian	March 7, 1975
8. Aquilino Torres	Cémaco	March 6, 1975
9. Rafael Aparicio	Maritus	March 21, 1975
10. Ricaurte Saldarriaga	Chigore	March 21, 1975
11. Julio Muñoz	Topogre	May 20, 1975
12. Pesquera Dos Rios, S. A.	Tumaco	May 27, 1975
13. José D. Noriega	Secativa	June 7, 1975
14. Florencio López	Tatanagua	July 7, 1975
15. Felix Moreno R.	Dabaiba	July 29, 1975
16. Ren Regs, S. A.	Guaniaga	Aug. 18, 1975
17. Jorge E. Moreno Z.	Chinina	Sept. 8, 1975
18. Augusto López	Pocore	Dec. 29, 1975
19. Cía. Pesquera Ortega S. A.	Bulaba	Dec. 29, 1975
20. Luis A. Testa	Buquebuque	Dec. 29, 1975
21. Cía. Pesquera Chepipana S. A.	Abibeiba	Jan. 5, 1976
22. Cía. de Mariscos Muñor S. A.	Biru	Feb. 5, 1976
23. Pesquera Farallón, S. A.	Guaturo	Feb. 10, 1976
24. Arrendamientos Marítimos,S. A.	Chepauri	April 1, 1976
25. Pescadores Istemeños, S. A.	Corobari	May 3, 1976
26. Rodolfo Ortiz	Carabaro	May 7, 1976

Source: BNP - Project Unit

December 2, 1977

ANNEX 2

PANAMA

FISHERIES PROJECT (LOAN 784-PAN)

Disbursements by Categories

(US$)

	Allocated			
	Loan Agreement 08/02/71	Revised 04/17/75	Disbursed as of 10/31/77	Balance Cancelled
Category I				
(Construction and equipment of shrimp trawlers)				
1. Vessel construction costs			2,899,410.12	
2. Spare parts			46,289.40	
Total	2,300,000	2,950,000	2,945,699.52	4,300.48
Category II				
(Technical assistance services)				
1. Captains' training program			27,018.00	
2. Fishing port feasibility study			398,387.00	
3. Other			1,545.36	
Total	500,000	450,000	426,950.36	23,049.64
Category III				
(Unallocated)	600,000	-	-	-
Total	3,400,000	3,400,000	3,372,649.88	27,350.12

December 2, 1977

PANAMA

FISHERIES PROJECT (LOAN 784-PAN)

Financial Rate of Return

The financial rate of return has been calculated on the following basis:

A. Earnings

Except for 1977, when total actual catch per boat is 33,880 lb, the annual catch has been calculated on the following basis:

1. Catch per fishing day: 183 lb

2. Number of fishing days: 240 days during year 1 (1976) 216 in year 2 (ban on all species during February and March from 1977 on), decreasing by four days a year afterwards.

3. Ex-vessel prices in 1976 constant terms:
   1976: US$2.58 per lb (actual)
   1977: US$2.30 per lb (actual 1977 price deflated by 1977 inflation)
   1978 onwards: 3% annual increase over a "normal" 1976 level of US$2.05 per lb

   Actual prices in 1976 were exceptionally high, following recovery of demand after the 1974/75 recession. A "normal price" for 1976 has been calculated on the following basis: Annual rate of increase 1970-75: 15%, applied to current 1975 price. (1975 appears to be a representative year, whereas 1974 prices were exceptionally depressed and 1976 prices were exceptionally high).

4. Rate of increases in real prices: From 1970 to 1975 unit prices of shrimps have increased by about 15% per year on average, or 4% in real terms (inflation as measured by the wholesale price index). Operating costs for the same number of fishing days increased by about 12.5% per year, as did the inflation rate, or very little in real terms. Costs would have increased by about 14% if the catch per fishing day had not decreased substantially, since labor costs are directly related to catch value, even if 1976 shrimp prices had been more "normal." For future projections, various estimates have been made at 2% (projected at appraisal), 3% and 4% rates of increase in real shrimp ex-vessel prices (and concurrent increase in crew costs). The median 3% has been taken as the most likely.

B. Operating Costs

1. Trip Expenses: (US$ per fishing day)

- Crew	90.0 on year 1, 18% of catch value afterwards
- Food	9.0
- Fuel and lubricants	89.2
- Miscellaneous	8.1
	196.3 (actual)

2. Ship Expenses:

- Repairs and maintenance: (US$ per year)

Year 1	6,200 (actual)
Year 2 onwards	9,000 increasing by 3% p.a.

(This last figure is an average of normal annual costs, an engine overhaul every second year, and payments for participation in the preventive maintenance program, which started in 1977.)

- Fishing gear: (US$ per year)

Year 1	2,800 (actual)
Year 2 onwards	3,500 (replacement of about 2/3 of the gear each year)

- Dinghy, watchman, docking fees	1,200 (actual)
- Insurance	7,840
- Taxes and legal expenses	1,000
- Overhead	2,500
- Depreciation	8,250

C. Rate of Return and Sensitivity

The rate of return obtained under the above assumptions is 17% (detailed calculations and projected cash flow are presented in Tables 1 and 2). To allow comparisons with the appraisal report, the same vessel life of 16 years has been assumed. However, the rate of return is sensitive to various other assumptions regarding the number of fishing days per year and the rate of increase in shrimp prices.

	Rate of Price Increase Over 1976 "Normal" Price			
	Constant	2%	3%	4%
240 fishing days in year 1, 216 afterwards, decreasing by four per annum				
1976: $2.58/lb and 1977: $2.30/lb	5%	14%	17%	20%
240 fishing days in year 1, 216 afterwards				
1976: $2.58/lb and 1977 = $2.30/lb	11%	17%	20%	23%

PANAMA

FISHERIES PROJECT (Loan 784-PAN)

Project Boats - Financial Rate of Return
(.55 or B/.)

	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BENEFITS																
Catch per fishing day (lb)	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183
No. of fishing days	240	216	212	208	204	200	196	192	188	184	180	176	172	168	164	160
Total catch (lb)	43,920	39,880	38,796	38,064	37,332	36,600	35,868	35,136	34,404	33,672	32,940	32,208	31,476	30,744	30,012	29,280
Price per lb.	2.58	2.30	2.17	2.24	2.31	2.38	2.45	2.52	2.60	2.67	2.76	2.84	2.92	3.01	3.10	3.19
Gross earnings	113,314	77,924	84,187	85,263	86,237	87,108	87,877	88,543	89,450	89,958	90,914	91,471	91,910	92,539	93,037	93,403
Residual value a/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20,000
Total benefits	113,314	77,924	84,187	85,263	86,237	87,108	87,877	88,543	89,450	89,958	90,914	91,471	91,910	92,539	93,037	113,403
COSTS																
Investment costs:																
Vessel	165,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fishing gear	4,163	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total	169,163	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating costs:																
a) Trip expenses:																
Crew b/	21,600	18,356	15,154	15,523	15,679	15,818	16,104	15,938	16,101	16,192	16,365	16,465	16,564	16,657	16,767	16,812
Food	2,160	1,944	1,908	1,872	1,836	1,800	1,764	1,728	1,692	1,656	1,620	1,584	1,548	1,512	1,476	1,440
Fuel, lubricants	21,408	19,267	18,910	18,554	18,197	17,840	17,483	17,126	16,770	16,413	16,056	15,699	15,342	14,986	14,629	14,272
Miscellaneous	1,944	1,750	1,717	1,685	1,652	1,620	1,588	1,555	1,523	1,490	1,458	1,426	1,393	1,361	1,328	1,296
Sub-Total	47,112	41,317	37,689	37,356	37,208	36,939	36,853	36,347	36,086	35,751	35,499	35,174	34,827	34,516	34,180	33,820
b) Ship expenses:																
Repairs & maintenance	6,200	9,000	9,270	9,540	9,830	10,130	10,400	10,750	11,070	11,400	11,743	12,100	12,460	12,830	13,220	13,610
Fishing gear	2,850	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Dinghy, watchman	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Insurance	7,840	7,840	7,840	7,840	7,840	7,840	7,840	7,840	7,840	7,840	7,840	7,840	7,840	7,840	7,840	7,840
Taxes, legal expenses	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Overhead	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Sub-Total	21,590	25,040	25,310	25,580	25,870	26,170	26,440	26,790	27,110	27,440	27,783	28,140	29,000	29,411	29,260	29,650
Total Operating Costs	68,702	66,357	62,999	63,038	63,078	63,109	63,093	63,047	63 196	63,191	63,282	63,314	63,827	63,927	63,440	63,470
Total Costs	237,865	66,357	62,999	63,038	63,078	63,109	63,093	63,047	63,196	63,191	63,282	63,314	63,827	63,927	63,440	63,470
Net Benefit	-124,551	11,567	21,188	22,225	23,159	23,999	24,784	25,496	26.254	26.767	27,632	28,157	28,083	28,612	29,597	49,933

Financial rate of return: 17%

a/ 10% of acquisition costs (US$16,500), plus fishing gear (US$3,500)
b/ Including remuneration of captain/owner.

January 31, 1978

ANNEX 3
Table 1

PANAMA

FISHERIES PROJECT (Loan 784-PAN)

Project Boats - Cash Flow Projections
(US$ or B/.)

	Year 1	2	3	4	5	6	7	8	9	10	11	12
Cash Inflow												
Gross earnings	113,314	77,924	84,187	85,263	86,237	87,108	87,877	88,543	89,450	89,958	90,914	91,471
Long term loan a/	156,750	-	-	-	-	-	-	-	-	-	-	-
Short-term loan b/	12,000	-	-	-	-	-	-	-	-	-	-	-
Owner's equity c/	8,250	-	-	-	-	-	-	-	-	-	-	-
Total Cash Inflow	290,314	77,924	84,187	85,263	86,237	87,108	87,877	88,543	89,450	89,958	90,914	91,471
Cash Outflow												
Investment costs	169,163	-	-	-	-	-	-	-	-	-	-	-
Operating costs	68,702	66,357	62,999	63,038	63,078	63,109	63,093	63,047	63,196	63,191	63,282	63,314
Total Cash Outflow	237,865	66,357	62,999	63,038	63,078	63,109	63,093	63,047	63,196	63,191	63,282	63,314
Cash Balance before debt service	52,449	11,567	21,188	22,225	23,159	23,999	24,784	25,496	26,254	26,767	27,632	28,157
Debt Service												
Long-term loan d/												
Interest	14,891	14,891	13,771	12,545	11,202	9,731	8,121	6,358	4,428	2,314	-	-
Principal	-	11,788	12,908	14,134	15,477	16,948	18,558	20,321	22,251	24,365	-	-
Short-term loan												
Interest	1,440	-	-	-	-	-	-	-	-	-	-	-
Principal	12,000	-	-	-	-	-	-	-	-	-	-	-
Sub-Total: in current terms	28,331	26,679	26,679	26,679	26,679	26,679	26,679	26,679	26,679	26,679	-	-
in constant 1976 terms e/	28,331	24,612	22,783	21,207	19,806	18,514	17,302	15,693	15,116	14,153	-	-
Cash balance after debt service:												
w/ debt service in nominal terms	24,118	-15,112	-5,491	-4,454	-3,520	-2,680	-1,895	-1,183	-425	88	27,632	28,157
w/o debt serv. deflated to 1976 terms	24,118	-13,045	-1,595	1,018	3,353	5,485	7,482	9,803	138	12,614	27,632	28,157
Income tax f/	4,000	-	620	710	780	850	900	1,040	1,084	1,090	2,000	2,080
Depreciation g/	8,250	8,250	8,250	8,250	8,250	8,250	8,250	8,250	8,250	8,250	8,250	8,250

a/ 95% of total boat construction costs (B/. 165,000).
b/ BNP commercial loan for first year insurance (B/. 7,837) and fishing gear (B/. 4,163), at 12% p.a.
c/ 5% of boat construction costs.
d/ Repayable in 10 years, including one year of grace, at 9.5% interest p.a. (nine equal installments of B/. 27,631).
e/ Deflated by projected inflation index:

1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
100	108.4	117.1	125.8	134.7	144.1	154.2	170.0	176.5	188.5

(projected rate of international inflation).

f/ including income tax on captain/owner wage (about B/. 250 per year). Calculated in constant 1976 terms.
g/ 5% per year, over 20 years.

January 31, 1978

PANAMA

FISHERIES PROJECT (LOAN 784-PAN)

Economic Rate of Return

All streams have been valued in 1970 terms, using the wholesale price index as deflator:

1970:	100
1974:	164.5
1975:	187.6
1976:	202.2

A. Costs

1. Investment Costs

Boat construction was phased as follows:

Year	No. of boats		Unit cost (current terms) (US$)
1974	3	at	146,000
1975	(7	at	146,000
	(10	at	175,000
	(1	at	180,000
1976	5	at	180,000
Total	26	at an average of	165,000 per unit

2. Naval Architect and Training Officer

	1972	1973	1974	1975	1976
	(US$ '000)				
Current Cost					
Naval architect	5.4	1.6	0.8	3.5	-
Training	-	-	-	-	23.7
Total	5.4	1.6	0.8	3.5	23.7
In 1970 terms	4.7	1.3	0.5	1.9	11.7

3. Operating Costs

Year	Number of boats in operation
1974	Three boats for two months
1975	Three boats for one year and 14 boats for an average of six months
1976	17 boats for one year and Nine boats for an average of 10 months
1977 onwards	26 boats

The following transfer payments have been deducted from operating costs:

(i) taxes, license fees;

(ii) social charges and benefits (about 22% of labor costs);

(iii) deduction of 2% import duty on diesel oil.

B. Benefits

Benefits from the Boats

Under the assumption that the addition of the 26 project boats led to neither any incremental catch nor to any averted losses, no benefits should be expected before 1980, since the addition of the 26 boats would only contribute to the fleet overcapacity, resulting in a decrease in the national average catch per boat. The same total catch is obtained, but with the additional costs of the 26 boats. In 1976, construction of new trawlers was frozen until 1980, date at which it is expected that the natural retirement of old boats (six to eight per year presently) will have brought the fleet capacity back to the level of maximum sustainable yield.

In 1980 and beyond, however, the age of the whole fleet will be substantially higher than it was in 1970 and 1976.

	Trawlers 15 to 20 years old	Trawlers over 20 years old
1970	2	2
1976	76	4
1980	55	40

From 1980 on, one may therefore expect retirement rates to be substantially higher than at present: around 100 trawlers will need to be replaced, but if credit availability is as limited as in 1976 (practically none was available), only owners with substantial resources of their own and the few who will get financing from Loan 1398-PAN will be able to afford new boats. Between 1970 and 1976, with some credit available, about 36 boats between 15 and 20 years old were replaced, i.e., about six per year. If one assumes that the rate of retirement will increase from eight to 16 per year, and that only six will be replaced, the fleet size will be decreasing by 10 boats a year. Taking into account that five new boats will be built under the Second Fisheries Project, one could estimate that the 26 boats built from Loan 754-PAN would start yielding some replacement benefits for:

6 boats	in 1980 (boats retired but not replaced)
6 boats	in 1981
6 boats	in 1982
6 boats	in 1983
2 boats	in 1984
26 boats	

since the fleet would decrease by 26 boats more if they had not been built.

Regarding prices of shrimps, the assumptions that have been made are the same as those used for the financial rate of return, i.e.,

1976	:	US$2.58/lb
1977	:	US$2.30/lb
1978 onwards	:	+3% real increase over a "normal" 1976 level of US$2.05/lb (Annex 3)

Averted Losses to Processors

In order to be fully consistent with the methodology used at appraisal, averted losses to processors have been calculated after 1980 on the project boat catch (with the same phasing as above) on the same basis of US cents 4 per lb in 1970 terms. The economic rate of return so obtained, with only a deduction for taxes, is minus 2%. No shadow pricing was used at appraisal. With a further deduction of social charges and the 2% import duty on diesel oil, the economic rate of return is 0%.

C. Shadow Pricing

The following adjustments can be made:

(a) Shadow pricing of labor:

Alternative 1 - Shadow pricing unskilled labor at the minimum wage: the two deck hands each receive 3% of the catch value, i.e., around US$2,500 to US$2,800 per year. If the opportunity cost of unskilled labor is the minimum wage (US$1,300 per year), about 50% of the cost of unskilled labor (33% of labor costs) may be deducted.

Alternative 2 - All crew members and all shipyard labor would have been unemployed without the project, or employed in the marginal urban sectors. Labor could be shadow priced at 30% of its financial value.

(b) Application of a Standard Conversion Factor of 0.83 to expenditures in labor (at the above shadow wages), food, repairs and maintenance, fishing gear, dinghy, overhead, insurance and miscellaneous.

The resulting economic rate of return is 3% if labor is shadow priced according to Alternative 1, or 5% if labor is shadow priced according to Alternative 2.

D. Sensitivity

Sensitivity of the economic rate of return to various assumptions regarding: (a) the number of fishing days, (b) the rate of real price increase, and (c) the phasing of economic benefits, both with and without shadow pricing is presented in Table 2. It shows that the economic rate of return of this project may be estimated to be within a 3% to 12% range although, on the basis of past trends, it is likely to be no more than 7%. Excluded from these calculations are unquantifiable social benefits from the creation of employment and reduction of underemployment not only for the construction and operation of the 26 additional boats but also for the maintenance of an enlarged fleet. The project also gave the local shipbuilding industry an opportunity to gain higher technological knowledge which now allows it to more efficiently compete with foreign shipyards for the construction of fishing boats.

PANAMA

FISHERIES PROJECT (LOAN 284-PAN)

Economic Rate of Return a/
(US$ '000 at 1970 Prices)

A. Appraisal Methodology

	Year 1 (1972)	2 (1973)	3 (1974)	4 (1975)	5 (1976)	6 (1977)	7 (1978)	8 (1979)	9 (1980)	10 (1981)	11 (1982)	12 (1983)	13 (1984)	14 (1985)	15 (1986)	16 (1987)	17 (1988)	18 (1989)	19 (1990)	20 (1991)	21 (1992)	22 (1993)
INCREMENTAL COSTS																						
Naval Architect and Training Officer																						
Current terms	5	2	1	4	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1970 terms	5	1	1	2	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Investment Costs																						
Current terms	-	-	438	2,952	900	1 b/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1970 terms	-	-	266	1,574	445	...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Costs																						
1976 terms	-	-	34	680	1,633	1,668	1,638	1,639	1,641	1,642	1,648	1,653	1,653	1,654	1,658	1,655	1,670	1,675	1,722	1,754	1,770	1,785
1970 terms	-	-	17	332	808	825	810	810	812	812	815	817	817	818	820	818	826	828	852	867	875	883
Total Costs (1970 terms)	5	1	284	1,912	1,264	825	810	810	812	812	815	817	817	818	820	818	826	828	852	867	875	883
INCREMENTAL BENEFITS																						
Gross Income from boats																						
1976 terms			-	-	-	-	-	-	540	1,087	1,664	2,238	2,455	2,472	2,486	2,505	2,521	2,534	2,550	2,556	2,565	2,568
1970 terms			-	-	-	-	-	-	267	538	823	1,107	1,214	1,222	1,229	1,239	1,247	1,253	1,261	1,264	1,270	1,280
Residual value																						
Current terms			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	520
1970 terms			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	482
Averted loss in processors																						
1976 terms			-	-	-	-	-	-	18	34	55	67	73	71	69	67	67	65	63	61	61	61
1970 terms			-	-	-	-	-	-	9	17	26	33	36	35	34	33	33	32	31	30	30	30
Total Benefits (1970 terms)			-	-	-	-	-	-	276	555	849	1,140	1,250	1,257	1,263	1,272	1,280	1,285	1,292	1,294	1,300	1,792
Net Incremental Benefit (1970 terms	-5	-1	-284	-1,912	-1,264	-825	-810	-810	-536	-257	34	323	433	-39	443	454	454	457	440	427	425	909

Economic Rate of Return: -2%

B. Revised Methodology, with shadow pricing

INCREMENTAL COSTS																						
Naval Architect and Training Officer																						
1970 terms	5	1	1	2	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Investment Costs																						
1970 terms	-	-	266	1,574	445	...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Costs																						
1976 terms	-	-	28	525	[illegible]	[illegible]	[illegible]	[illegible]	1,287	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1970 terms	-	-	14	263	[illegible]	[illegible]	[illegible]	[illegible]	637	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Costs (1970 terms)	5	1	281	1,964	[illegible]	[illegible]	[illegible]	637	637	[illegible]	631	631	631	633	631	638	639	658	670	672	[illegible]	[illegible]
INCREMENTAL BENEFITS																						
1970 terms			-	-	-	-	-	-	276	555	849	1,140	1,250	1,257	1,263	1,272	1,280	1,285	1,292	1,294	1,300	1,792
Net Incremental Benefits (1970 terms)	-5	-1	-281	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-74	218	509	619	624	632	634	641	627	622	622	[illegible]	1,111

Economic Rate of Return: [illegible]%

a/ According to the following assumptions:
3% annual increase in real prices of shrimps; decreasing number of fishing days; benefits from boats as follows: : 0 in 1980, 12 in 1981, 18 in 1983 and 26 from 1984 onwards; shadow pricing of labor according to Alternative 1. .

b/ Spare parts (actually US$ .7 thousand).

... = negligible.

February 1, 1971

PANAMA

FISHERIES PROJECT (LOAN 784-PAN)

Economic Rate of Return - Sensitivity Analysis

(%)

	Full benefits of 26 boats in 1980				Full benefits from 6 boats in 1980 to 26 in 1984 a/			
	Rate of increase in real prices of shrimp				Rate of increase in real prices of shrimp			
	Constant 1976 (US$ 2.58/lb)	2% annual increase b/	3% annual increase b/	4% annual increase b/	Constant 1976 (US$ 2.58/lb)	2% annual increase b/	3% annual increase b/	4% annual increase b/
A. Without shadow pricing								
Decreasing number of fishing days c/	2	-2	1	4	-1	-5	-2	1
Constant number of fishing days d/	7	1	4	7	5	-2	1	4
B. With shadow pricing								
1. Shadow pricing of labor according to Alternative 1								
Decreasing number of fishing days c/	6	4	6	8	3	1	3 e/	5
Constant number of fishing days d/	9	7	9	11	6	4	6	8
2. Shadow pricing of labor according to Alternative 2								
Decreasing number of fishing days c/	8	6	8	10	5	3	5	7
Constant number of fishing days d/	10	8	10	12	7	5	7	9

a/ Benefits from six boats in 1980; 12 in 1981; 18 in 1982, 24 in 1983 and 26 in 1984.

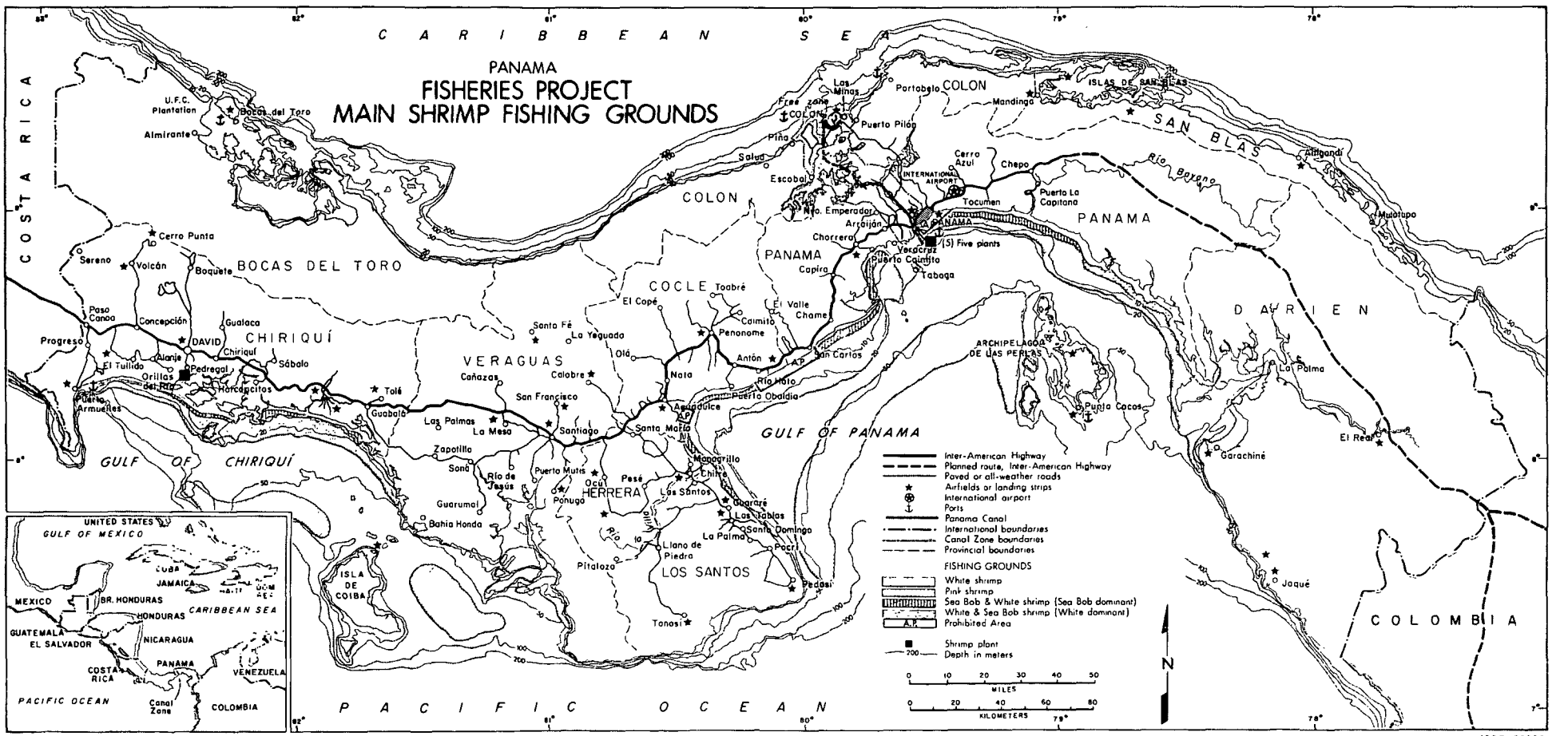
b/ 1976: US$2.58 per lb. and 1977: US$2.30 per lb. (actual). 1978 and beyond: stated annual rate of increase is applied from a "normal" 1976 level of US$2.05 per lb. (See Annex 3, table 1).

c/ 240 days in year 1; 216 in year 2; decreasing by four each year afterwards.

d/ 240 days in year 1; 216 afterwards.

e/ most likely range.

February 7, 1978



JUNE 1971

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