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PROJECT COMPLETION REPORT

MOROCCO

**JERADA COAL MINE MODERNIZATION
AND EXPANSION PROJECT
(LOAN 2508-MOR)**

JUNE 24, 1993

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CURRENCY EQUIVALENTS

At Project Appraisal (July 1984)

US\$1 = 9.5 DH

November 1992

US\$1 = 8.65 DH

FISCAL YEAR

January - December

ABBREVIATIONS AND ACRONYMS USED

BRPM	-	Bureau de Recherches et de Participations Minières
CIOR	-	Cimenterie de l'Oriental
CdM	-	Charbonnages du Maroc
KfW	-	Kreditanstalt für Wiederaufbau
ONE	-	Office National de l'Electricité
PCR	-	Project Completion Report
tpy	-	metric ton per year

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

Office of Director-General
Operations Evaluation

June 24, 1993

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Project Completion Note on Morocco
Jerada Coal Mine Modernization and Expansion project (Loan 2508-MOR)

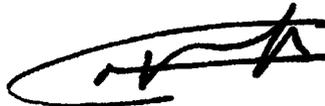
Attached is the report entitled "Project Completion Report on Morocco - Jerada Coal Mine Modernization and Expansion Project (Loan 2508-MOR)" prepared by the Middle East and North Africa Regional Office. Part II was contributed by the implementation agency of the Borrower. The Completion Report provides an informative and comprehensive account of Project achievements.

The coal mine expansion at Jerada was undertaken on the premise of relatively high energy prices, following the second oil shock. Declining coal prices and geological difficulties made the project financially unsound and uneconomical. Mine closure has emerged as the most appropriate course of action but social considerations have stood in the way of timely Government action.

The project performance is rated as unsatisfactory, its benefits as unsustainable and institutional development as negligible.

The Bank's assessment and management of project risks was unsatisfactory; the PCR hints that such projects would be better left for the private sector to handle.

No audit is planned.



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PROJECT COMPLETION REPORT

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JERADA COAL MINE MODERNIZATION AND
EXPANSION PROJECT (Loan 2508-MOR)

Preface

This is the Project Completion Report (PCR) for the Jerada Coal Mine Modernization and Expansion Project (Ln. 2508-MOR) in the Kingdom of Morocco. The Loan, made to Charbonnages du Maroc (CdM) in an amount of US\$ 27.0 million, was approved on March 21, 1985. The Loan closed on June 30, 1991, with total disbursements of US\$ 13.5 million, half the original loan amount. The remaining US\$ 13.5 million was cancelled.

The PCR was prepared by the Industry and Energy Division of the Maghreb Department in the MN Regional Office (Preface, Evaluation Summary, Parts I and III), and the Borrower prepared Part II. Comments received from the Project's cofinancier, KfW have been incorporated in Parts I and III.

The preparation of the PCR is based on the Staff Appraisal Report (SAR), the President's Report, legal documents, supervision reports, correspondence between the Bank and the Borrower, and internal Bank memoranda.

PROJECT COMPLETION REPORT

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JERADA COAL MINE MODERNIZATION AND EXPANSION PROJECT (Loan 2508-MOR)

Evaluation Summary

Background

i. The preparation of the Project reflected the outlook for oil and coal prices after the second oil price shock at the beginning of the 1980s. This prompted an energy policy to substitute domestic coal for imported oil and coal, in order to save foreign exchange (paras. 2.1-2.3). Also there was a growing coal market in Morocco and both the Government and the Bank believed that the existing Jerada coal mine would be able to produce coal at competitive prices with other fuels. Major consumers -- the national electric power company and the cement industry -- had converted their facilities from oil to coal. Morocco's performance in the mining sector had been good. In addition to promising coal prospects, a compelling factor in favor of the project was continued employment at Jerada, located in the eastern part of Morocco, where there were few alternative employment opportunities.

Objectives

ii. The Project had two sets of objectives. First, at the country level, the project was to (a) support the expansion of coal substitution for imported energy, (b) help assure the continued employment in a less-developed region by efficient plant operating practices and modernization of facilities, and (c) maintain an appropriate coal pricing policy. Second, at the level of the Borrower, CdM, the project objectives were to: (a) increase overall coal production from 800,000 tonnes per year (tpy) to 1 million tpy, (b) modify the technology used by the company to increase productivity, (c) improve CdM's organization and mine planning and (d) improve the safety, health and working conditions of the company.

Implementation Experience and Results

iii. The actual cost of the Project was US\$ 82.5 million, 112% of the cost originally estimated at Project appraisal, or 60% of the revised cost estimate. (Part III, Table 5). The most critical variance between planned and actual implementation was the planned construction of a mine shaft (Shaft 3). The shaft construction began when both coal production prospects and the coal price seemed favorable, but after later developments it became clear that completion of the shaft's construction no longer was economic. The Jerada coal mine's production fell far short of projections, mainly because of unexpectedly poor geological conditions. The production decline, together with a sharp decline of coal prices, made mine closure the most economic course of action. In retrospect, it would have been better to arrest the Project earlier, but for institutional and political reasons the Government hesitated to face the connected mine closing decision and the Bank was

reluctant to insist on it. For a detailed review of the Project's implementation, see Part I, paras. 5.1-5.6 and Part III, Table 4.

iv. The Project did not achieve its main objectives because of geological problems and lower coal prices than anticipated (paras.6.1-6.8). Safety, health and working conditions improved only marginally. The Project did not achieve its goal of increasing production to 1 million tpy or assure continued employment. Although the Project helped to postpone the decline in production temporarily, the economic rate of return on the project is still negative, mainly due to the decline in production. The geological reasons for the Project's failure mainly concern low seam thickness, adverse inclination, cracks and faults, basalt intrusions, dusty coal and high temperatures, all of which hindered the project from achieving its production objectives. CdM is not viable and has an annual cash operating loss of about US\$ 10 million.

Sustainability

v. The minimal benefits resulting from the Project are not sustainable, since the mine should be closed at the earliest possible date (para. 7.1). The Bank has reviewed the personnel situation of the company and has made a preliminary investigation of possible measures to alleviate the unemployment that would result from mine closure. The Bank has indicated, to the Government, its readiness to assist further in this matter.

Lessons Learned

vi. The following is a summary of the main lessons which emerged from the Project, based on the detailed lessons for the Bank and the Borrower covered in Part I, paras. 8.4 and 9.3:

(a) Mining projects with difficult geological conditions require risk-taking entrepreneurship and the flexibility for quick decision making, characteristic of the private sector. The Bank needs to re-evaluate the extent to which it should become involved in risky projects, in particular at a time when commodity prices are volatile (e.g., energy price forecasts proved to be too optimistic after the second oil shock).

(b) The Bank and CdM should have insisted on a more rigorous geological survey and evaluation prior to project appraisal. Also, it would have been prudent to phase project implementation more carefully, i.e., making the construction of a new mine shaft an option which would be implemented only with prior assurance of sufficient mine production. Furthermore, the Bank should discuss possible consequences of project failure with the Borrower and the executing agency management team at a very early stage of the Project, reaching an early commitment to actions required in such a case.

(c) The Bank should have insisted more strongly on the operation of the mine as a commercial undertaking, rather than as a component of the Government's social and regional development policy, insisting that the Government refrain from interference with the company's financial management and clearly defining the respective role of the executing

agency in terms of operational viability and productivity, and of the Government in terms of social objectives, constraints and obligations. During Project's execution, the Bank should have applied management, technical, financial and economic evaluation criteria more consistently, and discontinued its support for the Project as soon as the expected economic rate of return became marginal. But the Bank, by continuing to support the Project, provided the wrong signal to the Government, which may have continued its support of the Project because of on-going Bank support.

(d) The Government should ask and accept independent expert advice in a risky project. The Bank should maintain an independent judgment on the project by reviewing such expert advice and should formulate its own appreciation of the situation through field visits. The reliability of the consultant's recommendations should be assessed on a systematic basis during project implementation through discussions with Government representatives and the executing agency management and executives.

(e) The Government should not be involved with industrial activities which are commercial by nature requiring quick decision-making, which usually is not consistent with the operation of a public sector bureaucracy. For example CdM should have been able to make a decision on mine closing and a related action plan several years ago. The Government should be geared to provide assistance for solving social problems connected with a mine closure.

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JERADA COAL MINE MODERNIZATION AND EXPANSION PROJECT (Loan. 2508-MOR)

PART I: PROJECT REVIEW FROM BANK'S PERSPECTIVE

1. PROJECT IDENTITY

Name	:	Jerada Coal Mine Modernization and Expansion Project
Loan Number	:	2508-MOR
RVP Unit	:	MN
Country	:	Morocco
Sector	:	Energy
Subsector	:	Coal Mining

2. BACKGROUND

2.1 After the second oil price shock in the early 1980s, the Moroccan Government's energy sector objectives centered on developing local energy resources to reduce dependency on energy imports. The Government took immediate action to (a) improve oil and gas exploration (b) study the feasibility of utilizing oil shale, Morocco's only major energy resource and (c) expand production of the Jerada coal mine, the only mine producing coal in the country and in North Africa. At the time, Morocco appeared to be a particularly promising case for energy import substitution. The country had become highly dependent on imported energy and its economy was relatively well developed, with good economic growth prospects. The country's own energy resources, were either scarce (oil, gas and coal) or of uncertain economic viability (oil shale); nevertheless, local and foreign experts considered them viable alternatives for imported energy. The Bank supported the Government's energy sector development policies with loans for oil exploration, oil shale engineering, and the Project under review in this report.

2.2 Consistent with the Government's energy strategy, the Project supported the substitution of local coal for imported oil. There was a growing local coal market and it appeared that the existing Jerada coal mine would be able to produce coal competitively. Potential customers of Jerada coal, the Office National d'Electricité (ONE) and the Cimenterie de l'Oriental (CIOR), had converted their plants from oil to coal. There was also the belief that high oil prices would assure sufficiently high international coal prices to allow

competitive operation of the Jerada mine. The Government was to increase the price of the coal Jerada produced to the level of opportunity costs of imported coal. An increase of mine output was to facilitate effective utilization of the Jerada power plant, meet other customers' needs, and reduce the mine's unit production costs.

2.3 The macroeconomic impact of the Project was also considered to be favorable and consistent with the country's overall economic goals. The Project was to contribute to foreign exchange savings through the substitution of oil imports and was to maintain employment in an area of eastern Morocco, with low employment prospects. Finally, Morocco had a relatively good record in mining performance.

3. PROJECT DESIGN

Conception and Justification

3.1 The conceptual foundation of the Project appeared to be sound. The Jerada mine was the only coal mine in the country. Its operations were proven, and coal reserves appeared to be sufficient. The Project called for a concentration of operations with a relatively modest and apparently feasible expansion of production. It was a significant reduction from an earlier scheme of developing a new mine (Siege VI), a much more ambitious project.

Risks

3.2 At the time of project appraisal, the Bank and CdM considered geological risks small, due to knowledge of the coal deposit from existing operations; unfortunately, geological conditions in the new area turned out to be worse than in known areas (para. 5.3). The Project addressed potential geological risks through its component for an exploration drilling program and the requirement for the satisfactory completion of drilling and engineering prior to execution of the contract for shaft-sinking. The Project took account of technical/economical risks connected with capital-intensive mechanization of underground mining by restricting mechanization to a small number of longwall units after an extended test period¹. Other equipment supply components of the Project were of a less risky nature. The Project was to minimize managerial risks by introducing, during the Project's preparation, improvements in management and organizational structure. In fact, prior to the Project, CdM was separated from its BRPM parent organization, to allow more efficient management with greater financial responsibility. The inclusion of a technical assistance component in the Project was also an important element for reducing managerial risks. Financial risks were considered to be low by the existence of an adequate local market and the adoption, by the Government, of a coal pricing policy based on opportunity costs of imported coal, which were sufficiently high at that time to protect the mine and the Project.

¹ A pre-identification mission of September 1981 rejected the Project at that stage because the proposed mechanization was insufficiently tested.

Impact of Project Design on Project Performance

3.3 The sufficiently favorable geological conditions in the known areas of the mine combined with the strong assumption in project design that these conditions would occur in prospective production areas were a significant feature of the Project's design. Using this assumption as a basis for decision-making had a serious impact on Project results. Unfortunately, mining conditions in the new areas turned out to be considerably worse than anticipated at appraisal and after the original evaluation of the additional drilling². Concerns about the geological nature of the deposit came to the forefront only after mining in the first area fully prepared under the Project showed unsatisfactory results³. This was during the period 1987/88, after Cdm already had made the decision to go ahead with construction of Shaft 3 based, in retrospect, on an interpretation of drilling results which did not sufficiently account for the serious geological problems later discovered (para. 5.3). Also, the belief that better mine planning and a more rational, less dense grid of roadways could offset geological risks, proved to be an error⁴.

4. PROJECT OBJECTIVES AND DESCRIPTION

4.1 The project had two sets of objectives. First, at the country level, the project was to (a) support the expansion coal substitution for oil by increased domestic coal production, (b) help assure the continued employment in a less developed region by efficient operating practices and modernization of plant facilities, and (c) ensure the maintenance of an appropriate coal pricing policy. Second, at the level of the company, Cdm, project objectives were to (a) expand coal production at Jerada from 800,000 tpy to 1 million tpy, (b) modify the technology used by the company in order to increase productivity, (c) improve Cdm's organization and mine planning and (d) better the safety, health and general working conditions of the company.

4.2 In order to achieve the above objectives, the Project contained the following components: (a) an exploration drilling program to prepare underground development work and shaft sinking; (b) underground development work to prepare future mining areas and to simplify existing mining areas; (c) the sinking of an additional vertical shaft to maintain production capacity of

² In their report of August 1986, Cdm states that the drilling confirmed appraisal assumptions and that relatively good mining conditions could be expected in western parts of the mine.

³ Even though the development of new mining panels in the north-central part of the deposit had demonstrated the existence of apparently acceptable mining conditions, the coal extraction units (longwalls) encountered basalt intrusions and other geological irregularities which led to abandonment of some of the reserves and low productivity and high cost extraction of the remaining reserves in that area.

⁴ Due to much less reconnaissance work and the lack of medium-term mine planning in Cdm's pre-Project operation, the old network of roadways was dense and erratic. It was believed that more exploration drilling, accelerated advancement of roadways and systematic medium-term mine planning, all introduced under the Project, would significantly simplify the mine's network of roadways. In reality, the new network had to be constantly adapted to the changing geology and therefore looks very similar to the old one.

the single mine after completion of the Project and the depletion of CdM's smaller mines; (d) the installation of underground and surface equipment to increase efficiency, production capacity and to improve safety and health; and (e) technical assistance to CdM.

5. PROJECT IMPLEMENTATION

Overview

5.1 At the project completion date (June 30, 1991), the implementation of about 75 % of the Project's original scope had taken place, at a cost of US\$ 82.5 million, or 112% of the original appraisal estimate (60% of the revised cost estimate). The most critical variance between planned and actual implementation is in the construction of the new mineshaft under the Project, Shaft 3, which was abandoned after it had become clear that its completion was uneconomic. The mine's production fell far short of projections, mainly because of poor geological conditions and related problems in project design and implementation. The unforeseen production problem, together with the coal price decline and the inability of CdM to adjust its operations, made mine closure the most economic course of action. In retrospect, it would have been preferable to arrest the Project earlier, but for institutional and political reasons, the Government hesitated to face the connected mine closing decision, and the Bank was reluctant to insist on it.

The Shaft 3 Construction Issue

5.2 At project identification, and during much of project preparation, the construction of a new mineshaft was not foreseen. Shaft 3 became a project component after a feasibility study, which in hindsight, was based on insufficient exploration data and engineering to support its construction. The Bank had insisted on several precautionary measures but all of them failed to prevent the decision to go ahead with shaft construction. First, the Borrower was asked to carry out a supplementary study of the Shaft to demonstrate its necessity and economic justification⁵. The study concluded that the shaft would be absolutely essential for extending economic mine operation beyond 1990, that it was the least-cost solution, and that its implementation was urgent in order to avoid a drop in mine production. Secondly, CdM did exploration drilling as part of the Project and presented a report on the results, along with their evaluation for more detailed planning of mining in new areas; this evaluation covered the zone around and beyond the location of Shaft 3⁶. The report indicated that reserves were adequate and that mining conditions in the new areas were relatively favorable, allowing some mechanization. Third, in February 1987, when a Moroccan delegation visited Washington, CdM submitted a report on the engineering of Shaft 3, together with an acceptable workplan for its construction. CdM thus was in compliance with the loan covenant regarding the execution of the shaft

⁵ Etude Justificative du Puits III, August 1985.

⁶ Rapport sur le Développement des Exploitations des Bassins Sud et Centre - Leurs Raccords avec le Puits III et leur Extension vers l'Ouest, Charbonnages du Maroc, August 1986.

construction⁷. In addition, due to CdM's production problems, which had already become apparent at that time, the Bank had requested, as a fourth precaution, a re-evaluation of the economic benefits of constructing the shaft⁸. The study concluded that despite lower production and coal prices, the construction still would be justified. However, the mine's output continued to decline. In 1989, BRPM re-examined the geological evaluation of drilling in the area around Shaft 3 and found that previous conclusions were erroneous. They found much lower reserves and, more importantly, mining conditions that were considerably more difficult than previously indicated. There was a change in CdM's management and the new management came under BRPM's control. Expectations were that the new management would halt and reverse the production decline. After a further drop in production, the Bank communicated formally to the Government, in January 1990, that the preferred action was to discontinue the Project and close the mine as soon as possible. However, given the serious social consequences related to such a decision, the Bank was also willing to support the Project further, with the condition that the Government implement an appropriate action plan to reduce costs and assure CdM's financial viability. Due to the unsatisfactory economic viability of the project, KfW did not finance Shaft 3.

The Action Plan Issue

5.3 In February 1990, a joint Bank/KfW mission examined a draft action program prepared by an inter-ministerial committee. The main components of the plan were to reduce personnel by about 25 %, to transfer all debt and social charges to the Government, and to assure appropriate financial liquidity of CdM for efficient operation. CdM were to maintain a production level of 620,000 tons per year. While, in principle, the proposal appeared acceptable, there was a lack of clarity in the definition of some components and an absence of concrete implementation steps. In May 1990, the Bank, in consultation with KfW, notified the Government that it would suspend disbursements within 30 days if it did not take appropriate steps for clarification and implementation of the plan. Further correspondence led to extending the date of suspension, but the Government was not forthcoming in making the necessary clarifications and taking the additional steps required. Therefore, on August 7, 1990, the Bank and KfW suspended disbursements⁹. Meanwhile, the continued drop in production made it clear that continuation of mining operations was less and less justifiable. Finally, the envisaged Action Plan was no longer an acceptable solution, since the cash cost of production, even after restructuring and elimination of redundant staff, far exceeded the sales price of coal and the opportunity cost of energy.

⁷ Loan Agreement, Section 3.02 (a). The Bank's agreement is recorded in the Aide-Memoire of February 6, 1987.

⁸ The study was conducted by CdM, with considerable assistance from a consultant and the Bank.

⁹ KfW would have been ready to suspend disbursements already in 1989, but the Bank was reluctant because it first wanted to give the Borrower a chance for appropriate actions to improve production.

The Mine Closing Issue

5.4 In 1991, the Bank and KfW concluded that completion of the Project (i.e. equipping Shaft 3) and continuation of the mining operations were no longer justified economically. In June 1991, before the closing date, the Bank formally communicated to the Government that it would not be able to lift suspension of disbursements, unless the Government renounced the decision to equip the shaft and started to prepare a program for orderly closure of the mine. The Bank offered assistance for social measures and possible development of alternative economic activities, indicating its readiness to increase the loan amount of an envisaged PERL II by US\$ 30 million for this purpose. The Government did not accede to this offer. On November 27, 1991, the Bank notified the Government that it had cancelled the remaining undisbursed portion of the loan amount, US\$ 7.5 million. The Bank had previously cancelled US \$6 million based on a revised financing plan¹⁰. Therefore a total of US\$ 13.5 million, or 50% of the total loan, was cancelled. KfW accorded a loan of DM 40.0 million which later, in agreement with the Moroccan Government, was reduced to DM 5.5 million. This amount was mainly used for downpayment for equipment supply and it is expected that this downpayment will be fully reimbursed by the supplier. KfW's final loan will be reduced to about DM 1.1 million.

Critical Decisions in Project Implementation

5.5 The decision of 1987 to go ahead with shaft construction was justified by the production level and the price of coal at that time. While lower than at appraisal, the Project's economic return still appeared acceptable. Cdm claimed that the drilling results showed no reason to believe that coal reserves would be insufficient or mining conditions significantly worse than anticipated. In retrospect, only major differences in project design could have reduced the risk.

5.6 The Government, in 1989, after re-interpretation of the exploration drilling, could have taken the decision to implement a drastic action program to restore financial viability of the Company, or the decision to arrest the Project and prepare closing of the mine. The Government most likely did not make the first decision because it wanted to give the new management a chance to improve the company's performance. The Government probably hesitated to take the second decision because of its serious social consequences. With some delay, the Government made a decision on an action program in February 1990; however, the plan was never implemented due to internal disagreement about the financing of Cdm's deficit and the political impact of personnel reductions.

¹⁰ US\$ 6.0 million were cancelled from the Bank's loan because Cdm decided not to select the lowest evaluated bidder for the shaft equipment and to utilize alternative financing available from KfW. Cdm made this choice because they wanted to get the best quality equipment and expand their financing base.

6. PROJECT RESULTS

Achievement of Country Objectives

6.1 **Coal Substitution.** The Project had only a minor impact on the energy sector and the national economy. The modest coal production increase which resulted from the Project (as compared to the "without" scenario) helped to save about 400,000 tons of coal imports during the period 1985 to 1991. However, the impact on foreign exchange savings was negative. The foreign cost of the Project was about US\$ 35 million, more than twice the net foreign exchange savings due to the lower coal imports of the period 1985 to 1991¹¹.

6.2 **Continued Employment at Jerada.** Employment at Jerada continued at a constant level during the implementation period of the Project. However, due to declining coal output drastic reductions of the labor force will be necessary to reduce financial losses (para. 7.1).

6.3 **Maintenance of Appropriate Coal Pricing.** According to a project covenant, the Guarantor was to ensure that the price of coal was at least 85% the opportunity cost of imported coal during the Project. The Guarantor complied with this covenant. Unfortunately, the international price of coal decreased significantly during the project period, and the covenant could not provide the financial security expected at appraisal.

Achievement of CdM Objectives:

6.4 **Expansion of Production to 1 million tpy.** The Project did not achieve CdM's coal production objectives. At appraisal, Siege V, the mine section where all future production was to take place, was producing at a rate of 350,000 tons per year (other mine sections, at that time, contributed another 450,000 tons per year). Mostly due to the Project, production from Siege V increased temporarily to about 700,000 tons per year. Today, at 500,000 tons per year, production is still significantly higher than without project but due to geological conditions it will diminish until full closure of the mine.

6.5 **Improved Mining Technology and Productivity.** The project made some improvements to critical underground mine equipment for ventilation, compressed air supply, material transport and partial mechanization of coal extraction, all designed to increase productivity and output of the mine. Generally, the implementation of these components took place on time and within budget¹². While these components could not prevent the ultimate decline in production, the decline would have been greater without them. The Project also modified the coal preparation plant. While the original plan was to debottleneck the screening section, this was changed during project

¹¹ Based on a foreign cost of about 45 \$/t cif Morocco minus 10 \$/t foreign exchange in the variable cost of production.

¹² One variance was the number of longwalls which have been installed for partially mechanized coal extraction; instead of the planned four units, only two were installed. In view of the deteriorating geological conditions, this decision was correct.

execution to the addition of a fine coal-washing section. The change probably was justified, although some problems with meeting coal product specifications made marketing more difficult¹³.

6.6 **Improved Safety, Health and Working Conditions.** Overall, safety, health and working conditions improved only marginally, if at all. CdM maintained basically the same accident rates and silicosis incidents, while working conditions in some areas of the mine improved through better ventilation.

6.7 **Improved CdM Organization and Management.** After the initial strengthening of CdM, introduced as part of the Project,¹⁴ the company continued to make organizational changes and appoint new key middle-level managers. In addition, CdM used the Consultant's services to assist them in better planning, preparing and organizing the underground production, maintenance and service functions¹⁵. Finally, in 1989, the Company's top management changed. The relative strengths and weaknesses of the first and second management teams are discussed in the sections of this report on Borrower performance (paras. 9.1-9.3).

Economic and Financial Impact

6.8 The economic impact of the Project is difficult to quantify, because the continuation of mine operation is no longer justified financially and economically. A revaluation of the economic rate of return under the assumption that the mine would close at the same date in the "with" and "without" cases, indicates a strongly negative return (Part III, Attachment to Table 6). Financially, CdM now has an annual cash operating loss of about US\$ 10 million.

7. PROJECT SUSTAINABILITY

7.1 The principal benefits resulting from the Project are not sustainable, since the mine should be closed at the earliest possible date. Technically, the lifetime of the mine and the Project in its present configuration (i.e. without equipment for Shaft 3¹⁶) could continue to about the year 2000 or beyond, initially at the present level of production and then gradually declining to about half the present level or less. However, on an economic

¹³ The middlings had to be blended with imported coal in order to be acceptable for the power plant. Had the quality of the middlings been acceptable without blending, a major portion of the imports would still have been necessary to satisfy demand.

¹⁴ At negotiations, CdM presented a plan for strengthening management of the mine, which was subsequently implemented.

¹⁵ To this effect, experienced operation engineers of the Consultant stayed for training purposes over an extended period at the mine, as part of the technical assistance contract financed by the Bank.

¹⁶ In case the Shaft would be equipped, the technical lifetime would be longer, but financial losses would be much higher.

basis, such an operation would not be viable. The Bank has reviewed the personnel situation of the company and made a preliminary investigation of possible measures to alleviate the unemployment problem¹⁷ that would result from mine closure. Within the next five years, the Company's personnel can be reduced to about 50% by normal and early retirement, by the transfer of silicosis cases to the health insurance scheme, and by non-renewal of contracts for migrant workers from different parts of the country. A small portion of the remaining half could probably find employment in the regional economy, in the agricultural, artisanal and commercial sectors, with the assistance of compensation payments. For many of the workers, however, it will be necessary to (a) develop plans for retraining and transfer to other regions, (b) establish major new regional development programs, and (c) provide suitable unemployment assistance. The Bank has indicated, to the Government, its readiness for assistance in these matters¹⁸.

8. BANK PERFORMANCE

8.1 The Bank's strengths in project execution were (a) its provision of advice to CdM and the Government throughout the project cycle, (b) early warnings of the Project's problems during supervision, (c) the preparation of updated financial projections, (d) a re-evaluation of the costs and benefits of the Project and (e) its recommendations for an action program to address the major problems of the Project and CdM, and ultimately, closure of the mine. The Bank often mediated between CdM and the Government and among different ministries within the Government. The Bank's involvement was also instrumental in securing co-financing for the Project.

8.2 The Bank's performance also had several weaknesses. At the project preparation stage, the Bank did not sufficiently appreciate the risks and appraised the Project before the drilling campaign was completed. The Bank's coal price projections turned out to be too optimistic and the Bank did not see the gravity of the geological risk. The Bank could not provide detailed technical advice on the feasibility of the mining plans presented by CdM, as they were based on the interpretation of a large volume of data from the mine's operation. The Bank had to depend to a great extent on the Consultant's advice and CdM's views. In retrospect, it seems that the Bank should have been more prudent in accepting the production forecasts and mining plans of CdM and the Consultant. Often the Bank could not achieve timely implementation of its advice. In the critical end-phase, the Bank could not achieve sufficient consensus among the different parties involved for implementing a meaningful action plan. Possibly the Bank may have been too accommodating, allowing CdM to vacillate in its decision-making on important issues.

8.3 The main lessons the Bank learned through the Project are the following:

¹⁷ Study carried out by an expert from Charbonnages de France in the framework of the Bank's Human Resources sector work.

¹⁸ However, no formal decision to scale down production and close the mine has been taken by Borrower and Government. In fact, during June 1992, the Borrower, tried to obtain alternative German export financing, but the request was rejected.

- (a) The type and the timing of a project are important considerations. Mining projects with difficult geological conditions are inherently risky. The risk can be significantly increased through poor timing. For example, an energy project conceived during the second oil shock ran the risks of not being a very high priority in the long-run because of over-optimistic price forecasts. The Bank needs to re-evaluate the extent to which it should become involved in risky projects based on speculative international prices. Such projects are probably much better suited for the private sector, which can act more flexibly and faster to overcome unforeseen difficulties.
- (b) The impact of natural conditions, which cannot be changed, such as the geology of a coal deposit, can be disastrous, and no project should go ahead without a rigorous assessment of the corresponding risks and an appropriate project design. For interpretation of exploration results in difficult terrain, more than one expert should give an opinion at a very early stage of the project. Based on the various opinions, there should be a decision to drop it entirely, or proceed cautiously by excluding risky components, or design very stringent safeguards. One option would be to have a Technical Assistance Project, or a PPF, to ensure that the exploration work was completed correctly before the design of an investment project. Another option would be to adopt a phased implementation to reduce technical risks. For example, it may be essential to assure that certain production levels are achieved before proceeding with shaft sinking. If the shaft construction does not prove to be economic, the rest of the Project should be economically viable on its own. Also, the Bank should discuss the risks and possible consequences of project failure with the Borrower at an early stage of the project, with full understanding of and early commitment to actions required in such a case.
- (c) The Bank should have requested from the Government at the outset of the Project more autonomy for CdM and agreed on actions for events it anticipated potential risks were to materialize.

9. BORROWER PERFORMANCE

9.1 CdM had a change in its management during the project (in 1989) and the review of performance in this section will make the distinction "first management" and "second management." The main strengths of the first management were professional and managerial competence coupled with action orientation and willingness to take new approaches and risks, as particularly demonstrated during the Project's design and early implementation phase. The implementation of project components, including difficult tasks such as the procurement and execution of work contracts, all executed by the first management, presented no major problems. CdM employed staff resources efficiently. The second management's main strengths were its experience with exploration and its conservative approach. The Government's main strengths were well-defined responsibilities among its agencies, and transfer of considerable authority to CdM's management, at least during the early part of the Project's implementation phase.

9.2 The main weaknesses of Cdm's first management were the negative sides of their strengths; they made some changes and certain actions too fast, without a sufficient assessment of the risks. The second management's main weakness was the lack of own initiative for action, or too much reliance on Government decisions. Both management teams tended to utilize the Consultant too much for backing up their own decisions, which often were based on socio-political considerations, rather than being completely open to neutral advice. The Government's main weakness, as demonstrated during the later project implementation phase, was its inability to arrive at a firm decision and implement it.

9.3 The main lessons learned by the Borrower, through the Project, are the following:

- (a) For Cdm. The company should seek and accept independent frank expert advice at every state of the project. Risk management and financial business decisions should be the prime concern of the Company and should not be shared with government agencies. Reliance on Government assistance does not further the Project and is likely to be counterproductive. Business and politics should be kept separated to avoid a deadlock on decisions. The Company's role should be to make business decisions on technical and economical grounds only. Probably, social and political implications will and should be considered, but these should be referred to the appropriate authorities.
- (b) For the Government. The Government should not be involved in industrial activities which are commercial by nature and require quick decision and action, which often are not consistent with the nature of the public sector and its bureaucracy. For example, Cdm should have been able to make a faster decision on mine closing and a related action plan. A simple and clear partition of responsibilities within existing organizational structures of the Government should be maintained; full consensus within a committee takes time or may never be achieved. If necessary, a small special unit with full authority for implementation of exceptional tasks, such as the closing of a mine, should be created.

10. PROJECT RELATIONSHIPS

10.1 The relationship between Bank and Cdm, as well as that between Bank and Government were good throughout the Project. The Bank tried to accommodate the views of both Cdm and the Government and to mediate in case of differences. While the different parties were not always in agreement, there was always a friendly working atmosphere.

10.2 There was also a good relationship with co-financier KfW, in particular during the later phase of project implementation. Close cooperation was maintained for such critical steps as requesting an appropriate action plan, suspending disbursement on the loan, requesting the renouncement of equipping the shaft, recommending the closure of the mine, and offering assistance for resolving the social problems connected with the mine closing.

11. CONSULTING SERVICES

11.1 The Consultant had a very good record of expertise for the assignment. He provided valuable assistance to Cdm during project preparation and in the early phases of project implementation. Later in the Project, however, when production problems developed, BRPM demonstrated that the interpretations of the drilling program, in which the Consultant had a supervisory role, did not account for geological problems that ultimately hindered the viability of the Project. Also, the consultant did not foresee the extent of the production difficulties, and did not propose sufficiently rigorous corrective actions.

12. PROJECT DOCUMENTATION AND DATA

12.1 Considering the Project's scope and background, the project documents were appropriate. They could have been more strict to reduce technical risks, but that would have required a different project design. The Staff Appraisal Report was adequate, although as noted in paras. 6.1-6.8 Project results deviated markedly from projections. Cdm's reporting, although not very regular and timely, was of high quality. Project files on this PCR were not very comprehensive but this did not prove to be a major impediment to the preparation of the PCR.

PROJECT COMPLETION REPORT

MOROCCO

**JERADA COAL MINE MODERNIZATION AND
EXPANSION PROJECT (Loan 2508-MOR)**

PART II: REPORT OF THE BORROWER

PROJECT COMPLETION REPORT

MOROCCO

JERADA COAL MINE MODERNIZATION AND
EXPANSION PROJECT (Loan 2508-MOR)

FOREWORD¹⁹

The analysis summarized here was prepared from the viewpoint of the new General Management, in office since May 1992. It does not necessarily reflect the views of the parent organization (*Bureau de Recherche et de Participation Minière - BRPM*) or the Moroccan Government. It is based on internal reports prepared by Charbonnages du Maroc (CdM), reports prepared by outside parties and, above all, on interviews with the key protagonists involved. This study obviously also takes account of the Project Completion Report prepared by the World Bank in April 1992.

In retrospect, the development plan for the Jerada mine can be seen as almost a textbook example of what could be called a process of mutual delusion, in which the inadequacies of one party are compounded and aggravated by the blindness of the other, the whole thing being masked by a bureaucratise that removes all contradictions and tones down all differences.

We do not intend to dwell on the most obvious causes for the failure of the development plan, which have been clearly identified in the World Bank's completion report, even though the report tends, in an extremely (overly) diplomatic manner, to sugarcoat certain truths and fails to follow the implications through to their full conclusion:

- Inadequate geological studies on which erroneous interpretations were pinned;
- Narrow economic and financial analysis, severely skewed by the closeness of a short-term event (second oil shock);
- Failure to follow the logical sequence to be observed, e.g. decision to dig Shaft 3 prior to the exploration drilling program;
- Added to the initial errors in assessment, the inability to go back and make timely adjustments, as and when the real facts became known.

These failings, which defy not only scientific reason but plain common sense, are now sufficiently well known and recognized so we need not dwell on them. However, the important thing is to delve further and to ask ourselves

¹⁹ Translation of the original Part II in French, which the Borrower prepared and sent to the Bank October 26, 1992.

how this collective blindness could have come about.

1. REVERSE DECISIONMAKING: "WORKING BACKWARDS"

It was as though once an idea was put forward by a blinkered decisionmaker, from then on the sole aim was to justify that idea *a posteriori*. Good sense was ignored and even the hard facts which became increasingly evident were disregarded, in defiance of even the most elementary intellectual and professional principles.

Such a mechanism, which originated in Morocco, was only able to come fully into play because the counterweights set in place (World Bank, foreign consultant) did not function as they should have.

2. LACK OF APPROPRIATE MANAGEMENT CAPABILITIES

The management skills required to direct such a project were, in fact, totally lacking. The lack of analytical thinking, the managers' inability to openly express their misgivings, the prevailing climate of intimidation, and the top-down management style, which excluded any participatory approach, all tended to stifle the slightest inclination to think independently, to challenge the official line or to take a stand against the top-down production-obsessed approaches.

As regards the local managers, it is also clear that the silence of the outside participants, (the World Bank) and their calculated and self-serving blindness (foreign consultant) were bound to discourage any attempt on their part to speak out against the official position and to point out its fallacies.

3. ABSENCE OF EFFECTIVE COUNTERBALANCES

The World Bank was put into the awkward position of having to depend on other parties for its key information. At no time did it hire, or even show an interest in hiring, people capable of checking and confirming the official information it was being fed. At no time did it recruit managers of sufficient caliber to go and independently compare the actual situation in the field with the official statements being put out. What is more serious, at no time did it realize the full extent of the manipulation undertaken to get rid of anything that did not jibe with the official pronouncements. Had the World Bank been better aware of the local situation and paid more attention to what insiders were saying, it would have been able to sound the alarm sooner and more vigorously. As for the consultant, the least that can be said is that he proved himself incapable of following the most elementary principle of consulting, namely the need to stand back and view matters from an overall perspective.

In brief, under these circumstances, no control mechanisms, whether planned or already in place, could have functioned as intended.

4. GOVERNMENT-FOCUSED RATHER THAN COMPANY-FOCUSED CENTRALIZATION

Much of the economic argument was based on macro-considerations, such as price-fixing by the Government, competing world coal supply, etc. As a result, the center of gravity was (un)consciously shifted toward the Government authorities, which had the effect of de-emphasizing the micro-economic and administrative dimensions and tending to remove accountability from the local management.

The Government authorities were thus unwittingly playing the soothing role of "last resort," on call if things went badly.

CONCLUSIONS

The meager improvements made in areas such as ventilation and transportation (of personnel and equipment) can hardly offset the direct costs incurred as a result of the development plan, not to mention opportunity costs and also the psychosocial costs due to CdM's disillusionment and loss of credibility as a result of the failure of the plan.

We, for our part, maintain, that, contrary to the official line, the basic problem posed by the failure of the development plan was a human one and hinged on whether or not individuals were capable of handling reality. Rather than a lack of good advice, there has, on all sides, been a lack of courage, an absence of critical thinking and a lack of clear-headedness, given the hasty, careless and slapdash nature of the project and its servile approach shrouded in pseudotechnical jargon.

The lesson that can be learned is that the management of a project such as a development plan is not just an academic number-crunching exercise, but one that calls for above-average management capability, i.e. an investment in people, first and foremost: people who are not easily taken in, people who practice Cartesian doubt, people capable of demystifying pseudotechnical rhetoric and seeing through what simply amounts to ego trips, power struggles and sociopolitical scorekeeping. In a nutshell, more important than project-management technique is a project-management culture based on independence and clear-headedness coupled with the ability to take into account the complexity of the psychosocial variables associated with human-resource management, all of which override the technical dimension *per se*.

PROJECT COMPLETION REPORT

MOROCCO

**JERADA COAL MINE MODERNIZATION AND
EXPANSION PROJECT (Loan. 2508-MOR)**

PART III: STATISTICAL INFORMATION

CHARBONNAGES DU MAROC

Department of Accounting and Finance

TABLE 2: FINANCING

(in millions)

	In Foreign Exchange		In local currency (DH)		% Actual
	Estimated	Actual	Estimated	Actual	
- IBRD	\$27.0	\$13.5	221.0	110.0	50
- KfW	DM 40.0	DM 5.5	215.0	29.7	14
- FRANCE	FF 100.0	FF 77.1	157.8	121.7	77
- SWITZERLAND	DM 15.0	DM 9.7	80.9	52.3	65
- OTHER	\$0.25	\$0.2	2.0	1.6	80
TOTAL (1)			676.7	315.3	47
- C.D.M.			468	379.4 (*)	81
TOTAL (2)			1,144.7	694.7	61
(*): Drilling/shaft + 15% Handling costs + CCOD Financ. (316 + 47 + 16.4)					

CHARBONNAGES DU MAROC

Department of Accounting and Finance

TABLE 3: DRAWINGS

CUMULATIVE DRAWDOWN (US\$)

(in millions)

Year	Estimated	Actual	% Actual
1986			
I	1.2	2.5	208
II	2.5	2.8	112
1987			
I	4.0	4.7	118
II	6.5	4.7	72
1988			
I	10.0	6.4	64
II	13.5	8.5	63
1989			
I	17.0	11.1	65
II	20.5	11.4	56
1990			
I	24.0	12.2	51
II	26.0	13.5	52
1991			
I	27.0	13.5	50
II			

CHARBONNAGES DU MAROC

Department of Accounting and Finance

TABLE 6:

(in millions)

	1985	1986	1987	1988	1989	1990	1991
Production							
Estimated	0.80	0.85	0.93	1.00	1.00	1.00	1.00
Actual	0.77	0.77	0.63	0.64	0.50	0.53	0.55
Payroll							
Estimated							6,100
Actual	7,915	7,572	7,344	6,748	6,256	6,299	6,357