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IEN Staff Report: Restricted Distribution

November 1993

Involuntary Resettlement in Hydropower Projects

*A review of appraisal and supervision procedures in projects
financed by the World Bank, 1978-1992, and of projects in
the pipeline over the next five years*

Pablo Gutman
Consultant, IENDR

with an overview by
Dennis Anderson and Pablo Gutman

The World Bank

Industry and Energy Department

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Preface

This is a contribution by the Industry and Energy Department to the World Bank's review of resettlement issues encountered in its projects. It is directed primarily toward the Bank's energy and environmental staff involved in hydroelectric projects that have implications for resettlement.

The paper was prepared by Pablo Gutman (consultant to IENDR), who worked on the subject during April–June 1993. Dennis Anderson (IENDR) and Pablo Gutman wrote the overview.

The document was improved by detailed comments and suggestions from Michael Cernea, Scott Guggenheim, and Tova Solo. Information and comments were gathered from a large number of persons inside the Bank and a few outside it. Their contributions are gratefully acknowledged.

Overview

1 This report reviews the World Bank's approaches to resettlement in hydroelectric projects. It is part of a Bank-wide review of resettlement issues commissioned by senior management in November 1992.¹

Hydroelectricity and Hydro Finance in Context

2 The Bank finances about four hydroelectric projects a year, which is less than 2 percent of the total number of projects it finances and around 4.5 percent of its total lending. Most of these projects are non-controversial, as they are cost-effective and involve little displacement of people. Others (Narmada being a polar case) are commonly disputed on the grounds of cost and of the resettlement problems they lead to, and raise controversies out of all proportion to their importance in the Bank's portfolio.

3 Not financing hydroelectric schemes would have little effect on the Bank's aggregate portfolio, even in electric power. Lending for thermal power plant, for the development of national grids and distribution systems, and for the efficient development and use of electricity (policy and price reforms) totals more than twice the amount of lending for hydropower projects, and the demands for external finance for non-hydropower projects are very high on account of the rapid growth of demand for electricity in developing countries. The total installed electricity generation capacity in developing countries is over 700 gigawatts (GW), and demands are doubling every eight years or so; in the next ten years, developing countries will require, and will probably install, an aggregate capacity roughly equal to that of the United States or of the European Communities today. Of this, the Bank is unlikely to be able to finance more than 5 percent on current trends, and could readily concentrate its resources wholly on non-hydropower projects and policies.

4 Yet this would be to ignore the concern of the Bank's member countries to use resources efficiently in ways that will raise incomes and living standards. Hydroelectricity is often the least-cost option for producing electricity, and it is the Bank's policy to support least-cost investments *provided* the costs of complying with environmental policies and resettling people displaced by the projects are fully included in the costs.

1. Memorandum from Mr. Rajagopalan to the Regional Vice Presidents, November 18, 1992.

2 Involuntary Resettlement in Hydropower Projects

Table 1 Hydropower Installed and Under Construction (MW capacity)

<i>Region</i>	<i>Installed</i>	<i>Under Construction</i>	<i>Total</i>
Africa	19,832	2,480	22,312
LAC	99,002	28,240	127,242
ASIA ^a	111,527	40,771	152,298
ECA ^c	21,383	4,013	25,396
<i>Total Developing Countries</i>	<i>251,744</i>	<i>75,504</i>	<i>327,248</i>
OECD ^b	298,432	10,594	309,026
Ex-USSR	64,360	12,600	79,960
<i>Total World</i>	<i>614,536</i>	<i>98,698</i>	<i>713,324</i>

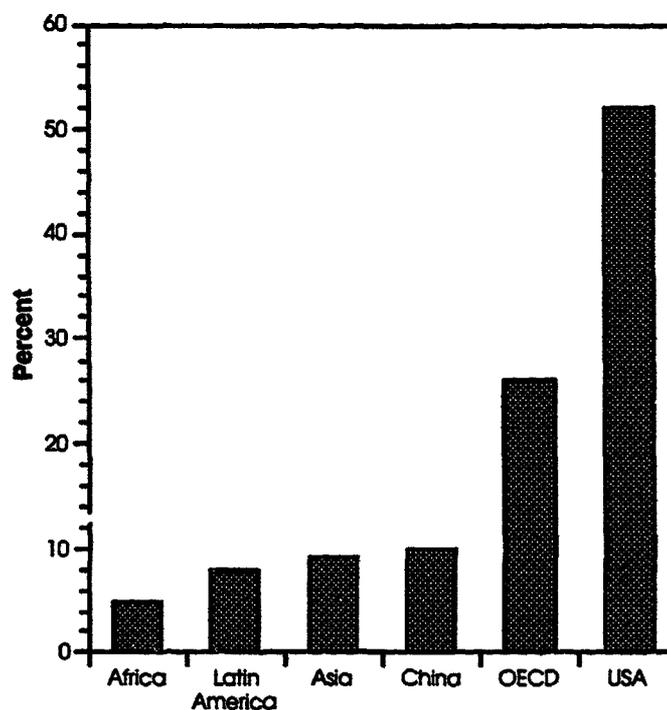
Source: Reed Publishing Group (1993)

^aPlus Oceania minus Japan, Australia, and New Zealand.

^bOECD countries minus Portugal and Turkey.

^cEurope and Central Asia excluding any OECD countries (see b).

Figure 1 Percentage of Hydro Potential Used (1990)



Source: World Resources 1992-93

5 Developing countries, like industrial countries in the past, continue to depend on hydroelectricity. There are currently 75,000 MW of hydroelectric projects under construction in developing countries (Table 1), of which the Bank is financing less than one-sixth and providing loans and credits amounting to about one-twentieth of the financial requirements. It is estimated that developing countries have used less than 10 percent of their hydropower potential—5 percent in Africa, 8 percent in Latin America, 9 percent in Asia, and 10 percent in China. In contrast, there are 22,000 MW under construction in the OECD and the former Soviet Union, where electricity demands are no longer growing quickly, while the OECD countries have used 25 percent of their hydropower potential (52 percent in the U.S.).

6 In the context of the present paper, therefore, the key questions are whether resettlement problems are being addressed in a socially satisfactory way and whether the costs are being estimated reliably. The Bank's Operational Directive 4.30 is clear as to the treatment of these questions in Bank projects; it has been reviewed internally and externally many times and found to be sound. This review therefore concentrates on the consistency of project implementation with OD 4.30. It reviews not only projects under implementation, but in an attempt to learn from past experiences—and also to see how the Bank is adapting to ever tightening policies—it also further reviews the Bank's implementation of all hydropower projects financed and completed since 1978.

7 After a short introduction (Chapter 2), the following report focuses on three main issues:

- a. The outcome of the projects in relation to the resettlement issues and goals (Chapter 3).
- b. The past and current treatment of resettlement issues during the hydro project life cycle (Chapter 3).
- c. The economics of resettlement and its impact on resettlement itself and on the projects' overall costs and performance (Chapter 4).

8 Since the report is concerned with the implementation of the Bank's resettlement policies, it draws extensively on appraisal, supervision, and project completion reports and audits, and on interviews with Bank staff.

Attention Given to Resettlement

9 Projects initiated after 1991 began to move through the Bank's pipeline in the wake of the Bank's concern about resettlement, brought about by previous policy reviews. The documents already available in the Regions' Technical Departments show that in all cases, depending on the stage of the project, detailed social studies have been either available, under way, or requested. In most cases qualified experts participated in drafting the terms of reference and in reviewing the outcomes of these studies. If the

Bank's new emphasis on resettlement is maintained, the current pipeline of projects will give a thorough consideration to resettlement issues.²

10 A significant increase in the attention given to resettlement components is visible in the last five years. Where 500 or more people will be affected, SARs after 1988 provide a thorough discussion of the issues, and the necessary preparatory studies were completed before the projects were appraised. Supervision of resettlement issues is also more frequent. The picture is less positive for the bulk of projects that were initiated before 1988 and are still being implemented; in several cases preparation was poor, as has been supervision. Also, small resettlement components tend to be overlooked both in old and recent projects.

The Costs of Resettlement

11 The costs of resettlement have not been well estimated in the past. They are almost invariably underestimated by large amounts, there is no relevant detail or analysis of the components of cost, and there is nothing to show whether people would be or were better off or worse off as a consequence of being resettled.

Past Underestimation of Costs

12 The encouraging increase recently in the attention and professionalism given to resettlement in Bank projects has to be seen in the context of the propensity of practically everyone involved in hydropower projects to underestimate the costs and the difficulties of resettlement. It will be a major step forward if new projects were to estimate the costs—and also the elements of the costs—more reliably. Cost escalation is a problem that is of course not confined to resettlement, nor only to hydropower, nor even to developing countries. A recent review of the costs of Bank financed hydropower and thermal power projects found that (a) there is a wide distribution in the difference between actual costs and costs estimated at appraisal, but that (b) cost overruns were about 35 percent on average for hydro projects and 10 percent for thermal power projects.³ The underestimation of costs of resettlement, however, has been even greater in the past—for fourteen closed projects, over-runs averaged 54 percent.

13 In two respects, however, this is to understate the amounts by which the costs of resettlement are underestimated. First, resettlement problems can cause slippage. This is exemplified by the Guatape II Hydro project in Colombia, where the electricity

2. Ongoing and prospective projects are listed in Table 3.17 and the Annexes to the report; the number of hydro projects per year is likely to decline to about three and non-hydro projects to rise in the next five years.

3. John Besant-Jones and Jamshid Heidarian "Factors associated with the reliability of cost and schedule estimates for power generation projects in developing countries" IEN Draft, June 1993. The dispersions of costs of power plant in industrial countries are also wide.

losses arising from late commissioning amounted to \$25.5 million⁴ of unsold energy, a sum equivalent to 18 percent of the project total costs or 83 percent of actual resettlement costs. Thailand's Khao Laem scheme similarly slipped by a year owing to the difficulties of resettlement. Reference should also be made to the other examples provided in para. 3.20, which show how costly poor resettlement policies can be. Second, more seriously, when the financial requirements of resettlement are underestimated, the implementing agencies are tempted to "squeeze" the families being resettled in an attempt to keep costs down to their underestimated levels—a source of hardship and resentment to the families resettled, and of disruption to the project. The Bank's Operational Directive states that, on economic grounds alone, families resettled should not be worse off as a consequence of the project, which is to say that in the interests of all parties, compensation should err on the side of generosity.

Aggregate Resettlement Costs and the Design and Choice of Project

14 For closed projects, aggregate resettlement costs averaged about 11 percent of total project costs. But the dispersion is very large: in some projects resettlement costs were only 1 to 3 percent of costs (Nepal, Malaysia, Ghana-Kpong), in others they were as high as 22 percent (Colombia-Guatape II, and Korea-Chungju). For active projects and projects in the pipeline, much the same averages and ranges are found, and for much the same reasons. Some projects involve little resettlement because they have low storage volumes per unit of power and energy delivered; they have highly favorable topography, high heads, or can be designed as run-of-river or with high power to energy ratios. Population densities also vary greatly between one project and another. The population affected by a project may vary from 10 to 100 people (India-Kerala and, in the pipeline, Tanzania VI, Thailand-Lan Takhong, Indonesia (two projects) and Sri Lanka-Kakule Ganga) to a few hundred (several projects in this group—see Table 3.9) to 50,000 to 70,000 or more (China-Shuyikou I & II, Indonesia Power X and XIII, and Argentina/Paraguay-Yacyreta) to 200,000 (as has been estimated for Narmada).⁵

15 Some projects are therefore highly sensitive to the escalation of the costs of resettlement and other factors, while others are not. It can be concluded *that addressing resettlement problems in a socially satisfactory way will mean that some hydro projects will no longer be the least-cost option, unless they are redesigned to reduce the extent and costs of resettlement by lowering storage capacities, while others will still be economically desirable.* A cost sensitivity analysis undertaken in this review readily confirms this conclusion.

16 The objective criterion for deciding whether a project falls into one situation or the other is the equalizing discount rate. When the analysis shows that the project is

4. All dollar (\$) amounts are U.S. dollars unless otherwise noted.

5. The average number of people to be resettled is around 10,000 per project, but this is heavily weighted upwards by a few large projects.

marginal, and is sensitive to the assumed cost of resettlement, then one of the following is clearly to be preferred:

- The thermal alternative
- A redesign of the project to raise throughput and lower storage volumes
- Another hydro project.

Economists (and indeed environmentalists) often argue in addition that improvements in the efficiency with which energy is used, brought about, for example, by reforms in pricing policies, may help a country to reduce electricity demand. But in the circumstances of developing countries, where demand is growing rapidly, this option only “buys time” and does not mean that decisions on new hydropower supplies or their alternatives can be escaped, only postponed. In addition, the projects are routinely appraised on the assumption (often a condition of the loan) that demand management measures—the principal instrument of which is pricing policy—will be implemented.

Components of Costs—The Need for Analysis

17 It is only recently that project managers have begun to assess resettlement costs thoroughly during project preparation and to include them in the appraisal exercises. Before 1990 the best that most project documents offered was just one figure related to “preliminary works and land acquisition.” With currently available information it is difficult to determine what standards or criteria were used, and there was no information that could have helped country departments (or even the project managers themselves) in preparing or assessing resettlement programs, or in providing guidance to borrowers, consultants, and contractors. In some projects, the costs of resettlement amount to more than those of the penstocks and powerhouse, and therefore merit similar care and analysis.

18 This deficiency, as noted, is now being addressed. In active and future projects it will be necessary to distinguish among components of cost and for the project preparation studies to go into detail. Cash compensation and new land entitlements are of course only two of several components of cost meriting analysis. Social and economic infrastructure—water, sanitation, health, education, roads, housing, and agricultural extension and training—are others. Development services such as agricultural extension may also be desirable. In addition, projects need to finance the costs of administering resettlement. This paper suggests that the costs might usefully be classified into the following components:

- a. Compensation costs (land and properties lost).
- b. Resettlement costs (land acquisition, transport of belongings, housing, transitional income and any other investments needed to restore or improve living conditions of the people being resettled).
- c. Replacement of lost public assets such as bridges and roads.
- d. Local infrastructure to improve living conditions and economic prospects.
- e. Development services.

- f. Administration, overheads and logistics.
- g. The present value (PV) of the land inundated in addition to that counted in items (a) and (b) (see below). This would include, for example, the PV of cropping, livestock, forestry, and non-farm activities in the area, estimated in light of the growth of populations and economic activity, and thus of the demand for land.

Guidance on these matters needs to be made publicly available to contractors, consultants, borrowers, and those involved in the supervision and administration of the resettlement components of projects.

Per Capita Levels of the Costs of Resettlement

19 Another reason why resettlement costs differ is that compensation differs greatly between projects. Given the poor analysis of the costs and terms of resettlement in past projects, it is not possible to analyze this further at the present time. Compensation and the supporting infrastructure need to provide for losses of capital as well as of income, and will thus need to be some multiple of per capita incomes, somewhat greater than the ratio of capital assets to per capita incomes in the regions affected. Data are rarely available on this. In closed projects, resettlement costs per affected person were three times the per capita GNP of the borrower country. SARs of active projects expect to invest five to six times the per capita GNP of the borrower country for each person to be relocated. This again suggests that resettlement is being taken more seriously than in the past, though the problems noted in the previous subsection still need to be addressed for many projects.

The Impact of Projects on Human Welfare: The Dearth of Information

20 Given the goal of improving the living standards of people to be resettled, it is surprising how little is known of the actual effects of projects on the incomes and welfare of people resettled. Only three out of thirty-one closed projects mention the incomes of the displaced people; actual incomes fell in two of these three cases. Discussions with staff and others have confirmed that relevant information is not only lacking but is often not gathered. Yet surveys into incomes and welfare of displaced people—before, during and after a project—would be only a trivial component of costs and are surely required for the design, implementation, and evaluation of an equitable policy.

The Value of the Land Inundated

21 In the large majority of hydroelectric projects the full value of the land inundated is underestimated. Typically, the value of land lost is accounted for in the economic evaluations in a narrow way, since only the cost of land actually acquired and paid for by the project is considered. This too must lead to a significant underestimation of project costs in the more populous agricultural areas. In areas where populations are rising and many people may wish to use the land for agriculture or some other purpose, this practice cannot be defended (see also para. 18g above).

Bank Procedures, Finance, and a Country's Policies

22 The Bank is, of course, only one of the actors in the project cycle; and the projects are those of the countries in question. The best resettlement programs are found in countries where a clear national policy on resettlement issues has been adopted and where institutions are well trained in dealing with involuntary resettlement (as in Thailand).

23 Where a national policy on involuntary resettlement is lacking or is delegated to some sub-national level, the treatment of resettlement is unpredictable. The Bank is well placed to finance technical assistance to help countries develop a policy. Since good policies are as likely to emerge from concrete experiences with project preparation and implementation as from any other source, the T/A could be beneficially attached to projects. From these, and from past experience in the country in question, a national policy can be built up. Experience in other countries is also relevant.

Project Preparation and Appraisal

24 The best performance (in terms of compliance with Bank's guidelines) follows when a social impact assessment is carried out early in the project preparation stage and is conducted by specialists independent from the borrower and the engineering consultant. Early participation of specialists during project preparation can help define the scope of the project and improve its performance. A resettlement policy and details of its costs and the administrative arrangements to be made, like the engineering studies, should be part of the preparation documents submitted to the Bank for appraisal. A summary of resettlement policies and costs should be a standard requirement for all SARs of projects.

Supervision and Post-Project Activities

25 A comprehensive review of supervision shows that until recently it was lax (See the review of supervision missions in Chapter 3). In projects active as of 1986, less than half of supervision missions reported on resettlement, and people knowledgeable about resettlement were involved in only a small minority of cases. The situation has generally improved since then (Table 2).

Table 2 Frequency of Supervision (Percent of Supervision Missions)

<i>Region</i>	<i>No comments</i>		<i>Professional review^a</i>	
	<i>1986</i>	<i>1992</i>	<i>1986</i>	<i>1992</i>
Latin America	72	27	14	41
MENA	64	64	24	14
Asia	55	47	6	19
Africa	59	46	22	15

^{a/} The percentage of such reviews increases in all regions if non-specialists are included.

26 The importance of supervision was emphasized by the Wappenhans report, and need not be repeated here. In the case of resettlement, the knowledge required of local issues is very large, and it is a task demanding much time if it is to be properly done. It is questionable whether adequate time and effort can be devoted to it in the course of regular supervision missions.

27 An improvement would undoubtedly be brought about by the appointment of people in the borrowing country who would be in charge of a day to day supervision of one or several loans. The Bank should consider such an arrangement. The people responsible would red flag emerging project problems to the country department, collect the information required by the supervision missions, and brief the missions on their arrival.

28 In some projects, resettlement issues may arise after construction, and there is a good case for extending the arrangement beyond the normal project implementation period. This is not only because people are often still being resettled as the dam is being filled, but also because of the need to ensure that people resettled are satisfied and reasonable grievances have been addressed. In addition, continuing the in-country resettlement team arrangement would help in audits and post-evaluations of the projects.

Project Completion and Audit Reports

29 Looking for the analysis of resettlement in existing PCRs and PPARs is a disappointing exercise. One third of the PCRs and PPARs reviewed make no mention of the issue. Half the PCRs reviewed considered that resettlement objectives were accomplished. But nowhere was "accomplishment" defined. In fact only three out of thirty cases reviewed mentioned the effects on family incomes after resettlement. By implication, in most PCRs and PPARs success seems to mean that people have been removed from the project area without major complications for the project schedule, a poor standard of success according to the Bank's resettlement policy.

30 This review suggests that, first, to cope with the long term problems of resettlement, follow-up and monitoring activities should be contemplated as part of the resettlement program and included in the resettlement plan. Second, because project construction and Bank involvement will probably come to an end far before income restoration is fully achieved, some automatic mechanisms to deal with emerging problems should be included in the main project. Several recent projects (e.g. in Argentina, China, and India) have proposed to earmark a small percentage of the electricity sales for local development activities. This could be good practice.

The Finance of Resettlement

31 The Bank's direct involvement in any project component increases with the level of its financial input. A review of twenty-one active hydropower projects entailing resettlement shows that two thirds of the projects have had no Bank financing for that component. Since resettlement plans are repeatedly hampered when borrowers fail to allocate resources in the time and amount required, task managers should be encouraged to increase Bank financing for resettlement, without necessarily changing the overall financing

of the project. It would increase the priority given to resettlement issues by the borrowers (and the Bank). It could also increase the quality of budgeting during project preparation and reduce the likelihood of undervaluation and later cost overruns.

Projects in the Pipeline

32 This review was also required to discuss projects in the pipeline in light of its general findings. The discussion is provided in Chapter 3. The main points are repeated here for convenience.

33 Africa with eight projects and Asia with fourteen make up a total of twenty-two hydroelectric projects for the near future.⁶ Slow energy demand growth during the 1980s and falling public investment can explain the lack of projects in Latin America and MENA. In both regions some traditional borrowers like Brazil and Turkey failed to meet the Bank's recent sectoral policy (the difficulties were mostly related to energy pricing) and were no longer eligible for new loans. Should this situation change both Brazil and Turkey could add more hydro projects to the pipeline.

34 For eighteen pipeline projects with available information the average number of families affected—554—is less than 25 percent of the average for 1988-92, which was 2,400. Even if these figures are only tentative (actual numbers can vary dramatically during project preparation), they do show a trend. There is a clear interest, both in borrower countries and in the Bank, in reducing the number of people displaced by development projects. This interest can be seen in the preference for run-of-river projects (Tanzania, Madagascar) or additions to existing systems (Indonesia's Cyrata, Thailand's Lam Takhong, China's Tianhuanping), which entail limited resettlement. In addition, the Bank's country staff reports several cases where the project idea was abandoned or is undergoing major changes (e.g., Swaziland's Komati Multipurpose) in order to reduce social and environmental impacts.

35 As discussed above, the professional attention given to resettlement problems in hydro projects is improving greatly. Findings made in previous reviews of the problem are being acted upon. The preliminary status of most pipeline projects, however, precludes further comments on how well the policies are working out in practice.

Recommendations for Future Operations

36 Despite the problems associated with the resettlement of people in hydro projects, there is no reason why these problems cannot be addressed in a way satisfactory to all parties. The first step is a thorough analysis of the costs and requirements of resettlement. People's welfare needs to be increased—not decreased—by resettlement, and

6. From this total, four projects (Swaziland's Komati and China's Xiaolangdi, Yangtze and Inland Waterways) are multipurpose projects with comparatively small energy components. Kenya's energy project also has hydro as a minor component.

ensuring that this will happen will require attention to compensation, the replacement of lost assets, the provision of social and economic infrastructure and other services, and the establishment of good administrative arrangements in which the staff are responsive to local concerns. In this way, resettlement issues will be “internalized” in the project design and finance.

37 The second step is to accept that, when the costs of resettlement are high (i.e., sufficient to make the project no longer a cost-effective means of supplying electricity), then the alternatives are indeed to be preferred. The alternatives may be other hydro projects, a redesign of the project under question to reduce the number of people affected, or a thermal or renewable energy project. There are standard procedures for appraising such options, and a proper application of them will point to a more satisfactory solution—and reduce the social costs and controversies of resettlement.

38 With these general findings in mind, the report makes the following recommendations for future projects:

Costs

39 The analysis of the costs of resettlement should cover not only the aggregate costs of resettlement, but also the various components of costs. This need not lead to a “ballooning” of the SAR; just as engineering studies of the dam and the powerhouse are available for the use of the relevant parties, and are indispensable for a project, so should be the studies and surveys of resettlement undertaken during preparation.

Welfare

40 The overall investment and other expenditures on resettlement should err on the side of generosity, in accordance with OD 4.30. It is the responsibility of the project implementing and financial agencies involved to ensure that the welfare of the people resettled is increased, not decreased. There are reported cases of the latter happening. In order to monitor compliance with policy there will be a need in the larger projects for surveys of incomes and welfare before, during, and after the project.

Sensitivity Analysis and the Alternatives to a Project

41 A full sensitivity analysis of the costs of resettlement is a requirement of all projects. Projects need to be robust with respect to possible increases in costs, and this can be ascertained through calculations of the equalizing discount rate or net present value of costs under alternative assumptions.

42 The costs of resettlement have consistently been underestimated in the past, as have the effects of failures in the process of resettlement on project implementation and construction schedules. The economic justification for a project will sometimes turn on the costs of resettlement. If at appraisal these costs are estimated to be 5 percent or more of total project costs, close scrutiny is required, since cost over-runs and slippages could undermine the economic returns—quite apart from the social problems that would be encountered. When a project’s returns, relative to the alternatives, are sensitive to cost escalation, the various options noted previously—the thermal alternative, other hydro

projects, or a redesign of the project to lower storage volumes and displace fewer people—need to be reconsidered.

Land Values

43 The value of land inundated, not just the value of land occupied by the oustees, should be calculated and considered as part of project costs. Such calculations would allow for population growth and for the potential value of the land for agriculture, forestry, and other purposes.

Supervision

44 The special qualifications required of those responsible for overseeing a project present a problem where the resettlement costs are significant often add to the “supervision intensity” of hydro projects. The Bank should consider recruiting people to work full-time in the field on the supervision of resettlement both during *and* after project implementation, and perhaps to help in other project duties. The inadequacies and difficulties of supervision in the past reinforce this recommendation.

Good Practices in Resettlement

45 There is a need for a vehicle through which successful experiences with resettlement and ideas on new and promising approaches can be shared among countries. China, for instance, is developing “model” resettlement areas so that people can see the sorts of new homes, land, infrastructure, and development services with which they would be provided under a project; apparently this is creating a “demand” for resettlement in some areas. There are many other examples of promising approaches. National policies also differ greatly among countries. The Bank could facilitate better policies through the publication and dissemination of case studies of good practices.

1

The Problem

1.1 The overarching objective of the World Bank is to promote economic development in low and middle income countries (developing countries) mainly through lending operations, but also through technical assistance, training, policy development, and other associated activities. As part of this mission, the fate of poor populations in developing countries has been of concern throughout the Bank history. Alleviating poverty is a priority target of many Bank policies and loans.⁷ The Bank expects that investments in infrastructure, services, education, health, rural and urban development, and other sector projects will directly or indirectly raise the productivity and well-being of the poor in developing countries.

1.2 Nevertheless, the Bank has become increasingly aware that the side effects of some development projects can increase, temporarily or permanently, the hardship of poor people in local communities. Involuntary resettlement is a clear example of a negative externality of development projects. The construction of major infrastructure, irrigation, hydropower, urban renewal, and large industrial projects all affect local communities. Very large projects can force thousands of people to move.⁸ Those who are not moved often lose their traditional sources of income. Environmental damages brought about by large development projects are another example of negative externalities affecting not only local communities but also the regional or world population.

1.3 If not adequately compensated for, negative externalities can bring serious hardships and even impoverishment to local communities, undermine the project's estimated economic benefits, and ultimately jeopardize the Bank's overall economic development objectives. Since 1980, with major reviews in 1986 and 1990, the Bank has addressed the issue of involuntary resettlement in its projects. As stated in 1990 Operational Directive 4.30, the goals of the Bank's resettlement policy are (a) to avoid to

7. See for example the recent Bank publications, "Poverty Reduction Handbook" (1993), "Implementing the World Bank's Strategy to Reduce Poverty" (1993), and the "World Development Report 1990."

8. More than 1.8 million people are being moved in Bank projects active as of May 1993.

the extent possible negative impacts to local population; (b) to compensate for the unavoidable negative impacts so as to increase the livelihood of the affected population; or (c) to at least restore the living standards and income levels enjoyed prior to the project.

1.4 The Bank's involuntary resettlement policy has a clear social focus: "putting people first." It should be noted at the outset that this makes good economic sense. If a development project cannot withstand the costs of internalizing negative externalities, its economic benefits are highly questionable.

1.5 Notwithstanding the Bank's and borrowers' progress in the treatment of resettlement, they have failed to match growing public expectations. Criticism increased in the late 1980s, particularly in relation to the Sardar Sarovar (Narmada) irrigation project in India, which led to the Bank's appointment of an independent review commission for this project. The findings of the Morse commission are well known today (see Morse & Berger, 1992) and point to several breakdowns in the effective application of the Bank's resettlement policies and standards. Partly as a result of the Morse report the Bank has embarked during 1992-93 in an overall assessment of resettlement issues in Bank projects with the objective of ensuring the consistency of resettlement implementation with Bank policies and guidelines and with loan/credit agreements.

1.6 While some critics have suggested that the Bank should avoid financing projects that entail resettlement because they may have high social costs or high political costs, this is not the approach of this review. On the one hand such a procedure would ignore the concerns of the Bank member countries to use resources efficiently, and in many cases hydropower or other large projects can be the most efficient alternatives even after all environmental and social costs are duly met. On the other hand it is important to realize that resettlement is not unique, but one of a larger group of social issues which is present in many if not all development projects; in addition, with proper cooperation and terms of resettlement, the projects can and should be beneficial to all parties. With increasing world concern for the environment and human livelihood it is easy to envisage that more and more development projects will be subject to public scrutiny. In this regard resettlement issues should be considered not in isolation but rather as part of a general trend of increasing public demand for accountability of development projects and policies.

2

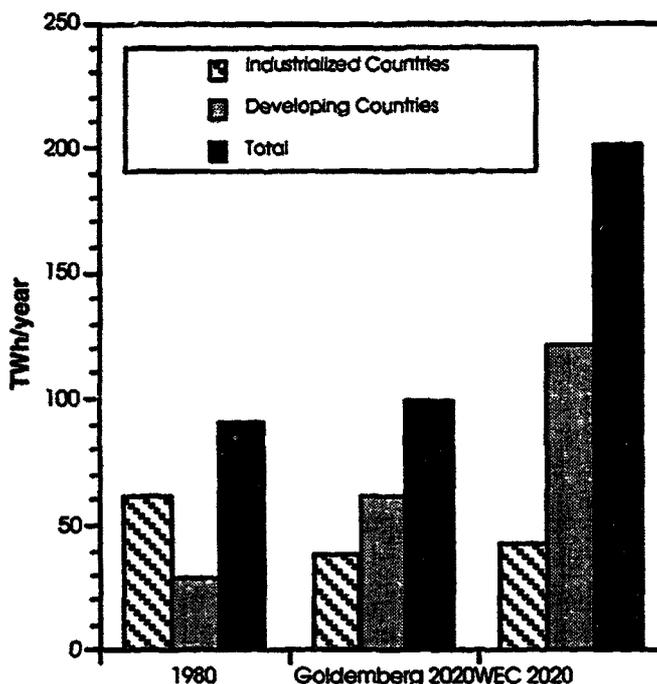
Hydropower Projects in Perspective

Introduction

2.1 Energy has been a main input to development worldwide during the last two centuries, growing faster than population or wealth. In 1992 the world primary energy consumption was approximately 7,800 million toe (tonnes of oil equivalent). Major energy sources are oil, coal, and gas, with hydropower being some 6 percent of total energy production in recent years. Developing countries' share of energy consumption remains modest (28 percent in 1992), and per capita consumption is one tenth of OECD countries' figures. This picture will change dramatically in the next twenty to thirty years due to the slow growth of energy consumption in industrial countries (where markets have matured) coupled with rapid increases in energy demand in developing countries, stemming from population and economic growth.

2.2 The amount and distribution of future energy consumption is a highly disputed issue. Nevertheless, even the most aggressively conservationist scenarios allow energy consumption in developing countries to increase approximately 3.4 percent a year in the next three decades to represent 60 percent of world energy consumption by 2020. Less stringent scenarios put forward rates of growth twice that size and predict that by 2025 energy consumption of OECD countries will be below 25 percent of total world consumption (see Figure 2.1). Even then per capita consumption in developing countries would be less than half the present levels of OECD countries.⁹ With less than 10 percent of their hydropower potential currently tapped, developing countries have many opportunities for hydropower development.

9. The most frequently used source for energy projections is the World Energy Council (last estimations released in February 1993). Quotations are from Churchill (1993). An extremely ambitious conservationist scenario for the year 2020 is put forward by Goldemberg et al (1987). Goldemberg's figures have been repeatedly quoted not on behalf of their realism but because they depict what seems the lower feasible limit.

Figure 2.1 Scenarios for Global Energy Use

Source: Besant-Jones 1989

World Bank Financing of Energy and Hydropower Projects

2.4 Producing and distributing power is a capital intensive activity. According to several sources, developing countries invested an annual average of 40 to 50 billion dollars during the 1980s in their power sectors. Additional investment of 50 to 100 billion dollars per year will be necessary during the 1990s to meet the different energy scenarios reviewed in the previous point (Churchill and Saunders, 1989). Of this total perhaps 15 to 20 percent could be spent on hydropower projects.

2.5 Investment in the electricity industry has been an important lending area for the World Bank. About 15 percent of the Bank's cumulative lending through June 1992 was devoted to power financing. This figure went down in the last five years (1988-92) to about 12 percent of the Bank's total lending or \$3 billion a year. Compared with developing countries' investment in power, Bank lending represented 7 percent of total sectoral investment in the 1980s and could be between 3 and 6 percent of future investment needs during the 1990s.

2.6 Between 1988 and 1992 the Bank's lending for hydropower projects averaged \$705 million a year. This amount was 4.5 percent of the Bank's total lending and 5 percent of total hydropower investment in developing countries during the 1980s. Should Bank lending for hydropower remain around \$0.7 billion per year, it will amount to

between 2 and 5 percent of the hydropower investment forecasted for developing countries in the 1990s. With Bank loans averaging one third of total project costs, the Bank participates in about 15 percent of the annual hydropower investment in developing countries.

2.7 Despite the visibility of the hydro projects the Bank finances, there are on average only 3 to 4 hydro projects financed per year, out of a total of over 220 projects per year.

Hydropower Projects and Involuntary Resettlement

2.8 Hydropower projects are commonly considered the prototypical development effort that entails involuntary resettlement of a large number of people. Yet an examination of the World Bank's portfolio reveals a variety of complex projects under the general category of hydropower:

- a. New hydro projects that include the construction of one or more large dams that will flood thousands of hectares (e.g., 93,500 ha in China's Shiukou, 50,000 ha in Argentina's Yacyreta). These projects will most probably affect a considerable number of people upstream and downstream of the dam site.
- b. New hydro projects that do not include the construction of a large dam (e.g., India's Kerala and Uttar Pradesh projects, Malawi's Power V). This is the case with small run-of-river projects or a pumped storage scheme. In these projects the land claimed is generally less than 300 ha, and the affected population less than 500.
- c. Projects that add onto existing projects to upgrade one or more components (e.g., Haiti's Third Power Project, Laos' Nam Ngum). These projects commonly entail very little or no involuntary resettlement.
- d. Projects that add to a previous loan for a hydro project (e.g., China's Shuikou II, India's Karnataka II or Argentina's Yacyreta II). Projects with a second or third stage tend to be large and costly and usually have significant resettlement components. In these cases the resettlement component often proves elusive because displacement can crop up in the first stage (Karnataka), in the second stage (Yacyreta), or in between. For resettlement evaluation as well as for cost-benefit analysis, all stages of development of a single site should be considered as parts of a single project.

2.9 Although a simple typology can help in a first project screening, it should be remembered that the actual size of the potentially affected population is always project-specific. Even for large dam projects the actual size of affected population can vary dramatically. The siting of a dam in a remote place or in a narrow canyon or gorge can limit its impact, as in the case of Turkey's Berke Dam, which affected fewer than 150 people. On the other hand, in Argentina and Paraguay, two countries with very low

population densities, the Yacyreta Hydro project (with the reservoir at its maximum capacity) will require the displacement of over 50,000 people because its location results in the partial flooding of two cities. The Ruzizi II project (shared by Burundi, Rwanda, and Zaire) was presented at appraisal as a run-of-river dam project with resettlement limited to thirty dwellings. In the course of project execution that number soared to 2,560 families.

3

Treatment of Resettlement During the Project Cycle

Involuntary Resettlement in Project Preparation: A Review of Staff Appraisal Reports (SARs)

3.1 To analyze the treatment of resettlement issues during project preparation, this study has considered all twenty-one Bank-financed hydropower projects active as of March 1993 with known resettlement components, plus another forty-seven hydro projects that had already closed by that date. The total sample of sixty-eight projects dates back to fiscal year 1978, before the Bank issued its first resettlement guidelines.¹⁰

3.2 Tables 3.1, 3.2, and 3.3 show the number and size of the projects by region. The overall number of new hydro projects has diminished in the last five years in all regions (Table 3.1) while the average size has increased (Table 3.2). At the same time, the average affected population per project has modestly diminished in the last five years as compared with the ten previous years (Table 3.3). This trend could represent a positive effort on the part of borrowers and the Bank to reshape power projects in order to reduce the number of people affected. For example, in Thailand's Power III Project (FY 92), the design and siting of Pak Mun Dam was changed several times, mainly to reduce the size of the affected population from a first estimate of 20,000 to the final number of 1,500.

3.3 A significant increase in the consideration given to resettlement components in the last few years can be seen in Table 3.4. In cases where 500 or more people will be affected, SARs after 1988 generally provide a thorough discussion of the issue in the chapter on the project and more detailed treatment in an annex. In all these cases several background studies either have been or will be available at appraisal (e.g., Thailand's Pak Mun of FY 92 and most of China's projects after 1989).

10. In Table 1 of the Annex the complete list of the sixty-eight projects is presented. Projects have been selected to match the fifty-nine hydropower projects reviewed by David Butcher (1990). This allowed the present study to update the tables and comments made in Butcher's document. Minor adjustments have been made to the format of the tables in some cases.

Table 3.1 Hydro SARs Reviewed by Region and Period

	78-82	83-87	88-89	90-92	All	%
Africa	3	7	1	3	14	20
Asia	9	11	4	4	28	41
MENA	3	3	-	1	7	10
LAC	11	5	2	1	19	28
All	26	26	7	9	68	100

Table 3.2 Hydro Financing by Region and Period (millions of current dollars)

Region	78-82	83-87	88-89	90-92	All	%
Africa	108	282	18	190	598	7
Asia	591	1,887	1,435	601	4,514	50
MENA	320	457	-	270	1,047	11
LAC	1,389	486	712	300	2,887	32
All	2,408	3,112	2,165	1,361	9,046	100

Table 3.3 Average Affected Population by Project

	1988-1992	1978-1987
Number of Affected Families	68,488	38,510
Number of Projects	24	16
Average Families Affected per Project(*)	2,853	2,406

(*) The difference between the two periods could be exaggerated since only half of the projects in the 1978-87 period reported the number of affected families. Non-reporting projects would probably have smaller resettlement impact. Old SARs, however, tend to underestimate resettlement components more than recent SARs, acting in the opposite direction.

Table 3.4 Level of Information Provided by SARs

Item Discussed	% of Projects with information before 1989	% of Projects with information after 1989
Size of Reservoir	50 %	100 %
Downstream Effects	58 %	100 %
Health Effects	44 %	100 %
Resettlement Monitoring Plan	12 %	66 %

3.4 Table 3.5 confirms that since the late 1980s large resettlement components receive more attention than before 1980. Unfortunately, the consideration of small resettlement components lags behind. Relocation of a few hundred people is still treated in a few lines with no references to costs, alternatives, or resettlement plans and little or no comment on the background studies supporting the statements made in the SARs (e.g., Turkey's Berke of FY 93, Malawi Power V of FY 92). This seems to be the result of a confusion between social and economic relevance. It is true that resettlement of a small group of people may represent only minor costs for a hydropower project, but this does not mean that the fate of a few hundred people matters less than the fate of several thousand people. In fact, Operational Directive 4.30 clearly requires a detailed consideration of resettlement issues, no matter what the size of the population involved. Tables 3.6 and 3.7 (compensation and resettlement packages offered) again show a trend toward a broader approach. More assets are eligible for compensation and more alternatives are offered to resettlers.

Table 3.5 Status of the Resettlement Plan at Appraisal

<i>Status of Plan</i>	<i>Number and (Percentage) of Projects</i>			
	<i>1978-1982</i>	<i>1983-1987</i>	<i>1988-1989</i>	<i>1990-1992</i>
Not Mentioned	8 (31%)	10 (38%)	0	0
Mentioned				
Plan Available before SARs	2 (8%)	6 (23%)	6 (86%)	6 (67%)
Plan for Later Preparation	9 (35%)	3 (12%)	0	1 (11%)
Plan Not Discussed	4 (15%)	2 (8%)	0	0
Plan Not Required (*)	3 (12%)	5 (19%)	1 (14%)	2 (22%)
All	26 (100%)	26 (100%)	7 (100%)	9 (100%)

(*) Includes "rural development but not resettlement" and "n/a" from Butcher (1990) Table 3.8 for period 1978-89. For 1990-92 it includes two projects (Berke in Turkey and Power V in Malawi) where the small number of displaced people did not require a resettlement plan according to SARs.

Table 3.6 Type of Compensation Offered to Affected Population

<i>Compensation Method</i>	<i>Number of Projects</i>			
	<i>1978-1982</i>	<i>1983-1987</i>	<i>1988-1989</i>	<i>1990-1992</i>
Not Mentioned / Unspecified	12	6	0	1
Cash for Houses and Crops	0	1	1	0
Cash for Houses Only	0	0	1	0
Cash for Houses and Land	8	11	2	1
Cash for Houses, Land, and Crops	2	2	2	7
Land for Land	2	1	0	0
Under Dispute in Court	0	1	0	0
Other	2	4	1	0

Table 3.7 Resettlement Package Offered to Affected Population

<i>Package Offered</i>	<i>Number of Projects</i>			
	<i>1978-1982</i>	<i>1983-1987</i>	<i>1988-1989</i>	<i>1990-1992</i>
Not Mentioned / Unspecified	15	9	0	1
Only Land	0	1	0	0
Only Water Supply	0	1	0	0
Land plus Agricultural Resources	0	0	2	0
Land plus Agricultural & Social Services	0	1	1	0
Houses plus Land and All Services	5	4	2	5
Houses and Services but no Land	0	0	0	1
Choice of Self or Planned Resettlement	2	4	0	2
Only Training and Assistance	0	0	1	0
Only Employment	0	1	0	0
Other (*)	4	5	1	0

*Other: Cases where information was unclear.

3.5 The picture is less positive for the bulk of current active projects, which were initiated before 1988; in several cases preparation and surveillance of resettlement issues were poor.¹¹ The most common problems stem from underestimation of costs and people affected and unforeseen social impacts, which have translated into cost overruns, schedule slips, and undue hardships for local populations. The most critical problem is that most projects approved before 1988 fail to address the issue of income restoration.¹²

11. Of 21 hydro projects active in December 1992, more than half were approved before 1988.

12. For further comments, see the section Resettlement Goals and Results.

3.6 Income restoration, the centerpiece of the Bank's resettlement policy, requires that resettlement plans at appraisal include (a) an account of the level and sources of income of the families to be displaced; (b) several resettlement options with estimates of their income generation potential; and (c) a program to match resettlers' demands and the project resettlement options. Yet most pre-1988 resettlement plans lacked any income restoration strategy and dealt only with compensation for lost assets.

3.7 The Bank is only one of the actors in the project cycle, and the best resettlement programs (in terms of compliance with the Bank's guidelines) are found in countries where a clear national policy on resettlement issues has been adopted (e.g., China) and where institutions are well trained in dealing with involuntary resettlement (e.g., Thailand). Where a national policy on involuntary resettlement is lacking or is relegated to some subnational level, the treatment of resettlement is less predictable. In all regions the Bank's presence and determination to promote its own policy objectives appear to be prime catalysts to fostering national concerns about resettlement.

3.8 In project preparation and implementation, the Bank should adhere to the following guidelines:

- a. The Bank should encourage borrowers to adopt national policies for involuntary resettlement in development projects. Where this is not possible, a sectoral policy should be formulated to address resettlement issues in energy projects.
- b. A social impact assessment should be conducted early in the project preparation stage by a specialist independent from the borrower and the engineering consultant.
- c. Early participation of specialists from the Agriculture and Environmental Departments during project preparation should be encouraged to help define the resettlement component's scope, streamline evaluation, and improve performance.
- d. Resettlement plans should explicitly consider the issue of income restoration through a careful identification of the pre-project income flows and the presentation of alternatives that actually address the different situations of the affected population. In several large hydro projects China has experimented with early pilot resettlement. The pilot resettlement helps both affected people and project officers to better understand and adjust the resettlement process.
- e. For projects with a resettlement component, a thorough treatment of resettlement issues in the SAR should be standard. This treatment should include (a) a comment in the main text; (b) clear figures on resettlement size and costs as part of the project's main tables; and (c) a more detailed annex with references to the supporting project documents.

Involuntary Resettlement During Project Development: A Review of Supervision Missions (SMs)

3.9 To analyze the treatment of resettlement issues during project development this study has put together information from supervision missions of thirty-seven

hydropower projects which run from 1979 through 1992. The list of loans (Table A-2) brings together twenty-four loans approved between 1980 and 1987, taken from Butcher (1987), and twenty-one projects active as of December 1992 which have been reviewed by Salam and Tewari (1993).¹³ Tables 3.8 through 3.11 present figures taken from supervision missions, arranged by region, for two partially overlapping groups of projects: (a) projects active in 1986; and (b) projects active through the end of 1992. Information on the total number of supervision missions, the number of supervision missions that report on resettlement, and the participation of resettlement experts is presented.

3.10 Supervision during project implementation is an important component of the Bank's activities, using about a quarter of the Bank's operational staff time. Furthermore the Bank and borrowers alike consider Bank supervision missions a critical input for project success. Concerns about the declining performance of Bank projects during the 1980s have brought about renewed efforts to review current supervision practices and their effectiveness (see OED, 1992b). The present Bank-wide resettlement review, like its predecessors (Cernea 1986, World Bank 1988d; Butcher 1987, 1990; Salam and Tewari 1993), also considers Bank supervision critical to the implementation of a successful resettlement plan:

The findings indicate a strong association between sporadic Bank supervision and the accumulation of major problems late in the project life that delay completion, cause political problems and major cost overruns, and leave people impoverished. (World Bank, 1988d, p.3)

3.11 In looking at the sheer number of supervision missions (SMs) that reviewed resettlement performance, one could argue (as Salam (1993) does) that more supervision mission does not necessarily mean a better resettlement program. In fact, the capacity of supervision missions to actually affect project implementation may not be very high. In a recent presentation at the Bank's headquarters, Mr. M.S. Gill, former resettlement deputy for Maharashtra State, India, argued that (a) in some cases SMs are not aware of local limitations and make unaffordable demands; (b) subsequent SMs acknowledge delays in the resettlement plan but have little leverage at hand to foster implementation which is mostly paid for by the borrower; and (c) local resettlement officers find it difficult to reconcile the Bank's interest in resettlement with its reluctance to finance it. Therefore, a high number of SMs could merely be a symptom of a troubled project. However, this does not detract from the fact that closer supervision may be needed either to spot problems or to help correct them.

13. The total number of projects is less than the sum of both studies because several projects are in both lists, and successive loans to the same project have been considered in most cases as part of the same project.

Table 3.8 Basic Information on Resettlement in Supervision Missions, Africa

<i>Region / Project / FY Open-Closed</i>	<i>Affected people</i>	<i>Projects Active as of 1986</i>				<i>Projects Active as of 1992</i>			
		<i>Total super. missions</i>	<i># Comment on reset.</i>	<i>Reviewed by non specialist</i>	<i>Reviewed by specialist</i>	<i>Total super. missions</i>	<i># Comment on reset.</i>	<i>Reviewed by non specialist</i>	<i>Reviewed by specialist</i>
Swaziland / Power 3 / 81-86	300	6	3	2	1				
Burundi / Ruzizi II / 84-90	2560 fam*	6	5	1					
Kenya / Kiambere / 84-92	6,000	9	6	1	2				
Togo-Benin / Nangbeto / 84-92	10,600	11	5	3	3				
CAR / First Energy / 89-	1,400	8	4	2	2				
Lesotho / Highlands Water / 92-	8,500	2	2						
Uganda / Third Power / 92	847	3		3					
Totals—7 Projects		32	19	6	7	13	6	5	2
Percentages		100%	59%	18%	22%	100%	46%	38%	15%

* fam: families instead of people

Table 3.9 Basic Information on Resettlement in Supervision Missions, Asia

Region / Project / FY Open-Closed	Affected people	Projects Active as of 1986				Projects Active as of 1992			
		Total super. missions	# Comment on reset.	Reviewed by non specialist	Reviewed by specialist	Total super. missions	# Comment on reset.	Reviewed by non specialist	Reviewed by specialist
Thailand / Khao Laem / 80-85	10,800	6		6					
Indonesia / Power X / 81-86	60,000	6	1	4	1				
Thailand / Power Subsector / 81-88	385 fam*	1	1						
China / Lubuge / 84	2,320	4	4			4	4		
India / Upper Indravati / 83	15,000	7	5	1	1	20	5	6	9
Indonesia / Power XIII / 83-91	50,500	1		1					
India / Indira Sarovar / 84	9,500	5	3	1	1				
Nepal / Marsyangdi / 84-	430	13		6	7		16	6	10
India / Kerala Power / 85-	50	9	9			11	11		
China / Yantan / 86-	40,000					5		5	
China / Shuikou / I & II / 87-	67,240					9	1	4	4
India / Karnataka I & II / 87-	2,000					14	8	4	2
India / Utter Pradesh / 88-	350					6	4	2	
India / Maharashtra / 89-	400					5	2	1	2
India / Nathpa Jhakri / 89-	400					8	7	1	
China / Daguangba / 91-	23,800					3		1	2
China / Ertan / 92-	30,000								
Thailand / Pak Mun / 92-	1,500					1		1	
Totals—18 Projects		52	29	20	3	102	48	35	19
Percentages		100%	55%	38%	6%	100%	47%	34%	19%

* fam: families instead of people

Table 3.10 Basic Information on Resettlement in Supervision Missions, EMENA

<i>Region / Project / FY Open-Closed</i>	<i>Affected people</i>	<i>Projects Active as of 1986</i>				<i>Projects Active as of 1992</i>			
		<i>Total super. missions</i>	<i># Comment on reset.</i>	<i>Reviewed by non specialist</i>	<i>Reviewed by specialist</i>	<i>Total super. missions</i>	<i># Comment on reset.</i>	<i>Reviewed by non specialist</i>	<i>Reviewed by specialist</i>
Turkey / Karakaya / 80-89	17,000	15	10	3	2				
Yugoslavia / Visegrad / 85-90	475 fam*	2	2			7	5	2	
Turkey / Kayraktepe / 86-	6,000	4	2		2	12	9	1	2
Turkey / Sir / 86-93	7,000	4	2		2	9	4	3	2
Totals—4 Projects		25	16	3	6	28	28	6	4
Percentages		100%	64%	12%	24%	100%	64%	21%	14%

* fam: families instead of people

Table 3.11 Basic Information on Resettlement in Supervision Missions, LAC

<i>Region / Project / FY Open-Closed</i>	<i>Affected people</i>	<i>Projects Active as of 1986</i>				<i>Projects Active as of 1992</i>			
		<i>Total super. missions</i>	<i># Comment on reset.</i>	<i>Reviewed by non specialist</i>	<i>Reviewed by specialist</i>	<i>Total super. missions</i>	<i># Comment on reset.</i>	<i>Reviewed by non specialist</i>	<i>Reviewed by specialist</i>
Guatemala / Chixoy / 79-91	3,450	20	13	5	2				
Argentina-Paraguay / Yacyreta / 80-	50,420	14	10		4				
Honduras / El Cahon / 80-88	10,000	10	8	1	1				
Colombia / Playas / 81	1,400	5	5						
Colombia / Guavio / 81-	11,000	7	4	2	1	15	6	6	3
Colombia / Rio Grande / 84	1,050	2	2						
Mexico / Hydroelectric / 89-	5,500						6		
Argentina-Paraguay / Yacyreta II / 92	50,420						1		1
Totals—8 Projects		58	42	8	8	22	6	7	9
Percentages		100%	72%	14%	14%	100%	27%	32%	41%

3.12 There is no information available to analyze the quality of SMs. In relation to the frequency of SMs addressing resettlement issues, Latin America shows the most positive trend, with significant increases both in the percentage of supervision missions reporting on resettlement and in the participation of resettlement experts. Asia presents a similar positive but more modest trend. In Africa, reporting by supervision missions on resettlement has increased over time, but participation of resettlement experts in supervision missions has decreased. In MENA, consideration of resettlement issues in supervision missions remains stagnant and the participation of experts has decreased. For both indicators, recent figures from MENA score as the lowest of the four regions.

3.13 Among the major causes of low resettlement supervision, most previous studies point to (a) insufficient budget for project supervision; (b) lack of visibility of resettlement issues during the mission preparation, which results in Terms of Reference (TORs) that do not mention resettlement supervision; (c) lack of technical expertise to review resettlement issues; (d) lack of time to visit resettlement sites; and (e) poor monitoring and reporting by the borrower. To correct these problems the following steps are recommended:

- Every supervision mission to projects with resettlement should report on the resettlement plan.
- In-depth supervision of the resettlement component should be conducted (a) regularly and (b) whenever a major problem in the resettlement plan arises.
- The participation of resettlement experts in supervision missions should be encouraged in order to foster the capability and the commitment of both the borrower and the Bank.
- Collaboration among the Energy, Agriculture, and Environmental Departments should be encouraged. The Agriculture and Environment Departments could provide resettlement experts for the SMs of hydropower projects and could also help to identify qualified consultants, define TORs for the resettlement component, and review the SMs' outcomes.
- The appointment of a resettlement specialist to the project's "Panel of Experts" is highly recommended in any project entailing a significant resettlement component. The Panel of Experts is an independent group, appointed by the borrower country to monitor project implementation.
- A major change could be brought about by the appointment of a person in the borrowing country, to be in charge of day to day supervision of one or several loans. This person, either a hired consultant or a member of the local Bank office, should (a) red flag emerging project problems to the country department; (b) collect the information required for the periodic SMs; and (c) brief the SMs upon arrival on project news.

- Borrowers should be encouraged to develop in-house monitoring capability during the complete project cycle, including the operation of the project and the follow-up of social outcomes of the resettlement program.
- The recommendations of the 1992 OED review of the Bank's SMs (OED 1992b) should be more generally implemented. This will surely have a positive impact on resettlement supervision

Involuntary Resettlement After Project Completion: A Review of Project Completion Reports and Project Performance Audit Reports

3.14 To consider the treatment of resettlement at the end of projects this study has reviewed all Project Completion Reports (PCRs) and Project Performance Audit Reports (PPARs) available for hydro projects after 1980. A list of the thirty-one projects is presented in Table A-3 and part of the information collected appears in Tables 3.12 to 3.15.

3.15 Most of the projects reviewed in these tables began before the Bank issued resettlement guidelines (i.e., prior to 1980), and almost all PCRs and PPARs were prepared well after the Bank spelled out its concern about resettlement (i.e., after the mid-1980s). One should expect, then, that most projects would exhibit weak resettlement performance and that the PCRs and PPARs would be highly critical of this poor performance. Actually the picture is not so neat. There are some good resettlement programs in the early 1980s and several poor reviews among recent PCRs and PPARs.

Table 3.12 Basic Information on Resettlement in PCRs and PPARs, Africa

<i>Project</i>	<i>PCR/PPAR no.</i>	<i>People affected</i>	<i>Comments on resettlement</i>	<i>Resettlement reported as critical</i>	<i>Resettlement costs as % of total</i>	
					<i>SAR</i>	<i>PCR</i>
Ghana, Kpong Hydro & Third Power	PPAR 5781	7,000	incomplete	no	5.1%	2.3%
Zambia, Kafue Hydro	PCR 5566	?	(*)			
Sudan, Third Power	PCR 9014	?	(*)			
Swaziland, Third Power	PPAR 8823	400	incomplete	no	na	na
Madagascar, Andekaleka Hydro	PCR 10249	?	(**)			
Burundi, Rwanda, Zaire; Ruzizi II	PCR 10755	2,560 fam	incomplete	yes	na	na

na = Mentioned, but no figure presented

? = Not mentioned

fam = families instead of people

(*) Not mentioned, probably small resettlement program.

(**) Not mentioned, probably significant resettlement program.

Table 3.13 Basic Information on Resettlement in PCRs and PPARs, Asia

<i>Project</i>	<i>PCR/PPAR no.</i>	<i>People affected</i>	<i>Comments on resettlement</i>	<i>Resettlement reported as critical</i>	<i>Resettlement costs as % of total</i>	
					<i>SAR</i>	<i>PCR</i>
Thailand, Pattani Hydro	PCR 5607	1,100 fam.	detailed	no	10%	12,3%
Thailand, Khao Laem	PCR	10,800	limited	yes	5.3%	7.6%
Fiji, Monasuva-Wailoa Hydro	PPAR 6574	?	(****)			
Nepal, Kulekhani Hydro	PPAR 6177	2,550	fair	no	0.9%	0.9%
Indonesia, 10th Power Project	PPAR 7902	60,000	detailed	no	6.8%	9.3%
Thailand, Power Subsector	PCR 7887	385 fam	detailed	no	4.3%	15 %
Malaysia, Ninth Power	PCR 7637	na	minimal	no	3%	3%
Korea, Chungju Multipurpose	PCR 8379	9,300 fam	fair	yes	32%	36% (**)
Laos, Nam Ngum Hydro	PCR 8374	?	(*)			
Indonesia, 13th Project	PCR 11014	50,500	Detailed	no	30%	18% (***)
Sri Lanka, Fourth Power Project	PPAR 3710	?	(*)			

na = Mentioned but no figure presented

? = Not mentioned

fam = families instead of people

(*) Not mentioned. Probably small

(**) Compensation costs were very high.

(***) Costs for "Preliminary and environmental works"

(****) Not mentioned. Probably significant

3.16 A significant portion of all the PCRs and PPARs reviewed have very little to say about resettlement. One third of the PCRs and PPARs reviewed make no mention of the issue even when the project description strongly implies that some involuntary resettlement was involved. This is the case when the project refers to the construction of new dams in a densely populated country like Romania or a small island country such as Fiji, or reports the flooding of large areas in Rio de Janeiro, Brazil.

3.17 In other cases single sentence references are made to a "successful resettlement program," but there is no comment on the issue and no figures on the number of people or costs involved. Cost reporting is particularly weak, with many PCRs and PPARs including resettlement costs as part of "preliminary costs" or "civil works." By

region Africa and MENA present the least informative reports and Asia the most complete ones, with LAC falling in between.

3.18 Half the PCRs reviewed considered that resettlement objectives were accomplished. But nowhere is "accomplishment" defined. By implication, in most PCRs and PPARs success seems to mean that people have been removed from the project area without major complications for the project schedule, a poor standard of success according to the Bank's resettlement policy.

3.19 PCRs or PPARs of projects in Thailand and Indonesia provide the fullest information of all the cases reviewed. They present detailed pictures of the number and background of affected people, the program put in place, the kind of compensation paid and type of resettlement facilities offered, and the costs of the program. They also comment on pre- and post-resettlement family income and mention monitoring and follow-up activities. It should come as no surprise that these projects spent above average percentages of the projects' total costs on resettlement.

Table 3.14 Basic Information on Resettlement in PCRs and PPARs, MENA

<i>Project</i>	<i>PCR/PPAR no.</i>	<i>People affected</i>	<i>Comments on resettlement</i>	<i>Resettlement reported as critical</i>	<i>Resettlement costs as % of total</i>	
					<i>SAR</i>	<i>PCR</i>
Morocco, Sidi Chero-Al Massira	PCR 5173	na	minimal	no	17.5%	17.5% (8)
Romania, Riul Mare-Retezat Hydro	PPAR 6861	?	(**)			
Yugoslavia, Visegrad Hydro	PCR 10242	475 fam	minimal	no	na	na
Turkey, Karakaya	PCR 10243	17,000	minimal	no	na	na
Yugoslavia, Middle Neretva Hydro	PCR 10334	na	minimal	no	na	na

na = Mentioned in the document but no figure presented
? = Not mentioned

(*) "Land indemnization, roads and buildings"
(**) Not mentioned. Probably significant

3.20 In six cases (20 percent of the total under review), resettlement was reported as critical for the project's success by the PCR or PPAR. Some excerpts from the documents reviewed help us to understand the reasons and also give hints for future projects management:

- Burundi/Rwanda/Zaire's Ruzuzi II grossly underestimated the number of people affected. The project was appraised as a small run-of-river development affecting thirty families. Once the project was already well-advanced, the Bank found that it would actually affect some 2,560 families. As the PCR states: "...the Ruzuzi II project undertook major construction on the Rwanda-Zaire border in a densely populated area of subsistence farming. A major construction project in such an area

must have its ecological and social impact assessed by specialists early in the project cycle and provide for adequate compensatory actions” (Word Bank 1992g, p. iii).

- Korea’s Chungju Multipurpose faced extremely high compensation costs for lost assets. This situation can be expected in most hydro projects located in wealthy and/or densely populated areas. In Korea’s case compensation costs made up 90 percent of all resettlement costs, which in turn amount to more than one third of the total project costs.
- Thailand’s Khao Laem developed a resettlement program in a difficult social setting where squatters, illegal immigrants, and different cultural groups and languages were involved. Due to the complexities of resettlement not anticipated at appraisal, the reservoir filling was delayed by one year with associated higher project costs.
- Brazil’s Paulo Afonso IV presents a case where extensive and costly remedial measures were necessary to compensate for unforeseen social impacts. Upstream resettlement costs escalated five hundred percent (from \$12 to \$62 million). Downstream, an independent polder project was devised to avoid the flooding of some 11,000 families’ land, at a cost of more than \$55,600 per family. According to OED the polder project was clearly economically non-viable. Had the polder project been considered part of the Paulo Afonso hydro project, the rate of return of the whole project could have fallen below the capital opportunity cost of capital. Worse, despite all the costs incurred, the resettlement exercise failed to adequately compensate the affected population. According to the PPAR,

The project achieved successful results in developing the hydropower resources of the region. The value of those results as compared with the hardships endured by the population displaced by Sobradinho reservoir cannot, however, be reasonably assessed in this report. A major lesson to be learned from the resettlement component of the project is that planning resettlement is as important as planning the hydroelectric power plant and should be dealt with accordingly (World Bank, 1986a, pp. 42, 17).

- Colombia’s Guatape II was also forced to deal with resettlement issues not foreseen at appraisal. According to the PPAR,

The resettlement and compensation of the individuals who were affected by inundation required lengthy negotiations, largely because the borrower and the Bank failed to anticipate the complexity of the problem involved....The Bank refrained from further comments on the relocation program prior to effectiveness of the loan agreement. For example, Bank staff neither requested nor proposed an implementation schedule for the relocation program (World Bank, 1981c, p. iv, 6).

The project suffered from 40 percent cost overruns and a three year time slip mostly as a result of a three-year delay in the resettlement plan. According to the PPAR, delays result in high losses. Nevertheless, the PPAR managed to conclude optimistically, "this lesson appears to have been learned by the Bank, as evidenced by the particular attention now given to relocation programs" (idem, p.15). Even if this statement were true for the Bank at large, it was certainly not true for Colombia. The Guatape project was closed in 1980. Two years later the Guavio Hydropower project began in Colombia, also with the Bank support. A few years later it exploded with resettlement problems stemming from grossly inadequate preparation before appraisal. Ten years later resettlement problems at Guavio are still being addressed by Colombia under Bank supervision.

- Guatemala's Chixoy project represents another example of poorly managed resettlement issues. The resettlement plan was prepared by the local agency in 1978 and was thoroughly revised by the Bank as late as 1984, when it was found to be "seriously flawed" according to the PCR (World Bank, 1991b). Resettlement activities began in 1979 and were still in progress ten years later. Resettlement was not the only critical issue at Chixoy; it was a very complicated project that had major engineering problems, 120 percent cost overruns, and a 3½ year delay.

3.21 In Thailand and Korea the resettlement processes do not appear to have resulted in undue hardship for the affected population. The opposite was true in the other four cases reviewed. This indicates that a critical resettlement component need not be a burden on the project or the population if it is carefully anticipated and developed. On the other hand, a critical resettlement component can also turn into a major cost for the project and can influence its overall economic performance (this point is discussed in more detail in Chapter 4).

3.22 In conclusion, it should be stressed that PCRs and PPARs offer important opportunities to take stock of project implementation. Resettlement deserves detailed treatment in PCRs and PPARs. However, most of the PCRs and PPARs reviewed are based only on what turns up in the project files. If resettlement has been well treated at appraisal and supervision it will be well represented in PCRs. If not, the issue will simply not appear. The approach of PCRs and PPARs should not be only to ask, "what is in the files?" but also, "what should be reported?" In the case of resettlement issues, PCRs and PPARs should report on the extent to which Bank resettlement directives have been applied and the outcomes achieved. Good examples of reporting on resettlement are to be found in most PCRs and PPARs for power projects in Indonesia and Thailand. They show that a thorough treatment of the issue runs to no more than two pages of the document plus consistent quoting of figures in tables and annexes.

Table 3.15 Basic Information on Resettlement in PCRs and PPARs, LAC

Project	PCR/PPAR no.	People affected	Comments on resettlement	Resettlement reported as critical	Resettlement costs as % of total	
					SAR	PCR
Colombia, Guatape II, 1973 -1980	PPAR 3718	3,600	detailed	yes	13%	22%
Brazil, Sao Simao Hydro	PPAR 3500	14,000	fair	no	7%	5%
Honduras, Nispero	PCR 5420	?	(*)			
Brazil, Itumbiara Hydro	PCR 6099	?	(**)	no	6%	7% (0)
Brazil, Paulo Afonso IV	PPAR 6578	70,000	detailed	very critical	1.7%	4.4% (†)
Guatemala Aguacapa Power	PCR 7890	?	(*)			
Honduras, El Cajon Power	PPAR 7901	10,000	incomplete	no	na	na
Colombia, San Carlos I & II	PCR 10237	?	(‡)			
Guatemala, Chixoy Hydro	PCR 10258	3,450	Incomplete	critical	n.a.	n.a.

na: mentioned in the document but no figure presented

?: not mentioned

(*) not mentioned, probably small

(**) not mentioned, probably significant

(0) Only land acquisition costs

(†) This figure underestimate resettlement costs because it does not include the cost of the "Lower San Francisco Polders project" developed to avoid downstream flooding of agricultural areas.

(‡) Indirect mention to affected population, probably significant

Involuntary Resettlement in the Near Future: Projects in the Pipeline

3.23 Table 3.16 presents the available information on hydro projects in the pipeline.¹⁴ Africa with eight projects and Asia with fourteen make up a total of twenty-two hydroelectric projects for the near future.¹⁵ Slow energy demand growth during the 1980s and falling public investment can explain the lack of projects in Latin America and MENA.

14. Only projects with IEPs have been quoted. Nevertheless, the level of information available varies widely. MENA, LAC and EA2 reported on several project ideas (three, four and one respectively) but they had not yet arrived to the IEPs stage at the time of this writing.

15. From this total, four projects (Swaziland's Komati and China's Xiaolangdi, Yangtze, and Inland Waterways) are multipurpose projects with a comparatively small energy component. Kenya's energy project also has hydro as a minor component.

Another factor may be that such traditional borrowers from these regions as Brazil and Turkey failed to meet the Bank's recent sectoral policy (these difficulties were mostly related to energy pricing) and were no longer eligible for new loans. Should this situation be overcome, both Brazil and Turkey will probably add several hydro projects to the pipeline.

3.24 For eighteen pipeline projects with available information the average number of families affected—554—is less than 25 percent of the average for 1988-92 (see Table 3.3). Even if these figures are only tentative (actual numbers can vary dramatically during project preparation), they do show a trend. There is a clear interest, both in borrower countries and in the Bank, in reducing the number of people displaced by development projects. This interest can be seen in the preference for run-of-river projects (Tanzania, Madagascar) or additions to existing systems (e.g., Indonesia's Cyrata, Thailand's Lam Takhong, China's Ertan II and Tianhuanping), which entail very limited resettlement. The Bank country staff also reports several cases where the project idea was abandoned or is undergoing major changes (e.g., Swaziland's Komati Multipurpose) in order to reduce social and environmental impacts.

3.25 Current new projects (initiated before 1992) began to move through the Bank's pipeline in the wake of the Bank's concern about resettlement, brought about by the 1992-93 resettlement policy review. The documentation already available in the Regions' Technical Departments show that in all cases, depending on the stage of the project, detailed social studies have been either available, under way, or requested. In most cases qualified experts participated in drafting the terms of reference and in reviewing the outcomes of these studies. If Bank interest on resettlement does not lose momentum, there is a good chance that current pipeline projects will give thorough consideration to social impacts.

3.26 The early stage of most pipeline projects precludes further comments on how they are treating resettlement issues. On the other hand, this same early stage should provide enough flexibility to incorporate the recommendations of the current resettlement policy review. One particular concern is that pipeline projects are failing to look at the relationship between resettlement costs and the project's overall economic performance, a point argued in this study in relation to active and closed projects (see Chapter 4). On the contrary, there is a risk of a widening gap between the treatment of social and economic issues during the project preparation cycle as they increasingly fall under different responsibilities and expertise. If the suggestions made in Chapter 4 regarding the economics of resettlement are endorsed, a quick incorporation of these concerns in to the projects in the pipeline will be needed.

Table 3.16 Basic Information on Resettlement in Pipeline Projects, May 1993

Region, Country, and Project	Stage TA/TB	Affected people	Documents available	Comments	Project costs (US\$M)		
					Total (a)	Reset. (b)	% (b/a)
<i>Africa</i>							
Benin, Togo; Adjarala Hydro	TA 93 TB 94	7,300	SAR/EA	80 MW	212	9.7	4.5
Burundi, Rwanda, Tanzania; Rusumo Falls	TA 96 TB 97	321 fam		61.5 MW			
Tanzania; Power VI, Lower Kihansi	TA 92 TB 93	2 fam	SAR/EA	180 MW R.R.	191.8	1.9	1
Guinea; Garafiri (1)	TA 94 TB 95	1,435/2,040	EA	75 MW	na	na	na
Madagascar; Ambodiroka Hydro	TA 97 TB 98	no	EA	13 MW R.R.	na	na	na
Swaziland; Komati multipurpose (2)	TA 94 TB 94	18,400	EA	15 MW	na	na	na
OMVS regional; Transmission lines (3)	TA 94 TB 95	no	EA	200 MW	na	na	na
Kenya; Energy Sector	TA 93 TB 94	no	EA	70 MW	130	na	na
<i>Asia</i>							
Thailand; Lam Takhong(4)	TA 93 TB 93	45	SAR/EA	1,000 MW			
Thailand; Mae-LB Water diversion	TA 85	na	na	na	na	na	
China; Tianhunaping Hydro (5)	TA 93 TB 93	no	SAR/EA	1,800 MW	571	9.1	1.6
China; Ertan II (6)	TA ? TB 95	(30,000)					
China; Longtan Hydro	TA ? TB 96						
China; Xiaolangdi multipurpose (7)	TA 93 TB 93	181,000	SAR/EA	1,800 MW	2,935	487.8	16.6
China Yangtze Water Resources (8)	TA 93 TB 94	2,000 fam	EA	300 MW			
China, Inland Waterways (9)	TA 94 TB 94	na		350	na	na	
Indonesia, Cirata Hydro (4)	TA 93 TB 93	17 fam	SAR	500 MW	259	na	na
Indonesia, Outer Islands (10)	TA 93 TB 94	30 fam	EA	90 MW	237	na	na
Nepal, Arun Hydro (11)	TA 93 TB 93	155/1,760 fam	EA	400 MW	1,170	1.5	0.01
India, Baglihar Hydro	TA 96 TB 96	200 fam	EA	450 MW	950	na	na
Pakistan; Ghazi Barotha	TA 93 TB 95	980	EA	1,400 MW	1,770	48.2	2.7
Sri Lanka; Kakule Ganga Hydro	17 fam	EA	70MW R.R.	na	1	na	
Average affected population for 18 projects		554					

TA: Tentative appraisal; TB: Tentative Board presentation; fam: families; R.R.: run-of-the-river

(1) People to be resettled and people affected.

(2) The major component is irrigation. Only 360 people are displaced by the reservoir.

(3) Some agricultural land lost, no information on compensation available.

(4) No resettlement, only land acquisition.

(5) Only land acquisition and compensation, no number of people mentioned in SAR. No people to be resettled.

(6) Second loan to the same project. No new affected population.

(7) Mainly for flood control and urban water provision; the power component is marginal.

(8) Multipurpose project. Only families affected by the hydro subcomponent, Jiangya Multipurpose Dam, quoted.

(9) Mostly a water transport project with marginal power components.

(10) Figures quoted are for the subcomponent Besay Hydro, only land acquisition, no resettlement.

(11) Families severely affected, and families affected. Project strongly opposed by INDR (memo May 4, 1993).

(12) China's Xiaolangdi is not included. Ertan II is assigned no affected population. Average of 5 people per family used.

Resettlement Goals and Results

3.27 As mentioned previously, the current goal of the Bank resettlement policy is "to improve [the resettled population's] former living standards, income earning capacity, and production levels, or at least to restore them" (World Bank 1990f, p.1). This statement does not differ from the one put forward by the Bank's resettlement policy of 1980.¹⁶ It is surprising to note how little the Bank knows about the fulfillment of its own resettlement policy. Only three out of thirty-one closed hydropower projects with a PCR or PPAR mentioned the income of the displaced people, and incomes actually fell in two of these three cases.¹⁷

3.28 The lack of information on oustee income is not limited to hydropower projects. A recent Bank review stated that "a striking finding is how few projects for which OED reports are available...have information on incomes of the displaced population" (OED, 1993d, p.5). This lack of information can be traced to the resettlement plans. Where information on the pre-project income situation is lacking it will be very difficult to assess the income evolution. It could also be argued that most PCRs and PPARs come too early in the resettlement process to be able to comment on income restoration. In this regard the recent studies carried out by OED are of particular interest because they are one of the few Bank efforts to assess the fate of resettlers a decade after project completion.

3.29 As part of the current Bank review of resettlement policies, OED has carried out four field evaluations of resettlement programs that formed part of the Bank's portfolio during the 1980s. Two of these field studies refer to hydro projects: Thailand's Khao Laem, under construction during 1980-84, and Ghana's Kpong project, under construction during 1977-82.

3.30 OED has reported its findings in case study documents and a general overview report (OED, 1992a, 1993a, b, c, d). In general terms, both the Khao Laem and Kpong projects are praised for having addressed resettlement issues in quite a comprehensive way, at a time when the Bank had not yet fully developed its resettlement guidelines. The Khao Laem experience is favorably assessed, although it is noted that the local agency failed to adequately compensate illegal immigrants from Burma settled in the project area. Family incomes in the Ghana project were found to be lower after resettlement than before. This finding is tempered by the fact that the whole country has gone through negative income growth in the last decade, and OED acknowledges the commitment of the Ghana government to assist the resettled villages. Of the four cases reviewed by OED, only the Thailand case showed higher incomes after project for the displaced population.

16. See World Bank 1980 page 1 point 2.

17. Indonesia's Tenth and Thirteenth Power Projects, where families' income fell, and Thailand's Power Subsector Project, where families' income grew.

3.31 With the little information available, one is forced to conclude that during the 1980s many Bank-financed resettlement programs failed to accomplish the goals of restoring income and living conditions of affected populations. In addition to the recommendations made for project preparation, the following actions should be taken throughout the project cycle and beyond:

- Follow-up and monitoring activities should be contemplated as part of the resettlement program and included in the resettlement plan. Resettlement in general and income restoration in particular are long-term processes, far exceeding the main project implementation period, even in such relatively long term projects as hydropower.
- Because project construction and Bank involvement will probably come to an end far before income restoration is fully achieved, some automatic mechanisms to deal with emerging problems should be included when possible in the main project. Several recent cases in Argentina, China, and India) have proposed to earmark a small percentage of electricity sales for local development activities. Such a practice could be a good approach for any development with significant local negative externalities.
- The Bank should recognize that involuntary resettlement has no simple economic and technical solution and increase social accountability by (a) opening project components up to public scrutiny; (b) training project officers both at the Bank and the borrowing agencies to better cope with openness and accountability issues; (c) raising resettlement issues in sectoral loans and in overall policy negotiations with borrower governments; and (d) publicizing the Bank's approach to resettlement, the environment, and other issues of public concern.

4

Resettlement and the Economics of the Project

Assessing the Costs of Resettlement

4.1 Only recently have the majority of project managers begun to assess resettlement costs fully during project preparation and to include them in the appraisal exercises. Before 1990, the best that most projects offered was just one figure related to “preliminary works” or “land acquisition.”

4.2 Poor cost reporting is commonly the consequence of poor information gathering during project preparation. Worse, however, are the legal frameworks or institutional arrangements in some countries that simply allow the energy agency to pass the responsibility for resettlement on to other agencies without ever considering resettlement costs as part of the project costs. In Turkey, for example, the energy agency’s responsibility ends with land acquisition. Most SARs of hydropower projects in Turkey present figures for land acquisition without mention of other resettlement costs. Yet to omit certain costs from the analysis merely because they are to be paid for by a third party is an economic mistake (for further comments, see the section on economic evaluation).

4.3 Although presentation of resettlement costs has improved in recent years, no standard criteria are currently used to break down cost estimates either in the SARs or in the resettlement studies summarized in some SARs. Some projects include resettlement and land acquisition as “preliminary costs” (e.g., India’s Upper Indravati). Others add environmental investment to resettlement (Mexico’s Hydroelectric Development Project, India’s Uttar Pradesh Power Project, Central African Republic’s Energy Project).

4.4 It also happens that projects with very large resettlement components often do not report land acquisition costs, either because no payment for land is envisaged or because it is included under other sorts of compensation payments. On the other hand, some projects present important land acquisition costs without any mention of people living in the affected area. For example, the India Kerala project SAR gives an estimate of \$8 million for land acquisition with no reference to population in the area to be compensated or

resettled.¹⁸ A year later, India's Indravati project estimated costs of land and resettlement of 20,000 people at more than twice Kerala's land acquisition costs (\$16.2 million).

4.5 In many projects only a fraction of the affected population requires full resettlement (e.g., Turkey's Sir Hydropower or Lesotho's Highlands Water Project), yet no SAR distinguishes between compensation and resettlement costs, making it impossible to do a full analysis of costs. Also, in several projects (e.g., Central African Republic's Energy Project), important public infrastructure of national or regional significance was flooded and rebuilt, and these costs have been presented as resettlement costs.

4.6 In sum, the lack of a standard presentation of resettlement costs has several drawbacks. With currently available information it is very difficult to (a) assess the accuracy and detail of resettlement costs; (b) evaluate ratios (price per ha, investment per person compensated or relocated, etc.); (c) compare resettlement costs across countries and projects; (d) arrive at any standards or criteria that could help country departments in preparing or assessing resettlement programs; and (e) give guidelines and establish requirements for borrowers, consultants, and contractors regarding the assessment and presentation of resettlement costs.

4.7 The Bank has proposed guidelines for the presentation of resettlement costs (Cernea, 1988 pp. 65-81). They have not been used in any of the projects reviewed, perhaps because they are too detailed and demanding. Even allowing for flexibility in each particular case, the adoption of a simple grouping of resettlement costs for use in project preparation could significantly enhance cost estimates and comparisons. The following suggested groupings for resettlement costs are based on the above-mentioned guidelines:

- a. *Compensation costs.* Mainly land and other asset acquisition in the area of the project and payments for lost incomes. This figure should also include the costs of censuses, surveys, and valuations studies.
- b. *Resettlement costs.* Land acquisition in the resettlement area, costs of housing and local infrastructure, necessary studies, transportation of population and their belongings, transitional income payments, and any other investments directed to restore the living condition of the population resettled.
- c. *Replacement of lost public assets.* The infrastructure over and above that built for the local resettlement component. This would include national roads, bridges, and any other infrastructure of national or regional scale affected by the project.
- d. *Development components.* Activities to improve living conditions in the project and in the resettlement area, over and above the resettlement components. This includes local development projects, new services, agricultural extension, etc.

18. The SAR mentioned only 17 families of squatters with no rights to compensation according to the government. The families have since sued the government and have been awarded due compensation.

- e. *Administrative costs.* Staff, offices, technical assistance, community participation activities, communication and similar, if it is possible to separate them from the general overheads of the project.

Some Patterns in Current Resettlement Costs

4.8 Resettlement costs are not standard values. On the contrary, they are likely to vary from project to project. Poor current reporting of resettlement costs further complicates the comparability of the few available figures. Nevertheless, Tables 4.1 through 4.6 summarize cost information for both closed and active projects, and relate resettlement costs to total project costs and per capita levels of compensation.

4.9 Table 4.1 confirms a point made in previous reviews of resettlement issues but that has been little substantiated up to now: Most cost exercises during the 1980s underestimated resettlement costs. Resettlement cost overruns for fourteen closed projects averaged 54 percent (with a high standard deviation). The weighted average increase is smaller—40 percent—but still very significant. Only three projects ended with actual resettlement costs lower than at appraisal.

4.10 Large resettlement costs (see Tables 4.1 and 4.2) are commonly associated with very high compensation payments (as in Korea), large numbers of people to be relocated (as in China's Shukoy, Argentina's Yacyreta), or projects with difficult resettlement processes (as in Colombia's Guatape II). Large cost overruns reflect poor planning and usually conflicting resettlement processes.

4.11 Table 4.3 compares resettlement costs with the total project costs. In half of the closed projects reviewed, the percentage cost overruns for the resettlement components were larger than overall project cost overruns, resulting in an increased participation of resettlement in total final costs. For example, in the Thailand Power Subsector project the costs of relocation as a proportion of total project costs increased threefold. In Colombia's Guatape II resettlement costs doubled as a proportion of total costs.

4.12 On average resettlement costs were estimated as 8.9 percent of project costs at appraisal but increased to an average of 11.1 percent at project completion. Resettlement increased as a proportion of total costs by 25 percent from SAR to PCR. These figures are probably lower than actual because, as mentioned previously, several resettlement costs are not accounted for in most projects.

4.13 Table 4.4 presents resettlement costs as a percentage of total project costs for active projects as estimated in the SAR. On average, active projects estimate lower proportions for resettlement costs in total project costs, compared with closed projects, either in SARs or PCRs (Table 4.3). This finding can be explained by current active projects having smaller resettlement needs, a trend highlighted in Chapter 2; this is also supported by Tables 4.5 and 4.6, which compare per capita resettlement costs in closed and active projects. On average, closed projects paid per capita resettlement costs of three times the per capita GNP of the borrower country at the time of the project completion. SARs of active projects expect to pay five to six times the per capita GNP of the borrower country at

appraisal.¹⁹ It remains to be seen how active projects will manage the very common problem of unexpected increases in the size of the displaced population—increasing the resettlement budget or reducing the per capita payments.²⁰

Table 4.1 Resettlement Costs in Closed Projects

Region, country, and project	FY SAR	FY PCR	Resettlement costs (US\$ M current)		Cost Overruns %
			at SAR	at PCR	
<i>Africa</i>					
Ghana, Kpong Hydro & Third Power	1981	1985	11.3	5.4	- 48
<i>Asia</i>					
Thailand, Pattani Hydro	1977	1985	14.63	16.32	+ 11
Thailand, Khao Laem	1980	1986	19.06	28.58	+ 50
Nepal, Kulekhani Hydro	1975	1986	0.6	1.1	+ 83
Indonesia, Tenth Power	1979	1989	49.2	63.6	+ 29
Thailand, Power Subsector (1)	1981	1989	14.2	27	+ 90
Malaysia, Ninth Power	1980	1989	7.3	3.1	-42
Korea, Chungju Multipurpose (2)	1976	1990	176.1	185.9	+ 5
Indonesia, 13th Project (3)	1983	1992	187.7	113.8	-39
<i>MENA</i>					
Morocco, Sidi Chero-Al Massira	1976	1984	29.2	37.1	+ 27
<i>LAC</i>					
Colombia, Guatape II	1973	1981	12.8	30.7	+140
Brazil, Sao Simao Hydro	1972	1981	27.3	47.9	+ 75
Brazil, Itumbiara hydro (4)	1975	1986	36.8	72.2	+ 96
Brazil, Paulo Afonso IV (5)	1975	1986	30.9	83.9	+275
COST OVERRUNS, SIMPLE AVERAGE OF 14 PROJECTS					53.7
Standard Deviation					(85.2)
COST OVERRUNS, WEIGHTED AVERAGE 13 PROJECTS (6)					40.1

(1) Preliminary and resettlement costs (2) Compensation costs were very high

(3) "Preliminary and environmental works"; no explanation in PCR for the huge difference.

(4) Only land acquisition

(5) The figure for the Paulo Afonso underestimates resettlement costs because it does not include the cost of the "Lower San Francisco Polder Project" developed to avoid downstream flooding of agricultural areas.

(6) Indonesia's 13th project is not included in the weighted average because it includes "preliminary works" and the PCR did not explain the huge difference with the SAR estimations

19. Note that the difference between closed and active projects could be understated because the former compare actual resettlement payments with GNP at the end of the project whereas the latter compare proposed payments with GNP at the beginning of the project.

20. This is a relevant question in light of a recent review of the resettlement portfolio of India that found that four out of seven hydro projects have doubled the number of displaced population estimated in the SARs: Upper Indravati from 15,000 to 26,000 persons; Kerala from 50 to 150; Karnataka II from 2,000 to 4,000; and Maharashtra from 350 to 2,500. (See World Bank, 1993g)

Table 4.2 Resettlement Costs in Active Projects

<i>Region, country, and project</i>	<i>FY SAR</i>	<i>Resettlement costs at appraisal (US\$ M current)</i>
<i>Africa</i>		
C.A.R., M'Bali Energy I (1)	1988	3.1 - 5.0
Leshoto, Highlands (1)	1991	65.7
Benin, Togo; Nangbeto (1)	1984	10.4
<i>Asia</i>		
China, Yantan	1986	75.8
China, Ertan	1992	89.4
China, Daguanga	1991	28.8
China, Shukoi I & II	1992	207.2
India, Srinagar (1)	1988	5.2
India, Karnataka	1986	9.4
India, Indravati (2)	1986	16.2
India, Kerala(3)	1985	8.0
India, Nathpa	1988	0.5
Nepal, Marsyangad	1984	0.4
Thailand III	1990	6.4
<i>MENA</i>		
Turkey, Berke(3)	1991	6.0
Turkey, Sir (3)	1986	20.0
Turkey, Kayraktep (3)	1985	34.5
<i>LAC</i>		
Argentina, Yacyreta II (4)	1992	31.4
Argentina, Yacyreta total	1992	776.8
Mexico, Power (5)	1989	22.8

(1) Resettlement plus environmental costs

(2) Only land acquisition and "preliminary costs"

(3) Only land acquisition costs

(4) Only resettlement costs

(5) Resettlement plus research and environmental costs

Table 4.3 Comparison of Resettlement Costs and Total Project Costs in Closed Projects

<i>Region, country, and project</i>	<i>FY SAR</i>	<i>FY PCR</i>	<i>Resettlement as % of total project cost</i>	
			<i>at SAR</i>	<i>at PCR</i>
<i>Africa</i>				
Ghana, Kpong Hydro & Third Power	1981	1985	5.1	2.3
<i>Asia</i>				
Thailand, Pattani Hydro	1977	1985	10	12.3
Thailand, Khao Laem	1980	1986	5.3	7.6
Nepal, Kulekhani Hydro	1975	1986	0.9	0.9
Indonesia, Tenth Power	1979	1989	6.8	9.3
Thailand, Power Subsector (1)	1981	1989	4.3	15
Malaysia, Ninth Power	1980	1989	3	3
Korea, Chungju Multipurpose (2)	1976	1990	32	36
Indonesia, 13th Project (3)	1983	1992	30	18
<i>MENA</i>				
Morocco, Sidi Chero-Al Massira	1976	1984	17.5	17.5
<i>LAC</i>				
Colombia, Guatape II	1973	1981	13	22
Brazil, Sao Simao Hydro	1972	1981	7	5
Brazil, Itumbiara Hydro (4)	1975	1986	6	7
Brazil, Paulo Afonso IV (5)	1975	1986	4.5	5.9
AVERAGE FOR 13 PROJECTS (6)			8.87	11.06
Standard deviation			(8.2)	(9.74)

Available figures for resettlement costs were compared with total project base costs at SARs and with total project costs at PCRs or PPARs.

(1) Preliminary and resettlement costs

(2) Compensation costs were very high

(3) "Preliminary and environmental works," no explanation in PCR for the large difference.

(4) Only land acquisition

(5) The figure for Brazil's Paulo Afonso underestimates resettlement costs because it does not include the cost of the "Lower San Francisco Polder Project", developed to avoid downstream flooding of agricultural areas.

(6) Indonesia's 13th project is not included in the average because it includes "preliminary works" and the PCR did not explain the huge difference with the SAR estimations.

Table 4.4 Comparison of Resettlement Costs and Total Project Costs in Active Projects

<i>Region, country, and project</i>	<i>FY SAR</i>	<i>Resettlement as % of total project costs</i>
<i>Africa</i>		
C.A.R., M'Bali Energy I (1)	1988	5-9
Lesotho, Highlands (1)	1991	5
Benin, Togo; Nangbeto (1)	1984	10
<i>Asia</i>		
China, Yantan	1986	13
China, Ertan	1992	6
China, Daguanga	1991	17
China, Shukoi I & II	1992	30
India, Srinagar (1)	1988	2
India, Karnataka	1986	2
India, Indravati (2)	1986	5
India, Kerala (3)	1985	3
India, Nathpa	1988	<1
Nepal, Marsyangad	1984	<1
Thailand III	1990	5
<i>MENA</i>		
Turkey, Berke (3)	1991	1
Turkey, Sir (3)	1986	11
Turkey, Kayraktep (3)	1985	9
<i>LAC</i>		
Argentina, Yacyreta II (4)	1992	2
Argentina, Yacyreta total	1992	14
Mexico, Power (5)	1989	2
AVERAGE FOR 20 PROJECTS		7
Standard Deviation		(6.97)
AVERAGE FOR 18 PROJECTS (6)		8
Standard Deviation		(6.92)

Available figures for resettlement costs were compared with total project base costs at SARs.

(1) Resettlement plus environmental costs

(2) Only land acquisition and "preliminary costs"

(3) Only land acquisition costs

(4) Only resettlement costs

(5) Resettlement plus research and environmental costs

(6) Without India's Nathpa and Nepal's Marsyangad, because they have very small resettlement components

Table 4.5 Comparison of Resettlement Costs Per Person in Closed Projects

<i>Region, country, and project</i>	<i>Document and year (*)</i>	<i>Per capita resettlement costs (US\$—current) (a)</i>	<i>Per capita GNP (US\$—1990) (b)</i>	<i>a/b</i>
<i>Africa</i>				
Ghana, Kpong Hydro & Third Power	PPAR, 1982	771	238	3.2
<i>Asia</i>				
Thailand, Pattani Hydro	PCR, 1985	2,472	830	3.0
Thailand, Khao Laem	PCR, 1984	2,646	840	3.1
Nepal, Kulekhani Hydro	PPAR, 1983	431	160	2.7
Indonesia, Tenth Power	PPAR, 1986	1,060	500	2.1
Thailand, Power Subsector (1)	PCR, 1985	2,597	830	3.1
Malaysia, Ninth Power (5)	PCR, 1987	7,750	1,820	4.2
Korea, Chungju Multipurpose	PCR, 1985	3,997	2,180	1.8
Indonesia, 13th Project (2)	PCR, 1991	2,253	610	3.7
<i>MENA</i>				
Morocco, Sidi Chero-Al Massira	PCR, 1981	?		
<i>LAC</i>				
Colombia, Guatape II	PPAR, 1980	8,527	1,260	6.8
Brazil, Sao Simao Hydro	PPAR, 1979	3,421	1,770	1.9
Brazil, Itumbiara Hydro (3)	PCR, 1981	?	2,220	
Brazil, Paulo Afonso IV (4)	PPAR, 1984	1,198	1,720	0.7
AVERAGE OF 1990 VALUES 12 PROJECTS				3.0
Standard Deviation				(1.5)

(*) The year refers to the date of actual cost estimation, or project closing normally several years before PCR or PPAR. Except as otherwise indicated, costs are taken from Table 3.16 and people from Tables 3.12 through 3.15. For Thailand's Pattani and Power Subsector and Korea's Chungju, six individuals per family was used, as quoted in the OED (1992) report on Thailand's Khao Laem.

(1) We have used the figure of US\$6 million quoted in the text of the PCR as resettlement costs. If the figure of US\$27 million for "preliminary and resettlement costs" from the PCR's Table 3.16 were used, the cost per person would be completely out of range compared to all other resettlement programs in Thailand.

(2) "Preliminary and environmental works."

(3) Only land acquisition.

(4) The figure for Brazil Paulo Afonso underestimates resettlement costs because it does not include the cost of the "Lower San Francisco Polder Project," developed to avoid downstream flooding of agricultural areas.

Table 4.6 Comparison of Resettlement Costs Per Person in Active Projects

<i>Region, country, and project</i>	<i>Document and year (*)</i>	<i>Per capita resettlement costs (U.S.\$-current) (a)</i>	<i>Per capita GNP (U.S.\$-current) (b)</i>	<i>a/b</i>
<i>Africa</i>				
C.A.R., M'Bali Energy I (1)	SAR, 1988	3,714	370	10
Lesotho, Highlands (1)	SAR, 1990	7,725	540	14.3
Benin, Togo; Nangbeto (1)	SAR, 1983	981	266	3.7
<i>Asia</i>				
China Yantan	SAR, 1986	1,895	300	6.3
China Ertan	SAR, 1991	2,980	390	7.6
China Ertan Mastilovic (2)	Superv., 1991	4,000	390	10.2
China Daguanga	SAR, 1991	1,210	390	3.1
China Danguanga Mastilovic (2)	Superv., 1991	1,700	390	4.3
China Shukoi II	SAR, 1992	3,081	412	7.5
India, Karnataka	SAR, 1986	4,700	290	16.2
India, Indravati (3)	SAR, 1986	810	290	2.8
India, Nathpa	SAR, 1988	1,754	340	5.1
Nepal, Marsyangad	SAR, 1984	930	160	5.8
Thailand III	SAR, 1990	4,240	1,420	3
<i>MENA</i>				
Turkey, Berke (4)	SAR, 1991	10,416	1,672	6.2
Turkey, Sir (4)	SAR, 1986	2,850	1,110	2.5
Turkey, Kayraktep (4)	SAR, 1985	5,750	1,130	5.1
<i>LAC</i>				
Argentina, Yacyreta II (5)	SAR, 1992	12,015	2,362	5.1
Argentina, Yacyreta total	SAR, 1992	15,406	2,362	6.5
Mexico, Power (6)	SAR, 1989	4,145	1,990	2.1
AVERAGE VALUE FOR 20 PROJECTS				6.4
STANDARD DEVIATION				(3.8)
AVERAGE OF 1990 VALUES 18 PROJECTS (7)				5.4
STANDARD DEVIATION				(2.3)

(*) The year refers to the date of cost Table in the SAR. Except as otherwise indicated, costs are taken from Table 4.1 and people from Tables 3.8-3.11. For India's Nathpa and Nepal's Marsyangad five people per family were assumed based on India's other projects. Where two cost figures were available the smaller was used. GNP figures are taken from the World Bank Atlas up to 1990; thereafter they have been projected at recent rates of growth. All dollar figures are current prices of the year quoted.

(1) Resettlement plus environmental costs

(2) In a memo of December 1991 Mastilovic gives figures for China higher than the SARs.

(3) Only land acquisition and "preliminary costs"

(4) Figures refer only to land acquisition (Compensation)

(5) Only resettlement costs

(6) Resettlement plus research and environmental costs

(7) Lesotho and India's Karnataka are not considered in this average.

Schedules and Costs of Delays

4.14 Hydropower projects are large and complicated undertakings. In their review of forty-nine Bank-financed hydro projects, Merrow and Shangraw (World Bank, 1990a) reported average construction periods of 5.7 years and a range from three to twelve years. In most cases the local community begins to feel the effects of the dams through related activities (e.g., studies, passing of laws declaring the area to be of public interest, land acquisition plans, etc.) a long time before the construction begins.

4.15 In this framework it is reasonable to expect that complaints about appropriate timing or delays are one of the most common sources of conflict between the affected population and the investment agencies, a fact reported by many supervision missions and PCRs. Complaints about prolonged delays in payments, inappropriate resettlement schedules, and failure to provide offered services in due time are common.

4.16 An extreme example is provided by the Yacyreta dam on the Argentine-Paraguayan border, where international agreements between the two countries were signed in 1973 and works begun in 1979. Today, in 1993, construction is still going on after more than eight years of delay. Some 50,000 people will be affected by Yacyreta. By 1992, 8,500 people were already resettled. Another 7,750 people will need to be resettled before the reservoir reaches the 78m level, and a final 25,250 will have to be resettled before the level rises to 83m.

4.17 Several project documents, including the SAR (Yacyreta Hydroelectric Project II), praise the project management precisely because it delays the relocation until the very last moment, so that local population will not be unnecessarily disrupted (World Bank 1992e, Annex 2.7. Attachment 1 pg. 1). People affected see the problem exactly the opposite way.²¹

4.18 As early as 1979 a law was passed that froze the land market in the area affected by the dam project. According to the law, no property in the area could be sold, no improvement made, and no new public infrastructure built in the area. As a result, living and economic conditions have been deteriorating for almost fourteen years, and no compensation for this hardship is foreseen.

4.19 Freezing the local land market early in the project has a financial rationale for the energy agency: to avoid price rises. On the other hand, to force a social status quo up to the moment of physical moving has several drawbacks. Bank resettlement experts suggest that relocation should begin as early as possible, rather than at the very last minute. Early relocation would allow the affected population to retain for some time both sites, the old and the new one. Only part of the population would move to the new site; others would continue farming the old area until the final resettlement. This would increase the

21. Based on conversations of the consultant with representatives of the association of affected people.

time available to displaced people to establish themselves in the new place and would reduce the costs and hardships of the involuntary resettlement. Some experts argue that early resettlement is more difficult in urban areas because of the danger of squatters occupying vacant houses. However, these have to be counted as part of the costs and difficulties of early resettlement, and are not a reason for avoiding the policy given that the social costs and difficulties of delay are even greater.

4.20 Resettlement delays are not only a concern of the affected population; they should also be a major concern for project officers. In several cases delays have affected the schedule of the whole project, as exemplified by the Colombia Guatapé II Hydro project. According to the PPAR (World Bank, 1981c, p. iv):

The resettlement and compensation of the individuals who were affected by inundation required lengthy negotiations, largely because the borrower and the Bank failed to anticipate the complexity of the problem involved...the final costs of the resettlement, in US\$ equivalent, was more than double the original estimate and the process took about three years longer than envisaged. This delay, which in turn delayed the filling of the reservoir and storing of water energy, cost the economy the equivalent of [an entire year of energy generation from Empresas Publicas de Medellin].

4.21 Based on the PCR figures, the electricity losses reported (3,335 GWh) amounted to \$25.5 million of unsold energy, a sum equivalent to 18 percent of the total project costs or 83 percent of actual resettlement costs. Similar consequences of resettlement delays can be found in the Thailand Khao Laem Hydroelectric Project.

4.22 Costs of project delays are estimated in the sensitivity analyses of several SARs. In most cases a delay of one year would lower the rate of return about one point and reduce the project's net present value by approximately 20 percent.²² In economic sensitivity exercises time delays also delay investment, partially reducing the costs of the schedule slip. But at the time of reservoir filling most project investments are already in place, so the opportunity cost losses would probably be greater than the values quoted above. Resettlement delays are related to:

- *Poor planning, implementation and supervision.* This point has been repeatedly brought out by previous and ongoing reviews of resettlement experience. More expert resources are needed during project preparation and implementation both in the local agencies and the Bank.
- *Chronic delays in budget allocations by the borrower, who is the main or sole source for resettlement financing.* As discussed below, an increase in Bank resettlement financing could help enhance not only this particular component but the economic benefits of the project at large.

22. See for example the economic return exercises in Berke Hydropower Project, Turkey; and Nathpa Jhakri Power Project, India.

Financing

4.23 Because the Bank is a financial institution, its direct involvement in any project component increases with the level of its financial input. The current levels of resettlement financing are very low, mostly for the following reasons:

- a. The Bank does not contribute to land acquisition on the grounds that land acquisition is a transfer payment with no value added component.
- b. The Bank prefers to finance the project's imported components while almost all resettlement costs are in local currency.

4.24 A review of twenty-one active hydropower projects with resettlement components shows that two-thirds of the projects have had no Bank financing of resettlement components (Table 4.7).

4.25 It could be argued that because money is fungible, what matters is the proportion of the Bank's participation in a project's total costs, rather than its financing of a particular item. Because of the Bank's reimbursement procedures, however, this is only partially true.

4.26 It is often in the borrowers' self interest to tackle the project components that have the greatest share of Bank financing first and to postpone or not invest at all in components with low or zero Bank financing. In fact this is often what happens. Resettlement components are repeatedly hampered because borrowers fail to allocate resources in the time and amount required.²³

4.27 The Bank could meet these problems by using conditionality safeguards. Disbursement for item *x* could be withheld until the borrower has met certain objectives of the resettlement component. In fact, resettlement issues appear many times in project covenants, but Bank officers often do not demand the enforcement of such covenants because they do not realize the social and economic costs of resettlement delays.

4.28 Task managers should be encouraged to increase Bank financing for resettlement components, without necessarily changing the overall financing of the project. This could be a strong signal both to borrowers and Bank task officers that resettlement issues matter. It would increase the priority of resettlement issues for borrowers and would force Bank officers to pay greater attention to the component's performance. It could also increase the quality of budgeting during project preparation and reduce the likelihood of undervaluation and later cost overruns.

23. In the presentation of Mr. M.S. Gill (mentioned previously in Chapter 3), he argued that the Bank has little leverage to foster its resettlement policies with borrowers since most of the time it offers no financing to support resettlement goals.

**Table 4.7 Bank Financing for Resettlement Costs vs. Total Project Costs
(for projects active as of March 1993)**

<i>Region, country, and project</i>	<i>FY SAR</i>	<i>% of Bank financing of resettlement component</i>	<i>% of Bank financing of total project costs</i>
<i>Africa</i>			
C.A.R., M'Bali Energy I (1)	1988	42- 71	25.5
Lesotho, Highlands (1)	1991	3	6.1
Benin, Togo; Nangbeto (1)	1984	50	29
Malawi; Power V	1992	0	23.7
Uganda; Third Power	1992	0	37
<i>Asia</i>			
China, Yantan	1986	0	6
China, Ertan	1992	0	20.1
China, Daguanga	1991	18	34.7
China, Shukoi I & II	1992	42.7	40.7
India, Srinagar (1)	1988	0	71.2
India, Karnataka	1986	42.5	54.2
India, Indravati (2)	1986	0	65.2
India, Kerala (3)	1985	0	52.8
India, Nathpa	1988	0	32.9
Nepal, Marsyngad	1984	0	33.1
Thailand III	1990	0	4.1
<i>MENA</i>			
Turkey, Berke (3)	1991	0	45.6
Turkey, Sir (3)	1986	0	54.7
Turkey, Kayraktep (3)	1985	0	46.9
<i>LAC</i>			
Argentina, Yacyreta II (4)	1992	28.6	20
Mexico, Power (5)	1989	0	35.7
AVERAGE FOR 22 PROJECTS (6)		12.1	35.2
STANDARD DEVIATION		(21.3)	(18)

SAR figures for resettlement costs and total project costs including contingencies were used.

- (1) Resettlement plus environmental costs.
- (2) Only land acquisition and "preliminary costs."
- (3) Only land acquisition costs.
- (4) Only resettlement costs.
- (5) Resettlement plus research and environmental costs.
- (6) The largest figure for CAR was used.

Economic Evaluation

4.29 According to standard cost-benefit evaluation of development projects, all direct and indirect costs, benefits, externalities, and opportunity costs stemming from the project should enter the economic evaluation of the project.²⁴ Bank resettlement guidelines (OD 4.30 and related) clearly require that all resettlement costs and potential benefits should be duly considered in the economic evaluation of the project. In the same vein, Bank environmental guidelines (OD 4.01) ask for a thorough consideration of environmental benefits and costs. Although the full consideration of all possible costs and benefits is an ideal that few if any projects achieve, the hydro projects reviewed seem to fall short of what is feasible and useful.

4.30 Until 1990 most projects were appraised before the costs of environmental protection and resettlement were available, so economic evaluations seldom took environmental and resettlement costs into account. In the last two to three years increasing attention has been paid to resettlement and environmental costs during project preparation, but these costs are incorporated in the economic evaluations in a very narrow way—only costs that actually will be paid for by the project are considered. For example, in Turkey expropriation laws give resettlement responsibilities to a specific government agency. Thus, neither the power agencies nor Bank officials consider resettlement costs as part of the project cost at appraisal.

4.31 Moreover, there are many externalities or opportunity costs that could be estimated, thereby enhancing the cost-benefit exercise. These are not considered at appraisal. The most clear cut case is the opportunity cost of the land to be flooded. Project cost tables do not take the commercial value of land as an indicator of opportunity cost, but measure only the portion of land acquisition covered by the project. This shortcoming affects the economic evaluations of all hydro projects. Most economic studies of natural resources forecast increasing demand for many types of land (agricultural, forest, range, urban) as a result of increasing population; land losses to erosion, desertification, and urbanization; and increasing demand for wilderness. It is likely, therefore, that the value of land inundated would increase over time in many populated or agricultural regions. Economic evaluation should take this into account.

4.32 An example is provided by the Lesotho Highlands Water Project. The SAR acknowledges that agricultural land is today so scarce in Lesotho that it will not be possible to replace the agricultural land lost by the displaced population (World Bank 1991i).

[T]herefore, households losing arable land will receive the equivalent volume of food crops and grains for fifteen years to replace the loss of crops. Fodder will be provided to local grazing associations for five years to replace lost fodder production on grazing lands (*idem*, p. 51). [A fund

24. As opposed to private firm economic analysis where only direct costs and benefits are accounted for.

for rural development will also be created with the capitalized payments of future compensations.]

4.33 This is a case where economic theory would have suggested that an irreversible commitment of such a scarce resource may have an opportunity cost larger than its current market price or the capitalized value of current crops over the project life. These costs were not considered in the Lesotho project.

4.34 A more accurate picture could be obtained at appraisal by roughly assessing land use potentials in the area of the project and using market prices in nearby or similar areas to value the opportunity cost of the land lost to the project. Use needs to be made of data on historical land price trends and forecasted population and GNP growth to adjust present market values to better capture future opportunity costs. Other social costs that should be better considered during project economic evaluation are (a) downstream impacts; (b) the costs of increasing occurrence of diseases; and (c) the costs of increasing human hazards.²⁵

4.35 A symmetric point should be made in relation to indirect benefits. Most SARs mention irrigation potential, water regulation, reservoir uses for tourism, and other economic activities as indirect benefits of hydropower projects, but few attempt to measure them, unless they are an explicit component of the project.

The Economic Impact of Fully Internalizing Resettlement Costs

4.36 It has been increasingly argued that, should resettlement and environmental costs be duly assessed, many large hydro projects would not be desirable, either on social or economic grounds.²⁶ This is a difficult issue to analyze in a short review such as the present one. On the one hand, to estimate the economic ranking of hydro projects the exercise should consider hydropower against all other alternatives, including energy savings and non-conventional sources, and the availability of each source at a country or regional level compared with forecasted energy demands, including the export and import of energy and energy related inputs.

4.37 On the other hand, environmental and resettlement costs for hydro projects and all other energy sources are today poorly assessed and key data are missing. Furthermore, several environmental and resettlement issues are only partially amenable to monetary valuation. They need to be based on value judgments and social priorities before they can be incorporated as restrictions into an economic evaluation exercise.

4.38 With the available information, a more limited but nevertheless interesting exercise can be tackled—mainly to consider what would happen to the economic ranking of hydro projects if resettlement costs escalated, all other things being equal.

25. According to the Indonesia 10th Power Project PPAR, seventy people drowned during the first fourteen months of the reservoir operation.

26. See Goldsmith and Hildyard (1984) and Besant-Jones (1989).

4.39 To understand such an exercise and its limitations it is necessary to briefly review the Bank's evaluation methods for power projects. Current economic evaluations of power projects financed by the World Bank are based on the long term expansion plan of the borrower country's energy sector. These plans already take into account national and regional demands and least-cost alternatives. Each project to be financed is then analyzed as a component of a time-slice of the overall energy plan, and the Bank evaluates (a) the financial performance of the energy agency and of the project; (b) the comparison between the project and the next best alternative (a combustion power plant, electricity imports from other country or region, etc.); and (c) the internal economic rate of return of the project. While the methodology is well established, the actual exercise is subject to several cost and forecast uncertainties. For instance:

- During the 1980s most projects failed to recognize the economic slowdown in Latin America and Africa and grossly overestimated energy demand growth. This in turn led to costly overinvestment in the power sector (Table 4.8).²⁷
- In most cases there is detailed information only for the project in question. In the 1980s most exercises assumed that prevailing high oil prices would go on indefinitely. This assumption often favored hydro project investments that were actually poor choices when faced with the lower oil prices prevailing in the late 1980s and 1990s. For instance, the PCR for Guatemala's Chixoy project states, "For the project to be a least-cost solution oil prices would have to rise and remain at a level of about \$37 per barrel over 40 years" (World Bank 1991b, p. ii).

4.40 Keeping in mind that project economic evaluation is an uncertain exercise, Tables 4.8-4.11 give some basis for discussing the resettlement costs in relation to the overall economic performance of hydropower projects.

Financial Performance

4.41 Because prices for electricity are generally administratively determined, the financial performance of power projects is critically dependent on the level of electricity tariffs (set by government in most cases). Many developing countries set electricity tariffs far below average costs, either for industrial promotion or social equity reasons. The Bank has campaigned for tariff increases, which should allow better financial performance, and in some cases (e.g., Brazil) has stopped lending to the power sector because of a disagreement over the country's tariff policy. In all power loans most of the covenants refer to the need to raise tariff levels. Yet in many countries tariffs remain low and the financial performance of the project is far below the power sector marginal costs no matter how well the projects are planned and evaluated (Table 4.6). This means that there is often little room to discuss the impact of resettlement costs on financial benefits because the financial benefits to the utility are often very limited. Economic cost-benefit analysis and least-cost analysis help to unveil some of these benefits.

²⁷See also the OED 1990 review of Colombia's energy sector.

Table 4.8 Internal Economic Rate of Return at SARs and PCRs

Region, country, and project	FY SAR	FY PCR	Internal economic rate of return		Economic evaluation
			SAR	PCR/PPAR	
<i>Africa</i>					
Ghana, Kpong Hydro & Third Power	1981	1985	16	7.5	negative
Zambia, Kafue Hydro	1973	1985	18	6.6	negative
Sudan, Third Power	1980	1990	16	7 (*)	negative
Swaziland, Third Power	1981	1990	9.4	6.8	negative
Madagascar, Andekaleka Hydro	1978	1987	11.3	7.5	negative
Burundi, Rwanda, Zaire;Ruzizi II	1984	1992	10	2.5	negative, low tariffs
<i>Asia</i>					
Sri Lanka, Fourth Power	1969	1981	24	30	positive
Thailand, Pattani Hydro	1977	1985	11	12	positive
Thailand, Khao Laem	1980	1986	16	16	positive
Fiji, Monasuva-Wailoa Hydro	1978	1986	18-14	9.5-10.5	at break even
Nepal, Kulekhani Hydro	1975	1986	6	3-6	at break even point
Indonesia, Tenth Power	1979	1989	16	11.45	at break even point
Thailand, Power Subsector	1981	1989	12	9.5	at break even point
Malaysia, Ninth Power	1980	1989	13.5	13.5	positive
Korea, Chungju Multipurpose	1976	1990	12	13.9	positive
Lao, Nam Ngum Hydro	1982	1990	17.8	16.6	positive
Indonesia, 13th Project	1983	1992	14	9	at break even point
<i>MENA</i>					
Morocco, Sidi Chero-Al Massira	1976	1984	9.6	11.1	at break even point
Romania, Riul Mare-Retezat Hydro	1976	1987	6.5	6.3	not clear
Yugoslavia, Visegrad Hydro	1985	1991	10	12	positive
Turkey, Karakaya	1976	1991	15.1	11.8	at break even point
Yugoslavia, Middle Neretva	1977	1992	11.2	10.2	at break even point
<i>LAC</i>					
Colombia, Guatape II	1973	1981	16	11 (*)	not clear
Brazil, Sao Simao Hydro	1972	1981	17	9.2	negative
Honduras, Nispero	1979	1984	9	4.6	negative
Brazil, Itumbiara Hydro	1975	1986	22.9	9.1	not clear, negative
Brazil, Paulo Afonso IV	1975	1986	23.3	13.2	positive
Guatemala, Aguacapa Power	1977	1989	14.9	10	at break even point
Honduras, El Cajon Power	1981	1989	9.9	4.6	negative
Colombia, San Carlos I & II	1978	1991	13.5	14.5	positive
Guatemala, Chixoy Hydro	1978	1991	13	6.5	negative
Guatemala, Aguacapa	1977	1989	14.9	10	positive

(*) Financial rate of return, IERR was not calculated at PCR

Internal Economic Rate of Return

4.42 Calculation of the Internal Economic Rate of Return (IERR) is supposed to give a better picture of the true benefits of a development project and its estimation is a standard procedure in project evaluation. On the cost side, market prices are corrected to reflect social opportunity costs (excluding taxes, usually increasing imported costs and decreasing internal wages). On the benefits side, the actual electricity tariffs are substantially corrected upward to better reflect the consumers' willingness to pay. In some cases there are attempts to measure all of the benefits accruing to consumers (the consumer's surplus), but in most cases some adjusted electric tariff is taken as a proxy for benefits.²⁸ With this framework, the project IERR is the rate that equalizes the stream of forecasted costs and benefits. If the IERR is above the average return of capital in other investments (the opportunity cost of capital, or OCC), the project is considered economically sound.

4.43 In Table 4.9 we have quoted available information on IERR, OCC, and resettlement costs for active projects. The table shows how much resettlement costs must increase to make a hydro project economically nonviable. On average, an overall cost increase of about 25 percent over the SAR's figures would jeopardize the economic health of the projects quoted in Table 4.10.²⁹ This increase can result from resettlement costs escalating an average of 1.5 times for projects where they were already 10 percent or more of total costs at appraisal. For projects with a smaller resettlement component (e.g., 5 percent of total) a threefold increase in resettlement costs would be needed to trouble the project (note that these are average figures with high standard deviations for each).

4.44 As shown in Table 4.1, resettlement cost overruns found in closed projects are usually below 100 percent. Only in two out of fourteen cases have they escalated more than 100 percent: Colombia's Guatape II (1.4 times) and Brazil's Paulo Afonso (2.8 times). From Table 4.2 we know that in Paulo Afonso resettlement costs were a moderate percentage of total costs (4.5 at appraisal and 5.9 at PCR). In this case even a three-fold increase in resettlement costs did not fully jeopardize the project economic benefits (Table 4.8). In the Colombia Guatape II project, resettlement costs were already above 10 percent of total project costs at appraisal and escalated to 22 percent at completion. In fact, as Table 4.8 confirms, Colombia's Guatape II presents a weak economic performance at completion, and the PPAR clearly points to increasing resettlement costs as a major reason. In most cases resettlement costs, even with substantial cost overruns, do not endanger the overall economic performance of the project, mainly because resettlement costs are not a large proportion of total project costs. When resettlement costs are 10 percent or more of the total project costs at appraisal, however, overruns in this component can affect the economic viability of the project.

²⁸For example, some cost benefit exercises will take the energy costs of self generated energy or the long range marginal costs of the electricity sector as a ceiling of the willingness to pay for electricity.

²⁹. Considering only projects with positive economic outlook at appraisal (i.e., IERR \geq 12).

Table 4.9 Sensitivity of the Internal Economic Rate of Return to Resettlement Cost Overruns as Estimated at SARs, Active Projects

<i>Region, country, and project</i>	<i>FY SAR</i>	<i>IERR</i>	<i>OCC</i>	<i>Critical cost increase % (1)</i>	<i>Resettlement as % of total project (2)</i>	<i>Necessary increase in resett. costs to put IERR below OCC (%)</i>
<i>Africa</i>						
C.A.R., M'Bali Energy I	1988	14.6	12	30	5.3-8.9	337 - 566
Leshoto, Highlands	1991	12	12	20	4.8	416
Benin,Togo; Nangbeto	1984	10	12		10	-
<i>Asia</i>						
China, Yantan	1986	12	12	10	12.9	77
China, Ertan	1992	15	12	25	6.4	375
China, Daguanga	1991	15	12	25	17.3	145
China, Shukoi I & II	1992	19	12	?	28.2	?
India, Srinagar	1988	11	12	?	2	?
India, Karnataka	1986	12	12	-	2.1	-
India, Indravati	1986	12	12	10	5.2	200
India, Kerala	1985	13	12	?	3	?
India, Nathpa	1988	17	12	45	0.04	11250
Nepal, Marsyangad (3)	1984	3.9-5.9	12	-	0.2	-
Thailand III	1990	16	12	30	4.8	625
<i>EMENA</i>						
Turkey, Berke	1991	15.2	12	30	1	3000
Turkey, Sir	1986	11.5	12	-	11	-
Turkey, Kayraktep	1985	11.3	12	-	9	-
<i>LAC</i>						
Argentina ,Yacyeta total (4)	1992	24-28	12	80	14	571
Mexico, Power	1989	13	12	15	2.3	652
AVERAGE FOR 13 PROJECTS WHERE ESTIMATED RESETTLEMENT COSTS AT SARs WERE 4.8 % OR MORE OF TOTAL COSTS (5)						304
Standard deviation (sd)						(250)
AVERAGE FOR 6 PROJECTS WHERE ESTIMATED RESETTLEMENT COSTS AT SARs WERE 10% OR MORE OF TOTAL COSTS						158
Standard deviation (sd)						238)

IERR: Internal Economic Rate of Return, OCC: Opportunity Cost of Capital

Average for critical cost increase for ten projects with IIER over 12 percent is 24 percent with a sd of 10. Argentina's Yacireta was not included (see note 4).

(1) It measures the percentage increase in total project costs that would reduce IBER below OCC making the project "non economic"

(2) Figures are taken from Table 4.3, with all the restrictions mentioned therein.

(3) IBER are based on current and/or proposed tariffs. Consumers' surplus was not estimated.

(4) The high IBER and robustness of the project results of not including \$3 billion of "sunk costs" in the evaluation performed by the Bank in 1992 (see World Bank 1992c, annex 2.9)

(5) C.A.R. M'Bali project was considered with both resettlement costs

Table 4.10 Financial Rates of Return for Active Projects as Estimated at SARs

<i>Region, country, and project</i>	<i>FY SAR</i>	<i>Estimated financial rate of return (%)</i>
<i>Africa</i>		
Lesotho, Highlands (1)	1991	6
<i>Asia</i>		
China, Yantan	1986	11
China, Shukoi I & II	1992	13.5
India, Srinagar (1)	1988	1
India, Karnataka	1986	4
India, Indravati (2)	1986	9
India, Kerala (3)	1985	5.7
India, Nathpa	1988	6.8
Nepal, Marsyngad	1984	3.9–5.9
Thailand III	1990	13

4.45 The problem with the IERR is that resettlement is not the only component prone to overrun. In fact, all types of cost overruns are common in hydropower projects. In a recent review of hydro projects, Besant-Jones (1993) found that average cost overruns were 35 percent (in current prices). Hence IERRs at completion are significantly lower than at SAR (Table 4.8).³⁰

The Least-Cost Alternative

4.47 A least-cost analysis compares different alternatives designed to meet a specific target. In the case of electricity production the target is the forecasted demand, and the proposed hydro project is compared with a second best alternative, usually a thermal power plant.³¹ The Equalizing Discount Rate (EDR) is the rate at which the proposed project costs are equal to the costs of the second best alternative. Again, if the EDR is higher than the OCC the proposed project is considered a good investment. In Table 4.11 the available information on EDRs and resettlement costs is presented. In the same way as Table 4.9, Table 4.11 compares EDRs with OCCs to find what cost overruns would make the hydro project an uneconomic choice. The table demonstrates that on average, a cost overrun of 20 percent is sufficient to make the project uneconomic.

30. In almost all cases, reduction in the forecasted electricity demand or prices imputed to electricity sale are also important reasons for the plummeting IERR.

31. The least cost alternative is more limited than the IIER approach in that (a) it does not try to measure all the project benefits but only the cost difference between two projects; and (b) it assumes a certain energy production target and therefore is ill-prepared to consider a no project or energy conservation alternative.

Table 4.11 Sensitivity of the Equalizing Discount Rate to Resettlement Cost Overruns as Estimated at SARs. Active Projects

<i>Region, country, project</i>	<i>FY SAR</i>	<i>EDR</i>	<i>OCC</i>	<i>Critical cost increase % (1)</i>	<i>Resettlement as % of total project (2)</i>	<i>Necessary increase in reset. costs to put EDR below OCC (%)</i>
<i>Africa</i>						
C.A.R., M'Bali Energy I (1)	1988	20.2	12	?	5.3- 8.9	
Lesotho, Highlands (1)	1991	na			^o 4.8	
Benin, Togo; Nangbeto (1)	1984	14	12	?	10	
<i>Asia</i>						
China, Yantan	1986	13	12	15	12.9	116
China, Ertan (3)	1992	na			6.4	
China, Daguanga (3)	1991	na			17.3	
China, Shukoi I & II	1992	18	12	35	28.2	124
India, Srinagar (1)	1988	na			2	
India, Karnataka	1986	na			2.1	
India, Indravati (2)	1986	18	12	20	5.2	385
India, Kerala (3)	1985	na			3	
India, Nathpa	1988	na			0.04	
Nepal, Marsyangad	1984	15	12	10	0.2	5000
Thailand III	1990	15.7	12	20	4.8	416
<i>MENA</i>						
Turkey, Berke (3)	1991	na			1	
Turkey, Sir (3)	1986	na			11	
Turkey, Kayraktep (3)	1985	na			9	
<i>LAC</i>						
Argentina, Yacyreta total (3)	1992	na			14	
Mexico, Power	1989	18	12	?	2.3	
AVERAGE FOR 4 PROJECTS WHERE ESTIMATED RESETTLEMENT COSTS AT SARs WERE 4.8 % OR MORE OF TOTAL COSTS (5)						267
STANDARD DEVIATION						(154)

EDR: Equalization Discount Rate, OCC: Opportunity cost of Capital.

Average for critical cost increase (five cases) 20%, sd (9.3)

(1) It measures the percentage increase in total project costs that would reduce EDR below OCC making the project "noneconomic" (2) Figures are taken from Table 4.3, with all the restrictions mentioned therein.

(3) The SAR has an exercise on least-cost alternatives, but no EDR and sensitivity analysis is performed

4.48 For projects with high resettlement costs (more than 10 percent of total costs at appraisal), an overrun of 1.5 times will be enough to jeopardize the project's justification. A very unlikely three-four-fold cost increase will be necessary in the case of moderate resettlement costs (around 5 percent of total costs at appraisal).

4.49 Before elevating the second-best alternative to first choice status, however, it should be noted that currently no least-cost exercise takes account of the resettlement or environmental costs of the second-best alternative. Thermal power technology has probably fewer resettlement costs but unless "clean" fuel and emission control technologies are used, can have larger environmental costs as compared to hydro projects. Energy technology is changing fast, however, and we are far from assessing the true costs of alternatives in most least-cost exercises. The general conclusions are:

- a. Currently there is not enough information to assess full resettlement costs of hydro projects or other alternatives. Nevertheless, we do know that in most hydro projects resettlement costs are underestimated at appraisal and several costs—both social and environmental—are only partially accounted for in the economic evaluation.
- b. Even with the current partial cost assessment, if resettlement costs at appraisal are 10 percent or more of total costs, particular efforts should be devoted to more careful cost estimation since resettlement cost overruns could jeopardize the project's internal economic rate of return (IERR). (Resettlement schedule slips could be as costly as cost overruns; most sensitivity analyses equate a one year delay to a drop of one point in the IERR.)
- c. A more refined cost comparison between power alternatives (the equalizing discount rate exercise) could actually change the ranking of projects when resettlement and environmental costs are 10 percent or more of total costs at appraisal. Such a comparison would require a better assessment of the resettlement and environmental costs not only of the hydro project but also of the other alternatives as well. This could probably be better done as a sectoral exercise or in the national energy plans rather than on a project-by-project basis.

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Annex

Table A-1 List of Sixty-Eight Hydropower Projects for Comparison of Resettlement Treatment in SARs

<i>FY</i>	<i>Region</i>	<i>Country</i>	<i>PROJECT NAME</i>
			<i>Active (A)** / Closed (C) as of March 93</i>
78	Africa	Madagascar	Andekaleka (C)
80	Africa	Sudan	Third Power (C)
80	Africa	Fiji	Second Power (C)
81	Africa	Swaziland	Power 3 (C)
84	Africa	Burundi/Rwanda/Zaire	Ruzizi II Hydro (C)
84	Africa	Tanzania	Power IV Mtera (C)
84	Africa	Rwanda	Power (C)
84	Africa	Kenya	Kiambere Hydro (C)
84	Africa	Togo/Benin	Nangbeto Hydro (C)
86	Africa	Ethiopia	Energy (C)
89	Africa	Central African Republic	First Energy (A)**
92	Africa	Lesotho	Highlands water project (A)**
92	Africa	Malawi	Power V (A)**
92	Africa	Uganda	Third Power (A)**
78	Asia	Fiji	Monsavu-Wailoa Hydro (C)
78	Asia	Thailand	Pattani- Hydro (C)
79	Asia	Nepal	Kulekhani Hydro (C)
80	Asia	Thailand	Khao Laem Hydro (C)
81	Asia	Indonesia	Power X (C)
81	Asia	Thailand	Power Subs. Project (C)
82	Asia	Laos	Nam Ngum III Hydro (C)
84	Asia	China	Luguge Hydro (A) **
83	Asia	India	Upper Indravati (A)**
83	Asia	Indonesia	Power XIII Cirata (C)
84	Asia	India	Indira Sarovar (C)
84	Asia	Nepal	Marsyangdi Hydro (A)
85	Asia	India	Kerala Power (A)**
86	Asia	China	Power VI Yantan (A)**
86	Asia	Papua New Guinea	Power III Yonki Dam (C)
87	Asia	China	Shuikou Hydro (A)**
87	Asia	India	Karnataka Power (A)**
87	Asia	Western Samoa	Afulilo Hydro (C)

88	Asia	India	Karnataka Power II (A)**
88	Asia	India	Uttar Pradesh Power (Srinagari) (A)**
89	Asia	India	Maharashtra Power (A)**
89	Asia	India	Nathpa Jhakri Hydro (A)**
91	Asia	China	Daguangba Hydro (A)**
92	Asia	China	Ertan Hydro (A)**
92	Asia	Thailand	Pak Mun Hydro
93	Asia	China	Shuikou II (A)**
78	LAC	Colombia	San Carlos Hydro (C)
78	LAC	Colombia	San Carlos Hydro (C)
78	LAC	Guatemala	Chixoy Hydro (C)
79	LAC	Colombia	Mesitas Hydro (C)
79	LAC	Colombia	San Carlos Power II (C)
79	LAC	Honduras	Nispero Hydro (C)
80	LAC	Argentina/Paraguay	Yacireta Hydro (A) **
80	LAC	Colombia	Medellin Power Scheme (C)
80	LAC	Honduras	El Cajon Hydro (C)
81	LAC	Colombia	Playas Hydro (C)
81	LAC	Colombia	Guavio Hydro (A)**
82	LAC	Peru	Power VI (C)
83	LAC	Haiti	Power III (C)
84	LAC	Colombia	Rio Grande (C)
84	LAC	St. Vincent / Grenadines	Power I (C)
85	LAC	Panama	Power VII (C)
87	LAC	Chile	Pehuenche-A (C)
89	LAC	Argentina	Electric Power Sector (Yacyreta) (A)**
89	LAC	Mexico	Hydroelectric Development (A)*
92	LAC	Argentina	Yacyreta II (A)**
78	MENA	Yugoslavia	Middle Neretva Hydro (C)
80	MENA	Turkey	Karakaya Hydro (C)
81	MENA	Romania	Power IV (C)
84	MENA	Egypt	El Keima & Aswan II (C)
85	MENA	Yugoslavia	Visegrad Hydro (C)
	MENA	Turkey	Kayraktepe Hydro (A)**
87	MENA	Turkey	Sir Hydro (A)**
93	MENA	Turkey	Berke Hydro (A)**

Twenty-one active projects as of March 1993 plus forty-seven closed projects. Total sixty-eight projects. Projects have been selected to match the fifty-nine hydropower projects reviewed by David Butcher for the period 1979-90 in Butcher (1990).

Table A-2 List of 39 Hydropower Projects Included in the Supervision Missions Review ³²

<i>FY</i>	<i>REGION</i>	<i>COUNTRY</i>	<i>PROJECT NAME</i> <i>Active (A)** / Closed (C) as of March 93</i>
81	Africa	Swaziland	Power 3 (C)
84	Africa	Burundi/Rwanda/Zaire	Ruzizi II Hydro (C)
84	Africa	Kenya	Kiambere Hydro (C)
84	Africa	Togo/Benin	Nangbeto Hydro (C)
89	Africa	Central African Republic	First Energy (A)**
92	Africa	Lesotho	Highlands water (A)**
92	Africa	Uganda	Third Power (A)**
80	Asia	Thailand	Khao Laem Hydro (C)
81	Asia	Indonesia	Power X (C)
81	Asia	Thailand	Power Subsector (C)
84	Asia	China	Lubuge Hydro (A) **
83	Asia	India	Upper Indravati (A)**
83	Asia	Indonesia	Power XIII Cirata (C)
84	Asia	India	Indira Sarovar (C)
84	Asia	Nepal	Marsyangdi Hydro (A)
85	Asia	India	Kerala Power (A)**
86	Asia	China	Power VI Yantan (A)**
87	Asia	China	Shuikou Hydro (A)**
87	Asia	India	Karnataka Power (A)**
88	Asia	India	Karnataka Power II (A)**
88	Asia	India	Uttar Pradesh Power (Srinagari) (A)**
89	Asia	India	Maharashtra Power (A)**
89	Asia	India	Nathpa Jhakri Hydro (A)**
91	Asia	China	Daguangba Hydro (A)**
92	Asia	China	Ertan Hydro (A)**
92	Asia	Thailand	Pak Mun Hydro (A)**
92	Asia	China	Shuikou II (A)**
79	LAC	Guatemala	Chixoy Hydro
80	LAC	Argentina/Paraguay	Yacireta Hydro (A) **

32. The following list includes twenty-four energy projects reviewed by Butcher (memo April 1987) for the period 1980-87 and twenty-three projects active as of December 1992 which have been reviewed by Abudal Salam and Deepali Tewari (unpublished papers 1993). Because several projects are in both lists the total is only thirty-nine. Furthermore, some successive loans for the same project are considered together in tables 9-12 rendering thirty-nine projects.

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80	LAC	Honduras	El Cajon Hydro (C)
81	LAC	Colombia	Playas Hydro (C)
81	LAC	Colombia	Guavio Hydro (A)**
84	LAC	Colombia	Rio Grande (C)
89	LAC	Mexico	Hydro Development (A)**
92	LAC	Argentina	Yacyreta II (A)**
80	MENA	Turkey	Karakaya Hydro (C)
85	MENA	Yugoslavia	Visegrad Hydro (C)
86	MENA	Turkey	Kayraktepe Hydro (A)**
87	MENA	Turkey	Sir Hydro (A)**

Table A-3 List of 31 Hydropower Projects Included in the PCRs and PPARs Review

<i>Year³³</i>	<i>Region</i>	<i>Country</i>	<i>Project Name</i>	<i>Report Type (No.)</i>
85	Africa	Ghana	Kpong Hydro & Third Power	PPAR (5781)
85	Africa	Zambia	Kafue Hydro	PCR (5566)
90	Africa	Sudan	Third Power	PCR (9014)
90	Africa	Swaziland	Third Power	PPAR (8823)
91	Africa	Madagascar	Andekaleka Hydro	PCR (10249)
92	Africa	Burundi, Rwanda,	Ruzizi II	PCR (10755)
81	Asia	Sri Lanka	Fourth Power	PPAR (3710)
85	Asia	Thailand	Pattani Hydro	PCR (5067)
86	Asia	Thailand	Khao Laem	PCR
86	Asia	Fiji	Monasuva-Wailoa Hydro	PPAR (6574)
86	Asia	Nepal	Kulekhani Hydro	PPAR (6177)
89	Asia	Indonesia	Tenth Power	PPAR (7902)
89	Asia	Thailand	Power Subsector	PCR (7887)
89	Asia	Malaysia	Ninth Power	PCR (7637)
90	Asia	Korea	Chungju Multipurpose	PCR (8379)
90	Asia	Lao	Nam Ngum Hydro	PCR (8374)
92	Asia	Indonesia	13th Project	PCR (11014)
84	MENA	Morocco	Sidi Chero-Al Massira	PCR (5173)
87	MENA	Romania	Riul Mare-Retezat Hydro	PPAR (6861)
91	MENA	Yugoslavia	Visegrad Hydro	PCR (10242)
91	MENA	Turkey	Karakaya	PCR (10243)
92	MENA	Yugoslavia	Middle Neretva Hydro	PCR (10334)
81	LAC	Colombia	Guatape II	PPAR (3718)
81	LAC	Brazil	Sao Simao Hydro	PPAR (3500)
85	LAC	Honduras	Nispero	PCR (5420)
86	LAC	Brazil	Itumbiara hydro	PCR (6099)
86	LAC	Brazil	Paulo Afonso IV	PPAR (6578)
89	LAC	Guatemala	Aguacapa Power	PCR (7890)
89	LAC	Honduras	El Cajon Power	PPAR (7901)
91	LAC	Colombia	San Carlos I & II	PCR (10237)
91	LAC	Guatemala	Chixoy Hydro	PCR (10258)
92	LAC	Guatemala	Aguacapa & Chixoy	PPAR (10830)

33. The year of publication of the PCR or PPAR.