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Integrated Impact Assessment for Sustainable Development: A Case Study Approach

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Summary. — The realization of sustainable development requires the use of different disciplinary approaches to the impact assessment of development proposals, which can give a balanced consideration to the multidimensional nature of sustainable development targets. This need has led to a growing interest in the integration of different methods of appraisal and evaluation into impact assessment methodology and practice. This article contributes to the development of a useable methodology for conducting integrated impact assessment (sometimes called integrated appraisal) by using case study experiences of development proposals. Three case studies, each of which has significant economic, environmental and social dimensions, are examined to see how appraisal was carried out in practice. Their primary purpose is to clarify some of the approaches to integrated appraisal currently in use as a prelude to identifying ways in which practice may be strengthened in the future. © 2001 Elsevier Science Ltd. All rights reserved.

Key words — integrated impact assessment, integrated appraisal, sustainable development

1. INTRODUCTION

Sustainable development is increasingly accepted as a fundamental objective for public policy and decision-making in different types of economy (developed, developing and transitional) and at different levels of intervention (aggregate, sectoral and project). While there is no consensus on a single, precise definition of sustainable development, there is general agreement, nevertheless, that it encompasses the economic, environmental and social dimensions of the development process as reflected in the UN definition of sustainability:

development is a multidimensional undertaking to achieve a higher quality of life for all people. Economic development, social development and environmental protection are interdependent and mutually reinforcing components of sustainable development (United Nations, 1997).

The growing acceptance of sustainable development as an overarching policy goal has

stimulated interest in assessing the impact of particular interventions on sustainable development, and has led to the emergence of integrated impact assessment, based on the use of a number of sustainable development principles and indicators, as one method for according the

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same level of consideration to economic, social and environmental impacts (George, 2000).

Concurrent with this recent interest in the integration of different disciplinary perspectives into impact assessment methodology and practice has been the increasing recognition of the role of stakeholder involvement in assessment (World Bank, 1997a; DFID, 1995). The involvement of both the various parties that will be directly and indirectly affected by a particular intervention, and representatives of the business community and civil society, can be seen as an extension of public accountability to stakeholders, and as such has a political and social value itself. The process of consultation with affected parties and other stakeholders can also have instrumental advantages, for example, by drawing on local or specialist knowledge to improve design, or by reducing uncertainty by building political consensus and ownership (Bond, 1998; Hulme & Taylor, 2000).

The development of a methodology for conducting integrated impact assessment, and for incorporating stakeholder participation into the assessment process is still at an early stage, and major methodological and practical issues remain to be resolved. What is more familiar is the methodology and application of separate forms of economic, social and environmental assessment at the project level. Cost-benefit analysis, environmental impact assessment and social impact assessment have been practiced for many years and, in the first two cases at least, their methodologies are well established at the project level (see Kirkpatrick & Lee, 1997, Chapter 1 and the references it cites on the scope and methodology of each of these forms of appraisal). But, the application of specialized economic, social and environmental appraisals at the policy, plan and program level (strategic-level appraisal) is much less developed. Economic analysis is the most developed at the strategic level, environmental assessment is much less developed (though growing), and social appraisal is the least developed form of strategic assessment.

One way of developing a useable methodology for conducting integrated impact assessments, is to build on case study experience. This paper considers three separate case studies, each of which has significant economic, environmental and social dimensions. The purpose of the analysis is twofold. The primary objective is to explore how appraisal was carried out in practice, the extent to which an integrated approach to assessment was used, and the ex-

tent to which this was conditioned by the context in which it was applied. A second objective is to draw some preliminary conclusions from the case studies, as to how a more appropriate and effective integrated appraisal may be realized.

The paper consists of five sections. Section 2 provides an overview of integrated appraisal—the different methodologies on which it draws, the current state of knowledge and use, and various issues and problems relevant to its future development and application. Section 3 presents the three case studies, providing a description of each scheme, an account of the appraisal methods and stakeholder participation processes that were used, and an indication of the extent to which some form of integrated appraisal was used. Section 4 provides a comparative analysis of the case studies, and draws together a number of general observations relating to the methodology and practice of integrated appraisal used in the three projects. Section 5 summarizes the principal case study findings and provides a number of recommendations on improving integrated appraisal practice.

2. AN OVERVIEW OF INTEGRATED APPRAISAL

Interest in integrated appraisal has grown on a wide front and "integration" has been discussed in a variety of contexts that need to be distinguished (Kirkpatrick & Lee, 1999). For example, integration may refer to:

- procedural and organizational arrangements to enable environmental, economic and social appraisal methods to be applied at similar points in time (Scholten & Post, 1999).
- methodological guidelines that encourage different types of appraisal (environmental, social and economic) to use consistent assumptions, methods and data and, when combined in an overall appraisal, to avoid gaps and overlaps in their coverage (Lee & Kirkpatrick, 1997a,b).
- development of crossdisciplinary insights which may not be fully acknowledged in single disciplinary appraisals (Tol & Vellinga, 1998; Toth & Hizsnyik, 1998).

The growth in interest in integrated appraisal has outpaced the rate of progress in developing an integrated methodology and approach to decision making. At the methodological level,

the likelihood of inconsistencies arising between separate appraisal methods, and of interdependencies between different types of impacts being overlooked, has become increasingly apparent (Lee & Kirkpatrick, 1997a; Rotmans, 1998). At the procedural level it has been difficult to coordinate the timing of separate appraisals, to synchronize these with the timings of decisions in the planning cycle, and to incorporate participation in each stage of appraisal and decision making.

It is possible to identify two polar positions in the spectrum of integrated appraisal approaches, which we categorize as "weak" and "strong" (see Lee & Kirkpatrick, 1997b). In the "weak" case, separate forms of appraisal are undertaken. The timing of the separate stages in the appraisal cycles may be coordinated, but the decision-making authority has considerable autonomy in deciding how these appraisals are "integrated" when making a decision. In the "strong" case, the environmental, social and economic appraisals are integrated with each other for the duration of the appraisal process, and the decision-making authority uses the overall appraisal in reaching its decision. In reality, however, both methodological developments and current practice are much closer to the weak end of the integrated appraisal spectrum than to the "strong" position.

Thus far, "weak" and "strong" integration has described the manner in which different disciplinary perspectives might be brought together in appraisal. "Integrated" appraisal can be understood more widely to include the involvement of stakeholder groups in assessment and decision making through the delegation of responsibilities to lower institutional levels. But here also the degree of integration achieved in practice has been "weak." There has been very little participatory involvement in economic appraisal, and the participatory and consultative processes in environmental and social assessment have been insufficiently related to each other.

3. INTEGRATED IMPACT ASSESSMENT—A CASE STUDY APPROACH

This article is premised on the belief that an examination of assessment as practiced can usefully inform the further development of an integrated approach to assessment and decision making. By adopting a case study approach we

may obtain valuable insights into the feasibility of adopting a more integrated approach to assessment overall, the different forms it may take and to the implications this might have for decision making.

We report on three major development schemes—the Area-Based Growth with Equity (ABGEP) Programme in Sri Lanka, the Manantali Energy Project covering Mali, Senegal and Mauritania, and the Acid Waters Problem Study in Wales, UK. We first provide a description of the three case studies, covering their background and history.

(a) Background to the case studies

The *Manantali Energy Project* (MEP) is a large-scale scheme to finance the installation of a 200 MW hydropower facility at the existing Manantali dam in Mali and a transmission system to distribute the power it generates to Mali, Senegal and Mauritania (World Bank, 1997a). The Manantali dam was initially constructed in the early 1980s to provide water storage, regulate river flow, and (as it was planned) generate power. A second dam, at Diama on the delta, was built at the same time to prevent the intrusion of salt water into the lower delta. Both dams have been in operation since 1988.

The Manantali and Diama dams allowed the extension of irrigated agriculture around the delta area and the supply of water for the city of Dakar. They also had serious environmental and health impacts. Combined with changing rainfall patterns, the Manantali dam has resulted in the curtailment of the annual flood and the environmental and production systems which depend on it. Downstream in the delta, the elimination of salt water intrusion has led to increased incidence of bilharzia and other health problems.

The impacts of these earlier investments engendered considerable local resentment, as well as unfavourable perceptions at both local and institutional levels, which later became transferred to the Manantali Energy Project. The involvement of three countries, the relations between two of which have been difficult (to the extent of them being at war, at one juncture), has added further complex institutional and political dimensions to the proposed scheme.

The ABGEP in Sri Lanka was initiated in 1998, in response to the limited regional development that had occurred in the previous

decade. Despite rapid economic growth following economic liberalization in the 1980s, there has been limited development in certain regions in recent years in Sri Lanka. This lack of regional development, coupled with weakly structured development planning at the provincial level, led to the preparation of a US\$6 million UNDP program to support regional development by strengthening links between local, regional and national levels. The program was intended to integrate the activities of government agencies, nongovernmental organizations (NGOs) and the private sector, over a five-year period. As a start, the Regional Development Division of the Ministry of Plan Implementation and the Provincial Council of Uva Province were charged with preparing a fundable pilot scheme in what is one of the largest and most disadvantaged provinces.

The Acid Waters Problem (AWP) in Wales has been recognized and researched by Welsh scientists since at least the early 1980s (Edwards, Gee, & Stoner, 1990; Stevens, Ormerod, & Reynolds, 1997; Brookes, 1998). Large areas in upland Wales have become acidified, due to atmospheric deposition, with consequential adverse effects on soils, water quality and biota in both upland and lowland areas. Despite a number of significant corrective measures being taken, it was estimated that by the mid-1990s:

34% of soils in Wales are affected and, in these areas, about 50% of first to third order streams may have been damaged by acidification. In terms of nature conservation, Wales is the worst affected region in Britain with over 43% of the total area of sites of Special Scientific Interest (SSIs) potentially damaged by freshwater acidification (Stevens *et al.*, 1997, p. 1).

Predictions indicate that emissions will fall and the quality of upland streams will improve in the future. Water quality and biological conditions elsewhere in Wales will improve more slowly, however, and in some cases, may deteriorate further. Therefore, significant problems are still likely to exist in year 2030 unless other measures, additional to those already agreed, are taken (Stevens *et al.*, 1997). In the later 1990s, this became of growing political interest, particularly with the establishment of the new Welsh Assembly.

(b) *Assessment methods and procedures*

For the *Manantali Energy Scheme* an environmental assessment (EA) was commissioned

during the scheme preparation stage (ERM, 1995). This included a review of available ecological, socioeconomic and natural resource data, field investigations, and public consultation. While no separate social assessment was undertaken, the EA did explicitly address a broad range of social issues.

An environmental mitigation plan, the PA-SIE¹ was elaborated for the MEP, based on the EA. This consists of six components (OMVS, 1999):

—impact mitigation: Standards and monitoring arrangements to minimize and mitigate the impact of construction of project works;

—land acquisition: Standards and procedures for land acquisition and rehousing, compensation, etc.;

—reservoir management: The development of a detailed environmentally sustainable reservoir management plan;

—environmental health: Pilot programs to eradicate bilharzia and malaria from the valley;

—accompanying measures: Including rural electrification and income-generation projects for communities near the transmission lines;

—monitoring, coordination and communications.

An economic analysis was also undertaken as part of the appraisal of the MEP. The average net electricity output of the project was valued at the current weighted average high-voltage tariff of the three countries and was considered to be the minimum economic value of the plant output. The quantity of energy produced was to rise to 758 GWH in 2002 and thereafter. Net economic benefit was calculated as the value of net energy to be produced by the turbines less the costs of the transmission network (the investment already made in the dam at Manantali was excluded). While the analysis made allowance for an assumed reduction of 20,000 ha. in the average area of flood recession agriculture, no attempt was made to value other environmental costs or their associated impacts (e.g., on livestock grazing, fisheries, forestry and village water supply) or effects on human health.² The resulting internal rate of return was calculated to be 16% (World Bank, 1997a,b, p. 53).

Given competing claims on water (for power generation, irrigation, flood recession agriculture, etc.), the long-term social and environmental impacts of the dams will depend critically on the future management of the

Manantali reservoir. The project design envisages that OMVS³ should operate the reservoir "in such a way as to ensure that on average there is an artificial flood sufficient to enable the cultivation of 50,000 ha as often as possible." The requirements of water for the artificial flood would take priority over those for electricity generation⁴ (World Bank, 1997a, p. 101). According to the model used in appraisal, the artificial flood would imply a 7% reduction in the level of electricity production from its potential maximum (i.e., that would be achievable without the constraint to provide an artificial flood). While the value of the electricity thus forgone was significantly higher than the agricultural benefits from cultivation of the additional inundated land (US\$14million compared to US\$4.5 million), the nonquantified economic and social benefits were considered to be sufficient to swing the balance in favor of the artificial flood (World Bank, 1997a; Lamagat, 1996).

For the ABGEP, the appraisal approach that was initially adopted was a significant departure from traditional methods of assessment. A process approach, combining planning and appraisal, was used with the objective of identifying a set of sustainable and equitable development projects which at the same time would strengthen regional project planning capabilities. This alternative approach was characterized by broad participation, managerial flexibility, in-built learning mechanisms and the strengthening of devolved institutions, while acknowledging the political dimension of project preparation and the weak planning and appraisal capacities at provincial level (Bond & Hulme, 1999).

The problems of the area selected for the pilot scheme (Uva Province) included low investment, deforestation, lack of land tenure for smallholders, and limited private sector economic activity. At the institutional level, there was a high level of dependence on state bureaucracies, combined with a low and ineffective level of NGO involvement.

In following a process approach, the Planning Unit of the Provincial Administration initiated a strategy of devolved planning which comprised the following elements. The first step was to clarify the concept of balanced concern for growth, equity and environmental sustainability, and to communicate the concept to key thinkers and activists from all sectors. Sectoral analysis was then initiated within this framework through a series of 13

sectoral "brainstorming" workshops involving secondary stakeholders (officials from provincial ministries, Chamber of Commerce, business sector and NGOs) to elucidate potentials and constraints for the type of development proposal. Competitive proposals in outline "sketch" format were invited from any agency wishing to promote innovative development according to ABGEP principles through institutional/sectoral collaboration. Task groups were formed from the workshops to oversee this process, thereby diffusing and devolving part of the appraisal function. Each of the 125 sketch proposals, received from 44 agencies within 2-3 months, were reviewed by Provincial Planners and returned with comments on "fit" with concept. A second round of refined proposals was received and 48 were selected by the provincial planning authorities, from half of the 44 agencies, for the first annual tranche of funding support. The proposals fell into three main groups: institutional development, land and water-based economic development, and non-farm economic development.

In effect, the integrated appraisal function was devolved and informalized within and between the various agencies. Dialogue between the Provincial Planners and the proposing agencies ensured that the proposers understood what was required to keep their proposals in line with program aims. The "in-principle acceptance" of proposals for inclusion within an annual tranche of funding was therefore realized without any formal appraisal. Although final detailed plans would be individually scrutinized by planners before support is provided, to ensure they were within the spirit and expectations of the programme, this would not involve any formal appraisal in the traditional sense of that term, other than financial appraisal by the banks for the proposed co-financing of project costs.

The impact of this program will depend on future changes in a complex, diverse and unpredictable region, involving both planning and investment as well as their social, environmental and economic outcomes. Since change will also be induced through both the experience and the outcomes of a large number of small investment projects, implemented over a number of years, there is no single point at which formal appraisal, integrated or otherwise, might meaningfully be undertaken.

This program followed a process approach to project selection, and participation was an

integral feature of its planning approach. At the same time, the Planning Unit of the Provincial Administration undertook a number of initiatives to strengthen political and institutional support for the program. These included briefings of national and provincial Ministers on the aims and underlying thinking of the program and dialogue with key agencies of central government to make them aware of the constraints to regional development originating at the national level of government and administration.

In the case of the AWP in Wales, the appraisal work commenced at the beginning of 1998, when the Environment Agency Wales requested the National Centre for Risk Analysis and Options Appraisal (hereafter, the National Centre) of the Environment Agency to advise on methods for the appraisal of strategic options for the future management of acid waters in Wales.⁵

The approach which was adopted for the first phase of this appraisal was strongly influenced by previous experience in the National Rivers Authority (one of the predecessors of the Environment Agency), particularly in developing methods for carrying out environmental impact assessments and more strategic environmental appraisals of water resource options in different catchment areas (see, for example, Gardiner, 1992).

The main ingredients of the appraisal methodology were:

(a) Construction of an evaluation matrix which listed—

(i) 13 options to reduce the acid waters problem (these were grouped into five broad categories—sulphur reduction; nitrogen reduction; land use and forestry management; liming; bio-remediation);

(ii) 11 appraisal criteria (environmental, social and economic) by which assessment of each of the options was to be undertaken.

The variables in the matrix were initially identified by Environment Agency Wales and the National Centre, based on expert judgement, reviews of previous EIAs and the available literature. They were expressed in a relatively simple form considered appropriate to strategic level analysis and taking into account the time and resources available for the appraisal. The evaluation matrix was then tested and agreed within workshops facilitated by the National Centre.

(b) Completion of the matrices, assigning scores (high, medium, low) to each option/

criteria cell, based on the collective judgement of the workshop participants. The information upon which this judgement was based was largely provided by the participants themselves.

(c) Comparison of options, using four pre-selected decision factors, an unranked paired-comparison technique (Dean & Nishry, 1965) and some sensitivity testing.

Two conclusions were drawn from this first phase of the appraisal. First, only three of the 13 options could be safely eliminated from further consideration. These related to bio-manipulation, fish genetic manipulation and liming of agricultural land and catchments. Second, there was little observable difference, at this level of analysis, between the overall appraisals of the remaining options and the application of sensitivity tests did not materially alter this conclusion. It was then recommended that the appraisal should be extended into a second phase which would retain several features of the first study, including further consideration of the 10 remaining options, and also appraise combinations of different option types. During the second phase (which was ongoing when this research was undertaken) more studies were being undertaken to strengthen the information base of the appraisals, the range of expertise involved in the appraisals was being widened (for example, in economic and social appraisal) and a wider range of stakeholders were to be engaged in the process.

Central to the Phase 1 approach were three workshops held in March 1998, July 1998 and April 1999. Those participating in the first workshop were drawn from Environment Agency Wales, the Welsh Office, certain Welsh forestry organizations, the Countryside Council for Wales and the National Centre. The spread of organizations represented at the two subsequent workshops was broadened slightly. The personnel participating in the workshops were predominantly environmental scientists with interests in the Welsh acid waters problem.

4. COMPARATIVE ANALYSIS OF THE CASE STUDIES⁶

(a) Contextual and procedural issues

The approach taken within each scheme to its assessment differed significantly. This re-

flected the particular political, historical, institutional, technical and financing factors in each context and the stage in the planning and appraisal of the "scheme" which it had reached.

In the case of the Manantali energy scheme, the construction in an earlier period of the Manantali and Diama dams without adequate environmental and social safeguards, had two important implications for the preparation of the subsequent energy scheme analysed here. In particular, the negative environmental and social impacts of these earlier investments had engendered considerable local resentment, as well as unfavorable international perceptions of their appraisal, and much of this spilled over onto this scheme. At the institutional level, the involvement of three countries added institutional and political challenges, which were compounded by the number of government agencies (not to speak of the 12 co-financiers) also associated with the scheme.

In the ABGEP case the decision to adopt a process approach, in which planning and appraisal were interactive, was partly a reaction to the perceived "failure" of the traditional appraisal approach to produce regionally balanced growth with suitable social and environmental sustainability outcomes (see also, Hulme & Taylor, 2000 concerning the process approach). It was also partly a recognition of the considerable uncertainty about future outcomes at early stages of appraisal in the planning cycle.

"Acid waters" have been a political issue in Wales for the last 15-20 years and sustainable development has become an important goal of the newly established Welsh Assembly and of the Environment Agency. The principal aim of the Environment Agency is "to contribute towards the objective of achieving sustainable development, having regard to its responsibilities and resources" (Environment Agency, 1998). The commissioning of the National Centre to undertake the appraisal study was seen, therefore, as an appropriate response to the likely political interest in further investigation of this longstanding problem.

Clearly, there are significant differences in the motivations of the different agencies in applying appraisal on an integrated basis. In the case of the Manantali energy scheme, it was a requirement of World Bank funding to undertake an environmental assessment (EA). The

unfavorable perceptions engendered by the earlier phase of development added further pressure to undertake a social and environmental appraisal. In the ABGEP case, individual project selection was demand-driven, with the "bottom-up" identification of projects for funding replacing the more orthodox "top-down" supply-driven appraisal procedures. As a result there was a high degree of local "ownership" of project selection. In the "acid waters" case, a major driver in the appraisal process was the newly established National Centre whose main activity is appraisal. This has ensured a high level of commitment to the appraisal process. It has also meant that the appraisal methodology used, has been significantly influenced by the National Centre itself, also taking into account the early stage in the planning process at which the Phase 1 appraisal was undertaken.

All three case studies involved a range of agencies in the appraisal process. The procedures for coordination between the agencies, however, varied. In the Manantali energy scheme the main agencies were the World Bank and OMVS (Implementing Agency) which followed established World Bank procedures for interagency cooperation. For the Sri Lankan program, the procedures for interagency cooperation were negotiated and evolved on an ongoing basis, reflecting the nature of the process planning approach that was adopted. For the acid waters case, interagency coordination was informal during Phase 1, partly because it was a very early stage in the process, and partly because it was the first case of its kind handled by the Environment Agency and its National Centre.

(b) *Methodological issues*

To what extent did the case study appraisals employ an integrated methodology; and what methods, if any, were used for consultation and participation of stakeholders?

For the Manantali energy scheme, the complex, long-term, uncertain and geographically dispersed nature of potential impacts, including effects on environment, local economy (agriculture, fisheries, pastoralism, etc.) and human health, presented considerable methodological challenges to appraisal. The impacts, affecting diverse stakeholders in intricate and unpredictable ways, are difficult to measure, to predict, or to value in economic terms.

Rather than integrate the different disciplinary perspectives, the appraisal proceeded by conducting economic analysis in parallel with assessments of environmental and health impacts (although an estimate of the costs of flood recession agriculture forgone was included within the economic analysis). While there was little formal integration of economic, environmental and social perspectives in the scheme's appraisal, neither did any one of these obviously dominate at the expense of the others. Rather, the various appraisals both reflected and contributed to, the evolution of the program policy over a number of years. The process was also influenced by public debate and international lobbying over the same period.

The parallel assessments of the environmental and health impacts of the Manantali energy project were effective in identifying means to minimize or mitigate various impacts of the project (especially the direct impacts of construction) (Jobin, 1993). They also strengthened the case for a water regime which gave some weight to downstream agricultural interests, an aspect of the project which had previously been neglected.

For the ABGEP, individual project identification was an output from the sectoral "brainstorming" workshops which generated a large number of outline project proposals. Detailed comments were prepared on the majority of these proposals by the provincial agencies and local consultants and, of the original 125 outline projects, 48 were accepted for detailed planning within the first tranche of funding. The criteria for selecting projects were not explicitly formulated, but the accepted projects met most or all of the requirements of the program. They were divided into three main clusters: institutional development initiatives, land and water-based economic developments and nonfarm economic developments. Production and social equity considerations were reflected throughout and environmental considerations were evident in many of the projects.

In the case of the acid waters study, the appraisal of options followed a well-defined methodology, which had evolved over a period of 15 years, and originated within the National Rivers Authority (a predecessor of the Environment Agency), for carrying out environmental assessments of water resource projects. At the same time, it reflected the broad strategic nature of the policy options under consider-

ation and the early stage in the planning process at which the first phase of the appraisal was being undertaken.

The methodological approaches to integrated assessment in these three cases can be summarized as follows. For the Manantali scheme, separate appraisals were carried out in parallel, and integration occurred only at the decision-making stage. In the acid waters case, a single, technically integrated appraisal, covering all appraisal criteria, was used from the outset. In the ABGEP case, no explicit integrated, technical methodology was used in individual project appraisal and selection, except that the projects selected for funding were identified according to sustainable development principles and were judged according to their consistency with the program's overall objective of integrated regional development.

The three cases also show considerable variation in the methods used for consultation and participation of stakeholders in scheme appraisal. For the Manantali energy scheme, the establishment of an institutional framework allows for consultation of local communities on scheme impacts, provides them with timely information on planned flows and floods, and obtains feedback on environmental, social, economic and health impacts. At the local level, this framework comprises local consultative committees (CCL), consisting of representatives of the local administrative authority, OMVS, the relevant government services, elected local representatives, stakeholders associations (including associations of farmers, herders, fishers and women), and locally active NGOs. At the national level, a consultative committee has been established in each country to play an advisory role both in project implementation and subsequent reservoir management, whose members include the main institutions and agencies concerned as well as an NGO delegate and delegates from the local governments and community-based organizations.

To ensure the establishment and functioning of these institutions, a social and environmental unit is to be established within OMVS, consisting of personnel with skills in participatory development and social impact analysis. Responsibilities of this unit will include establishing the consultative mechanisms, training and orienting their members, and monitoring social and economic impacts.

For the ABGEP, consultation with secondary stakeholders was fundamental to the whole

process of planning and appraisal to try to ensure that stakeholders played a central role in formulating the projects selected for funding. In Phase 1 of the acid waters study, consultation was mainly limited to the main agencies involved and certain technical experts. Social scientists and economists were not involved at this early stage, and few interest groups participated in the appraisal workshops. It was envisaged, however, that both the range of appraisal disciplines and of interested stakeholders involved would be broadened during subsequent phases of the appraisal.

5. CONCLUSIONS AND RECOMMENDATIONS

This investigation has served two main purposes. The primary aim has been to clarify some of the approaches to integrated appraisal which are currently being used and the main determining influences on these. A secondary aim has been to identify possible ways of strengthening integrated appraisal in the future. The main findings and recommendations are summarized below. Since the investigation was limited to three cases, the conclusions are provisional and need to be tested using a larger sample of appraisals.

(a) *Case study findings*

Each of the three cases relates to a relatively large scheme and, in each instance, the appraisal has been carried out at a relatively early stage in the planning cycle, with other important stages of appraisal and decision making to follow. Partly because of its large scale, each scheme has a potentially large number of stakeholders and its political sensitivity, national and international, is likely to be high.

In a number of other respects, the three cases are very different. They are located in different countries, and are being processed under different political, regulatory and socio-economic conditions. The nature of the three schemes is also very different: a large-scale energy project, a substantial program containing nearly 50 smaller-scale community development projects and a countrywide environmental improvement policy initiative. The key stakeholders in each scheme are very different and, equally significant, so are their

organizational goals and their approaches to technical appraisals, consultations and decision making.

Despite these differences, there are some common features. Each of these three schemes is expected to have economic, social and environmental consequences, although the relative importance of each may differ. Given the early stage in the planning process and the long time scales involved in each case, any estimates of the size of these consequences is subject to a great deal of uncertainty. Logic suggests that some form of integrated appraisal, which incorporates the appraisal of these three types of impact, is likely to be helpful in the planning and decision making which takes place during the planning cycle. More especially, it is likely to be helpful when their likely contribution to sustainable development (with its economic, social and environmental pillars) is being assessed. Yet, is this achievable and to what extent is this being satisfactorily achieved at the present?

At one level, each of the three case studies provides an example of economic, social and environmental impacts being considered, and taken into account, alongside stakeholder consultation, in overall appraisal and decision-making. As deeper analysis has revealed, however, the similarities between the three cases probably end there. They are at different points on the continuum between "weak" and "strong" integration but additionally reveal other important methodological differences.

—In one case (Manantali), an internal rate of return, based on a cost-benefit analysis, has been estimated but this has not been attempted in the other two cases, where economic appraisal has been handled in a more preliminary manner.

—In one case (Manantali), a formal environmental assessment has been undertaken, in another case (acid waters), the assessment of different types of environmental impacts is a prominent part of the overall appraisal but these are only assessed in a preliminary manner, while in the third case (ABGEP) environmental assessment *per se* is not treated as an explicitly distinguished part of the overall appraisal.

—Separate social impact assessments were not undertaken in any of the three cases but, in at least two of these, social impacts were regarded as important but handled in different ways. In the Manantali scheme, a broad range of social impacts was addressed

within the EA while, in the ABGEP case, social impacts were central considerations in the linked appraisal-planning process that was in use. In the acid waters study, consideration of some social impacts was subsumed in certain of the evaluation criteria used in the overall appraisal but social impacts were not separately identified and assessed at this stage in the planning cycle. —The approach adopted to the integration of economic, social and environmental impacts in the overall appraisal was very different between the three studies. The acid waters study used an explicitly defined multicriteria methodology which encompassed all types of impact considered relevant to appraisal at this stage in the planning cycle. In the Manantali case, the economic appraisal and environmental (and social) impact assessment proceeded as separate, parallel studies. Their combined use in planning and decision making was handled through the procedures of the key stakeholders, such as the World Bank—an integrated appraisal methodology, as such, was not used. In the ABGEP project, integration within the overall appraisal and its use for planning and decision making were realized through workshops within which key stakeholders participated.

—Similarly, the approach adopted to stakeholder involvement and community consultation varied considerably between the three cases. In the ABGEP case, stakeholder involvement, through workshops etc., was central to the whole integrated appraisal-planning process. In the Manantali case, the extent of consultation in the economic appraisal was very limited; and some public consultation formed part of the EA process but it was not extensive. More extensive local and national consultations are envisaged in subsequent stages of the planning and implementation process. In the acid waters case, a limited range of stakeholders played an important role in the Phase 1 appraisal but no public consultations took place at that stage. Greater stakeholder participation and public consultations are envisaged in subsequent stages.

It is important to recognize that these major differences in specialized and integrated appraisals do not, in themselves, imply that the integrated appraisals described are deficient. On the contrary, given the different influences on their approaches to appraisal and decision

making, it would be surprising (and possibly disturbing) if they were identical. This basic need for diversity in approaches to integrated appraisal has to be taken into consideration when formulating proposals for improving integrated appraisal practice.

Among the more important influences, which have led to differences in appraisal approaches between these three cases, are the following:

—the nature of the proposed action being appraised (a well-defined large project; a program comprising a considerable number of small projects; a national-level environmental policy);

—the historical, institutional and cultural context within which the proposed action is being planned and appraised (a predominantly economic context for appraisal, later widened to include some social and environmental issues; a predominantly community development context, somewhat suspicious of traditional appraisal methodologies; a technically-oriented, multicriteria analysis (MCA) approach to appraisal, mainly involving experts from the principal stakeholders);

—the stage in the planning and project cycle at which the appraisal is taking place (all appraisals may be described as occurring at an early stage, with acid waters being at a very early stage, and the Manantali project being "least early" of the three). It is noteworthy, in all three cases, that the appraisal appears to reflect the predominance of one of its components at the inception of the scheme—economic (Manantali), social (ABGEP), or environmental (acid waters). In all three cases, however, the basis for the appraisal (in terms of breadth of coverage, degree of formality and detail, and/or extent of consultation and stakeholder involvement) was likely to change at subsequent stages in the process.

(b) *Improving integrated impact assessment practice*

Integrated appraisal is still in its infancy and, understandably, there is considerable scope for its improvement. For reasons already stated, we do not propose a single standardized methodology for universal application. Rather, we consider the choice of method should be sensitive to the nature of the proposed action, the stage in the planning and project cycle at

which it is being appraised and the context (institutional, regulatory, cultural) in which the appraisal will take place. We also accept that, for practical reasons, a "step-by-step" approach to the improvement in integrated appraisal (IA) procedures and methodologies may be needed.

Our proposals below on choice of IA method are partly based on the analysis of the three case studies and partly on the other IA literature to which reference has also been made in this article. These proposals are preliminary, given the small number of cases which have been investigated. We hope others will be stimulated to undertake additional IA case studies possibly using the *Case Study Checklist* (covering appraisal context, procedures and methods) which is contained in Appendix A.

—Determine the most appropriate overall approach to IA which should be followed, taking into account the nature of the proposed action to be appraised, the stage/s in the planning process at which it is to be appraised and the context (institutional, regulatory, cultural) in which it will be appraised. Clarify whether a "step-by-step" strategy to the full implementation of this approach is to be adopted.

—Plan and make explicit, from the beginning, the contributions to be made by different disciplines and their relationships to each other. This should be undertaken within a framework, which covers the economic, social and environmental goals of

the proposed action; the assumptions upon which the IA is based; the consistency of the data to be collected; the predictive and other appraisal methods to be used; the scheduling of the appraisal activities to be undertaken and the common procedures to be followed. A balanced and careful approach to the early scoping of the appraisal could be very helpful in developing this IA framework.

—Plan the process of participation/consultation with stakeholders, and its relationship to the technical IA studies being undertaken.

—Develop effective ways of presenting IA issues and findings to stakeholders, the public and decision makers (e.g., displaying, in simple formats, the extent to which each of the economic, social and environmental goals is likely to be achieved by the proposed action, and the likely benefits and disbenefits which will be experienced by each stakeholder group).

—Extend the IA process into the implementation phase of the action, so that the actual economic, social and environmental impacts are monitored, evaluated and managed as part of an IA management system.

—IA skill needs should be carefully assessed at the outset of the appraisal process, as well as the use to be made of multidisciplinary teams within it. Skill deficiencies should be addressed, in line with the step-by-step strategy, through supporting measures for the preparation of IA guidelines, training courses and institution-strengthening.

NOTES

1. Program d'Atténuation et de Suivi des Impacts sur l'Environnement.

2. This modification was somewhat arbitrary as the argument was being simultaneously made that the project would reverse the negative downstream environmental and social impacts of the earlier investments of Manantali by introducing improved reservoir management and other measures.

3. Organization de la Mise en Valeur de la Vallée du Fleuve Sénégal, the implementing agency.

4. But not over the requirements for pumped irrigation, even though the flood would not be guaranteed due to variability in rainfall.

5. The National Centre was established in 1998 "to assess risks to the environment and provide guidance on appropriate techniques to appraise options (to assist) the Agency to maximise its contribution to sustainable development. A key component of this process is informing Agency and other decision makers through robust assessments of technologies and environmental, economic and social assessments of options" (Environment Agency, 1999).

6. A checklist of questions (see Appendix A) was applied to each of the schemes, and the information obtained then provided the basis for the comparative analysis summarized in this section of the article.

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APPENDIX A. CHECKLIST OF QUESTIONS FOR INDIVIDUAL CASE STUDIES

A.1. Contextual questions

1. What are the problems, organizational goals, etc. which triggered this appraisal and which may be influencing how it is undertaken (i.e. what is the relevant, contextual history of the appraisal)?
2. What has been the importance of political, historical, institutional and other factors in

constraining/predisposing the appraisal to consider particular options?

3. What is the scale and timing of the action to which the appraisal relates? Does the case study relate to the appraisal of a policy, plan, program or project and at what stage of its preparation is the appraisal being undertaken?

4. How does the organization responsible for the appraisal view its purpose and intended use? For example, is it perceived to be a sustainability appraisal or a more narrowly-based appraisal? How is the appraisal intended to be used for planning and decision making purposes?

5. How did the parties involved perceive appraisal as a tool for achieving sustainable development, e.g., was it seen as essential, merely useful, or reluctantly undertaken as a requirement of an external agency? In the use of appraisal, were alternatives appraised (how many?), or was a single option appraised against set criteria?

6. In absolute terms, and also relative to other case studies examined, where would the case be put on a scale between situations where there is high stability, certainty, good data, competent organizations, good understanding, simplicity of contextual situation and political stability; and situations where there is instability, uncertainty, poor or absent data, weak organizations, poor understanding, complexity and political fickleness?

7. How did the development proposal originate in terms of problem analysis and identification procedures?

A.2. Procedural questions

8. How many agencies were involved in the appraisal and its use for decision making? What in broad terms was the nature and extent of the inputs of the major agencies involved? How were their inputs coordinated?

9. What types of personnel were involved (numbers, skills, disciplines), implementation arrangements and costs (order of magnitude) for the various analyses/appraisals that were undertaken.

10. What were the main appraisal and interagency coordination procedures followed in the major agencies involved? To what extent did these follow standard appraisal procedures adopted within the agencies concerned?

11. To what extent was the appraisal constrained by time, financial or other limita-

tions? How far, and in what ways, did these influence the appraisal approach and methods used?

12. What are the main subsequent stages in appraisal, decision making and implementation which are to be followed after this stage of the appraisal is completed? In what ways, if any, is the character of any subsequent appraisals of this action likely to differ significantly from that of the current stage of appraisal? This is concerned with any follow-up to the appraisal that may be relevant to its interpretation and evaluation.

A.3. Methodological questions

13. Which stakeholders were consulted during the appraisal and how were they consulted? What assumptions were made about the nature and homogeneity of their interests? What institutional arrangements were made to consult them? Were these arrangements temporary or on-going?

14. What general methodological approaches and more specific appraisal methods were used to assess economic, social and environmental impacts either separately or in combination? To what extent was an integrated methodology used from the outset of the appraisal or did the integration occur at a late stage in the appraisal?

15. To what extent are the appraisal methods, used by the principal agencies involved, formulated in their guidelines? Is a copy of the relevant guidelines available?

16. Where separate appraisals were undertaken, to what extent were they consistent in terms of the assumptions, data, prediction methods, evaluation/significance criteria used?

17. To what extent did the methods used analyse the distributional consequences of the scheme?

18. Where more than one methodology perspective/approach was used, were their findings integrated, *in practice*, for planning and decision making purposes or not? Did one of them tend to have a predominant influence or not?

19. How important was the appraisal process as a whole in influencing the outcome? What specific decisions or design measures can be traced directly to economic, environmental and social analysis, respectively and together?

20. To what extent do capacities for economic, environmental and social analyses exist

for monitoring, post auditing and for adaptive management responses based on these, during and after implementation? To what extent are these implementation phase analyses and management responses occurring in practice?



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