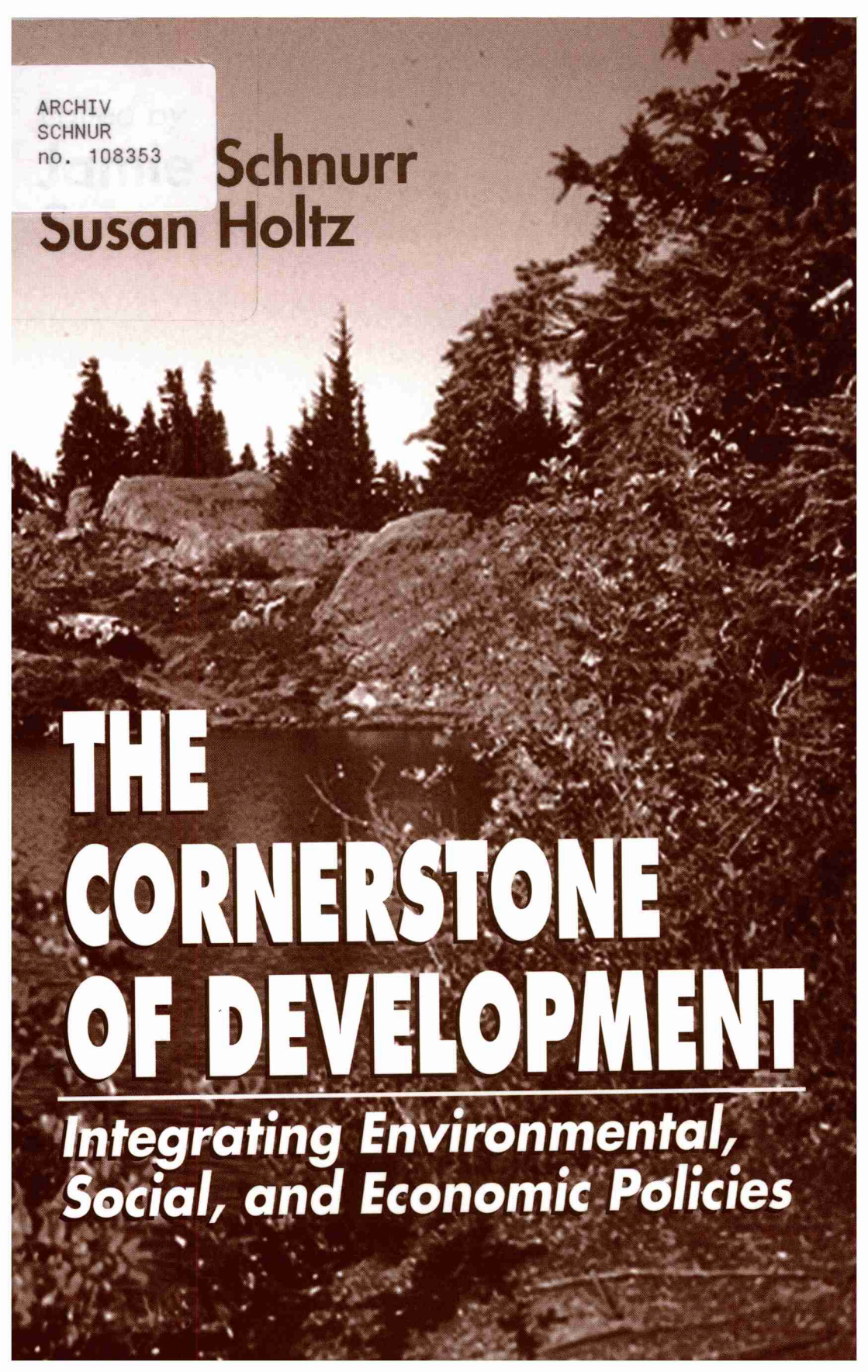


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Susan Holtz



# THE CORNERSTONE OF DEVELOPMENT

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*Integrating Environmental,  
Social, and Economic Policies*

# **THE CORNERSTONE OF DEVELOPMENT**

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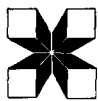
*Edited by*  
**Jamie Schnurr**  
**Susan Holtz**

# **THE CORNERSTONE OF DEVELOPMENT**

***Integrating Environmental,  
Social, and Economic Policies***



**IDRC**



CANADA

**INTERNATIONAL DEVELOPMENT  
RESEARCH CENTRE**

**Ottawa, Canada**



**LEWIS PUBLISHERS**

**Boca Raton London New York Washington, D.C.**

*MS 51  
2-11-93*

## Library of Congress Cataloging-in-Publication Data

The cornerstone of development : Integrating  
environmental, social, and economic policies / edited  
by James Schnurr and Susan Holtz.  
p. cm.  
Includes bibliographical references.  
ISBN 1-56670-353-0 (Lewis Publishers)  
ISBN 0-88936-842-2 (International Development Research Centre)  
1. Environmental management. 2. Environmental  
policy. 3. Sustainable development. I. Schnurr, Jamie. II. Holtz, Susan.  
GE3000.C64 1998  
363.7'05—dc21

98-34436  
CIP

## Canadian Cataloguing in Publication Data

Main entry under title:

The cornerstone of development : integrating environmental, social, and economic policies

Includes bibliographical references.

ISBN 0-88936-842-2

1. Sustainable development – Developing countries.
2. Community development – Developing countries.
3. Economic development – Developing countries.
- I. Schnurr, Jamie.
- II. Holtz, Susan
- III. International Development Research Centre (Canada)

HC79.E5C67 1998      338.91      C98-980139-X

Co-published by  
Lewis Publishers  
2000 Corporate Blvd., N.W.  
Boca Raton, FL 33431, U.S.A.

and by  
International Development Research Centre  
P.O. Box 8500  
Ottawa, ON  
Canada K1G 3H9

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International Standard Book Number 0-88936-842-2  
International Standard Book Number 1-56670-353-0  
Library of Congress Card Number 98-34436  
Printed in the United States of America 1 2 3 4 5 6 7 8 9 0  
Printed on acid-free paper

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## Chapter 7

# Supplying Clean Water to the Citizens of Nairobi

P.M. Syagga



## Introduction

Integrating environmental, social, and economic concerns in planning for sustainable development has received considerable attention in recent years. Chapter 8 of Agenda 21 (UNCED 1992), signed at the Earth Summit, declares that environmental protection is at the centre of the sustainable-development process and cannot be considered in isolation from social and economic development. The increased interest in integrated policy-making stems from a recognition that the separation of economic, social, and environmental factors in decision-making has not been conducive to sustainable development. However, much remains to be learned on how best to adjust and reshape decision-making processes to fully integrate environment and development activities. Research is needed to examine the conditions that facilitate and promote integrated-policy development. In addition, because research often represents a first step in bringing about a change in the way decisions are made, research processes need to be developed that in themselves provide a basis for building integrated-policy processes. The purpose of integrated-policy research is to inform policy-making and promote the design and implementation of policies that reflect the interdependence of social, economic, and environmental systems. This chapter presents some observations on integrated-policy research from an African perspective and illustrates these with a case study of a research project to evaluate the Third Nairobi Water Supply Project in Nairobi, Kenya. This is followed by an analysis of the case, highlighting both the strengths and weaknesses of the research project, with particular emphasis on links between research and policy.

## Integrated-policy research and planning in East Africa

The overall objective of integrated policy is to promote sustainable development in the context of policies that integrate efficient use of environmental resources, reduction of poverty, and strengthening of human and institutional capacity for development. In Africa, environmental degradation and poverty combine to create a vicious cycle, with poverty a key factor in producing environmental degradation and vice versa. This cycle can be narrowed and eventually broken if sustainable development, as an environmental-management system, becomes the norm.

Despite this gloomy picture of economic and ecological crisis in Africa, many countries still take a purely conservationist approach to environmental management, rather than one that focuses on the broader context of sustainability and simultaneously addresses both human and resource sustainability. In much of Africa, the linkages between environment and development continue to be overlooked, as evidenced by sectoral-development programs without a structural environmental perspective. A methodology linking environment with economics or social policy remains unclear and elusive, a result of the lack of institutional development, appropriate techniques, and an enabling political climate.

Integrated-policy concerns first appeared in the development literature in Africa during the 1960s. In essence, the literature called for increased attention to the interrelationship between individual aspects of rural development and for the implementation of packages of mutually reinforcing activities in the rural areas. Various attempts to undertake a set of interrelated activities simultaneously were made in projects such as the Gezira irrigation project in Sudan and the Accelerated Rural Development Programme in Botswana (Sterkenburg 1987). These and many other projects in East Africa reflected a basic-needs approach to development, employing measures directed at generally improving the living conditions in the rural areas, without identifying a target population.

In more recent times, the concept of integrated development has been applied in a variety of situations, in both rural and urban areas, but with emphasis on target groups, particularly the poor. Multilateral and bilateral agencies, national governments, and nongovernmental organizations (NGOs) are sponsoring programs that incorporate integrated activities as a development package, which, for lack of a better term, researchers in the region have named the "package approach." Housing projects in East African cities, such as Dar-es-Salaam, Kampala, Lusaka, and Nairobi, have targeted low-income groups, used site and service schemes and squatter-upgrading projects, and incorporated activities to improve housing conditions and activities to promote income generation. This represents a move away from the sectoral approach that, for instance, considered housing development only as shelter provision.

Accordingly, *integrated policy*, as used in East Africa, refers to a development policy that addresses a package of issues and aims at improving the living



conditions of a target group. Solutions to issues are to be implemented simultaneously as an integrated set of activities. As emphasized at the Earth Summit, human beings are at the centre of concerns for sustainable development. If sustainable development is to be achieved, environmental protection must be considered an integral part of the development process — it cannot be considered in isolation. Because of the delicate ecological base of most of the countries in Africa, environmental concerns are achieving political prominence, particularly within regional bodies such as the Inter-Governmental Authority on Drought and Development. Although the conservation message has been given political legitimacy in some countries, available evidence suggests that the capacity of the existing institutions to develop and implement sustainable-conservation programs is limited (Kiriro and Juma 1989). The available knowledge on natural-resource management and economic and social policy is still limited, and more systematic efforts are needed to collect and analyze information to enable key policymakers and practitioners to identify feasible policy options.

Environmental awareness in urban areas is increasing, particularly in light of deteriorating urban infrastructure and the problems of waste management. A number of cities now implement programs that incorporate environmental concerns, such as the Sustainable Cities project in Dar-es-Salaam and the Green Towns project in five secondary towns in Kenya. Still lacking are legally enforceable standards or codes of practice on environmental issues to facilitate monitoring.

Efforts have been made to include approaches to development similar to those of Agenda 21 in the project packages. The objectives of Agenda 21 can only be reached, however, if the region fully appreciates the significance of environmental concerns in social- and economic-development planning.

## **Key features of the package approach**

The package approach to development policy in East Africa has included various aspects of integration in the planning and implementation processes in specific projects. The following are some features of integrated-policy research and planning in East Africa;

### **Inter- and intrasectoral integration**

Inter- and intrasectoral integration is based on specific functions and resource positions and incorporates inter- and multidisciplinary tenets of integrated-policy research. For example, for project implementation in the present case study, an Inter-Ministerial Task Force was formed, incorporating key ministries, particularly those with portfolios for water, environment, agriculture, and provincial administration.

### **Target-group participation**

Target groups participate in the planning and decision-making process, particularly in projects targeting poor communities. The degree of participation has depended on the type of activity, as well as the implementing agency. Projects

executed by international and national NGOs have sought to obtain full participation of the target groups, from inception to completion, by operating through community-based organizations. Projects implemented by government agencies, on the other hand, use civil servants as agents of change; participation of target groups is limited and primarily at the implementation stage. Clearly, there is vertical integration in the package approach, although the degree of integration is variable. In the present case study, an Environmental Action Programme committee was formed as a subcommittee of the Inter-Ministerial Task Force and included all government-department heads, NGOs, and representatives of the affected population in the project area. The committee was to oversee project implementation on the ground. However, in terms of integrated-policy research, vertical integration is seen to be achieved only when the beneficiaries fully participate, from project planning right through to implementation. The beneficiaries might include community groups and other stakeholders, such as policymakers and advisers. Thus, the integration process in this local context has not yet fully realized its potential.

### **Administrative, or horizontal, integration**

Administrative, or horizontal, integration is based on multi- and interdisciplinary activities within the package. These activities may or may not involve environmental concerns, as no deliberate efforts are made to integrate these concerns with economic or social issues. Often, environmental concerns come into consideration with issues like population and agriculture or in studies on human settlements. Poverty studies, particularly in the urban context, seem to be concerned with income generation and health, rather than with environmental degradation *per se*.

The extent of horizontal integration of leadership, the working arrangements, the inclusion of various disciplinary perspectives, and the type of research tools depend on how the research project was initiated, who prepared the brief, and what type of award systems are in place to promote involvement and integration. Often, the disciplinary perspective prevailing at the initiation of the project is the perspective that is assumed by those who take up the role of team leadership as principal researchers, and that influences decisions about the disciplinary perspectives of people invited to participate.

In this scenario, researchers from each discipline are asked to prepare a proposal on how the activity or task should be carried out, as well as estimating the cost and time involved. Each researcher is expected to execute the research independently and present a draft for the team leader to incorporate into the whole report. Invariably, the final research document is structured in sections, according to the inputs of the researchers' various disciplines. For instance, in this case study, the initial feasibility study was carried out by an engineering consulting firm, with an engineer as the team leader. Researchers from other disciplines were asked for their inputs; however, the engineering concerns about the dam construction were most prominent. The project's involvement of the affected population was minimal.

In sum, integrated research in East Africa still has some way to go and may require deliberate efforts to realize its potential. At the outset, both researchers and policymakers may see integrated-policy research as synonymous with participatory research.

## Participatory research

In participatory research, the researcher has a subjective commitment to the target community and to the betterment of human conditions. Thus, in theory, the target population is given a chance to express its views on relevant solutions to its problems, and more research time is spent in and with the community so that community members can participate in the identification of research questions, the selection of methods of data collection, and the analysis. Various forms of knowledge, including valid popular knowledge stemming from people's socio-cultural heritage and practical experience, are accepted. However, in practice, difficulties arise in choosing community representatives. The complex reality of power relations in the community acts to favour individuals having different levels of participation, depending on factors such as age, gender, socioeconomic status, and family background. In many cases, the participating group may not be representative of the whole community. In participatory research, as well as in integrated-policy research, greater benefit derives from widening the spectrum and increasing the number of people who participate.

This need is often addressed by selective participation strategies, recognizing that existing local forms of decision-making that provide for popular representation may not reflect the values and norms for participation held by outsiders.<sup>1</sup> Although participatory research is also action oriented, it has a vertical-integration methodology and therefore falls short of horizontal-integration requirements for integrated-policy research. Integrated-policy research is not only participatory but also multi- and interdisciplinary in approach and gives special consideration to the interdependence of social, economic, and environmental concerns. This is yet to be fully realized in East Africa, and deliberate actions of researchers and policymakers will be needed to meet the demands of integrated-policy research.

## Methodology of integrated-policy research

Policies and programs for sustainable development can be successful only if the people affected by these policies and programs fully participate in their development and implementation. As a rule, the majority of decision-makers at the technical level in most governments and development agencies in East Africa are social scientists; only a few are natural scientists, and they have failed to apply

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<sup>1</sup> Syagga, P.M. 1994. Integrating environmental, social and economic policies (INTESEP) in urban planning and development research in eastern and southern Africa. In IDRC highlights report. INTESEP workshop, Abidjan, Côte d'Ivoire. International Development Research Centre, Ottawa, ON, Canada. Unpublished manuscript. Annexe 1. pp. 1–23.

the available scientific knowledge to human situations. Under the influence of politicians, a tendency has been to go for easy options with short-term gains, without due regard to long-term sustainability.

The prevailing assumption among many policymakers is that politicians at local and national levels represent the community and that involving these representatives ensures the full participation of the community. Researchers have also thought that politicians hold the goodwill of the community and that the politicians' involvement secures community acceptance. Consequently, numerous intervention programs in development have failed. The need to ensure community acceptance for the sustainability of interventions has led many to look at the value of participatory methods to help match beneficiary needs and realities with development initiatives and thereby contribute to the greater local control and sustainability of these efforts (Baldwin and Cervinskask 1991).

This is particularly relevant to integrated-policy research. In terms of the research-policy nexus, it is essential to use the tools of participatory research to promote real dialogue, horizontally between researchers and vertically between policymakers and beneficiaries. The fact that we live in a dynamic society forces us to revise the traditional perspectives and methodological tools we use to investigate development problems. A new approach is needed to define research problems, gather and analyze data, and report information to advise policy. New types of arrangements within and between institutions, beneficiaries, and decision-makers may also be needed to effectively use such research methods. The underlying issues are bringing the different disciplines to adopt a common approach to development issues and getting policymakers to appreciate the contribution of the community in the research process.

### **Planning**

Integrated-policy research involves greater collaboration, cooperation, and communication among the research team, policymakers, and beneficiaries. It thus needs both horizontal and vertical integration. Accordingly, integrated-research preparation (problem definition and team selection) should be a participatory process, involving multistakeholder partnerships, so that a shared understanding of the problem develops. An effective team leader is essential to the success of the project. Because integrated research addresses social, economic, and environmental concerns together, the different disciplines must adopt a common approach to the research design and implementation at the planning stage.

### **Data collection and analysis**

To ensure appropriate integrated-policy research, the team leader should balance the input from each researcher but remain focused on the problem and not be distracted by competing disciplinary assumptions. Analytical tools and concepts used by one discipline should be transferable to and readily understood by researchers from another discipline. Collaboration, cooperation, and communication in data collection and analysis should be ongoing among the researchers, beneficiaries, and policymakers. The researchers from different disciplines

should agree on a common set of parameters, a common level of significance for accepting the research results, and a common format for presenting data. All the other actors in the research process should be involved in reaching this common understanding.

### **Presentation of findings**

Given that integrated-policy research aims at informing policy-making and promoting interdependence of policy concerns, the presentation of research results should focus on achieving cooperative agreements for change. The approach should build trust and confidence among partners as a basis for a common agenda, common priorities, and common actions. The presentation should also tap and make more effective use of local and indigenous knowledge and skills and be a capacity-building process. A synthesis of research should be presented in a format amenable to existing policy mechanisms and should be followed up with a workshop with all stakeholders and a proposal for a plan of action. All this will help promote an effective research-policy nexus.

## **The practical role of research in integrated policies**

This section examines a specific effort to promote integrated research in the design stage of a research project. The shortcomings of this project provide a number of lessons for the design and implementation of future integrated-policy research.

### **The Third Nairobi Water Supply Project evaluation**

#### **Background**

Since Nairobi became the administrative capital of Kenya in 1900 a number of water-supply projects have been undertaken, but until the Third Nairobi Water Supply Project, none involved an environmental-impact assessment (EIA) before implementation, particularly with respect to residual impacts of the water abstraction and the sludge-waste disposal into the rivers. Also absent from these projects were assessments of their socioeconomic impacts.

As the population of Nairobi was growing at 6% per year and would treble by 2010, Nairobi City Council (NCC) embarked in 1988 on the Third Nairobi Water Supply Project, expected to yield 460 000 m<sup>3</sup> of water per day (Syagga and Olima 1996). The estimated cost of the project was 30.5 million US dollars, and the project was cofinanced by the Overseas Economic Co-operation Fund of Japan, the African Development Bank, the European Investment Bank, NCC, and the Government of Kenya. The three funding agencies were represented by the World Bank, and their funding was channeled through the World Bank. When completed, the project was expected to displace 500 households and flood 350 ha of land used for small-scale tea farming. In

addition, the water was to be pumped to Nairobi in 4-m-diameter pipes, constructed on 24-m-wide wayleaves acquired through private parcels of land, over a distance of some 60 km. Although the project site was in a rural district, and hence the affected people were in a rural settlement, the ultimate beneficiaries were to be the residents of the City of Nairobi.

Recognizing this project would have both positive and negative impacts on the population and the environment, NCC commissioned a number of studies to prepare plans for an environmental-action and -monitoring program (Howard Humpreys [Kenya] Ltd and Environmental Resources 1988; Syagga Associates 1988; Acquasystems Consultants 1989). These plans were to ensure that few negative socioeconomic and environmental impacts resulted from the implementation of the project. For instance, NCC had to initiate and facilitate investigation of any negative effects on the environment, including soil erosion and pollution, from construction and operation of the dam and its aqueducts. NCC was also required to pay prompt and adequate compensation to the displaced families and work out resettlement programs to minimize personal suffering, as provided under section 75 of Kenya's Constitution and the *Land Acquisition Act*, chapter 295 of the *Laws of Kenya* (GOK 1968). However, these commissioned studies were carried out independently by the three firms, and the implementation of the plans seems to have been considered as separate rather than integrated tasks.

The construction of the dam was completed in 1995, and the 500 displaced families were compensated, moved out of the area completely, and resettled in new areas, some as far as 500 km away. In 1994, NCC commissioned two consulting groups to carry out research to evaluate the implementation of the environmental-action and -monitoring program drawn up in 1989, as well as any other NCC actions during the dam construction, either around the dam or elsewhere in the project area. In addition, the consultants were to make further recommendations to improve the project's sustainability and develop management options for the reservoir and the route followed by the tunnels and pipelines over the 60-km distance between the dam site and the distribution point in Nairobi. Unlike previous studies, however, in this study the World Bank and NCC made a deliberate effort to have integrated research on the two major themes, the environmental and socioeconomic impacts of the project.

## Management of the evaluation research

### Research planning

Two consulting teams were commissioned to carry out the research, one to evaluate the socioeconomic impacts of the project and the other to evaluate the environmental impacts. The consultants had earlier participated in preparing the 1989 action plans. NCC initially invited them to submit their proposals to carry out the evaluations. The consultants were then invited to a meeting with representatives of NCC and the World Bank to discuss their proposals in detail. With

the necessary amendments, the proposals formed the terms of reference for the work, as two separate projects, to be carried out with appropriate collaboration between NCC and the researchers. Although it was unclear to both the researchers and NCC how best to collaborate in this project, it was clear from the terms of reference that the results were to lead to integrated-policy development. The main terms of reference for the researchers were the following:

- ♦ To evaluate actions taken to contain disturbances in the dam catchment and their ecological impacts;
- ♦ To evaluate actions taken to contain disturbances and soil erosion along the pipeline route;
- ♦ To assess and evaluate the sludge-waste disposal system at water-treatment works and suggest remedial measures to counteract the increased sludge–water ratio.
- ♦ To determine whether displaced households were better or worse off than they had been before the project, in terms of access to social amenities (education, health, transport, etc.) and economic status;
- ♦ To evaluate the effectiveness of the resettlements and the rehabilitation process for displaced households;
- ♦ To recommend future management options for the reservoir and pipeline route, taking care to recognize that only environmentally friendly activities could be carried out by either NCC or the local community; and
- ♦ To work in collaboration with appointed NCC officials, to submit the draft report within 3 months for comments from NCC and the World Bank, and to submit a final report within 1 month of the receipt of comments from NCC and the World Bank.

### **Vertical and horizontal integration**

To facilitate the consultants' work, NCC assigned a sociologist in charge of the resettlement program to the socioeconomic team and a water chemist to the environment team. The two officials held a joint meeting with the consultants to agree on a preliminary work plan.

The consulting teams each had members from the University of Nairobi. The lead consultant for the socioeconomic study, a land economist specializing in real-estate valuations and compensations, formed a team with a sociologist, an economist, a public administrator, and 10 graduate assistants. The lead consultant for the environmental study, an ecologist, formed a team with a zoologist, an agriculturalist, a water-quality chemist, a public-health technician, and a laboratory technologist. The two lead consultants, who became the team leaders, then independently organized separate work programs. Each team then separately met with its respective NCC official — a departure from the

integrated-policy-research process initially set out by NCC and the World Bank — and agreed on detailed work plans.

The socioeconomic team used questionnaires, observations, and sampling to survey the displaced households, scattered in five districts of the country (it had been impossible to secure enough land for a single resettlement site). The NCC sociologist, in collaboration with the provincial administration, helped the team trace 259 household heads (of the 500 displaced) and their dependants. The team conducted interviews, as well as made observations, on how the families were coping with life in their new homes. In addition, the team interviewed a sample of officials from NCC, the central government, the contractor, and people living in the vicinity of the project.

The questionnaires had been drawn up with sections dealing with different issues, according to the prime areas of concern of each specialist. After discussing the sections together, the research team and NCC arrived at a consensus about the sequence and wording of the questions. The team split up into groups consisting of one researcher and three or more research assistants to administer the questionnaires. Results from separate groups were entered and analyzed together using Statistical Package for the Social Sciences software.

The economist basically did the quantitative analysis and presented the results. Presenting the qualitative aspects was mainly the work of the sociologist and the public administrator, who took notes during the field surveys on their impressions of the respondents and, together with the lead consultant, carried out most of the background literature review. Although the report was written in parts by four consultants, using the appropriate data, it was edited by the lead consultant and the sociologist. The typed draft was then circulated to the four researchers and NCC for their comments.

The lead consultant, after receiving the comments, called a meeting of the researchers and the NCC official and circulated the comments for discussion. The lead consultant then prepared a final draft of the report and submitted it to NCC to be incorporated with the report from the environment team.

Contrary to expectations, not much collaboration took place between the two research teams during data collection, analysis, or report writing. Their methods of investigation, as well as their perceptions of the project, were different in the main. One team was more concerned about people, whereas the other was more concerned about the environment.

The environment team used scientific laboratory techniques and observations in their research. Unlike the socioeconomic team, which traveled widely, this team concentrated its work in the project area, where it observed the eco-anthropological changes that had occurred in land-use patterns in the watershed and adjacent catchment areas and the impacts of construction activities on the riparian ecosystems, from the dam site to the treatment plant, and beyond, to the treated-water reservoir in Nairobi. This team also collected samples of water from the streams for quality testing (dissolved oxygen, temperature profiles, etc.) and to test the fishery potential of the dam. Like the socioeconomic team



members, each member of the environment team had a separate assignment, to be carried out independently within a given time frame. Each researcher drafted a separate piece, which was submitted to the lead consultant for discussion and subsequent editing.

When reports from both teams were ready, NCC called a meeting to discuss the subreports and the best way to incorporate them into one document. There was also the issue of who was to merge the two reports. It was agreed that the draft reports, "Socio-economic Appraisal," and "Physical and Environment Evaluation," be submitted in their present forms to NCC and the World Bank for their comments. After receiving the comments from the two institutions, the lead consultants edited the final reports and presented them in two separate volumes.

Again contrary to expectations, the two reports were not jointly written or cross referenced. Instead, they have to be read as independent reports. This makes integration in policy formulation and implementation difficult. The fault here lies with the two research teams, which considered their assignments as being different and independent, as well as with NCC, which had neither the idea nor the experience of coordinating integrated research.

## **Assessment of the research**

The research was policy-demand driven and made useful recommendations to the NCC and the Kenyan government on how best to handle compensation and resettlement to avoid human misery and how best to manage the dam and the pipeline in an environmentally friendly way. As discussions with NCC officials showed that they were enthusiastic about putting some of the recommendations into practice and thereby creating a good research-policy nexus, it is unclear why the proposed action plans were never fully implemented.

In terms of integrated-policy research as theoretically conceived, this research project fell short of some of its requirements. The role of the beneficiaries, for instance, was neglected during the research design, as well as during the preparation of the report. The beneficiaries should have included those displaced, those around the dam site and pipeline, and Nairobi residents who receive the water. The management of the reservoir and the pipeline requires the participation of the community to prevent water pollution, avoid damage to the pipes, etc. The beneficiaries only participated as interviewees and had no ownership of the research in any sense. For this reason, unless NCC provides incentives, it may be difficult to use the research results in environmental-protection initiatives. In other words, appropriate vertical integration was not incorporated into this study, even under the conventional participatory research. At the time of the survey, this resulted in residents along the pipeline puncturing it at various points to draw water, which, if uncorrected, may lead to a lot of wasted and unaccounted for water.

With respect to horizontal integration, the conduct of the research could be described as multidisciplinary, rather than interdisciplinary. Although the

research was multisectoral in terms of involving several disciplines, the process lacked collaboration, cooperation, and communication between the two teams. Some form of cooperation and communication occurred, but only within each team. The effect of this was duplication in collection of some socioeconomic data, such as on changes in the land-use patterns of people whose land was only partly acquired, like those along the pipeline wayleave. This information could have been collected by only one group if the two groups had compared notes initially about their research methods. In some instances, the researchers contradicted each other if observations had been made at different points. For instance, whereas the socioeconomic group observed that the contractor had not rehabilitated most of the land along the pipeline, the environment group gave the impression that the contractor had rehabilitated the land by planting Nippier grass. In fact, the landowners had done the rehabilitation, and they have since asked NCC for additional compensation for work carried out on behalf of the contractor. Such contradictory findings, of course, led to contradictory recommendations for policy.

The final report reflects the fact that the synthesis of the data was more an accumulation of various findings than an integration of the research components. This is especially noticeable in the environment volume, with each part reading independently of the others. The socioeconomic team at least had one survey instrument and methodology for data analysis.

The two volumes of the report were edited for uniformity of writing style. Although each volume maintained the scientific rigour of its respective discipline, the whole report failed to exploit the commonalities. The fault lies in the professional prejudices of the researchers, as well as in NCC's lack of expertise in coordinating integrated research.

Finally, the research failed to provide any training or workshop to involve stakeholders. The reports were presented in writing only to the researchers, NCC, the World Bank, and the government. The public and other institutions were unaware of the findings and the recommendations. Because the research was commissioned, NCC and the World Bank now claim to own the information and researchers may not disseminate it without their authority. However, permission may be possible if the researchers are willing to disclose only the positive aspects of the findings.

Despite its shortcomings, the evaluation exercise did reveal a number of positive aspects. Indeed, as Syagga and Olima (1996) observed, the Third Nairobi Water Supply Project had both positive and negative impacts. On the positive side, the project created direct employment at the construction site and in small-scale businesses that serve the construction workers. Labour for future dam maintenance will also be required. The project has also created a number of facilities for the benefit of the surrounding community, notably a primary school, a health clinic, an improved road network, and a power-supply station. Above all, the project will supply enough water to sustain Nairobi's growing needs to 2005.

However, the project has caused a considerable amount of suffering for displaced households. Extended families were split up, compensation money was inequitably distributed within households, the total compensation was insufficient, and families suffered a loss of earning capacity. The dam altered the microclimate in the vicinity, and more mosquitoes are breeding and causing sickness in the surrounding areas. Farmers are also having to deal with soil erosion arising from the unprotected high embankments, and the remaining parcels of land are economically unproductive. These should have been considered during the feasibility study, which points again to the need for integrated-policy research.

### **Research-policy links**

Vertical integration in the project was weak. The participatory role of the community members was limited to that of respondents rather than that of owners of the project. To date, they have no idea what the research findings were or what role they would be expected to play in the future.

At NCC, only the Water and Sewerage Department officials were involved. No other NCC departments or any of its policymakers participated, so they may be unaware of the relevance of the research and may not support the implementation of its recommendations, particularly any that have financial implications. A dissemination seminar or workshop would therefore have been most appropriate for the rest of NCC's officials, whose future support may be very crucial. Some of the recommendations touch on national policy, such as land-acquisition processes and compensation and resettlement of displaced populations. Other recommendations, like using the dam for sports and fishing, will need collaboration from the Ministry of Environment and Natural Resources or the Ministry of Tourism for implementation. These ministries and many others need to be familiar with the project and have an opportunity to give their opinions and support in advance of implementation. NCC therefore requires a lot of political goodwill, as well as professional support, from various organs of the central government to implement the recommendations. Equally important is the need to sensitize other local authorities and institutions in the country that may undertake similar projects so that they can benefit from the lessons already learned. The dissemination methods adopted so far have, however, precluded any meaningful participation in this research-policy link on a wider scale.

Thus, some of the major shortcomings of the research-policy links in this project can be summarized as lack of community participation, ineffective reporting and dissemination strategies, and inappropriate institutional structures for implementation. However, the impact of the study is gradually gaining ground. The two lead consultants were subsequently invited to participate in a proposed major hydroelectric generating project, principally to deal with issues of land compensation and EIA. However, even in this research project, the issues of vertical integration, particularly with respect to community involvement, remained unresolved.

## Conclusion

The evaluation research for the Third Nairobi Water Supply Project is an example of the integrated research typical of many African countries. The research had socioeconomic and environmental components. It was policy oriented and conducted by researchers from a number of disciplines in the social and natural sciences. The results had important implications for policy formulation both at the national level and at the specific-project level. The role of institutions in promoting an interdisciplinary understanding of issues was evident, particularly when NCC decided to award the consultancy as a joint project (although with two separate contracts). The leadership appeared effective, leading to timely completion of the research. The incentive system, in the form of consultancy fees, appeared appropriate.

However, in East Africa, the concept of integrated-policy research is yet to be appreciated. This example of a research project exhibits a number of weaknesses in the ways integrated-policy research is conducted that may be typical for the region. Full participation of the beneficiaries was lacking in the research process. Other organs of NCC and of the central government that were crucial to policy formulation were also uninvolved. This suggests a lack of appropriate mechanisms and institutional structures to facilitate research-policy links. Poor horizontal integration between the research teams resulted in accumulation of various findings, rather than the integration of research components. The methods of reporting and the dissemination strategies appeared ineffective for wider research-policy links.

Although data collection by the socioeconomic team created no serious problems, some issues arose, such as how better or worse off a particular household was and what would be adequate social compensation. No consensus was achieved on the assessment of nonuse values of the land because these are not easily quantifiable. The environmental team had even greater problems with indicators of environmental quality. For instance, Kenya has no appropriate pollution standards, thus making it difficult to implement policies on conservation and pollution control and monitor their effects (Syagga 1994). Even in the developed countries of the North, indicators of sustainable development are the subject of continuing debate in economic planning and environmental management. Various models are proposed and continually revised, using simulations (Kuik and Verbruggen 1991). Adequate experience is also lacking in mobilizing popular participation in the formulation and implementation of policies at the national level. In this respect, integrated-policy research has a role to play, as research is about generating new knowledge and solving problems and can help policymakers to either select interventions for specific contexts or improve interventions.

## Recommendations

This case study provides some key lessons for future research efforts aimed at integrating policies for sustainable development in Africa:

- ♦ Research problems should be identified in close consultation with the users of the research results. If research problems are improperly identified, then research on a problem is likely to produce findings irrelevant to the user, creating bottlenecks in research–policy links. A more recent feasibility study for a hydroelectric generating project in Kenya, being carried out by two leading engineering firms, is facing similar problems because of limited consultation with the people whose property will be acquired for the project.
- ♦ Monitoring and evaluation should be part of the research. Research is conducted to find solutions to specific problems or to better understand a given situation. Without a process of monitoring and evaluation, it is difficult to determine how successful the solutions are. What is more pertinent, however, is the timing of the appraisal. In this case study, for instance, elaborate action plans were to be implemented in 1989, but the evaluation, which was not carried out until 1994, showed that implementation was still incomplete. Perhaps it was too late or too costly to correct some of the negative impacts.
- ♦ Interdisciplinary research projects should be followed by policy-formulation workshops. Government planners should be encouraged to participate in and use such workshops to develop their own ideas on how to cope with policy options. Government departments should also be encouraged to work with scientists on live problems to strengthen the link between the researchers and the policy planners and implementors. However, the amount of funding allocated for policy research is usually such a small proportion of any total project funding that it rarely allows for dissemination workshops.
- ♦ Research and training need a more integrated approach. Research projects need to provide or to be integrated with planned training components that build up the necessary skills of researchers, technicians, and support staff in training institutions. A few institutions, such as the School of Environmental Studies at Moi University in Kenya, are now adopting integrated research and training in their programs.
- ♦ National governments need to formulate environmental policies for both urban and rural settlements. EIA requirements for proposed development programs imply that environmental indicators and standards have already been developed. This is far from reality in most African countries. Accordingly, national governments and the international community should support and encourage research in

environmental management to provide baseline data for formulating policies. A few countries, notably Kenya, Tanzania, and Zimbabwe, have national environmental action plans, but implementation is still hampered by a lack of scientific parameters. For instance, countries like Kenya and Tanzania, which have traditionally harboured refugees, have, to date, been unable to appreciate and accordingly to plan for environmentally sustainable refugee settlements.

- ♦ Institutional capacity of various national governments and related agencies needs to be strengthened so that they can cope with the needs of integrated-policy research. Just as sustainable development requires that environmental costs be integrated into economic systems, it also requires that citizens be integrated into the political process. The pursuit of sustainable development requires a political system that recognizes effective citizen participation in decision-making. The national environmental action plans, which are in various stages of development in many African countries, should recognize this requirement.