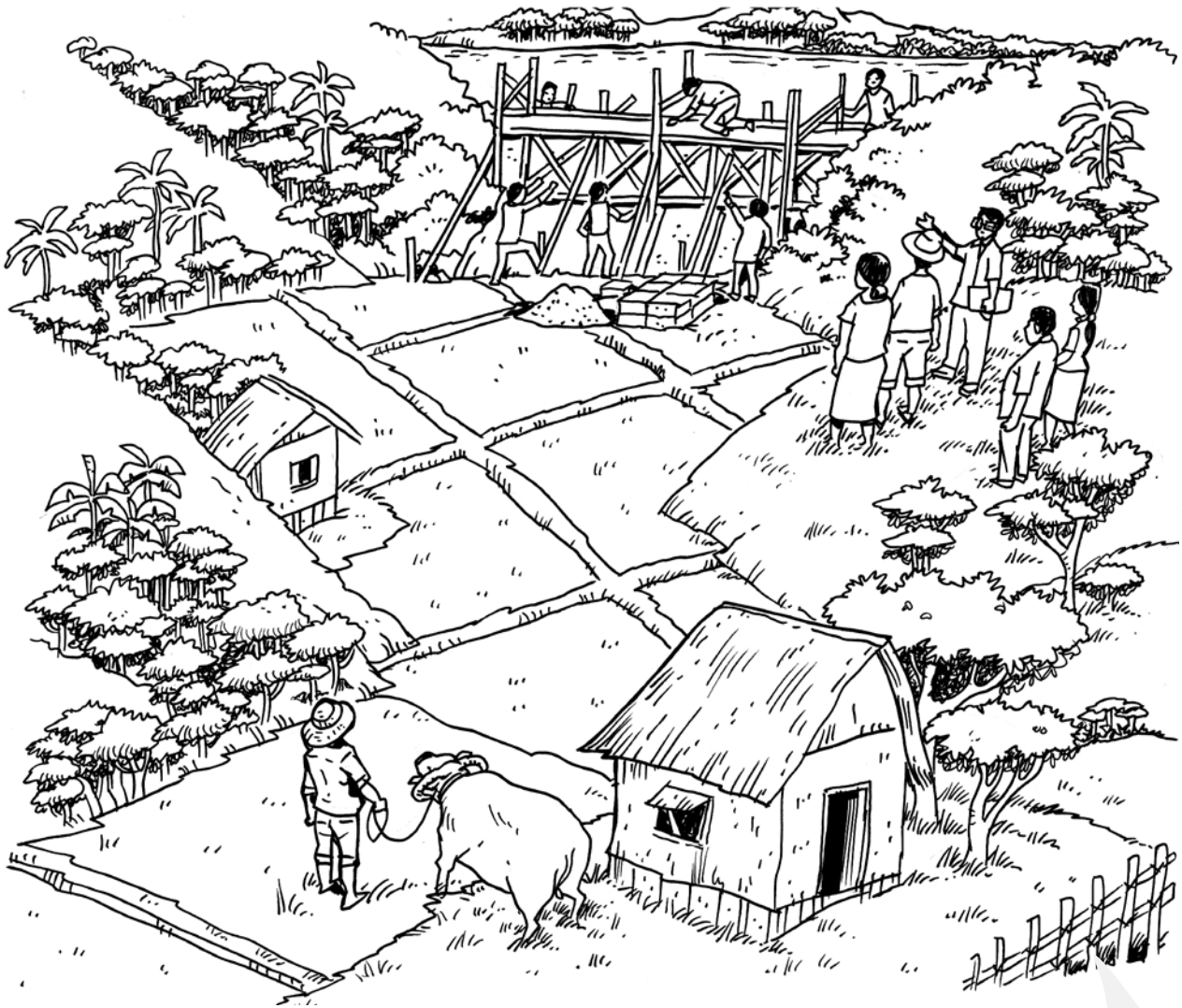


Improved Decision Making for Dam Planning and Operation



Construction of large dams in Africa is set to increase in the near future. The new dams have the potential to bring significant social and economic benefits. To maximize these benefits, negative impacts associated with dam building in the past must be avoided. This requires better planning and management of dams. In this context, the CGIAR Challenge Program on Water and Food conducted research in the Nile and Volta Basins that illustrates the importance of environmental and social issues and provides specific

recommendations on how to better incorporate these issues in the planning and operation of dams.

The research identified seven key issues deemed the most important for intervention efforts. Further analysis of these issues resulted in specific recommendations intended to enhance the benefits as well as to avoid or mitigate the adverse impacts of dams.

1. Enhance stakeholder input to the decision-making process

Stakeholder participation is key to improving decision making and governance in the planning and operation of dams. For decisions to be sustainable, it is important that local people feel involved and that their points of view are acknowledged and, where possible, acted on. This requires empowering all stakeholders to be involved in the decision-making process at the outset. Many government policies acknowledge



Recommendations

- ◆ Share information openly and improve the transparency of decision-making processes for all stakeholders.
- ◆ Make the decision-making process cooperative rather than adversarial.
- ◆ Empower weaker stakeholders by providing them with information that relate directly to concerns which they themselves identify.

the need for participation and some experience has been gained in Africa. For example, in Senegal, the water requirements of different stakeholders utilizing different natural resources were identified, and this informed modeling efforts to determine dam release regimes on the Senegal River. In South Africa, attempts to involve stakeholders in planning flood releases from the Pongolopoort Dam have been only partially successful. In both cases, local stakeholders were only involved after the dams had been built and the adverse impacts had occurred. Even when people disagree with the decisions made, they are more likely to be accepted if they have been consulted and have actively been involved in the decision making.

2. Improve options assessment

A comprehensive option assessment, as described by the World Commission on Dams (WCD), is critical for sustainable development. In any given situation, development needs should be matched to the most appropriate development options. Hence, before a dam is built, a “need assessment” should be conducted and a dam (or dams) must be identified as the most feasible/beneficial option.

Recommendations

- ◆ Option assessments need to be conducted early in the process, before decisions on the type of investment are made.
- ◆ Such assessments should identify the costs and benefits (and to whom) of all possible options and screen out those that are not-feasible. Decisions should not be guided by financial concerns alone. Non-monetary benefits also need to be considered and some form of multi-criteria analysis is essential.

Clearly, a comprehensive assessment requires a detailed evaluation of the ability (both positive and negative) of different options to fulfill needs.

3. Improve consideration of downstream environmental and social impacts

By their modification of flow-related ecological processes, dams can reduce opportunities for people whose livelihoods are dependent on riverine ecosystems. Environmental flows are the flows released from a reservoir in order to maintain valued features of the ecosystem, including those elements that support livelihoods. They are essential for the sustainable and equitable development of aquatic resources. Many countries of sub-Saharan Africa would benefit significantly from programs to build capacity in environmental flow assessment.

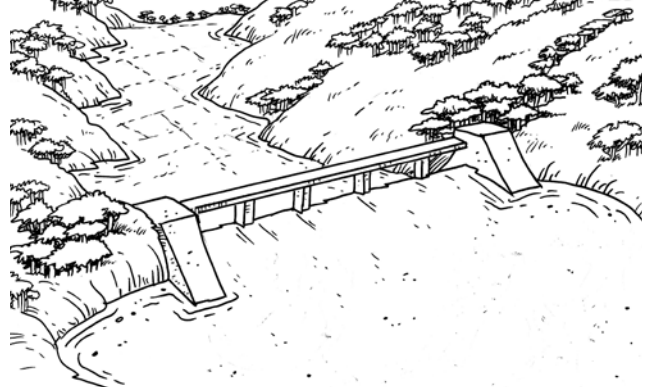
4. Consider possible

Recommendations

- ◆ Environmental flow requirements should be developed using the expert opinion of national ecologists, hydrologists, social scientists and others who have detailed knowledge of and experience of with the region's rivers.
- ◆ Such environmental programs should deal explicitly with livelihood issues and research to better understand flow-ecology-livelihood links as well as how to proceed with limited knowledge.

health impacts and the role of dam operation in mitigation

In Africa, there are particularly strong links between diseases and the construction of infrastructure,



including dams. However, public health impacts arising from the construction and operation of dams are often poorly understood and often overlooked during planning for and operation of dams. Public health agencies are often not involved or only marginally involved. As a result,

Recommendations

- ◆ The use of existing models, which simulate the mechanisms underlying disease vector dynamics and their relations to the environment, is a good starting point for predicting the likely impacts prior to dam construction.
- ◆ Health impact assessments (HIAs), which are similar to EIAs but with a focus on health provide a systematic approach for screening, assessing, appraising and formulating management plans to address key public health issues. They need to be a standard tool in dam planning.

adverse disease impacts are often passed to health authorities to deal with, rather than being more fundamentally incorporated into the planning process. Inadequate consideration of public health impacts can seriously reduce the envisioned benefits of large dams and, in some circumstances, may undermine their sustainability.

An innovative approach to disease control that has not been widely explored in Africa is the use of dam management as a form of environmental control, for example, reducing malaria by managing reservoir water levels to reduce mosquito breeding habitats. Research conducted in Ethiopia has shown that, at least under certain circumstances, manipulation of water levels has the potential to reduce breeding habitats by drying out puddles around reservoir shores.

5. Improve mechanisms for compensation and benefit-sharing

The primary beneficiaries of dams often live far away from where the dams are located. Those who live closer to the dam, either upstream or downstream, are the most likely to be adversely affected. Too often, in project planning and implementation, national interest has been the primary consideration and local concerns are neglected.

Ensuring equitable outcomes from development requires that measures are developed to sufficiently offset any negative impacts. The construction of a dam should be a development opportunity for all. This means ensuring stable improved livelihoods of all affected people. However, in the past, the focus

Recommendations

- ◆ **Share some of the benefits generated by a dam with the communities directly affected.**
- ◆ **Project plans must include “attractive” compensation and incentives to the affected population. This means a package that improves or at least restores the social and economic base of those affected.**
- ◆ **Ensure a more equitable distribution of benefits as well as accountability of those agencies entrusted with benefit redistribution by designing a transparent system for establishing and implementing compensation schemes.**

has generally been on immediate compensation and relocation and, even when this has been done well, little thought has been given to how livelihoods are best enhanced and supported in the long term. A key component, almost never considered, is how to retain stable social structures, particularly in displaced communities.

6. Improve follow-up to EIAs conducted for dams

Currently, environmental impact assessments (EIAs), in various forms, are the primary tool for examining the environmental and social consequences, both beneficial and adverse, of large dams. They are widely viewed as safeguards to ensure that environmental damage is minimized and adverse social impacts are avoided. However, to be effective, EIAs require competent and comprehensive follow-up, which involves the implementation of measures taken to mitigate the adverse environmental and social impacts

of a project, plus monitoring to determine their effectiveness. Without some form of systematic follow-up to decision making, EIAs simply become a mechanism to secure a development permit, rather than a meaningful exercise in environmental management.

Recommendations

- ◆ **Effective policies and institutions need to be in place.**
- ◆ **Ensure that project managers have the tools necessary to facilitate effective monitoring of impacts and to predict potential consequences of changes arising from construction and operation of dams.**
- ◆ **Provide dam operators with tools to assist in the archiving, analysis and interpretation of data collected in monitoring.**

riparian states can lead to tensions between countries if downstream states feel that these dams are depriving them of water to which they are entitled or for which they have a need. In many instance control of water by upstream states is viewed as an issue of national security by downstream nations.

Recommendations

- ◆ **Create a knowledge base from which riparian countries can draw and to which they can contribute information relevant to the sustainable development of water resources.**
- ◆ **Develop a common basis for policy and strategic analyses, facilitating dialogue/ negotiations between riparian states.**
- ◆ **Develop tools for the integrated management of infrastructure (including large dams) throughout the basin with the objective of maximizing benefits and minimizing costs for all the riparian countries.**

7. Improve water resource management in transboundary basins

Africa is a continent with a large number of rivers that cross international borders, so-called “transboundary” rivers. When a dam is built on a river that flows entirely within the borders of a single country, the costs and benefits associated with the construction of the dam are borne by individuals and groups within that country alone. However, when a dam is built in a transboundary basin, a different calculus must be made. In the absence of a well- defined water-sharing agreement, construction of dams in upstream

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Key Reference

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