

INSTITUTIONAL ISSUES RAISED BY THE
SOUTHERN ZONE WATER MANAGEMENT PROJECT

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DFM FRAMEWORK FOR ANALYSIS OF
SOUTHERN ZONE WATER MANAGEMENT PROJECT ISSUES

The Decentralizations Finance and Management (DFM) Project uses a combination of institutional analysis and design and public finance economics to address problems of renewable resource development and use. The Southern Zone Water Management (SZWM) Project proposes to encourage participatory development and management of irrigation water, hillsides, and upland plateaux along the Casamance River in southern Senegal. The central issues are which organizations should be involved in resource development and management, and how they should be organized so that they operate effectively.

I. INSTITUTIONAL ISSUES

On the local level, the critical problem is to determine the most appropriate roles for the target groups in the design, construction, operation, and maintenance of community irrigation infrastructure and to develop a strategy for fostering or strengthening, at the target sites, local institutions capable of playing those roles.

Appendix D of the Project Identification Document (PID) contains a list of priority sites for project activity. Presumably, many of the technical aspects of these sites are fairly well documented. What kind of materials exist on institutions in the same areas? Background information about the area, the economic characteristics of the resources, and the experiences and organizational potential of existing groups must be obtained before a strategy to catalyze local participation can be developed.

DFM uses the following analytic framework to guide field investigations of existing institutional design problems and to develop feasible solutions to these problems in collaboration with host country rural producers, officials, and PVO representatives. The analytic framework encompasses:

- the economic characteristics of target renewable resources such as irrigation waters, plateau vegetation, and hillside water-harvesting installations, given technology currently available in the Casamance zone for their management, whether they are:

private goods,

public goods,

common property resources, or,

toll goods;

- the institutions at the local, commune, regional, national, and international levels, conceived as sets of rules, which structure decision-making concerning renewable resources, and create positive and negative incentives that channel human behavior into patterns which either encourage or inhibit the appropriate management, maintenance, and enrichment of renewable resources;
- the interactions which occur, in light of the above, when individuals adopt strategies to pursue their objectives within the sets of rules that govern human capacity to organize and fund activities, access to renewable natural resources, and use of renewable natural resources; and,
- the outcomes in terms of the efficiency and possibly the equity of activities which affect the management and maintenance of renewable resources.

To use this framework effectively, each of the four sets of issues must be analyzed as follows in sections A through D below.

A. The Economic Characteristics of the Target Renewable Resources

It is important to analyze the consumption characteristics of each renewable resource because these characteristics affect how particular types of renewable resources can best be provided (i.e., funded) and actually produced. Privately consumed goods and services can be produced through private activity. Public goods and services and common property resources must generally be provided by a public jurisdiction, although the providing jurisdiction may be informal as well as formal. Actual production of resource-management services may be contracted out to public or private producers, or produced by the providing jurisdiction. Failure to take these characteristics into account in developing resource management institutions can seriously reduce the effectiveness of those institutions. The characteristics of these four types of goods may be defined as follows.

Private goods are characterized by exclusion and separable consumption. They are subject to exclusion (it is feasible to prevent unauthorized individuals from using them) and consumption is separable or rivalrous. Such goods and services can be

produced privately if demand exists because producers can reap benefits from their investments.

Public goods are not subject to exclusion. All within an affected area enjoy the benefits of an improved environment, for instance, and consumption is joint or non-rivalrous (X's enjoyment of fewer days of dusty harmattan does not detract from Y's enjoyment of the same environmental improvement). Private producers will not generally invest in management of renewable natural resources which have the characteristics of public goods because they cannot recover their investments: the goods are freely available to all and consumption by one does not reduce the amount available for others. Public goods are typically produced on a sustained basis only if a public jurisdiction decides to provide them, by a collective decision, and through collective financing arrangements.

Common property resources are not easily subject to exclusion within the user group, but are separable or rivalrous in consumption. Again, private individuals acting as private individuals will not produce or manage common property resources because they lose in the process. If such resources are to be managed, a public jurisdiction (institution), such as a quarter, village, commune, agency of the central government, special district for watershed management, etc., must do it.

Finally, toll goods are subject to exclusion, but are consumed jointly in a non-rivalrous manner.

B. Institutional Structures

Institutional structures include the formal and working rule(s) of property law, the working rules of organizations, constitutional rules that determine which groups can organize and how, etc. This section outlines a number of pertinent areas, and suggests a series of questions which field investigations should address.

1= Property Rights

Existing Land Tenure Rights

This is a very important issue which, we suspect, deserves much more attention. In particular, what are the tenure rules controlling access to and use of the lands to be affected by the project? What incentives do tenure rules create for sustainable resource use and investments in upgrading the resources? One issue mentioned in the PID is that women often control irrigated lands in Manding

areas. Local organizations should reflect and accommodate the particular land tenure patterns of the different sites.

Renewable Resource Property Rights

Another set of issues relate to rules governing the use of resources in the project area. Some of those rules in operation in the project area, such as the Forestry Code, have been prescribed by national-level institutions. To what degree are the working rules of access established at the national level enforced locally by officials of national agencies, e.g., the forestry and livestock services? To what degree do the Rural Communities have the authority to make and enforce rules and adjudicate disputes regarding access and use of resources? To what degree do officially-recognized special districts which have the authority to make and enforce rules exist?

2. Determining the Appropriate Local Institutional Structure

Are local-level institutions already operating which could effectively take on new water management functions? In particular, to what extent does the Government of Senegal's (GOS) Rural Community structure¹ operate in the project area? Is it an effective institutional framework for local participation? To what extent does it provide the institutional framework for making community decisions, enforcing rules, and adjudicating disputes concerned with regulating the use of community resources? To what degree can the Rural Communities be strengthened to the point of taking on these responsibilities? To what extent does the structure and experience necessary to manage resources exist outside the official structure of local government? To what degree can the Rural Community set up sub-jurisdictions or special purpose jurisdictions?

3. Fitting the Institution to the Task

Since different types of resources call for different types of management, what types of tasks concerned with the management of different resources are most effectively and appropriately handled by a local community? What level is most appropriate for the management of each type of resource? What are the appropriate sizes for the jurisdictions that will manage different tasks associated with different resources? Irrigation

¹ A decentralized jurisdiction which organizes ten to twenty villages in a new jurisdiction [Commune rurale] exercising "delegated powers" under the supervision of GOS administrative authorities.

systems are common property resources, that is, access to water is difficult to control within the user groups, but consumption of water is separable or rivalrous. If access to irrigation waters can be controlled, for instance, through small locks and/or dams which capture run-off, the group can exclude others from using irrigation waters within their system. But each member of the group will consume his share of the resource separately, that is, water used by one irrigator cannot simultaneously be used by another.

In a small watershed where a lot of the land is already under cultivation, the way in which slopes are exploited will have an effect on the output of the fields farther down. Such fields are usually private goods with externalities. If holders of uphill fields permit surface waters to run off in ways which cause erosion in fields lower down, farmers on the lower parts of the watershed will undoubtedly have an interest in an institution which can manage resource use on lands above their fields.

The watercourses in the Casamance targetted by the project, such as the Baila and Soungrougrou, are large-scale common-property resources. Consumption of the resource will be separable. However, it will be hard, at the watershed level, to exclude a community or an individual from enjoying such use. On the other hand, no single local jurisdiction will be able to impose rules for management of resource use on this scale. To what extent will it be feasible to catalyze the formation of federations of community organizations managing a series of micro-watersheds along these streams, to regulate use of waters to minimize negative externalities, and to create the basis for future investments in watershed and irrigation system management?

4. Mandate of the Local Institutions

These local institutions will have responsibilities in a wide range of areas, including the following:

Public Finance

How will activities be funded? Ways must be found to ensure that the target group or jurisdiction will not only help build the irrigation infrastructure, but will also operate and maintain it. What methods can local public authorities, PVOs, and local groups employ to ensure that the beneficiaries of resource management bear their fair share of the costs? Can they devise separable selective benefits, e.g., access to water, to induce resource users to maintain regulatory structures? To what extent is it feasible to establish user fees for certain services, the proceeds of which can be used to finance provision of public goods or management of common property resources? Are specialized pieces of equipment or services required by all

irrigation works that should be organized by a particular level of government,, for instance the provincial level? Could equipment use or service delivery be organized through the private sector under contracting arrangements with the providing jurisdiction? Could grants be transferred from the provincial to the local level to enable local jurisdictions to purchase irrigation maintenance services from private producers?

Resolution of Disputes

Disputes over access to and use of resources can be expected to arise at all levels within the project zone. What institutional level will most efficiently settle particular types of disputes? What will be the transaction costs in time, energy, money invested or risked to resolve different types of disputes? What resources are available to a member of the target group dissatisfied with local moot decisions. What are the implications of appeals for the stability as well as equity of local rule systems? What are the courts of appeal?

5. Public and Private Institutional Support of Local Institutions

As the local institutions develop, the project will identify responsibilities that are beyond local capacities. We suspect these will cluster in certain technical areas and in the area of agricultural extension support. Regional branches of national institutions will have to fill in these gaps. Outside support may also take the form of national or regional legislation setting broad rules for resource use, or adapting existing codes more effectively to current circumstances.

On the level of national institutions and their regional/local presence, the most important role is to be responsive to the needs of local groups which cannot be met locally, and to facilitate delivery of that support to them. These government jurisdictions may provide support directly. They may also contract out to private firms or other jurisdictions for particular types of support.

The PID acknowledges the challenge of coordinating the activities of at least two Ministries – the Ministry of Rural Development and the Ministry of Hydraulics – in the implementation of the project. These two line Ministries will be backed up by an interministerial committee chaired by the Ministry of Plan and Cooperation, and including representatives of the relevant technical ministries and a designee of the Ministry of Finance.

The problem will be, as in the Command Water Management Project in Pakistan or the Command Area Development Project in

India to reorient the bureaucracy in these ministries. The civil servants in the interministerial coordinating body backstopping the project must have incentives to collaborate with their counterparts across ministry frontiers in support of local water management groups. To what degree will it be possible to endow the coordinating body with special powers and rule-making authority that will allow it to override certain institutional obstacles? Finally, to what extent will it be possible to remove functions from the jurisdiction of the ministries to encourage greater flexibility of approach at the local level?

C. Interactions

Interactions are defined here as the patterns of human behavior which result when people adopt strategies to achieve their goals in light of the economic characteristics of the natural resources they use, and the institutions or working rules which define, in practice, who can use those resources and under what conditions. In the SZWM area, existing resource use patterns must be identified first. This applies not only to the bottom-land paddies and gardens, but also to the associated slopes and uplands which constitute each micro watershed. Use patterns are likely to be complex in terms of resource management and exploitation strategies, the variation of uses over the annual cycle and during seriously abnormal (dry) years, and the interactions and impacts of uses on one another. Whether herders and farmers who exploit plateau woodstocks, pastures, and soils, do so in a manner consistent with sustained-yield use affects not only future possibilities for productive, multiple-use exploitation of those areas, but also the continued productivity of bottom lands.

The interactions analysis focuses on how patterns of use and abuse influence the current productivity of the resource base and how they affect the future potential of renewable resources. If the impacts are on balance positive, then use rules and management systems can be considered adequate under existing conditions. If the impacts appear to be on balance negative, then the system can be expected to deteriorate over time, barring changes in use rules or technology.

From a system design perspective, changes in the technology or use rules can change the incentives to protect, use, and renew or maintain the resource. Where existing interaction patterns lead to abuse of the resource base, trying to change technology or rules to create more appropriate incentives would seem to make sense. Where population growth rate projections indicate that increased pressure on the resource base is likely in the future, changes in rules or technologies designed to increase investments in productivity seem advisable.

D. Outcomes

Outcomes indicate the results of interactions in terms of equity, efficiency, or other relevant evaluation criteria. Evaluation of resource management systems within the SZWM Project could address efficiency issues. Questions here might include whether technologies used to protect or exploit existing resources are appropriate in terms of overall cost considerations, and their tendency to encourage resource users to invest in maintenance or improvement activities in light of probable returns from such actions. Equity issues, which would be difficult to assess in the short run,, would include the distribution of benefits from investing in or preserving a given resource within the SZWM Project area, and whether this would tend to encourage or discourage support for resource management by all classes and groups of rural producers, by some, or by none.

II. ADDRESSING THE INSTITUTIONAL ISSUES

A DFM team could use the framework outlined above to guide decision-making about where groups should be formed to manage particular resources, and how those groups might be structured so that the transaction costs of renewable resource management are kept to acceptable levels. The same framework will also guide analysis of those situations in which groups need not be formulated, but where some form of public regulation of resource use will be necessary. The framework will also guide work with local people and GOS officials about areas in which regulation and groups are not currently necessary.

The project will have to develop an outreach function, rather than passively waiting for requests for assistance from local groups. The outreach unit may have to develop its own information base to make final determinations of target sites. Who will do the actual field outreach? PVOs? CERs? The project should promote minimum consistency in the approach of these different outreach organizations on points of common concern, while allowing each PVO or CER to experiment with its own techniques on all points where a common approach is superfluous. The outreach unit should also develop norms for evaluating the readiness of local groups to begin project activities in the community. In **effect**, in collaboration with the PVOs, CERs, etc., the project will have to develop a methodology for identifying sites and for either strengthening existing local resource management units or catalyzing the formation of community groups that will manage the new resources capably.

At the local level, the greatest contribution to the success of the project would be the development of a methodology for the PVOs, the CERs, etc., to use to strengthen or catalyze the development of resource user associations, where appropriate, in those communities targeted by the project. A methodology is necessary for the project to enjoy orderly, organized, coherent, and consistent implementation. Basing the field program on an explicit methodology has the added advantage of increasing the quality control and reducing the supervisory load of project implementation.

Presumably, a number of different PVOs and other groups will be involved in the development of local resource user groups. They will have to work together to think through the process of group formation. A DFM project team could moderate a series of sessions, ensure that all the important points were covered, and develop a final document. The DFM team could help representatives of the other groups conceptualize issues involved in the process of forming resource user groups.

DFM could then oversee field testing of the methodology and incorporate adjustments into the final methodological document. DFM could even be responsible for monitoring the process of resource user group formation for the life of the project and instituting further modifications in the light of experience. The final product of such an effort would be a field-tested methodology for the creation of local resource-user groups. This would have widespread application to development projects in Senegal and elsewhere.

At the level of national institutions, the most important contribution would be an analysis of the areas where local resource-user groups are dependent on national institutions for support and the degree to which the national-level institutions are in a position to satisfy the local resource-user groups. The objective here would be to make practical recommendations toward reconfiguring and reorienting at least the regional presence of these national institutions to give local resource-user groups the maximum support possible.

Abundant evidence indicates that national institutions in all countries are severely limited in their capacity to respond appropriately to regional or local needs. Instituting certain measures may require changes in national policy or legislative intervention. These accommodations can be expected only after protracted delays.

Therefore, one design criterion for local resource-user groups could be maximum local autonomy. This would protect the integrity and sustainability of the benefits of local resources.

A DFM Project team could carry out the analysis of the relationship between the local resource-user groups and the national institutions and make recommendations on the structure and operations of the relationship.

III. DFM'S MODEST PROPOSAL

Clearly, at this point, we can make only limited concrete suggestions to the Mission to strengthen the SZWM Project. There are too many unanswered questions. We assume that a certain number of them will be answered in the Project Paper (PP), and, therefore, we would be very interested in reading it as we refine our thoughts on the project.

To speak more concretely and directly to the institutional issues in the SZWM Project we need more information about the types of issues discussed above. In order to gather that information we would recommend a short Temporary Duty (TDY) in the project zone for a DFM project team. A proposed Scope of Work follows.