Of Dialogue, Debate, and Development: The Use of Participatory Rural-Appraisal Methods to Improve Farmer-Managed Irrigation Systems in Kenya

John Thompson[§]

INTRODUCTION

THIS PAPER-AND the research from which it draws its conclusions are based on the premise that much of the problem with agro-ecosystem management in Kenya, and Africa in general, rests with the processes of generating and utilizing ideas and innovations, and that much of the solution lies in the local land managers' abilities to understand their own collective capacities and actively participate in decision making. It is about promoting practical discourse, critical reflection, and communicative action among farmers involved in the management of small-scale gravity-irrigation systems. It is informed by the literature on basic human needs, agrarian change, farmer participation in agricultural research, and social theory (cf., Wisner 1988; Berry 1984; Farrington and Martin 1988; Giddens and Turner 1987).

[§] John Thompson is a Research Fellow at the Graduate School of Geography, Clark University, Worcester, Massachusetts, USA. He was formerly Resources Adviser to the National Environment Secretariat, Ministry of Environment and Natural Resources, Nairobi, Kenya.

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IRRIGATION DEVELOPMENT IN KENYA

From the Ground Up

Over the past year, the National Environment Secretariat (NES) of the Ministry of Environment and Natural Resources (MENR), Kenya, in association with the Clark University, U.S.A., has carried out a series of local-level studies on environmental resource management as part of the program, *From the Ground Up*. From the Ground Up is a collaborative effort of institutions in Africa and North America committed to improving environmental resource management in Africa. The program is administered and coordinated by the World Resources Institute.

The objectives of From the Ground Up are threefold: 1) to learn what institutional and managerial elements contribute to effective environmental resource management at the local level, 2) to discover how community institutions and self-help groups can serve as effective agents of resource management, and 3) to ascertain how communities can better identify long-term needs and opportunities for enhancement of the resource base and sustainable[1] resource use.

Irrigation Development in Kenya: A Policy Shift

Various sources have estimated that Kenya has an irrigation potential of between 350,000 and 540,000 hectares (ha), and another 300,000 to 1,000,000 ha amenable to valley bottom drainage (FAO 1986; Tidrick 1983; GOK 1989a; IBRD 1984). Despite this potential, the level of investment in irrigated agriculture has been relatively low since independence and only somewhere between 36,000 and 41,000 ha are currently under irrigation (GOK 1989a; Ruigu 1988; Coward et al. 1985). The bulk of this irrigated land is found on large commercial enterprises (producing coffee, pineapples, etc.) and large public schemes operated by the National Irrigation Board and the Bura Irrigation Settlement Project on the lower Tana River. Less than 5,000 ha are irrigated and controlled by modern and traditional small landholders (Table 1).

In the past, the emphasis on large-scale irrigation was part of a broader government policy to stabilize food supplies on drier lands, to absorb the growing labor force, and to intensify food and cash crop production (GOK 1986). Recently, however, attention has shifted towards smaller schemes and the agro-economic potential they hold. Size alone is not enough to determine the sustainability of a system. Yet, smaller often does mean less technically complex and more socioeconomically and environmentally manageable, particularly when the level of active farmer involvement in decision making is high (Chambers 1988; Alila 1986; Uphoff 1986; Coward et al. 1985).

The government's new policy calls for the promotion of small-scale, largely farmer-managed, socioeconomically and technically viable irrigation systems. For this reason, a detailed investigation

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[1] The term sustainable is used here to mean the capacity of resource-management strategies to both conserve local agro-ecological resources and ensure social and economic viability.

of the core elements affecting the performance of those systems and the development of realistic approaches to improving their management were considered both relevant and timely.

Table 1. Irrigated area by type of scheme and crops in Kenya, 1988.

Type of irrigation development	Principal crops	Area (ha)
Large commercial schemes	Coffee, pineapple, and horticulture	23,500
National Irrigation Board	Rice, cotton, and horticulture	9,000
Bura Irrigation Project	Cotton and maize	2,500
Modern small landholder (promoted by GOK or NGOs)	Rice, maize, and horticulture	2,500
Regional authorities	Maize, rice, and horticulture	1,200
Traditional small landholder	Maize, legumes, sorghum, and millet	800
Modern small landholder (farmer-managed)	Maize, legumes, and horticulture	500
Total		40,000

Sources: GOK 1989a; GOK 1989b; Ruigu 1988.

PARTICIPATORY RURAL-APPRAISAL METHODS

Rapid rural appraisal gained popularity among rural development specialists in the late 1970s as a means to quickly mobilize resources to mitigate the problems of the rural poor (Carruthers and Chambers 1981).

The From the Ground Up researchers at the National Environment Secretariat concur with the view that smallholder farmers must have a strong voice and countervailing power to hold government- and external-support agencies accountable and to ensure some measure of control over their productive resources. The National Environment Secretariat believes local people must be active and be equal partners in the research and development process, not simply "project clients" or "beneficiaries."

These considerations have led the National Environment Secretariat to take rapid rural-appraisal methods one step further by promoting the active participation of smallholder farmers in the appraisal and amelioration of their local environmental resource-management problems.

The result has been the development of participatory rural-appraisal (PRA) methods for local-level environmental resource-management assessment and planning.

Like rapid rural appraisal, participatory rural appraisal selectively combines methods from formal surveys and detailed participant-observation studies in a flexible framework and seeks to foster a constructive dialogue between the investigators and the local people. Unlike rapid rural appraisal which generally relies on technical specialists to apply techniques, analyze findings, and select the proper course of action, participatory rural appraisal brings the local land managers into the center of the diagnostic activities, working with them in the critical appraisal and analysis of their own environmental resource-management problems and opportunities, and supporting them in their efforts to generate and implement viable plans of action for the sustainable utilization of their natural resources. This flexibility and grassroots orientation make participatory rural appraisal useful for conducting action-oriented research on farmers' perceptions, values, objectives, and indigenous knowledge systems, as well as on their interactions with the underlying biophysical and economic environments. Perhaps even more importantly, it encourages local people to critically reflect on their own situations and needs and the obstacles to meeting them. As the National Environment Secretariat witnessed firsthand, such critical considerations can sometimes lead local people to set new priorities and channel their collective efforts into activities that bear lasting results.

The information garnered from the participatory rural appraisals is used to create and implement village resource-management plans (VRMPs). Each village resource-management plan is a realistic, community-based plan of action in which resource-management options are clarified, priorities are identified, and roles and responsibilities are clearly spelled out. The village resource-management plans are used by the communities -- with the assistance of external authorities and agencies where needed -- to develop, utilize, and conserve their local resource base.

Eight Phases of Participatory Rural Appraisal

The participatory rural-appraisal methods utilized by the National Environment Secretariat have eight well-defined phases.[1]

1. *Site selection.* Sites for participatory rural-appraisal (PRA) analyses are chosen either after requests from community representatives are received or upon the recommendations of government administrative and/or technical officers. Locations tend to be areas which have experienced prolonged ecological stress or declining productivity.
2. *Introductory site visits and planning sessions.* A PRA team of six researchers from the National Environment Secretariat (three physical scientists and three social scientists - in this case three women and three men) headed by a senior research officer, makes a preliminary visit to the site and local government offices. The team meets formally with local community and government officers and conducts an informal reconnaissance of the

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[1] A detailed description of each of these phases can be found in the handbook, *Conducting Participatory Rural Appraisal in Kenya* (1989), prepared jointly by NES, Egerton University, and Clark University. Write: the Director, NES/MENR, P.O.Box 67839, Nairobi, Kenya.

site by vehicle and on foot. A considerable amount of time is spent describing the PRA procedures and stressing the need to interact with a representative crosssection of the community (e.g., women and men, poorer farmers and wealthier farmers, tail enders and those close to the sources). To avoid misunderstandings or misconceptions, special emphasis is given to clarifying what the PRA cannot do as well as what it can do. During those initial meetings, mutually acceptable project objectives and field schedules are developed.

3. *Data collection.* Data collection begins as soon as a commitment is made after the diagnostic analysis of the site. It starts with the collection of all available documents and secondary sources of data on the systems' respective histories and performances to date. Short background reports are prepared from this information. Following this, three basic types of data are collected during the actual PRA:

   a) *Spatial.* A natural resources map of the site is drawn by members of the National Environment Secretariat PRA team and a group of farmers. The farmers identify land-use patterns and problems, agro-ecological variations, and other physical, economic, and social characteristics of the area. The map is further developed over the course of the investigation. It provides a simple, yet accurate visual record of the resource-management activities occurring within the community. With the aid of the resources map, a number of representative routes or "transects" through the area are selected along which the researchers walk accompanied by small groups of farmers. The informal discussions held with the farmers encountered during those walks were useful in highlighting resource-management problems and opportunities on the spot. Similar transects were made with various technical officers from relevant ministries (e.g., agriculture and water development). Their insights and observations also contributed to a better understanding of local activities and conditions. The bulk of the spatial data are typically collected in one to two days.

   b) *Temporal.* Two days are generally spent working with small representative groups of farmers. The focus is on temporal information and local institutions. For these meetings, the National Environment Secretariat PRA team divides into pairs (one physical scientist and one social scientist, one woman and one man). Each pair of researchers leads groups of between 8 and 18 farmers through specific exercises such as descriptions of seasonal calendars (land- and resource-use practices occurring throughout an agricultural cycle), major historical events within the community, long-term trends and changes in land-use patterns and resource-management practices and local institutional capacities and their internal and external linkages and influences. Visual aids -- diagrams, charts, and cutouts -- are used to direct the discussions. These help both the National Environment Secretariat researchers and the farmers to keep the meetings on course.

The emphasis is on practical discourse and critical reflection. The National Environment Secretariat investigators, acting as facilitators, encourage the farmers to critically assess their resource-management situation and consider appropriate measures for improving conditions. To encourage free and open debate, no local government, technical, or administrative officers are

present during these meetings. Once the participants understand the format, the group discussions become generally lively, very informative, and occasionally heated.

c) *Socioeconomic.* During the transects, the farmers help the National Environment Secretariat PRA team to identify a socioeconomically representative cross-section of farm households. The heads of these households are later contacted and asked if they would mind being interviewed. The National Environment Secretariat PRA team then spends approximately two days formally interviewing those farmers and drawing rough sketches of their farms with their assistance.

To complete this activity relatively quickly the PRA team splits into pairs. Each research pair interviews six to seven persons. Every effort is made to interview an equal number of women and men (approximately 20 in all). The informants are asked their views on water supply and distribution, system maintenance, agricultural production, crop-pest and disease management, forestry and agro-forestry, marketing of cash crops, the organizational capacity and linkages of the water users' organization, and a number of related matters. Their responses are later combined with the information collected during the semi-structured group discussions to produce detailed lists of local resource-management problems and opportunities.

Neighboring farmers are encouraged to listen quietly to the questions and answers and after these are completed they are invited to take part in informal group discussions. These discussions are often useful for clarifying points raised during the interviews.

4. *Data synthesis and analysis.* This diversity of appraisal is known as "triangulation" -- the use of various sources and means of gathering relevant information. Triangulation is one of two central themes of rapid appraisal (McCrackin et al. 1988).

The other theme is the pursuit of "optimal ignorance," which is the amount, relevance, accuracy, timeliness, and actual use of information required to produce tangible results effectively and efficiently (McCrackin et al. 1988). Working within a realistic and acceptable range of ignorance and imprecision, the National Environment Secretariat PRA team, along with a number of farmer-representatives, synthesizes the information to produce a summary document of the primary resource-management problems and opportunities, for possible action. It requires approximately two to four days to process this information and prepare the preliminary document on problems and opportunities.

Once completed, this document enables the investigators to target a number of specific problem areas which are beyond the technical competence of both the local farmers and the environmental scientists at the National Environment Secretariat (e.g., the marketing of cash crops, the development of grain grinding facilities, etc.). Using this information, the researchers can request the assistance of the appropriate agencies. The technical experts generally participate in a workshop to analyze and rank the problems and opportunities with the farmers, local government officers, and the PRA team.

5. *Ranking opportunities.* With the problems and opportunities in mind, community members, with the aid of the National Environment Secretariat PRA team, local-government officers (and other technical experts, when needed), analyze and rank the problems and opportunities identified during the course of the appraisal. Different ranking criteria and exercises may be employed to achieve consensus about the most feasible opportunities, depending on the

group's wishes.[8] In general, the farmers are encouraged to rank opportunities based upon social suitability, cost-effectiveness, technical feasibility, and ecological sustainability.

A total of 40 to 50 farmers normally attend a workshop. They represent most of the local institutions and self-help organizations in the community (e.g., the water users' organization, women's groups, church groups, and the road-construction group). The National Environment Secretariat PRA team coordinates the discussions with the assistance of local farmer-leaders and administrative officers. The local-government technical officers and technical advisers are asked to address the group on their respective areas of expertise and answer specific questions as the workshop proceeds. They play an important role in ensuring that the selected opportunities will be feasible in economic, ecological, and technical terms. Chalkboards and wall charts are utilized for listing important comments and considerations.

The workshop lasts one to two days. It is held in a centrally located community center. Lunch is prepared by local residents and paid for by the government. Where possible, transportation is provided for those farmers who live farthest from the meeting place.

6. *Preparing the Village Resource-Management Plan (VRMP).* A detailed village resource-management plan emerges from the workshop. In it, the major opportunities for solving the primary problems are noted, roles and responsibilities are spelled out, and required resources and realistic time frames are identified. Before closing the workshop, all parties must agree to the overall form and content of the village resource-management plan.

   The workshop is particularly useful in bringing the farmers and officers face to face and opening up lines of communication not used previously. Positions and perspectives can be clarified on both sides. By the end, the participants are generally satisfied with the outcome of the discussions.

7. *Adoption and implementation of the VRMP.* The VRMP may be seen as a contract between the farmers, the government, and external support agencies (where involved). While the existence of the VRMP is not a guarantee that all objectives will be accomplished or that differences within a community will be lessened it has been the National Environment Secretariat's experience that significant and tangible changes can and do take place -- and in a relatively short period. Moreover, those changes can be sustained largely with local resources and local leadership.

   Where external support is required the VRMP clearly states what needs to be done, when the project should begin, where it will take place, and who is responsible. What remains is how it should be done, and even that is discussed during the workshop and is outlined in the VRMP.

8. *Follow-up: monitoring and evaluation.* Once the process is set in motion, the VRMP acts as a kind of baseline from which all future changes can be measured. Monitoring of progress can be achieved by comparing a condition or situation today to that when the VRMP was implemented. While few sanctions exist to take direct action against those who fail to fulfill

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[8] The National Environment Secretariat has employed the ranking criteria developed by the International Institute for Environment and Development (McCrackin et al. 1988) -- stability, equity, productivity, sustainability, and feasibility -- with some success. It has also found pairwise ranking to be effective. Be forewarned, however:ranking, no matter the approach, is a time-consuming and exhausting exercise.

their roles and responsibilities, social pressure and opinion can often be used to reprimand or motivate laggards.

The entire process of diagnostic analysis and planning and implementation of the VRMP provides valuable managerial and technical experience to local institutions and increases their capacity to act meaningfully on their own. The essence of sustainable development is to have local institutions and responsible leaders in rural communities who can direct the course of local initiatives as they see fit. Monitoring, evaluation, and project modification can take place with little external direction or major investment of resources because local people have the capacity for follow-up.

PARTICIPATORY RURAL APPRAISAL AND FARMER-MANAGED IRRIGATION SYSTEMS

The National Environment Secretariat used the PRA methods in its work in two small-scale, farmer-managed, gravity-irrigation systems, the Njoguini, Gitero and Kabati Self-Help Water Project, Nyeri District in the central part of the country, and the Njukini Irrigation Project, Taita-Taveta District in southern Kenya. A multidisciplinary team of six scientists spent a total of six weeks conducting PRAs at the two sites. Emphasis was placed on the active participation of the local people in the appraisal and analysis of their environmental resource-management problems and opportunities. The National Environment Secretariat team acted primarily as a catalyst in this process, promoting a constructive dialogue between the local people and the relevant government authorities, and among the community members themselves.

With the National Environment Secretariat's assistance, the farmers assessed their problems and opportunities relating to water supply and distribution, agricultural production and marketing, crop pests and diseases, livestock and dairy production, marketing, mechanized agricultural services, road construction and transportation, tree-nursery improvements and agro-forestry techniques, fish-pond development, public-health problems and services, and income generation. Site-specific village resource-management plans emerged from these appraisals. The major opportunities were selected, roles and responsibilities were agreed to, and required resources and realistic time frames were identified. In actuality, even before written copies of the VRMPs were made available action had been taken both locally and by the National Environment Secretariat and a collection of ministries, parastatals, and external-support agencies to rectify a number of the more pressing problems. These included new crop-production strategies and marketing arrangements, engineering adjustments in water delivery, improvement of local tree nurseries, reconstruction of local roads, and the development of a grain-grinding facility. The social energy released during the appraisals and analyses had set the wheels in motion. Ideas were put into action and actions led to results.

According to informal discussions with farmers, these activities are a direct result of the PRA/VRMP process of appraisal, analysis, and action in which they were central players. They expressed satisfaction with the ideas and information that had been generated and made special note of how the process had enabled them to better understand their own institutional capacities.

SUMMARY AND CONCLUSIONS

It has been the experience of the National Environment Secretariat that, through a process of practical discourse, critical reflection, and communicative action, participatory rural-appraisal methods can help local people to identify their problems and opportunities and select strategies that will help mitigate the situation. The National Environment Secretariat has now tested the PRA methods in five different locations in Kenya and is continuing to monitor the progress of the farmers at those sites. More time is needed before the longer-term effects of the PRAs and VRMPs can be evaluated. Nevertheless, preliminary results indicate that the PRA holds the potential to: 1) intimately involve a community in the appraisal and analysis of its own environmental resource problems and opportunities; 2) facilitate community mobilization and participation, particularly of women; 3) move beyond the conventional sectoral approach to evaluation and offer a holistic perspective on the factors that impinge on a community's progress; 4) provide high-quality information in a short period and at a low cost; 5) generate a clear picture of local institutional capacities and linkages; and 6) offer a simple, yet effective method of system monitoring without the need for foreign experts or a large investment of resources.

After reviewing the National Environment Secretariat's research in Kenya, the World Resource Institute recently decided to initiate field trials of participatory rural appraisals and village resource-management plans in eight other African countries involved in the From the Ground Up program. This broad range of experience should further illuminate the potential applications and limitations of those methods and plans.

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