ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

OECD

PERMANENT INTERSTATE COMMITTEE FOR DROUGHT CONTROL IN THE SAHEL

CILSS

CLUB DU SAHEL

SAHEL D(83)190
January 1983
Or: English

PARTICIPATION, LOCAL ORGANISATION, LAND AND TREE TENURE: FUTURE DIRECTIONS FOR SAHELIAN FORESTRY

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SUMMARY

This paper reviews social forestry aspects of the CILSS/CLUB DU SAHEL Forestry Programme Assessments (FPA's) for The Gambia, Mali, Niger and Upper Volta, prepared during 1981-82. It focuses on participation, local organization, land and tree tenure issues as these affect prospects for popular reforestation and environmental management activities in sahelien states.

The paper attempts five things:

1. a summary of FPA materials relating to social forestry issues;
2. a critique of FPA presentations;
3. an analysis of the logic of popular participation in social forestry activities, and institutional implications of that logic;
4. an examination of constraints which currently impede participation in sustained-yield use activities; and
5. six recommendations concerning reorientation of forestry policy to broaden, gradually but deliberately, popular participation in environmental management.

The Assessments for the four countries reflect awareness of social forestry issues, but focus predominantly on technical forestry problems. They do not present a unified analysis of current institutions and practices from a participatory perspective; FPA recommendations thus do not thoroughly explore the logic, benefits and costs of participation, nor do they address the full range of institutional reforms necessary to promote participation.

Social forestry assumes rural dwellers must bear greater responsibility than they now do for assuring sustained-yield use of renewable natural resources. As presently organized, forestry departments lack the money, manpower and materiel necessary to control resource use adequately and to provide for future supplies

of wood, pastures, soils and water. Only rural populations can directly handle those tasks; foresters' role should be increasingly one of extension to support and strengthen participatory management efforts. This implies foresters will gradually reduce their current efforts to police resource use and to provide future wood supplies through departmentally-run reforestation operations.

Rural people will not however automatically move to manage renewable resources, nor will they be moved by propaganda urging conservation consciousness and participation in sustained-yield management unless

1. they see a real need for such investments of time, energy and money, and
2. technical, economic, financial, legal and political constraints they currently face are overcome or reduced to the point where participation becomes feasible.

At present, lack of knowledge about sylviculture and about inexpensive reforestation techniques (e.g., various ways to manage natural regeneration more actively) dissuade many people. So do ambiguous tree and land tenure rights and the difficulty of getting legal recourse to assert and validate rights. Finally, inability to make and enforce resource use rules at the quarter or village level frustrates management attempts in many sahelien communities.

Recommendations propose four broad changes in forestry policy.

1. The burden of resource use regulation should be shifted from foresters to rural Saheliens, by gradual "decodification" or "privatization" of tree tenure rights. Authority over specific trees, bush areas and forests should be vested in particular groups or individuals. Legal recourse in defense of these rights should

be available at the local level from village notables authorized to hear and decide cases concerning disputes over use of resources, particularly trees.

2. Foresters should be prepared to do extension work through retraining courses which teach them how to work with peasants and herders to resolve resource management problems. To assured that retrained foresters, who now function mainly as resource cops, take extension work seriously, on-the-job incentives rewarding solid extension performance will have to be established: mere re-education will not suffice by itself to modify field agent behavior. Deliberate attempts must be made as well to set up extension networks so that retrained foresters will have means of contacting interested individuals in rural areas; the latter can greater magnify foresters' impact and influence by transmitting information through growing networks of resource users.

3. Various forms of applied research must be envisaged. Some will tackle technical forestry questions such as improving growth characteristics of local species and heightening productivity of natural forests. Others will focus directly on social forestry questions, e.g., where would it be reasonable to decodify tree tenure rights, what extension systems work best in what particular types of local sahelien environments, etc.

4. Existing forestry institutions might be reorganized to create more parastatals with greater control over employee job performance and responsibility for promoting popular participation in resource management activities, in part by strengthening local organization, perhaps through creation of resource user groups.

1. INTRODUCTION

1.1. This paper reviews four major social issues in contemporary sahelien forestry: participation, local organization, tree tenure and land tenure. It explores them to analyze why rural Saheliens now often fail to manage renewable natural resources. In so doing, the essay comments frequently on positions the Forestry Programme Assessments (FPA's) for The Gambia, Mali, Niger and Upper Volta* take concerning these problems. Finally, drawing on this analysis, on Assessment propositions, sahelien social forestry research and expert opinion, it suggests solutions.

1.2. Contents. The essay comprises four parts: (1) the overview of the argument, presented in this introduction; (2) a restatement of the problematic situation which makes social forestry initiatives imperative; (3) a detailed analysis of constraints on popular participation in resource management; and (4) recommendations to overcome these hurdles to more effective participation and sustained-yield management of sahelien woodstocks** and associated renewable natural resources - water, soils and pastures.

*The Forestry Programme Assessments for The Gambia [GFPA], Mali [MFPA], Niger [NFPA] and Upper Volta [UVFPA] merit close attention, both for factual material they marshal and for what they reveal about current elite forester thinking on problems of resource management and possible solutions, including increased participation.

**The term "woodstock", as used in this essay, denotes all ligneous vegetation, from small bushes to large trees. This seems especially appropriate in light of the character of sahelien "forests", and the importance of even dwarf specimens in stabilizing the environment.

1.3. The Argument. The essay makes the following argument. Environmental management problems reflect the impact of changing man/animal/land relations, as human populations and their herds try to wrest an existence from shrinking resource bases [GFPA: I, 15; NFPA: I, 41-43, P.3.2.1.1.; UVFPA: 36-37, P.3.2.1.]. Forestry departments confront severe constraints in trying to stem desertification and achieve sustained-yield use of renewable natural resources. They are under-financed and often under-staffed [GFPA: I, 26-30; MFPA: 95-97, esp. P.5.1.2.2.; NFPA: I, 57, 110-11, II, 117, 119; UVFPA: 47, 49-50, esp. P.5.1.4., points 1, 3]. Many foresters even lack funds to get to the field to protect state forests from user encroachment, to say nothing of managing them efficiently once they get there.

1.3.1. The FPA's envisage long-term solutions to environmental problems mainly in terms of forester-initiated and -controlled activities. In terms of money allocated and personnel involved, industrial plantations and departmental management of existing state forests* still claim the lion's share of foreign aid expenditures and forestry service budgets and effort. Furthermore, as the Assessments correctly assert, more money, materiel and often manpower will be necessary to achieve technical, research and management break-throughs in sahelien woodstock management.

1.3.2. Basic Criticism. But more money, materiel and manpower will not alone resolve problems forestry services face in trying

*Proposals advanced in some FPA's to involve rural populations in sustained-yield management of forest resources now under direct state control do introduce an element of participation [e.g., NFPA: I, 80, P.a., third item; UVFPA, 96 ("classement de forêts au profit des collectivités")].

to manage sahelien woodstock and associated resources. Contemporary sahelien environmental management problems are (1) too complex, for social reasons, and (2) too dispersed over a vast landscape to be amenable to solution by a small cadre of field foresters working in isolation without sustained popular support. Even were service manpower levels doubled and operating budgets octupled, agents' impact would remain modest without a thorough-going re-orientation of forestry policy.

1.3.2.1. Traditional Management Approaches. Sahelien foresters have traditionally sought to manage woodstocks in two ways.

First, resource use control has been attempted through creation of state forests and through systems of commercial cutting permits and personal harvesting authorizations set up under forestry code provisions. Roving forest guards enforce cutting regulations against (some) violators [NFPA: II, 133-34, point 3.]. These use control systems are widely regarded as ineffective at present [NFPA: 179, P.8.1.2.2.1.; UVFPA: 63-64, P.6.1.3.2.; Thomson, 1977: passim, esp. 63-64; Thomson, 1980a: 5, 9; Thomson, 1982: 9-10, esp. Table III].

Second, investment in future supplies has been undertaken largely as an in-house operation, in rain-fed and irrigated plantations operated by forest service personnel [GFPA: I, 22, P.1.1.a.; NFPA: I, 57, P.4.1.1., II, 110-12, Ps. 1.3. - 4.; UVFPA: 45-47, Ps. 5.1.1. - 2.]. Amounts and quality of wood produced fall far short of future or even current needs, according to all Assessment calculations.

1.3.2.2. Criteria for New Approaches. Somehow, means must be

found to magnify the impact of forest service efforts, especially given the recently expanded action agendas of most sahelien forestry departments [GFPA: I, 47-49, Ps. 2.3.a. - d.; MFPA: 92, P.5.1.1.2.; NFPA: II, 134-40]. On the following point a broad consensus is developing:

1. People must take more responsibility for producing new increments of renewable resources which they are now consuming to the point of exhaustion.

A second point, not broached in the Assessments, is advanced here as a practical corollary of the first:

2. Rural dwellers must gradually bear much more of the burden of policing use of current and future supplies of renewable resources, particularly wood.

1.3.2.3. Implications. These propositions imply forestry departments and environmental management agencies must shift the bulk of their activities away from repression and in-house production of future supplies. Instead, they must concentrate on assisting rural people to produce new supplies of wood in adequate amounts, to manage watersheds, protect soils and cope with other resource exploitation problems, as well as promoting popular acceptance of more efficient, cheap wood stoves.

1.3.2.3.1. Participatory Projects: A Start. Recent forestry department initiatives, inventoried by the FPA's, to involve rural people in resource management (woodlots, windbreaks, mini-nurseries, dune stabilization, soil regeneration through Acacia albida plantings and protection, etc.) represent useful efforts to translate the participatory management principle into practice [MFPA: 145-50, Ps. 7.1.1.3.1. - 2.; NFPA: I, 80, P.a., 89-100,

102-07, II, 134; UVFPA: 26-27, P.2.2.2.2.c., 69, 71, Ps. 7.1. - 2.].

1.3.2.3.2. Popular Policing: The Rationale. Departments must also seek new strategies to control woodstock use. As now constituted, use regulation is an antagonistic adversary proceeding pitting foresters against populations. Because field agents are and will remain too few to protect the woodstock effectively from unauthorized use, the current system succeeds only in foredooming most extension efforts because so many villagers view foresters, not as teachers concerned with reforestation, but only as "the enemy" [MFPA: 120-21, P.6.2.1.; NFPA: II, 133-34; UVFPA: 77, P.8.1.2.]. (The Gambia happily represents something of an exception in this area [GFPA: I, 65, P.2.2.]).

Policing to enforce use controls will remain indispensable [MFPA: 202, P.8.1.6.2.; Hardin, 1968; Baden, 1977: 137-46; Ostrom and Ostrom, 1977: 157-72, esp. 159]. Popularization of conservation principles and widespread acceptance of the ideal of sustained-yield exploitation of renewable resources throughout sahelien rural areas will not eliminate the need for use controls. Some people will always be tempted to serve themselves at the expense of the common good. If such behavior is not consistently and persistently punished, use controls will rapidly collapse as other individuals refuse to make sacrifices from which unprincipled users will benefit.

The current ineffectual system, which makes foresters solely responsible for woodstock policing, must be replaced by a system which secures popular cooperation in use control. Forestry

policy must now gradually promote popular policing of resource use, and thus sustained-yield management. The job will only be done properly when rural Saheliens - ten thousand times more numerous than foresters - are given adequate incentives to police use of sahelien woodstocks, and so effectively protect them.

1.3.2.4. Assessment Positions. Though none directly advocate popular policing, the Assessments reflect awareness of participation issues and advocate to an extent popular collaboration in woodstock management [GFPA: I, 47, P.2.3.a.4.; MFPA: 122-23, Ps.6.3.1., 6.3.4.; NFPA: I, 71, P.5.3.1.; UVFPA: 49, P.5.1.4.2., 94-95, P.8.4.]. All also note ways in which land tenure, tree tenure and local organization rules and limits may impede participatory resource management.

Fundamentally however the FPA's stress technical forestry aspects of resource management problems and underplay social forestry issues and dilemmas. Most urge "propaganda" to heighten peasant awareness of resource management issues, but few express interest in hearing peasant perspectives on resource management problems, which probably remain as highly variable as sahelien environments. The Assessments generally assume rural Saheliens now see the need for environmental management [NFPA: I, 110, P.7.1.1.; MFPA: 124; UVFPA: 73, P.8.1.1.]. A new "conservation consciousness" may be surfacing in some areas (see, e.g., Thomson: 1982b: 507, esp. Table I]. But this does not prove it to be a generalized phenomenon throughout all regions of all sahelien states.

1.3.2.4.1. Participation Indicators? Participation in National Arbor Days or in planting village woodlots may be largely a political response to authorities' declarations of "the importance of the anti-desertification struggle." Such ephemeral forms of participation should be viewed with some skepticism: they may do precious little to change either rural peoples' fundamental perceptions of resource problems or the objective resource management difficulties they face. Effective interest in reforestation is more surely demonstrated when groups or individuals care over a period of years for trees they plant. What is needed instead of a generalized assumption of popular interest in sustained-yield management is more detailed information about nuances of local opinion and organizational possibilities and the quite substantial variations in each which may exist within even small geographic areas [see, e.g., Thomson, 1980b: 12-17].

1.3.2.5. Participation-Promoting Institutional Innovations. The FPA's individually mention a number of institutional innovations necessary to promote participation. Among them are: forestry department re-organization to create public corporations permitting greater flexibility in woodstock management; modification of forestry legislation; revisions in agent training curricula to stress extension work; and reordering of research priorities. But none systematically explores all of them from the perspective of their impact on participation opportunities. In consequence, the Assessments do not present a coherent analysis of the unquestionable costs and strains, as well as benefits, which popular participation in resource management involves.

1.3.2.5.1. Participation Costs. These costs and strains include partially relinquishing forestry department authority over renewable resource management activities, for instance by privatizing tree tenure rights, as a quid pro quo in many cases for more popular participation in assuring woodstock sustained yield. They include outlays to rethink curricula and retrain forestry agents to handle extension tasks compentently, and policy changes to give foresters the personal incentives necessary to insure they take extension work seriously. Foresters must learn to listen to peasants, instead of assuming they have all the answers [Raintree, 1983: passim; Thomson, 1980b: 17-19]. This will require a sacrifice in personal authority which some field agents may be loathe to make. Most particularly, they include strains of institutional changes in local organization and local resource rule enforcement capabilities: these are also preconditions in many places for extensive, sustained popular participation.

1.3.2.6. Research Priorities. The Assessments correctly devote much attention to natural resource inventory efforts; to calculating sources of woodstock supply in light of projected regional demands for agricultural lands and for wood consumption; to analyzing costs and systems of firewood transport; to upgrading technical forestry research efforts; and to exploring problems of popularizing improved wood stoves [NFPA: I, 124-25, P.7.2.2.2.; UVFPA: 102-05, P.8.5.3.3.; Yameogo, Ouedraogo and Baldwin, 1982: 2-3, 31-41]. These concerns are all entirely appropriate.

However, the same sort of detailed attention must be devoted to examining means by which rural inhabitants can be brought

to share over the long run the undeniable burdens of effective renewable resources management. This is after all a condition for social survival in many sahelien areas threatened by desertification because of extensive and spreading agricultural activities, even if fuelwood demand falls, reducing direct threats of environmental degradation.

2. PROBLEMATIC SITUATION IN SOCIAL FORESTRY

2.1. The Fundamental Problem. Sahelien forestry departments face a fundamental problem: how to stop working against rural people and start working with them. To do so, they must shift most of the direct burden of renewable resource use regulation and management from professional foresters to rural Saheliens. Those foresters relieved of policing duties and direct wood production chores can devote the necessary time and energy to becoming effective forestry extension workers, capable of showing rural Saheliens how to better manage woodstocks, do agro-forestry and stabilize environments.

2.2. Promoting Participation. Three factors affect choice of a strategy to achieve popular participation in resource management.

2.2.1. First, the daily realities of millions of Saheliens' lives are keyed to thousands of different sahelien micro-environments. Local conditions vary dramatically from place to place. Not every sahelien landscape is a "desertification hotspot". Some still contain significant bush areas, and thus adequate supplies of fuelwood, building poles and pastures, as well as long-duration fallow reserves. Other local milieux have become so degraded they

cannot satisfy residents' resource demands [GFPA: I, 5-8, Ps.2.1.a. - b.; MFPA: 30-33, Ps. 2.2.1. - 3., 37-44, P.2.4.; NFPA: I, 15-20, Ps.2.1.1. - 2., 25-29, P.2.1.4.3.; UVFPA: 9-15, Ps.2.1.2.1. - 2.].

2.2.2. Second, people unquestionably identify ecologic changes (though they may know themselves currently unable to stem degradation). Rural dwellers assess resource abundance or scarcity as a function of:

a. objective availability, and
b. relative availability compared to earlier conditions.

2.2.3. Third, human reactions to environmental problems seem governed mainly by these differing perceptions of variable and changing situations. Two consequences follow:

1. people will rationally manifest differing degrees of concern about resource shortages [see, e.g., UVFPA: 34-37, Ps. 3.2., 3.2.1.];
2. willingness to consider doing something (as opposed to actually doing something) about resource scarcity will vary by area.

2.3. Forestry Policy Implications. These three points generate two practical implications for forestry policy:

2.3.1. First, identify areas where most local people want to actively manage resources. Foresters need to know where villagers urgently want to renew the woodstock, before proposing reforestation actions, just as they need to test soil conditions carefully before deciding what species to plant, or whether to plant at all.

2.3.2. Second, in areas of high public awareness, concert efforts at all governmental levels to make it easy and attractive for people to innovate in resource management activities.

2.4. Facilitating Resource Management. How can resource

management be made "easy and attractive"? First, resource management opportunities, as defined by rural Saheliens in conjunction with foresters and other environmentalists, not by professionals alone, must be pin-pointed. Second, constraints on management opportunities must be identified, and efforts made to remove them, or to find ways to circumvent them [Raintree, 1983: passim].

2.4.1. Avoiding the "Village Woodlot" Fallacy. Popular participation in identifying resource management opportunities and constraints is imperative if foresters are to avoid future repetitions of the "village woodlot" fallacy. That fallacy lay in foresters' often unexamined assumption that villagers shared their perceptions. Foresters saw village woodlots as a resource management opportunity. But their analysis of the problem, predominantly administrative and technical, took little account of social factors villagers had to confront. What foresters saw as a management opportunity often looked to villagers, for political reasons, like a highly risky investment. The interest many rural Saheliens express in individual woodlots confirms foresters initially failed to focus on all relevant elements in the local resource management scene; they thus directed much effort to promoting socially or politically infeasible solutions [NFPA: I, 68, P.4.5.1.2.; UVFPA: 28, P.2.2.4.; Thomson, 1979: 1-2].

3. CONSTRAINTS ON PARTICIPATION IN RENEWABLE RESOURCE MANAGEMENT

3.1. Social and Technical Constraints. As has been widely recognized, social factors played a major role in the village woodlot debacle [Hoskins, 1979b: 18-20; Winterbottom, 1980: 10-13;

Thomson, 1979: 22-24]. These factors also influence other woodstock management efforts (live fences, bush fires, exploitation of state forests, etc.). They can be usefully analyzed as a series of potential constraints on innovation in resource management activities. Four general categories of constraints exist: technical, economic and financial, legal and political. Because technical factors interact powerfully with social factors, the general discussion of constraints begins with the former.

3.2. Technical Constraints. While many Saheliens know in intimate detail products of various tree species, fewer are accomplished amateur sylviculturalists [see, e.g., NFPA: I, 31-32 P.2.1.5. ("financières," "sylvicoles culturales"); Weber, 1983; Thomson, 1983a: passim, esp. "technical constraints"]. Since wood resources until recently were a "free good", simple fallowing - passive management of natural regeneration - provided for future supplies. Many Saheliens thus have much to learn about "active" sylviculture. A fund of local knowledge often exists however [UVFPA: 7, P.2.1. ("-par la sélection intensive..."); Weber, 1983: passim]. Foresters can build on it if they identify species better adapted to local needs and conditions, and if they can provide interested local users information about reforestation techniques, soil conservation and enrichment, agro-forestry applications, etc. [on the last point, see, generally, NAS: 1983].

In some cases, a small amount of material support may help peasants overcome technical problems (plastic nursery pots, selected seeds, etc.), but in all likelihood, reliable, regularly provided technical advice about site, seed and species selection,

planting, trimming and harvesting procedures, etc., will be much more useful than materiel backup.

3.3. Economic and Financial Constraints. Resource management must make economic sense and be financially feasible before rural people will cooperate in efforts at reforestation. Most Saheliens operate on a narrow margin of security, and so try to minimize risks. But this is not tantamount to saying they will never take risks [Popkin, 1979: 18-22 provides an extremely interesting analysis of this problem]. Especially those who have a bit of surplus, be it land - temporarily fallowed fields - labor or capital, may invest it in woodstock management if wood scarcities become apparent or wood prices rise in area markets (both are increasingly common phenomena in the Sahel [MFPA: 88-89, Ps.4.4.1.1.3. - 4.; NFPA: II, 17, P.2.2.; Winterbottom, 1980: 2-3, esp. Table 1]).

3.3.1. Cutting Investment Costs. Investment costs - planting, protecting and maintaining trees to maturity - may dissuade many villagers. Technical developments make sense which both increase productivity of tree species that will grow and survive under local conditions, and can be used by rural people with the limited means at their disposal. The research programs outlined by several FPA's give due weight to this point [MFPA: 105, P.5.2.4., 197-08, P.5.2.6.2.1.; NFPA: I, 59, P.4.2.4.; UVFPA: 53-54, P.5.2.3., programmes 3 - 5, 55-56, Ps. 5.2.6. - 7.; GFPA: I, 33, Ps. b. - c.]. Several FPA's advocate using local species and sustained-yield exploitation of existing natural stands. Both initiatives may lead

to inexpensive techniques for actively managing natural regeneration which might easily be popularized, if extension services are set up to handle such tasks. Local nurseries capable of delivering on time healthy plants which villagers desire (for whatever reason) improve chances trees planted will be accepted, cared for and protected. Agro-forestry applications - soil stabilization, nutrient pumping, windbreaks, live fencing - may permit more intensive, integrated resource management in local environments.

3.4. Legal Constraints. Land tenure and tree tenure rules may create major barriers to investments in new supplies once local people begin to feel the pinch of wood shortages. So may legal processes by which disputes are resolved concerning these rules [for a fuller discussion of these issues, see Thomson, 1981a: 126-45; UVFPA: 95-96, P.8.4. raises a number of the issues in a succinct fashion.]

3.4.1. Defining Tree Tenure: A New Necessity. Until quite recently, abundant supplies of land and trees justified use rules which treated these resources as free goods. Any one could collect wood in the bush commons, usually without authorization [UVFPA: 21, P.2.1.5.1., "d'ordre politique foncier", 60, P.6.1.1.; NFPA: II, 62; Thomson, 1983b: 175-76]. Access to land, under either grants or loans, usually took place with minimal limitations on the user's right to exploit both land and trees as he saw fit [MFPA: 119, P.6.1.1.].

Given abundant resource conditions, such rules fittingly promoted exploitation of otherwise under-utilized production factors.

But when resources grow scarce, and when investment in new supplies becomes imperative, permitting uncontrolled exploitation of common property resources ceases to be a functional rule. Uncertainty about who will reap results of investment in reforestation and land fertility must discourage local investment in either case [UVFPA: 67, P.6.2.1.3.]. Ambiguity about control of benefits from investment in resource management (e.g., more wood, less water or wind erosion, improved soil fertility or water availability) will exist where goods are legally treated as unregulated common properties; or where regulations governing common properties can be easily manipulated; or where land is loaned for an indeterminate period of time; or where ownership and use rule conflicts exist within a single jurisdiction (based on "customary" law differences in inter-ethnic situations, or divergences between local and national rules). Unpredictability of the legal process often also raises doubts about the value of resource use rights. National forestry codes and land tenure codes often run counter to local rule systems [MFPA: 121, P.6.2.1.; NFPA: II, 60-62, P.5; UVFPA: 67, P.6.2.1.3.]. Uncertainty about which version might be applied in some potential future dispute can easily discourage people from investing their limited surplus of land, labor or capital in production of new supplies of now scarce resources.

3.5. Political* Constraints. In many contemporary sahelien communities, local political conditions render long-term collective

*"Political" as used in this context derives from the word policy. A policy is defined as a decision which can be enforced by sanctions. "Political constraints" thus refer to difficulties which arise from sanctioned decisions, or from the inability to make sanctioned decisions at certain political levels, e.g., the local level.

activities impossible. (The Swiss-financed village woodlot program in Upper Volta implicitly recognizes this [UVFPA: 149-50, P.d.].) Table 1., below, suggests both the generally low levels of local competence residents perceived in these four sites in 1979 and the marked inter-village variations which may exist among adjacent communities (Villages 1 and 2 shared a common border, as did 4 and 5). These villages ranged in resident population from 500 to 1,500.

Table 1.* "About what sorts of things can you make laws?"

Villages / Reported Areas of Local Competence	NIGER 1	NIGER 2	UPPER VOLTA 4	UPPER VOLTA 5	Totals
None	6 (16%)	24 (71%)	0 (0%)	0 (0%)	30 (20%)
Marital problems	21 (55%)	3 (9%)	36 (69%)	22 (71%)	82 (53%)
Marital problems plus other issues (alms, livestock control, well-digging, etc.)	10 (26%)	6 (18%)	12 (23%)	9 (29%)	37 (24%)
Any problem	1 (3%)	0 (0%)	4 (8%)	0 (0%)	5 (3%)
N =	38	34	52	31	154

Sahelien communities which approximate even the "best" of these four illustrative cases (Village 5.) in terms of perceived low level of policy-making competence face a real dilemma. Implications for participatory renewable natural resource management on a collective basis are devastating. In such milieux, local political conditions dictate that villagers cannot, for lack of effective local political

*Table presents results of surveys administered in three villages of a canton in Niger's south-central Mirriah Arrondissement, and in two villages of an arrondissement in Séguénéga Subprefecture in the Yatenga region of northern Upper Volta in 1979 by James Thomson under a Rockefeller Foundation International Relations fellowship. In the third Nigerien village, 11 respondents (43%) reported no local competence, 15 (58%) some competence; interviewing errors preclude a detailed break-down of degrees of competence.

frameworks, jointly protect and culture village woodlots, live fencing or windbreaks during critical initial years until they become established. They cannot as a group police woodstock or pasture use on village lands. They cannot develop and systematically maintain watershed management by collective action over the lands of all holders in a single watershed. Joint soil conservation operations and the like are impossible where these depend on the capacity to enforce collective decisions, because that capacity does not exist.

3.5.1. Collective Action Conditions. Collective action possibilities will be greater whenever local communities enjoy both rule-making capability, including taxation and resource use regulation, and rule enforcement capability. Where a small, or even a large number of local decision makers (with or without state authorization) can effectively establish binding local regulations concerning resource use, taxation and other such critical building blocks of sustained collective action, long-term management operations are feasible. Autonomous local resource management operations become possible and indeed probable, if popular opinion supports them, where local communities can enforce their own locally-made rules in village or quarter moots, at low cost. This appears to have been the case, for instance, in pre-colonial Mossi society [UVFPA: 21, P.2.1.5.1. ("d'ordre social et traditionnel", 65-66, P.6.2.1.1.], where earth priests (tengsoba-namba) exercised general control over allocation of land and regulated bush fires.

By contrast, in communities where local cohesion is

lacking [NFPA: II, 57, P.4.; UVFPA: 21], it would be naive to assume local initiative will suffice to sustain effective collective action over the long run. If making and enforcing resource use and management rules depends on the willing consent of each and every person affected, locally-initiated collective efforts become practically impossible to sustain. Under such circumstances, if environmental problems are to be dealt with to any extent collectively, either outside leadership in policy-making, and in implementation, and in enforcement must be constantly provided, or the conditions of local public collective action must be modified. (It is highly problematic whether all environmental management problems can be resolved by individual efforts unaided by collective backup at the local level, at least to provide a framework for coordination and enforcement of rights and duties.)

3.5.2. Top-Down Implementation Unlikely. The former approach - outside policy-making, implementation and enforcement - seems excluded by limited government manpower as well as by bureaucratic inefficiencies. Many administration and extension tasks are now badly executed for lack of manpower, or for lack of responsive manpower. What likelihood then is there these same organizations and individuals can successfully shoulder the burden of daily supervision of renewable natural resource management activities in local milieux throughout the Sahel where management has become imperative? The answer in a word? None.*

*The parastatal forestry development corporations now operating in Mali [MFPA: 93-94, P.5.1.1.2.2.] and proposed for Niger [NFPA: I, 126, P.7.2.2.4.] and Upper Volta [UVFPA: 109-11, P.8.6.2.] might engender greater agent responsiveness by making rank, reward and advancement more dependent on job performance than

3.5.3. Can Local Collective Action Conditions Be Changed? That leaves the other option: improving local-level collective action conditions in those communities now too "under-governed" to envisage sustained collective activities. In many areas, increasing capacity for autonomous collective action will be difficult for a variety of reasons [see, e.g., Thomson, 1983c: passim]. One is often lack of authority to raise taxes, at local initiative, to finance environmental management activities (payment of woodlot guards, production of seedlings, establishment of soil erosion control structures, etc.), as is the case in Niger [NFPA: II, 59, notes the arrondissement (two levels above the village, three above the quarter) is the lowest level rural jurisdiction with any taxing authority].

Yet if national governments do not begin seriously experimenting, at least in selected sites, with efforts to create really viable, effective local (i.e., village and quarter) governments, solutions will not be found. Government invitations or exhortations to villagers to participate either on a voluntary basis in local operations, e.g., coooperatives or village development groups, or on a non-voluntary basis under the direction of outside government officials, are not adequate responses.

3.5.4. A brief example may illustrate this point. No one would expect citizens to pay state taxes voluntarily, were it clear those who refused to pay would face no punishment. Why then should all villagers be expected to comply voluntarily with environmental management regulations, many of which may be onerous for particular

(fn. p. 18 con't.) on academic diplomas. But foresters will still be too few to deal with all, or even with a major portion of environmental management problems on a direct basis.

individuals in the short or even in the long term, if it is well and widely known non-compliance is not punished? If some can flaunt regulations, benefit from resource-maintaining investments of others and yet refuse to bear their fair share of the costs, is it reasonable to expect those otherwise willing to participate with cash, time or effort, to do so? Hardly. This suggests increased attention to conditions of local non-voluntary collective action will be necessary where individual initiative and individual activities do not suffice to ensure adequate environmental controls.

3.5.5. Organizational Reform Criteria. What is needed under such circumstances are local non-voluntary jurisdictions responsive to local interests and local needs. Villagers must acquire the capacity to make decisions with minimum expense in time and effort necessary to acquire appropriate authorization, i.e., through duly constituted local governments or special districts which can make binding and enforceable rules concerning environmental management. Such rules must be enforceable on a non-voluntary basis, by appropriate local judicial actions, against recalcitrants and violators.

3.6. Constraints Interdependent. Changes in one constraint may influence impacts of others. Technical innovations, such as genetic engineering to increase thorn species growth rates, may make live fencing - enclosures - much more attractive than at present. This might obviate the current need for collectively-implemented dry season grazing controls to promote reforestation. Enhanced collective action capability could make windbreaks or hydraulic erosion control structures economically feasible where they may not now be. Localizing the tree tenure legal process may enhance the value of trees, promoting reforestation.

4. RECOMMENDATIONS

Running through the six recommendations which follow is a common theme: social forestry is not industrial forestry. Social forestry is people-, not machine-intensive. Sahelien foresters, governments and donors must assess sahelien reforestation programmes from a participatory management perspective. They must examine rural people's interests ("felt needs"), experiences with constraints and insights about how to overcome them, rather than assuming herders and villagers will respond automatically to "propaganda" and foresters' interests. The plain fact is: they won't...unless the propaganda and foresters' viewpoints make sense to target populations in terms of promoting activities which are feasible in light of constraints potential peasant sylviculturalists face.

Social forestry activities take place in specific social contexts. It is imperative that foresters learn to know and to understand those contexts, in their great diversity, if they want to promote social forestry initiatives efficaciously. A key criterion of evaluation in forestry projects and proposals should be: "how will this program reduce constraints on participation?"

Six inter-related reform proposals will be advanced:

1. gradual "decoding" or privatization of property rights over trees in fields
2. gradual localization of tree tenure rule enforcement
3. research to:
   a. determine when and where to initiate policies 1. and 2., above;
   b. identify technical constraints involved in managing natural regeneration, planting trees, etc.; and
   c. monitor social forestry innovations and efforts
4. retraining foresters to prepare them to do effective extension work

5. development of extension systems to provide foresters means to contact peasants interested in improving their individual or common woodstocks
6. development of parastatal corporations as a means to popularize participatory management of woodstocks, promote local (village and quarter) government capability in renewable resources management, as well as to do a more effective job of managing state forests.

Before land tenure rule changes can be advocated, more information about existing land tenure practices and judicial processes concerning land tenure dispute resolution is required. Otherwise, proposed reforms will likely either do more harm than good, or remain purely paper phenomena, little affecting rural realities.

4.2. "Decoding" Tree Tenure Rights. This is a complex topic, fraught with problems. Most "solutions" will impose costs on some or all users. It is unlikely that a single forumla denationalizing tree tenure will be appropriate for the entire Sahel, or even for all regions of a single country.

4.2.1. Private Rights in Trees: An Alternative to Code Controls. Privatization of tree tenure rights offers an alternative to national forestry code controls as a solution to the problem of insuring sustained-yield woodstock management. The current system of national ownership and subsidiary usufructory rights could be replaced by village, quarter or individual ownership of specific parts of the woodstock (woodlots, trees located on fields, common bushlands, state forests, etc.). Such a tree tenure system assumes the more direct property rights would give user-owners a strong incentive to control exploitation and provide for adequate future supplies [UVFPA: 95-96, P.8.4., clearly states this position].

4.2.1.1. Is This Assumption Justified? The evidence suggests it

is in some places, but not in others. Where supplies still exceed demand, it often is not. There, relaxation of code restrictions would probably simply substitute uncontrolled use of local woodstocks for uncontrolled use of national woodstocks. Relaxation might also legalize the current widespread devastation of remaining natural forests by farmers in search of new, fertile lands. Under such circumstances, abolishing national controls seems ill-advised. (Note however that maintenance of national authority over such threatened woodstocks may hardly delay their destruction if forestry departments cannot mobilize the manpower necessary to enforce use regulations.)

4.2.1.2. The assumption of better woodstock management through tree tenure privatization appears more justified where (a) villagers perceive wood shortages, (b) would be willing and able to enforce property rights and (c) would invest in creating new supplies if they could be reasonably sure they would reap benefits of their investments. In some sahelien areas these three conditions are already met. Private woodlots in Niger's Tera and Bouza Arrondissements, and at various locations in Upper Volta and Mali, as well as pronounced interest in individual or family woodlots remarked on in the Nigerien and Voltaic Assessments, confirm this. In some areas field owners now with increasing frequency prevent others from cutting trees on their land [NFPA: II, 120]. This also lends support to the contention if their purpose is to defend existing trees rather than merely to escape having to pay a fine if a passing forester notices a cut tree. Table 2. below shows that both motivations are possible - though defense of trees

predominates - and that respondents' projected reactions to this hypothetical situation vary somewhat.

Table 2.* "What would you do if you saw someone trimming branches or cutting a tree on your field?"

Villages / Projected Reactions	NIGER 1	NIGER 2	NIGER 3	UPPER VOLTA 4	UPPER VOLTA 5	Totals
Do nothing; inform individual he will pay any fines assessed by forester	7 (20%)	4 (12%)	5 (20%)	4 (7%)	0 (0%)	20 (11%)
Forbid trimming or cutting; lodge a complaint against the individual	28 (80%)	29 (88%)	20 (80%)	50 (93%)	33 (100%)	160 (89%)
N =	35	33	25	54	33	180

All five villages have experienced decreasing wood supplies since the drought, which probably explains the overall high proportion of respondents projecting positive action to defend trees on their fields. Such positive action responses may however be somewhat inflated by some Nigerien villagers' perceptions that defense of trees was the "appropriate" response, i.e., desired by foresters. Foresters never visited the Voltaic villages, so their opinions would not have affected responses there.

4.2.2. Privatization Problems. Problems must be expected from privatization if tree tenure rights are at variance with land tenure rights. Vesting control over trees in him "who works the land" risks eviction of tenants where the effective land tenure rule accords property rights to those "who first cleared the field" and their descendents. Landowners may seek to prevent tenants from establishing property rights either to newly-planted trees or to natural regeneration which the latter may protect. Those whose fields are already

*Source: see fn., p. 16.

treeless may likewise generate problems if no nearby bush land remains where they can exploit a common woodstock. Common land woodstocks would also pose a problem: who is to decide who owns them and how they should be exploited?

4.3. Localizing Tree Tenure Legal Process. Privatizing tree tenure rights implies as a practical corollary localizing legal recourse and enforcement. This would markedly reduce costs to tree owners of defending their woodstock rights. A villager can generally find his quarter head, village chief, earth priest or local Muslim cleric much more easily than he can track down a roving forestry agent. Thus authorizing local notables to handle tree tenure disputes would encourage litigation in defense of tree property rights. Such proceedings would slowly clarify those rights in local moots open to all. Decisions would be publically debated rather than being handled in administrative proceedings between forester and violator. The latter often exclude non-interested parties. Moot proceedings would help inform locals of the new system of tree tenure rights, as well as defining content of rights.

4.3.1. Translating Forestry Codes. Wherever forestry codes are to remain in force, it would be extremely useful to translate them into local languages, as the Maliens are reportedly doing [MFPA: 121]. This would permit rural Saheliens to inform themselves about their rights and responsibilities under the codes, something which is now, for most, impossible.

4.4. Research Activities. Two major types of research activity must be undertaken in sahelien forestry programmes. The Assessments appropriately propose various kinds of technical research. Social

research, not mentioned in the Assessments, is also imperative if social forestry initiatives are to succeed on other than a hit or miss basis.

4.4.1. Technical Research should focus at least in part on innovations which will remove technical constraints on popular reforestation. Increased growth rates, more resistant species, improved planting techniques for difficult sites (e.g., micro-catchments on lateritic soils, association of soil conservation terraces and in-field plantings, etc.) would all apparently find approval among peasant sylviculturalists. Many other topics might also be usefully explored, including particularly, means to artificially promote natural regeneration. Much of this technical reserach must have an applied orientation, i.e., the research topics and implementation of technical innovations must themselves be considered problematic. They should be determined in light of rural sylviculturalists' needs. Genetic engineering feats which produce hybrids more productive only under experimental station conditions contribute little to sahelien reforestation.

4.4.2. Social Research will condition the success of social forestry efforts. Clearly, changes in tree tenure rules (decodification) must be introduced in an informed manner. The UVFPA proposes establishing a "Bureau Veritas" to evaluate impartially fuel consumption characteristics of 'improved' woodstove models [UVFPA: 114-15, P.8.7.1.4.], an extremely useful suggestion. Similarly, to prevent either "ardent participationists" or "forestry code hard-liners" from biasing information and thus policies to suit

their own orientations, the same sort of independent, applied research organizations should be established to determine where local conditions warrant decodification [see above, pp. 22-24, P.4.2.] and where it is appropriate to maintain existing code regulations. Such a research unit should monitor local governments' and foresters' performances in enforcing tree tenure provisions. Additional research - logically prior to technical investigations proposed above [p. 26, P.4.4.1.] - concerning barriers to reforestation which rural Saheliens identify should be undertaken. If such information were gathered impartially, chances are much better that applied research findings would actually be adopted in rural areas. Social research units should also carefully monitor performance of social forestry extension workers, both to identify successful approaches and to provide an informed basis for "course corrections" and policy modifications.

Implementation of various state forest participatory management schemes suggested in the Assessments should also be closely monitored. What works? What doesn't? Must written contracts or statutes detailing rights, duties and procedures of use and recourse be set up [Hoskins, 1979a: 54-55, Ps. 6.A. - B.]? Is it reasonable to accord control (use policy establishment and enforcement) over a portion of state forest wood and by-products to neighboring villagers, on the basis of simple proximity and residence in particular communities? Would it be preferable to establish special user groups, charged with assuring sustained yield of the specific resources they exploit, rather than relying on existing jurisdictions [for some considerations, see, e.g.,

Thomson, 1981d: 23-49; Thomson, 1981e: 7-19]? Who benefits and who is hurt by various approaches? Which leave the woodstock better off? What forms of use rules and procedures for insuring individual and group investment in future supplies are most productive? Which fail? Questions of this sort must be answered, and changes in answers tracked over time, if forestry departments are ever to succeed in deliberately designing effective participatory environmental management institutions.

4.5. Converting Resource Cops to Extension Workers. The Assessments recognize how police work - enforcing code use regulations - undercuts foresters' now sporadic efforts at extension. Decodification and localization of enforcement procedures would gradually eliminate this problem. If foresters, liberated from policing duties, are then to serve a useful purpose, they must improve their mastery of technical forestry procedures. Above all, they must learn extension techniques: the arts of contacting people, communicating with them, listening to and understanding their problems, and working with them to devise, not only appropriate technical, but also feasible social solutions. In particular, forestry guards and préposés, recruited as ex-soldiers to enforce forestry code provisions as resource cops, must be retrained to deal with extension tasks, as their enforcement role is eliminated.

Retraining will require special efforts to perfect technical competence and to develop extension work skills. Here again, applied research should be used to monitor success or failure of specific approaches to training and to extension. Failure to do so will risk either training foresters poorly or training them to

do the wrong things; this must be avoided, both to protect agents' morale and to build public confidence in foresters' commitment to extension work and participatory forestry. Applied research can also help to evaluate individual agents' performance of their job duties in the field, and thus will create an incentive for field foresters to take extension work seriously. It will be imperative for forestry departments to convince agents their task lies in discovering constraints and problems rural dwellers face in trying to reforest their own small portions of the Sahel, and then working out with villagers solutions to avoid or overcome those problems. Field agents must see the necessity of treating rural people as a potentially supportive clientele rather than as "the enemy" whose efforts to destroy renewable resources must be curbed at all costs.

4.6. Extensions Systems for Social Forestry. The fundamental problem is to devise systems which will provide foresters contacts among the population. Individuals should be especially skilled in sylvicultural matters, capable of promoting participation, of developing local networks of interested individuals and funneling information to them, and of identifying resource management constraints and problems to which foresters can then seek solutions.

4.6.1. Extension System Themes. Specific areas of promise for sahelien social forestry extension work include techniques of propagation by cuttings (a fund of local knowledge often exists, concerning, e.g., Commiphora africana, Euphorbia balsamifera and Ficus thonningii, and should be deliberately expanded), by direct seeding and by active management of natural regeneration.

Success of these techniques depends, among other things, on knowledge - now not widely dispersed in many sahelien communities - of preferred seed harvesting times for particular species, seed storage techniques, best times and locations for planting, pruning techniques and timing for various species, and of multi-species communities where individual species reinforce community survivability and/or growth rates, etc.

4.7. Parastatal Corporations. Public organizations established to exploit sahelien woodstocks may sometimes be useful vehicles to promote participation in management. Depending upon organization or reorganization of particular forestry departments, such parastatals might take on responsibility, not only for in-house exploitation of natural forests and industrial plantations, but also for development of retraining courses, extension systems, and the like. They could be set up to provide forester managers with greater control over personnel, o that agents who failed to perform well as extension workers could be disciplined or fired, rather than being retained or promoted because of success on some exam little relevant to job performance [see Assessment proposals cited above, fn., p. 18].

4.8. Local Organization. Initiatives to promote more effective local organization are not discussed here as a separate item. Local organization figures as an integral part of recommendations 1., 2., 5. and 6. (decodifying tree tenure, localizing tree tenure legal processes, developing social forestry extension networks and using parastatals to promote popular participation in sustained-yield management of state forests). It might also play a role in

some aspects of applied research, detailed in recommendation 3.

In general local organizations must enjoy real policy-making, implementation and enforcement powers, and be able to allocate valued rights, information or goods if they are to exert any lasting influence on renewable resource management. Forestry departments should avoid developing a single set of model statutes for user groups, or a single set of use rules governing exploitation of renewable resources by local communities. It would be much more productive, in terms of discovering locally feasible solutions which work in a given context with its attendant constraints, to allow local experimentation, perhaps within some broad limits, and then monitor developments to see what approaches work best. There are no fixed solutions to these types of social problems, it should be noted, and there is a great deal of room for learning.

5. SUMMARY

The prevailing top-down approach to renewable resource management, although slowly giving away to more participatory schemes, remains firmly established despite its severe inadequacies. Social forestry advances will come only at considerable cost in reorganization of forestry institutions and reorientation of forester attitudes. Integrating social factors into resource management actions, and making a large place for local initiative as a key to more effective management, constitute the standing challenge for sahelien forestry through the end of the century. It is an urgent challenge: failure to allow rural Saheliens to meet it will almost certainly condemn them to bear rising costs of environmental degradation.

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