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STRUCTURING NATURAL RESOURCE MANAGEMENT AGENCIES IN DEVELOPING COUNTRIES - SOME LESSONS FROM MADAGASCAR AND BOTSWANA

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ABSTRACT

Natural resource management agencies in developing countries face challenges often fundamentally different than their developed country counterparts. Application of developed country or colonial institutional models hinders effective natural resource management in developing country settings. Lessons from case studies in Botswana and Madagascar indicate that key areas in developing country resource management agencies are institutional structure, program relationships with local communities, training, and terms of employment. Emphasis on effective operation of field staff and orientation of management to human needs in each of these areas can lead to improved natural resource management. Conservation biologists need to be aware of these opportunities as their input is increasingly sought in addressing resource management issues in developing countries.

Natural resource management agencies in developing countries face challenges which are very different from those which apply in developed countries. Conservation biologists may be called upon to comment on the structure of these agencies, particularly when assisting nations in the design of conservation programs. Developed country biologists can only give appropriate advice if they are aware of the demands faced by developing country institutions and some of the options for coping with these demands.

Among the most obvious challenges facing natural resource management agencies* in the developing world are critical limitations in financial means and an impoverished, agricultural socioeconomic setting (Jansen, 1989). While restricting subsistence use of resources by the underprivileged has been a theme in developed country conservation, it is the leitmotif of conservation in developing countries. Despite the wide recognition of these issues, most developing country natural resource management agencies continue to be modelled on developed country institutions which have relatively ample budgetary support and operate in industrial or post-industrial settings (Lusigi, 1981, Dasmann, 1984; Myers, 1972). The limitations of

[* - In the context of this paper, non-agricultural natural resources management agencies - primarily forestry, wildlife and parks authorities.]

developed country models are becoming apparent, but these lessons must be understood and applied to institutional redesign if the shortcomings of existing institutional structures in the developing world are to be overcome (Matownyika, 1989; Halffter, 1981).

Using developed country models forces developing country natural resource management agencies to operate with institutional structures designed for much higher levels of inputs (finance, training) and much lower levels of output (enforcement, area). The 1989 budget of the United States National Park Service was $733 million, and the U.S. parks system encompassed 31.9 million hectares. The aggregate annual national parks budgets for all of Africa are on the order of $100 million, and these agencies are charged with the protection of 59.8 million hectares (Leader-Williams and Albon, 1988). The situation may be even worse for forestry agencies in Africa. Agencies in Latin America and Asia face comparable constraints (Dourojeanni, 1989). These financial considerations alone would dictate that developed country models should be adapted before application to third world conservation agencies.

The impact of access restrictions on resource users is also much greater in developing countries (Marks, 1976). Developed country recreational or commercial users generally have ample resources both for finding alternatives and for negotiating with government regulators (Eidsvik, 1978). In contrast, the developing country agriculturalist may have little or no margin for bearing the costs of reduced access to resources, and may have little means for responding to government regulation other than avoidance (Marks, 1984). The consequence of this is that developing country natural resource management agencies should invest in social outreach to a greater extent than developed nation agencies. Without this investment, conservation measures

may result in human suffering, resource degradation, or violent conflict between conservation agencies and resource users.

Complicating these problems is the lack of trained conservation personnel in the developing world. Salaries offered by developing country conservation agencies are generally far below those offered in developed countries. As a result, university trained professionals from developing countries often find opportunities in the developed world or with international agencies more attractive than returning home (Chambers, 1983). This creates a critical shortage of trained manpower in conservation agencies in developing countries. Governments and donors generally attempt to bridge this gap through the provision of long-term technical assistance. Such assistance can be extremely expensive even by developed country standards (up to $250,000 for one technical assistant per year) and completely of reach for governments without donor support. When donor support terminates, lack of human resource reasserts itself, and resource management may be little further advanced than prior to donor intervention.

Developing country agencies then face greater need for social sensitivity, greater pressures on resources over greater areas, and far lesser availability of human and financial potential to apply to resource management. Each of these factors argues for novel and flexible institution structure in developing country resource management agencies. Unfortunately, many, if not most, developing country resource management agencies cling to underfunded, understaffed reflections of developed country (or colonial) institutions (Grove, 1987; Matowanyika, 1989). The need to reform these structures and develop institutions responsive to the special needs of developing countries is explored in the context of two case studies below. The cases selected are a forestry agency in Madagascar and the wildlife

authority of Botswana. While these cases come from very different social and ecological settings, common themes suggest lessons for agencies in other developing countries.

MADAGASCAR - DIRECTION DES EAUX ET FORETS

Forest protection in Madagascar is charged to the Direction des Eaux et Forets of the Ministere de Production Animeaux, Eaux et Forets (MPAEF). This Direction has responsibility for the island's remaining natural forests amounting to about 10 million ha, as well as over 47,000ha of plantation forests (IBRD, 1989). The staff of the Direction consists of approximately 250 professional foresters.

The Direction is ineffective in controlling deforestation in Madagascar. Deforestation rates in the eastern moist forest of the island are on the order of 200,000 ha per year (IBRD, 1989). Rates are lower in the dry deciduous and spiny forests of the south and west. Most deforestation is due to clearing for shifting cultivation, charcoal production, or burning. Loss of Madagascar's forests is of extreme biological significance because of the uniqueness of the island's flora and fauna. Primate endemism on Madagascar is in excess of 98% (Mittermeier, 1988). The reasons for the ineffectiveness of the Direction des Eaux et Forets (DEF) in controlling deforestation relate to levels of finance, departmental structure, and lack of training.

Structure and Training

DEF is the continuation of a highly stratified French colonial forest protection service. The Direction has no less than seven levels of bureaucratic hierarchy (Seyler, 1987).

Central administration of DEF in the capital city of Antananarivo is supported by six provincial services. Each provincial service is in turn divided by Circumscription, and Circumscription subdivides into Cantonnement. The lowest level in the professional hierarchy is the position of Triage, which is supported by forest guards and day laborers.

Chefs de Circumscription, Cantonnement and Triage are civil servants, as are central and provincial officers. Forest guards and day laborers are contract personnel, with no guarantee of job security. When government budgetary constraints arise, forest guards and laborers are the first to be terminated (Raymond Rakotonintrina, personal communication). Civil servants are generally retained, but pay freezes and attrition have been used to reduce salary costs.

The Government of Madagascar has suffered serious budgetary problems over the last decade. These problems have severely impacted DEF. Madagascar's economic difficulties emerged in the debt crisis of the early 1980s, and structural adjustment and IMF budgetary ceilings have steadily compressed government revenues and spending over the last 8 years. Environmental and conservation programs have suffered particularly serious setbacks, as resources were diverted to food subsidies and vital social services. DEF suffered layoffs of forest guards, major attrition to the private sector and retirement, and loss of operating and investment funding during this period (Seyler, 1987). DEF budgets have been reduced 75% in real terms since 1980. The DEF investment budget for Madagascar's 36 protected areas was less than one thousand dollars in 1986.

Continuing high rates of attrition within DEF will be particularly damaging in the long term. Each year the Direction loses 10-15 foresters, while new recruitment into DEF runs at 4-5

professionals per year. The result of this process is an aging and demoralized professional cadre. Over half the professional foresters in the Direction are currently over 50 years old (Seyler, 1987). The vacancy rate in field forester positions stands at over 50%.

The overall picture of DEF after ten years of budgetary and personnel contraction is one of a pyramid without a base. The hierarchical French administrative structure has been slowly eroded from the bottom, leaving a top-heavy organization ineffectual in the field. Figure 1 illustrates DEF planned and present structure. In late 1988, central and provincial DEF positions were completely filled and nineteen of twenty Chef de Circumscription positions were manned. In contrast, Almost half of all Chef du Cantonnement positions stood vacant (68 of 170). At the level most important to field enforcement and extension, the situation was even more critical. 189 of 270 Chef de Triage posts stood vacant in 1988. The DEF forest guard contingent stood at under 200 at this time. Presently there is less than one DEF field agent (Chef de Triage or forest guard) for every 100,000ha of remaining forest in Madagascar.

Forestry training in Madagascar is in equally dire straits. The agricultural institute at which government foresters are trained has been shut down most of the decade due to budgetary constraints. Applicants for DEF forestry positions must in theory come from this program. The training backlog has contributed to the DEF attrition problem, or at least provided government with a convenient excuse for low levels of recruitment and associated savings in salaries. Training at the institute, when it is available, focuses on traditional forestry disciplines. Social forestry has not been part of the curriculum.

There is no training program for DEF field staff. Whatever training is received by forest guards is provided on-the-spot by DEF foresters. Guards often are not literate, and have little prospect of future training or advancement even if they perform well within DEF.

Donor Support

Major international support for environmental programs in Madagascar is coalescing around the extreme poverty and biological importance of the island (IBRD, 1989). The Swiss Cooperation has the largest environmental program in the country. The Swiss have focussed on sustainable forestry and forest protection in the dry deciduous forests of western Madagascar. At their project site near Morondava, the Swiss are experimenting with long rotation, species-enriched sustainable exploitation. The Swiss project has augmented forest protection locally and has recently expanded into addressing the social causes of deforestation.

While the Swiss program is the largest in funding commitment, the World Wide Fund for Nature (WWF) has the most diverse and rapidly expanding program. The WWF commitment began at under one hundred thousand dollars annually in the late 1970s. The program focussed initially on a review of Madagascar's protected areas and has evolved into a major effort to mount development projects to ease destructive pressures on a series of priority reserves. The United States Agency for International Development (AID) has contributed heavily to this effort. The WWF program was bolstered by a two million dollar debt swap in early 1989. The proceeds of this exchange will contribute to protection of priority protected areas and initiation of the first-ever Forest Guard training program in the country.

More recently, the World Bank has mounted an Environmental Action Plan for Madagascar. German Aid (GTZ) has announced a $30 million environmental commitment for Madagascar, and AID is planning a 5 year, $25 million dollar conservation program.

Donor efforts to date have not addressed the essential problems facing DEF. Past donor efforts have focussed on local projects, drawing remaining competent DEF personnel into protection efforts for relatively limited areas. The Swiss program has recognized the key role of resumed training, and plans to support refurbishing of forestry training at the agricultural institute. The WWF program has provided supplementary guards at protected areas, and may augment the national forest guard contingent as part of the debt swap arrangement. The World Bank has spearheaded an effort to remove national park protection from DEF, a move which will strengthen parks protection, but do little to improve DEF performance in forest management. DEF institutional structure remains outdated, inappropriately modeled on French systems, and crippled by attrition of trained staff. DEF is completely unprepared to meet the complex social and technical task of addressing the root causes of deforestation in Madagascar. It is presently incapable of providing even short-term enforcement.

BOTSWANA - DEPARTMENT OF WILDLIFE AND NATIONAL PARKS

The Botswana Department of Wildlife and National Parks is responsible for management of the nation's wildlife, parks, and reserves. Poor infrastructure, a diverse wildlife base, and wide popularity of hunting in rural areas combine to make this a challenging task (Hannah et al, 1988). Botswana also has an unusually extensive protected area system, with over 18% of national territory set aside as natural area.

The Department faces this challenge with a professional staff of approximately 280, supported by about 250 non-civil service positions (FGU, 1987). Botswana's large area (576,000km^2) and extensive protected areas of (over 10,000,000ha) mean that DWNP has one of the lowest staff/national area ratios in Africa. It has fewer national park staff per unit area than any other parks authority in Africa (FGU, 1987).

Protected areas in Botswana have historically faced relatively few threats, owing to low population density, poor roads, and good internal security (Child, 1970). Low levels of DWNP management input have been effective under these conditions. Department wildlife management has been less effective. Overhunting, both legal and illegal, has combined with drought and a rapidly expanding cattle industry to decimate wildlife populations in Botswana (Arntzen and Veenendal, 1986).

Wildlife depletion in many areas of Botswana has been facilitated by poor administration of the hunting license system (FGU, 1987). Audits of the licensing system have revealed widespread abuses in which poor staff motivation and training have played a key role. Public relations are also a problem with the Department, with beatings of citizens and other adversarial

relationships with communities reported from some rural areas. Overall effectiveness of the Department has therefore been fair to good under favorable parks circumstances and difficult conditions for wildlife management. Department capability and performance need to be improved considerably to manage the recovery of the nation's wildlife estate and ensure the integrity of the nation's protected areas in the face of increasingly complex pressures.

Structure and Training

DWNP structure follows a classic organizational pyramid typical of law enforcement agencies (Figure 2). 71% of DWNP staff are field agents, while upper management comprises 2% of staff. In Contrast to Madagascar, the overwhelming majority of Departmental posts are filled and the Department is rapidly expanding. Current development plans call for the Department to more than double over the next five years (FGU, 1987).

Also in contrast to Madagascar, the DWNP has no major budgetary shortfalls. The Government of Botswana enjoys high revenues from diamond mining, and the country enjoys heavy donor input thanks to its position as a front line state and a democratic, effectively functioning government (Arntzen and Veenendal, 1986). There is strong donor interest in protecting Botswana's fragile arid environment and wildlife management and parks tourism are seen as important components of this protection. DWNP is heavily augmented with foreign technical advisors.

Training of DWNP staff is handled in-house for field level personnel (Game Scouts), and out of country for warden and

management-level staff. Management training is generally good. Management trainees are sent to Mweka Wildlife Training Institute in Tanzania or to university courses in Europe or the United States (FGU, 1987). Game Scout training is conducted at the department's Wildlife Training Center (WTC) in Maun, and is much less effective. The WTC course emphasizes academic biology and police tactics. Little field biology is taught at the center and no instruction in community extension is offered. The training interval is long, with most Game Scouts waiting four or five years to receive the 9 month WTC course. No refresher training is offered.

Recruitment for DWNP Game Scouts occurs in the capital, and is restricted to school graduates who compete successfully on government civil service examinations. This restricts entrance to applicants from more urban, eastern parts of the country. As a result, the system recruits relatively well educated, urban-oriented young men with little interest in, or aptitude for, posting to remote areas. Rural residents, more comfortable in isolation and more knowledgeable about wildlife (but with restricted access to formal education, are largely excluded. In addition, DWNP is not a desirable post in government, so those candidates which are accepted are usually those unqualified for other government service. The system recruits those least qualified for government service, rather than those best motivated to work with wildlife in isolated field posts.

Despite the disparity between recruit aptitudes and Department needs, DWNP has no active screening process for new recruits. Game Scouts may not receive formal training until their fourth or fifth year of service, by which time termination can only be effected through bureaucratic civil service procedures. The posting of untrained Game Scouts with poor aptitude for primitive living conditions and isolation results in

a number of chronic problems in DWNP field personnel. Game Scouts work to minimize time in the field, alcohol and drug use are problems, and disciplinary problems arise in remote areas.

Donor Support

As discussed above, donor support for conservation in Botswana is strong (Hannah et al, 1988). The European Community has an open-ended, multi-million dollar program committed to strengthening DWNP. This program has provided buildings (but not technical assistance) at the Wildlife Training Center, technical assistance in management, and infrastructure and materials for a variety of protected areas. The United States Agency for International Development is instituting a wildlife utilization program which will support further technical assistance to the Department. Other donors maintain rural development portfolios in which wildlife utilization is involved.

Perhaps the most significant development in DWNP effectiveness is the rapid expansion of the Department which has been promoted under the EEC assistance program. Under a proposal currently approved by government, the DWNP staff complement will more than double over the next five years. This extremely significant expansion is a remarkable commitment on the part of the Government of Botswana, and is an excellent example of host government partnership in strengthening a natural resource management agency.

DISCUSSION

Experience in the very different environments and social settings of Botswana and Madagascar suggest common elements necessary to improve natural resource management. Both DEF and DWNP have too few field staff. Both have central management structures based on developed country models which require levels of trained staffing which is not available indigenously. Training is inadequate in both cases, particularly for field staff. Field staff selection is based on economic or civil service criteria bearing little relation to aptitude for field work. All of these factors act to create natural resource management systems which are weakest at their most critical point - the point at which government management policies are actually applied to resources and resource users by field staff.

The result of program weaknesses at the field level is poor resource management. Field staff are poorly trained and motivated, and in most cases had little initial aptitude for field work or resource management. This leaves precisely those people most responsible for the success of government programs poorly equipped to implement programs or evaluate their success. Coupled with low field staff/area ratios, field staff incapacity minimizes the influence of government efforts on actual resource use. This is born out in both Madagascar, where forests are disappearing almost unimpeded, and in Botswana, where wildlife numbers have declined dramatically under drought and minimal management.

Improving resource management in this setting requires programs which emphasize increased numbers and enhanced effectiveness of field staff. Scarce resources must be applied to hiring and maintaining effective field personnel, rather than

to attempts to mimic the large central technical staffs of developed country resource management agencies. The lessons from Madagascar and Botswana suggest four areas in which action can be taken to emphasize the field and depart from developed country models. These are:

1. institutional structure
2. program orientation
3. training
4. hiring and terms of employment

Potential actions in each of these areas are explored in more detail below.

Institutional Structure

Effective natural resource management requires a field staff adequate in size to address challenges to the resource base (Leader-Williams and Albon, 1988). Neither DEF or DWNP has a field force adequate to meet existing threats to the resource. On a field staff/area basis, both of these agencies rank among the lowest in the world. In comparison on a field staff/rural population basis both would fare somewhat better, but staffing is still well below that required for effective resource management (Hannah et al, 1988).

Where field staff are insufficient in number, restructuring of organizational hierarchies may be the first step in achieving effective resource management. Central policy-makers are of little use if there is no effective implementation in the field. Restructuring can be used to redirect resources from central professional positions towards the re-establishment of an effective field force. Professional staff salaries may be higher

than those of field staff by a factor of ten or more, so reductions in central staff may be used to support the creation of a relatively much larger number of field positions. In this way, an increase in field staff can be achieved without an increase in budget allocation. In excessively hierarchical agencies (such as DEF), such a reorientation can be used to increase field staff while reducing unwieldy bureaucracy and the need for expensive technical assistance.

Emphasis in reorganization should be on creating as 'flat' an organizational pyramid as possible. A minimum hierarchy includes field supervisors, regional officers and central administration. Such a structure concentrates budgetary resources in the field, where resource management programs ultimately succeed or fail. It also reduces the need for trained professional manpower, a factor which is often critically limiting in developing countries (IBRD, 1988). Such a system also demands that management staff are well-trained and effective, as will be discussed below.

Program Orientation

A second component of resource management adapted to developing country situations is a strong human orientation in the management strategy (Halffter, 1981). Both DEF in Madagascar and DWNP in Botswana rely on traditional law enforcement techniques in their field activities. These techniques cannot be effective where resource users vastly outnumber enforcement personnel (Jansen, 1989). It is for this reason that foresters are known as 'the most hated men' in Madagascar (Jolly, 1980) and that antipathy and even violence occur in relationships between DWNP field staff and remote communities.

Human orientation in a resource management program means both strategic responsiveness to population-based pressures and tactical sensitivity to the conditions and needs of resource users (Child, 1984). In contrast to developed country settings, most pressure on resources in developing countries stems from rural subsistence use which increases in direct proportion to population growth (Anderson and Grove, 1987). These population-based pressures are less mobile and less responsive to simple deterrents than are the recreational and industrial pressures more common in affluent countries. Response to these pressures requires a strategy which responds to demographics as well as territory. Simple territorial administration should be balanced against the need to have field agents concentrated where pressure on the resource base is greatest. This may mean leaving some gaps in territorial coverage in sparsely populated areas with little pressure on the resource.

Once field staff have been strategically placed to respond to population-based pressures, they must employ tactics which are effective in controlling subsistence use of resources. In most remote areas (i.e., those areas in which the resource base remains the richest), effectiveness is likely to be correlated with human sensitivity much more than with brute force. Isolated forest guards or game scouts using traditional enforcement will be able to accomplish little (other than placing themselves in considerable personal danger) in communities dedicated to illegal exploitation. An alternative approach is to maintain tolerance for inevitable subsistence use while making orderly progress in reducing it.

This human-oriented approach opens with dialogue (Korten and Carner, 1984). Effective community cooperation in conservation requires conservation agents who listen to, understand and respect the community they serve (Owen-Smith and Jacobsohn,

1989). Reduction of illegal use requires provision of alternative resources coupled with enforcement to prevent wasteful and unnecessary use. Coupling dialogue with enforcement reduces conflict with the local community and leaves conservation field staff better able to constructively work with resource users to develop means of reducing exploitation (Child, 1984). This more human-oriented approach may also involve cooperation between the resource management agency and other government ministries in working towards coordinated efforts to control land use and stimulate local development (Halffter, 1981).

Training

A successful human- and field-oriented natural resource management program requires staff specifically trained to operate in a 'flat' organizational structure and relate effectively to resource users (Chambers, 1974). DEF has no training for field staff, and management staff receive technical training geared to serve the existing highly bureaucratic, centralized administrative structure. DEF has no internal capacity for management training. Botswana has capacity for training of field staff, but this program is strongly oriented towards traditional enforcement and comes too late in the career cycle to be effective. Most Game Scouts are in their third to fifth year of employment before they receive training.

Field staff, as the implementing force of any resource management strategy, should receive first priority in training. For a human- and field-oriented approach, this training should include methods of community interaction and an emphasis on integrity and responsibility while functioning under minimal supervision in remote areas. Training should come early in the career cycle, prior to posting to the field.

The second key element in a decentralized natural resource agency is training in management skills for supervisory staff. Reliance on a 'flat' institutional structure is only effective as long as regional and central supervisors are able to give direction and support to field staff. This requires management skills which are rare in any government, but which can be instilled with proper training. Chambers (1974) has concluded that attention to management effectiveness is one of the best means of improving program performance in developing countries. Managers must make realistic demands on subordinates, provide logistical and administrative support when requested and maintain direction of field activities without requiring meaningless reports or meetings which detract from program implementation. These principles apply to any program, but are doubly important to the effectiveness of a field-oriented program in which hierarchy has been kept to a minimum. These skills must be developed and continually refined in a training program for supervisory staff if such a program is to be effective.

Recruitment and Terms of Employment

Two final ingredients in a successful reorientation towards field effectiveness are appropriate recruitment policies and terms of employment for field staff. Recruitment should be from rural as well as urban areas, from groups appropriate for community-oriented work in remote areas. Terms of employment should be non-civil service, with an initial brief probationary period associated with training and increasing employment security associated with work performance. These issues are perhaps best illustrated by reference to the Madagascar and Botswana cases.

In Madagascar, field staff (Forest Guards) are hired on a day labor basis. Guards are recruited by foresters from available local labor pools under no formal recruitment procedure (Seyler, 1987). Forest Guards have no job security and are terminated at the first sign of central budget limitation. They may be unavailable or have found other work when budgets are restored. Under these recruitment policies and terms of employment, government investment in Guard training would not be cost-effective or rational.

In Botswana, field staff are civil servants. They are recruited through the civil service procedure, which requires formal education ("O"-levels) and a written examination (FGU, 1987). Once in the civil service, Game Scouts are seldom terminated, regardless of work performance. Government training is justified under these terms of employment, but recruitment selects for applicants poorly suited to field work, and opportunity for post-employment termination of inept candidates is slight.

These examples illustrate the need for selective recruitment and appropriate terms of employment. Establishing an effective field resource management presence requires recruiting individuals with special skills and aptitudes. These include the ability to function under limited supervision, good human relation skills, and aptitude for outdoor work in remote areas. This precise mix of skills is unlikely to be common in either the day labor pool or in educated, urbanized civil service applicants. In addition, it may be desirable to hire field staff directly from target communities. All of these considerations argue for a selective recruitment process, specifically tailored to meet the needs of decentralized resource management.

Maintaining an effective field staff requires terms of employment which permit job security adequate to justify investment in training and reward positive work performance, but sufficiently flexible to permit termination of ineffective staff (Chambers, 1983). Perhaps the ideal terms of employment are progressive contracts, beginning with one year duration and increasing in duration in each succeeding contract, to a maximum duration of five or six years for very senior employees. Unsatisfactory performance would result in failure to renew the contract or a reduction in duration. Positive work performance is rewarded with progressively longer contracts. The initial contract period should be very short, and correspond to the length of introductory training. Unsuitable applicants would be screened during training and their contracts dropped.

Overview

Together, structural reorganization, human orientation, training, recruitment and terms of employment can serve to orient natural resource management agencies to the specific needs of developing countries. Reorienting organizational structure permits staff resources to be concentrated in the field, at the point at which government programs must influence resource use. Human orientation provides a strategy by which this field presence is targeted at, and responds effectively to, population-related pressure on the resource base. Because field- and human-orientation are new in most resource management agencies, specially designed training must be instituted in concert with organizational and strategic reorientation. Training must focus on field staff, which is the reverse of the situation in most developing country agencies, where training is reserved for mid- and upper-level bureaucrats. In complement to this, training of

administrators must emphasize management as well as technical skills, to permit effective functioning of a structure which is 'bottom-heavy' by design. Finally, the entire program must be supported by recruitment programs and terms of employment which seek out and reward applicants with the special blend of skills required for effective natural resource management in the field.

What would such a program look like in Madagascar or Botswana? In Madagascar, DEF hierarchy would be streamlined and forest guard numbers augmented. This would reduce the bureaucracy of the DEF system and enhance field performance. DEF would have to institute both management training and guard training, terms of employment of guards would need to be made more secure, and recruitment would have to be much more selective, perhaps focusing on hiring from villages with deforestation problems.

In Botswana, existing hierarchy is much more appropriate than in Madagascar and government financial resources are much greater. Here, field training must be upgraded and management training introduced. Program strategy needs to be more human-oriented. Terms of employment should be <u>less</u> secure and recruitment should be much more responsive to needed field skills.

Such a reorientation program could pay significant dividends in settings as diverse as Madagascar and Botswana. Madagascar could apply these principles to transform a top-heavy and completely ineffectual forest management agency into a field-oriented institution which might begin to control deforestation on one of the world's most biologically unique islands. Botswana is planning a major expansion of its Wildlife Department with donor assistance. With a largely appropriate organizational structure, this expansion would portend improved management of

the country's wildlife estate, were it not for wholly inappropriate recruitment and training policies. Under present programs, Botswana's rapid DWNP expansion will result in a large, unqualified, unmotivated and poorly trained Game Scout contingent.

The hope of the Madagascar situation is that a proper institutional structure and orientation can be coupled with a meaningful training and hiring program, and the Direction des Eaux et Forets can be rebuilt along very positive lines from the ground up. The tragedy of the Botswana case is that government is expending scarce resources to develop a large, inappropriately oriented department, almost certain to be ineffective, with which it will be permanently saddled.

Donor Role

Despite heavy donor involvement in restructuring developing country bureaucracies, little donor attention has been directed at reshaping conservation agencies. This is because the target of 'policy reform' and 'structural adjustment' loans has been the reduction of government size and expenditure. The need for increased field level staff in conservation organizations does not fit comfortably into this initiative. Restructuring conservation institutions to emphasize field personnel and training and reduce upper and middle management may fit this agenda, however. In Madagascar, for instance, field personnel earn several hundred dollars per year, where professional positions carry annual salaries in the thousands of dollars. Paring 50-100 bureaucrats from the DEF hierarchy could therefore more than double the number of DEF Forest Guards. This type of expenditure reduction coupled with enhanced effectiveness is exactly the point of donor programs in institutional reform.

CONCLUSION

It has been suggested that increased effectiveness in natural resource management in developing countries can be achieved through increasing emphasis on field personnel and decreasing management hierarchy. This may not be popular with developing country resource managers who wish to build institutions along the lines of their developed country counterparts'. Reducing advanced degree positions to increase effective field presence may be seen as reducing the 'stature' of an agency. However, the ultimate stature of a resource management agency is measured in the condition of the resource base, and by this measure, human-oriented, field-based agencies may earn the higher measure of respect in the final analysis.

This approach can only work through introduction of an innovative training program which includes pre-employment screening and emphasizes human elements of conservation. Only such training can produce motivated field personnel capable of functioning with the increased degree of autonomy implied by a 'flat' organizational structure. Reorientation must also be supported by appropriate recruitment programs and terms of employment.

Donor programs have often skirted institutional issues in developing country natural resource management institutions by focusing support on individual projects. This has concentrated resources on particular locations or topics, often drawing host government resources away from other functions. By ignoring the institutional issue, the project approach has often produced results that disappeared with the conclusion of donor input. This approach has been characterized by high hopes and high

inputs, but little lasting impact on natural resource management. Donor sponsorship of institutional reform and innovative training might instead result in broad improvement of natural resource management and have lasting impact.

Conservation biologists need to be aware of the shortcomings of developed country institutional models in developing countries. It is not enough to decry inadequate financial commitment and point out that donor efforts tend to be expensive local band-aids. Suggesting more effective ways to use scarce finances will improve resource management and at the same time attract additional donor interest. Institutional restructuring is one means of achieving such improvement.

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