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1. INTRODUCTION

In Africa, policy interventions to increase livestock productivity centre around the sedentarization of the herdsman. However, the encouragement of the transition from a nomadic pastoral economy to a sedentary one often entails serious ecological and economic risks. Nonetheless, evidence has shown that the limited potential of available natural resources can possibly be used wisely and flexibly under difficult and varying ecological conditions based on local technical knowledge and management systems of most pastoral communities (FAO, 1990). Such management usually involves elaborate rules, regulations and sanctions (Hecht 1985; Chopra et al, 1989). With the local management system it has been possible not only to minimize production loss but also to resolve social conflicts (Wade, 1987). In general, however, results concerning the effectiveness of local management systems have been mixed. Whereas the systems have worked in many places, failures have been recorded in several others (see Feeny *et al*, 1990). This underscores the need to investigate existing systems with due regard to their peculiarities and ascertain the conditions under which successful management can be accomplished.

The government of Nigeria has placed emphasis on the sedentarization of nomadic pastoralists in its effort to develop the livestock sector of the nation's economy. The policy was pronounced during the Third Plan period (1975-80) when government sought to assist States to acquire, gazette and develop grazing land for the exclusive use of the nomadic herders. The long-term objective of the policy is to enable the herders to settle down to portions of such reserved land to enable them raise credit for improvement upon the land and adopt modern technologies of livestock production. The provision of infrastructural facilities such as watering points, improved pastures, treatment centres and feed stores was to be embarked upon by the government as part of the strategies to develop the grazing reserves. During the Fourth Plan period (1981-85) the Federal Government allocated ₦26.178 million for the implementation of its programme on Grazing Reserves, Pasture Development and Supplementary Feed Schemes. Under the programme, government was to acquire and demarcate 5 million hectares of land for pasture development and for the establishment of livestock service centres in a bid to provide assistance to 10,000 nomadic families to settle down permanently. The programme at the state level was to cost ₦53.684 million. All the states concerned within the semi-arid, derived and guinea savannah zones were to gear their efforts towards the establishment of grazing reserves, production of supplementary feeds, hay production and range forage improvement as well as resettlement of nomadic herdsman. The local governments involved were expected to spend ₦9.5 million during the Plan period for the same purpose.

Despite the efforts of the Nigerian government to ensure increased productivity in the livestock sector by providing incentives for the settlement of the nomadic herdsman, it has not been possible to ensure sustainable use of the available environmental resources such as rangelands and grazing resources in the savannah areas of the country. This raises the issue as to whether the available resources are being carefully managed to ensure its renewability and

regeneration. The issue is crucial because notwithstanding the plausibility of a sedentarization (conversion from nomadic to settlement living) policy, achieving desired results is unlikely unless the sustainability of resource use is guaranteed. Efforts aimed at maintaining sustainability would benefit from reliable information about the nature of existing property-rights regime under which grazing resources are held and the effectiveness of the management practices in the face of growing population. Currently, such information is lacking in the country

2. RATIONALE FOR THE STUDY

In view of the increasing vulnerability of dryland areas to environmental degradation, the question as to how the migrant populations on marginal lands can be stabilized is quite pertinent.

Stabilization will involve various options including provision of off-farm employment, income generating opportunities, credit and subsidy policies as well as effective management of the environmental resources. The appropriate choice and combination of actions will depend on the understanding of the migrants' perception and the effects of their activities on the existing environmental resources.

The focus on settlement of pastoralists and rangeland is significant in view of the fact that rangeland appears to be the most severely degraded and suffered greatest productivity loss in Sub-Saharan Africa compared to irrigated land and rainfed cropland. According to Crosson and Anderson (1995), the estimated productivity losses for each of these land uses are irrigated land 6.8 percent, rainfed cropland 14.1 percent; rangeland 44.5 percent. Moreover, the rangeland is important for increased livestock productivity just as is vital to the livelihood of many households. But as a common-pool resource, the benefit derived from it is subtractive; thus the question of how to prevent its over-exploitation through effective management as population grows is crucial for development policy. Nonetheless, existing work on local level capabilities in resource management in Nigeria is scanty. Available studies have concentrated on the fisheries sector. Emerging results, however, point to the striking potentials of local collective actions in sustainable management of the fisheries resources. There is need therefore to bridge the information gap regarding the use and control of access to the rangelands in the dryland areas of the country. Moreover, the settlement of herders in the savannah areas implies that the available grazing resources will be exploited by higher population of users. Unless there is careful management of the resources sustainability of use cannot be guaranteed. This study is apt to provide information as to how sustainable resource use can be achieved in the dryland areas of Nigeria. Specifically, the study seeks to review the settlement policy, examine the pattern of resource use and analyse the resource management practices associated with the rangeland.

2. DATA AND STUDY BASE

The study was conducted in Kwara State of Nigeria. The state is unique in its coverage of savannah vegetation. Three of the four types of this vegetational belt can be found within the boundary of the state. This makes it attractive for the settlement of herders. Also within the savannah belt, the state is in the forefront in the implementation of herders sedentarization policy. Both secondary and primary data were used in the study. Secondary data collection involved extraction of information from documents (such as policy briefs, project reports, etc.). The documents were obtained from relevant sections of the MANR in Ilorin. The methods of collecting the aforementioned primary data included (i) in-depth interviews of top government

officials concerned with the implementation of the sedentarization policy, (ii) sample survey of settlers, (iii) non-participant observation and (iv) focus group discussions (FGD). Items (i) and (iii) were handled personally by the Principal Researcher (PR). While on the field, the PR identified, appointed and trained the enumerators who conducted the sample survey of settlers. Suitable personnel who understood the local dialect were employed and trained for the purpose of the focus group discussions which were held in the presence of the PR. Interview schedule and discussion guidelines were prepared by the PR for the purpose of collecting data using in-depth interviews and FGD. On the other hand questionnaires constitute the main research instrument for the purpose of collecting data through a sample survey of settlers. A random sample of 100 households were selected for the purpose of the survey.

3. PASTORALISTS SETTLEMENT POLICY

The main focus of the settlement policy is the development of grazing reserves in the state. The objectives of the policy are (i) to provide feed and water for pastoralists on a year-round basis, (ii) to eliminate nomadism, improve cattle production and raise the living standard of pastoralists, (iii) to ensure efficient use and protection of environmental resources and (iv) to prevent or minimize incessant clashes between herders and farmers which often result in bloodshed and loss of life.

3.1 Implementation Strategy

The procedures involved in the implementation of the policy include land acquisition, demarcation, surveying, gazetting of grazing reserve, development of grazing reserve and settlement of pastoralists. Table 3.1 presents the list of grazing reserves at various stages of acquisition in Kwara State. The Gidan Magajia is one of the two grazing reserves that have been gazetted in the state. It is the largest in the state and the focus of attention in this study.

Two implementation committees were set up for the purpose of development and management of the reserve as well as settlement of pastoralists. They are the policy committee at the state level and grazing reserve management committee at the local government level. The former is charged with the responsibility of formulating and defining development policy and ensuring that the management committee is provided with the means to achieve management objectives. The latter is to advise and assist on matters affecting the settlers on a day-to-day basis as well as identifying settlers for the reserve. It is expected that pastoralists in the reserve will constitute themselves into co-operatives to enable them qualify for loans.

3.1.1 Development Activities

The Order setting up the reserve stipulates that it should be maintained through proper grazing management and improvement activities such as water development, fodder conservation

plan, range reseeding and fertilization, control of undesirable weeds and fire tracing.

Other development activities include construction of earth dams, boreholes and wells to provide watering facilities, construction of roads, office and residential quarters, establishment of livestock services centre and pasture development. Moreover, efforts are to be made to ensure that the highest possible level of productivity is achieved without endangering the reserve. To this end the government stipulates that soil and water conservation and other erosion control methods should be

Table 3.1: Grazing Reserves in Kwara State

Name	Size (ha)	Stage of Acquisition	Location (LGA)
1. Nweri	9,065	Gazette notification	Baruten
2. Kinikini	16,449	"	Kaiama
3. Gidan Magajia	21,156	Gazetted	Baruten
4. Moli	19,353.7	Gazette notification	"
5. Wuru	18,583	"	"
6. Okuta	6,451.6	"	"
7. Olodan	3,626	"	Ifelodun
8. Igbaja	3,626	"	"
9. Alapa	3,626	"	Asa
10. Babanla	4,200	"	Ifelodun
11. Chita	4,403	Gazetted	Edu
12. Lata	20,232	Gazette notification	"
13. Oro	13,000	"	"
14. Sharagi	6,800	Acquired	"
15. Shao	3,629	"	Moro
16. Kaiama	3,620	Acquired	Kaiama
17. Omi-Eran (LSC)	1,000		Irepodun

used to prevent degradation, desertification and overgrazing, and to maintain the carrying capacity of the reserve. Both the Federal and Kwara state governments are supposed to play active part in the development of the grazing reserve. The Federal government is to be involved in the provision of infrastructure such as dams, roads and means of transport for range guards through the agency of the National Livestock Projects Division (NLPD). The Kwara state government has the responsibility to acquire the land following stipulated legal procedures and provide staff for the management of the reserve. As at 1992, five government officials consisting of a project officer, a veterinary assistant, two range guards and a security guard were operating in the reserve.

3.1.2 Implementation Constraints

The grazing reserve has not been developed to a satisfactory standard. Pasture development is relegated to the background in the scheme of things. Transport facilities for project staff is grossly inadequate and this constitutes a great impediment to rule enforcement. Besides, there has been high turnover of range guards and as the time of the survey for this study (1997) no range guard was available to operate in the reserve. There were only three government officials consisting of the project officer, a livestock overseer and a security guard who sometimes serves as the range guard. The settlers were also faced with animal health problems and this has discouraged some settlers from staying in the reserve all year round. Diseases such as helminthiasis and fascioliasis have caused considerable cattle mortality. These diseases were more serious than trypanosomiasis. Although tsetse flies such as *Glossina morsitans*, *G. palpalis* and *G. tachinoides* are rampant in the reserve, the settlers keep the Keteku breed of cattle and the crosses which are more trypanolerant than the white fulani breed which is common in the northern part of the country generally.

Government officials attributed the low level of development to financial constraint. But more importantly is the fact that there is no strong commitment on the part of the government to develop the reserve and to ensure effective management. As at 1997, the four earth dams constructed for stock watering were yet to be fenced. They are therefore exposed to trampling by the animals which can lead to leakage of water in no distant future. Although five boreholes were earmarked for construction only two have been drilled and none is functioning at present. With respect to management there was considerable delay in the inauguration of the local management committee and this led to prolonged infiltration of unauthorized farmers into the reserve with its attendant conflicts and limitation on resource use by the settlers.

3.2 Perception of Sedentarization by Pastoralists

All the pastoralists confirmed that the settlement policy is desirable. They claimed that the policy is good because (i) it allows pastoralists to have a sense of belonging to the society, (ii) it enables them to have a home, (iii) it encourages peaceful coexistence and exchange of ideas, (iv) it allows pastoralists to go into farming which is an additional source of income, (v) it prevents frequent clashes between pastoralists and farmers, (vi) it facilitates access to veterinary services, (vii) it increases livestock productivity and (viii) it reduces the hardship of pastoralists generally. Indeed, majority (62 percent) of them claimed that they were better off as settlers especially in view of the opportunity to farm and earn more income and the relative comfort that is associated with sedentarization. The reasons adduced by the remaining 38 percent for

preferring nomadism are basically cultural. According to one of them

"I grew up as a nomad. It is our culture. I am a Fulani. It is my great grandfather's work. Besides, the animals feed well. Cattle in particular love moving from one place to another".

Although the settlers are appreciative of government's efforts in developing the reserve, in terms of the construction of dams and roads within the reserve as well as provision of veterinary services including vaccination in insect control, they still encounter a lot of problems in their new environment. The most important problems identified by them are as follows.

- Shortage of good drinking water during the dry season;
- Long distance from settlement to the nearest village;
- Inadequate means of transportation;
- Lack of good roads;
- Lack of hospital to provide modern health care services;
- Lack of veterinary clinics;
- Lack of drugs for animals;
- Lack of primary school for the children of pastoralists is too far away;
- Menace of tsetse flies and cattle diseases;
- Lack of adequate pasture;
- Too many unwanted strangers (poachers and hunters);
- Unavailability of grain milling machines; and
- Conflict with farmers.

To the extent that government is committed to the alleviation of the settlers' problems it is unlikely that there will be a reduction in the current population of settlers and their livestock in the foreseeable future.

4. CHARACTERISTICS AND ACTIVITIES OF SETTLERS

The characteristics of the settlers can affect the management and use of the available resources in the grazing reserve. Thus, in this section we consider some of their socio-demographic characteristics and pattern of resource use.

4.1 Settlers Characteristics

An examination of the residency status of the settlers included in the study indicate that they have been living in the grazing reserve area for the past 13 years. They have considerable experience in farming (about 25 years) and animal rearing (about 26 years). The average age of the settlers is 45 years. All of them practise the same religion (Islam) and they are illiterate. Apart from being muslims, none of the pastoralists belong to any other form of social organization. Majority (about 89 percent) of them are agro-pastoralists (meaning that they are both farmers and herders) while 11 percent concentrate on animal rearing. On the average, there are 13 persons within a household. Other key characteristics which have implications for the management of the reserve include settlers understanding of what is meant by grazing reserve, their knowledge of the boundary of the reserve and the distance between the location of residence and the location of grazing. The pastoralists seem to have good understanding of grazing reserve. According to them, the GR is land set aside exclusively for grazing purposes. The land belongs to the government but it is to be used as home for pastoralists. Majority of the

settlers reside very close to the grazing locations. For instance, 59 percent are within a radius of 1-2 km, 28 percent within 3-4 km, 6 percent within 5-6 km and 7 percent within 7-8 km. Judging by the rigour of trekking, 52 percent regard the distance as far, while 27 percent say it is near. About 11 percent consider it to be very far; while only 10 percent say it is very near. However, the settlers have no idea about the boundary of the grazing reserve. They are also ignorant of the exact boundary between their camps and the neighbouring villages. This, as we shall see, has negative implications for the management of the reserve.

4.2 Pattern of use of the Rangeland

The settlers' activities relating to the use of the reserve are indicated in Table 4.1. The reserve is used mainly for grazing, crop production and gathering of firewood. On the average,

Table 4.1: Settlers Activities in the Grazing Reserve

Activities	Proportion of Settlers
(i) animal grazing	100
(ii) tree cutting	61
(iii) land clearing	90
(iv) gathering of firewood	70
(v) bush burning	49
(vi) crop production	93

Source: Survey data, 1998.

4.3 bundles (steres) of firewood are cut per week by the settlers concerned. The aforementioned activities are associated with bush burning. Many settlers (61 percent) also cut trees from the reserve for building purposes. Although the reserve is being used for multiple purposes, 58 percent of the settlers indicated that animal grazing is the most important activity while 42 percent claimed that crop production is the most important. This shows that the settlement policy has encouraged the development of agro-pastoralism in the study area. As access to land is guaranteed by the policy there is a growing tendency among the settlers to diversify their economic base. With regard to crop production, the farmers concentrate on the production of yam, maize, cassava and sorghum which are among the basic food staples in the country. The settlers depend on the reserve not only for the survival of their animals but also for their own subsistence. Indeed, the farmers are of the opinion that they should be permitted to cultivate an average of 6 ha per household in order to meet the food consumption requirements of the household members.

As regards livestock production, the pastoral system typically consists of cattle, sheep and goat. On the average a pastoralist has 39 head of cattle, 27 sheep and 21 goats. An examination of the livestock management practices shows that all the settlers have access to the earth dams constructed by the government for the supply of drinking water for the animals.

However, only few of them carried out necessary vaccinations (against diseases such as rinderpest and contagious bovine pleuropneumonia), deworming and dehorning of their animals. Since their resettlement, vaccination was carried out once by 11 percent of them, twice by 31 percent and three times by 38 percent. Deworming was carried out once by 9 percent of them, twice by 16 percent and three times by 25 percent. Only one percent of them carried out dehorning once. In terms of feeding, the animals depend solely on the natural vegetation for grazing and browsing. With the exception of salt lick, no other form of supplementary feeding was provided for the animals by any of the settlers. Thus, the livestock management system is still at a rudimentary stage which encourages intensive use of the grazing resources within the rangeland. With the lack of provision of supplementary feeds, it is important to manage the available resources effectively in order to sustain the carrying capacity of the reserve.

5. MANAGEMENT OF THE RANGELAND

The grazing reserve upon which the settled pastoralists depend for their livelihood can be regarded as a common-property resource or better still, common-pool resource. Conceptually, common-property resources share two basic characteristics - excludability (or control of access) and subtractability (Feeny *et al*, 1990). The first implies that the physical nature of the resource is such that controlling access by potential users may be costly, and, in the extreme, virtually impossible. Typically, range and forest lands pose problems of exclusion. The second implies that each user is capable of subtracting from the welfare of other users. Even if users cooperate to enhance the productivity of their resource, the nature of the resource is such that the level of exploitation by one user adversely affects the ability of another user to exploit the resource. Thus, common-pool resources are potentially subject to congestion, depletion or degradation depending on the degree of exploitation (see Blomquist and Ostrom, 1985; Randall, 1983).

Even though it is important to identify the nature of the property-rights regime under which the resource is held, the information will not provide sufficient basis for drawing valid conclusions concerning behaviour and outcomes relating to the use of the resource. It is also imperative to understand the institutional arrangements governing access to and use of the resource. In essence, the challenges in the management of the resource need to be examined and fully understood. For analytical purposes, four categories of property rights within which common-property resources are held have been identified in the literature. They are open access, private property, communal property and state property (see Berkes *et al*, 1989; Bromley, 1989; Bromley and Cernea, 1989; Ciriacy-Wantrup and Bishop, 1975; Demsetz, 1967; Feeny *et al*, 1990; Ostrom, 1986). Open access is the absence of well-defined property rights. Access to the resource is unregulated and is free and open to everyone. In the case of private property, the rights to exclude others from using the resource and to regulate the use of the resource are vested in an individual (or group such as a corporation). Such rights are transferable; and are usually recognized and enforced by the state. As regards communal property, the resource is held by an identifiable community of interdependent users. These users exclude outsiders while regulating use by members of the local community. Within the community, rights to the resource are unlikely to be either exclusive or transferable; they are often rights of equal access and use. With regard to state property, rights to the resource are vested exclusively in government which in turn makes decisions concerning access to the resource and the level and nature of exploitation. The nature of the state property regime differs from the other regimes in that, the state has coercive powers of enforcement.

Inadequate knowledge about the prospects for successful management of common-pool resources under the various property-rights regime has resulted in misleading propositions for changing the way that such resources are managed. According to one school of thought, full private property rights over the commons are a necessary condition for avoiding over-exploitation (Demsetz, 1967; Gordon, 1954; Johnson, 1972; North and Thomas, 1977; Picardi and Siefert, 1976; Scott, 1955). According to another, it is absolutely essential to give an external agency, such as the state, full authority to regulate the commons (Carruthers and Stoner, 1981; Hardin, 1968). These propositions have been faulted by several success stories about communal-property regimes and the role of local collective actions (see Cox, 1985; Dahlman, 1980; Mckean, 1982; Wade, 1986, 1987). It is important to stress, however, that a particular property-rights regime will not automatically provide a panacea for the exclusion and enforcement problems that are inherent in the management of the commons. Even communal-property regimes have collapsed in some places whereas they continue to be viable in many others (Feeny *et al.*, 1990). Thus according to Wade (1987), there can be no general presumption that collective action will work in the management of common-property resources, any more than there can be a general presumption that it will fail.

The management of range lands can fall under any of the four categories of property rights. In any case, the design of management rules, enforcement procedures and users perception of sustainable resource use are major determinants of management outcome. In order to fully understand the outcome, a model of the commons has to incorporate the nature of the interactions among users and regulators in addition to the nature of the resource, the whole array of decision-making arrangements and the property-rights regime (Oakerson, 1986; Godwin and Shepard, 1979). Moreover, cultural factors and socio-economic setting under which resource users operate are likely to influence the users attitude and behaviour regarding the maintenance of sustainable resource use. To this extent they are important in determining the nature of management outcome.

5.1 Nature of the Common-Property Regime

The Gidan Magajiya grazing reserve was established by the government of Kwara state through the Grazing Reserve Order of 1st January 1987. The reserve covers an area of about 21,156.56 hectares of range land typical of the transition vegetation between forest and southern guinea savannah and comprises generally low, flat land with food drainage into the surrounding rivers. *Andropogon* species are dominant in the area and provide most of the forages being utilized by livestock. The area is also rich in palatable browse plants such as Terminalia Aninaceus and Daniellia Oliveri. The area receives about 1250mm of rainfall annually from March to October, and the temperature ranges from 19⁰C to 33⁰C. The pastoralists have varying perceptions of the ownership of the GR and that of grazing locations and farm land. About 60 percent claimed that government is the owner of the grazing locations 39 percent regard the land as the property of the village head while a herder claimed to be the owner of the grazing land. As regards the farm land, 67 percent claimed government ownership, 25 percent indicate that the village head is the owner while 8 percent regard themselves as owners.

5.2 Mechanisms for Controlling Access to Resources

The framework for the management of the Gidan Magajia Grazing Reserve (GMGR) derives from the 1965 Grazing Reserve Law of Northern Nigeria. Under the law the Governor is

charged with the following responsibilities: (i) prescribing the persons who may use the grazing reserve and the number and type of stock which may be permitted therein; (ii) prescribing the parts of the grazing reserve which may be used and the times when they may be used; (iii) providing for the issuance of grazing permits to persons using the grazing reserve and prescribing the fees for such grazing permits; (iv) regulating the management generally of the grazing reserve and prescribing the activities which may be carried on therein; (v) regulating the conditions of entry to the grazing reserve; and (vi) imposing penalties for a breach of any of the regulations.

Accordingly, the Kwara State Order establishing the GMGR gives the general public the right of way over all dry season motor roads and all foot paths within the reserve. The native communities within the villages of the peripheries and within the enclaves are also assigned the rights to (i) draw water, (ii) collect dead wood for fuel, (iii) collect wood from uncultivated and non-browse trees, (iv) collect fruits, leaves, barks and roots of economic trees and medicinal plants, (v) collect sand for building and other purposes, (vi) extract clay and mud for pot making and building and (vii) collect honey provided it does not entail setting of bush fires.

The government appoints an officer to be in charge of the reserve and to bear responsibility for the management of the reserve and enforcement of rules. To assist the officer and for the purpose of orderly control and use of the reserve a Grazing Reserve Management Committee (GRMC) was set up by the government. The Chairman of the LGA or his representative and NLPD district officer are to serve as chairman and secretary respectively. The other members are officer in charge of the grazing reserve, district head, the most senior Emir/Chief in the LGA, area veterinary/livestock officer, Village head, divisional police officer, representatives of the ministries of education and health as well as the representative of settlers in the reserve. The functions of the committee are to (i) screen applicants for grazing permits, (ii) advice on the management of the reserve and (iii) perform other relevant functions assigned to it by the government from time to time. Nonetheless, there seems to be no restriction of access in practice. For instance, between 50 and 100 hunters enter the reserve a year without any permission. Some people even settle illegally in the reserve farming and hunting. Hunting endangers the life of both the pastoralists and the animals.

5.3 Mechanisms for Regulating Resource Use

The order establishing the GMGR prohibits burning, hunting and fishing within the reserve. Any person setting fire to any part of the vegetation in the reserve other than scheduled farming areas, shall be guilty of an offence unless permission to burn is given in writing by the officer in charge of the reserve. No one is allowed to disturb the soil in whatever form unless permitted by a competent authority. Damage to the vegetation of the reserve in any form is also prohibited. No farming is permitted in the reserve except in areas specifically assigned for that purpose. In general, scheduled farming area should not exceed 5% of the total area of the reserve. Invariably, the area devoted to farming by an authorized pastoralist shall not exceed 5% of the grazing area allocated to him.

The rules guiding the use of resources are not properly enforced. For instance, hunting is a regular activity in the reserve. And it is carried out both day and night with effrontery by hunters who enter the reserve illegally. Furthermore, there is no specific allocation of grazing locations. However, among the pastoralists it was decided that if two of them are operating in a given area, they must give adequate space between them. There are two other rules imposed by

the pastoralists themselves. First, trees [such as *Terminalia Aninaceus (kawo)*, *Daniellia Oliveri (maje)*] used for browsing and whose leaves remain fresh and succulent even during the dry season, should not be felled. Second, sick animals are not allowed to use dams used as sources of drinking water for healthy animals.

5.4 The Challenges of Exclusion of Outsiders And Rule Enforcement

Although the government is endowed with the machinery for rule enforcement based on its enormous statutory power, effective actions have been stalled on account of negligence and resource limitations. The prospect for sustainability of resource use in the reserve does not seem to be bright unless there is a change in the level of commitment of the government and the settlers towards improved management. The settlers are of the opinion that hunting should not be permitted and that patrol of the grazing reserve is necessary. However, they are not ready to contribute or participate in any way. According to them the government should bear the responsibility of employing range guards in sufficient numbers for effective policing of the reserve. In terms of what the settlers foresee as their role in ensuring sustainable use of the reserve, there are three areas of concern. First, they are ready to pay grazing fees only if there is assurance that government will provide adequate pasture. Second, they are willing to pay for drinking water for the animals but only if supply is sufficient and steady and illegal use is prohibited. The settlers prefer the allocation of specific portions of the reserve to each of them only on the condition that government will provide adequate water, pasture and other facility to ensure sustainability.

5.5 Effectiveness of Resource Management

The management of the resources in the GR is far from being effective. This is evidenced by the extent of poaching, the erratic manner in which burning is carried out and the incidence of conflicts. As regards poaching, it has been difficult to enforce the rule which excludes unauthorized persons from entering the reserve. Nomadic herders move in and out of the reserve with effrontery. Hunters from both far and near also enter the reserve in defiance of the laid down rules. There are three categories of resource users who are associated with bush burning in the reserve. They are pastoralists, farmers and hunters. The pastoralists use burning to reduce woody plants and improve herbaceous pasture for livestock grazing while the farmers use it for land clearing for the purpose of planting arable crops. The hunters use burning to increase visibility for finding game animals, to drive game animals and to attract them after burning by vegetative resprouting. Usually, burning is done at the convenience of the individual; it is neither controlled nor prescribed. Thus, the possible advantages that can be derived from burning in terms of range improvement have not been realized. Perhaps the most visible evidence of lax management is the issue of conflict. And in what follows we examine the types and various causes.

5.5.1 Types and Causes of Conflict

The types of conflicts among resource users in the grazing reserve are as follows.

(i) **Settlers versus Farmers** - About 10 percent of the pastoralists have been involved in this type of conflict. The pastoralists involved entered the farms of farmers in neighbouring villages grazing and destroying valuable crops (millet and sorghum) in the process. Such an encroachment has led to the displacement of farmers from areas earmarked for crop farming.

When the displaced farmers could no longer bear the hardship, the matter was referred to the village head. At the end, the pastoralists were asked to leave the farms and to pay compensation to the affected farmers. The conflicts arising from destruction of crops by pastoralists have also been resolved through litigation. The pastoralists are often found guilty by the court and are made to pay compensation to the farmers for the damages. In 1997, the compensation paid in respect of damaged sorghum ranged from N1,600 to N3,000. On the other hand several unauthorized farmers have entered the reserve in defiance of warnings by project officers and the village head of *Bankubu* where the reserve is located. This generated considerable tension between the agro-pastoralists and the arable crop farmers in 1996. The farmers were not deterred by the intervention of project officers and a meeting of the local management committee had to be convened to prevent violent clashes between the two parties. The committee had to take the intruders to their respective village heads and ward heads who warned them to desist from further encroachment. Some of the farmers who were adamant as at 1997 received letters of warning from the State Officer of NLPD. Copies of the letter were sent to the heads of neighbouring villages and the Divisional Police Officer who later intervened to serve as mediators.

(ii) **Settlers versus Settlers** - The sources of this type of conflict are threefold. They are farming-related, grazing-related and struggle for power and leadership among the settlers. Disputes have occurred over the choice of farm land within the reserve. Settlers accused themselves of indiscriminate farming, farming too close to one another and using unauthorized areas for farming. On each occasion, the leaders among the settlers intervened and resolved the conflict. The right to use a particular areas for farming has also been contested by some settlers. Conflicts of this nature have been resolved by elders among the settlers and the head of the nearest village to the grazing reserve. The grazing-related disputes among settlers arose from the unwillingness of a pastoralist to comply with the rule preventing pastoralists from allowing sick animals to drink water from the dam used by healthy animals. When the animals of the pastoralist died, he claimed that his colleagues have poisoned the water. The aggrieved settler resorted to litigation. As a result of the conflict, a settler who was spearheading the enforcement of the rule was arrested and detained for 30 days. The victim engaged the services of a lawyer and spent about N20,000 before he was released. The struggle to assume a leadership position among the settlers generated a lot of conflict and animosity. Rivalry among the self-appointed leaders constitutes the underlying cause of violation of regulatory mechanisms and frequent confrontation which have been difficult to resolve through non-adjudicatory procedures.

(iii) **Settlers versus Nomads** - The nomadic herders from the northwestern part of the country still find their way into the reserve. Encroachment by nomads is common between November and May which is usually the dry period when pastoralists migrate from the north to the south in search of water and pasture. These nomads are the Bororo Fulanis who differ from the settled Baruba Fulanis in terms of temperament and attitude to life. The frequent clashes between these groups of herders are resolved through the intervention of the village head or adjudication in the law court.

6. CONCLUDING REMARKS

The need to discourage nomadism in Nigeria has been recognized over the years and

appropriate settlement policy has been formulated in Kwara state to address the problem. The development of the Gidan Magajia Grazing Reserve where the pastoralists have settled is far from being fully satisfactory. The necessary infrastructural facilities have not been fully provided after almost a decade of the implementation of the policy. It has been difficult to prevent unauthorized persons from having access to the reserve. Due to lax management, conflict is a common phenomenon within the reserve. The lack of pasture development signals the possibility of over-exploitation of the grazing resources as the number of pastoralists increases in future. It also implies that in implementing the settlement policy, there is no adequate attention by the government to the environmental implications. Furthermore, external input into the pastoral system is at a very low level. It is limited to occasional supply of veterinary services by government agencies in the form of tsetse-fly control and cattle vaccination. The use of supplementary feeding is negligible despite the fact that availability and quality of grazing resources are being adversely affected by shortage and irregular distribution of rainfall. The involvement of the private sector in the supply of necessary inputs and provision of animal health-care services is hampered by the low level of infrastructural development around the grazing reserve. The roads leading to the surrounding villages are in a deplorable condition and the settlements of pastoralists are not easily accessible. Veterinary practitioners therefore consider the area unattractive for the establishment of business enterprises and uneconomical for frequent visits.

In view of the foregoing, it may be difficult for the settlers to realize the expected productivity gains from animal husbandry. They are however, encouraged by the possibility of deriving additional benefits from farming within the reserve. In other words, food security and diversification of income sources are key components of the driving force behind the settlement policy. Nonetheless, if the pastoralists in the state are to be fully sedentarized, the government has to pay attention to the social life of the settlers. The attention given to health services should not be limited to the animals; the settlers' accessibility to health-care services should also be accorded priority. Moreover, the education of the pastoralists' children must be considered as part of the settlement policy. The Kwara state government should liaise with the National Commission on Nomadic Education to ensure that primary schools are established at suitable locations for the benefit of the settlers' children.

Besides, government should be more committed than ever before to the development and management of the reserve. The officials associated with the management of the reserve should undergo necessary training in range management. With the requisite skill, the project staff can provide extension services to the settlers relating to crop farming practices and resource use. This is with a view to ensuring that the use of the grazing resources is sustainable. Specifically, adequate supply of water, improved pasture development, prevention of indiscriminate burning and enforcement of rules restricting access of unauthorized persons should be given high priority in the implementation of the settlement policy. The range guards should be re-instated and they should be provided with the facilities for effective patrol of the reserve. As the settlers become empowered economically and socially, it should be possible to involve them in the management and development of the reserve. Fortunately, they are willing to contribute financially towards improved pasture development and uninterrupted supply of water for the animals.

BIBLIOGRAPHY

- Berkes, F., Feeny, D., MacCay, B. J., and J. M. Acheson (1989) "The Benefits of the Commons", *Nature*, 340: 91-93.
- Blomquist, W., and E. Ostrom (1985) "Institutional Capacity and the Resolution of a Commons Dilemma", *Policy Studies Review*, 5(2): 383-393.
- Bromley, D. W. (1989) "Property Relations and Economic Development: The other Land Reform" *World Development*, 17: 867-877.
- Bromley, E. W. and M. M. Cernea (1989) "The Management of Common Property Natural Resources", *World Bank Discussion Paper*, No. 57, Washington D. C.
- Carruthers, I., and R. Stoner (1981) "Economic Aspects and Policy Issues in Groundwater Development", World Bank staff Working Paper 496, Washington, D. C.
- Chopra, K. G., K. Kadekodi, and M. N. Murty (1989) *Participatory Development: People and Common Property Resources*. New Delhi, India: Sage.
- Ciriacy-Wantrup, S. V. and R. C. Bishop (1975) "Common Property as a Concept in Natural Resource Policy", *Natural Resources Journal*, 15: 713-727.
- Cox, S. J. B. (1985) "No Tragedy on the Commons", *Environmental Ethics*, 7: 49-61.
- Crosson, P. and J. R. Anderson (1995) "Achieving a Sustainable Agricultural System in Sub-Saharan Africa", *Building Block for Africa 2025 Series*, Paper No. 2, The World Bank, Washington, D.C.
- Dahlman, C. (1980) *The Open Field System and Beyond: A Property Rights Analysis of an Economic Institution*. Cambridge University Press, Cambridge.
- Dasgupta, P., and K. Maler (1990) "The environment and Emerging Development Issues", *Proceedings of the 1990 World Bank Annual Conference on Development Economics*, Washington, D. C. pp. 101-131.
- Demsetz, H. (1967) "Towards a Theory of Property Rights", *American Economic Review*, 57: 347-359.
- Dregne, H. and Chou, Nan Ting (1992) "Global Desertification Dimensions and Costs", in *Degradation and Restoration of Arid Lands*, Texas Tech University, Lubbock, Texas, pp. 249-282.
- Erdmann, T. K. (1993) "An Analysis of 10 African Natural Resources Management Practices" Technical Paper No. 8, Office of Analysis, Research and Technical Support, United States

Agency for International Development.

FAO (Food and Agriculture Organization)(1990) "Herders' Decision-making in Natural Resources Management in Arid and Semi-Arid Africa", *Community Forestry Note*, No. 4, Rome.

Feder, Ernest (1977) "Agribusiness and the Elimination of Latin America's Rural Proletariat", *World Development*, 5: 559-571.

Feder, Ernest (1979) "Agricultural Resources in Underdeveloped Countries: Competition Between Man and Animal", *Economic and Political Weekly*, 14(30-32): 1345-1366.

Feeny, D., F. Berkes, B. J. McCay and J. M. Acheson (1990) "The Tragedy of the Commons: Twenty-Two Years Later", *Human Ecology*, 18(1): 1-19.

Godwin, R. K., and W. B. Shepard (1979) "Forcing Squares, Triangles and Ellipses into a Circular Paradigm: The Use of Commons Dilemma in Examining the Allocation of Common Resources", *Western Political Quarterly*, 32: 265-277.

Gordon, J. S. (1954) "The Economic Theory of a Common-Property Resource: The Fishery", *Journal of Political Economy*, 62: 124-142.

Gregersen, H., P. Oram and J. Spears (eds) (1992) Priorities for Forestry and Agroforestry Policy Research, Report of an International Workshop, International Food Policy Research Institute, Washington, D. C.

Hardin, G. (1968) "The Tragedy of the Commons", *Science*, 162 (December):1343-1348.

Hecht, Suzanna (1985) "Environment, Development and Politics: Capital Accumulation and the Livestock Sector in Eastern Amazonia", *World Development*, 13(6): 663-684.

Jodha, N. S. (1980) "The Process of Desertification and the Choice of Interventions", *Economic and Political Weekly*, 15.

Jodha, N. S. (1985) "Population Growth and the Decline of Common Property Resources in Rajasthan India" *Population and Development Review*, 11: 247-264.

Jodha, N. S. (1986) "Common Property Resources and Rural Poor in Dry Regions of India", *Economic and Political Weekly* (India) 21 (July): 1169-1181.

Johnson, O. (1972) "Economic Analysis, the Legal Framework and Land Tenure Systems" *Journal of Law and Economics*, 15: 259-276.

McKean, M. A. (1982) "The Japanese Experience With Scarcity: Management of Traditional Commons Lands", *Environmental Review*, 6: 63-88.

North, D., and R. Thomas (1977) "The First Economic Revolution", *Economic History Review*, 30: 229-241.

- Oakerson, R. J. (1986) "A Model for the Analysis of Common Property Problems", National Research Council, Proceedings of the Conference on Common Property Resource Management. National Academy Press, Washington, D. C., pp. 13-30.
- Olomola, A. S. (1993) "The Traditional Approach Towards Sustainable Management of Common Property Fishery Resources in Nigeria" *Maritime Anthropological Studies*, 6(1&2): 92-109.
- Olomola, Ade S. (1998) "Sources and Resolution of Conflicts in Nigerian Artisanal Fisheries", *The Society and Natural Resources*, 11: 121-135.
- Ostrom, E. (1986) "Issues of Definition and Theory: Some Conclusions and Hypotheses", National Research Council, Proceedings of the Conference on Common Property Resource Management. National Academy Press, Washington, D. C., pp. 599-615.
- Peters, P. E. (1987) "Embedded Systems and Rooted Models: The Grazing Lands of Botswana and the Commons Debate", in McCay, B. J. and J. M. Acheson (eds.), *The Question of the Commons*, University of Arizona Press, Tucson, pp. 171-194.
- Picardi, A., and W. Siefert (1976) "A Tragedy of the Commons in the Sahel", *Technology Review*, 78: 42-51.
- Randall, A. (1983) "The Problem of Market Failure", *Natural Resources Journal*, 23(1): 131-148.
- Scott, A. D. (1955) "The Fishery: The Objectives of Sole Ownership", *Journal of Political Economy*, 63:116-124.
- Stycos, J. M., and I. Duarte (1994) "Parks, Population and Resettlement in the Dominican Republic" *EPAT/MUCIA Working Paper*, No. 16, United States Agency for International Development.
- Talbot, L. M. (1986) "Rangeland Destruction in East Africa", *Population and Development Review*, 12:441-452.
- Wade, R. (1986) "Common Property Reserve Arrangement in South Indian Villages", National Research Council, Proceedings of the Conference on Common Property Resource Management. National Academy Press, Washington, D. C., pp. 231-257.
- Wade, R. (1987) "The Management of Common Property Resources: Finding a Cooperative Solution", *World Bank Research Observer* 2(2): 219-234.