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PROBLEMS, PROSPECTS AND POLICY IMPLICATIONS**

by

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## **Introduction**

1. Grazing Reserves in Nigeria are areas set aside for the use of pastoralists and are intended to be the foci of livestock development. Grazing reserves resemble group ranches in that both consist of clearly defined areas of rangeland which provides grazing for determined herds of livestock (Oxby, 1982a). On group ranches in Kenya pastoralists have a right to land under national law. In Nigeria, they have not in the past had such rights and grazing reserves more closely resemble what Oxby (1982a) termed 'grazing blocks'. There are now plans for issuing 30 year leases for parcels of land within the grazing reserves in order to encourage them to invest in land improvement.
2. The stated purpose of Grazing Reserves is the settlement of 'nomadic' pastoralists; they offer security of tenure as an inducement to sedentarization through the provision of land for grazing and permanent water (Suleiman, 1986). Large pieces of land have been demarcated, some legally sanctioned by order in the Official Gazette and infrastructure, such as dams and boreholes, constructed. Potential settlers are recruited through the livestock extension service.
3. This paper reviews some problems associated with these reserves and offers suggestions to make them more productive and relevant to the needs of the intended beneficiaries. Although based on experience in grazing reserves in the subhumid zone of Nigeria some of the conclusions should be applicable elsewhere.

## **Historical Background**

4. In Nigeria the practice of preserving land for exclusive use by livestock existed prior to colonial times. Allocation of grazing grounds to pastoralists around towns and villages for use particularly during the cultivation season were socially sanctioned (Waters-Bayer and Taylor-Powell, 1986). However, since there was no legal instrument to prevent encroachment by crop farmers, such reserved areas subsequently disappeared with increasing population and cropping intensity.
5. This phenomenon was most visible in the subhumid zone of Nigeria where pastoralists from the semi-arid zone further north traditionally moved to exploit dry-season pastures. Additionally, improved veterinary services and tsetse control and eradication campaigns have resulted in an expanding ruminant livestock population in the subhumid zone itself and in restricting pastoralists' access to the grazing lands (Waters-Bayer

and Taylor-Powell, 1986). Combined with this, the greater preference afforded to local (i.e. subhumid zone) farmers' livestock both for grazing and water has contributed to the further reduction of the resources available (Kjenstad, 1988). Conflicts between farmers and pastoralists frequently occurred as a consequence.

6. The Nigerian Government's Grazing Reserve Act of 1964 was a response to the problem of alienation of grazing lands increasingly being faced by the pastoral population at the time. In a broader framework, the law was also taken as one of the policy measures to address some of the constraints confronting livestock development in Nigeria. Thus, grazing reserves were established not only to protect grazing lands from crop farming and provide easier access to them by pastoralists but also to encourage the sedenterization of nomadic/transhumant pastoralists through legally secure titles to grazing water and, in general, as one means of promoting livestock development.
7. By 1980 2.3 million ha were acquired as grazing reserves by the northern state governments (Oxby, 1982b), constituting 10% of the total 22 million ha envisaged under the Third National Plan (Ministry of Agriculture, 1981). High compensation levels for acquisition of grazing reserves recommended by the Federal Land Act of 1978 is indicated as a major cause for the low implementation in establishing grazing reserves. Further, only few of those established were formally gazetted leaving the original objectives largely unfulfilled (Waters-Bayer and Taylor-Powell, 1986). In some specific cases, none of the pastoral Fulani households settled on the reserves were previously nomadic having been residents around the crop farming villages prior to the establishment of the grazing reserves (see Kjenstad, 1988).
8. Permanent residence of pastoral herds in the subhumid zone is a relatively recent phenomenon. Various surveys in the 1980s (summarized in Kaufmann and Blench, forthcoming) have shown that an increasingly large proportion of herders are permanently resident in the zone throughout the year. Ecological and social conditions in the subhumid zone are very different from those further north, and pastoralists are still in the process of adapting to these new challenges. A consequence of this situation relevant to development planning is that many assumptions about pastoralists' strategies derived from studies in the semi-arid zone must be modified.

## Prevailing problems

### Ecology

9. The subhumid zone is characterized by a rainfall of 900-1500mm and a growing period of 180 to 270 days. The soils are generally luvisols low in carbon and nitrogen with poor drainage and cation exchange capacity. They tend to form a hard crust, making manual land preparation laborious. Erosion caused by continuous cultivation and over-grazing often leads to rangelands with bare soils.
10. The herbaceous cover in range areas consists mainly of species of Loudetia, Hyparrhenia, Brachiaria and Andropogon. Even though the rainfall and radiation could support high dry matter yields, fodder is actually low in quantity and quality due to the poor soils. Even in the wet season, maximum productivity in the Kachia grazing reserve 120 km south east of Kaduna, for example, is very low (2250 kg/ha) (Mohamed-Saleem, 1986). Although the more fertile inland valley (fadama) soils may yield dry matter up to 5 tons/ha, they are much less abundant and are increasingly used for cropping.
11. The accepted minimum 7.5% crude protein required in ruminant diets is only available for four months of the year and even then digestibility of the natural forage is low. The ligneous browse (mainly Azelia africana, Khaya senegalensis, Adenodolichos paniculata and Daniella oliveri), although nutritious, does not provide sufficient bulk to make up the deficit. These limited forage resources are depleted by accidental and deliberate fires. Herds must be seasonally moved out of the grazing reserves to exploit crop residues in neighbouring farmers' fields. Apart from these short-distance movements, some pastoralists with home bases on grazing reserves still practice transhumance. In the subhumid zone, where adequate fodder is generally not available from range resources, such movements depend on the goodwill established between arable farmers and pastoralists.

### The social context

12. The cultivators among whom the pastoralists now live were traditionally subsistence farmers with extensive swidden (slash and burn) agriculture. They kept very few livestock, mostly small trypanotolerant breeds of goats and sheep. Although sleeping-sickness is generally cited as the reason for the sparse population of the zone, it is now recognized that the high labour inputs required for cultivation also deterred settlement. Farming systems are marked by a wide diversity of crops and crop

mixtures, often combining cereals, grain legumes and tubers. Compared with the humid and semi-arid zones, regional marketing and long-distance trade were poorly developed.

13. An unfortunate consequence of this situation is that all the most fertile pockets of land in the zone have been occupied. Grazing reserves cannot be sited in populated regions without dislocation of indigenous populations and consequent ill-will. Reserves are necessarily situated in places previously avoided for sound ecological reasons. As an illustration of this, when ILCA tried to keep cattle permanently on Kachia reserve without supplementation, almost half the animals suffered severe malnutrition stress because of insufficient and low quality feed that resulted from the poor nature of the soils.
14. The pastoralists are primarily livestock rearers and usually only plant small fields of cereals, often with hired labour, to supplement the household food supply. With rare exceptions the pastoralists outside the grazing reserves do not 'own' land and must borrow it from local farmers. Since marginal land fallow is widely available, and some agronomic benefits may accrue from manure, farmers have generally been willing to enter these arrangements. However, long residence does not imply ownership, and recently, with poor relations between the two communities and a growing population, farmers have been requesting the return of their land. In the same way as farmers, some wealthier Fulbe have been able to obtain 'Certificates of Occupancy' issued by Local and State Governments, but these are not generally available.
15. Whether on or off the grazing reserves the pastoralists do not generate enough crop residues to feed their cattle. The relative value attached to farmers' residues corresponds to the variation in systems of payment for their use by pastoralists. These range from zero payment to situations where bookings are made by pastoralists with farmers well in advance of harvest and payments in cash or kind deposited to ensure access. In the vicinity of the Kachia grazing reserve, there are as yet no cash payments by pastoralists to farmers for crop residue grazing. However, in the more arid parts of northern Nigeria, it is already common; for example, in Kashere, Kombani and Ladongor areas of Bauchi State and the Katsina environs (Ingawa, 1987). In the Abet area, near to the Kachia grazing reserve, in the 1982 and 1983 dry seasons some farmers tried to obtain cash payments from Fulbe for allowing cattle to graze their residues (Powell, 1986).

## Grazing reserve development: issues and future prospects

### Planning and investment policy

16. In the past grazing reserve development has, typically, relied heavily on building infrastructure such as roads, dams and milk collection centres. In 1986, a typical reserve may involve costs of the following order:

<u>Item</u>	<u>Naira</u>
Roads and firebreaks	90,000
Water developemnt	120,000
Housing and buildings	260,000
Stock handling facilities	30,000
Office equipment	5,000
Pasture improvement	400,000
Tractors and equipment	60,000
Motor vehicles	35,000
Total infrastructure costs	1,000,000

Source: NLPD records

One US \$ = 7.8 Naira

17. Broadly speaking, neither pastoralists nor neighbouring farmers have been appreciative of these developments because they have not been accompanied by improvements at the herd level. All the amenities are as accessible to people off the reserves as those on. Some of the facilities are not very practical. For example, the use of milk collection centres implies higher processing costs in maintaining the higher hygiene standards required for handling fresh milk that will not be immediately consumed. There will also be opportunity costs due to the loss of the traditionally accompanying enterprise of selling processed cereal foods that are mixed with sour milk just before consumption. Moreover, because of transportation and handling costs the milk collection centres have rarely been able to offer prices as high as those in local markets. The pastoralists' response has been to retain their capacity to move away and not invest heavily in specific residential sites.
18. Neighbouring communities of cultivators often perceive reserves as fallow land 'belonging' to them, for the use of expanding future populations, from which they

have been disenfranchised. If they could perceive the benefits in terms of overall land use they may be more understanding. The farmers can appreciate the value of manure especially to crops such as ginger which require high levels of organic matter. In the Abet area, at one field day where arable farmers were able to see the increased yields of crops grown in fodder banks led to much greater interest in the adoption of forage interventions to improve crop yields and small ruminant productivity. The opportunity to exploit the cattle owners' much larger capital base to invest in land improvement and items such as fencing for mutual benefit could be appreciated once the fear of crop damage is removed.

19. For grazing reserves to develop effectively they must be integrated with the broader social and economic environment, particularly as livestock producers depend on co-operation with cultivators. Settled pastoralists need markets for sale of their products and purchase of household goods and farm inputs. Almost all sedentary pastoralists grow subsistence crops and they often hire labour for crop production. Unfortunately, reserves have all too often been planned as exclusion zones to separate the two communities, in part because of the belief that the primary need was to preserve land from arable encroachment<sup>1</sup>. The consequence has often been to exacerbate rather than alleviate inter-community tensions.
20. Apart from land tenure, the most pressing issues are thus feed security (from the point of view of livestock producers) and some more positive agronomic benefits (from the point of view of cultivators outside the reserves). At a technical level, the most urgent priority is developing a convincing low-input package to improve livestock feed resources appropriate to the socio-economic context.

#### Security of tenure

21. Tensions easily rise around grazing reserves where an indigenous population's land has been excised without due compensation. Farmers become antagonistic to projects and try to harass the settled pastoralists. Their antagonism surfaces in an increase in court cases relating to crop damage and disputes over land deemed to be within the reserve. In Kachia in the early 1980s, crop damage rather than land disputes predominated (Waters-Bayers and Taylor-Powell, 1986), but recently other types of cases are being brought to court (Kjenstad, 1988).

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<sup>1</sup> Grazing Reserves developed out of Forest Reserves, which were set up in the colonial era, and were intended to conserve woodland resources.

22. This type of uncertainty, as well as the poor forage, does not make the reserve an attractive place. Over the decade from 1978 only 34 households settled on Kachia reserve, an area of over 30,000 ha., despite a capital investment estimated at close to 1m naira. There is a further somewhat ironic feature that none of the pastoralists who have settled in Kachia grazing reserves were previously nomadic. All of them have been living in the Kachia area for generations and simply relocated a few miles to the reserve. Their motive was greater security of tenure, basing their action on assurances that the grazing reserve "belongs to the Fulani" (Waters-Bayer and Taylor-Powell, 1986).

### Feed security

23. Improving feed resources in West African rangelands is not simple. Nzamane (1984) ruled out the widespread use of nitrogen fertilizer on native grasses because of its high cost and the problems of land preparation. As legumes can fix soil nitrogen through the activity of nodule bacteria, they could be introduced into rangeland pastures to correct their nitrogen deficiency. However, legumes are in turn dependent on phosphate fertiliser, and they tend to have adverse effects on range ecology by encouraging low-quality nitrophilous plant species.
24. Bayer et al. (1984) proposed that grazing reserves be used for wet season grazing and cropping by pastoralists, and remain as dry season residences for only part of the family and herd. Animals left in the reserves during the dry season could be supported by small strategic legume pastures (fodder banks). ILCA has been working with fodder banks since 1981.
25. Forage legumes offer the best means presently available for alleviating the poor soil and dry season nutritional deficiencies in cattle. However, forage production packages must take into account economic and ecological constraints such as seasonal bottlenecks on labour availability, accidental fires, land tenure and the poor soils. To succeed, control of each unit must be vested in the individual herd owners who are expected to benefit from them.

### **Fodder banks and grazing reserves**

26. ILCA considered these points in designing and testing various low input techniques for the establishment of legume pastures. The standard fodder bank is a 4 ha. area

of fenced pasture sown with Stylosanthes hamata cv. Verano. Details of fodder bank establishment methods can be found in Otsyina et al (1987).

27. In addition to ILCA, several other agencies, including a UNDP supported grazing reserve development project, have conducted applied research on this topic. In an effort to improve the feed resources available to settled pastoralists in the Wawa Zange and Wase grazing reserves in Bauchi and Plateau States of central Nigeria respectively, Santhirasegaram (1984) tried three models involving mixtures of Andropogon gayanus and Stylosanthes hamata cv. Verano in rotation with crops. Range management officers in Keana and Awe grazing reserves, Plateau State, established 1 ha units of Stylosanthes pastures using a tractor in 1981 (Mohamed-Saleem, 1987).
28. The package for establishing and managing fodder banks has been adopted for replication by the National Livestock Projects Division. To date over 175 fodder banks have been established in the country, and most of these are outside grazing reserves. Given security of tenure the prospects for the increased adoption of fodder banks look promising. The evidence available suggests that mixed farmers who have more secure land rights have been much more ready to adopt fodder bank technology (Ingawa et al, 1988). Funds for future grazing reserve expansion are available under the Second Livestock Development Project.
29. Forage legumes can also be used to promote crop production of the grain and crop residue yields. In trials, cereals planted after a phase of improved pasture yields were nearly double those on natural fallow. The labour required for ridging "fodder bank soils" is also lower than that for a natural fallow (Tarawali et al., 1987). Integrating legume pastures with cropping thereby reduces the need for chemical fertilisers and labour per unit harvested. Greater yields do require more labour at harvest but that is a tolerable problem.
30. This type of integrated pasture-crop production could be introduced most readily where pastoralists are already cropping on the reserves. Apart from the benefit to themselves, this would demonstrate yield advantages to farmers off the reserve as well, thereby encouraging them to provide fallow land on loan to landless pastoralists for pasture development. Since 30% of cropland should be fallow at any one time the potential off the reserves is substantially greater. Although grazing reserves have a vital role to play in introducing innovations, they cannot be expected to meet the needs of all the pastoralists in Nigeria.

31. On the other hand, since over 50% of the dry matter produced from cropping, as well as the weeds on fallow and crop fields can only be turned into human food by ruminants, it would appear perverse to waste them by denying access to livestock. Grazing reserves should thus have two primary functions:

- i. To set aside land for the use of small-scale livestock producers willing to test interventions supported by government livestock departments. In this way they can present a model of crop-livestock integration to be replicated beyond the reserve.
- ii. To secure grazing areas where cattle can be separated from crops at critical times of the year without otherwise isolating them. This could potentially include cattle belonging to cultivators thus promoting the integration of the communities. This would facilitate the continuation of the practice of utilising all available crop residue and minimise the sources of friction between farmers and cattle owners. It will also allow far more pastoralists to benefit from the expenditure on grazing reserves than if the herds are expected to be resident year round in the reserves.

#### **Conclusions and policy implications**

32. The paper reviewed the present position of grazing reserves in terms of their objectives and suggested steps to meet more closely these objectives. The evidence presented suggests that there are two key elements in encouraging the sedentarization of pastoralists: feed security and unambiguous land tenure.

33. Strategic reasons would strongly suggest that the grazing reserves be utilized:

- o to provide test sites for evolving viable production systems from interventions in pastoral development;
- o to provide pastoralists with grazing areas to which they could withdraw their livestock when farmers' crops are at vulnerable growth stages;
- o to support the exploitation of the resources available in the two systems for the mutual benefit of crop farmers and pastoralists by not treating the grazing reserves as enclosures permanently separating the pastoralists and their cattle from cultivators.

34. For tactical reasons priority should be given to settling the prevailing land tenure (e.g. through certificates of occupancy or long-term leases) and feed security (e.g. fodder banks) problems.
35. In all cases it is clear that the first priority is consultation, sensitivity to local issues and coherent extension advice rather than continued emphasis on infrastructure. There may be a need for small-scale credit in the initial stages of pasture improvement to encourage adoption of the techniques. However, the costs of this will be negligible compared to the costs of heavy plant to clear land and put in dams and boreholes. If the physical developments are phased in line with settlement and land improvement in the reserves there will be higher returns to that investment.
36. Improved pastures should be integrated with cropping because it is technically necessary and will promote mutuality between arable farmers and settled pastoralists. The grazing reserves should be used to demonstrate concepts appropriate to the majority of pastoralists who will continue to reside off the reserves amongst farming communities.
37. If grazing reserves are to succeed, they should not be conceptualised as creating the opportunity to create small ranches or mixed farms. They must be a part of districtwide land use plans, intended to encourage integration of cattle enterprises into the overall economy. Clearly demarcated areas within the reserves should be allocated to specific households with a certificate of occupancy to guarantee their right for cropping and strategic fodder development. They should be a focus of low-input technology directed towards improving the productivity of the resources available to small and medium-sized herd owners.
38. The implications for government policy which emerge from the above discussion can be summarized as follows:
  - i. government investment will need to move away from costly and bulky development of physical infrastructure on grazing reserves to a more phased development which can be undertaken by the producers themselves; in this connection, credit policy needs to be re-oriented to support the adoption of small-scale technology by both pastoralists and crop farmers.

- ii. government policy should be reoriented to the development of integrated crop/livestock systems mutually benefitting pastoralists and crop farmers. Research and extension services should be geared into supporting such integration.
  
- iii. land tenure policy should be reviewed to accommodate such integration by offering secure land rights which will induce settler pastoralists to invest in land improvement for livestock as well as crop production.

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