

The Feasibility of Local Government-assisted Pastures Establishment in Some Core Cattle Producing States of Northern Nigeria

Okaiyeto, P.O. and O.S. Iamidi

National Animal Production Research Institute Ahmadu Bello University,
Shika Zaria, 810001, Nigeria

Abstract: Over ninety percent of Nigeria's cattle population are in the northern states. Its rangelands are the main sources of fodder intakes by the animals. The cattle are mainly indigenous breeds and can hardly attain its reproductive and growth potentials because of such situations. Its owners/managers-pastoral Fulani-are not able to benefit from the health, education and welfare of Government as they are compelled to move from areas of relative fodder decline to those that carrying capacities are better. These realities imply difficulties in adopting modern cattle management that includes pasture establishment. The International Bank for Reconstruction and Development in 1954, in recognition of these limitations, suggested the establishment of Grazing Reserves as a solution and the Grazing Reserve Law was enacted in 1965. Several were established but none could have successes attributed to it. This study reviews the reports of the European Union assisted Sokoto Environmental Project as it pertains to pastures establishment. The Reports showed that in terms of benefits, yields from unfenced range were a maximum of 2,110 but rose to 6,050 kilograms per hectare when fenced. For established pastures and for each of the two indigenous grasses, yields rose from 13,000 to 25,000 kilograms per hectare. Grazing days, rose from a maximum of 350 to 931 days. Extrapolating reported costs to 2004 ones, Ripping, pasture establishment and its fencing will require N640,697.00, N194,096.00 and N1,163,400 or N1,998,193.00. It is concluded that LGAs in the core cattle producing States can afford this amount. It can thus be an alternative to grazing reserves. It will be in the Wards and its supervision will be more effective as its users/owners will be nearer to it. It is recommended that pilot projects on two per LGA should be considered.

Key words: Core cattle, feasibility, production, state, pastures, Nigeria

INTRODUCTION

Nigeria has a total land area of 923,770 of land and effective land area of 910,770 square kilometres. It is made up of Arable, Permanent Crops, Meadows and Pastures, Forest and Woodland and others with 31.00, 3.00, 23.00, 15.00 and 28.00% shares, respectively. These land areas and its distributions are sufficient for the attainment of optimality in quantitative and qualitative live animals especially cattle, sheep and goats.

The estimated cattle, sheep and goats population of Nigeria in 2004 were 16.00, 30.81 and 48.74 millions, respectively. These are found under the management of the pastoral Fulani, Village farmers and few others in urban areas. The structures of ownership were 83.10, 18.84 and 0.36% under the management of the pastoral Fulani, in the Villages and the few urban areas. As for goats and sheep, the figures were 3.32, 93.71 and 2.97 and 12.20, 83.09 and 4.79%, respectively. These are produced in the four ecological zones of the country. The first is the Humid (in both southern Guinea Savannah and

Rainforest), followed by Sub-Humid and Semi-Arid (Savannahs) zones and fourthly the Arid (Sahelian) zone. There were 1.30, 34.58 and 15.07% of the National herd within the Humid Zone. In the Sub-Humid, the figures were 3.29, 57.18 and 28.56%, respectively. The Semi-Arid and Arid zones had 48.98, 60.88 and 52.67 and 6.21, 3.26 and 52.67%, respectively. In terms of population densities, the figures for each zone were 1.33, 13.89, 20.90 and 39.68 cattle per square kilometres. For goats, the figures were: 54.30, 28.94, 41.18 and 32.98 and for sheep: 8.5, 44.90, 35.50 and 27.29 per square kilometres, respectively (Federal Department of Livestock and Pest Control Services-FDL and PCS-1992: 426 and Unpublished FDL and PCS Report, 2004).

Therefore, in the case of cattle, they are managed mainly in the second and third zones. These animals rely mainly on natural occurrence of seasonal herbaceous and leguminous plants for their nutritional intakes. Hence, volumes and distribution of rainfall are very important in total biomass production. It implies that in the Arid zone, biomass production will be relatively and far lower than

for example, the Humid one. However, in the Humid and Sub-Humid zones, there are limitations to cattle production arising from incidences of endemic diseases. It restrains exploitation of the grazing land especially in the wet season. These are partly, why transhumance prevails. Cattle owners are compelled to move from areas of shrinking fodder resources to those ones that can support their animals especially in the dry seasons.

Transhumance is mainly associated with the pastoral Fulani in Nigeria. Consequently, the pastoralists are not able to benefit fully, from the health, education, welfare and other developmental dividends of the three tier of government. For them to benefit, their settlement becomes imperative. Without it, it will remain impossible for the them to own land, develop it to include pastures establishment; upgrade their breeds of cattle to include those with higher productivity indices and evolve sustainable crops-livestock linkages/integration. With increases in their population and their herds; coupled with increases in human settlement and agricultural activities, the Nation will gradually be faced with shrinkages in livestock productivity if these limitations are not addressed.

These limitations were recognized when in 1949, the Colonial Administration and Government of Nigeria, commissioned a Study on the Nigerian economy. The International Bank for Reconstruction and Development (IBRD) carried it out. Its recommendations for livestock development hinge on the settlement of the major producers, the pastoral Fulani. Hence, it recommended the establishment of grazing reserves. This recommendation was accepted and The Grazing Reserves Law was passed in 1965. FAO/UNDP Report, 1980: 1-2 further explains:

This law was designed to settle pastoralists in areas specially set-aside for them and to provide them with technical assistance. Some 23 million hectares of former forest reserves, in 284 locations, were identified to serve this purpose in the northern States. This land could accommodate a majority of the pastoralists and their cattle herds if it were developed. Settlement of this land by pastoralists would provide a unique opportunity for advancing the national livestock industry. The National Grazing Reserve Program has been in operation in the northern States for several years. Funds were used to evict and compensate squatters and to construct dams, wells, boreholes, service centres, access roads and cattle dips for communal use. Some of these facilities were not fully utilized, as they were not properly located to serve specific communities and work programmes and there were insufficient support from the extension services.

There are 2.77 million hectares of gazetted and developed Grazing Reserves in the cattle producing areas of Nigeria and 0.63 million hectares of undeveloped ones. The levels of development differ from one reserve to the other. Those in Katsina, Plateau and Bauchi States are far ahead of others because they were gazetted in the early 1960s and have received funding from offshore bilateral/multilateral aids and loans. In these, paddocks and watering points are well demarcated and located. Supporting facilities such as dipping pits, crushes and mini-veterinary clinics were also available.

Initially, grazing reserves were developed with the aim of handing them over to the communities settled in it for management. This became difficult due to problems associated with title ship on land, rising variable and fixed costs and expertise needed to manage it being beyond the scopes of those settled. The National Council for Agriculture and Rural Development in 1978 issued the Guidelines on the Development of Grazing Reserves. Under it, right of occupancy to land will be vested to the family (or lineage).

Fixed and variable costs associated with procuring and managing machineries such as graders, bulldozers, tractors and its implements/equipment, costs/prices of fuels and oils and spare parts were also rising continuously. As the value of the Naira, was not appreciating, its timely maintenances became serious limitations. Added to it, were labour costs (salaries and allowances) that were also rising. Hence, some of the reserves begun or planned were not completed or contemplated. These further discouraged the pastoralists and viewed the grazing reserves as provisions of reserved areas for grazing during the dry seasons and not for settlement purposes^[1-3].

These scenarios have sustained the near stagnancies in the composition of Nigeria's meat supply emanating from the ruminants. For example, between 1963-1964 Beef, Goat meat and Mutton accounted for 44.9, 22.10 and 9.50; and 1979-1980, 34.30, 20.60 and 8.60%, respectively. These are general decreases in supplies. The figures for 2002-2003 were 34.71, 20.05 and 18.82%. Unless in the case of mutton, it was relative stagnation for beef and goat meat (Federal Ministry of Agriculture^[4-6]). Concepts must therefore be evolved and justified so that its development and execution can be a possibility. A means of integrating livestock production with those of crops through the activities of the Local Government Authorities (LGAs) must be sought. This may have the tendency of reducing the social goods load and enhance its transition to private goods. This could be possible as

Table 1: Summary of costs (1994 and 2004 in Naira)

Items	1994 Costs (Naira)	2004 Costs (Naira)
Ripping	80435	640697
Pasture Establishment	139270	194096
Fencing	388775	1163400
Subtotal	608480	1998193
Tractors 4x3, 1m	1800000	12400000
Vehicles 4x3m	1200000	1200000
Materials, etc.	300000	1500000
Total	3108480	27898193

Source: SEPP annual report^[9]

the LGAs are, through its wards nearer its people who will be the direct users. Therefore, apt supervision will prevail.

Table 1 presents the vital statistics justifying the need for this study. Human population is known to be on the increase and this will also include those of the pastoral Fulani. States in the Sub-Humid and Semi-Arid zones are facing both human and cattle population increase. Allied to these, the densities of livestock at both wet and dry season periods. While the cattle population of the country and the two zones may not be viewed as high, its subtle rise will put pressure on the existing rangeland. This will in turn lower productivity levels and thereby, flows of feasible returns. In marginal rainfall areas, desert encroachment will be enhanced. Overgrazing will be the norm leading to degradation of the soils. Finally, adoptions of relevant technologies will become difficult.

Because of the problems and limitations enumerated earlier, LGAs should now be fully involved into changing these scenarios. It is being postulated that they will not be convinced to venture into this transformation/ improvement thrusts without substantive data to justify it. This is why this study assembled data and analysed it from a Project that was executed in the Semi Arid Zone. This is the recourse feasible because research institutes or agricultural development projects in of the core cattle producing zones are no longer financially capable of carrying out pilot studies that could indicate the fixed and variable costs needed for rational decision making.

This study reviewed the importance of pasture establishment (indigenous and improved ones) as it increases livestock productivity levels. For example, The Completion Report of the German-assisted but defunct Mokwa Cattle Ranch also gave additional justifications on how indigenous grasses and improved ones, are good pasture resources. What is needed is protection from fire and fencing to limit encroachments by other cattle. It stated that:

... Less than 500 acres (200 hectares) of Green Pacum pasture produced enough roughage (hay and silage) for

more than 3000 cattle in 1973. Some of the fields were harvested upto four times in one rainy season of 6 months. ... Indigenous grass *Andropogon gayanus* can be used for fattening the rainy season giving a yield of 0.300 kg/head while improved Green Pacum gives 0.500 kg/head per day. Highest per day weight gain was with molasses, grass silage and cotton seed or dried brewers grain of 0.750 kg/head. Therefore, indigenous grasses are cheaper when available.

These benefits can be accruable to Nigeria's pastoralists and small-scale livestock farmers on sustainable basis. However, there are costs such as land preparation, fencing and pastures establishment that transcends the capacities of these groups in the short run. There is the need therefore, for interventions to come from arm of government that can supervise it optimally such as the LGAs with their wards can do.

If pastures/rangeland are to be established/improved, fencing is required. It has the desired advantage of protecting the ecological setting through controlled grazing and minimizing encroachments. Plants' attainment of its potentials in terms of growth and vigour becomes feasible and with weeding and fertilizer application added to it, pasture/rangeland productivity is increased^[7]. In the short run, farmers may not adopt these strategies because of its inherent fixed and variable costs. But with logical intervention from LGAs, in the medium and long runs, its demonstrational effects may change/improve upon the situation positively. Increase in qualitative biomass production and extended carrying capacity will prevail. Specifically for rangeland development, SEPP has shown that under natural grass growth and regrowth regime, 2,100-6050 kilograms of biomass can be produced when no effort is made to protect it with fencing to control overgrazing. When fencing prevails, 13,000-25,000 kilograms were produced^[8].

Qualitatively, this translated to 1,190 to 3,500 dry matters per kilogram and per hectare. When established as pasture, the indigenous grasses, *Pennisetum pedicellatum* and *Andropogon gayanus* (one and two year old) produced 9,310 and 8,285 kilogram of dry matter per hectare. In terms of grazing days, unfenced natural pasture and fenced ones provided 119 and 350 grazing days. But when fenced, *Pennisetum pedicellatum* and *Andropogon gayanus* provided 931 and 825 grazing days per hectare, respectively^[8].

This study has two objectives. They are:

- To show the various costs centres associated with pastures establishment

- To show the financial outlay needed for the establishment

MATERIALS AND METHODS

In order to attain these objectives, data on the concluded and reported European Union-assisted Sokoto Environmental Protection Project (SEPP) were used. The Program was a holistic approach toward ecological upgrading and productivity levels from farming and general health, education and welfare upgrading. The Program was carried out in Zurmi LGA presently, in Zamfara State. This LGA is in the Semi Arid zone of Nigeria. The study could therefore, have feasible extrapolations that can be used in similar ecological zones of the country.

The Project's Report contained details of costs centres, its fixed and variable costs for pasture establishment and rangeland development upto 1994. These were re-evaluated so that 2004 prices can be extrapolated rationally. This was done with the cooperation and assistance of Sokoto State Agricultural Development and Sokoto State Community Development projects. Contact first made in May 2002 and re-evaluation of prices was carried out between February 2003 and November 2004.

RESULTS

The results of this Study are presented in six Tables (Table 2-4). Bulldozers and graders are usually required for first-time land and soil preparation for pastures establishment. A Grader is required for the construction of access roads to the field and its paddocks. These are classified as heavy-duty machines. After these first-line operations, these machineries may not be required. Hence, it is always, drawn from the pool of machineries in the State or LGA, hired or leased. Tractors are required for ploughing, harrowing and planting purposes. It is also used for haulage of inputs and materials required for the operations. Utility vehicles will also be required but may not be solely dedicated to the project. All costings embodied/embedded the values of operations carried out by these machineries, tractors and vehicles.

Table 2 shows the costs for the whole operation. The cost of the project without machineries and vehicles procured specifically for it but hired or leased was N608,480.00 as reported in 1995. This has changed to N1,998,193.00 in 2004. And for 2004, if vehicles were to be added, it will become N 27,898,193.00.

Table 3 shows the astronomic price changes that prevailed between 1995 and 2004. Those of 1995 were merely 14.78, 0.17, 0.6 and 0.2,% of the 2004 ones. Diesel

Table 2: Costs of ripping virgin land for pasture establishment

Item	Unit	1995 Costs (Naira)	2004 Costs (Naira)
Diesel (litres)	7586	32847	485504
Oils (Drums)	299	12432	74750
Blades	30	28500	47163
Wages		6656	33280
Totals		80435	640697
Cost per Hectare		237	2703

Source: SEPP Annual Report^[8]

Table 3: Costs of establishing pastures

Operation	Cost (1995) Naira	Cost (2004) Naira
Ripping	26070	43142
Discing	7920	13106
Seed	98480	162969
Labour	6500	97046
Total	139270	194096
Cost per hectare	1393	1941

Source: SEPP Annual Report^[8]

fuel and materials for heavy machines in use indicated higher wages. On per hectare basis, there was 87.47% price rise. The situation did not change subsequently for Pasture Establishment. Table 3 shows its percentage shares as: 0.6, 0.6, 0.06 and 0.07, respectively.

There are items of these developmental foci that could be viewed as fixed costs. Tractors when purchased have a life cycle of ten years. These will give an amortized N1.24 million and N620.00 per hour given 2,000 h per annum. This amount is within the per hour institutional tractor hiring charges. Pastures have a life cycle of five years and thus, an amortized value of N 3,8189.20 per annum. Erected fences have a life cycle of 15 years and amortized value of N77, 560.00 per annum. Therefore, in planning for replacement costs, these amortized values could be used to set aside on annual basis funds that will be needed in the future.

Fencing Costs as shown on Table 4. The Project's prices were all lower than the extrapolated ones. Costs that escalated highly were those of barbed wire, cattle proof wire, tying wire and cement. It is being postulated that because of its very high import contents, its values were affected by declining Naira values.

DISCUSSIONS

What this study has shown is that small and medium scale cattle farmers cannot afford the costs of pastures establishment. Even where titleship to land prevails, the capital required may exceed their networkths. Therefore, there should be a form of institutional intervention that will tackle this problem. States in the core cattle producing zones have been exposed to past programs (including grazing reserves). However, LGAs are yet to be involved because it is a long-term developmental thrust and relatively capital intensive. It is unlike crops production where on annual or bi-annual basis; trends of results (and successes) can be clearly seen and assessed.

Table 4: Fencing costs with cattle proof wire

Item	Number	Cost (1995) Naira	Cost (2004) Naira
Wooden Post	109	32700	65400
Iron posts	1300	166400	390000
Barbed wire	28	14000	44800
Cable proof wire	145	130500	290000
Tying wire	4	600	114000
Cement	95	17575	129600
Labour		21600	129600
Total		388775	1163400
Cost per kilometre	7.2	5400	161583
Cost per hectare		1143	3438

Source: SEPP Annual Report^[8]

These perceptions need to be changed especially in LGAs with comparative advantages for ruminant production. This is because apart from tractors, vehicles and other materials, core costs of pastures establishment is under two million Naira. Hence, if an LGA can select three Wards for a Pilot study, it will require an outlay of six million Naira only. It is assumed that these are within their capabilities.

The following recommendations are hereby presented and are:

- LGAs in the core cattle producing States (Sokoto, Kebbi, Zamfara, Katsina, Kaduna, Kano, Jigawa, Gombe, Bauchi, Adamawa, Yobe, Borno and Plateau) should evolve LGAs' Pastures Development pilot schemes.
- Non-core cattle producing northern States such as Kogi, Benue, Kwara and Nasarawa should also consider this concept.
- The LGAs should liaise with the Agricultural Development Projects, River Basins and Rural Development Authorities, universities and research institutes in the northern States that can provide them with expertise.
- LGAs could select some progressive farmers with cattle and title to land for such a pilot scheme.
- In all LGAs of the core cattle producing states of the north, efforts should be made to identify (or form) community groups and cooperatives for pastures and silage production.

It is being concluded that core cattle producing LGAs and States in the northern States, because of the immense comparative advantages they have, should also ensure that this sub sector witnesses growth and development.

With the dormancy of the grazing reserve programs, a new facet to such development should be evolved. In pursuit of it, the LGAs should be adequately involved.

REFERENCES

1. UNDP/FAO, 1986. Livestock development in grazing reserves. Nir83/010. Report of the interim evaluation mission. FAO of the UNO, Rome, Italy, pp: 2-19.
2. UNDP/FAO, 1988. Livestock development in grazing reserves. Nigeria. Project findings and recommendations. FAO of the UNO, Rome, Italy, pp: 1-27.
3. Second Livestock Development Project (SLDP), 1983. Preparation report. Final report. Livestock Projects Unit, Kaduna, 23: 30-36.
4. Federal Government of Nigeria, 1954. The Economic development of Nigeria. A Report of a Mission Organized by IBRD at the request of the Governments of Nigeria and UK. FGN Printer, Lagos, pp: 168-181.
5. Federal Agency for Economic Cooperation (Agriculture, Forestry and Food Economy), 1974. Completion report: Mokwa Cattle Ranch. 6236 Eschborn, Stuttgarter, Strasse 10, Germany, pp: 26-27.
6. Central Bank of Nigeria, 2000-2003. Annual report of the central bank of Nigeria. CBN Headquarters, Garki, Abuja.
7. Otsyina, R.M., R.R. Von Kaufman and M.A. Mohammed-Saleem, 1987. Manual on fodder bank establishment and management. ILCA Sub Humid Zone Programme. Kaduna, Nigeria, pp: 18-21.
8. Sokoto State Environmental Protection Project, 1994, 1995. Annual Reports. Giginia Secretariat, Headquarters, Sokoto, Nigeria.