INTRODUCTION: CHALLENGES AND PROSPECTS OF PASTORAL AND LIVESTOCK PRODUCTION IN NIGERIA:

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Background

This short exposition attempts to provide a general overview of what could be considered the major concerns of animal agriculture in Nigeria as a background to the diverse and penetrating issues raised by the various contributors. The country, like the West and Central African sub-region, is blessed with abundant renewable natural resources. The drier part of the country between 7°–14°N (see Map 1) is best suited for ruminant production of different livestock breeds and species. It has a variety of vegetations stretching from the sahel in the extreme northeast (Yobe and Borno States) to derived savanna in the southern tip of Taraba, Kogi and Kwara States. The mean annual rainfall varies greatly according to the vegetational distribution between ca. 200mm and 1500mm.

The bulk of the country's livestock resources are under smallholder production system. Cattle, sheep and goats are raised virtually by every rural household and these constitute an integral part of the farming systems. The bulk of local milk and milk products as well as meat and meat products supplies come from the flocks and herds of these producers predominantly pastoralists. The livestock sub-sector is responsible for a significant proportion of agricultural product. As a provider of employment and income, livestock production constitutes important forms of livelihoods for rural and urban dwellers. From livestock comes a variety of industrial products that are used locally and exported. Increasingly, animals have served as source of farm power to increase crop production at the household and national levels. Draught animal power would not only permit an increase in the area brought under cultivation but also lead to increased production per capita. This translates to additional income for the household as well as increased gross national product.

Production systems

Three broad systems of livestock production can be discerned. Transhumant pastoralism, agro-pastoralism and ranching. It should be emphasized that livestock production (especially ruminants) is concentrated in the hands of pastoralists who hold over 90% of the nation's ruminant livestock popu'ation.

Transhumance pastoralism

This form of livestock production involves the movement of animals within or between eco-regions primarily in search of fodder and water. Transhumance may be over a long or short distance. But whatever distance is covered, a major characteristic of this system of production is the total attention given by the producer to raising livestock. No crop production is done. Transhumance is a major feature of pastoral production. Well over 80% of the ruminant population of this region is kept under this production system. This production strategy has been

occasioned by the seasonal alteration in the availability of fodder and water as well as the avoidance of diseases including trypanosomiasis in the high risk areas where otherwise fodder and water abound. The system involves the grazing of animals over varying distances, depending on availability of water, fodder and security of lives and property. Transhumance may be between or within agro-ecological zones. Where dry season grazing is available short distance transhumance is practised. Otherwise, pastoralists embark upon long distance transhumance. This may involve transversing several ecological zones in search of pasture and water.

As a result of population and market driven forces, available crop lands are being more intensely cultivated. Virgin lands including marginal lands utilized by pastoralists are opened to cope with the increased cropping needs. Traditional grazing resources often used during the wet season are fast disappearing. So also are dry season grazing resources provided by wetlands being increasingly utilized for dry season farming of vegetables for urban and peri-urban markets (Gefu, 1996). This shrinking of pastoral resources is generating serious conflict (often resulting in fatality) between crop and livestock producers. Transhumant pastoralists are, nevertheless, settling where the natural and social environment is conducive and supportive of their livelihoods.

Agropastoralism

This involves livestock and crop production in a settled environment. For agropastoralists both crop and livestock production constitute livelihood activities where the livestock rearing component may be of higher economic importance.

Over the years pastoral mobility has been constrained. This is resulting in increased incidence of conflict on the one hand, and on the other providing an impetus to spontaneously sedentarize. The latter case, however, only occurs where adequate land has been secured by the pastoralist. When, therefore, the conditions to settle are ripe, pastoralists, who hitherto were engaged in nomadic production voluntarily sedentarize. The settled pastoralist now experiences new production environment. These include the mode, structure and organization of production, pattern of social relationship with other pastoral groups and the host (new) community at large. One of the immediate changes the newly settled pastoralist experiences is the reduced number of animals. This is necessarily so because of limited grazing resource available to him. It is this group of pastoralists that development interventions are often targeted as a result of being easily assessable by development and extension workers.

Ranching

The group of ruminant livestock producers that fall within this category is almost limited to government and institutional farms as well as a few elite farms. They do not contribute significantly to domestic meat and milk production. In the past, government has been directly involved in ranching operation with very dismal results. To this extent, therefore, the livestock industry can be said to be dependent on the contributions made by transhumant and settled pastoralists.

Great but under-utilised potentials

The Nigerian livestock industry constitutes a very important national resource with a great deal of untapped potentials. Domestic livestock species contribute significantly to the nutritional, socio-economic and cultural requirements of Nigerians. The larger ruminants (cattle and camels) are

particularly important in increasing and improving crop and livestock production through the use of these animals as sources of farm and off-farm power, notably their use for animal traction. However, since most of the large ruminants are fed at or even below maintenance for a considerable part of the year, productivity (growth rate, calving rate and milk yield) is low and morbidity and mortality rates are high.

There is a large gap between demand and supply of meat and meat products. In 1988, for instance, beef supply stood at 260.000 tons while goat meat was 209.000 tons in the same year (EIU, 1990). This is a far cry from the effective demand for meat and meat products. The share of animal protein in total protein intake has therefore remained far short of officially estimated minimum requirements of about 75 grams of total protein and 35 grams of animal protein per person per day. In 1985, for example, only 7.0 grams of the total 45.0 grams of protein consumed by Nigerians was of animal origin. The situation today is no better. Indications are that the situation is worsening as population growth is not matched by a corresponding rise in animal per caput production. This suggests that the contribution of animal products to protein consumption is less than 16 per cent. The country has, therefore, a serious deficiency of daily per capita protein intake necessitating the importation of livestock and livestock products. Similarly, the daily calorie supply per capita, estimated at 2146, (World Bank, 1989) is well below world average figures. It is, thus, obvious that the total protein consumption is below recommended levels.

There has been a steady decline of the man/livestock ratio from 1:0.23 in 1960 to 1:0.17 in 1987 This deficit has continued to worsen as the years go by. The animal-source protein deficiency was further compounded by the devaluation of the Nigerian currency after 1986 animal supplies from neighbouring countries was no longer forthcoming. Hitherto, about 30% of animal supply in Nigeria came from Chad, Cameroon, Niger, and Burkina Faso. However, the devaluation of the Naira resulted in a reversal in the movement of livestock in the region, with net outflow from Nigeria to other countries where higher value was got for animals and animal products. It became imperative, therefore, to turn to sedentarized pastoralists for the bulk of the domestic supply of meat and animal products.

By 1983, for example, Nigeria recorded an import bill of about N1,121 million from food and live animals alone. In 1984, a total of 549,768 heads of cattle was imported into the country (Federal Livestock Department, 1984:27). The figure represents about 43 per cent of the total recorded supply in the country and was valued at N429.4 million (at an annual average price of N781 per head) at that time. The efforts of the present administration in reversing the import-dependedness of Nigeria in meat and other livestock products is a welcome development. It is, however, hoped that this will be sustained so as to develop our livestock industry while saving foreign exchange and creating jobs and livelihoods for the teeming rural and peri-urban dwellers. Considering that the bulk of the animal-source protein available to majority of Nigerians come from small holder producers (especially pastoralists), effort aimed at improving productivity necessarily should be geared towards enhancing the production environment of the small holders. For example, pastoral households are vulnerable due to a variety of production constraints that put livelihoods at great risks.

Going by the livestock resource endowment, Nigeria can be self-sufficient as well as export livestock products to other countries within and outside the region. If the activities of the sector are well articulated and organised, the industry is capable of employing up to 25% of the work force while providing meaningful livelihood to numerous rural and urban inhabitants. The industry could, indeed, be turned around from being a dismal contributor to the GDP to that of a vibrant earner of domestic and foreign revenue. The industry is capable of generating as much income/revenue as being currently generated by the oil industry in less than six years (Ahmed

Joda, 2003) only if the multifaceted problems facing the industry are sincerely and methodically addressed. All that is required is commitment to relevant and well-articulated problem-solving research, development and extension programmes, which would not only receive generous funding from all concerned (private and public sectors) but also would transcend geo-political and ethnic manipulations. A sustained agenda for improved production of quality protein would not only lead to enhanced outputs but would raise the quality of living and by implications the productivity of Nigerians, especially the teeming population of the youth. There are, however, a host of constraints.

Livestock infrastructure

Government has made some infrastructure available for the use of ruminant livestock producers in the zone. The most common facility remains the grazing reserve where other services are provided for the use of pastoralists.

The Grazing Reserves Law of 1965 was an attempt by Government to settle nomadic pastoral families and their herds. Grazing reserves are areas acquired by Government for the purposes of developing it for use by nomadic pastoralists. The law stipulated procedures for acquisition, development and management of the reserves. Although the law is about 30 years old, there are only few grazing reserves which have been gazzetted, developed and fully operational. Indeed, of the 365 grazing reserves earmarked for development, only 50 (13.7%) have been thus far gazetted.

Overgrazing, fuel wood extraction and encroachment by arable farmers have left the pastoralists with no meaningful grazing land. The land is being degraded with heavy vehicles that ply the reserves to load the firewood. This has led to erosion and destruction of the ecosystem. Moreover wildlife have moved out or have been hunted to extinction.

Transhumant Routes and cattle movement

Trade cattle movement into and out of the Zone is via transhumant routes on the hoof and by shipment by road. Cattle routes (burtali) were established in the Northern region after the Jihad (Holy war). The cattle routes led to hurmi (grazing grounds) which were allocated to nomadic Fulani herdsmen for grazing especially during the cropping season. However, with increasing population and absence of legal Statutes to prevent farming encroachment, most grazing grounds and their connecting routes disappeared under cultivation. The cattle routes that run from North to South are divided into three sections. They are the Northwest, Central and Northeast routes. The Central routes pass from the, far North and are used by the transhumant herdsmen from Niger and Chad Republics and from Kano and Jigawa States. The North-west route brings in herdsmen from Sokoto and Kebbi States while the North-East routes are used by transhumant herds from Yobe and Borno States. At present most of the cattle routes have been encroached by cultivation and movement of cattle on the hoof is constituting a major problem resulting in serious conflict between herdsmen and arable farmers. The problem has led to lost of lives and properties. The National Livestock Projects Division (NLPD), through a loan from the World Bank attempted to re-trace the cattle routes during the Second Livestock Development Project (SLDP) with the aim of re-establishing them for use by transhumant pastoralists, but this effort was not carried to term. The traditional movement of cattle is from the North to the South and back to the North again. During the dry season (May to October), cattle move from the North to the South in search of water, forage and/or crop residues.

Some factors affecting livestock and products production

Several reasons have been advanced for the low productivity of livestock in Nigeria. These include, among others, genetic and reproductive parameters, environmental factors including inadequate and poor quality feed, disease challenges, socio-economic, and cultural practices, government policies and programme priority, high population growth rate, which has driven demand for animal protein far beyond supply. A key factor in the livestock production equation is the land question in the context of access to grazing and watering resources by livestock producers, especially pastoralists.

The land question

In the course of discussing problems confronting the Nigerian pastoralist, the usual factors that readily come to the fore are water, fodder, animal health and recently conflict. Very little attention is given the issue of land tenure and access to pastoral resources. The centrality of the issue that surrounds the system of land use especially in pastoral areas can be clearly seen in the wake of the need to provide pastoralists some amount of security of access to grazing resources. This is borne out of the necessity to pursue a more serene and productive pastoral livelihood. If this must happen, the present pastoral peoples and communities will have to have 'a place' they can call their own. This is the only sure way to get the best out of the huge potentials that exist in the pastoral economy. Regrettably, the way and manner in which land is currently administered in Nigeria leaves a lot to be desired by pastoralists. The need for a land reform is not too far fetched. This is based on the following assumptions:

- Production is the bedrock of a virile and strong economy. Pastoral production has continued to sustain the domestic protein demand needs
- No nation building can be achieved without equal opportunity and access to resources by all citizens
- Where above are lacking, security is compromised (food, social, political).

There is, therefore, the need to evolve a sustainable and workable land use system that will support productive activities and guarantee national security.

Land reform in most developing economies is inextricably linked (but not limited) to and interrelated with agrarian/agricultural and rural development. This is so because the bulk of the population that reside in rural and peri-urban areas and who engage in primary production depend almost exclusively on availability of land in what ever form this may be required. Land, as the primary means of production in the support of a variety of livelihoods especially for the resource-poor, must be readily available especially for the category of producers considered to be resource-poor. The land question is core to any serious attempt to tackle rural poverty and food security and so must be put into proper perspective. Land must be available to persons and groups who are ready to put same into good and productive use. The provision of food (and the means of producing food) is a fundamental human requirement, which should be met through a properly articulated policy on land. In order to come to grips with the realities on the ground, therefore, a thorough and exhaustive analysis and understanding of all the important variables central to achieving meaningful improvement in the lives of millions that derive varying degrees of livelihoods from land and land resources has to be undertaken. It must be mentioned rather emphatically that the major bottlenecks that stand in the way of meaningful access to and control

of land must be removed if significant socio-economic progress is to be made. This is more imperative in the realisation of some of the important goals set for itself by the State in Nigeria within the context of poverty alleviation and food security.

Land use and land tenure in Nigeria

In countries that are predominantly agrarian-based like Nigeria, land is the most valuable asset available to the farming population. In an era of agricultural revolution, coupled with conditions of economic development under the situation of increasing population, structural changes take place, old forms of production give way to new ones in order to suit new socio-economic and cultural situations. Land in this context means "all endowments of nature on, over, or under the surface of the earth, and thus stretches from rural land to urban centres, mines, fisheries and sea-beds, even encompassing the whole ecosystem" (Aboyade, 1972).

The various definitions of land tenure (see, for example, Parsons 1970; Dorner, 1964; Timmons 1943; Famoriyo 1979b), whether seen from an institutional or legal perspective or a network of relationships, can be reduced to regarding land tenure as that which defines the ways in which individuals gain access to, and acquire rights of use over land, either temporarily or permanently. This implies that certain privileges, opportunities and claims are conferred on the individual user of land. Most developing countries of the world are confronted with land problems in different dimensions and of varying magnitude. In Nigeria, for example, land is the most important resource or single input in the system of agricultural production. Land use may, therefore, be considered as human activity within the entire biotic complex in a given ecosystem. The aim of this activity is to promote prudent land use in order to effect an improvement in the life of the people in general and those of the rural population in particular.

State lands, as Famoriyo (1979a) pointed out, exist in Nigeria through gifts, grants and through the implementation of laws of Nigeria. In accordance with the Land Tenure Law of 1962, States in the northern part of Nigeria were vested with rights of ownership in 'native lands' leaving the individual with only rights of occupation and use of land. This situation has, however, been undergoing some reformation in accordance with the Land Use Act of 1978. All these reforms and changes in the administration of land in Nigeria have resulted in unforeseen adverse consequences on individual and groups of land users in different parts of the country. Our concern in this paper is the extent to which the land question has affected the productivity of pastoralists in Nigeria.

The Public Lands Acquisition (Miscellaneous Provisions) Act 1976, No. 33 was promulgated by the Federal Military Government in 1976. The Act spelt out clearly the basis on which lands compulsorily acquired for public purpose would be assessed and compensation paid. It further specified maximum compensation that would be paid for compulsorily acquired land in different zones in the country. Two years later, in 1978, the Land Use Act was promulgated. This is the most recent measure directed towards land tenure and land use in Nigeria. The Act essentially vests all land in each state of the Federation in the Military Government of that State, to be held in trust and administered for the use and common benefit of all Nigerians. The Act was in response to problems relating to private and public acquisition of land in Nigeria. The Act aimed at easing agricultural production by making land available to agricultural investors in order to promote agriculture. Since its introduction, many comments have been made about the act. One gathers from these that the Land Use Act is one of the most controversial decrees "since it affects the basis of family ownership of land in a rather radical manner and purports to shift the emphasis from land ownership to dynamic land use" (Famoriyo, 1979a).

The intentions of the decree are noble especially in attempting to destroy the cankerworm that had eaten deep into the fabric of Nigerian agrarian system. Land, according to the Act, can be made available to land users to the limit of 1.25 acres (or half a hectare) of undeveloped land in the urban areas and 500 hectares of agricultural land or 5000 hectares of grazing land to be held under customary tenure in the rural areas. Unfortunately, the Land Use Act does not appear to have any positive effect on improving the agrarian situation at present. This is because of the difficulty of implementing the terms of the Act in a situation where ignorance prevails. In the rural areas, however, the terms of the Act may be difficult to implement because in spite of the Act, many Nigerian farmers still find it easier to acquire access to land through the customary land tenure arrangements rather than the Land Allocation Advisory Committee. This is a result of the strong traditional attachment which farmers still hold to land. The case of pastoralists is even more precarious as they have been left out of the scheme of things and at the mercy of community leaders who decide what quantity of grazing is permitted the pastoralist on very short term basis if at all. From the comments made in the past two decades by different professional bodies and a cross section of stakeholders, the objectives and philosophy of the Land Use Act seem to still enjoy the overwhelming support of Nigerians. However, the complaint has been some unnecessary, unsuitable and impracticable provisions and the implementation of the major provisions of the Act (Orojo, 1991). Other concerns raised on the Act include absence of a consideration of our customary practices and consideration of insecurity of title and the vesting of land in the Governors and the requirement of consent. These are areas that need attention if the discomfort brought by the Act is to be avoided.

The land issue has not been made any easier by the inability of relevant authorities to implement the provisions of the Land Use Act. The need to address areas of the Act in order to remove areas that constitute impediment to livestock producers is long overdue. When and if pastoralists are able to freely own their land, it would be much easier to mobilize and commit human and financial resources to developing permanent infrastructure in support of their livestock production livelihoods.

Demography

The problem of locally produced animals and animal products grew at the attainment of political independence and worsened as the years went by. These problems can be situated within the general framework of population and policy dynamics in the country. On the one hand human populations have continued to expand giving rise to higher food (of animal origin) demands without corresponding expansion in the supply chain which had been hampered by dwindling grazing resources occasioned by limited or lack of accesses of pastoralists to production inputs. Often times, the policies enunciated are in direct contradiction of an enhanced pastoral production, thereby negating the goals of improved agricultural and food production. The short supply of meat and animal, products had to be supported by importation. The situation by 1976 was that the volume of food and live animals imported into the country outshot that of export in the same commodity As local supplies dwindled, increasing huge foreign exchange continued to be allocated for the procurement of meat and livestock products. Colossal import bills were incurred by both the Federal and State governments by early 1980's.

Low input production

Another reason that may be adduced to the use of low inputs may be the subsistent nature of livestock production. Except for a few commercial poultry and ruminant farmers, the majority of producers, especially the pastoral producers, are not motivated by overall market forces. To this

extent, therefore, they are not motivated to invest on inputs that would accelerate the process of production. Their activities are largely dictated by reasons other than the commercialization motive that is often associated with economic activities. For such livestock producers, subsistence requirements for household members are the overriding determinant of the production endeavor. To this extent, therefore, minimal inputs are expended just to meet the basic needs, and so animals do not express their potentials in a reasonable time frame. This would in turn affect the price producers get for their animals when they are eventually offered for sale. If the price offered for their livestock and animal products are considered unattractive, they may withhold sale. This may even be compounded by the structure and operation of livestock market where middlemen appropriate for themselves unimaginable supper normal profit margins, leaving livestock owners only marginally rewarded for all their labour and input. Also the perishable nature of livestock products such as milk, eggs, etc compel the disposal of these products within a specified time period, so as to avoid total loss. All these, among others, have contributed to the low and declining level of protein intake in the country. The result of a combination of these factors has led to short supply of meat and milk in the country. The country has had to resort to importation of these commodities, thereby making Nigeria a net importer of animal products.

Policy and research issues

The issue of improved and increased productivity has been a recurrent concern in animal agricultural research dating back to colonial era. The need for improvement of the sub-sector through articulated programme of research, development and information dissemination to end-users has always been made by both communities of scientists and technocrats within and outside Nigeria. Going by the contribution of the agricultural sector before the advent of the oil boom years and the current place of agriculture in terms of productivity and sectoral allocation, a lot of re-thinking and revamping of the sector is imperative. This is so because the future of the country can be said to hinge on the quality and quantity of agricultural production. This is even more apparent for the non-crop agricultural sector, particularly the livestock sub-sector. Indeed, Nigeria can be self sufficient as well as export livestock products to other countries within and outside the region. All that is required is commitment to relevant problem-solving research agenda which would not only receive generous funding from all concerned but also would transcend political and ethnic manipulations (Gefu, 2004). A sustained agenda for improved production of quality protein would not only lead to enhanced outputs but would raise the quality of living and by implications the productivity of Nigerians, especially the teeming population of the youth. In any economy, research is the engine of growth. This is even more so for the livestock sub-sector, where constant changes are experienced in agronomic practices resulting from climatic and ecological changes, consumption patterns, economic and political atmosphere and a variety of other considerations including fiscal and monetary policy of the central government. But the most important factor in the livestock production equation can be said to be the type of livestock research policy pursued. To a very large extent, the policy on livestock and livestock research would determine the direction in which the sub-sector can be meaningfully improved. Research into livestock matters are germane to the evolution of well informed policy for guided change in livestock production. Conversely, the type of livestock policy in place would, to a very large extent dictate the kind of research problems that would be embarked upon by the various bodies charged with the responsibility of moving the livestock industry forward. For instance, the research institutes with the mandate to engage in livestock improvement will have to operate with stipulated policy framework if they are to receive funding and other logistic support from their

parent body. The policy of donor agencies and bi-lateral organizations would likewise determine the amount of off-shore funding that would be available to Nigerian livestock researchers and development workers. Yet the policies adopted by governments and donor agencies are shrouded in the political agenda of funding agencies.

Destruction of grazing reserve and stock routes

Lack of or limited access to grazing land due to encroachment of crop farming activities and over grazing has reduced feed available and this, coupled with the obliteration of the cattle routes, have resulted in nasty conflict between pastoralists and farmers. Such conflicts have resulted in the loss of lives and properties.

Scarcity of water

Due to the long dry season in most parts of the zone, livestock on dry feed necessarily require a lot of water to utilize the feed. Although the zone is well watered by river systems, many areas are dry, hilly and rocky. Although there are many watering points scattered all throughout the zone, the water does not last long into the long dry season. During the wet season, access to watering points is limited due to encroachment of farm plots and the obliteration of stock routes by crop farmers.

Weak veterinary and extension services

Many of the known cattle, sheep and goat diseases are endemic in the zone and inadequate veterinary services and scarcity of drugs have made the diseases to take their toll. Lack of funding of the institutions and agencies charged with the responsibility of extension service delivery has led to inability of staff to conduct regular and effective extension services.

Bush fire

Bush fires in the dry season has resulted in wiping away the bulk feed so much needed by cattle, sheep, and goats. The short-term effect is depletion of grazing material. The long-term effect is disappearance of valuable species of fodder, which are not resistant to fire. This eventually leads to sparsely covered soil resulting in soil erosion and degradation of the land. In many areas stocks have to move far South of the zone to graze.

Co-operative groups

Co-operative group formation is important as a preserve weapon and as a means of harnessing resources. Co-operatives can lobby government to legislate policies that favour the sector. Input and marketing of product can be realised if co-operatives are set up to deliberate on these matters. Lack of funds is a constraint to livestock production. Co-operative groups are likely to be credit worthy to obtain loans from the bank for their production activities and also attract government attention to fund certain aspects of livestock production.

Livestock diseases

Disease of livestock constituted important factors that affect livestock production. The zone is a large area with varied conditions conducive for various disease organisms to thrive. The disease conditions which are found in the animals include: helminthiosis, contagious bovine

pleuropnemonia (CBPP) foot and mouth disease (FMD), dermatophilosis, Pestes des petit ruminants (PPR), black quarter, brucellosis, pink eye and cowdriosis (Heart water). Trypanosomosis in cattle can still be found in the Southerly parts of the zone. No outbreak of rinderpest has been reported in the zone since more than two decades and intact it is thought that Nigeria is free of the disease. CBPP is still a major disease problem in the zone but no outbreaks have been reported in any part of the zone of recent. Foot and mouth disease occurs in isolated cases in the zone but has also been contained. Dermatophilosis is a serious skin disease of Cattle, which is endemic in the zone. Small ruminants suffer from PPR, which cause heavy mortality in some years. The presence of ecto- and endo-parasites and pests result in such diseases as Helminthiasis (especially fascioliasis-liver fluke), Babesiosis, Dermatophilosis, Trypanosomiasis and mange, which are detrimental to livestock production. Udder abnormality in Sokoto Red Goats is a serious condition that is yet to be overcomed. Lamb and kids mortality are frequent and high, resulting in low animal offtake.

Some empirical evidences

The problems facing the livestock industry in the country comprise mainly resource availability and use/management. This is very vividly illustrated from the survey of transhumant and agropastoralists in the northwest and northeast transhumant corridors and graphically presented (see Figs).

Transhumant pastoralists

The problem most frequently mentioned by this group was the issue of conflict and watering points especially during the dry months (see pie chart.1). The problem has been recently compounded by the opening up of traditional dry season grazing haven for irrigated crop production. The Fadama project seemed to have contributed immensely to the conflict situation in many parts of the northern states. This conflict situation could be averted only if development projects are well planned and executed with the interest of all stakeholders adequately considered and taken into account in project implementation. The perceived problems as seen by this group of pastoralists has led them to suggest likely solutions (see pie chart. 2).

Agropastoralists

During a dry season survey, a group of settled pastoralists (agropastoralists) were interviewed in the same way their transhumant counterparts were interviewed concerning constraints faced and perceived solutions. For this group of producers, land constituted the major problem faced. Majority (64%) of them admitted that land constituted the single largest constraint to ruminant livestock production (see pie chart 3). This is understandable because of the amount of land required to maintain ruminant livestock in addition to land needed for crop production. Animal disease ranked second in the list of constraints faced. It is interesting to note that the transhumant pastoralists did not mention disease as a limiting factor. For the settled pastoralists, disease became an issue. Asked about what they believed was the way out of the problems listed, the agropastoral producers overwhelmingly mentioned the provision of land for both grazing and arable cropping (see pie chart 4).

Prospects for improving ruminant livestock production

The potential for cattle, sheep and goat production in the zone is enormous. The zone has several strengths that need to be tapped and utilized but some weaknesses that impede improved livestock production need be removed or ameliorated. The strengths that could be explored include:

Human resources

The zone is endowed with a variety of human resources engaged in various livelihood activities. Most of the people live in rural areas and are engaged in primary production. If agricultural enabling environment is created in the rural areas, it is capable of great agricultural output. Too many people at present are involved in down stream farming, i.e. buying and selling. There is need to be more actively involved in production of goods and services.

Vast land mass

As already mentioned the zone has vast upland and fadama that can be used to produce valuable crop residues for livestock feed. Some of the land can be set aside as grazing land and if properly developed and managed will help to solve the feed problem.

Animal resources

The population of cattle, sheep and goat is appreciable and if feed resources can be improved, it is possible to dramatically increase production. It is possible to increase productivity through selection, breeding and crossbreed with more productive animals. The use of artificial insemination can be useful in this regard.

The open nucleus concept of breeding can be used as a means of quickly improving the farmers herd. In this concept, herds of improved livestock are used to exchange for the farmers breeding herd, such that with time the non-productive animals in the farmer's herd will be disposed of with gradual improvement of the herd, specifically proven bulls, rams and bucks are used in this programme.

Dams

The zone is blessed with dams that can be used for irrigation agriculture, which will increase crop yields and residues production. Irrigation can also be used for forage production in the fadamas. Dry season production of crops in the fadama, if intensified, will also augment feed production.

Grazing reserves and stock routes

At present the grazing reserves and stock routes are in a deplorable state. If attempts are made to renovate the reserves and re-demarcated and protect the routes, it will lead to availability of more feeds. The stock routes should have service centres or posts where pastoralists can purchase supplies, drugs and get veterinary attention. Good management of the grazing reserves is important to avoid overgrazing and encroachment by crop farmers.

Strengthening of veterinary and extension services

Animal health services and delivery of new technologies are important in livestock production. This should be given adequate attention by both the private and public sectors.

Livestock processing and marketing

Processing and marketing of livestock products

Most of the cattle, sheep and goats are sold on the hoof. There is a need to add value to livestock by processing them into products which have long shelf-lives. This is particularly important at periods of high production, e.g. surplus milk production during the wet season, fattened bulls using crop residues, processing of animal skins into hides, etc. This will provide employment to more people and makes way for more production of the commodity paving the way for self-sufficiency.

Crop-livestock integration

The concept of crop-livestock integration is not new in the zone. Inhabitants have used livestock in farming since time immemorial. Because of the cost of modern farm inputs crop-livestock integration has become more important. Therefore cattle are used for cultivation of the soil and manure is used as a soil enhancer. In turn crop residues from farms are used for feeding livestock. Crop livestock integration especially among smallholder producers should be encouraged to take advantage of the accruing synergy.

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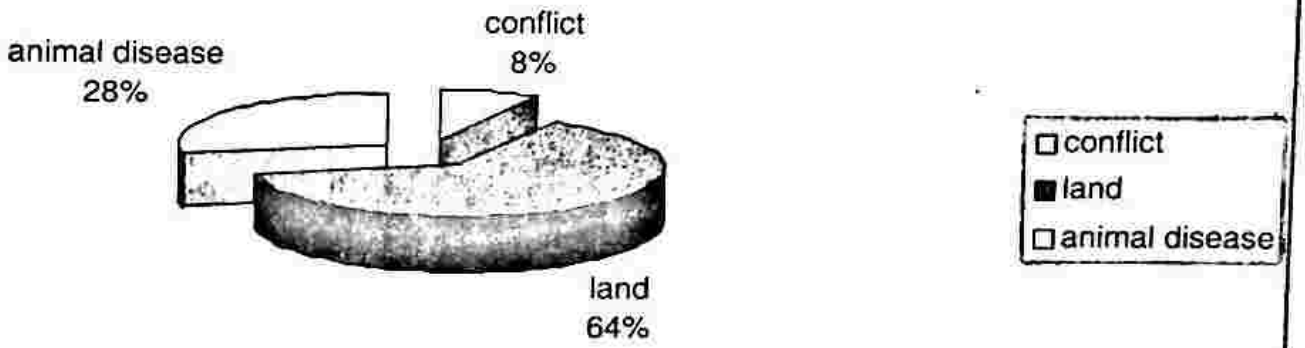
Fig. 1 agropastoralists- constraints



agropastoralists-solution