

**BASELINE STUDY ON LIVESTOCK-WILDLIFE-ENVIRONMENT
INTERFACE IN THE NIGERIAN SECTOR OF THE LAKE
CHAD BASIN**

Being an IUCN consultancy Project undertaken

BY

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TERMS OF REFERENCES

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For the carrying out of baseline studies prior to the implementation of initiatives to foster adaptation to climate change at Livestock - Wildlife - Environment interface with down-scaling of incidence of conflicts based on natural resources in the Nigerian's part of the Lake Chad Basin

BACKGROUND

Arid and semi-arid areas are widespread in Africa, covering between 60-80% of the land surface. They are host to a large portion of grazer populations and, to a lesser extent, sedentary farming communities. Continued population growth as well as pressure on natural resources which is increasing significantly both lead to a multitude of conflicts. Arid and semi-arid areas are fragile ecosystems where natural resources such as water, fertile soils and vegetation are rare. Presently, the ecological dynamics are further complicated by the increasingly inevitable effects of climate change. There is serious competition between graziers and livestock, sedentary farmers and wildlife. These competitions for resources do not only lead to conflict, but also to ecosystems degradation. Streamlined management of natural resources, including conflict management, adaptation and mitigation of climate change has become imperative to avoid serious ecological disasters. The project "Grazing as a means of livelihood" is a joint initiative of the Inter-African Bureau for Animal Resources of the African Union and the European Union aimed at providing a solution to this problem. It is implemented by several partners including IUCN in the Lake Chad Basin. To better focus its interventions, the IUCN is planning a baseline study prior to the implementation of initiatives to foster adaptation to climate change at Livestock - Wildlife - Environment interface with down-scaling of incidence of conflicts based on natural resources.

OBJECTIVES OF THE STUDY

Overall Objective: *Identification of political and institutional entry points for support to the implementation of priority adaptation options in pastoral and agro pastoral systems*

Specific objectives

Stage I

- Examine existing national/regional strategies and policy documents develop priorities and budget allocations to identify policy and institutional obstacles
- Identify policy opportunities and promising institutions that are needed to create an enabling environment for climate change adaptation strategies
- Conduct an analysis of key actors and their links and an analysis of interactions between existing initiatives and actors to identify institutional and organizational entry points as well as the appropriate mechanism for dialogue involving the key partners
- Identify best management practices for livestock-wildlife-environment interface (type, location, time, etc.).
- Set priorities regarding the improvement of regional and national policy and institutional frameworks, (government, development agencies, non-governmental organisations) for climate change adaptation at regional, national and local level.
- Propose priority intervention sites in the intervention zone of the project.

METHODOLOGICAL APPROACH

Work will be based mainly on existing literature review, but also actors and grassroots initiatives in the zones most affected by the management of pastoral resources, livestock and wildlife will be consulted. The consultant will also consult with key actors, notably administrations (livestock, environment, forester and wildlife department, etc...), networks and community groups, research institutions (University of Maiduguri, etc), local NGOs. The study is one of the entry points with regard to regular interactions between community groups, NGOs and administrations; as such, the Consultant has to ensure that a good cross-section of these community groups, including women groups, are consulted.

The results of this work will be consolidated with studies from other countries (Cameroon, Chad) by the project team and presented during the project coordination meeting.

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EXECUTIVE SUMMARY

Climate variability and change have become serious environmental issues that pose a great deal of threats to vulnerable and impoverished people worldwide. Indeed, the scientific community, governments, development organizations and the private sector have increasingly recognize that arid and semi-arid lands deserve greater attention, not only for their large extent, widespread degradation and limited resilience to drought and desertification, but also for their potential capacity to sequester and store carbon in soils while supporting sustainable pastoral and agropastoral livelihoods for millions of people. Livestock and pastoral systems have a major role to play in climate change mitigation and, importantly, in supporting adaptation and reducing vulnerability. Reversing land degradation in the arid and semi-arid areas through improved pasture and rangeland management could contribute to restoring the soil carbon sink while also improving livestock-based livelihoods. Pastoral systems occupy two thirds of global dryland areas, host a large share of the world's poor and have a higher rate of desertification than other land uses. Livestock production is also a growing sector. It is estimated that 1 billion people depend on livestock, and livestock serves as at least a partial source of income and food security for 70 percent of the world's 880 million rural poor who live on less than USD 1.00 per day.

The review noted that there is significant potential for mitigating climate change through improved management of grazing lands in the arid and semi-arid lands within the Nigerian sector of the Lake Chad Basin, and emphasizes the concurrent opportunity to enhance the livelihoods of pastoral and agropastoral peoples and their adaptation capacity. These

opportunities can be realized only with targeted capacity building and effective incentives for improved management of these fragile ecosystems, backed up by pro-poor livestock policies, integrated processes that address natural and social dimensions, and funding mechanisms that enable multi-stakeholder engagement.

The review also analysed key actor, their links and then proposed strategic entry points for intervention in the livestock subsector. The review concluded that greater recognition and support is needed for sustainable pastoral and agropastoral systems around the Lake Chad Basin in view of their contributions to sustainable agriculture and rural development. Targeted support by governments, civil society organizations, development agencies and community donors, (agro)-pastoral networks, development practitioners and researchers is needed to harness this opportunity through awareness creation (sensitization) that will reduce the vulnerability of pastoral and agropastoral communities to climate change; documentation of information on the potentials of agropastoral lands in sustainable ecosystem management; capacity building in the sustainable livestock/wildlife management; establishing pro-poor livestock policies that address the obstacles and challenges faced by agropastoral people within the Lake Chad Basin; supporting a paradigm shift to build local and policy-level awareness and capacity for good grassland management and secure tenure at community and landscape levels; conducting targeted research on livestock-environment interface; promoting an integrated multistakeholder and multi-level processes that address the range of natural resources (land, water, rangelands, forests, livestock, energy, biodiversity) and social dimensions with active involvement by all concerned actors. In particular, the Chingurmi-Duguma sector of the Chad Basin National Park (CBNP) was chosen with specific activities for intervention by IUCN and the proposed contact organization.

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1.

INTRODUCTION

Arid and semi-arid lands occupy 41 percent of the earth's ice-free land area and are home to more than 2 billion people (UNEP, 2006). Of the 3.4 billion ha of rangelands worldwide, an estimated 73 percent are affected by soil degradation (WOCAT, 2009). Over 1 billion people depend on livestock, and 70 percent of the 880 million rural poor living on less than USD 1.00 per day are at least partially dependent on livestock for their livelihoods (World Bank, 2007). Livestock production can be found on two thirds of global drylands (Clay, 2004). Extensive pastoralism occurs on one fourth of the global land area and supports around 200 million pastoral households (Nori, *et al.*, 2005). In Africa, 40 percent of the land is dedicated to pastoralism (IRIN, 2007) and 70 percent of the population relies on dry and subhumid lands for their daily livelihoods (CBD/UNEP/TUCN, 2007).

These drylands, which are predominantly used for livestock production, are particularly sensitive to land degradation, with 10–20 percent of drylands already degraded (Millennium Ecosystem Assessment, 2005). Some 23 percent of the world's poor (nearly 300 million people) are located in sub-Saharan Africa, and about 60 percent of these depend on livestock for some part of their livelihoods (Thornton, *et al.*, 2008). In sub-Saharan Africa alone, 25 million pastoralists and 240 million agropastoralists depend on livestock as their primary source of income (IFPRI and ILRI, 2000).

Livestock products are the main outputs of grazing lands and continue to be the fastest growing agricultural subsector globally. In some developing countries, the livestock sector accounts for 50–80 percent of GDP (World Bank, 2007). Central and South America provide 39 percent of the world's meat production from grassland-based systems, and sub-Saharan Africa holds a 12.5 percent share – a large part of which originates from the drylands.

Livestock are socially and economically critical to rural livelihoods, thus high priority should be given to the sustainable management of the natural resources base that supports them. Grazing animals are the principal practical method of exploiting natural vegetation in dryland environments. Pastoralism is considered the most economically, culturally and socially appropriate strategy for maintaining the well-being of communities in dryland landscapes, because it is the only one that can simultaneously provide secure livelihoods, conserve ecosystem services, promote wildlife conservation and honour cultural values and traditions (ILRI 2006, UNDP 2006).

Dryland species and ecosystems have developed unique mechanisms to cope with low and sporadic rainfall. They are highly resilient and recover quickly from common disturbances such as fire, herbivore pressure and drought. These attributes have great significance for the global system, especially in the context of climate change (Global Drylands Partnership, 2008). Moreover, rangelands are essential to the subsistence of pastoralists and agropastoralists, who usually constitute the most vulnerable groups in this land-use system.

2. EXISTING NATIONAL/REGIONAL POLICY DOCUMENTS AND STRATEGIES IN THE LIVESTOCK SUBSECTOR IN NIGERIA

The general policy objectives of the livestock subsector in Nigeria have always been embedded in the agricultural policies of the country. In an effort to tackle the food security problems, the Federal Government initiated a number of agricultural policies, programmes and projects, largely within the framework of National Development Plans (1970-1974; 1975-1980; and 1981-1985). These policy instruments were expected to remain valid up to the year 2000. The programmes and projects include the enactment of a Law in 1974 which established the Department of Cooperatives in 1974; the establishment of Agricultural Research Institutes through the Nigerian Research Institutes Decree of 1975, whose mandate

was to conduct research into various crops, livestock and fisheries in the country; the National Accelerated Food Production Project (NAFPP) in the 1970s; the establishment of the Nigerian Agricultural Cooperative Banks, NACB from 1973 up to date; Agricultural Development Projects, ADPs from 1975 to date; Operation Feed the Nation, 1976-1979; River Basin Development Authorities, RBDAs from 1977 to date; Green Revolution from 1979-1983; Directorate of Foods and Roads and Rural Infrastructure, DFFRI from 1986-1993; the National Agricultural and Development Authority (NALDA), 1991-1999; and, the Presidential Initiatives on selected commodities launched in 2002, and, the National Food Security Programme, 2008 (See National Food Security Programme Report, 2008).

The general policy objective as it relates to the livestock subsector is to put all available livestock into best use; and to attain self-sufficiency in the production of livestock and livestock products; and to meet the animal protein needs of the country (MAMSER, 1986; Presidential Initiative on selected Commodities report, 2002. This is to be achieved through increased production either by expanding the resource base, by increasing the productivity of the existing resources through a systematic improvement of the national (livestock) production system or both.

The specific objectives of the livestock subsector are to (a) make Nigeria self-sufficient in the production of livestock products; (b) improve nutritional status of Nigerians through the domestic provision of high quality, protein-rich livestock products; (c) provide locally all necessary raw material inputs for the livestock industry; (d) allow for a meaningful and efficient use of livestock by-products; (e) improve and stabilise rural income emanating from livestock production and processing; (f) effectively protect the rural livestock farmer from the unpredictable vagaries and risks incidental to livestock production; (g) provide rural employment opportunities through expanded livestock production and processing; and (h)

effect proper land use and maintenance of the ecosystem for expanded livestock production (MAMSER, 1986).

In the year 2001, a new agricultural policy document was launched. The policy objectives as it relates to the livestock subsector include: Self-sufficiency in livestock production; . Enhancement of nutritional status of the populace; Efficiency in use of by-products and stabilization of income from livestock production and processing; and, Provision of veterinary public and animal health services. The policy strategies include: Provision of vaccines by the Veterinary Research Institute Vom to meet local and regional demands; Promotion of the manufacture of veterinary drugs for Nigeria and West African sub-region; Upgrading of local livestock breeds through the open nucleus-breeding program; Sedentarisation of nomadic pastoralists; and, promotion of range management (Manyong *et al*, 2003)

The First Livestock Development Projects(1976-1986) and Second Livestock Development Projects (1987-1995) jointly financed by the Nigerian Government and the World bank were major landmarks in the country's livestock subsector (Hassan and Jauro, 2003). The objective of the First Livestock Development Project (FLDP) was to improve beef cattle production for small-scale graziers, large commercial farmers and the general public in addition to the introduction of improved research, training and marketing support services, and the importation of trypano-tolerant stock. At the close of the project, it was rated to have had limited success. The Second Livestock Development Project's (SLDP) objective was to reduce the national animal protein supply gap, enhance productivity of the national herd and consequently the producers' income. At the close of the project, 12 grazing reserves were gazetted out of the 20 proposed; a total of 951 kilometres fire tracings as against 1200 kilometres proposed were constructed; 74 out of targeted 2860 dams were constructed; and a

total of 715 out of 2500 targeted transhumant families were settled in seven grazing reserves (Hassan and Jauro, 2003). Other projects embarked upon by Government included the Food Agriculture Organization/Federal Livestock Department Project (FAO/FLD), which attempted to provide infrastructure to improve milk production, enhance reproductive capacity of the local cattle, reduce losses from animal disease, identify reliable market outlets for surpluses of animals and milk from herds in and around the reserves; The EDF (European Development Fund softloan/grant for Integrated Rural Development Programme in Sokoto/Zamfara and Borno/Yobe State, which had a livestock component, focused mainly on range management; and the NEAZDP (NorthEast Arid Zone Development Programme in Jakusko-Nasari Grazing Reserve, which mobilized pastoralists into forming herd owners associations. Through the associations, charges for the provision of basic facilities were introduced. A reseeding programme was introduced. The associations operated bank accounts and members were signatories. NEAZDP extension workers visited regularly to update the pastoralists associations.

Governments' activities in the livestock subsector have dwelt largely on animal production, animal disease control, pest control services, and dairy development. In recognition of the ecological zonation of the country, which supports the raising of different kinds of livestock, government intends to encourage the production of various classes of livestock in the regions/zones of the country with proven comparative geographical and production advantage.

At the regional level, Lake Chad Basin Commission (LCBC) has developed a Strategic Action Plan (SAP) document that would provide a guide to managing the resources of the Lake Chad Basin. The section that is targeted on the livestock sector has been excerpted as follows :

2.1 *EQO II: Restoration, conservation and sustainable use of bioresources in the Lake Chad Basin*

EQO Indicator 1: Measurable and sustainable increase of the qualitative production of bioresources in the countries of the Lake Chad Convention Basin with reference to the average of the 1960s

EQO Indicator 2: Measurable and sustainable increase in livelihood of the populations of the countries in the Lake Chad Convention Basin are restored

Target 2: Promote environmentally sound agropastoral practices in the Lake Chad Basin

- 2.1 *Promote the best environmentally sound traditional agricultural practices based on soil fertility management and the use of biopesticide*
- 2.2 *Establish and promote best practice recommendations for the use of agrochemicals based on agroecological zones.*
- 2.3 *Demonstrate through pilot projects environmentally sound agropastoral practices such as soil conservation, creation of surface and groundwater protection zones, use of natural fertilizers, use of resistant crop strains and intensive livestock breeding.*
- 2.4 *Promote the best environmentally sound traditional pastoral practices*
- 2.5 *Combat eutrophication in sensitive zones by controlling soil and water contamination from agriculture and other nutrient sources.*
- 2.6 *Establish and apply soil information system for planning sustainable agriculture*

3. INSTITUTIONAL OBSTACLES TO IMPLEMENTING PAST LIVESTOCK POLICIES

In spite of the various policies and strategic actions at both national and regional levels to improve both livestock production and agropastoral practices, these efforts have been hampered by many obstacles. These are discussed below (See Manyong *et al*, 2003).

Policy Instability

One of the major constraints to livestock policy effectiveness (which has always been subsumed under agricultural policy) before 1999 was that of policy instability. Over the years, the rate of turnover in agricultural policies had been high, with many policies formulated and scrapped in rapid succession. Again, this problem could be partly ascribed to political instability, as every successive military government tended to jettison most of its predecessor's policies and programs in the erroneous belief that a new government could only justify its existence or make its mark by adopting entirely new policies and programs.

Inconsistency in Policies

One fundamental factor that made policy inconsistency so common was the failure of policy makers to adopt a *systems approach* to policy formulation. In a system approach, the entire spectrum of agropastoral systems and livestock development would have be viewed holistically.

Top-down approach

The base of the agricultural (and livestock) policy formulation process in Nigeria had, in the past, been top-down in approach as the level of involvement of local people and their institutions in the formulation of policies that affected their lives was minimal. In the circumstance, such policies tended to lack grassroots support and the popular mobilization required for their success.

Poor Implementation of Policies

There was a tendency to regard the formulation of policies as ends in themselves, rather than being means to achieving desired ends. As such, little attention was paid to the efficient implementation of policies. Bureaucrats and policy implementers tended to lose sight of the fundamental objectives of policies. Instead, they tended to focus on superficial issues. Poor managerial capacity, bureaucratic bottleneck, corruption and high rates of policy turnover tended to complicate the problem of policy implementation.

Weak Institutional Framework for Policy Coordination

Inadequate institutional arrangements for policy and program coordination had often led to a duplication of effort and general inefficiency in resource use among agencies and ministries of the same government, between federal and state agencies and between states. Inadequate monitoring and evaluation arrangements for policy implementation had also led to situations in which policies and programs tended to lose sight of their focus and original goals without corrective measures being taken.

Weak regulatory frameworks

Most of these policies had weak regulatory frameworks to effectively enforce their implementation. This in consequence has led to the degradation of most of the rangelands. The degradation includes substitution of annual grasses for perennial ones, reduction of plant cover available to protect the soil during the long dry season, trampling especially near Wells and along cattle tracks thereby damaging soil structure, impoverishment of soil nutrient status, and reduced range productivity through substitution of inedible plants for edible fooder plants.

4. THREATS TO WILDLIFE IN THE LAKE CHAD BASIN

The *Livestock Atlas of the Lake Chad Basin (CTA, 1996)* observed that some species such as the Ostrich, Lion, girrafe and Waterbuck are being threatened while other species such as the black rhinocerus, African Buffalo and several antelope species are already extinct. Several factors are responsible for this trend:

Political factors:

Political insecurity has a major negative effect on livestock conservation as most people use such firearms to hunt wildlife species even in protected areas as 'Bush meat' long after such wars are over. Political instability and frequent administrative changes are a considerable brake on long term management of natural resources.

Economic factors

The continued reduction in national budgets on wildlife conservation has a great effect on long term wildlife management. This also leads to overexploitation of wildlife resources. The continued fall in the standard of living and the development of the informal sector to overcome the gaps that developed in the formal also played a part in overexploitation of wildlife. The fall in the price of cotton, which is the main cash crop in the Lanke Chad Basin

forced farmers to search for other sources of income. Farmers (during food shortages) and pastoralists (during rinderpests outbreaks) find wild fauna as easy options.

Institutional and Legal factors

The centralized nature of wildlife management, where wildlife management is under the control of the state (which more often than not, does not have the financial, material or human resources to fulfil that role), somehow demotivated local collective initiative as well as that of the private sector. Areas delianated as protected during the colonial period rarely took the interests and needs of the local communities. The result was overexploitation of the ecosystems.

Demographic factors

Human population growth increases the demand for all natural resources. Their most obvious effects are deforestation, agriculture expansion, irrigation, hunting, reductions in soil fertility, heavy hunting and overfishing. These factors are responsible for the loss or deterioration of the habitats that are essential to the survival of wildlife.

Environmental factors

Drought, desertification, climate variability and change amongst others, are the causes of considerable modification of wildlife habitats in the Lake Chad Basin. The drought which affected the whole of sahel from 1972-1986, was most devastating to wildlife habitats and species.

5. CONFLICT AND CONFLICT MANAGEMENT

You can divide the ways people settle disputes within the Lake Chad Basin into three:

- Traditional authorities
- Police, courts and the army
- Local and State Government

Traditional authorities

In farming communities, there is a hierarchy of village elders, ward heads, Village Heads and District Heads who can be called on to resolve disputes. If the damage is serious, then a more senior leader is called upon to settle the problem. The main problem with traditional authorities is that their interest in these matters varies from one village to another. Some take action to set up court-like procedures, with witnesses, site inspection and independent assessment of costs. Others make arbitrary judgments, and people commonly accuse them of taking bribes. In some areas, the pastoralists are said to win all cases because they are wealthier than farmers and can pay more. Elsewhere, judgements are said always to go in favour of farmers.

Representatives of roughly three-quarters of the villages interviewed said they are satisfied with the traditional authorities. If they weren't satisfied, the next step is usually to call the police. More forward-looking village heads have established pre-emptive measures; in Yobe and Bauchi this is called the 'Hospitality Committee'. These are local residents appointed by the village head to go and meet with Fulani that are coming to an area or who are setting up camp. Most of these are transhumants who have already visited the area in previous years, which makes meetings easy to arrange. But problems can arise when a new group of herders comes to the area. The Committee tries to establish ground rules with the Fulani, so that if crop damage or other disputes occur, then both sides have accepted an agreed procedure. They also have an indigenous version of a Resource User Agreement, essentially demarcating land where grazing is acceptable and warning off the herders from potential farmland. One part of the 'traditional' system are the associations that have been formed in recent years to represent the interests of cattle-rearers and fisherfolk. The most well-known of these is Miyetti Allah, a Fulani association that has branches in nearly all states. A similar organisation, Al- Haya, represents the Shuwa and Koyam peoples. A national organisation

promotes the views of professional fisherfolk at state and national level. These organisations often play a role in dispute settlement, but they are only as good as their local representative, who may be active or entirely passive. Nonetheless, these associations should never be ignored and but rather worked with and strengthened, as they represent an important group of *fadama* users

Police, the courts and the army

Official structures such as the police and courts generally have a bad reputation among rural communities and are regarded as a last resort. Pastoralists never take cases to the police; they are natural victims because they can raise money rapidly and don't have the same rights as indigenes/settlers. But farmers do get the police involved when the traditional authorities fail them. The result is usually unsatisfactory, with farmers often reporting they have to make payments themselves to ensure the police take action and often subsequently receiving no compensation for damage to their farms. Pastoralists may be arrested and have to pay large sums to be released. The courts are of little use; people report cases being stuck there for many years. The army has no official role in conflict management at the local level, but some communities and local governments have called them in where civil insecurity has risen to unacceptable levels. Using the army to keep the peace is a last resort.

Local and State Government

Local and State Government officials are often themselves in conflict with traditional rulers over who holds power in a region. They would prefer to oversee peace-making committees and be in control, in what they see as their constitutional role. As a consequence, they sometimes undermine local rulers. For example, in Borno State, the traditional authorities have banned certain types of fishing nets as likely to damage fish-stocks. The Local Government chairman however, says that in the light of 'democracy', Everyone is free to fish in whatever way they choose. In some cases, Local Government has been active in

forming peace-making committees. The problem is that LG officials are elected by a certain section of the community and may tend to be populist rather than taking the interests of all groups into account.

Do these dispute resolution mechanisms work?

Traditional rulers undoubtedly play the most significant role in both managing conflict informally and arranging peace-making meetings when matters get out of hand. They are more accountable and responsible than any other group and are the only authorities to take preventive action. However, their power in the community is highly variable. In many areas the authority of traditional leaders has been eroded by development of local government. Where traditional authority is supported this has proved to be the most effective mechanism for low level mediation. Community opinion leaders can play an important role in minor conflicts both within and between communities where traditional mechanisms are recognised. Community council has the potential in some southern states to provide a low level conflict resolution mechanism if supported by state institutions. Leader to Leader Councils of traditional rulers, especially in the north can be highly influential but take time to mobilise Hospitality committee

Traditional mechanisms for dispute resolution are far from perfect but significantly better than any others and should therefore be a major target for reinforcement and strengthening. The police, courts and army should only be used as a last resort, and state and local governments should work to support and complement traditional process for resolving conflicts.

It would be romantic to imagine that relations between pastoralists and farmers have ever been uniformly good, in the past or present. However, from the 1980s onwards have seen an acceleration in the frequency of violent incidents. These can be attributed to a number of basic causes (Blench, 2004);

□ Movement of pastoralists into fresh terrain, where language, religion, culture and landholding patterns are unfamiliar

□ Increased desperation of pastoralists competing for a dwindling 'stock' of grazing land.

□ The taking of power in Local Governments by indigenous farming peoples who not promote pastoralists' interests

□ The collapse of the system of *burti*, or cattle tracks

□ Widespread availability of guns and other weapons combined with a general breakdown of law and order in the country as a whole

□ Increased size of herds due to greater access to modern veterinary medicine

□ Greater internationalisation of migration with pastoralists from neighbouring countries making long-range movements to access subhumid and humid zone pastures

Fatal conflicts between farmers and pastoralists are reported almost daily in the newspapers, but no effective action has yet been taken by government to analyse or remedy the causes of these conflicts.

Conflict is common between farmers and pastoralists. At times they are able to settle the matter within them and at times the (traditional ruler) or otherwise the *Lawal* had to intervene. Sometimes cases are referred to the police and subsequently to the Courts, when the two parties failed to agree totally. Although no formalised agreements have been reached regarding the use of fadama especially on access to grazing land and watering points, farmers fence plots to prevent animal damage to crops. The fences are however not strong enough to prevent cows from getting in. The river dries up in the middle of the dry season forcing

pastoralists to seek water elsewhere, reducing pressure along the fadama. Farmers depend solely on the tube-wells during this period for pumping water on their farm plots. This serves as a natural regulatory system for conflict. The major transhumance route passing through the area and the settlements are protected from encroachment.

Lessons Learnt

- The traditional authority can be effective if allowed to function without government interference
- Farmers can take initiatives to reduce conflict with the pastoralists, for example fencing plots.
- The present system of cultivating right up to the river bank is causing erosion, siltation and reducing the water-level thereby affecting fish breeding.
- There is no arrangement on the ground regarding the protection of local routes and access to watering points.
- The manner in which plots are dotted about in the fadama further complicates access to grazing.
- Political interference with the powers of traditional rulers can destroy an efficient and effective system.
- Dialogue can be established with the transhumant pastoralists.

Conflicts occasionally occur between the two groups of resource users, mainly from crop damage or access to grazing fields or watering points. At the fadama level no effort had been made to clearly define routes. Farmers fence their plots to keep livestock off but the fences are not strong enough to prevent incursions by large animals. However, when crops are damaged the Lawal settles most cases with only occasional reference to the police. The transhumance route is protected by the communities.

6. POLICY OPPORTUNITIES, RECOMMENDED PRIORITY POLICY, PROMISING INSTITUTIONS ON ADAPTATION STRATEGIES IN THE LIVESTOCK SUBSECTOR IN NIGERIA

Pastoral communities remain among the most politically and economically marginalized groups in many societies (Nori, *et al.*, 2005). Galaty (1992) notes that migratory herding cultures find themselves facing insecurity in multiple dimensions, including land, political, food, environmental and physical insecurity. Many exist in persistent states of crisis due to drought, disease, raids, pastures and the fact that their transit routes are shrinking in the face of spreading cultivation, nature conservation and control of movements across international borders. Pastoral marginalization comes from global processes involving structural adjustment, policy modernization and economic liberalization (Nori, *et al.*, 2005).

De facto common property resources that are commonplace in rangelands, and unclear private user rights for individual farms or plots of land encourage short-term resource exploitation rather than long-term conservation. Moreover, changes in land tenure may alter the behaviour of individuals and local communities, leading to land degradation – for example, overgrazing following the settlement of nomads (FAO, 2000). Key constraints stemming from lack of tenure, promotion of privatization, and minimal health and education services and security must be addressed to ensure that the synergistic relationship between livestock-based livelihoods and environmental health can be successful and sustainable. There are several cooperative efforts to enhance the voice of pastoralist groups. For example, the Segovia Declaration was put forward at the Convention to Combat Desertification (CCD) in 2007 by the participants of the World Gathering of Nomadic and Transhumant Pastoralists. The pastoralists, identifying the loss of grazing lands to crops and agrofuels as a critical concern, called for support such as: recognition of common property rights and customary use of natural resources; respect for customary laws, institutions and ownership; full

participation in policy-making decisions affecting their access to natural resources and economic and social development; and development of strategies and mechanisms to support pastoralists in reducing the impact of drought and climate change. Because biofuel production increasingly targets marginal farm lands, pastoralists have been identified as particularly vulnerable to losing access to essential grazing lands (Cotula, *et al.*, 2008). Improving pastoralists' capacities to cope with degradation and drought, and promoting sustainable and integrated management of croplands, rangelands and water resources requires a combination of measures. These can include adaptive management approaches, social organization and development of locally adapted regulations for resource access, and tenurial arrangements that cover the common property resources upon which millions of poor people depend for their livelihoods.

In Nigeria some of the policy opportunities are discussed based on the existing three tiers of governance. The role of the private sector, Non-Governmental Organizations are also discussed:

Federal Government

- Through the Federal Ministry of Agriculture and Water Resources (FMA&WR) could play the role of planning, coordination, facilitative and monitoring of projects in the livestock subsector
- Should provide funding for research efforts/initiatives drive in the development of new breeds and subsidy for various inputs.
- Gazzetting of grazinglands and grazing routes

State Government

- Subsidize the supply of certified feeds and vaccines for livestock
- Determine and monitor target production of strategic livestock of comparative advantage
- Funding of veterinary centres and nomadic education centres

Local Government

- Support State Governments in providing basic infrastructure (such as grazing lands, grazing routes, veterinary centres watering points) required by livestock-keepers

Role of other stakeholders (Private sector, NGOs and Development Partners) in livestock subsector

- To collaborate with various tiers of government to finance, execute and operate major programmes and projects (such as abattoirs, livestock markets, feed and premix plants etc) in the livestock subsector
- International donor partners are to support specific projects; support community-level initiatives, assist in capacity building and sensitization programmes through education/communication

The recommended priority policy and program responses on adaptation strategies in the livestock subsector; implementing agencies, responsibilities, budget, and monitoring and evaluation are shown in Table 1. The recommended policy programmes/actions are based on the following guidelines in prioritizing the actions:

- Actions that are capable of being monitored, evaluated and those which produce measurable benefits for the livestock subsector;
- Actions that incorporate community participation (stakeholders involvement) with a view to ensuring the sustainable use of livestock resources;
- Actions that contribute to the wellbeing of the local communities;
- Actions that are environmentally and socially acceptable; and,
- Actions that provide opportunities to develop the capabilities and potential of the communities and institutions in the livestock subsector;
- Actions that focused on Planned Adaptation, which realizes that climate change has impacted (and will continue to impact) the livestock sector and governments at all levels and other stakeholders must take act immediately.

Table 1. Recommended priority policy and program responses on adaptation strategies in the livestock subsector; implementing agencies, responsibilities, budget, and monitoring and evaluation.

Actions/ timeframe	Priority policy and program responses	Implementing Agency(ies)/ Institutions	Responsibility	Budget*	Recommended monitoring and Evaluation
Short term	<ul style="list-style-type: none"> • Public awareness on how climate change will impact on the livestock subsector; • Establishment of Livestock Early Warning Systems (LEWS) and other forecasting and crisis preparedness systems • Strengthened research on animal production, animal health; • Improved livestock capacity to cope with climate change through the identification and improvement of local breeds adapted to the local feed resources and tolerant to heat / cold stress; 	<p>Federal, States, Local Govts, NGOs, CBOs, NGOs, Mass Media, NIMET, NEMA, CBDA, LCBC, LCRI, UNIMAID</p> <p>UNIMAID; FMAWR-NAPRI, Shika, Zaria; IAR; NVRI; NITR, LCBC, CBDA</p>	<p>Sensitization of livestock keepers on how climate change will impact on the subsector; Assured participation of the livestock keepers (e.g. the pastoralists and agro-pastoralists who manage vast areas of lands and forests) in devising coping and risk management approaches to Climate Change through awareness building, collective action</p> <p>Capacity Building; Research into production and management of all livestock species; conduct research into all aspects of livestock diseases, their treatment and control</p>	*see note below	Private Mass Media Organization in Nigeria, NAPRI, IAR, NVRI, NITR, LCBC, HJKYBTF

<p>Medium term</p>	<ul style="list-style-type: none"> • Delienation of land as rangeland and enrichment of rangelands with high fodder potentials • Improved integrated pasture management systems and legislation that leads to increased conservation of nature and ecosystems, and effective development of cultivated pastures. • Increased investment in livestock productivity • devise and promote ecologically sustainable livestock production strategies and practices 	<p>Federal, States and Local Governments, CBDA and LCBC, UNIMAID</p>	<p>Provision and gazetting of land as rangelands; Expand water harvesting practices; building of water harvesting structures; reseeded of rangelands with species of high fodder potentials; Improved capacity of the livestock producers to cope with Climate Change vulnerabilities (water stress, heat stress, low yield); Identify options for risk management and crises mitigation through diversification of the livelihoods options of the livestock keepers;</p>	<p>*see note below</p>	<p>Lives-tock Organiza tions, NBC, LCBC</p>
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Long term	<ul style="list-style-type: none"> • Strategic reserves to ensure food security; • National Livestock Insurance Scheme; • Increased role of science and technology in helping livestock agriculture adapt to climate change, and in better understanding the causes and impacts of climate change. 	Federal Government in collaboration with State Governments, CBDA, LCRI, LCBC, UNIMAID	Maintaining strategic animal product reserves; provision of insurance for livestock keepers during disasters; Identify restocking and destocking options and policies that allow livestock producers to sell their animals in situations of emergencies and to rebuild flocks/ herds subsequently; Creation of Weather-based index insurance linked to measurable climate change events such as extreme heat, low rainfall; provision of rural financial incentives (e.g. risk funds, micro-credit) that allow livestock keepers to cope with uncertainties and adopt favorable and sustainable livestock keeping practices; thus reducing their vulnerabilities	*see note below	National Food Reserve Agency (NFRA); NIMET; LCBC
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Key: **NAPRI** (National Animal Production Research Institute); **IAR** (Institute for Agricultural Research) Zaria; **NVRI**=National Veterinary Research Institute, Vom; **NITR**=National Institute for Trypanosomiasis Research, Kaduna **LCBC**=Lake Chad Basin Commission **NBC**=National Boundary Commission **FMAWR**=Federal Ministry of Agriculture and Water Resources **CBDA**=Chad Basin Development Authority, **LCRI**=Lake Chad Research Institute **HJKYBTF**=HadejiaJama'are Komadugu Yobe Basin Trust Fund Secretariat, **NIMET**=Nigerian Meteorological Agency, **NFRA**=National Food Reserve Agency **UNIMAID** :University of Maiduguri

BUDGET Note *

At this stage a range of costs for each of the categories listed in Table 6 have been used, as follows:

Public awareness, Communication and advocacy activities	\$30,000 to 50,000 per activity
Data collection and research on specific projects (animal production and health)	\$350,000 to 500,000 per activity
Pilot projects (water harvesting structures, Strategic animal product reserves) across ecozones	\$500,000 to 1,000,000 per activity
National livestock insurance scheme	\$10billion

It is acknowledged that there will in fact be very large differences between the costs of different activities within the livestock subsector. However, since no one single Ministry, Department or Agency will fund the whole activities in the sector, it is suggested that this level of accuracy is appropriate for overall budgeting at the present time. As each activity is taken up for implementation a more precise cost will need to be calculated and a funding agency identified.

6. ANALYSIS OF KEY ACTORS AND THEIR LINKS AND INTERACTIONS BETWEEN EXISTING INITIATIVES AND ACTORS TO IDENTIFY INSTITUTIONAL AND ORGANIZATIONAL ENTRY POINTS AS WELL AS THE APPROPRIATE MECHANISM FOR DIALOGUE INVOLVING THE KEY PARTNERS

The analysis of key actors, their links and interactions is given in figure 1. The Lake Chad Basin Commission (LCBC), as an Inter - Governmental Agency, was established by the Fort

Lamy (N'Djamena) Convention and Statutes of May 22nd, 1964. Today, the LCBC comprises of six countries notably Nigeria, Cameroon, Chad, Niger, Central African Republic and Sudan. According to LCBC Convention and Statutes, the primary responsibilities of the Commission are *to regulate and control the utilization of water and other natural resources in the basin; initiate, promote and coordinate natural resources development projects and research within the basin area; examine complaints; and promote the settlement of disputes, thereby promoting regional cooperation.* In December 1977, the LCBC signed a protocol for harmonization of regulations relating to the fauna and flora in the four member States, and adopted plans for the multi-donor approach towards major integrated development for the Conventional Basin. In 1994, Member States approved a Master Plan for the development and environmentally sound management of the natural resources of the conventional basin. A Strategic Action Programme (SAP) with long-term vision (20 years) for the basin that was prepared by the Global Environmental Facility (GEF) was adopted by the Member States.

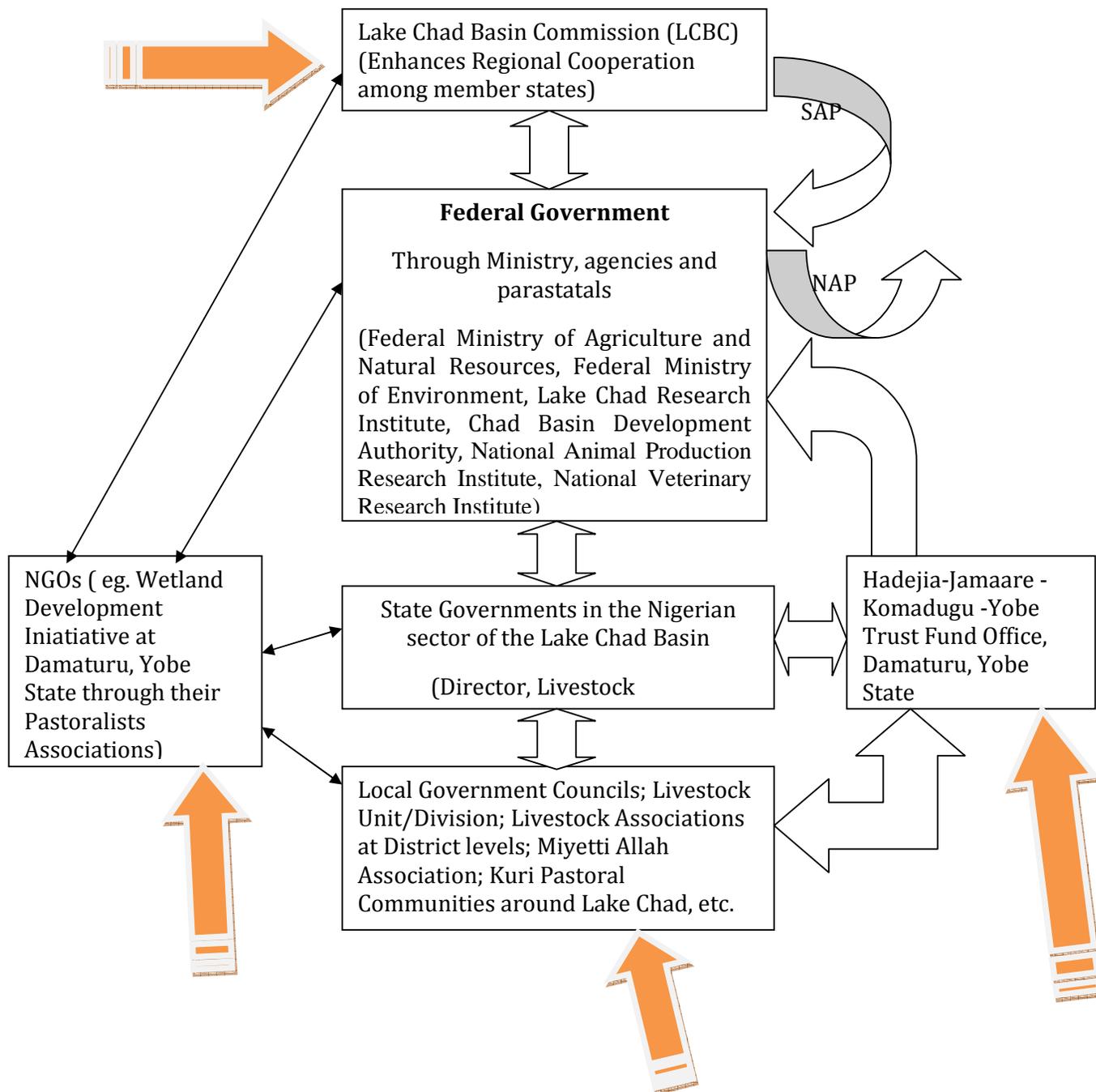


Figure 1. Analysis of key actors and their links in the livestock subsector in Nigeria (Drawn by Ayuba H K, 2011). Stripped red arrows indicate strategic entry points for support to the implementation of priority adaptation options in pastoral and agro pastoral systems in the Nigerian sector of the Lake Chad Basin

At the national level, planning and strategies for implementation of livestock programmes are handed down from the Federal to State and finally to Local Governments. Nigeria, through its relevant Ministries/agencies and parastatals (notably, the Federal Ministry of Agriculture and Water Resources, Livestock Division) are supposed to work towards achieving the overall objectives of attaining self-sufficiency in the production of livestock and livestock products; and to meet the animal protein needs of the country and promoting environmentally sound agropastoral practices within the Lake Chad Basin at the regional level. Through the National Action Plan (NAP) developed at the country level, inputs were then fed into the strategic regional programme. Nigeria's NAP provides an overview of the national efforts to combat desertification touching on the policy and legal framework, institutional framework, programmes, coordination, partnership and financial arrangements. The NAP document identifies priority areas such as land use and tenure, capacity building and support to local level community initiatives. Under sectoral programme areas, NAP identifies priority activities in vegetation cover and wildlife, conservation of biodiversity agriculture and pastoralism and soil and water management. The State's Department of livestock are expected to work hand in hand with the Federal Livestock Departments and the Livestock Units at the Local Government levels to achieve the overall objective of improving sound agropastoral practices.

Problems that arise from the administrative structure of three-tier governance, which affect livestock production include:

- *Bureaucracy.* The implementation of livestock policies can be hampered by bureaucratic bottlenecks and successful implementation can hardly be expected if dependence is placed entirely on existing administrative structures working within the existing framework.

- *Top-down approach.* Planning and strategy for implementation of the livestock policies are mostly done at the top and instructions passed down to the local governments for implementation. The pastoralists/rural people who are the ultimate beneficiaries are hardly involved in either the planning or the implementation. When viewed as a government programme, it is not likely to be widely accepted by the communities.
- *Inadequacy of well trained extension workers.* Well trained extension workers are inadequate in many local governments where grazing reserves are located, and the few on ground are not well motivated to encourage pastoralists towards sustainable agropastoral practices.
- *Inadequate financial resources.* Where government has delineated land as rangeland/grazing reserves, funds are needed to provide basic health facilities, construct deep wells, delineate grazing routes, and for training the pastoralists. Inadequate funding has affected the capacity of governments to reduce increased degradation of the grazing reserves.

The Hadejia Jama'are Komadugu Yobe Basin (HJKYB) a sub-basin within the Lake Chad Basin, covers a land area of over 148,000 square kilometers, cutting across six riparian states, (Bauchi, Borno and Yobe in the North East, Jigawa and Kano in the North West and Plateau in the North Central). The total population of the states stands at over 28 million people based on the 2006 National Population Census. Over 15 million of this population is directly or indirectly dependent on the water resources of the basin for their livelihoods in the forms of rainfed agriculture, irrigation, fishing, livestock husbandry and domestic water supplies.

The HJKYB is considered to be of strategic national and international importance. The basin is an area of relatively dense population concentration in a dry land region, with the population of over 15 million people critically and increasingly dependent on scarce water resources. It is the source of internationally shared water whose management in Nigeria has an important bearing on diplomatic relationships between Nigeria and four countries (Niger, Chad, Cameroon and Central African Republic). These countries share the Lake Chad basin in which the Komadugu Yobe sub-basin is located, and with Niger Republic, the River Niger. Nigeria is dependant on international goodwill in water resources management for its hydroelectricity generation program as well as the irrigation projects of the Chad Basin Development Authority. Nigeria is thus under pressure to demonstrate best practices in the management of international waters.

Due to the semi-arid conditions, scarcity of water has been, and continues to be, the major stimuli for the major development initiatives, which has placed the integrity of the HJKYB at risk. An integrated approach to effectively manage water and other natural resources of the Hadejia Jama'are-Komadugu-Yobe basin is the establishment of **The Hadejia Jama'are Komadugu Yobe Basin Trust Fund** in 2006 which has the task to deliver the basin from its water resources management crisis and alleviate poverty by attacking its root causes.

Structure of the HJKYB TRUST FUND

A 15-man Board of Trustees governs the Trust Fund. The Chairman, Vice Chairman and one of the members represent the Federal Government, while 2 members represent each of the six Riparian States.

A Technical Action Committee (TAC) assists the Board in the development of an action sheet for the Trust Fund to implement the Catchment Management Plan. This is to ensure ease of implementation and proper sequencing of its activities. The Committee classified the activities of the Trust Fund into three action domains as follows:

- i. Immediate/Short-term Actions;
- ii. Medium-term Actions;
- iii. Long-term Actions;

The action domains are to help the Trust Fund in addressing and achieving better water resources management and environmental issues that affect the Basin generally in a well coordinated manner.

For the day-to-day management of the affairs of the Trust Fund, there is a secretariat located in the geographical center of the basin, i.e. at Damaturu in Yobe State. The building was donated by Yobe State Government in fulfillment of the pledge made earlier. The Secretariat is manned by an Administrative Secretary, who is assisted by three managers who oversee Operations, Finance and Administration, and Planning Departments, respectively. Each Department has a number of officers that assist the managers by serving as Desk Officers for the various tasks being undertaken by the Trust Fund.

After inception, the Trust Fund set for itself vision, mission and strategic objectives in order to actualize its mandate.

Vision: A Basin where water resources are equitably and effectively distributed and regulated based on stakeholder consensus.

Mission: Integrated water resources management (IWRM) practice implemented in the basin.

Strategic Objectives

- a. Capacity of the Trust Fund for executing its mandate developed;
- b. Funds raised for administration and execution of projects;
- c. Awareness raised for efficient use of water and environmental management by communities, CSOs, Line Agencies and the Private Sector;
- d. Partnerships built for the joint planning and execution of projects that promote IWRM;

- e. Communities empowered for managing commonly owned infrastructures and environmental situations, and negotiating for services and access to resources;
- f. Catalyzed Policy and Institutional Reforms that make IWRM practice attractive and viable;
- g. Facilitate the execution of infrastructural projects that will allow the flow of water according to agreed allocations facilitated;
- h. Creation and broadening of a decision support system for land and water resources development in the basin.

Other Development Partners (such as Global Environment Facility, World Bank, African Development Bank, IUCN) and NGOs are working in collaboration with Local Governments, State Governments and the Federal Government of Nigeria to improve sound agropastoral practices.

7. ORGANIZATIONAL AND INSTITUTIONAL ENTRY POINTS FOR INTERVENTION IN THE LIVESTOCK SUBSECTOR

In view of the problems associated with the three-tier system of governance highlighted above, the following are considered possible entry points.

The HJKYB TRUST FUND office in Damaturu, Yobe State ; The Lake Chad Research Institute (LCRI) in Maiduguri, Borno State ; The Chad Basin Development Authority (CBDA), located in Maiduguri, Borno State ; The University of Maiduguri, located in Borno State ; and the Lake Chad Basin Commission(LCBC) in Ndjamaena ; represent good organizational and institutional entry points for intervention in the Livestock subsector in Nigeria because of the integrated approach they adopt in managing water and other natural resources of the Lake Chad Basin. NGO such as the Wetlands Development Initiative, located in Damaturu, Yobe State, could be another good entry point. All these organizations and institutions also have effective mechanisms for information retrieval and dissemination (E-mails, telephones, ability to reach a wide audience through their

connection with mass media organizations, and their ability to mobilize the local people/pastoralists for dialogue).

8. IDENTIFICATION OF BEST MANAGEMENT PRACTICES FOR LIVESTOCK-WILDLIFE-ENVIRONMENT INTERFACE

Conflicts over natural resources are increasing with wildlife losing the ground to livestock and land degradation is now increasing at alarming rates within the Lake Chad Basin. Thus, the overarching goal of any livestock-wildlife-environment interface project is to mainstream biodiversity and livestock resources at the interface between mixed production ecosystems and protected areas through the promotion and support of sustainable land use management systems for improved community livelihoods, biodiversity conservation and reduction of land degradation. The objective of the project is to promote the mainstreaming biodiversity and livestock resources at the interface between mixed production ecosystems and protected areas. This could be achieved through an examination of good practices that have been developed and tested over the years by various communities within the Lake Chad Basin.

- *Creation of institutions/organizations that enhance national and regional cooperation*

The establishment of the HJKYB Trust Fund office in Damaturu, Yobe State in 2006 and the Lake Chad Basin Commission office in Ndjamena in 1964, provide an opportunity for dialogue and exchange of ideas on good land use practices and mainstreaming of biodiversity within mixed wildlife/livestock production systems within the framework of national and regional cooperation. Lessons learnt by the HJKYB Trust Fund office as they relate with State Governments, Local Governments and communities within the six riparian States over resource use could be shared with other member states of the Lake Chad Basin Commission.

- *Consultative Stakeholders Forum for Conflict Management*

The HJKYBTF secretariat also has an active Stakeholders Consultative Forum that manages conflicts arising from the use of scarce resources in the Hadejia-Jama'are komadugu Yobe sub-basin. Conflict analysis in this sub-basin could provide regional lessons on the management approaches of contested trans-boundary resources among the pastoral nomads.

- *The Management Plan for Nigeria's First Ramsar site of international importance (Nguru Lake and Marma channel complex produced in 2002).*

Basically, this management plan focused attention on the sustainable use of the resources of Nguru Lake and Marma Channel by all stakeholders. In accordance with the RAMSAR guidelines, this management plan presented a set of mutually agreed prescriptions for the sustainable management of the site. It was based on a four-pronged approach consisting of: baseline description of the site, which identifies the salient features that determine or affect the ecological functioning of Nguru Lake and Marma Channel; evaluation of the sustainability of current and potential resources utilization practices; elaboration of the management and operational objectives necessary for ensuring the ecological integrity of the site in conjunction with its sustainable utilisation by the local communities; and, elaboration of a strategic action plan or management actions for the implementation of the management and operational objectives, taking into account other affiliated projects and programs in the technical and geographical area. It may be desirable for all regions within the Lake Chad Basin to have a Ramsar site..

- *The Catchment Management Plan (CMP) for Integrated Natural Resource Management of Komadugu – Yobe Basin (2006).*

The CMP proposed an action plan, covering a period of approximately 4-5 years, targeted at resolving identified water problems and challenges as well as instituting integrated natural resources management instruments in the region, to achieve equity of allocation, efficiency of use and overall sustainable development in the basin. The CMP provided a catalyst and an

overview of strategies for the integrated land and water resources management of the Basin. It described the process and the context, as well as the recommended strategic actions needed to turn around the deteriorating land and water resources situation, the peculiar ecological considerations as well as the legal and institutional framework for its implementation in the HJKYB. It set out specific strategic actions and activities to be achieved within the 4-5 year targeted period. It also provided strategies for implementing the plan. A critical look at issues within the lifespan of a typical political regime (4-5 years) is useful in assessing progress in natural resource management strategies.

- *Establishment of the Jakusko-Nasari Grazing Reserve, in Jakusko LGA of Yobe State*

The Jakusko-Nasari grazing reserve, located in Yobe State, Nigeria was gazetted as a statutory grazing reserve in April 1969. It has an area of some 80, 290 hectares. Sedentary animal husbandry is practiced where pastoralists reside permanently in the reserve but engage in agricultural practices outside the reserve. Three bore holes were drilled in the 1970s. When the grazing reserve was taken over by the Northeast Arid Zone Development Programme (NEAZDP) in 1990, a lot of development activities on both livestock and range management were made. Notable among these were the rehabilitation of Kuka-Maiwa borehole, construction of a well, construction of veterinary and human clinics under a drug-revolving scheme, a building for adult education with relevant materials for learning, and a storehouse for storage of seeds and nursery equipment. Various training activities were organized for the pastoralists in order to improve the productivity of the range and to avoid conflict over use of the rangeland.

9. PRIORITIES FOR THE IMPROVEMENT OF REGIONAL AND NATIONAL POLICY AND INSTITUTIONAL FRAMEWORKS FOR CLIMATE CHANGE ADAPTATION AT REGIONAL, NATIONAL AND LOCAL LEVEL

The rangeland and livestock ecosystems in Nigeria are complex, with myriad interactions among the biotic and abiotic components of the systems as well as the economic and social components (Nigeria's First National Communication, 2003). Thus, the livestock production systems are vulnerable (and will be most vulnerable in the future) to climate change in respect of (i) decrease in rainfall in the Sudan-Sahelian zone and consequent reduction in the available pastureland, (ii) increased in temperature (iii) increased evaporation and decline in availability of surface water resources for animals, (iv) possible increase in salinity at watering points due to increase temperature and evaporation in the face of reduced rainfall, and (v) declining fodder availability

Declining fodder availability, desertification, bushfires, diseases and decreased access to water pose serious threats to livestock production in the country. For instance, in the sudan-sahel zones, where most of the livestock are kept, Fulani pastoralists are frequently forced to encroach on farmlands due to shortage of fodder on the rangelands. This usually leads to bloody conflicts between the farmers and pastoralists. The growing shortage of fodder and water in the sudan-sahel zone is also putting pressure on the Guinea savanna and the fringes of the rainforests. In the coastal areas, increasing saltwater intrusion is degrading the quality of fodder and reducing fresh water availability in many areas (see HBF, 2008). To the extent that climate change leads to decrease in livestock production, it will impair the availability of animal protein including meat, egg, milk; and animal products such as hides and skins. It will also adversely affect employment in the livestock sector.

Climate change will impact (and has already impacted) upon a large range of physical/biological systems and sectors of human activity, among them is livestock. Livestock systems in Nigeria are changing rapidly in response to many drivers such as increase in human population, rapid urbanisation, increased demand for livestock products, and climate variability and change. In the particularly fragile sudan-sahel zones, transhumant

livestock are both victims of climate change and contributors to it, since they accentuate its impact. As they pass, animals degrade plant cover and nibble at young trees. In the Sahel, herds that leave for the more humid zones in the dry season have completely destroyed shrubs and grasses in some places. Drought coupled with overcrowding reduces the amount of grazing available, forcing herders to take their animals ever further afield and encroach on agricultural land.

Climate change has direct effects on livestock productivity as well as indirectly through changes on the availability of fodder and pastures. It determines the type of livestock most adapted to different agro-ecological zones and therefore the animals that are able to sustain rural communities. Climate change is expected to affect livestock at the species level. Possible types of climate change driven impacts that are likely to occur in the Nigerian pasturelands and the livestock sector are given in Table 2. Poor livestock keepers are among those whose livelihoods are most vulnerable to climate change. Extensive grazing systems will become less viable in semi-arid areas that become even more warm and dry. As pests and diseases move into new areas, the poor who can either not afford or access animal health services are more likely to experience increased morbidity and mortality among their animals. And the poor are the first to suffer market impacts of climate change on the cost of inputs. In low lying coastal areas, poor livestock keepers facing loss of land to rise in sea levels, will find it difficult to find alternative sites on which to re-establish their livelihoods. On the other hand, climate change is likely to lead to new market opportunities for livestock keepers.

Table 2: Likely Impacts of climate change on the Pasture Land and Livestock

Ecological impacts	Alteration in carbon storage capacity of the ecosystem; alterations in greenhouse gas emissions; disturbances in ecosystem functions (e. g. alteration in biogeochemical cycling, incidence of wild fires etc.); changes in soil quality and productivity; changes in biodiversity and changes in habitat suitability for wildfire. Changes in forage resources; shifts in range land vegetation structure or boundaries; changes in forage
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	quality and quantity; reduction in harvest forage; changes in length of growing season...
Livestock impacts	Reduced feed intake and changes in livestock productivity such as milk production, growth rates and weight gain, reproduction; and changes in water quality and quantity, shift in types of herbivores.
Socio-economic impacts	Changes in food production and security (locally and nationally; changes to incomes derived from livestock production, wildlife, and other range land outputs; changes in land use; changes in recreational use of range lands and alteration in scenic quality.

Source: Nigeria's First National Communication, 2003

Analysis on the livestock subsector in Nigeria suggest the following policy and program recommendations.

i. Design and implement good overall development policies and programs for the Livestock subsector.

Given the current uncertainty about location-specific effects of climate change, good development policies and programs are also the best climate-change adaptation investments. A pro-growth, pro-poor development agenda that supports livestock and agricultural sustainability will also contribute to food security and climate-change adaptation in the country. Adaptation to climate change is easier when individuals have more resources and operate in an economic environment that is flexible and responsive.

ii. Increase investments in livestock productivity.

Even without climate change, greater investments in the science and technology of livestock production are needed to meet the meat and protein demands of the country.

Climate change places new and more challenging demands on livestock productivity. Livestock productivity-enhancing research, including biotechnology, will be essential to help overcome stresses due to climate change. Livestock that are doing reasonably well in a range

of ecological zones rather than extremely well in a narrow set of ecological conditions will need to be encouraged.

iii. Reinvigorate national research on livestock production.

Capacity building in laboratory scientists and the infrastructure they require; Research into production and management of all livestock species; livestock diseases, their treatment and control Investment are needed. Partnerships with private organizations, NGOs and Development Partners are part of the solution. Collaboration with local farmers, input suppliers, traders, and consumer groups is also essential for effective development and dissemination of locally appropriate, cost-effective techniques to help revitalize communications among livestock keepers, farmers, scientists, and other stakeholders to meet the challenges of climate change. Extension programs can play a key role in information sharing by transferring technology, facilitating interaction, building capacity among livestock keepers, and encouraging them to form their own networks. Livestock keepers organizations can be an effective information-sharing mechanism and have the potential to provide cost-effective links between government efforts and livestock-keepers' activities.

iv. Support community-based adaptation strategies.

Livestock productivity, market access, and the effects of climate all are extremely location specific. Development partners and the Federal government should work to ensure that technical, financial, and capacity-building support reaches local communities. They should also encourage community participation in national adaptation planning processes. Community-based adaptation strategies can help rural communities strengthen their capacity to cope with disasters, improve their land-management skills, and diversify their livelihoods. While national adaptation policies and strategies are important, the implementation of these strategies at the local level will be the ultimate test of the effectiveness of adaptation.

v. Research, Learning and Pilot projects

Research results (<http://www.fao.org/agriculture/lead/themes0/climate/en/>) show that the most striking change caused by climate fluctuations will be the type of livestock species reared. If the climate becomes hotter and drier, goats and sheep will take precedence over cattle and chickens, which are very sensitive to the heat. The humid zones will in turn become more suited to poultry and large livestock, notably dairy cows, especially in high altitudes. But if rainfall increases in these areas, goats and chickens will become more attractive options. There is also an urgent need to use more improved local breeds, which are better adapted than imported breeds to the climate and to its variations.

In places with poor grazing where feed crops can be cultivated, keeping animals in stalls is advised, so as to limit their impact on the environment. Researchers should work towards improving the management of animal waste (manure and slurry) to reduce methane emissions, notably through more efficient conversion into biogas. Detailed analysis to quantify livestock's impacts at a national scale is required to shape policies that can effectively help in adapting to climate change. Other areas of research include: Assessing the contribution of various animal species and livestock production systems to GHG emissions using the Life Cycle Assessment approach, with the objective of facilitating better understanding of the sector's impacts, taking into account the differences across production systems and species; and Assessment and development of policy options for GHG emission reduction/adaptation strategies from the livestock subsector. Projects that will improve fodder crops and other feed and make them more digestible so as to reduce flatulence in ruminants are encouraged.

vi. Gender Considerations

Gender roles are the socially constructed expectations for women and men. These roles vary greatly among societies. Gender roles are important in the way livestock rearers think about livestock ownership and control, the division of livestock-related labour, and the transmission of livestock knowledge. Understanding the importance and the cultural nature of these roles are important for understanding the vulnerability of some of the gender categories in Nigeria. As a general rule, women alone do not herd large livestock such as cattle, but among the Fulani pastoralists in the sahel ecozone, women (including young girls) could be seen on camelback assisting in cattle rearing. In the grazing fields, while the men take care of the herd, the women fetch water for the herd or are involved in the selling of livestock products to buy cereal and leguminous grains as these provide much more energy and protein to the local livestock rearers. The women also keep animals such as goats, sheep and local poultry, where they do not have to move far to provide feeds for them. In the Guinea and Forest zones, both men and women keep animals such as goats, sheep, pigs, and poultry. The sale of live animals and their products and the use of animals for commercial transport (camels, donkeys and horses) are not only to generate income for the livestock-keepers, but are ways of coping with environmental challenges.

10. PROPOSED PRIORITY INTERVENTION SITES

The sudan-sahel zones are particularly dynamic ecosystems in that they undergo rapid and extensive shifts between multiple alternative vegetation states, as a result of highly variable, unpredictable and declining rainfall, increase in temperature, drought, desertification, fires, marginality of soil water and nutrient reserves. Because of the vagaries of climate in these rangeland systems, small changes in the frequency of extreme events may have disproportionate effects on what livestock managers could cope with. Biogeographical model (Henderson-sellers and McGuffie, 1995) suggest these semi-arid and arid ecosystems may be

among the first to show the effects of climate change. Already, the manifestations of climate change on the rangelands include reduction in grazing land productivity through substitution of inedible plants for edible fodder plants, and increase in bare surfaces.

Defining appropriate livestock interventions is not an easy task since livestock species are affected in different ways by different hazards and they also differ in terms of their vulnerability to specific types of disasters and in recovery capacity.

The design of equitable and effective service delivery in the livestock subsector within the Lake Chad Basin will require an understanding of (i) livestock ownership and use by the range of socio-economic groups within a disaster affected population (e.g. types of livestock owned and main health problems affecting these animals) and (ii) gender roles and responsibilities and the implications for planned activities. Key questions to be asked when designing interventions are:

1. What types of livestock systems have been affected by the disaster and how?
2. Which groups are most affected or vulnerable, and what are their priority needs?
3. Which livestock intervention is the most appropriate (considering the types of problems and target group)?

Table 3 shows the sites proposed for intervention in the livestock subsector.

Table 3: Proposed Intervention sites for intervention in the livestock subsector

S/No.	Proposed Priority Intervention	Proposed Site	Remark
1	Capacity building of Pastoralists, Infrastructural development in rangeland, Credit and microfinance, Improved fodder supply, animal marketing support, animal health, etc	Jakusko-Nasari grazing reserve, Jakusko LGA, Yobe state, Nigeria	There were some infrastructural developments in the 1970s and 1990s but seemed neglected now.
2	Fencing of Game reserve and protection of wildlife, Infrastructural development, Improved fodder supply, environmental education, capacity building	Sambissa Game Reserve, Konduga LGA, Borno State, Nigeria	51, 700 hectares, and has suffered more than 98 percent degradation of its natural resources

3	Classification of protected areas for conservation of biodiversity, rehabilitation projects, Integrated Biodiversity Development and Rehabilitation projects.	Sambissa Game Reserve, Konduga LGA, Borno State, Nigeria ; Chad Basin National Park (Chingurmi-Duguma, Bade-Nguru, wetlands, Bulatura Oases)	
4	Creation of areas as Ramsar site	Hadejia-Nguru wetland	In view of the importance of the site for migratory birds

11 SUGGESTED INTERVENTION SITE FOR THE PROPOSED IUCN PROJECT-THE CHINGURMI-DUGUMA PARK WITHIN THE CHAD BASIN NATIONAL PARK

BACKGROUND

The Chad Basin National Park (CBNP), located between Latitudes 11° 00' -13° 00' and Longitudes 13° 00'-15° 30'E (Figure), is one of the eight National Parks in Nigeria. It covers a total area of 2, 258 Sq. Km. The main objectives of establishing the CBNP are to:

- a. *Protect, preserve, conserve and manage a representative sample of indigenous fauna and flora resources unique to the north-east geographical subregion of Nigeria;*
- b. *Promote and encourage the sustained growth and abundance of these biological materials and botanical specimens;*
- c. *Encourage general interest and education among the public in the knowledge of wild animals and plants in order to gain their support for conservation;*
- d. *Encourage the public to visit National Parks and enjoy and appreciate the aesthetic, spiritual and environmental values of nature thereby popularizing their recreational and tourist values.*

The Park is fragmented into three independent ecological systems notably, Chingurmi-Duguma sector in Borno State; Nguru-Bade Wetlands sector; and the Bulatura sector, both in Yobe State. The National Park whose component parts are hundreds of kilometres from each other has its head office located at Maiduguri the Borno State Capital. The Borno State government has graciously provided a 12-hectare land near the Maiduguri International Hotel, to provide office space, staff quarters and a live museum for the promotion of conservation education.

The Chingurmi-Duguma sector is in the Bama Local Government Area of Borno State, adjoining the Waza National Park in the Republic of Cameroon, around coordinates 11°45'0"N 14°15'0"E / 11.75°N 14.25°E. It has an area of 1,228 km². The northern part is within the Sahel zone while southern sector has a typical Sudan–Guinea Savanna ecology, and includes *Acacia*, *Balanites* woodlands separated by dense stands of *Elephant grass*.

Waters from the Dorma river flood much of the sector in the rainy season, creating flood-plain wetlands that attract waterbirds and other wildlife. The resident Black Crowned Crane (*Balearica pavonina*) is abundant, but is considered vulnerable. The Helmeted Guineafowl (*Numida meleagris*) is also abundant. Demoiselle Cranes (*Grus virgo*) visit in the winter, as well as large numbers of White Storks (*Ciconia ciconia*). (See BirdLife International (2011) Important Bird Areas factsheet: Chad Basin National Park: Chingurmi - Duguma Sector. Downloaded from <http://www.birdlife.org> on 29/01/2011)

A 2007 report estimated that there were about 100 elephants in the sector, which may still migrate to and from the Waza park. The Cameroon and Nigerian park authorities have been cooperating to prevent poaching of wildlife and to raise awareness among the local people of the longer-term value of conservation. There have been discussions by the IUCN over making the sector and the Waza National Park an internationally designated protected area.

The Bade-Nguru Wetlands sector is part of the Hadejia-Nguru wetlands, and has an area of 938 km² around Latitudes 12°40'0"N and 12°66' and Longitudes 10°30'0"E 10.50°E (Figure 2). It lies in the southwest of the Bade and Jakusko Local Government Areas of Yobe State. The sector includes the Dagona Waterfowl Sanctuary, an important resting place for migratory birds. Annual rainfall ranges between 200-600 mm, during the period late May-September. With reduced flooding due to upstream dams and perhaps climate change, and

with increasing population, the environment is degrading. There is growing competition between humans and wildlife. Farmers set out poison to kill the crop-destroying *Quelea quelea*, in the process killing non-target species. Marginal land is now coming under cultivation and tree cover in the forest reserves is being depleted.

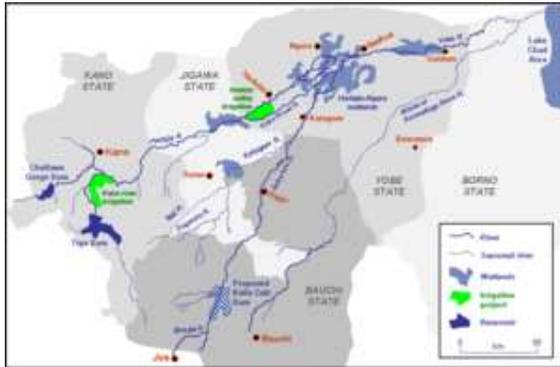


Figure 2 . Yobe River catchment area showing location of the Hadejia-Nguru wetlands

The Bulatura sector is in the Yusufari Local Government Area of Yobe State, and has an area of 92 km² around coordinates 13°15'0"N 11°00'0"E / 13.25°N 11°E. The sector has a series of swampy valleys separated by scenic sand dunes. The valleys contain rich deposits of potash.

12. SELECTED SECTOR : THE CHINGURMI-DUGUMA SECTOR

The Chingurmi-Duguma sector, situated between Latitudes 11° 45'-11° 75' and Longitudes 14° 15' and 14° 25' (Figures 3 and 4), is recommended for intervention in the IUCN Cameroon project for the following reasons:

- i. It is the largest of the three sectors covering an area of 1, 228 sq. Km.
- ii. Its location in Woloji and Gulumba Districts of Bama Local Government Area of Borno State, makes it contiguous with the Waza National Park in the Republic of Cameroon.
- iii. The proximity of the two Parks (Chingurma-Duguma and Waza) makes it easier for the research team to learn best practices since both Parks are within similar ecological zone.
- iv. The two Parks could form the basis for Integrated Ecosystem Management between Nigeria and Cameroon.
- v. There have been discussions by the IUCN in the past over making the sector and the Waza National Park an internationally designated protected area (Curt, 1996).

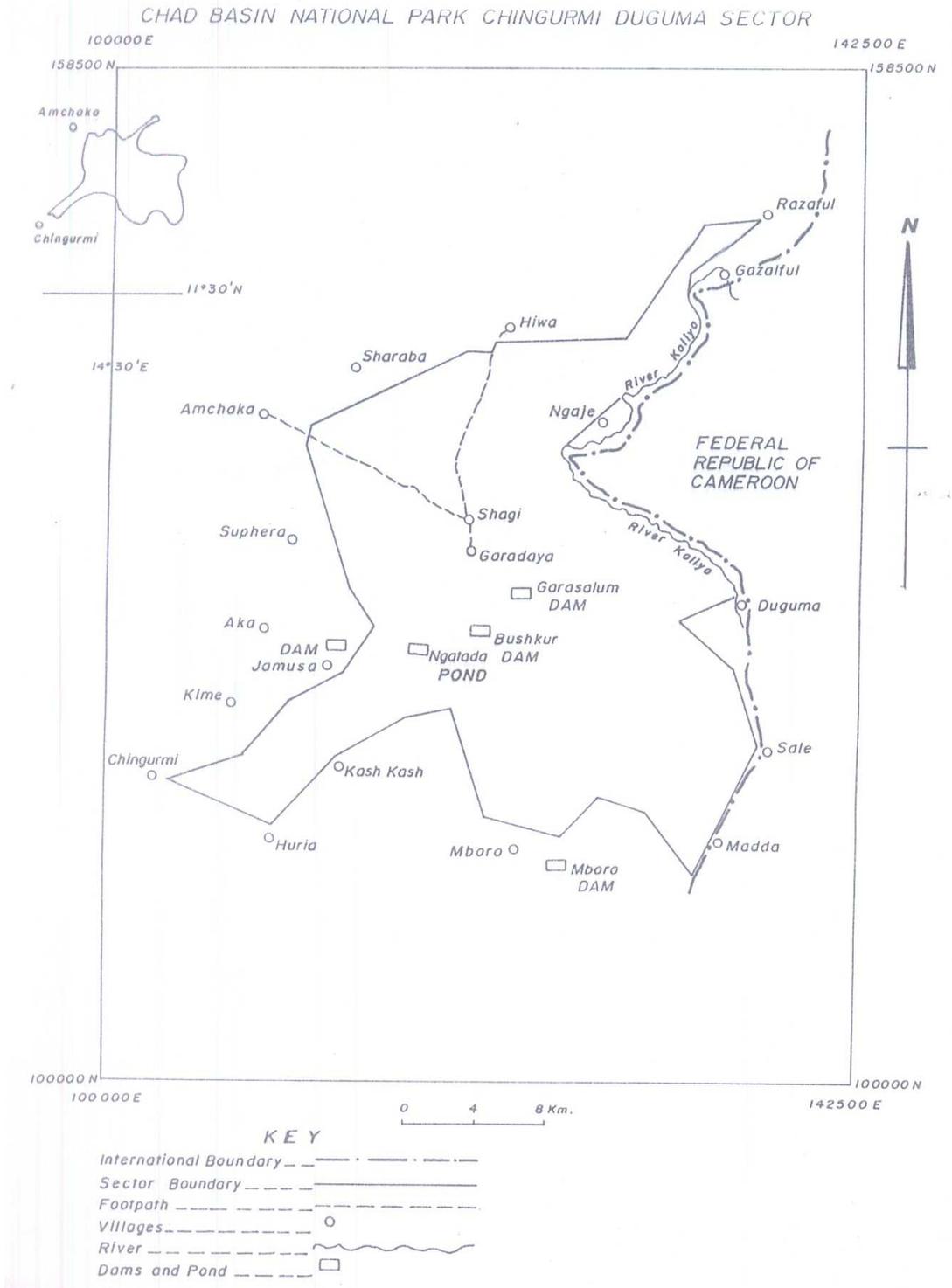


Figure 3: CHAD BASIN NATIONAL PARK-CHINGURMI-DUGUMA SECTOR

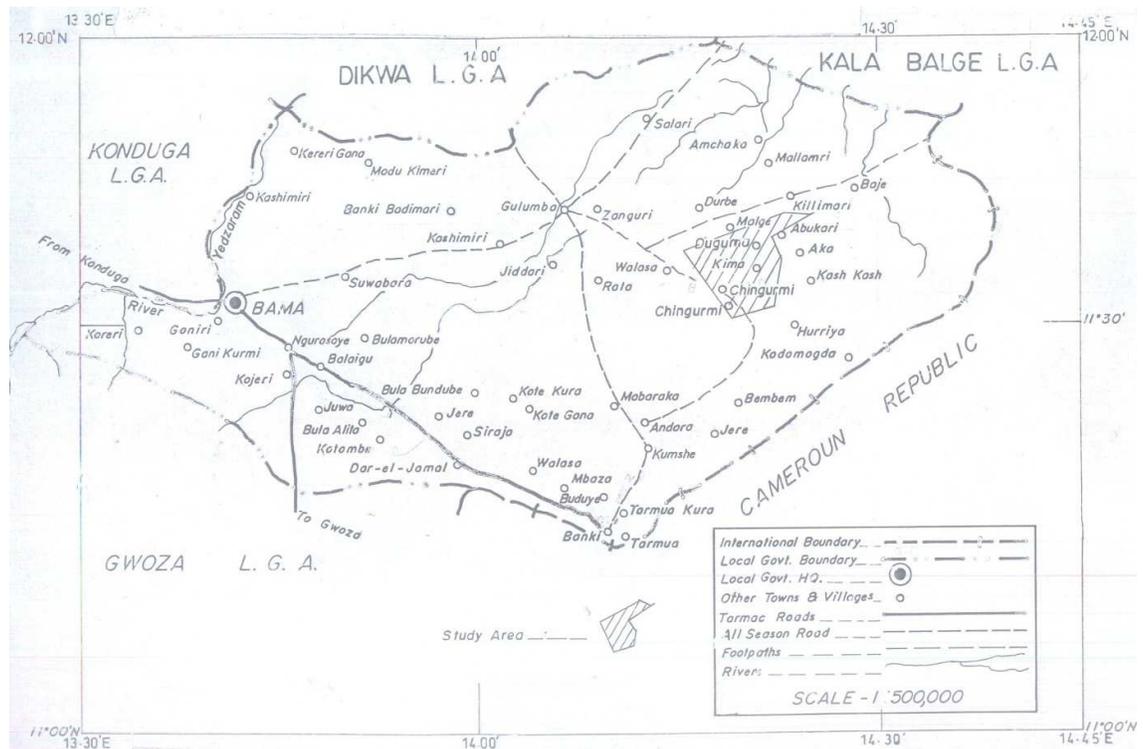


Figure 4: Bama LGA showing the Chingurmi-Duguma sector

The vegetation of the Chingurmi-Duguma Park is typical Sudan–Guinea Savanna, except in the most northerly part of the park where it takes on a more Sahelian aspect, partly due to the influence of human activities. Common tree and shrub species include *Acacia* spp., *Calotropis procera*, *Anogeissus leiocarpus*, *Balanites aegyptiaca* and *Sterculia setigera*. A large part of the park is flooded by waters from the Dorma river during the rainy season, creating flood-plain wetlands (e.g. the Kutila *fadama*) which attracts waterbirds and other wildlife. The resident Black Crowned Crane (*Balearica pavonina*) is abundant, but is considered vulnerable. The Helmeted Guineafowl (*Numida meleagris*) is also abundant. A 2007 report (Blanc, 2007; BirdLife International, 2011) estimated that there were about 100 elephants in the sector, which may still migrate to and from the Waza park. The Cameroon

and Nigerian park authorities have been cooperating to prevent poaching of wildlife and to raise awareness among the local people of the longer-term value of conservation (Caterina, *et al*, 2004). Artificial stock watering points have also been created in various places but these do not retain water through the dry season. *Gazella rufifrons* (VU) and *Loxodonta africana* (EN) are among the park's notable mammals. The park also offers Nigeria's only hope for the re-establishment of the nationally extinct *Giraffa camelopardalis* (LR/cd) population, since Giraffe (and other mammals) occasionally cross into the park from the Waza National Park in Cameroon. In terms of management considerations, despite the fact that this is a designated National Park, illegal grazing, fuelwood-collection and hunting take place. Bush fires are frequent. This is probably because local people profess to be unaware that the area was upgraded in 1991 from a Game Reserve to a National Park. Guineafowl egg-collectors invade the park during the species' breeding season.

To receive and accommodate visitors the park management has constructed and furnished a 4 units and 3-bedroom chalets at Gulumba base camp east of Bama Town. The camp is equipped with a borehole and the facility and the Gulumba communities jointly use a generator plant the borehole. The entire camp is fenced and secured.

13 RECOMMENDED INTERVENTION ACTIVITIES AND CONTACT ORGANIZATION TO HANDLE THE IUCN PROJECT

Proposed Activities at the Chingurmi-Duguma Sector

- Conflict Management issues
- Training-Establishment of Livestock Extension Services schools to serve as extension agents to pastoralists

- Provision of watering points around the Park
- Provision of animal and human health centres in the Park
- Provision of supplementary rangeland and livestock feeds
- Pastoral communities empowerment through skills development
- Provision of social infrastructure (access roads, improved water sources, etc)
- Environmental education on the dangers of poaching, hunting, bush burning etc around the Park.

Proposed contact Organization:

C/O

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14 CONCLUSION

Greater recognition and support is needed for sustainable pastoral and agropastoral systems around the Lake Chad Basin in view of their contributions to sustainable agriculture and rural development. Targeted support by governments, civil society organizations, development agencies and community donors, (agro)-pastoral networks, development practitioners and researchers is needed to harness this opportunity through awareness creation (sensitization)

that will reduce the vulnerability of pastoral and agropastoral communities to climate change; documentation of information on the potentials of agropastoral lands in sustainable ecosystem management; capacity building in the sustainable livestock/wildlife management; establishing pro-poor livestock policies that address the obstacles and challenges faced by agropastoral people within the Lake Chad Basin; supporting a paradigm shift to build local and policy-level awareness and capacity for good grassland management and secure tenure at community and landscape levels; conducting targeted research on livestock-environment interface; promoting an integrated multistakeholder and multi-level processes that address the range of natural resources (land, water, rangelands, forests, livestock, energy, biodiversity) and social dimensions with active involvement by all concerned actors. These holistic approaches and partnership processes must take advantage of win-win options among local, national and global goals; and, supporting adaptation to climate change and climate variability among pastoralists, including bringing existing traditional as well as modern technical, management and institutional options into play, and seeking consistency between climate change adaptation policies and pro-poor policies that support a vibrant and sustainable pastoral sector at local, regional and national levels.

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APPENDIX A

BASELINE STUDY ON LIVESTOCK-WILDLIFE-ENVIRONMENT INTERFACE IN THE NIGERIAN SECTOR OF THE LAKE CHAD BASIN

(GUIDE QUESTIONS)

THE INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE (IUCN) seeks to carry out a baseline study prior to the implementation of initiatives to foster adaptation to climate change at Livestock - Wildlife - Environment interface with down-scaling of incidence of conflicts based on natural resources in the Nigerian's part of the Lake Chad Basin. Kindly help in answering these questions as truthful as you can. Your answers will help in finding lasting solutions to degradation caused by the interactions of livestock and wildlife in the Lake Chad Basin. Thank you.

GUIDE QUESTIONS

1. Name the Ministry/Agency in charge of the livestock-wildlife sector in Nigeria

2. Who are the other key actors involved in pastoral –related research/activities within the Lake Chad Basin? (please give full names and addresses)

3. Provide the names and full addresses of NGOs /CBOs within the Lake Chad Basin working in the livestock-wildlife sector

4. Kindly provide information on the livestock policy (ies) in Nigeria (please provide any supporting documents)

5. What do you think are the obstacles to effective implementation of the Livestock Policies?

6. In case an International Organization like IUCN wants to intervene through some livestock projects, what projects would you suggest and why? Fill the table below

s/n	Suggested Projects	Reason(s)

7. Which communities within the Lake Chad region will need the most attention and why ?

s/n	Proposed community (Give full names and addresses)	Reason(s)

8. General Comments-----

APPENDIX B

Nigeria’s National Action Plan (NAP) document, which provides a holistic outlook on how to sustainably manage water and other resources of the Lake Chad Basin gave the following actions with budget lines and implementing agencies for the livestock –wildlife –environment interface within the Lake Chad Basin (See NAP, 2008)

NATIONAL ACTION PLAN – NIGERIA Action Sheet	
Action 1.2.1	Title of action: Increasing Pastoralists’ access to water and fodder
Objective	Increase access to water and fodder
Justification	Limited access to water and fodder hampers the traditional free range animal production
Brief succinct description	Limited access to water and fodder had forced many pastoral families having large herds to migrate to more humid climates in the middle belt and in southern Nigeria, while those with small herd sizes have lost their herds and migrated to towns and cities to become labourers and night watchmen. These problems have also aggravated violent conflict particularly with crop producers. Thus perpetuating loss of traditional livelihood and abject poverty
Expected results	<ul style="list-style-type: none"> ➤ A Access to year-round water for livestock secured ➤ B Access to year-round fodder supply secured ➤ C guidelines and procedures for participatory demarcation of watering points, grazing area and stock route in place
Pre-conditions	Collaboration of the statutory authorities; seed money to start the process; partner mobilization, ready for change in the way things are done.
Risks	Lack of Political will, poor management, lack of trusted leaders

Means	<i>Logistic: Technical, Scientific</i>	Transportation, meeting venues and facilities, DSAs; training facilities, trainers, availability of professionals in various fields of capacity building.				
	<i>Human resources</i>	1 Coordinator; 1 quantity Surveyor, 2 Civil Engineers, 2 Hydrologists, 1 meteorologist, 1 Training expert, 1 sociologist, 1 Environmentalist, 1 GIS Expert, and 1 land surveyors with their teams, 6 PRA (Participatory Rapid Appraisal) practitioners for 15 days; experts to appraise and design trainings, workshops, studies for hydro-meteorological data collection platform enhancement etc.				
Budget assessment		Budget	Number	Unit rate	Month/ day	Cost (NGN)
		Civil servant / government staff (month)	4	80,000.00	4	1,280,000.00
		Support staff (month)	4	50,000.00	4	800,000.00
		Missions of national staff (days)	8	5,000.00	15	600,000.00
		Support staff (days)	4	2,000.00	15	120,000.00
		National consultants (days)	6	18,000.00	15	1,620,000.00
		International technical assistance (missions and all costs included) (days)	3	36,000.00	10	1,080,000.00
		Sub-contracts				
		Capacity building and awareness raising activities (workshops, trainings, meetings,...) demarcation of cattle routes, and studies	1	Lum sum	Lump sum	80,000,000.00
		Equipment (investments) (a) Vehicles (4) (b) Motor cycles (10)			1	19,950,000.00
		Consumables (stationeries)		200,000.00	1	200,000.00
		Others (evaluation, editing, financial costs, audits...)				500,000.00
		Unforeseen (5%)				5,257,500.00
		TOTAL				110,407,500.00
Recurrent costs	Recurrent cost for training and retraining, monitoring and dissemination of knowledge on best practices.					
Financing Sources	Government: Federal, State, Local Governments Resource users: Stakeholders groups Donors: IDAs, HJKYBTF, etc.					
Implementation bodies	HJKYB Trust Fund in partnership with the FMA&WR, Riparian States and others.					
Work plan	The programme is to be carried out over a period of four years, while dissemination of knowledge on best practices is to continue even afterwards.					
Observations / Comments						

NATIONAL ACTION PLAN – NIGERIA	
Action Sheet	
Action 1.2.4	Title of action: Improved management of fisheries resources

Objective	Increase fish resources (quantity, size and diversity) and introduce methods of modern aquaculture/fish farming in an economic manner
Justification	Diminishing fish resources has led to unsustainable exploitation and loss of habitat all over the KYB. This has given rise to entrenched poverty.
Brief succinct description	Due to weak enforcement of fishing rules and regulations, there is widespread unsustainable exploitation of the resources, e.g. use of small mesh sizes, destruction. of natural breeding points. These have culminated into drastic reduction in quantity, size and diversity of fish and loss of habitat all over the KYB. The implications of which are food/nutritional insecurity, entrenched poverty and loss of livelihood.
Expected results	<ul style="list-style-type: none"> ➤ A High diversity of fish resources achieved ➤ B High catches realised ➤ C Ideal fish sizes in place ➤ D Rights and responsibilities of fishermen defined and respected ➤ E Correct mesh sizes accepted and used ➤ F Conducive and conflict-free fishing atmosphere in place ➤ G domestic fish farming introduced and popularized through: initiating (where not already available) the collection of data, continually update on aquaculture/fish (variety), farmers, methods, sources of supplies of inputs (water, fingerlings, feeds, medicine etc.), provide adequate information on fish farming, breeding systems, processing techniques, market outlets and other means of disposal. Arrange training sessions on fish-breeding for fish farm attendants, extension workers etc. to enhance their capacities and set up sources of producing native fish species and channels of distribution.
Pre-conditions	Collaboration of the statutory authority; seed money to start the process
Risks	Resistance from fishermen and fish dealers

Means	<i>Logist., techn., scientif.</i>	Transport, meeting and workshop venues and facilities; IEC materials, capacity building and materials for constructing fish ponds.			
	<i>Human resources</i>	6 coordinators for 3 months; 8 PRA practitioners for 5 days; 6 monitoring & evaluation officers for 3 month; 12 support staff for 3 months			
Budget assessment	Budget		NO.	Unit Rate (NGN)	Cost
	Civil servant / government staff		12	80, 000	960, 000
	Support staff		12 000	20, 000	720, 000
	Missions of national staff		0		
	National consultants		4 000	18, 000	216, 000
	International technical assistance (missions and all costs included) 10 days		4 1,440,000	36,000	
	Sub-contracts				
	Initiating (where not already available) the collection of data, continually update on aquaculture/fish (variety), farmers, methods, sources of supplies of inputs (water, fingerlings, feeds, medicine etc.), provide adequate information on fish farming, breeding systems, processing techniques, market outlets and other means of disposal. Arrange training sessions on fish-breeding for fish farm attendants, extension workers etc. to enhance their capacities and set up sources of producing native fish species and channels of distribution.		L/S 36,000,000 36,000,000		
	Capacity building and awareness raising activities (workshops, trainings, meetings,...) Formation				8 6 0 , 0 0 0
	Equipment (investments) 2 4WD		2 000	4, 800, 000	9,600, 000
	Consumables (stationeries)			1,000, 000	
	Others (evaluation, editing, financial costs, audits...)			3,500, 000	
	Unforeseen (5%)			2,714,800	
TOTAL				=N=57,010,800	
Recurrent costs	Recurrent cost for maintaining fishponds and replenishment of fingerlings will be covered by profit and subsidy.				

Financing Sources	Government Resource users Donors
Implementation bodies	LCBC/GEF project in partnership with HJKYB Trust Fund,, Federal Ministry of Agriculture and Water Resources, Ministries responsible for fisheries in the state and other Federal Government Agencies responsible for fisheries.
Work plan	Visits, awareness rising activities, workshops on: ideal mesh sizes, fishpond development and management, fish fingerlings management, fishing rights and responsibilities. Monitoring and evaluation.
Observations / Comments	The project is to be carried out over a period of ten to fifteen years in order to make it sustainable.

NATIONAL ACTION PLAN – NIGERIA	
Action Sheet	
Action No. 1.3.1	Title of action: Water Charter for sustainable development
Objective	Enhance the implementation of the National Action Plan (NAP) and Catchment Management Plan and similar documents in the KYB.
Justification	The purpose of implementation of the Charter is to pave way for the development or adoption and implementation of policies and strategies to promote effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Hadejia-Jama'are-Komadugu-Yobe basin Area to avoid or eliminate so far as reasonably practicable adverse cross-border impacts.
Brief succinct description	The water charter for sustainable development has been developed under the IUCN-KYB Project but has not yet been endorsed by the various riparian state governments. The signing of the charter would pave way for the concerted implementation of the catchment management plan (CMP), NAP and other similar documents to address the water and land related issues of the KYB.
Expected results	<p>The overall objective of this Charter is to foster closer cooperation for judicious, sustainable and coordinated management, protection and utilisation of shared watercourses and advance the agenda of regional integration and poverty alleviation. Details of these objective are:</p> <ul style="list-style-type: none"> (a) Provide a means for the states to come together in good faith to achieve the purposes of the charter; (b) Define a process and context for raising and addressing water and related natural resource management issues in the Hadejia-Jama'are-Komadugu-Yobe basin that have cross-border impacts, particularly those related to water quantity and quality, and flow regimes; (c) Advance the sustainable, equitable and reasonable utilisation of the shared watercourses; (d) Promote a co-ordinated and integrated environmentally sound development and management of shared watercourses; (e) Provide for the Komadugu Yobe basin states to jointly promote and support the management of water and related natural resources through a cooperative approach between community, industry, non-governmental organisations and other stakeholders, and all levels of government in the sustainable management of the Hadejia-Jama'are-Komadugu-Yobe basin.

	<p>(f) Promote research and technology development, information exchange, capacity building, and the application of appropriate technologies in shared water management and support informed decision making in the Komadugu Yobe basin area;</p> <p>(g) Raise general public awareness of the special biodiversity and heritage values of the Hadejia-Jama'are-Komadugu-Yobe basin Area.</p>				
Pre-conditions	Collaboration of the statutory authorities; seed money to start the process; partner mobilization, ready for change in the way things are done.				
Risks	Lack of Political will, poor management, lack of trusted leaders				
Means	<i>Logistics., technical., scientific .</i>	Transportation, survey materials and equipment, meeting venues and facilities, DSAs, machinery and labour ; training facilities, trainers, availability of hydro-meteorology experts.			
	<i>Human resources</i>	1 Coordinator; 1 quantity Surveyor, 2 Civil Engineers, 2 Hydrologists, 1 meteorologist, 1 Training expert, 1 sociologist, 1 Environmentalist, 1 GIS Expert, and 1 land surveyors with their teams, 6 PRA (Participatory Rapid Appraisal) practitioners for 15 days; experts to appraise and design trainings, workshops, studies for hydro-meteorological data collection platform enhancement.			
Budget assessment	Budget	Number	Unit rate	Month/day	Cost (NGN)
	Civil servant / government staff (month)	4	80,000.00	4	1,280,000.00
	Support staff (month)	4	50,000.00	4	800,000.00
	Missions of national staff (days)	8	5,000.00	15	600,000.00
	Support staff (days)	4	2,000.00	15	120,000.00
	National consultants (days)	6	18,000.00	15	1,620,000.00
	International technical assistance (missions and all costs included) (days)	3	36,000.00	10	1,080,000.00
	Sub-contracts				
	Awareness raising activities (workshops, trainings, meetings,...) establishment of relationships to pave way for the signing and implementation.	1	60,000,000	L/sum	60,000,000.00
	Equipment (investments) (a) Vehicles (4) (b) Motor cycles (10)		19,500,000	1	19,500,000.00
	Consumables (stationeries)		200,000.00	1	200,000.00
	Others (evaluation, editing, financial costs, audits...)				500,000.00
	Unforeseen (5%)				4,285,000.00
	TOTAL	=N=89,985,000.00			
Recurrent costs	Recurrent cost for training, maintaining of installed equipment, payment of salaries and allowances of staff to be engaged in the hydro-meteorological data gathering, processing and archive, dissemination.				
Financing Sources	Government: Federal, State, Local Governments Resource users: Stakeholders groups Donors: IDAs, HJKYBTF, etc.				
Implementation bodies	HJKYB Trust Fund in partnership with the FMA&WR, Riparian States and others.				
Work plan	The programme is to be carried out over a period of four years, while data gathering, processing, dissemination and archive is to continue even afterwards.				
Observations / Comments					

NATIONAL ACTION PLAN – NIGERIA Action Sheet		
Action No. 1.3.2	Title of action : Develop and initiate implementation of strategies for managing surface and groundwater	
Objective	Sustainable groundwater exploitation, management and protection	
Justification	Limited knowledge of groundwater resources in terms of the aquifer characteristics, sources of recharge, abstraction have led to un-sustainable groundwater development and utilization leading to un-informed decisions affecting the overall water sector in the KYB.	
Brief succinct description	Lack of properly instituted groundwater data collection, processing and archive as well as proper dissemination has affected the water sector in the KYB. These have lead to lack of IWRM, conflict in the use of the resources etc. Activities under this heading consist of carrying out studies to develop a diverse set of groundwater resource management strategies to meet the sustainable water resources management needs of the KYB to achieve multiple resource benefits. Actions to be undertaken include research activities and dissemination of information on the development, utilization and management of the various aquifers as well as the development of guiding principles for sustainable exploitation and use of the groundwater in the KYB.	
Expected results	<ul style="list-style-type: none"> ➤ Comprehensive hydrogeological data collection system and database system established. A restructured and expanded network for the collection of hydrogeological data, based on articulate specifications for, standardization of equipment employed at manned and unmanned monitoring stations, and the arrangements necessary for the operation and maintenance of various classes of the stations; undertake regular collation, assessments and compilations of hydrogeological, environmental and socio-economic information for wide circulation among all stakeholders in the KYB; and create a website for information dissemination. ➤ Establish network of groundwater monitoring points; ➤ Establish groundwater level profiles; and ➤ Establish spatial and temporal groundwater extraction patterns in the sub-KYB. ➤ Carry out studies of the knowledge base of the status of groundwater aquifers and their characteristics, abstraction rate, water quality and ➤ Develop a database system and strategies for the sustainable exploitation as well as protection of groundwater in the KYB. ➤ Develop comprehensive surface-groundwater conjunctive utilization for sustainable management of water resources in the KYB 	
Pre-conditions	Collaboration of the statutory authorities; seed money to start the process; partner mobilization, ready for change in the way things are done.	
Risks	Lack of Political will, poor management, lack of trusted leaders	
Means	<i>Logistics, technical, scientific.</i>	Transportation, survey materials and equipment, meeting venues and facilities, DSAs, machinery and labour ; training facilities, trainers, availability of hydro-meteorology experts.
	<i>Human resource</i>	1 Coordinator; 1 quantity Surveyor, 2 Civil Engineers, 2 Hydrogeologists, 1 meteorologist, 1 Training expert, 1 sociologist, 1 Environmentalist, 1 GIS Expert, and 1 land surveyors with their teams, 6 PRA (Participatory Rapid Appraisal) practitioners for 15 days; experts to appraise and design trainings, workshops, studies for hydro-meteorological data collection plat form enhancement.

	<i>Budget</i>	<i>Number</i>	<i>Unit rate</i>	<i>Month/ day</i>	<i>Cost (NGN)</i>
Budget assessment	Civil servant / government staff (month)	4	80,000.00	4	1,280,000.00
	Support staff (month)	4	50,000.00	4	800,000.00
	Missions of national staff (days)	8	5,000.00	15	600,000.00
	Support staff (days)	4	2,000.00	15	120,000.00
	National consultants (days)	6	18,000.00	15	1,620,000.00
	International technical assistance (missions and all costs included) (days)	3	36,000.00	10	1,080,000.00
	Sub-contracts				
	Capacity building and awareness raising activities for staff and decision-makers (workshops, trainings, meetings,...)	1	60,000,000	L/sum	60,000,000.00
	Equipment (investments) (a) Water level monitoring equipment (water level indicators) 60 Nos. (10 per state) @250,000.00 each =N=15.00M (b) Borehole cameras 6 Nos. (1 per state) @=N=3.5M each =N=12.00M © Vehicles 24 Nos. (4 per state) @=N=4.8M each =N=115.2 M (d) Motor cycles 60Nos. (10 per state) @=N=75,000 each =N=4.7M (e) Bicycles 60 Nos. (per state10) @=N=10,000 each =N=0.6M (f) Drilling of exploratory boreholes 240 Nos. (40 per state) @ =N=3.0M each on average =N=720M		240,000,000	1	867,500,000.00
	Consumables (stationeries)		200,000.00	1	1,200,000.00
	Others (evaluation, editing, financial costs, audits...)				5,000,000.00
	Unforeseen (5%)				18,784,000.00
		TOTAL			=N= 957,984,000.00
	Recurrent costs	Recurrent cost for training, maintaining of installed equipment, payment of salaries and allowances of staff to be engaged in the hydrogeological data gathering, processing and archive, dissemination. Website maintenance and update.			
Financing Sources	Government: Federal, State, Local Governments Resource users: Stakeholder groups Donors: IDAs, HJKYBTF, etc.				
Implementation bodies	HJKYB Trust Fund in partnership with the FMA&WR, Riparian States and others.				
Work plan	The programme is to be carried out over a period of four years establishing the system, while data gathering, processing, dissemination and archive is to continue even afterwards.				
Observations / Comments					

NATIONAL ACTION PLAN – NIGERIA						
Action Sheet						
Action no.1.3.3	Title of action : Harmonization of programmes for all stakeholders and Governments					
Objective	Harmonization of interventions and maximizing performance of various institutions					
Justification	Uncoordinated investments among the Institutions have lead to the inability by these institutions to achieve an integrated approach water development and management leading to duplication of efforts.					
Brief succinct description	Lack of coordination among various institutions at various levels have hindered the performance of these organizations leading to duplication of efforts and wastage of resources.					
Expected results	<p>➤ B: Programmes of Federal, State, and Local Governments and other Stakeholders harmonized: Identification of acceptable (preferably democratically elected) representatives and leaders of local stakeholder groups from each of the major sub-catchments in the Komadugu Yobe basin; Capacity-building of these community representatives and leaders in both the social and technical aspects of IWRM-based catchment management; and inclusion of these trained community representatives and leaders in all IWRM-related decision-making bodies in the KYB, not as token representatives but as active members with equal voice. integration agreements between the States and the Federal Government to standardize management instruments; events to promote harmonization, integration and coordination involving those responsible for planned and on-going interventions through dialogue and greater interaction of local and regional planners with the aim of fostering convergence among the various programmes; preparation of common “annual agenda of interventions” that would encompass plans and targets of each of the cooperating institutions complete with a framework for resolving potential conflicts and ways of promoting convergence; and setting of criteria and procedures for harmonizing and matching budgets and timelines for action among the cooperating Federal and State government agencies.</p>					
Pre-conditions	Collaboration of the statutory authorities; seed money to start the process; partner mobilization, ready for change in the way things are done.					
Risks	Lack of Political will, poor management, lack of trusted leaders					
Means	<i>Logistics., technical., scientific .</i>	Transportation, survey materials and equipment, meeting venues and facilities, DSAs, machinery and labour ; training facilities, trainers, availability of hydro-meteorology experts.				
	<i>Human resources</i>	1 Coordinator; 1 quantity Surveyor, 2 Civil Engineers, 2 Hydrologists, 1 meteorologist, 1 Training expert, 1 sociologist, 1 Environmentalist, 1 GIS Expert, and 1 land surveyors with their teams, 6 PRA (Participatory Rapid Appraisal) practitioners for 15 days; experts to appraise and design trainings, workshops, and coordination activities.				
Budget assessment		Budget	Number	Unit rate	Month/ day	Cost (NGN)
		Civil servant / government staff (month)	4	80,000.00	4	1,280,000.00
		Support staff (month)	4	50,000.00	4	800,000.00
		Missions of national staff (days)	8	5,000.00	15	600,000.00
		Support staff (days)	4	2,000.00	15	120,000.00
		National consultants (days)	6	18,000.00	15	1,620,000.00
		International technical assistance (missions and all costs included) (days)	3	36,000.00	10	1,080,000.00
		Sub-contracts				
	Capacity building and awareness raising activities (workshops, trainings, meetings,...), harmonization programme etc.	1	30,500,000	L/sum	30,000,000.00	

	Equipment (investments) (a) Vehicles (2) (b) Motor cycles (5)		9,975,000		9,975,000.00
	Consumables (stationeries)		200,000.00	1	200,000.00
	Others (evaluation, editing, financial costs, audits...)				500,000.00
	Unforeseen (5%)				2,308,750.00
	TOTAL				48,483,750.00
Recurrent costs	Recurrent cost for training, harmonization programme monitoring and dissemination of knowledge on best practices.				
Financing Sources	Government: Federal, State, Local Governments Resource users: Stakeholders groups Donors: EU, other IDAs, HJKYBTF, etc.				
Implementation bodies	HJKYB Trust Fund in partnership with the FMA&WR, Riparian States and others.				
Work plan	The programme is to be carried out over a period of four years, while dissemination of knowledge on best practices is to continue even afterwards.				
Observations / Comments					

NATIONAL ACTION PLAN – NIGERIA	
Action Sheet	
Action No. 1.4.1	Title of action : Prepare Regional Master Plan for ecotourism in the Lake Chad
Objective	Promote responsible travel to natural areas that conserves the environment and improves the well-being of local people.
Justification	Various sites for the development of ecotourism are available in the KYB. Their development would be used as a means of conserving the environment and improve the well-being of the local people.
Brief succinct description	Developing the tourism potentials of the sub-KYB, through the provision of "responsible travel to natural areas that conserves the environment and improves the well-being of the local people." Using the following principles: <ul style="list-style-type: none"> • Minimize impact. • Build environmental and cultural awareness and respect. • Provide positive experiences for both visitors and hosts. • Provide direct financial benefits for conservation. • Provide financial benefits and empowerment for local people. • Raise sensitivity to host countries' political, environmental, and social climate.
Expected results	Promote responsible travel to natural areas that conserves the environment and improves the well-being of local people by: <ul style="list-style-type: none"> ➤ creating an local and international network of individuals, institutions and the tourism industry; ➤ educating tourists and tourism professionals; and ➤ influencing the tourism industry, public institutions and donors to integrate the principles of ecotourism into their operations and policies.
Pre-conditions	Collaboration of the statutory authorities; seed money to start the process; dam operation plan and implementation plan in place, channel clearance activities addressed , stakeholders mobilized
Risks	Cultural interchange may be resisted by some stakeholders.

Means	<i>Logist., techn., scientif.</i>	Transportation, survey materials and equipment, meeting venues and facilities, DSAs, machinery and labour ; dam operation modelling software; water allocation model software			
	<i>Human resources</i>	1 Coordinator; 1 quantity and 1 land surveyors with their teams, 6 PRA (Participatory Rapid Appraisal) practitioners for 5 days			
Budget assessment	Budget		Number	Unit rate	Cost (NGN)
	Civil servant / government staff		4	80,000.00	3,840,000.00
	Support staff		6	20,000.00	1,440,000.00
	Missions of national staff		3	5,000.00	150,000.00
	National consultants		3	18,000.00	540,000.00
	International technical assistance (missions and all costs included)		2	60,000.00	1,200,000.00
	Sub-contracts				0
	Capacity building and awareness raising activities (workshops, trainings, meetings,...) to sensitize communities in the two countries		-	L/sum	10,000,000.00
	Equipment (Investments): development of a regional master plan for sustainable ecotourism.		-	L/sum	50,000,000.00
	Vehicles		4	4,800,000.00	19,200,000.00
	Motor cycles		6	75,000.00	450,000.00
	Generators		2	1,500,00.00	3,000,000.00
	Consumables (stationeries)				2,000,000.00
	Others (evaluation, editing, financial costs, audits...)				2,000,000.00
	Unforeseen (5%)				4,691,000.00
	TOTAL		98,511,000.00		
	Recurrent costs	Recurrent cost for maintaining the structures to be provided by the stakeholders			
Financing Sources	Government: Resource users: Donors:				
Implementation bodies	Chad Basin Development Authority, LCBC and Nigeria-Niger Joint Commission along with DSAs				
Work plan	The development is to take place over a period of five to ten years.				
Observations / Comments					

NATIONAL ACTION PLAN – NIGERIA					
Action Sheet					
Action no. 2.1.1	Title of action : Sustainable tree nurseries in the Komadugu Yobe basin				
Objective	To improve access to water for tree nurseries on a sustainable basis.				
Justification	Many afforestation and reforestation projects are failing largely because of shortage of seedlings and low survival rates of the transplanted seedlings. Guaranteed availability of seedlings will stem this trend of project failures.				
Brief succinct description	Unsustainable tree nurseries, responsible for project failures, are a result of low investment in tree nursery development and management inputs. Obtaining more accurate estimates of tree seedlings required; estimates and surveys of sources of the necessary inputs; adequate budget provision and sensitization of communities to appreciate the need for participating in tree nursery development, ownerships and management are necessary. Adequate and sustained water, fertilizer and pesticides supplies and manpower should be guaranteed.				
Expected results	<ul style="list-style-type: none"> ✓ i) Communities are expected to appoint/engage nursery managers ✓ ii) Guaranteed access to water supply ✓ iii) Guaranteed availability of seedlings 				
Pre-conditions	Sensitization of the community and acceptability of their assigned roles				
Risks	Community sentiments over foreign projects on religion bias				
Means	Logist., techn., scientif		Storages, transportation, working tools, geohydrological survey, meteorological data		
	Human resources		Co-ordinator and support staff		
Budget assessment		Budget	Num ber	Unit rate	Cost (NGN)
	(a)	Civil servant/government staff 1 month	1	80,000	80,000
	(b)	Support staff 1 month	6	20,000	120,000
	(c)	Missions of national staff 5 days	6	5,000	150,000
	(d)	National consultants 5 days	2	18,000	180,000
	(e)	International technical assistance (missions and all costs included)	1	??	??
	(f)	Sub-contracts: Solar Powered Boreholes	6	1,200,000	8,730,440
	(g)	Capacity building and awareness raising activities (workshops, trainings, meetings,...) Formation <i>participatory</i>	3	1,500,000	4,300,010
	(h)	Equipment (investments) 4-WD vehicle Motorcycles 6 (water) + 6 (Diesel) Tanks Standby Generators Hand Tools	3 36 12 Assorted	4,800,000 75,000 100,000 	14,400,000 480,000 1,200,000 4,400,000
	(i)	Consumables (stationeries)			973,000
	(j)	Others (evaluation, editing, financial costs, audits, ...)			875,000
	(k)	Unforeseen (5%)			1,882,550
		TOTAL			₦ 37,651,000
Recurrent costs	Running costs with subsidies and revenue from seedlings				
Financing Sources	Government: 45% = ₦ 16,942,950 in the ratio 8:4:1 by F:S:L governments Resource users: 5% = ₦ 1,882,550 Donors: 50% = ₦ 18,825,500				
Implementation bodies	Ministry of Environment in collaboration with local Communities				
Work plan	Estimate Nursery Capacity and Water Required, Contract borehole construction out				
Observation/comments	Communities to engage nursery managers; Government and communities to jointly engage vigilant inspectors/supervisors				

NATIONAL ACTION PLAN – NIGERIA					
Action Sheet					
Action no. 2.1.2	Title of action : Environmental river flows				
Objective	To: Increase access to unpolluted water flow for all uses and maintenance of ecosystem and restoration of biodiversity				
Justification	Increase the water regime flow				
Brief succinct description	To save and maintain the environmental integrity of the Komadugu Yobe basin the following need to be done: (1) take steps to ensure proper operation/regulation of both Tiga and Challawa gorge dams (2) enact/enforce laws on water-sharing and dam water releases (3) strengthen law enforcement agencies and legal instruments with clear-cut responsibilities and roles of different agencies through institutional, policy, legal, and social frameworks (4) introduce and enforce a system of incentives for compliance with and sanctions for defiance of environmental laws and regulations; by appropriately empowering an environmental enforcement co-ordinator to be assisted by trained monitors and guards (5) activate river flow gauging and water quality monitoring facilities.				
Expected results	<ul style="list-style-type: none"> ➤ Availability of fresh water flow for all intended uses ➤ Restoration of ecosystem and biodiversity ➤ Restoration of irrigation activities on the River Yobe system 				
Pre-conditions	Sensitizations of all stakeholders				
Risks	Resistance to change from old habit to new habit expected.				
Means	Logist., techn., scientif		Transportation, institutional framework, laws, chemicals, laboratories for water analysis		
	Human resources		Coordinator, law enforcement agents, guards,		
Budget assessment		Budget	Number	Unit rate	Cost (NGN)
	(a)	Civil servant/government staff 12 months	1	80,000	960,000
	(b)	Support staff (law enforcement) 12 months	6	20,000	1,440,000
	(c)	Missions of national staff 15 days	6	5,000	450,000
	(d)	National consultants 15 days	3	18,000	810,000
	(e)	International technical assistance (missions and all costs included)	1	??	??
	(f)	Sub-contracts (i) Soil and Water-Sampling Analyzer (ii) Photo documentation (iii) Installation of Hydromet. Equipment			10,200,000
	(g)	Capacity building and awareness raising activities (workshops, trainings, meetings,...)		1,500,000	5,500,000
	(h)	Equipment (investments) :- (i) Environmental Protection Personnel training (ii) 4-WD vehicle (iii) Motorcycles	4 12	4,800,000 75,000	3,400,000 9,600,000 240,000
	(i)	Consumables (stationeries) :-			1,345,000
	(j)	Others (evaluation, editing, financial costs, audits, ...)			1,348,000
	(k)	Unforeseen (5%)			1,766,000
		TOTAL			₦ 36,913,000
Recurrent costs	Government Annual Budgetary Provisions				
Financing Sources	Government: Budgetary provision 45%* = ₦ 16,610,850 Resource users: KYB 5%** = ₦ 1,845,650 Donors: 50% = ₦ 18,456,500				
Implementation bodies	Ministry of Environment				
Work plan	Review institutional frameworks, sensitization of stakeholders, enforcing the laws on safe				

	environment.
Observation/ Comments	

*To be equitably distributed by the 6 State Governments and Federal Government of Nigeria as follows:

0.05 (Borno and Yobe States, each), 0.10 (Bauchi and Plateau States, each), 0.15 (Jigawa State), 0.2

(Kano State), and 0.35 (Federal Government of Nigeria) i.e, Borno State and Yobe State will pay 5% each of ₦16, 610,850 while Kano State will pay 20% of ₦ 16, 610,850

**As flat rate environmental levy protection levy, to every resident of the Komadugu Yobe basin based on the KYB population

NATIONAL ACTION PLAN – NIGERIA

Action Sheet

Action no. 2.1.3	Title of action : Sustainable and functional Protected Areas (National Parks, Ramsar Sites etc)				
Objective	To improve access to fresh water for Park Visitors/Tourists and Animals and check poaching of wildlife and endangered species				
Justification	Forest and wildlife productivities have been declining. National Parks need to be rich in biodiversity and able to attract nature lovers without their productivities necessarily declining. Poaching which has been going on for long deserves attention to stem biodiversity losses.				
Brief succinct description	Tasks need to be carried out include: (1) Aerial and ground surveys to map out physical problems areas of logging and farming encroachment of NPs; (2) Plan to: a) reposition/increase number of wild life watering points, b) put in place water harvesting ponds to augment boreholes water supply, c) provide more freshwater supplies for nature lovers visiting NPs. (3) Mobilizing funds to implement (2) a, b, c); (4) Strictly enforcing and seeking to amend NPs laws, rules and regulations to plug the loopholes exploited by illegal loggers and poachers; (5) Seeking ways and means of better management with improved institutional, legal, policy and social frameworks; (6) Providing for training/employing more functional forest guards/monitors.				
Expected results	<ul style="list-style-type: none"> ✓ Better management arrangement ✓ Stakeholders are aware of dangers of poaching through sensitization ✓ Restoration of forest and wildlife productivities ✓ 				
Pre-conditions	Stakeholders' are fully sensitized and integrated into the government programme				
Risks	Illegal practices such as poaching and felling of trees are means of livelihoods of some people for which alternatives have to be provided				
Means	Logist., techn., scientif	Transportation, institutional framework, laws, provision of reservoirs, more boreholes,			
	Human resources	Coordinator, Park guards, labourers			
Budget assessment		Budget	Number	Unit rate	Cost (NGN)
	(a)	Civil servant/government staff 12 months	1	80,000	160,000

	(b)	Support staff 12 months	6	20,000	240,000
	(c)	Missions of national staff 30 days	3		
	(d)	National consultants 30 days	2	18,000	180,000
	(e)	International technical assistance (missions and all costs included)	1	??	??
	(f)	Sub-contracts: Aerial Survey			
	(g)	Capacity building and awareness raising activities (workshops, trainings, meetings,...) Formation	3		39,000
	(h)	Equipment (investments) :- (i) Training (2Sur + 6 Tor) (ii) 4-WD vehicle (iii) Motorcycles	1 6	4,800,000 80,000	4,800,000 480,000
	(i)	Consumables (stationeries) :- <i>posters, hand bills, duplicating papers, inks and tonners,</i>			380,000
	(j)	Others (evaluation, editing, financial costs, audits, ...) <i>fuel and lubricants</i>			100,000
	(k)	Unforeseen (5%)			35,8,200
		TOTAL			₦ 7,164,000
Recurrent costs	Revenue accrued to the park would be used for its operations and maintenance works.				
Financing Sources	Government: 50% = ₦ 13,582,000 Resource users: NIL Donors: 50% = ₦ 13, 582,000				
Implementation bodies	Ministry of Environment				
Work plan	Review institutional, policy, legal, and social frameworks, sensitization of stakeholders, enforcing the laws on poaching and forest reserves.				
Observation/ Comments					

NATIONAL ACTION PLAN – NIGERIA				
Action Sheet				
Action no. 2.3.1	Title of action: Effective river water pollution management			
Objective	Minimize river water pollution from kano industries			
Justification	Lack of effective control of effluents form Kano industries lead to extensive flooding of the Kano/Hadejia river systems. This causes death of fish and contamination of the water thus making it unfit and risky for consumption by humans and animals			
Brief succinct description	Kano city has a concentration of small and medium scale industries; these include ternaries and other chemical using. Most of the industries do not have primary treatment plants, they therefore release their liquid wastes into the river systems. This causes death of fish fingerlings and matured fish it also render the water unfit and risky for consumption by man and animals. If this problem is left unchecked there is going to be long-term health and economic harzards.			
Expected results	<ul style="list-style-type: none"> ➤ A Primary treatment plants constructed and put to effective use by all industries ➤ B Secondary treatment plants constructed and put to effective use by Kano state government ➤ C legislation for river pollution control enacted and enforced ➤ D all stakeholders became aware of the dangers of river water pollution 			
Pre-conditions	Cooperation of all industrialists operating in Kano, enforcement of pollution control legislation			
Risks	Resistance from industrialists, corruption of supervising government officials			
Means	<i>Logist., techn., scientif.</i>	Transport, laboratories for testing water samples, meeting venues and facilities, DSAs,		
	<i>Human resources</i>	1 Coordinator, 3 Laboratory Technicians, 6 Support Staff for 6 months		
Budget assessment	Budget			
		NO.	Unit Rate	Cost (NGN)
	Civil servant / government staff	4	80,000	960,000
	Support staff	6	20,000	120,000
	Missions of national staff	0		
	National consultants	1	18,000	180,000
	International technical assistance (missions and all costs included)	0		
	Sub-contracts	0		
	Capacity building and awareness raising activities (workshops, trainings, meetings,...) Formation	Lump sum		2,000,000
	Equipment (investments)	1 4wd	4,800,000	
		3 Motorcycles	240,000	
	Laboratories and equipment	6,000,000		
	Reagent for water testing	1,000,000		
Consumables (stationeries)	400,000			
Others (evaluation, editing, financial costs, audits...)	1,000,000			

	Unforeseen (5%)	835,000
	TOTAL	17, 535,000
Recurrent costs	Recurrent costs to be provided by HJKYB Trust Fund	
Financing Sources	Kano state government, HJKYB Trust Fund	
Implementation bodies	Kano state government, HJKYB Trust Fund	
Work plan	The work is to be carried out over a period of three month, routine supervision plan to continue by Kano state government and HJKYB Trust Fund	
Observations / Comments		

NATIONAL ACTION PLAN – NIGERIA				
Action Sheet				
Action no.2.4.2	Title of action : Land conservation and restoration			
Objective	Minimize wastelands			
Justification	To prevent loss of productive lands and regain those that have already been lost due to inundation, excessive flooding, weeds infestation as well as desiccation			
Brief succinct description	Inundation, excessive flooding and weeds infestation as well as desiccation contribute immensely towards the creation of wastelands in many parts of the Komadugu Yobe basin. Agricultural, grazing, forestry and fishing grounds have been rendered useless thus causing huge decreases in outputs and fall in productions. These aggravate food and nutritional insecurity and perpetuate poverty levels.			
Expected results	<ul style="list-style-type: none"> ➤ A Inundation minimised ➤ B Excessive flooding controlled ➤ C Weeds infestation controlled ➤ D Desiccation of lands minimised 			
Pre-conditions	Cooperation of dam operating authority and stakeholder awareness and appreciation of land conservation techniques			
Risks	Resistance from dam operating authority and the stakeholders			
Means	<i>Logist., techn., scientif.</i>	Transportation, survey materials and equipment, meeting venues and facilities, DSAs, machinery and labour; dam modelling and water allocation software		
	<i>Human resources</i>	1 coordinator, 1 Quantity and 4 land surveyors with their teams, 6 PRA practioners teams for 10 days		
Budget assessment	Budget			
		NO.	Unit Rate	Cost (NGN)
	Civil servant / government staff	6	80, 000	1,440,000
	Support staff	9	20, 000	540,000
	Missions of national staff	0		
	National consultants	3		
International technical assistance (missions and all costs included)	1	??	??	

	Sub-contracts	Lump sum	15,000,000
	Capacity building and awareness raising activities (workshops, trainings, meetings,...) Formation		8 000,000
	Equipment (investments)	3	14, 400, 000
	3 4WD vehicles	6	240,000
	6 motorcycles		3,550,000
	Equipment	000	
	Consumables (stationeries)		870,000
	Others (evaluation, editing, financial costs, audits...)	100,000	2,
	Unforeseen (5%)		2,
	TOTAL		2,187,000
Recurrent costs	Recurrent costs to be provided by user groups		
Financing Sources	Federal Government, Riparian states and local governments, HJKYB TF, donor agencies		
Implementation bodies	Federal ministry of environment of environment, HJKYB TF		
Work plan	The programme is to be carried out over a period of three years, while dissemination of knowledge on best practices is to continue even after the programme		
Observations / Comments	Selling the programme to benefiting communities will ensure sustainability		

NATIONAL ACTION PLAN – NIGERIA		
Action Sheet		
Action no. 2.4.3	Title of action : Development and dissemination of adaptive techniques	
Objective	To develop and disseminate adaptive technologies for sustainable resources management	
Justification	Application of inappropriate technologies causes considerable degradation to the environmental resources of the KYB and thus perpetuates the poverty level.	
Brief succinct description	There is widespread use of inappropriate technologies in the harnessing of the natural resources of the Komadugu Yobe basin, these results in deterioration and degradation of the resources base; general fall in productivity and productions which in turn perpetuate the levels. Poverty, income, as well as food and nutritional insecurities	
Expected results	<ul style="list-style-type: none"> ➤ Appropriate adaptive technologies developed ➤ Appropriate adaptive technologies accepted by all resources users ➤ General output levels and incomes increased ➤ Sustainability of resources ensured ➤ Food and nutritional securities achieved 	
Pre-conditions	Sensitizations of all stakeholders Affordability of the technologies User friendly nature of the technologies Cooperation and willingness of the stakeholders	
Risks	Resistance to change from old habit to new habit expected. Rising poverty level in the Komadugu Yobe basin may hinder acceptance	
Means	Logist., techn., scientif	Transportation, meeting venues and facilities, DSAs
	Human resources	Coordinator, 10 Appropriate technologies, 10 PRA practitioners, 10 support staff

	Budget	Number	Unit rate	Cost (NGN)
Budget assessment	(a) Civil servant/government staff 12 months	1	80,000	880,000
	(b) Support staff for 12 months	6	20,000	200,000
	(c) Missions of national staff 15 days	6	5,000	450,000
	(d) National consultants	4	18,000	320,000
	(e) International technical assistance (missions and all costs included)	1	??	??
	(f) Sub-contracts Development of adaptive technologies			85,000,000
	(g) Capacity building and awareness raising activities (workshops, trainings, meetings,...)			50,500,000
	(h) Equipment (investments) :- 4-WD vehicle	4	4,800,000	9,000,000
	Motorcycles	10	80,000	800,000
	(i) Consumables (stationeries) :-			600,000
	(j) Others (evaluation, editing, financial costs, audits, ...)			1,400,000
(k) Unforeseen (5%)			7,457,500	
	TOTAL		₦ 156,607,500	
Recurrent costs	Government Annual Budgetary Provisions			
Financing Sources	Government: Budgetary provision, HJKYB TF Resource users: KYB Donors			
Implementation bodies	HJKYB TF in collaboration with RBDAs and riparian state ADPs			
Work plan	The programme should start in the dry season when access to location is easy, this is to allow for demonstration and testing of the technologies by the intended users..			
Observation/ comments				

NATIONAL ACTION PLAN – NIGERIA	
Action Sheet	
Action no. 3.1.4	Title of action : Sustainability of ADP and NEAZDP
Objective	To increase access to farm inputs such as fertilizer, pesticides, improved seeds and especially water for rural domestic and agro-industrial uses
Justification	With improved access to farm-inputs especially water, farmlands will remain productive; agro-based industries, encouraged; people, gainfully employed; threat to food security minimized and poverty level reasonably controlled.
Brief succinct description	Update information on: the available land and water resources, and the capability of the different parcels of land. Estimate the water needs to keep the available land productive and subtract the available water from the needed water to determine level of augmentation required by tube wells and wash bores on the fadama farms. Source for: funds to drill tube wells and bore more wash bores; improved seeds, guaranteed supplies of fertilizers and pesticides; and sustainable agricultural extension services. Institute/revive rural development loan system and operate it transparently

Expected results	<ul style="list-style-type: none"> ➤ More areas cultivated therefore more food production ➤ Improved Food Security ➤ Poverty reduction ➤ Agro based industries established ➤ Increased Job opportunities and wealth creation ➤ Secure funding for ADPs and NEAZDP 					
Pre-conditions	Willingness of FGN and the governments of the riparian states to fund rural development programs.					
Risks	Unpredictable Changes in governments and decision makers					
Means	<i>Logist., techn., scientif.</i>	Transport, meetings and workshops venues and facilities, DSAs, Bore holes and Wash bores				
	<i>Human resources</i>	Coordinator, 2 Extension Experts, Communications Expert,				
Budget assessment	Budget		Units	Rates	Duration	Cost (NGN)
	Civil servant / government staff		7	80,000	12 months	6,720,000
	Support staff		4	20,000	12 months	960,000
	Missions of national staff					
	DSAs for Civil Servants		7	10,000	20 days	1,400,000
	DSAs National Consultants		4	10,000	40 days	1,600,000
	National consultants		4	200,000	12 months	9,600,000
	International technical assistance (missions and all costs included)					
	PRA Facilitator and Communications Expert		2	1,000,000	Two sessions	4,000,000
	Sub-contracts		12	1,200,000		14,400,000
	Bore Holes		36	600,000		21,600,000
	Wash bores		Lump sum for first year only			18,000,000
	Capacity building and awareness raising activities (workshops, trainings, meetings,...):					
	Stakeholder analysis of situation, strengths and weaknesses or needs assessment		1	3,000,000	Lump sum	3,000,000
	Workshops for development of revamping and sustainability strategies		4	2,000,000	Lump sum	8,000,000
	Awareness raising and training workshops for Extension workers		4	2,000,000	Lump sum	8,000,000
	Equipment (investments)					
	4WD Vehicle		1	4,800,000		4,800,000
	Lap Tops		4	200,000		800,000
	Consumables (stationeries)					
Fuelling and maintenance of vehicle		Lump sum			500,000	
Stationeries		Lump sum			400,000	
Electricity and Water		Lump sum			800,000	
Residential Accommodation for Core Team		Lump sum			4,000,000	
Paper and electronic media usage		Lump sum			400,000	
Others (evaluation, editing, financial costs, audits...)		Lump sum			2,000,000	
Unforeseen (5%)					5,549,000	

	TOTAL	116,529,000
Recurrent costs	Water charges, Subventions from FGN, State Governments and LGAs should institutionalize the organization.	
Financing Sources	Government: Budgetary provision 45% Resource users: 5% Donors: 50%	
Implementation bodies	Ministry of Agriculture and Water Resources	
Work plan	Surveys of resources, mobilization/acquisition of funds, implementation,	
Observations / Comments	The bane of rural development is unsuitable sources and supply of inputs. This has to be tackled head on.	

NATIONAL ACTION PLAN – NIGERIA		
Action Sheet		
Action no. 3.2.1	Title of action : Improve Data Collection, Information Management and Decision Support Systems	
Objective	Getting better information for decision making.	
Justification	Limited knowledge of hydrology and hydrogeology and water resources availability and use by the Institutions have lead to the inability by these institutions to make informed decisions affecting the overall water sector in the KYB.	
Brief succinct description	Lack of properly instituted data collection, processing and archive as well as proper dissemination has hindered the performance of these organizations. These have lead to lack of IWRM, conflict in the use of the resources etc.	
Expected results	<ul style="list-style-type: none"> ➤ C: Comprehensive hydro-meteorological data collection system and database system established. ➤ A restructured and expanded network for the collection of hydro-meteorological data, based on articulate specifications for, standardization of equipment employed at manned and unmanned stations, and the arrangements necessary for the operation and maintenance of various classes of the stations; ➤ Regular undertaking of collation, assessments and compilations of hydro-meteorological, environmental and socio-economic information for wide circulation among all stakeholders in the KYB. ➤ A website created for information dissemination. 	
Pre-conditions	Collaboration of the statutory authorities; seed money to start the process; partner mobilization, ready for change in the way things are done.	
Risks	Lack of Political will, poor management, lack of trusted leaders	
Means	<i>Logist., techn., scientif.</i>	Transportation, survey materials and equipment, meeting venues and facilities, DSAs, machinery and labour, training facilities, trainers, availability of hydro-meteorology experts.
	<i>Human resources</i>	1 Coordinator; 1 quantity Surveyor, 2 Civil Engineers, 2 Hydrologists, 1 meteorologist, 1 Training expert, 1 sociologist, 1 Environmentalist, 1 GIS Expert, and 1 land surveyors with their teams, 6 PRA (Participatory Rapid Appraisal) practitioners for 15 days; experts to appraise and design trainings, workshops, studies for hydro-meteorological data collection plat form enhancement.
Budget	<i>Budget</i>	Units Rates Duration Cost (NGN)

assessment	Civil servant / government staff	4	80,000	4 months	1,280,000
	Support staff	4	50,000	4 months	800,000
	Missions of national staff (days)	8	5,000	15 days	600,000
	National consultants	6	18,000	15 days	120,000
	International technical assistance (missions and all costs included)	3	36,000	10 days	1,620,000
	Sub-contracts	0			
	Capacity building and awareness raising activities (workshops, trainings, meetings,...): Establishment of mechanisms such as clearing houses	1	60,000,000	Lump sum	60,000,000
	Equipment (investments) Meteorological equipment Hydrological equipment Vehicles x 4 Motor cycles x 10 Bicycles x 10 Current meter x 6		240,000,000	Lump sum	240,000,000
	Consumables (stationeries)		200,000	Lump sum	200,000
	Others (evaluation, editing, financial costs, audits...)			Lump sum	500,000
	Unforeseen (5%)				15,035,000
	TOTAL				315,735,000
	Recurrent costs	Recurrent cost for training, maintaining of installed equipment, payment of salaries and allowances of staff to be engaged in the hydro-meteorological data gathering, processing and archive, dissemination.			
Financing Sources	Government: Federal, State, Local Governments Resource users: Stakeholders groups Donors: IDAs, HJKYBTF, etc.				
Implementation bodies	HJKYB Trust Fund in partnership with the FMA&WR, Riparian States and others.				
Work plan	The programme is to be carried out over a period of four years, while data gathering, processing, dissemination and archive is to continue even afterwards.				
Observations / Comments					

NATIONAL ACTION PLAN – NIGERIA						
Action Sheet						
Action no. 3.2.2	Title of action : Formation and Empowerment of Water Users Associations (WUAs)					
Objective	Harmonize resources uses so that user groups can live in symbiotic relationships					
Justification	Loss of lives and crops/produce/animals; conflicting relationships; out-migration and loss of livelihoods generally perpetuate food/nutritional insecurity and poverty					
Brief succinct description	Due to widespread and persistent resource use conflict in the Komadugu Yobe basin there is a general sense of insecurity, mistrust and fall in productions. These have culminated into loss of livelihoods and entrenched poverty.					
Expected results	<ul style="list-style-type: none"> ➤ A Symbiotic relationships between all resource user groups restored and sustained ➤ B Agreed resources use formula ➤ C Rights and responsibilities of each production group recognised and respected ➤ D Increased productivity and productions achieved 					
Pre-conditions	Collaboration of statutory authority; seed money to start the process					
Risks	Resistance from some stakeholders					
Means	<i>Logist., techn., scientif.</i>	Transport; meeting and workshop facilities and venues; IEC materials; conflict management skill; DSAs.				
	<i>Human resources</i>	1 coordinator; 5 support staff; 4 PRA practitioners for I month;.				
Budget assessment	Budget		Units	Rates	Duration	Cost (NGN)
	Civil servant / government staff		5	80,000	1 month	400,000
	Support staff		5	20,000	1 month	100,000
	Missions of national staff					
	National consultants		4	18,000	30 days	720,000
	International technical assistance (missions and all costs included)		0			
	Sub-contracts		6	300,000	1 month	1,800,000
	Capacity building and awareness raising activities (workshops, trainings, meetings,...):		Lump sum			860,000
	Equipment (investments)		Lump sum			4,800,000
	Consumables (stationeries)		Lump sum			20,000
	Others (evaluation, editing, financial costs, audits...)		Lump sum			20,000
	Unforeseen (5%)					436,750
	TOTAL					9,171,750
Recurrent costs	Recurrent cost for maintaining the process will be covered by government allocations.					
Financing Sources	Government and Donors					

Implementation bodies	LCBC-GEF in partnership with HJKYB Trust Fund
Work plan	Advocacy visits to traditional rulers, religious and opinion leaders, workshop on conflict management, participatory demarcation of stock routes, watering points and grazing areas and grazing management. Monitoring and evaluation.
Observations / Comments	

NATIONAL ACTION PLAN – NIGERIA	
Action Sheet	
Action no. 3.3.1	Title of action: Improvement of Water Governance
Objective	Improving water governance through institutional reforms (e.g. review of policies, reorganization of line agencies, review of laws) and capacity building of institutions and studies on water resources availability and rational use, as well as encouraging the application of participatory approaches
Justification	Law as a vehicle for change, and the related supporting institutional arrangements are vital for good governance in the water sector at the local, state and national, as well as the Trans boundary levels. The national legislation needs to be developed to reduce fragmentation among institutions responsible for water resources development, utilization and management, as well as to facilitate coordination and a participatory approaches. Policies need to be reviewed or updated and capacities of institutions enhanced to carry out their functions. The structures and functions of the existing line agencies to reduce subsisting conflicts of interest and overlaps in responsibilities.
Brief succinct description	Due to lack of policies and regulatory framework for water governance, inadequate (quality and quantity) of personnel and equipment, organizational instability, misplaced priorities, coupled with greed, political corruption, lack of incentives/challenges to staff etc. most water infrastructure have decayed, resources wasted, low productivity of staff, apathy, redundancy and confusion. The various agencies are unable to carry out their mandates, loss of biodiversity, widespread desertification etc are prevalent.
Expected results	<ul style="list-style-type: none"> ➤ A: Harmonized laws relating to water resources by way of conducting technical studies to assess conflicts and the overlap of land, environmental and water resources laws, developing proposals for reviewing these regulations with a view to instituting integrated management instruments (use authorizations, water use charges, classification of water bodies, information systems, Komadugu Yobe basin plans, enforcement and control mechanisms); ➤ B: consolidated guidelines for the implementation of water resources management instruments in the KYB; and ➤ C: Report of studies for the identification and consolidation of fiscal and compensatory mechanisms for the use and conservation of natural resources. ➤ D: Emergence of publicly accepted revised policy, draft bills leading to the passage of the bills by National Assembly and its ascension into an act of law by the President and Commander –In-Chief of the Armed Forces of Nigeria, leading to; ➤ E: Removal of policy inconsistencies that would separate responsibility for water regulation from agencies that are also engaged in service delivery functions as well as strengthen participation of vulnerable and disadvantaged groups; ➤ F: Institution of IWRM ➤ G: Improve accountability and efficient delivery of cost effective water and sanitation services ➤ H: Greater public-private sector partnership in mobilizing resources in water management and provision of services.

Pre-conditions	Collaboration of the statutory authorities; seed money to start the process; dam operation plan and implementation plan in place, channel clearance activities addressed , stakeholders mobilized			
Risks	Resistance from some stakeholders			
Means	<i>Logist., techn., scientif.</i>	Transportation, survey materials and equipment, meeting venues and facilities, DSAs, machinery and labour ; dam operation modelling software; water allocation model		
	<i>Human resources</i>	1 Coordinator; 1 quantity and 1 land surveyors with their teams, 6 PRA (Participatory Rapid Appraisal) practitioners for 5 days		
Budget assessment	Budget	Number	Unit rate	Cost (NGN)
	Civil servant / government staff (12 months)	4	80,000.00	3,840,000.00
	Support staff (12 Months)	6	20,000.00	1,440,000.00
	Missions of national staff (10 days)	3	5,000.00	150,000.00
	National consultants (10 days)	3	18,000.00	540,000.00
	International technical assistance (missions and all costs included) (10 days)	2	60,000.00	1,200,000.00
	Sub-contracts			0.00
	Capacity building and awareness raising activities (workshops, trainings, meetings,...) publicity campaign and social mobilization on IWRM (1.1.1)			48,000,000.00
	Research and studies to collect, analyse and synthesize knowledge, best practices to review, harmonise existing policies and laws, etc. (1.4.1)			60,000,000.00
	Organize public debate and dialogue to gain further inputs and Review of existing policies, bills, edicts and bye-laws (1.4.2)			12,000,000.00
	Equipment (investments)			
	(a) Vehicles	4	4,800,000.00	19,200,000.00
	(b) Motor cycles	8	75,000.00	600,000.00
	(c) Generators	2	1,500,00.00	3,000,000.00
	Consumables (stationeries)			1,500,000.00
Others (evaluation, editing, financial costs, audits...)			1,500,000.00	
Unforeseen (5%)			7,648,500.0	
TOTAL			160,618,500.00	
Recurrent costs	Recurrent cost for operating the dam and for maintaining the channels will be covered by water charges and subsidies			
Financing Sources	Government: Resource users: Donors:			
Implementation bodies	Hadejia Jama'are River Basin Development Authority;			
Work plan	Channel clearance to be carried out during dry season			
Observations / Comments				

