

Managing Transboundary Water Resources in the Lake Chad Basin



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Location of Lake Chad Basin and Member States of its Commission



Lake Chad Basin Commission

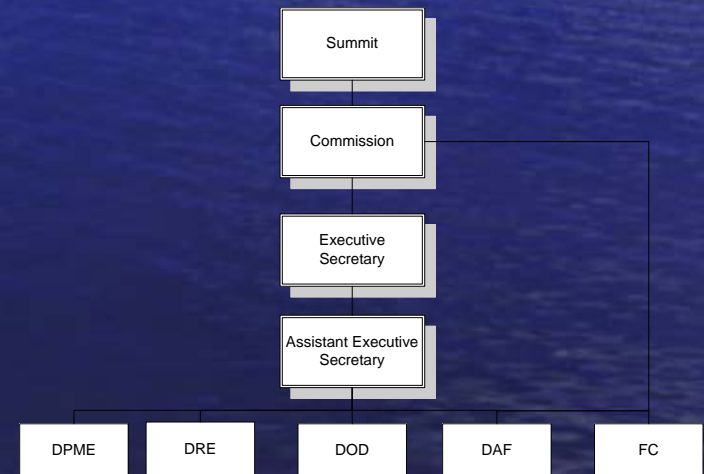
- Created
 - Friday 22nd May 1964
- Headquarters N'djamena, Chad Republic
- Current Member States:
 - Cameroun (1964)
 - Niger (1964)
 - Nigeria (1964)
 - RCA (1994)
 - Soudan (2000) Ratification yet
 - Tchad (1964)



- Structure
 - The Summit
 - The Commission (2 Ministers/MS)
 - The Executive Secretariat

- **Mission**

- Integrated Land and Shared Water Resources Management
- Promotion of Regional Economic Integration and Cooperation
- Regional Security Coordination



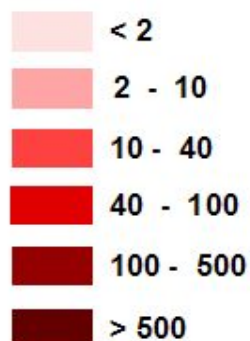
POPULATION DENSITY IN THE LAKE CHAD BASIN

Population per Member States

Member States	Population	Area (sq. Km)
Cameroon	2, 871, 200	74, 825
Niger	305, 280	200, 155
Nigeria	17, 648, 832	211, 916
R.C.A.	890, 400	217, 536
Tchad	6, 428, 056	439, 481
TOTAL	27, 943, 768	1, 143, 713

Legend

Population Density (Persons per sq.Km)



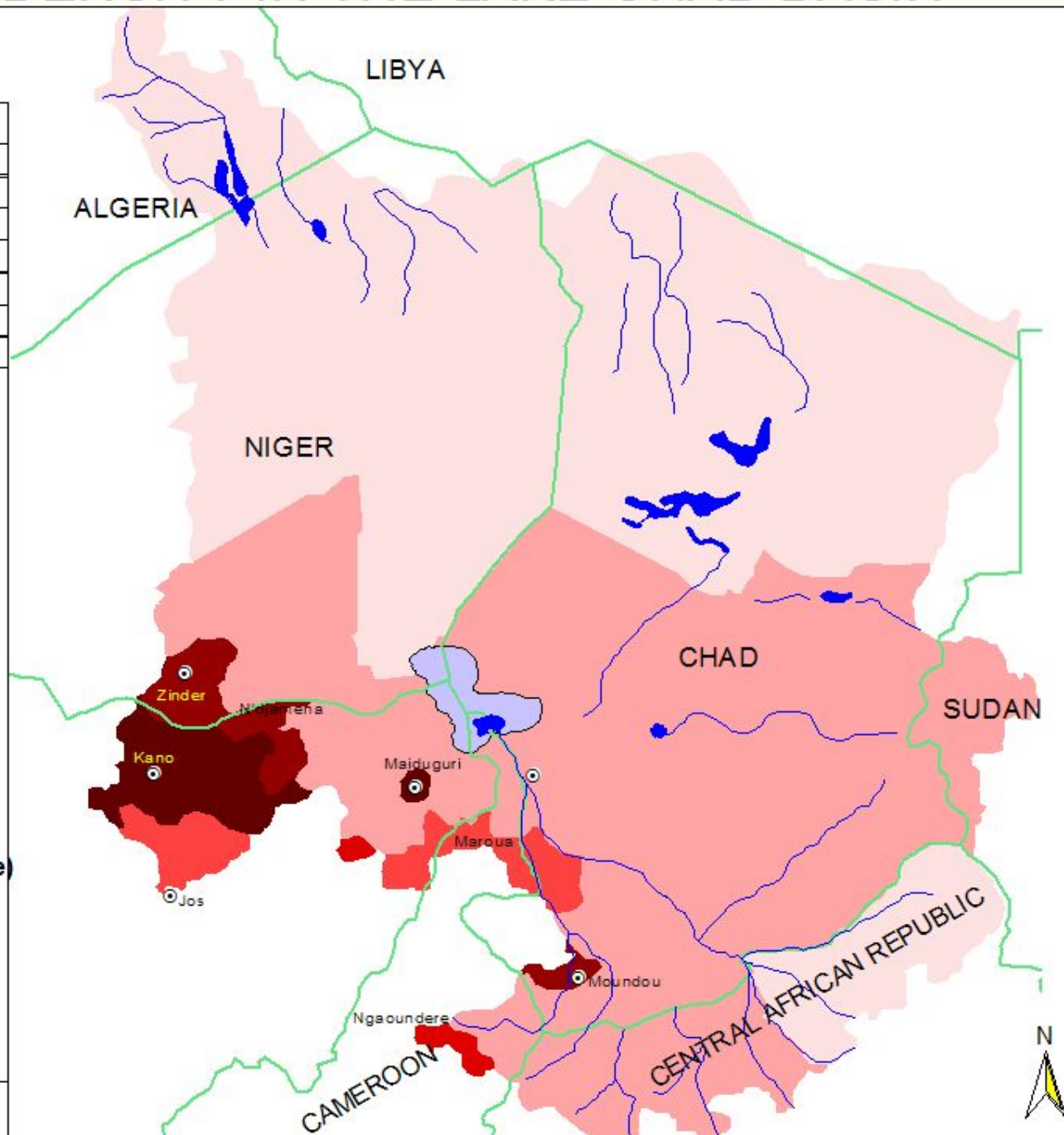
⊙ Major Cities (> 500 000 People)

Rivers

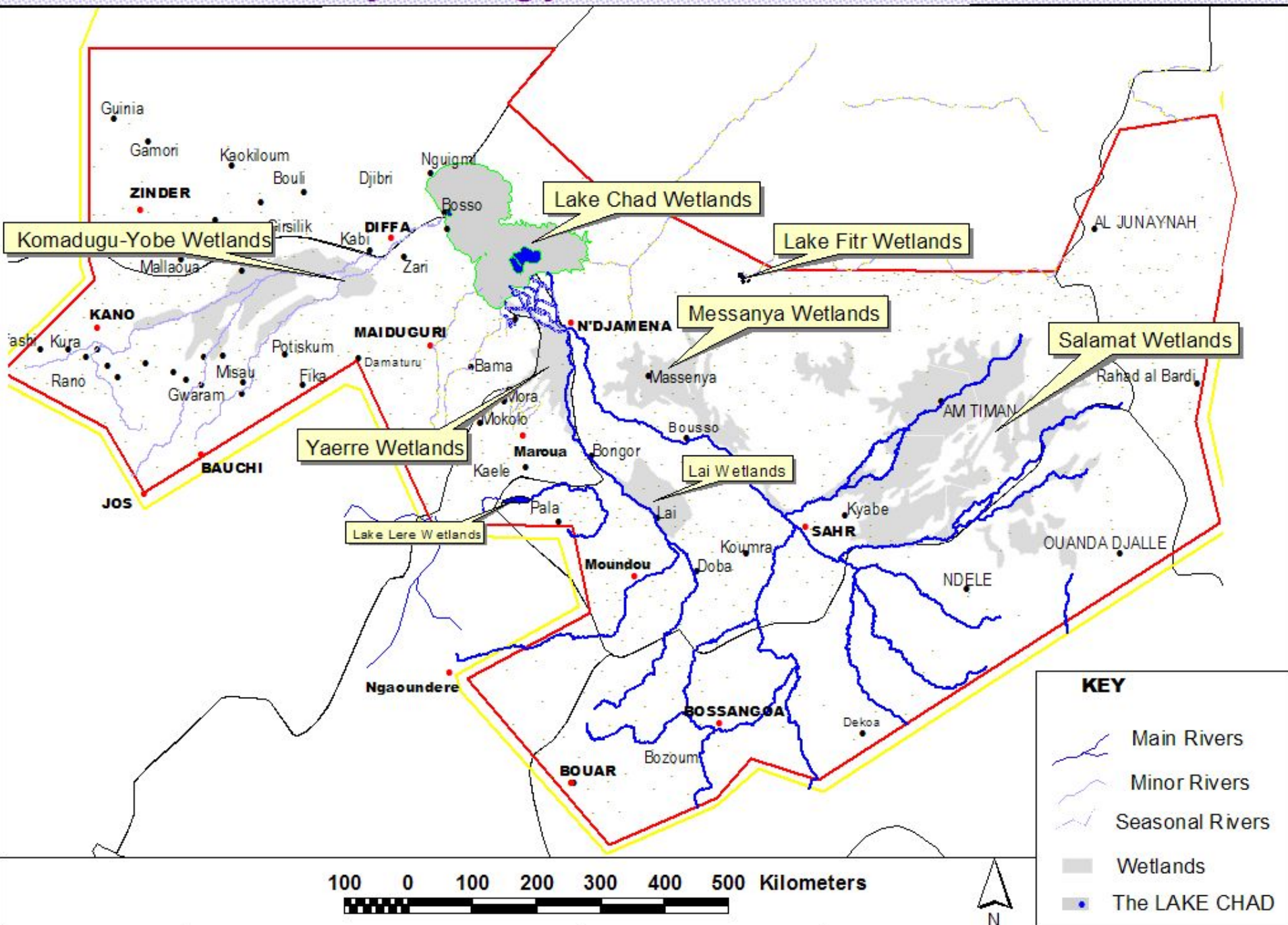
International Boundaries

Water Bodies

200 0 200 400 Kilometers

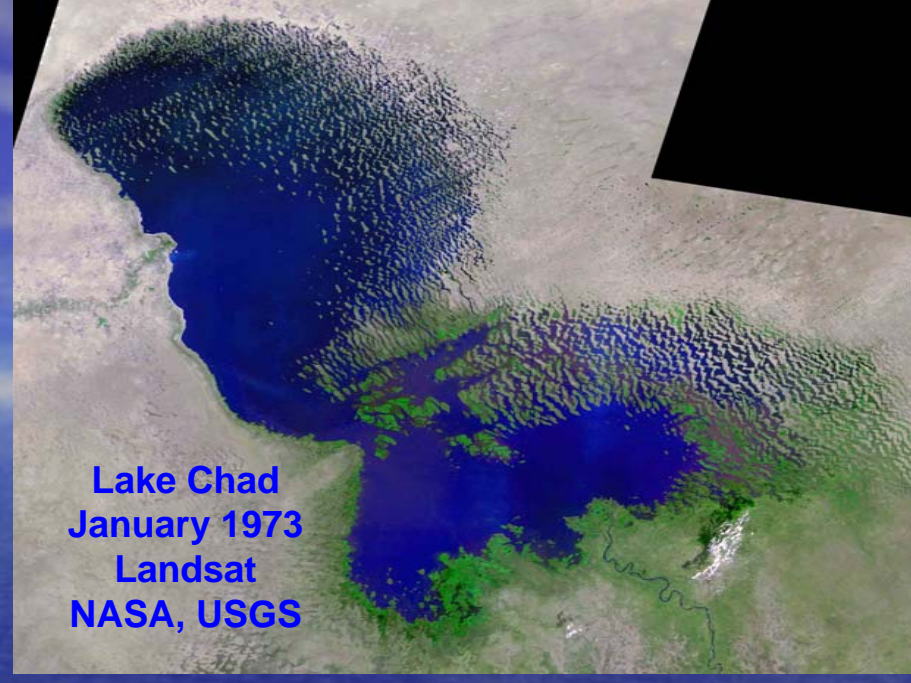


Hydrology of the Lake Chad

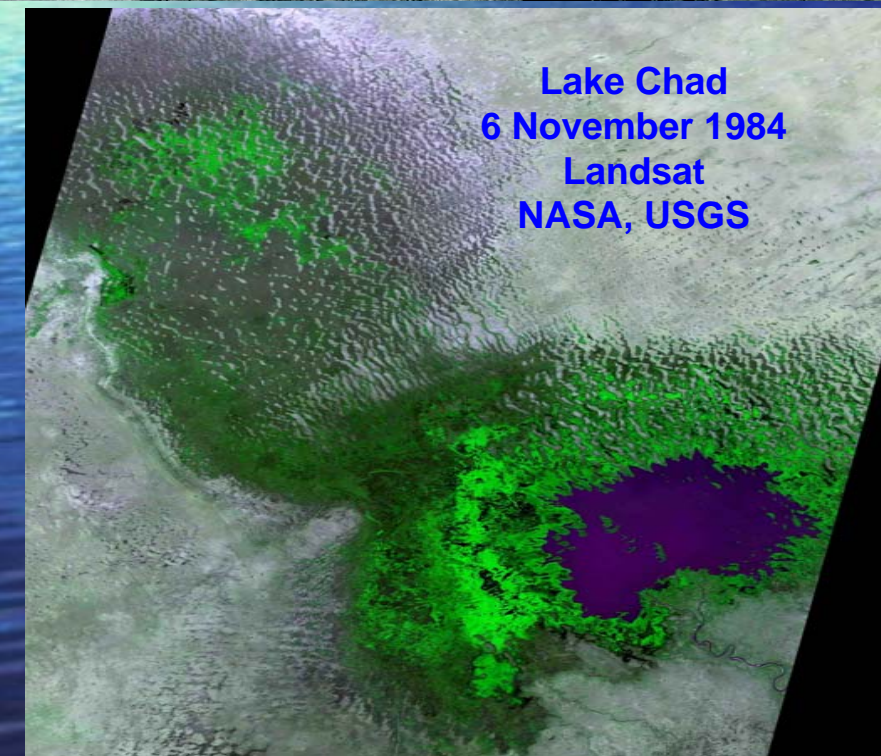




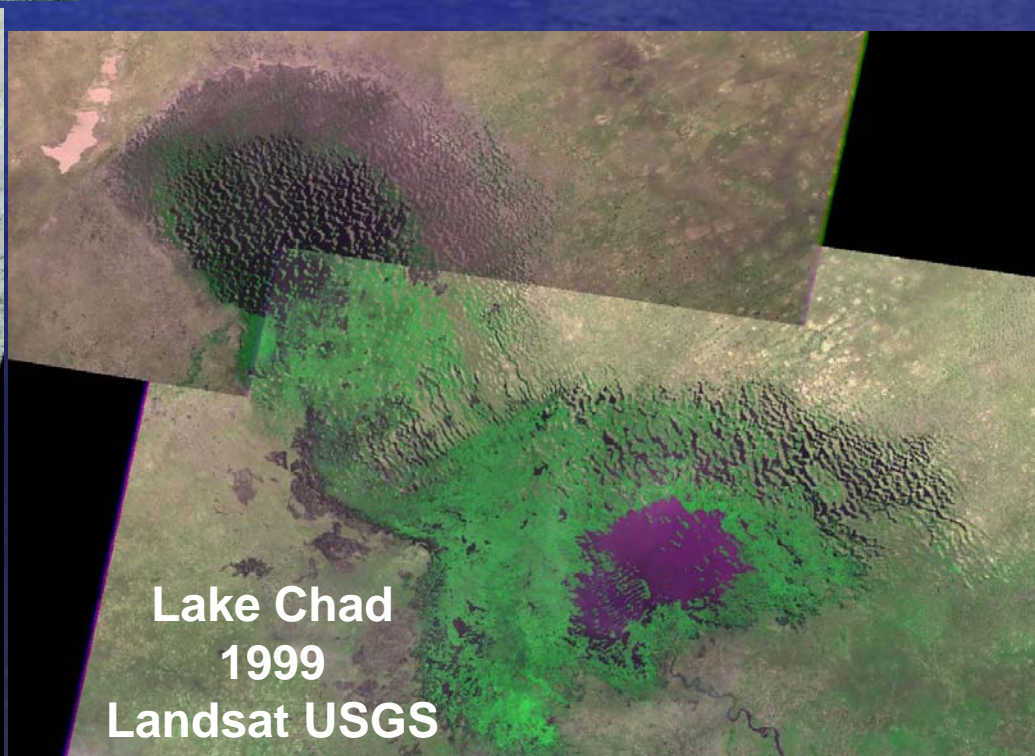
Lake Chad
31 October 1963
Argon
U.S. Department of Defense



Lake Chad
January 1973
Landsat
NASA, USGS



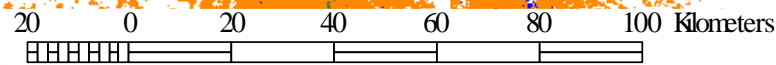
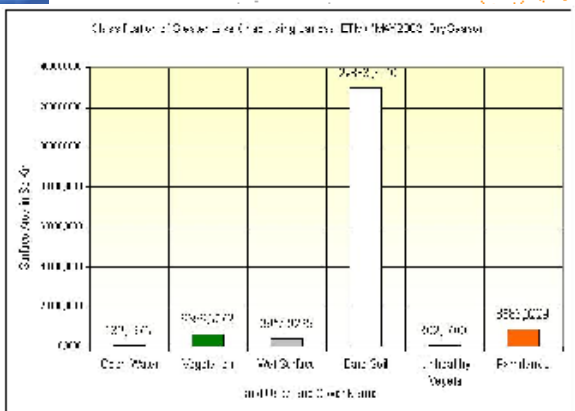
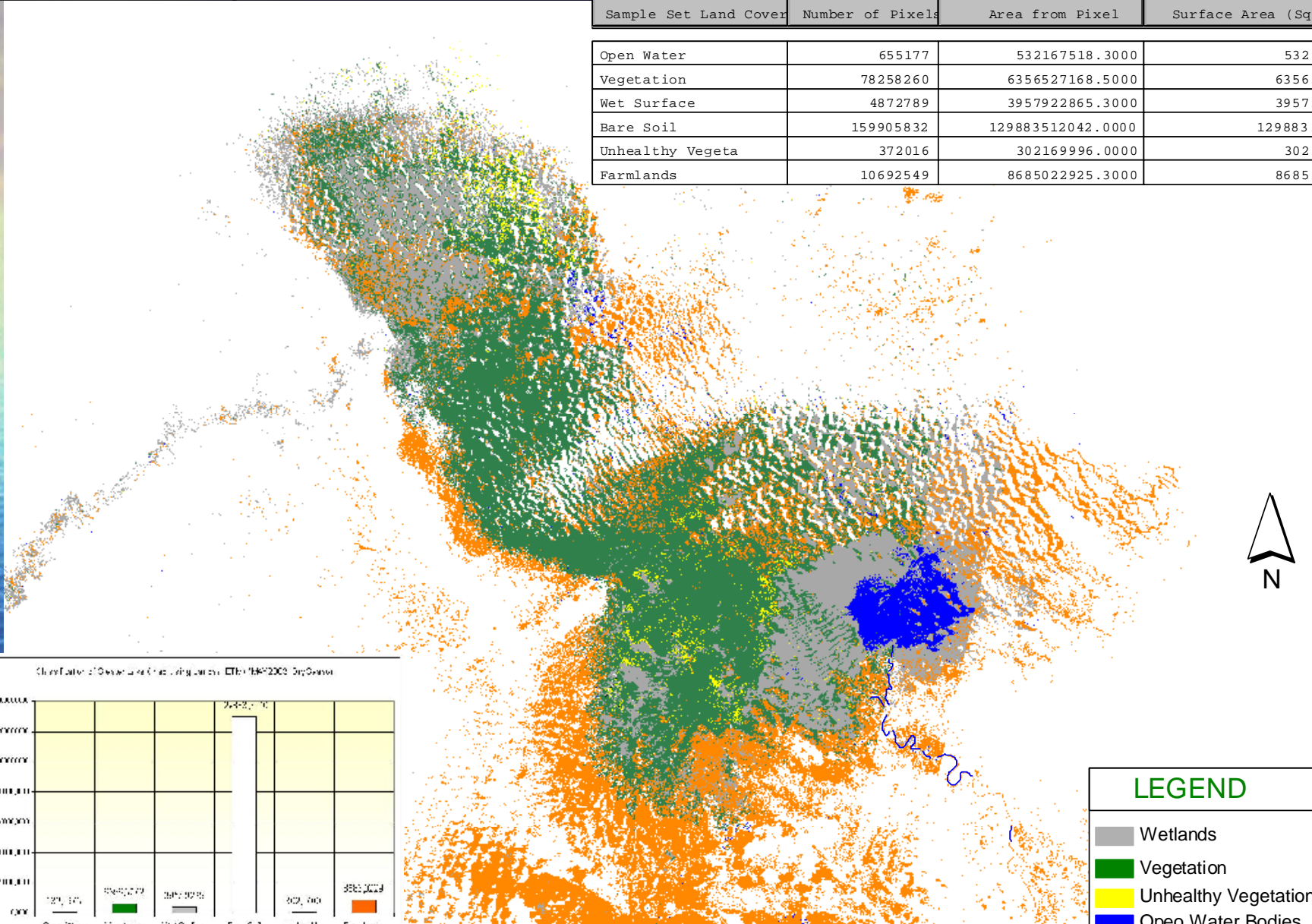
Lake Chad
6 November 1984
Landsat
NASA, USGS



Lake Chad
1999
Landsat USGS

Greater Lake Chad Land Use/Land Cover Supervised Classifications Using Landsat ETM+

Sample Set Land Cover	Number of Pixels	Area from Pixel	Surface Area (Sq. Km)
Open Water	655177	532167518.3000	532.1675
Vegetation	78258260	6356527168.5000	6356.5272
Wet Surface	4872789	3957922865.3000	3957.9229
Bare Soil	159905832	129883512042.0000	129883.5120
Unhealthy Vegeta	372016	302169996.0000	302.1700
Farmlands	10692549	8685022925.3000	8685.0229



LEGEND

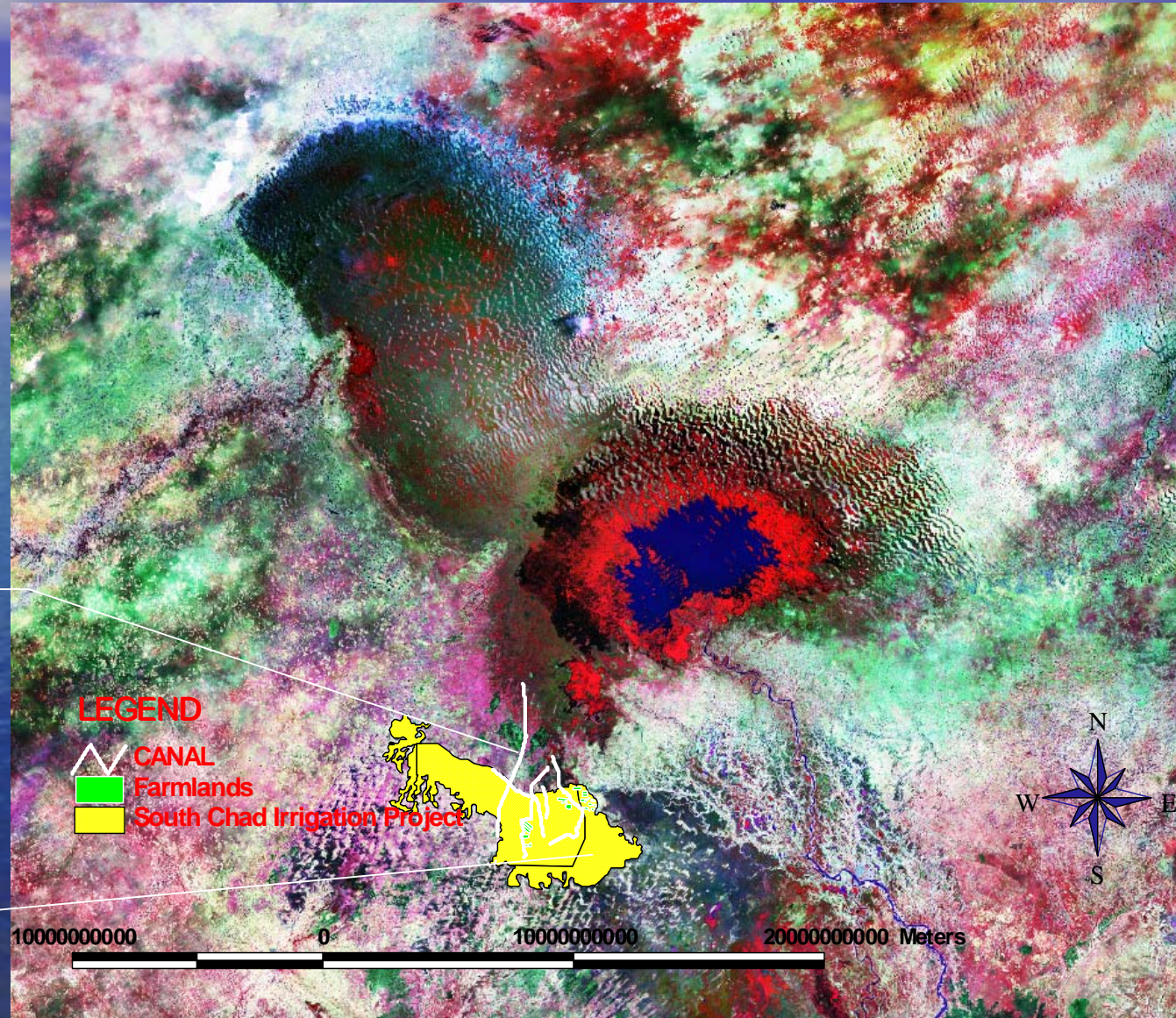
- Wetlands
- Vegetation
- Unhealthy Vegetation
- Open Water Bodies
- Farmlands

Lake Chad
1987
Landsat MSS
USGS

Effect of lake shrinkage on the South Chad Irrigation Project (SCIP) at New Marte

Main Irrigation Canal

Command Irrigated area



Analysis of Problems of Lake Chad Region

A. EFFECTS OF GLOBAL CLIMATE CHANGE

1. Lake Shrinkage

- Decline in fish production
- Cross-border movement of settlements
- Fear of drying up completely (1500 year the Lake dried up completely for 25-30 years)

2. Drought

- Change in mean isohyets values 30 Km Southwards
- Less flooding and decline in the receptive capacities of natural habitat – loss of biodiversity
- Decline in perennial vegetation/agricultural production (irrigation also)
- Water level has receded so far away out of reach of some member states of LCBC
- Migration of people and their livestock (Refugees)

3. Desert Encroachment

- Rate 1 – 2 Km per annum Southwards
- Excessively high winds leading to:
 - wind erosion
 - sand dunes

Analysis of Problems of Lake Chad Region

B. INEFFICIENT IWRM AT NATIONAL AND REGIONAL LEVELS

1. Bad practices leading to:

- In appropriate water use
- Bad reservoir operation
- Low revenue collection
- Poor management structures
- Poor O & M
- High level water losses
- Low skilled and inadequate Technical Manpower
- Inappropriate land and water use practices which lead to wide spread degradation of water and arable lands

2. Abandoning of effective traditional resource management practices

3. Poor Decision Making (unsustainable development decisions)

- Insufficient coordination with regional water and environment policies
- Upstream construction of large hydraulic structures without taking sufficient account of down stream requirement
- Improperly planned, costly investment
- Development decision do not take into account the very precarious means of subsistence of the people

Analysis of Problems of Lake Chad Region

4. Poor Data Management

- Absence of a proper mechanism for data collection, collation, storage and dissemination.
- The current obsolete data equipments coupled with unskilled personnel, poor logistic and lack of incentive also hamper reliable data management
- Insufficient knowledge of water resources and functioning aquatic ecosystem

5. Absence of effective system for monitoring the quantity and quality of water

6. Absence of effective early warning system and preservation measures

7. Absence of water demand management and/or adaptation of production method to conserve natural resources

8. No contingencies for handling emergencies (pollution control)

9. Lack of focus on the part of managers

- (e.g. LCBC inclined to service delivery at the expense of Regulatory Management function. In 1990 LCBC had to be brought back on track to its mandate of addressing Transboundary IWRM, security, cooperation and economic integration)

Analysis of Problems of Lake Chad Region

C. LEGAL FRAMEWORK (Legislation)

- Deficient water policies where they exist
- Absence of regional, national standards/guidelines for monitoring water quality and quantity
- Absence of cost-sharing mechanism
- Lack of incentives, subsidies and penalties to promote the use of appropriate and environmentally sound technologies for water conservation and pollution control
- Absence of necessary basin wide (Regional) water legislation. The national water legislations need to be updated and harmonised to give rise to regional water laws
- An attempt by LCBC/UNEP is now underway to produce an acceptable basin wide legislation for the use, conservation and protection of the available resources in the region. At the same time a mechanism is being developed for the enforcement of basin wide legislation
- Lack of Tariff Policies (inadequate water pricing) water still undervalued commodity.

Analysis of Problems of Lake Chad Region

D. WEAK COORDINATION

- Insufficient cooperation between sectors in a country and between the member states
- Peoples opinions and requirement are not sufficiently taken into consideration
- Non-existent of Environmental Education
- Regional and National Institutions do not respond quick enough to keep pace with changes
- No coordination between and among the stakeholders

E. WEAK ECONOMIC SITUATION OF MEMBER STATES AND PERSISTANT RURAL ECONOMY

- Disallow the optimum development, utilisation and administration of resources
- Disallow the water utilities, RBDA to fix proper water tariff and proper toll collection mechanism. (Poor O&M, water loses and difficulty in the overall management of water resources)
- Little incentives to motivate manager and conserve resources

Analysis of Problems of Lake Chad Region

F. WEAK STAKEHOLDER PARTICIPATION

- Donors provide little incentive for a coordinated and sustained policy of long term assistance aimed at sustainable development
- Institutional fragmentation and inadequate funding do not allow full participation at national and regional levels
- Grass root stockholder's participation is either non-existent or very weak where it exists

Economic Activities

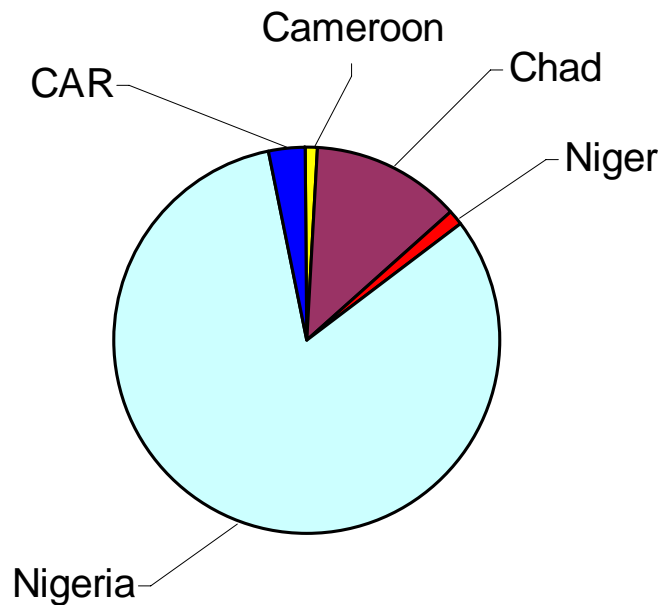


- **Agriculture**
- Agriculture - about 2.5 million tons of assorted grains per annum out of which only 10% comes from irrigation
- **Fishery**
- Fishing - about 200,000 tons per annum from about 176 Species of 26 families
- **Animal Husbandry**
- About 10 million domestic animals (cattle, goats/sheep, camels, donkey, horses, etc.)
- 65 wild animal species & 400 birds many migratory
- **Commerce**
- Mainly informal trade between and among the Member States of LCBC
- **Mining** (Petrol, Diamond, Gold & Natron)
- **Tourism** (not developed)
- Few national parks and hunting in CAR

World Bank Estimate of Total Water Sector Investment in Lake Chad Basin up to 2003

- Cameroon \$ 6.6 m
- Chad \$ 69.2 m
- Niger \$ 5.6 m
- Nigeria \$ 458 m
- CAR \$ 17.3 m

Water Sector Investment as at 2003



Approach

- **Campaign to save Lake Chad Basin** (Launched in 1994)
 - Public awareness
 - Promotion of indigenous skill/knowledge
 - New policy on alternative energy sources to firewood
 - Stakeholder participation
 - Adoption of appropriate technology
- **Establishment of Regional Parliamentary Committee of Lake Chad Basin (RPCLCB)**
 - Aim:
 - Ensure payment of budgetary contribution to LCBC
 - Assist LCBC in raising public awareness both at local, national, regional & international levels
 - Assist LCBC in fund raising for projects implementation.
 - Assist LCBC in formulation of policies and legislations, necessary for transboundary IWRM

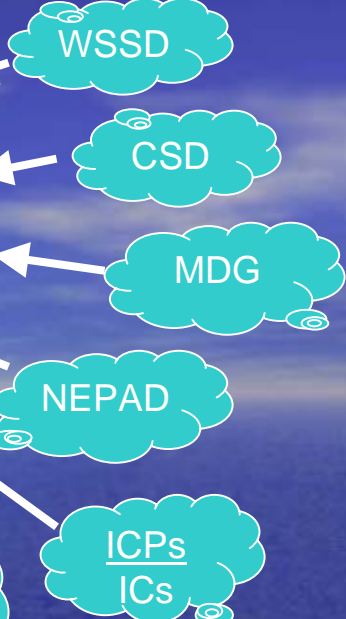
Approach (continues)

- **Establishment of technical Inter Ministerial Committee (IMC) of all stakeholders at national level of Member States**
 - Aim:
 - To disseminate information about all LCBC activities at local and national level of Member State
 - To provide LCBC with feedbacks from Member States
 - To provide LCBC with the necessary resource persons for implementation of projects and membership of its standing committee
- **Interventions**
 - Masterplan (prepared and approved 1994)
 - Strategic Action Plan and Programme (under preparation)
 - LCB Common Vision 2025

PLANNING ROAD MAP

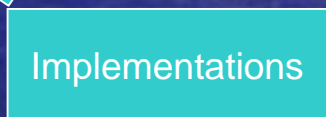
Vision Statement

A common vision of LCBC Member States for the Lake Chad Basin (Region) where land, water and all natural resources are conserved, sustainably exploited, managed in an integrated manner and shared equitably, in order not only to eradicate poverty and improve living standard of the people in the Lake Chad basin, but also to ensure peace, security, cooperation and sound economic developments of the region.



How to get there ?

Mechanism/Vehicle ?
 [LCBC] + Stakeholders



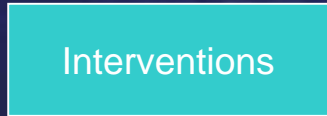
- a) Member States
- b) LCBC
- c) ICPs

Role

What Role ?
 [MANDATE]



PORTFOLIO



What Context ?
 Contents ?

SITUATION ANALYSIS

- a) Where are we today ?
- b) Where do we like to be in the future ?

Gaps

- a) ...
- b) ...
- c) ...
- d) etc

Approach (continues)

Implementation of Key Projects

A. MEGA CHAD PROJECT (funded by Belgium through UNEP, implemented by Unimaid & coordinated by LCBC)

- Promotion of the Use of Renewable Energy Resources and Conservation of Floral Species in the Dry Lands of Mega Chad.
- Objectives of the project is to;
 - 1) Promote renewable energy resources, particularly solar energy and biogas as an alternative to fuel-wood for domestic purposes;
 - 2) Promote appropriate water harvesting technologies that will optimise the use of the limited water resources in the Lake Chad Basin.
 - 3) Conserve the threatened flora species in view of their socio-economic importance to the local community;
 - 4) Educate and enlighten the local people on the sustainable management of the natural resources;
 - 5) Ensure community training and demonstration on rain water harvesting and the use of solar cooker, bio-gas digesters, clay-based fuel efficient stores and their fabrication by local artisans.

Approach (continues)

- B. INTEGRATED PEST MANAGEMENT PROJECT** (A research and development pilot project on integrated pest management (IPM) for subsistence farming in LCB. Funded by AfDB 1.5 billion CFAF)
- Objectives:
 - To test and validate modern IPM techniques over a period of two years with a view to reducing the crop losses caused by pest, weeds and crop diseases affecting millet and sorghum in 20 selected villages of LCB by at least 50%.
 - Components:
 1. Establishment of four IPM specialised units
 2. Establishment of IPM brigades in 20 pilot villages
 3. Supervision and training of extension workers and brigades
 4. Defining cost effective IPM techniques menu in four languages of LCB
 5. Strengthening of LCBC
 6. Linkages with all stakeholders (institution, decision makers etc)
 - Structure
 - A. Research & development
 - B. Training and information
 - C. Project Management

Approach (continues)

- C. LCBC/GEF PROJECT (funded by GEF through World Bank and UNDP)
- Title:
“Reversal of Land And Water Degradation Trends In The Lake Chad Basin Ecosystem”
 - Objectives:
 - **Short term:** to overcome barriers to the concerted management of the basin through well-orchestrated and enhanced collaboration and capacity building among riparians and stakeholders.
 - **Long term:** to achieve regional and global environmental benefits through concerted management of the naturally integrated land and water resources of the Lake Chad Basin
 - Phasing:
 - I. Identification of transboundary issues and acceptance of them by the LCBC riparian states [Masterplan, SAPlan]
 - II. Diagnostic analysis of transboundary issues in LCB and preparation of acceptable and donor friendly SAProgramme
 - III. Implementation of the SAProgramme which will be necessary for addressing the transboundary problems of IWRM in the basin: This 3rd and final phase of the project will provide a process

Approach (continues)

- i. Endorsement of the SAProgramme by the participating governments and the stakeholders
- ii. Translating the SAProgramme provision into national and regional policies and legislations
- iii. Mobilising institutional and investment resources for the SAProgramme implementation

● Components of Phase II (which is currently being implemented)

1. Project Mechanisms:

- Establishment of PMU and lead agencies in the riparian states to drive and coordinate TDA completion, pilot projects, policy initiatives and institutional linkages

2. Regional Policies and Institutional Framework

- Establish and/or enhanced to address transboundary issues during and beyond the life of the project

3. Engagement of Stakeholders/User Groups:

- Strengthen for efficient resources utilisation and conservation

4. Completion of TDA and Synthetic Framework:

- For concerted management of the basin resources

5. Regional Programs and Pilot Demonstrations projects:

- Created to test and validate methodologies, implementation modalities and secure stakeholder participation

6. LCBC/GEF SAProgramme:

- Designed and endorsed by the riparian governments and supported by donors

Approach (continues)

- D.** HYDRO-CHAD PROJECT: Partially supported by BADEA (USD250,000) Total cost of the project USD 855,000
- Title: “Assessment, monitoring and forecasting water resources of Lake Chad Basin”
 - Objectives:
 - Quick access to ready, accurate and reliable hydro meteorological data of the Lake Chad Basin for IWRM and socio-economic development of the regions
 - Implementation Components:
 - Establishment of a regional (at LCBC) and national Data Banks for data collation, processing, storage and dissemination as well as forecasts.
 - Rehabilitation and modernisation of hydro meteorological stations/platforms in the basin for reliable real-time data collection and transmission.
 - Updating and modernising the existing mathematical simulation model of the hydrometeorology of the LCB region
 - Establishment of satellite system (meteorsat) which serves to relay data from the network of DCPs to the national and regional data banks.
 - Training and capacity building

- E. Transferring small amount of water from Oubangui River (biggest tributary of Congo River) in order to refill the Lake Chad and its Wetlands
 - Transferring about 5% of Congo Basin waters that goes waste into the sea from Oubangui river, a biggest tributary of the Congo river into Lake Chad through the Chari river system of Chad basin.

- Objectives of IBWT

- Refilling the Lake and other wetlands in the Lake Chad basin for sustainable development of
 - Navigation
 - Agriculture (Irrigation)
 - Forestry
 - Tourism
 - Industries
- Hydroelectric Power Generation (Potentially up to ~700 megawatts)
- Reduction (elimination) of refugees problems in the basin
- Promotion of regional economic integration, cooperation and security
- Poverty alleviation through
 - Increased food production
 - Provision of portable water
 - Employment opportunities
- Drought mitigation and control of desertification and erosion

- Components of IBWT

1. Palambo Dam

- Water release regulation
- Water level adjustment
- Hydroelectric generation (~700MW)

2. Tunnel/Canal to connect the two basins 150-170 km long

3. River Training/Dredging

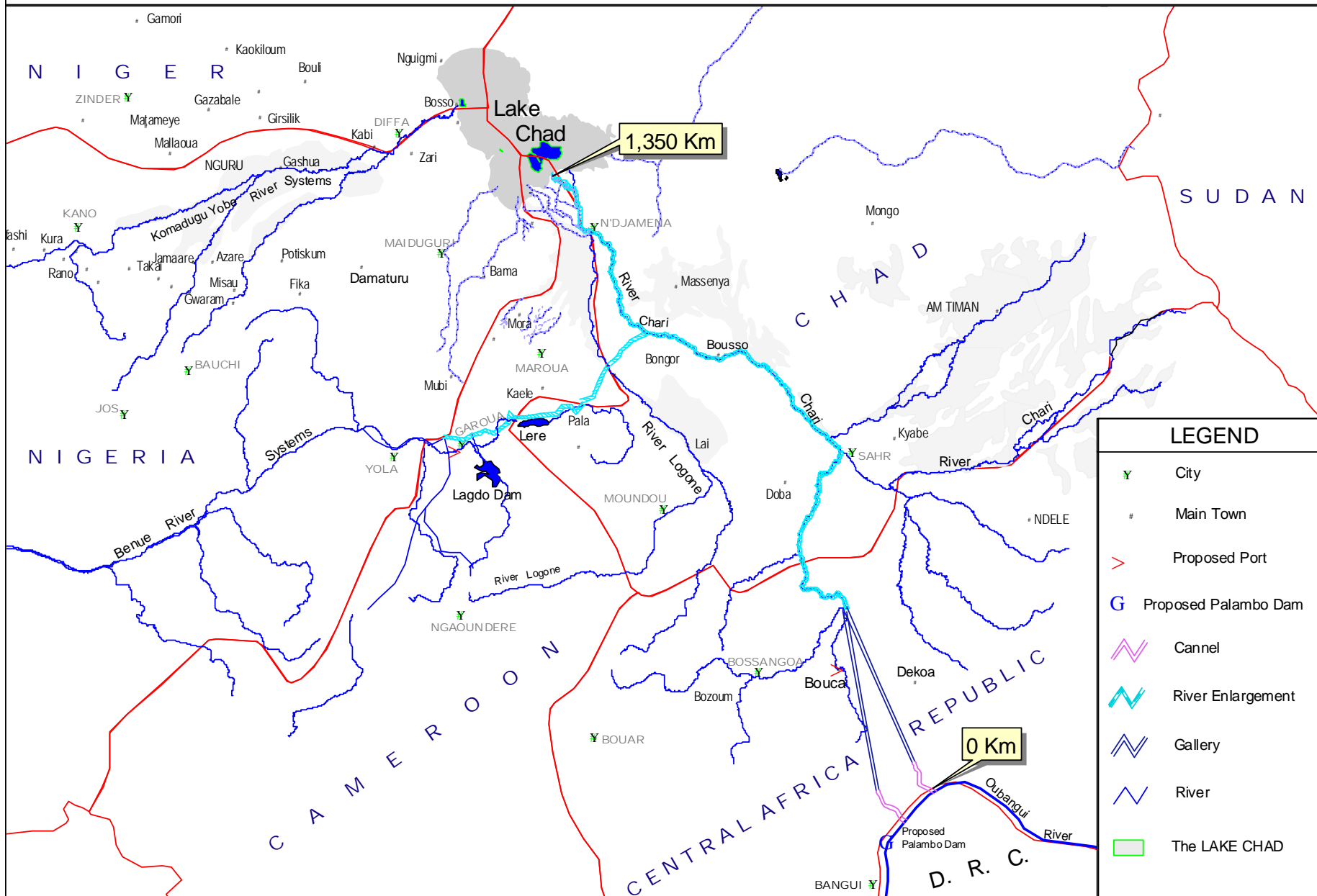
- To ensure discharge of 900 cm/sec

4. Construction/Rehabilitation of Identified River ports

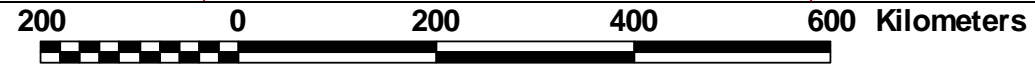
5. Necessary Measures to Improve the Environment

6. Desilting and linking the North and South pool of the lake

PROPOSED INTER-BASIN WATER TRANSFER

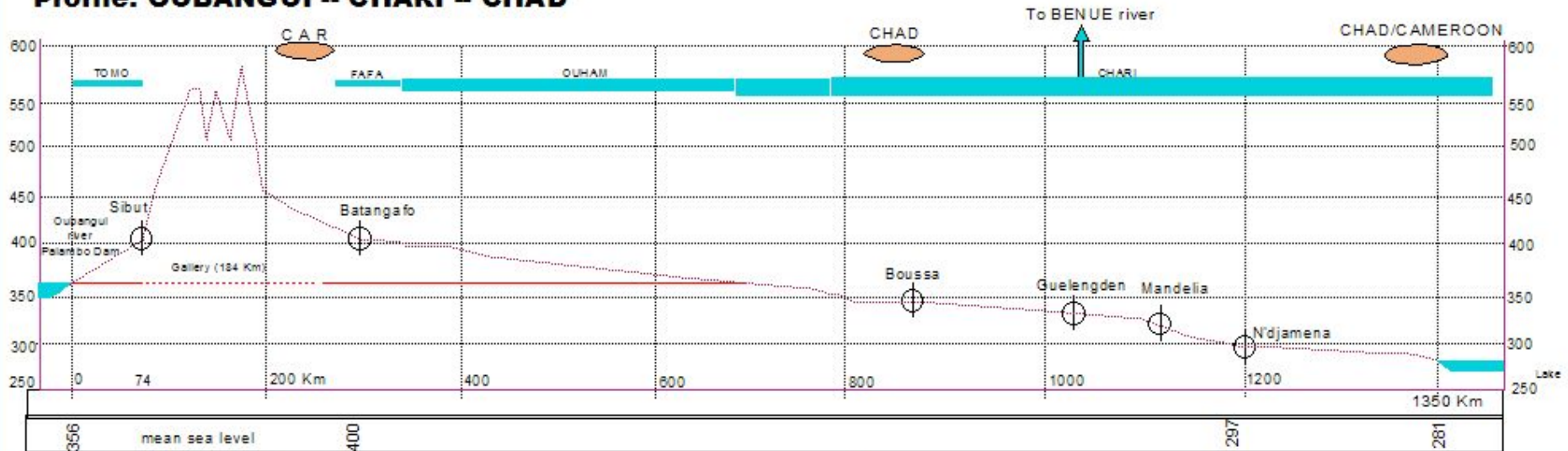


LEGEND	
Y	City
.	Main Town
>	Proposed Port
G	Proposed Palambo Dam
~	Cannal
~	River Enlargement
~	Gallery
~	River
□	The LAKE CHAD
■	Wetlands

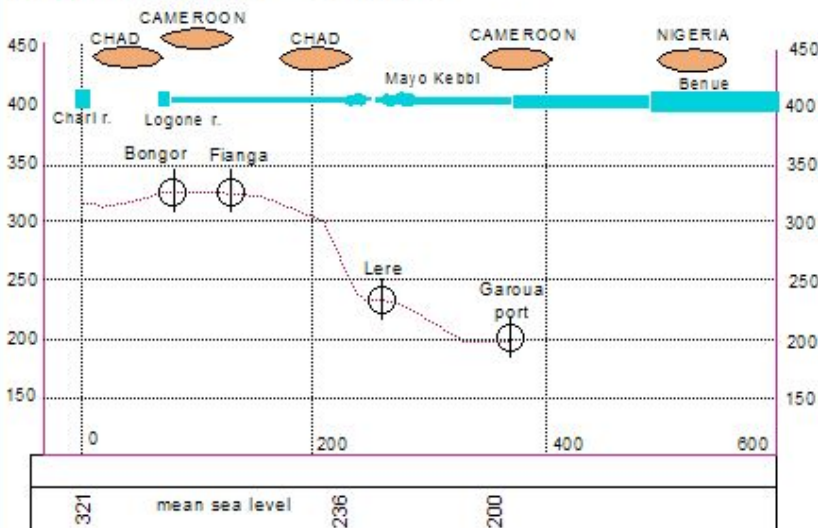


TRANSFER OF WATER TO THE LAKE CHAD (PROFILE)

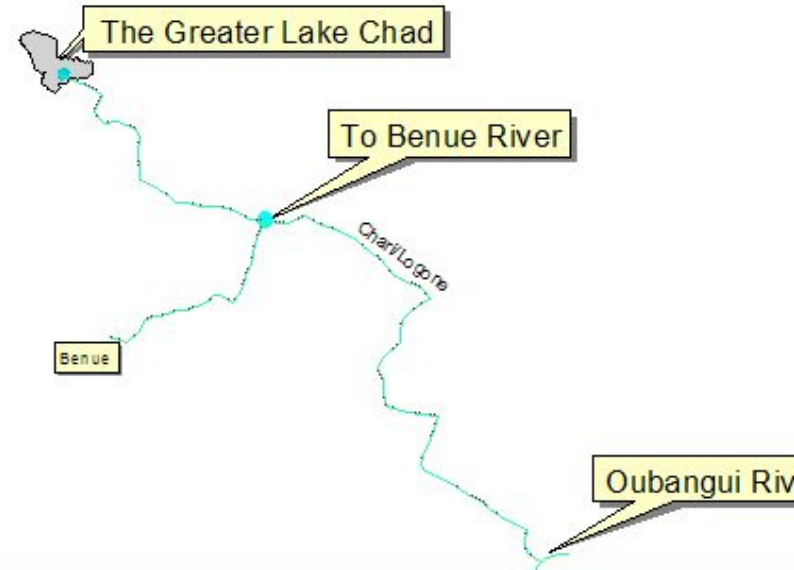
Profile: OUBANGUI -- CHARI -- CHAD



Profile: CHARI -- BENUE



KEY MAP



Development Partners Currently in the Region

- UN Agencies esp:
 - UNDP
 - UNEP
 - UNECA
 - UNESCO
- BMZ/GTZ
- WORLD BANK
- ABEDA
- RAMSAR CONVENTION
- LOCAL NGOs
- ECOWAS
- CEMAC
- GIWA

- FAO
- WMO
- IDB
- RIOB
- GWB
- WWF
- IUCN
- CCCD
- GEF
- EU
- AU

Still Looking for more Partners

Constraints

- Inadequate funding
- Inadequate qualified manpower
- Inadequate tools & equipments
- Insufficient donor assistance
- Absence of National IMC Committees



Thank you for your
Kind Attention
