Integrated Water Resources Management for the Lake Chad Basin





Cattle, Portable Drinking Water, Transport, Irrigation and Fishery.

Engr. Atiku A. Ahmed, MNSE

Director of Water Resources & Environment

Lake Chad Basin Commission

Congo Basin Forest Partnership

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Highlights:

- ✓ *Background*
- ✓ *LCBC Actions*
- ✓ *Definitions & Aims*
- ✓ *LCBC IWRM Challenges*
- ✓ *Technical Commitments*
- ✓ *LCBC IWRM Projects*

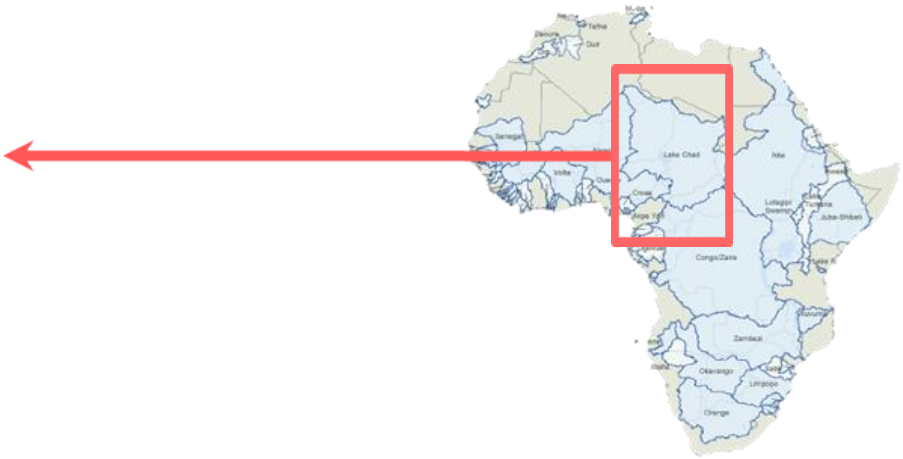
Lake Chad Basin Commission

- ✓ *In 1964 Chad, Cameroon, Niger and Nigeria signed the agreement creating the Lake Chad Basin Commission (LCBC)*
- ✓ *The headquarter of the LCBC is situated in N'Djamena, Chad Republic.*
- ✓ *The two other member countries joined the convention namely: Central African Republic (CAR) and Libya in 1994 and 2008 respectively.*
- ✓ *Surface Area @ inception was 25,000 square km*
- ✓ *Surface Area @ present is 2,500 square km*
- ✓ *The Lake Chad Basin has a population of Thirty (30) Million rural inhabitants, whose livelihood depends on the water resources of Lake Chad Basin.*

One of the largest African basins

2 500 000 km²

A shared inland lake

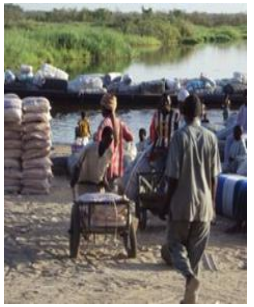


Basin Conventional Surface Area : 967,000 square km

A basin shared by 8 countries. the Lake It self is shared by 4 countries. Chari , Logone, KYB. North of the basin: no direct contribution.

30 million peoples within the basin

- **Consumptive uses:**
  - Irrigation: 150 000 ha - 1,8 km^3
  - Recession irrigation
  - Domestic consumption: 0,5 km^3
  - Cattle: 0,2 km^3
- **Non consumptive uses**
  - Transportation
  - Fisheries – Environment (wetlands) - >Minimum flows (floods, low waters)



Lake Chad Vision: 2025

The LCBC developed Lake Chad Basin Vision: 2025, as stated in the Vision Document 2025 is:

- ***The Lake Chad Region would like to see by the year 2025 the Lake Chad - common heritage and other wetlands maintained at sustainable levels to ensure the economic security of the freshwater ecosystem resources, sustained biodiversity and aquatic resources of the basin, the use of which should be equitable to serve the needs of the population of the basin thereby reducing the poverty level.***

The two principal objectives of the Lake Chad Vision, also consistent with the Africa Vision, are:

- ***A Lake Chad Region where the regional and national authorities accept responsibilities for freshwater, ecosystem and biodiversity conservation and judicious integrated river basin management to achieve sustainable development.***
- ***A Lake Chad Region where every Member State has equitable access to safe and adequate water resources to meet its needs and rights and maintain its freshwater, ecosystem and biodiversity resources.***

Strategic Action Programme (SAP)

SAP for the Lake Chad Basin has been prepared as part of the UNDP-World Bank-GEF project entitled "Reversal of Land and Water Degradation Trends in the Lake Chad Basin Ecosystem" and agreed by the LCBC Member States of Cameroon, Niger, Nigeria Chad, Central African Republic and Libya in 2008.

Primarily addresses the seven priority regional environmental concerns that were identified in the Trans boundary Diagnostic Analysis (TDA), namely:

- ***variability of the hydrological regime and fresh water availability,***
- ***water pollution,***
- ***decreased viability of biological resources,***
- ***loss of biodiversity,***
- ***loss and modification of ecosystems***
- ***sedimentation in rivers and water bodies***
- ***invasive species***

Investment Plan (IP)

- ***The Strategic Action Programme (SAP) which is supplemented by National Action Programmes, resulted in the development of the LCBC Five Year Investment Plan (2013-2017) which consist of fifty seven (57) Projects adopted by the LCBC Summit of Heads of State and Government held in April, 2012 in N'Djamena, Chad Republic.***
- ***It is worth mentioning that the Investment Plan (IP) will be presented to the Donors Roundtable.***

Integrated Water Resources Management

IWRM has been defined as

- ✓ *a coordinated, goal-directed process for controlling the development and use of river, lake, ocean, wetland, and other water assets.*
- ✓ *a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment. (GWP 2000)*
- ✓ *comprehensive, participatory planning and implementation tool for managing and developing water resources in a way that balances social and economic needs, and that ensures the protection of ecosystems for future generations.*

IWRM aims:

- *to promote more equitable access to water resources and the benefits that are derived from water in order to tackle poverty.*
- *to ensure that scarce water is used efficiently and for the greatest benefit of the greatest number of people*
- *to achieve more sustainable utilization of water, including for a better environment.*

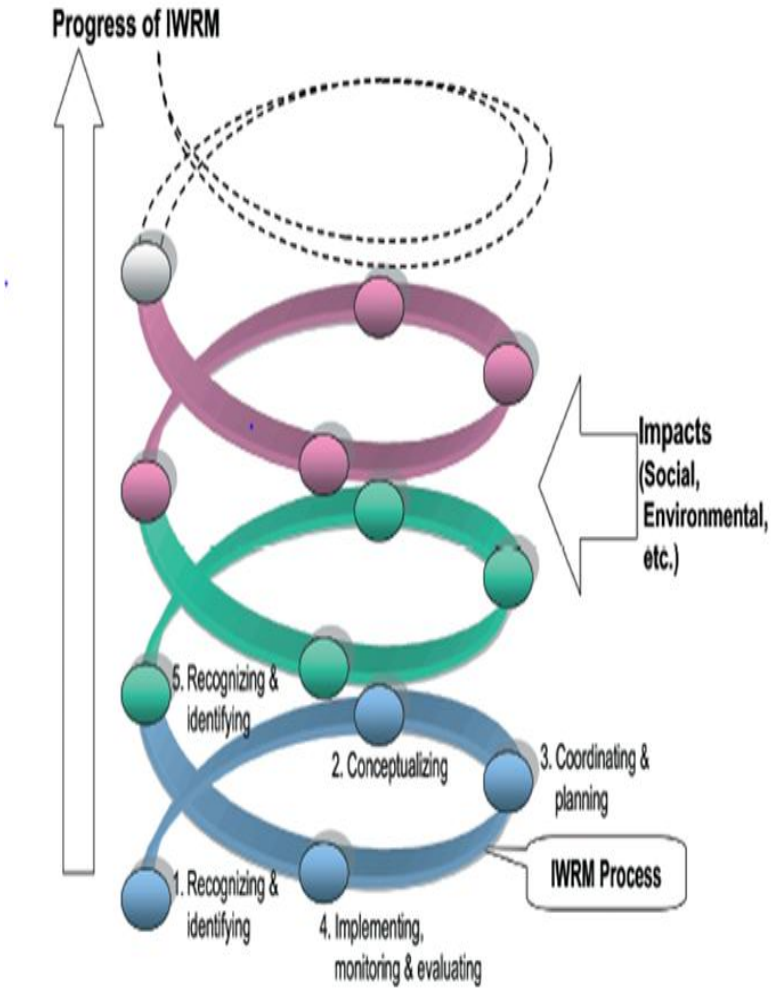
Process

IWRM process is a spiral process, each cycle of the spiral is a project concerning impacts (social, economic, environmental).

The project starts by :

- *Recognizing and Identifying gaps.*
- *Conceptualizing it.*
- *Planning and Coordinating*
- *Implementing, Monitoring and Evaluating*

At the second upper level of the spiral, the process is repeated and then IWRM progress.



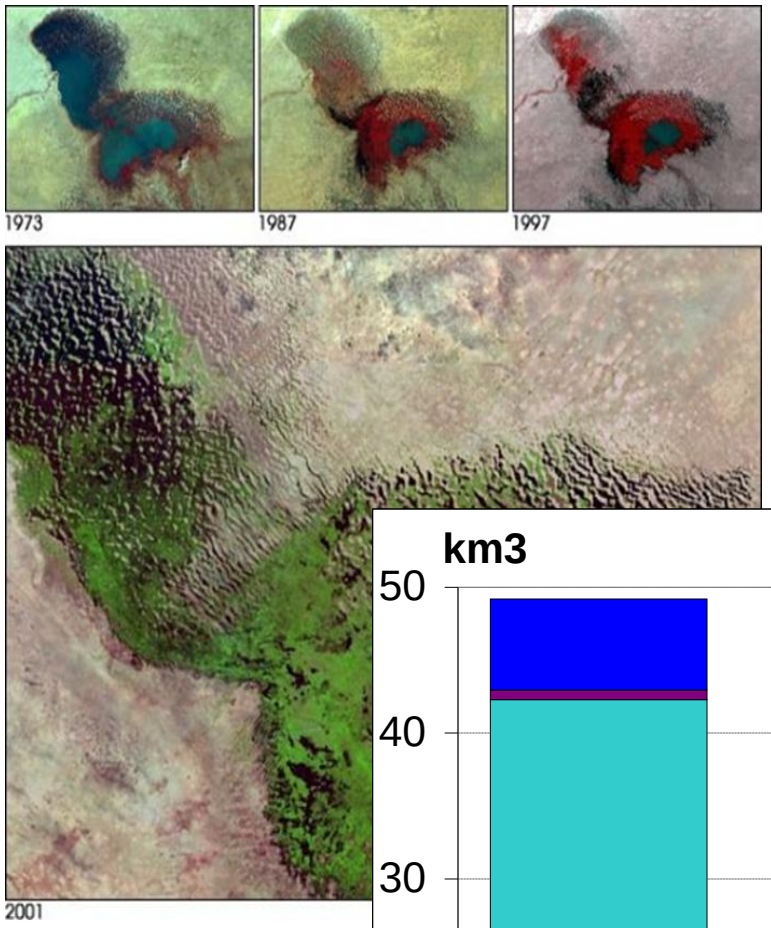
IWRM spiral

LCBC IWRM Challenges

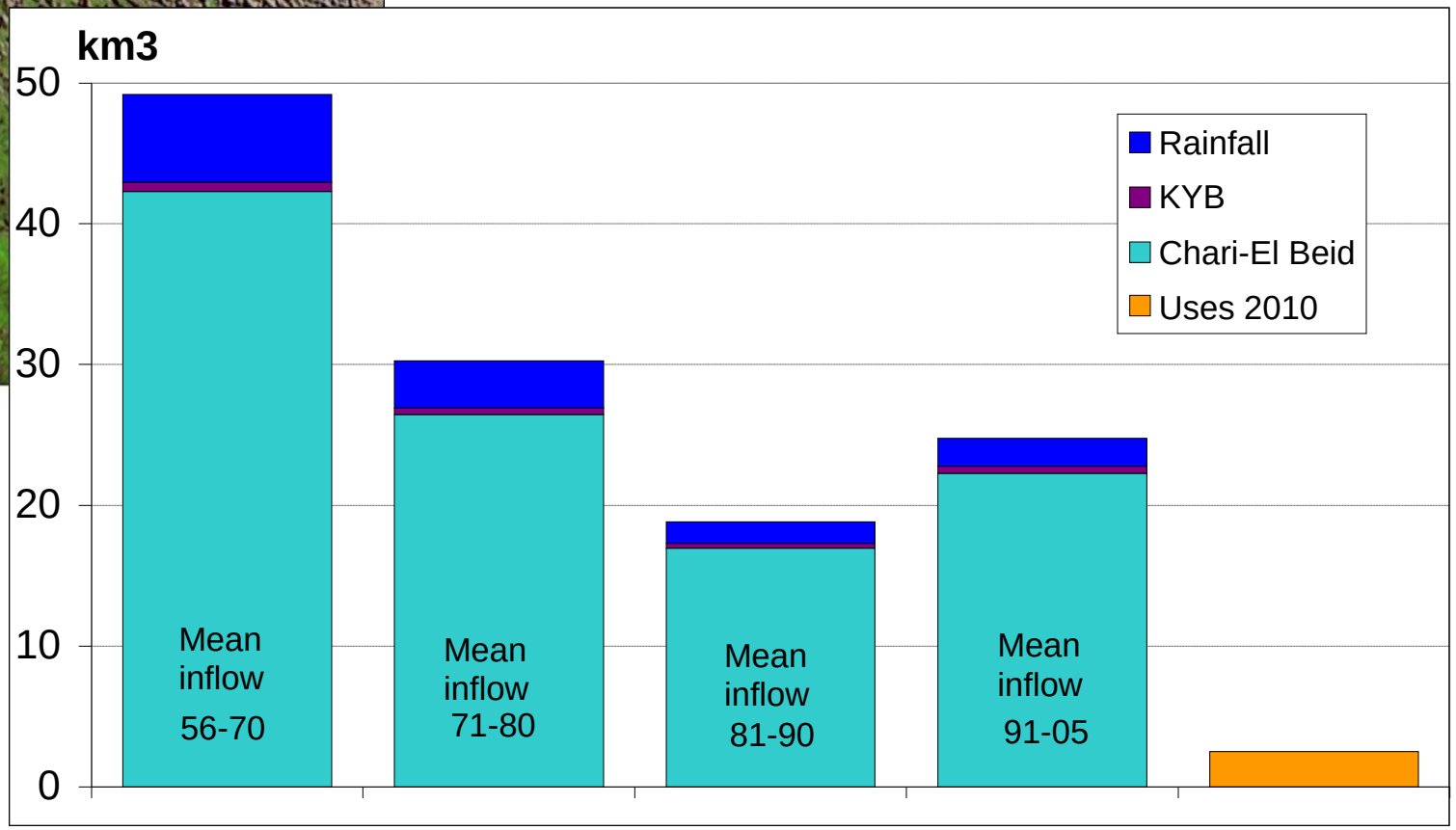
- Major IWRM challenges on the basin
  - Ecosystems, and in particular Wetlands,
  - Resources dependent on water (fish, pasture)
  - Water sharing during low waters, environmental flows
  - Lake filling : Maximum volumes to be abstracted
  - Data sharing
- Anticipate
  - Possible harms for future generations,
  - Crisis situations,
  - Possible conflicts.

- Define limits and practical commitments
- Design a cooperation framework to implement them

The lake Chad is not the Aral sea !

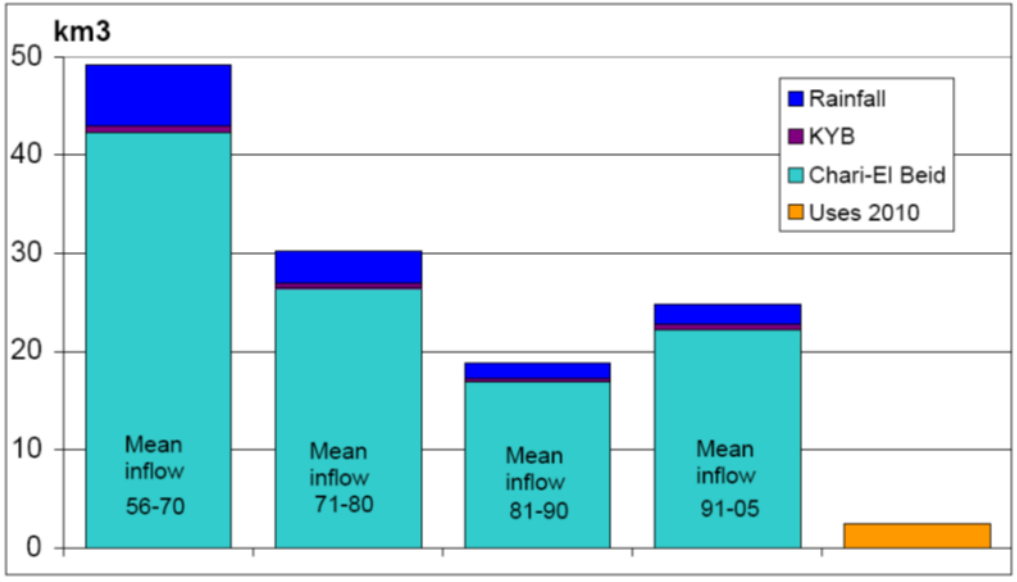


What are the max water abstractions for a limited impact on lake levels?



Technical commitments

- **Water sharing:**
  1. Control the **proportion of water abstractions from inflows** to the Lake
  2. Reserve **minimum flows during dry season** for the tributaries flowing into Lake Chad



Technical commitments

Ecosystems and Environmental Services

3. Reserve a minimum amount of flood waters to ensure that the basin's wetland areas are inundated
4. Preserve ecosystems
5. Create fishing reserves in part of Lake Chad and/or its tributaries.

Technical commitments

- Groundwaters
  6. Adapt groundwater abstraction to aquifer capacity.
- Pollutions
  7. Monitor and control pollutions
- Data management
  8. Share data and ensure smoothly-run exchanges of information

Well protection ???

Protected

LCBC IWRM Projects

IWRM is implemented through programs and projects as follows:

Projects	Donors	Cost	Objectives	Duration	Period
Integrated Management of Trans-boundary Water Resources of the Lake Chad Basin	*EU*	*2.5 millions Euros*	✓ *Reduce poverty, food security and environmental degradation.* ✓ *Management of the basin's water resources in a regional, sustainable, operational and equitable manner.*	*2 years*	*2009 – 2011*
Lake Chad: Sustainable of Surface Water Management	*GIZ*	*6.0 millions Euros*	❖ *Trans – boundary Project Management* ❖ *Improvement of Cooperation between Member States and LCBC*	*9 years*	*2005 - 2014*
Lake Chad : Sustainable Management of Groundwater Resources	*BGR*	*3.0 millions Euros*	▪ *Coordinate data exchange on Groundwater Resources between member states and incorporate them in a management system with a view to prepare sustainable strategies in water resources*	*6 years*	*2008 – 2014*

LCBC IWRM Projects Continued

Projects	Donors	Cost	Objectives	Duration	Period
Water Charter of the Lake Chad Basin	*AWF/LCBC*	*850 millions CFAF/150 millions CFAF*	➢ *Regulation of the waters of Lake Chad and its basin, development of tools for trans-boundary water management aims to reduce poverty and enhance socio- economic development*	*2 years*	*2009 - 2011*
Programme for Sustainable Development of the Lake Chad Basin (PRODEBALT)	*ADB/ Other development partners*	*30 millions UA/30,07 AU*	• *Sustainable conservation of Lake Chad for economic security for freshwater ecosystem, integrated and judicious river basin management for sustainable development and equitable use of natural resources for each country while preserving its ecosystems and biodiversity.*	*6 years*	*2008 - 2015*
Project of the Preservation of Lake Chad – Contribution to the Strategy of the Development of the Lake	*AFD*	*800,000 Euros*	❑ *Define the issue related to water and the related trends and developments;*	*3 years*	*2012 - 2015*

LCBC IWRM Projects Continued

Projects	Donors	Cost	Objectives	Duration	Period
			❑ *Define the major quantitative objectives related to the issue above. These objectives will be the basis of future strategies for the sustainable development of the lake. These quantitative values need to be assessed by the planning model for the management of water in the Lake Chad basin (input data or evaluation of the objective)* ❑ *Set up a cooperation platform between researchers and local stakeholders, mainly decision-makers so as to enable the researchers raise important issues to decision-makers and enable local stakeholders to understand and use the scientific knowledge.*		

LCBC IWRM Projects Continued

Projects	Donors	Cost	Objectives	Duration	Period
			❑ *To observe and model the hydrologic variability and determine the relationship between surface and groundwater in the Lake Chad basin.* ❑ *Support the ratification of the 1997 UN Convention on International Water Courses;* ❑ *Facilitate the implementation of the Water Charter through the support to the and ratification process by member countries;* ❑ *Strengthen the relations with the neighbouring transboundary basin organisms.*		

Highlights of Major Achievements of EU/LCBC Project: Integrated Management of Trans-boundary Water Resources of the Lake Chad Basin

Activities	*Achievement*
✓ *Institutional Strengthening of the LCBC:* *i. Defining responsibilities of Legal Counsel of LCBC* *ii. Support Basin Observatory of LCBC*	✓ *Regional Policies and Institutional Mechanisms are Strengthened*
✓ *Conventional Watershed of the Lake Chad Basin* *i. Support the development of the Water Charter* *ii. Strengthening Institutional and Legal Capacity*	✓ *The Technical framework of IWRM is established*
✓ *Hydrological Modelling and Planning of Water Resources Management*	✓ *The Planning Model and Management of Water Resources in the Lake Chad has been developed and tested.*
✓ *Relationship between Surface Water and Groundwater*	✓ *This activity was carried out by BGR/LCBC Project.*

GIZ- CBLT Project

Lake Chad: Sustainable of Surface Water Management

Objectives:

understand the hydro-meteorological cycle, particularly on:

- ✓ *mechanisms,*
- ✓ *Interactions*
- ✓ *feed backs between atmosphere – biosphere – hydrosphere*

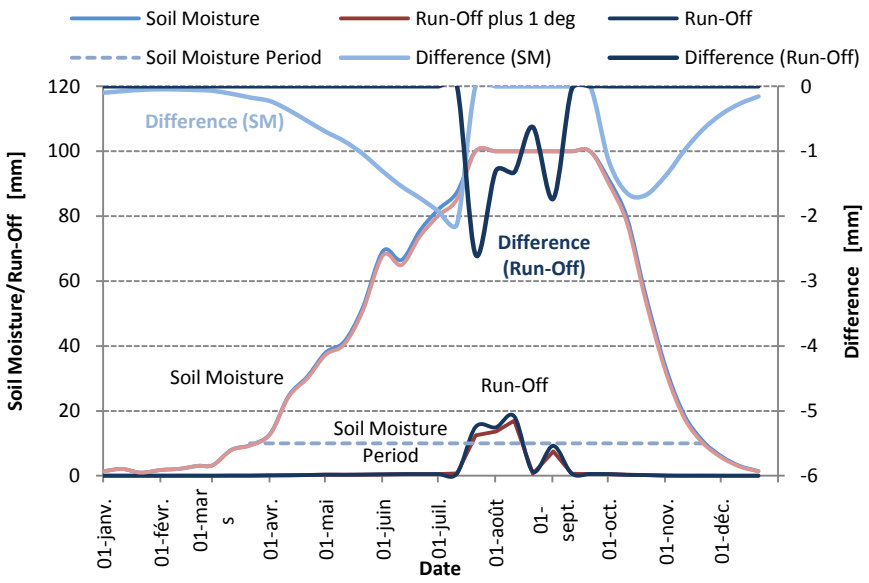
to:

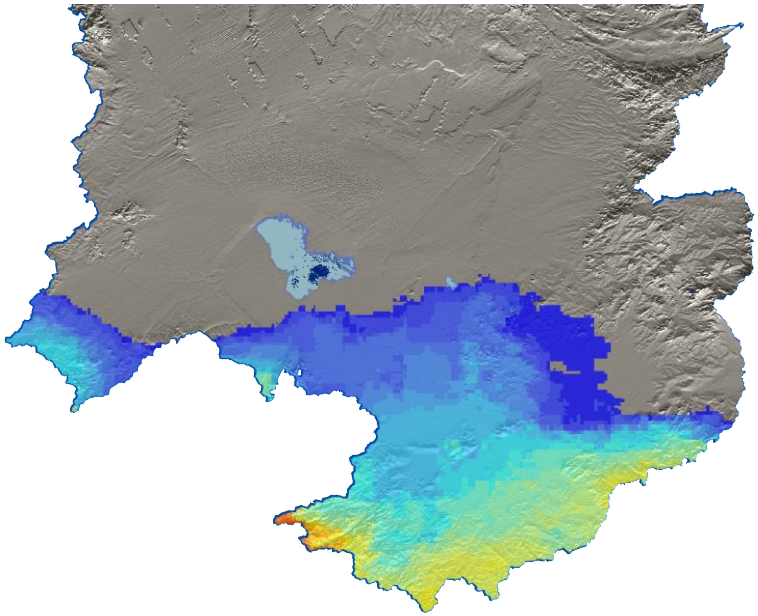
- ➢ *understand and judge the impacts of climate variation (change)*
- ➢ *judge the impacts of human interferences on the hydrological cycle*

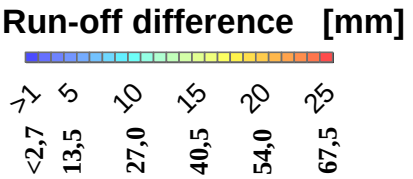
Hydrologic Modelling

Difference:

Run-off at 1°C temperature increase:
-2,3 km³ (-9%) in the 'effective' run-off area







Conclusions

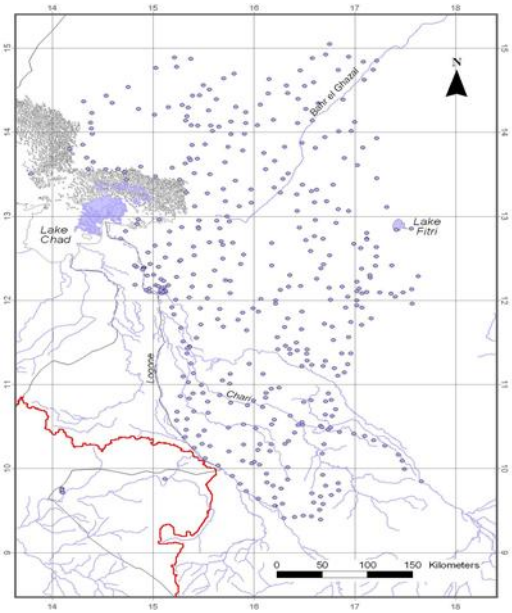
- *Climate change (variation) itself cannot explain observed lake level variations.*
- *Precipitation and river discharge control short term variations of lake's water levels (seasonal, year to year).*
- *Surface runoff itself is not enough to sustain water levels comparable to pre-drought lake levels.*
- *Groundwater is likely to have a long term impact on Lake Chad (on a scale of several years to decades).*
- *Causes for groundwater lowering include - without estimating their contribution - reduction in precipitation, groundwater pumping, irrigation and dams construction.*

BGR-CBLT Project

Lake Chad : Sustainable Management of Groundwater Resources

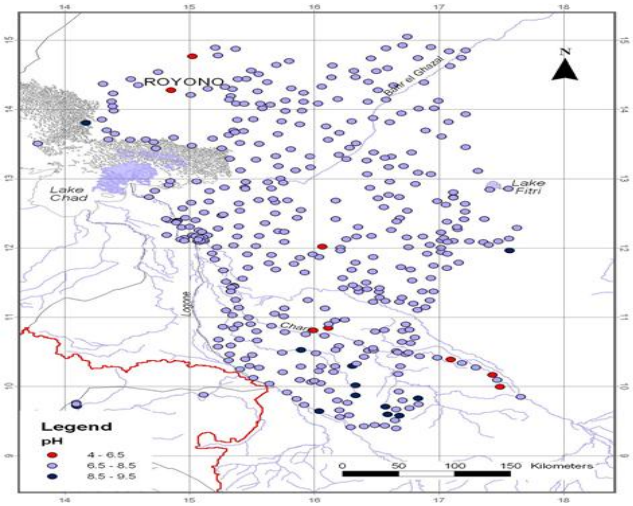
Setup of groundwater monitoring and field investigations /census of 441 water points in Chad

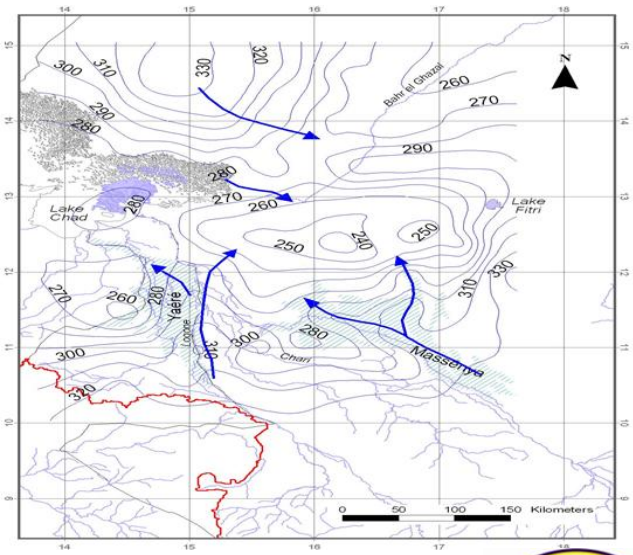
- ***422 groundwater points***
  - ***417 Quaternary***
  - ***5 Pliocne***
- ***19 surface water points***



Project Findings:

Field Measurements	Investigations
• water points location (GPS) • groundwater level • sampling – Anions, cations and tracer – elements – Isotopes: ^{18}O and ^{2}H (383), – ^{3}H (54)	✓ for the quaternary – regional flow direction – geochemical distribution – location of recharge zones ⇒ Groundwater resource ⇒ Protection The current phase study of surface water groundwater interactions in the Chari / Logone sub basin. Study of trans - boundary groundwater issues Capacity development Preparation of digital thematic maps Improvement of CBLT GW-Information System





Highlights of major progress for the LCBC Water Charter

- ***The draft Water Charter of Lake Chad Basin for a rational and equitable management of shared waters of Lake Chad Basin has been developed and adopted by of the 14th summit of Heads of States of the LCBC*** *and* ***is the written translation of a committment process driven step by step***

Statutes

- ✓ ***Recognition of fundamental rights***
  - Right to water and sanitation,
  - International waters,
  - Rights of local populations (genetic heritage, protection of traditional know-how, legal proceedings, gender issues).
- ✓ ***Water sharing***
  - No priority among uses. In case of conflict: drinking water
  - No possibility to reserve future rights to utilise water to the detriment of the existing equitable and reasonable use

Technical issues

- ✓ ***Quantitative water management***
  - limitation of the water abstractions
  - Environmental flows
- ✓ ***Pollution prevention at the source***
- ✓ ***Collection and exchange of data and information***
  - Obligation of collection
  - Harmonisation of the methods
  - Regional database

Cooperation framework

- ✓ ***Interdiction to cause significant harm***
- ✓ ***Settlement of disputes procedures***
- ✓ ***Prior notification for any new Project***
- ✓ ***Notice of emergency,***
  - to LCBC & Member States,
  - Emergency plans (floods, droughts)
- ✓ ***Promotion of common facilities***
- ✓ ***Clear responsibility in basin management.***







Implementation of the Charter

National level

- Obligation to prevent infringements - control,
- National reports of implementation
- National basin agency

International level

- Harmonisation of legal frameworks
- Implementation reports
- Possibility of inspection
- LCBC entitled with more assignements
- Stakeholders forum

Partnership

- participation of non-member states and international organisations

Highlights of Major Activities for the Programme for Sustainable Development of the Lake Chad Basin (PRODEBALT)

Activities	*Stage of Execution*
Component A: Protection of Lake Chad and its basin	
✓ *The Study and Planning of Optimal Management of Reservoirs and Water Supply point of the Basin*	✓ *The Study for Maga Vrick Canal has been completed*
✓ *Clearing out of the Vrick Channel of over 15 km to increase the flow of water into Lake Chad*	✓ *150 million fcfa bidding document for the cleaning works is ready and will be opened in October, 2012.*
✓ *Sensitization Campaign against Water Pollution*	✓ *This activity will conducted in each Member Country in 2013 .*
✓ *Control of Invasive Aquatic Plants in water bodies (12000 ha)*	✓ *The works for removing weeds will be launched in 2013*
✓ *Fixation of dunes over 8000 ha*	✓ *On going*
✓ *Soil moisture conservation of over 27000 ha*	✓ *On going*
Component B: Adaptation of production systems to climate change	
✓ *Extension of the Piezometric Observation Network*	✓ *The preparation of bidding documents*
✓ *Renovation of hydrometric observation network*	✓ *The preparation of bidding documents*
✓ *Improvement of Water Usage in Agriculture through small Irrigation Scheme (15000 ha)*	✓ *The preparation of bidding documents*
✓ *Improvement of Health through the control of Waterbone Diseases*	✓ *The preparation of bidding documents*

PRODEBALT Continued

Activities	*Stage of Execution*
Component C: Institutional Support ✓ *Strengthening of the Lake Chad Basin Observatory* ✓ *Development of Master Plan for the Control of Erosion and Silting of Sand* ✓ *Contribution to the final design of Water Transfer Project from Oubangui River to Lake Chad*	✓ *The preparation of work plan for PRODEBALT support* ✓ *The contract was awarded and will commence in October, 2012* ✓ *The preparation of Terms of References (TORs)*

Highlights of Major Activities for the Project of the Preservation of Lake Chad – Contribution to the Strategy of the Development of the Lake

The major activities of this project includes:

- *Draw a synthesis of the current knowledge to better evaluate the human and environmental interaction in the lake*
- *Better understanding of relations between the lake and the aquifers*
- *Stimulate the support of Member States to the UN Convention on the International Water Courses (1997 Convention) and assist LCBC in the ratification process of the Water Charter by its Member Countries*
- *Help LCBC in the synthesis and dissemination of results*

THANK YOU FOR LISTENING !!

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