

## **Proposal for Forming an IAA Study Group SG 4.12**

### **Title of Study**

SUSTAINABLE MANAGEMENT OF THE RESOURCES OF THE LAKE CHAD  
BASIN

### **Proposer(s):**

*(Must be member(s) of the Academy M or CM)*

Mr. TOMUKUM CHIA

### **Primary IAA Commission Preference:**

*(From Commission 1 to Commission 6) Commission 4-Space Systems Operations and Utilization  
Commissions: 1 Space Physical Sciences, 2 Space Life Sciences, 3 Space Technology & Systems Development, 4 Space Systems  
Operations & Utilization, 5 Space Policy, Law & Economics, 6 Space and Society: Culture and Education*

### **Secondary IAA Commission Interests:**

*(From Commission 1 to Commission 6) Commission 6 Space and Society: Culture and Education*

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### **Members of Study Team**

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#### **Chair(s):**

*(Must be member(s) of the Academy, M or CM)*

Mr. TOMUKUM CHIA  
Dr. Jean – Michel CONTANT  
Prof. Akinyede Joseph,

#### **Secretaries:**

Dr. GARBA HASSAN SAMBOO,  
United Nations Office of Project Services,  
RS and GIS Expert,  
N'djamena, Chad .

Ms Gwain Odette  
Global Centre for Compliance, Hazards and Disaster Management,  
Outer Space Affairs and Emergency Response Office,  
GLOCECOHADIM AFRICA

#### **other Members:**

*(Open to members and non- members of the Academy)*

Prof. Razoumny Yury N. Prof. Sondengam Beibam Lucas, Prof. Miniro Kusakabe, Mr. Mokom  
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Kimeng, Ferdilis Chah.

## Short Description of Scope of Study

### Overall Goal:

*(Expected scientific or practical benefit of the study group's efforts)*

Two IAA Studies were proposed during the First IAA Regional Meeting / Symposium in Cameroon , May, 22-24, 2009, and one study was on the Lake Chad Basin . Lake Chad is shallow with an average depth of 1.5m fed by rivers Chari and Logone,Komadugu-Yube and Ngadda / Yadzeram rivers.Variation in the surface area of the lake ranges from about 2.500km squares in the 1960s to less than 1.700 km Squares in the 1980s with a significant increase to 2.700 kms squares in 2006.The study will investigate the degradation trends using simple image processing techniques with landsat ,TM, ETM + and MERIS.Cross mapping analyses with Landsat TM and ETM + will be used to calculate the historical changes of different seasons/years (Wet/Wet; Dry/Dry; and Wet/Dry) for the next 20-year period (2010 to 2030).It will also show the use of Space Technology to investigate the minimum, maximum and seasonally flooded surface water extent of the Lake (Water Cycle Regime) for one season. The results of on going study by the Lake Chad Basin Commission – LCBC/GEF Project on “reversal of the drying Lake Chad through concerted management of resources in the basin – Water/Energy Balance of the Lake Chad ” are discussed. MSG and/or MODIS images are in use here

The Study Group Two IAA Studies were proposed during the first IAA Regional Meeting / Symposium in Cameroon , May, 22-24, 2009, and one study was on the Lake Chad Basin . Lake Chad is shallow with an average depth of 1.5m fed by rivers Chari and Logone,Komadugu-Yube and Ngadda / Yadzeram rivers.There is great variation in the surface area of the lake from about 2.500km squares in the 1960s to less than 1.700 km Squares in the 1980s with a significant increase to 2.700 kms squares in 2006.The study will investigate the degradation trends using simple image processing techniques with landsat ,TM, ETM + and MERIS.Cross mapping analyses with Landsat TM and ETM + will be used to calculate the historical changes of different seasons/years (Wet/Wet; Dry/Dry; and Wet/Dry) for the next 20-year period (2010 to 2030).It will also show the use of Space Technology to investigate the minimum, maximum and seasonally flooded surface water extent of the Lake (Water Cycle Regime) for one season. The results of on going study by the Lake Chad Basin Commission – LCBC/GEF Project on “reversal of the drying Lake Chad through concerted management of resources in the basin – Water/Energy Balance of the Lake Chad ” are discussed. MSG and/or MODIS images are in use here

was constituted with proposed issues focusing on: (1) identify priority the ecological situation in the area of the Lake Chad basin.Utilisations of satellite information to evaluate the state of the land internal water reservoirs. Projecting adequate, cheap, and affordable Space monitoring methods and procedures using the existing and promising space systems to organize water reservoirs' monitors in the ecological disaster regions of the Lake . Propose best approach and practices

Instructions and application form: see: "Scientific Activity" section at <http://iaaweb.org/content/view/256/393/>

especially in the areas of disaster mitigation, food security, water recycle, energy and environment; (2) present spatial information and technology availability or possibility for IAA-SGEI;

The studies would apply Remote Sensing and GIS techniques to quantify the degradation trends of the Lake Chad wetland. It involves use of simple digital image processing techniques with Landsat TM, ETM + and ASTER. The lake water is shallow with average depth of 1.5m and fed by the Chari and Logone river systems.

(3) recognize gaps among IAA members, organizations, and countries for the cooperation on IAA-SGEI; and (4) propose the IAA-SGEI implementation plan and action lines for 2010-2011.

**Intermediate Goals:**

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**Methodology:**

*(Email works, workshops, stand alone conferences, interim publications, etc.)*

IAA Study Group on Cooperation Program for Global Environmental Impact (IAA-SGEI for short) will have the first international workshop on Coordination and Cooperation for Global Environmental Impact from 29-30 May 2010 at the Institute of Remote Sensing Application , Chinese Academy of Sciences, Beijing , China .

**Time Line:**

*(Cannot exceed three years)*

**Final Product (Report, Publication, etc.):**

Report

**Target Community:**

**Support Needed:**

**Potential Sponsors:**

*To be returned to the IAA Secretary General Paris*

*by fax: 33 1 47 23 82 16 or  
by email: [sgeneral@iaamail.org](mailto:sgeneral@iaamail.org)*

**Date:**

*(No Signature required if document authenticated).*

***Follow-up Section for IAA use only***

***Initial Phase***

***Application received:***

***Commission Approved:***

***SAC Approved:***

***Web Site Section opened:***

***Members Formally Appointed by IAA:***

***Final Phase***

***Peer Review by Commission Completed:***

**Recommended by the Commission:**

**Final Report Received:**

**SAC Approved:**

**BOT Accepted:**

**Publisher Selected:**

**Study Published:**

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International Academy of Astronautics (IAA)- Academician  
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