



国际气候与环境科学中心
International Center for Climate and Environment Sciences



Reports of COMSATS International Thematic Research Group on “Climate Change and Environmental Protection”

Zhaohui LIN

**International Center for climate and Environment Sciences
Chinese Academy of Sciences**



Contents



I

Broad Objectives of COMSATS ITRG

II

Group Activities in 2015-2016

III

Plan for Group Activities in 2016 -2017



I. Broad Objectives of COMSATS ITRG



- **To achieve South-South cooperation by creating linkages among the organizations working in the “climate and environmental sciences” in the developing countries:**
 - **Joint Research Projects**
 - **Experts Exchange**
 - **Knowledge Sharing**
 - **Capacity Building**
 - Short-term (Training Course, Visiting Scientist Program)
 - Long-term (Post graduate Studies; PhD and Master Programs)
 - **Sharing of Facilities and Resources**



II. Activities of COMSATS ITRG



1. New International Collaboration Established

- Status of group members
- Visiting and MoU signing

2. Capacity Building Activities

- International Training Symposium and Workshop
- Graduate students and Postdoc program
- Short-term visiting

3. Research Progress from ITRG members



II. Activities of COMSATS ITRG



1. New International Collaboration Established

- Status of group members
- Visiting and MoU signing

2. Capacity Building Activities

- International Training Symposium and Workshop
- Graduate students and Postdoc progra
- Short-term visiting

3. Research Progress from ITRG members



Status of ITRG Group Members



➤ China: ICCES (Lead Center)

1. Pakistan: CIIT, PMD
2. Thailand: HAI (Hydro-Agro Information Institute)
3. Sri Lanka: ITI
4. Nigeria: Department of Physics, Imo State University
5. Iran: IROST, SCWMRI (Soil Conservation and Watershed Management Research Institute)
6. Malaysia: Centre for Electromagnetic and Lightning Protection, Faculty of Engineering, University Putra Malaysia
7. Bangladesh: Institute of Water and Flood Management, Bangladesh University of Engineering and Technology
8. Nepal: Himalayan Cryosphere, Climate and Disaster Research Center, Kathmandu University



Status of ITRG Group Members



9. Mongolia: Institute of Meteorology, Hydrology and Environment, Mongolia (IMHE)
10. Ethiopia: National Meteorological Agency
11. Uganda: Department of Meteorology, Ministry of Water and Environment
12. Sudan: Sudan Meteorological Authority

New Members:

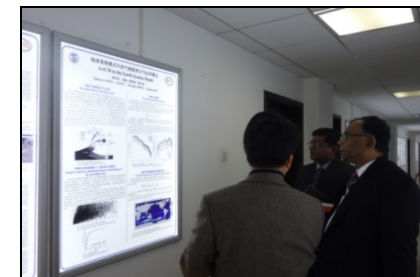
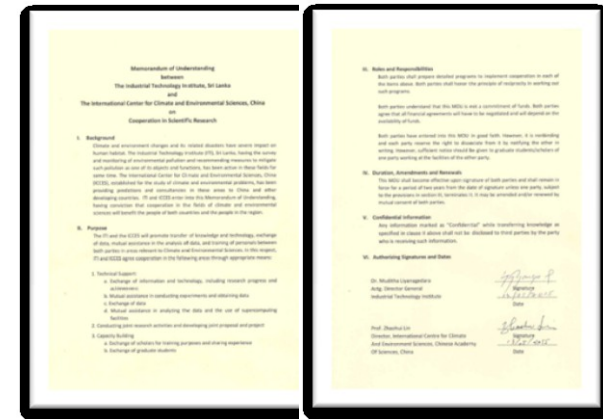
1. Chiang Mai University, Thailand
2. University of Ruhuna, Sri Lanka
3. High Mountain Research Center (HMRC), CIIT Abbottabad (Established 2015) --- **Dr. Bahadar Nawab**
4. Water Research Centre (WRC), CIIT Abbottabad (Approved 2015), UNESCO Category II Centre



Visiting & MoU Signing - Sri Lanka



- Prof. Zhaohui Lin visited Industrial Technology Institute (ITI) of Sri Lanka in 2015. The collaborative MOU was signed regarding the scientific cooperation between ICCES and ITI.
- Prof. Gamini Senanayake, vice Chancellor of University of Ruhuna (UoR), Sri Lanka, and Tilak Priyadarshana, Professor of UoR and director of center for international affairs, visited ICCES in 2015. Both parties agreed that the collaboration between ICCES and University of Ruhuna could be started with collecting data, data sharing and joint research in the field of climate and environmental science.



Visiting - Thailand



- ICCES scientists visited Chulalongkorn University, King Mongkut's University of Technology Thonburi, Hydro and Agro Informatics Institute (HAI), and Chiang Mai University in December, 2015.
- The main topic of this visit is to share joint research progress on seasonal climate prediction, and to explore and enhance further collaboration on climate and environment topics of common concern, e.g., the modeling and prediction of hydrological events such as flooding and drought, observation and simulation of air pollution such as severe haze induced by biomass burning, and research on vegetation-land-atmosphere interaction.



Visiting - Germany



- Dr Iftikhar A Raja and Dr Jamshed Iqbal visited University of Bonn in October 2015.
- They attended “Inter-disciplinary workshop on Research and Curriculum Development in Pakistan” organized by Institute of Crop Sciences and Resources Conservation (INRES).
- Dr Iftikhar A Raja gave a presentation of “Climate Change and Environmental Protection: Initiatives by CIIT, Pakistan”.



Visiting - Germany



- International Biochar Symposium, Geisenheim (27.09-30.09.2015), Germany, funded by DAAD Germany & CIIT Pakistan (AHMalik).
- Participation in the Climate Change Event in Berlin (organised by the famous Weekly German Newspaper “Die Zeit”), Berlin (01.10.15), funded by DAAD Germany & CIIT Pakistan.
- Visited Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany



II. Activities of COMSATS ITRG



1. New International Collaboration Established

- Status of group members
- Visiting and MoU signing

2. Capacity Building Activities

- International Training Symposium and Workshop
- Graduate students and Postdoc program
- Short-term visiting

3. Research Progress from ITRG members



Data Assimilation Summer School

- The “Data Assimilation Summer School” was held during July 1-3, before the 14th CTWF symposium.
- **180** participants, including **30** overseas participants from 10 developing countries

□ Topics:

- ✓ Basic algorithm and development of Data Assimilation
- ✓ Introduction of several data assimilation methods (3Dvar, 4Dvar, and EnKF);
- ✓ Observation processing, and Quality control (Satellite, and Radar, etc.);
- ✓ Key issues on applying the EnKF data assimilation method (Localization, Inflation, model uncertainty, etc.);
- ✓ Applications of complex data assimilation (including parameter estimation, observation impacts and targeting, and assimilation of rainfall observations, etc.);
- ✓ Data assimilation for coupled model, ocean model, land surface and Hydrology model, and atmospheric chemistry and transport data assimilation.



Data Assimilation Summer School
1-3 July 2015, Beijing, China

WCRP CORDEX Science and Training Workshop in East Asia

“The WCRP CORDEX Training Workshop in East Asia” ,23-26 November 2015,Beijing.

More than **50** students and young scientists from East and Southeast Asia region, including **Mongolia, China, Thailand, Pakistan, Malaysia, Indonesia, Vietnam, Myanmar, Sri Lanka**, took part in the training part.



The fourth ITRG meeting held in Colombo, Sri Lanka

4th ITRG meeting was held on May 16, 2015, at Industrial Technology Institute (ITI), Colombo, Sri Lanka.

Participating groups from 7 countries: Bangladesh, China, Iran, Malaysia, Pakistan, Sri Lanka, Thailand



The fourth ITRG meeting held in Sri Lanka



Nine sub-groups was created and their tentative coordinators being designated respectively :

- ① Dust Storms (Noroozi, Iran)
- ② Floods and Landslides (Shahina Tariq, Pakistan)
- ③ Droughts (Zhang He, China)
- ④ Hydrological Extremes (Tarekul Islam, Bangladesh)
- ⑤ Thunderstorm and lightening (Chandima Gomes Malaysia)
- ⑥ Cyclones and Storm surge (Basnayake, Thailand) -
- ⑦ Air, Water and Land Pollution (Lin , China)
- ⑧ Climate Modeling (Saiful Islam, Bangladesh)
- ⑨ Risk Management (Basnayake,Thailand; Lin, China)

Students & Postdocs



◆ PhD program in ICCES

- ✓ Thailand: Kritanai Torsri; Nigeria: Victor Nnamdi Dike; Sri Lanka: Sherly Selton.

◆ Postdoc program:

- ✓ Two young scientists: Bushra Khalid from CIII, Pakistan and Worachat Wannawong from Hydro and Agro Information Institute (HAI), Thailand,
- ✓ Dr. Bushra Khalid won the **Gro Brundtland Award** February 26, 2016.

Dr. Worachat Wannawong	Study of the regional operating model with a Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) Modeling System
Dr. Bushra Khalid	Model the spatial and temporal variations of physical environment that are mainly responsible to cause the outbreak of dengue fever.
KRITANAI TORSRI	To develop a seasonal rainfall forecasting system using a dynamical model for Thailand
DIKE VICTOR NNAMDI	Analytical and Simulation Studies of Extreme Weather & Climate Events over West Africa



Short-term visiting



- Visiting Professor Fellowship by CAS
 - ✓ Prof. Okey Nwofor from Nigeria, working on air pollution
 - ✓ 25,000 USD support for 3-months' visit

- Short-term visiting program by ICCES
 - ✓ Dr. **Chakrit Chotamonsak** from Chiang Mai University visited ICCES from November to December, 2015.
 - ✓ Dr. Chotamonsak presented their research progress on the simulation and prediction of climate change in Thailand.



In 2015, **7** visiting scholars from institutes and universities of different countries, were invited to visit ICCES and conduct collaborative research

II. Activities of COMSATS ITRG



1. New International Collaboration Established

- Status of group members
- Visiting and MoU signing

2. Capacity Building Activities

- International Training Symposium and Workshop
- Graduate students and Postdoc program
- Short-term visiting

3. Research Progress from ITRG members



Major Research Achievements - Bangladesh

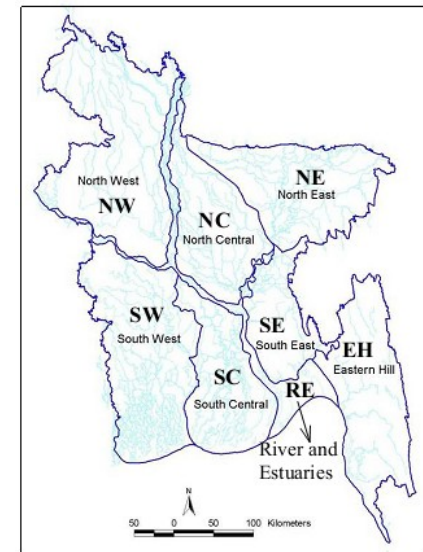


Institute of Water and Flood Management, Bangladesh University of Engineering and Technology

- ✓ Characteristics of Low Flow Extremes of the Brahmaputra River in Bangladesh under Climate Change Background
- ✓ Analysis of Trend and Variability of Precipitation and Temperature in Bangladesh to Assess the Impact of Climate Change
- ✓ Probability Distribution of Daily Precipitation Extremes in Bangladesh using L-Moment Approach

Low flow extreme	1956-1980		1981-2004	
	PPCC (Best fitted PDF)	Best fitted PDF	PPCC (Best fitted PDF)	Best fitted PDF
1Q	0.97867	EV3	0.96928	LN3
3Q	0.97622	EV3	0.99333	EV3
7Q	0.97282	EV3	0.99270	EV3
14Q	0.98541	EV3	0.98895	EV3
30Q	0.99115	EV3	0.97705	EV3

Change of Probability Distributions of the Low Flow Extremes



Hydrological regions of Bangladesh

Major Research Achievements - Pakistan



Department of Meteorology, COMSAST Institute of Information Technology

- Quantifying spatio-temporal changes in the extent of annual floods and disaster risk hazard assessment in Khyber Pakhtunkhwa from 2010 to 2013
- Quantify Assessment of Flood Affected Areas of Punjab Province (2010-2014) by using GIS Techniques

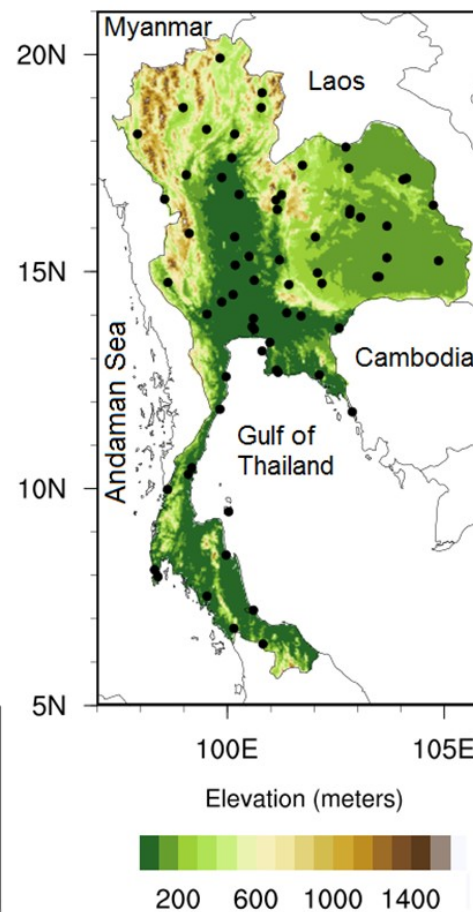
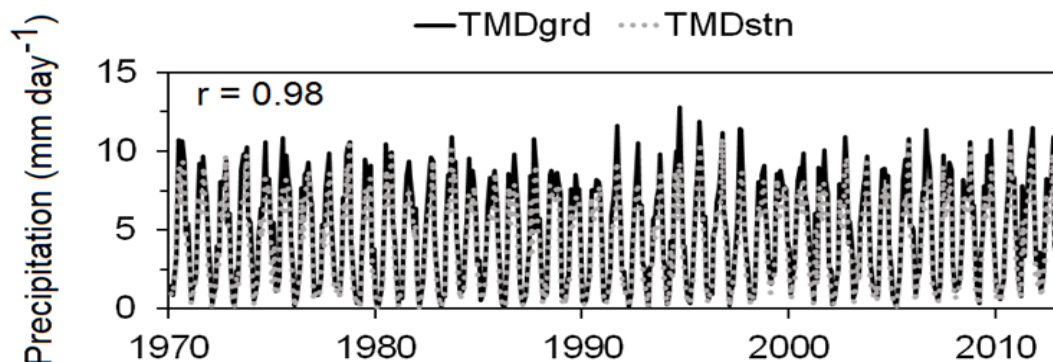


Major Research Achievements - Thailand



Hydro and Agro Information Institute, Ministry of Science and Technology, Thailand

- Development of a seasonal rainfall forecasting system using a dynamical model for Thailand
- Rainfall datasets have been collected over Thailand, and have been compared and evaluated with each other

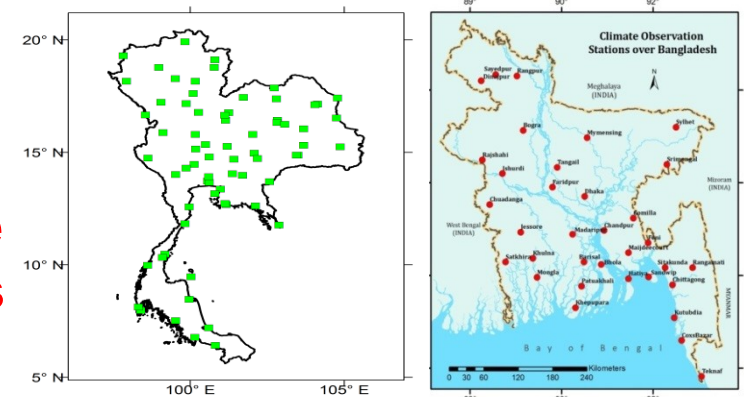
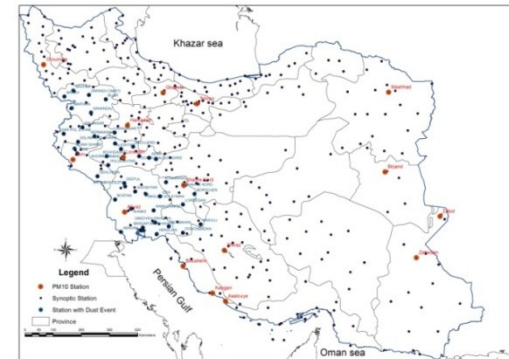


The International S&T Cooperation Program



Characteristics and Mechanism of the Extreme Climate Events under the Climate Change Background

- The International S&T Cooperation Program of China sponsored by MOST has successfully passed the final evaluation
- Meteorological observation data in the past 20-30 years from **Bangladesh, Nigeria, Sri Lanka, Mongolia, Nepal, Iran and other countries** has been collected
- ITRG carried out joint studies **to analyze the characteristics of extreme weather events in the above countries**, such as the characteristics of the meteorological disasters in Mongolia during the 1989-2013, and the decadal variations of flooding in Iran, etc.



III. Future Plan for Group Activities



- ❑ **2016 ICCES international training workshop**
- ❑ **Short-term visiting scholars and PhD students**
- ❑ **More institutions from COMASTS member countries**



2016 ICCES International Training Workshop



Basic Information:

1. Theme: Atmospheric Aerosol
2. Time: 25-27 September, 2016
3. Venue: Beijing Foreign Experts Building, Beijing, China

Topics:

- Aerosol observation
- Aerosol modelling
- Aerosol physics and chemistry
- Aerosol and air quality
- Aerosol and climate interaction

Welcome to join us!

<http://2016ctwf.csp.escience.cn>

Invited Lecturers:

□ Prof. **Brian Toon** (Department of Atmospheric and Oceanic Sciences and Research Scientist, LASP, Univ. Colorado)

□ Prof. **Margaret Tolbert** (Department of Chemistry and Biochemistry and CIRES, Univ. Colorado)

□ Prof. **Xiaohong Liu** (Department of Atmospheric Science, Univ. Wyoming)

□ Ms. **Mian Chin** (Goddard Space Flight Center, NASA)

11 participants coming from **Pakistan, India, Nigeria, Norway, USA, Ghana and China** have already registered at the website:



International Lecture Courses on Atmospheric Aerosol

25-27 September 2016 Beijing, China



Background:

With the rapid pace of industrialization and urbanization, there is a significant increase of the atmospheric aerosol concentrations. Atmospheric aerosols produced from human activities and natural processes significantly impact radiation, clouds, precipitation and regional and global climate. Aerosol pollution also has deteriorate effects on air quality, visibility, and causes substantial environmental, societal and economic issues.

In order to bring together experts to exchange ideas, discuss scientific problems in depth, and consider suitable solutions to aerosol-related issues through coordinated efforts, the international lecture course on atmospheric aerosol will be organized by the CAS-TWAS center of Excellence for Climate and Environment Sciences (ICCES).

Topics (Tentative, please modify):

- Aerosol observation
- Aerosol modelling
- Aerosol physics and chemistry
- Aerosol and air quality
- Aerosol and climate interaction

Important Dates:

Deadline for On-line Registration: *July 1, 2016*
Deadline for Abstract Submission: *July 1, 2016*
Notice of Abstract Acceptance: *July 31, 2016*

Invited Lecturers:



- Prof. **Brian Toon** (Univ. Colorado)
Professor, Department of Atmospheric and Oceanic Sciences and Research Scientist, LASP
- Prof. **Margaret Tolbert** (Univ. Colorado)
Distinguished Professor, Department of Chemistry and Biochemistry and CIRES
- Prof. **Xiaohong Liu** (Univ. Wyoming)
Professor and Wyoming Excellence Chair in Climate Science, Department of Atmospheric Science
- Ms. **Mian Chin** (NASA)
Physical Scientist, Goddard Space Flight Center

Local Organizing Committee:

Prof. **Zhaohui Lin**, Institute of Atmospheric Physics, Chinese Academy of Sciences
Prof. **Xiaohong Liu**, Department of Atmospheric Science, University of Wyoming

Organizer:

CAS-TWAS Center of Excellence
for Climate and Environment Sciences
(ICCES)
Institute of Atmospheric Physics(IAP)

Contact:

MS. Wencheng (Diane) CHEN
CAS-TWAS Center of Excellence
for Climate and Environment Sciences(ICCES)
Institute of Atmospheric Physics(IAP/CAS)
P.O.Box 9804, Beijing 100029, China
E-mail: dwf@mail.iap.ac.cn
Tel: +86 10 82995124
Fax: +86 10 82995123

- Theme: Atmospheric Aerosol
- Time: 25-27 September, 2016
- Venue: Beijing

<http://2016ctwf.csp.escience.cn>



Short-term visiting scholars and PhD students



Under the support of COMSATS, CAS, TWAS, ICCER can:

- ◆ Invite selected ITRG member as the visiting scholars for collaborative research on the extreme events in their respective countries
- ◆ Encourage young scholars from developing countries to apply for CAS-TWAS president's Fellowship for PhD study



How to join us (ITRG-CCEP)



Open to all research institutions from COMSATS member countries. Those who are interested in joining with us, please follow the procedures:

Preparing the proposal on the extreme events weather and climate studies for respective countries:

1. Specify the topics on extreme events: Drought, Flooding, Dust Storm, etc
2. Identify the focal point both for research and management for respective group
3. Describe the feasibility of the research project, especially the availability of the meteorological datasets needed for the research
4. Draft working plan and timeline for the execution of the project



Submit the proposal to group leader, and modify the proposal as suggested



Discussion of Group leader with COMSATS for final decision



Formal Certification Letter from COMSATS and Group



Thank You !