



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



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

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



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I. Broad Objectives of TG-CCEP

- **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 TG-CCEP (2012-2013)

1. International workshop

- 2012 CTWF International Workshop

2. First ITRG-CCEP project officially launched

- Formally approval of Chinese MOST international collaboration project (2011DFG23450)

3. New International Collaboration Established

- Proposal on “Mountain Meteorology and Extreme Weather hazards at CIIT”

4. Joint Research Activities

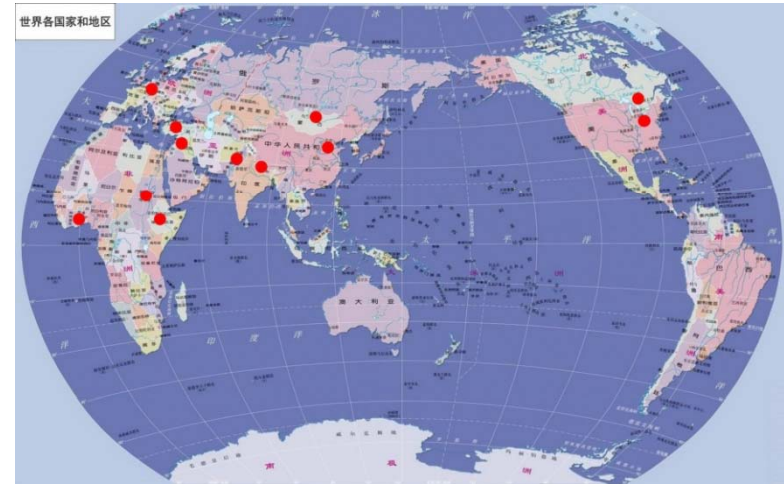
5. Capacity Building





1. International Workshops - CTWF 2012

**11th CAS-TWAS-WMO FORUM:
International Workshop on “Terrestrial
Ecosystems under the Changing Climate”
was held on September 2-5, 2012 in
Beijing, China.**



**11th CTWF International Workshop
Terrestrial Ecosystems under the Changing Climate**
September 2-5, 2012, Beijing, China



**Attendees: about 70
participants, including
22 international
representatives
coming from 9
developing countries
and 3 developed
countries.**



The main objective of the workshop was to investigate the changes in terrestrial ecosystem as well as its interaction with climate change, focused on two aspects: (i) Ecosystem structure, functioning, and biodiversity; and (ii) Biophysical and biogeochemical processes in terrestrial ecosystem.



The workshop had totally 37 presentations, covers various topics from the ecosystem research network, observation and simulation of ecosystem structure, functioning and biodiversity, development and application from mathematical theoretical ecological model to comprehensive earth system model, vegetation-atmosphere carbon and nitrogen cycling, etc.



2. First ITRG-CCEP project



□ International S&T Cooperation Program of China

科学技术部文件

国科发计〔2012〕229号

关于2011年度国家国际科技合作 专项第二批项目立项的通知

中国科学院 _____:

按照《国家科技计划管理暂行规定》和《国家科技计划项目管理暂行办法》的有关要求，国家国际科技合作专项2011年度第二批项目立项工作已经完成。经研究，现批准你单位推荐的由_____

中国科学院大气物理研究所

承担的_____气候变化背景下极端气候事件的规律及机理_____项目
(项目编号: 2011DFG23450)
作为2011年度国家国际科技合作专项第二批项目予以立项。

请按照国家国际科技合作专项管理的有关规定和要求,认真组

✚ Program title:

“Characteristics and mechanism of the extreme climate events under the climate change background”

✚ Domestic participants:

- International Center for Climate and Environment Sciences (ICCES)
- National Meteorological Information Center, China
- Research Institution of Meteorological Science, Yunnan Province

✚ International partnership

- COMSATS member countries





2. First ITRG-CCEP project

● Project Progress Timeline:

- November 2010 Thematic group discussion
- July 2011 First research proposal drafted by ICCES and submitted to MOST, CHINA, with COMSATS' help in identifying potential research collaborators
- November 2011 Submission of the modified version of proposal, with project been preliminarily approved by MOST
- January 2012 Project been formally approved by MOST
- April 2012 Budget been approved by MOST, with 3 years project initiated from May, 2012

● Total budget and duration

- 1 million CNY
- 1 May, 2012 – 30 April, 2015





2. First ITRG-CCEP project

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

1. GCISC/Pakistan
2. HiCCDRC/Kathmandu University/Nepal
3. IROST/Iran
4. CIIT
5. Sudan Meteorological Authority
6. Zimbabwe Meteorological Service
7. SPARCO/Pakistan
8. Pakistan Meteorological Department

Member of COMSATS'
ITRG-CCEP

Other Collaborators:

1. HAI/Thailand
 2. JGSEE/Thailand
 3. **African countries? (Ghana)**
 4. **South American countries?**
- And more....





3. New International Collaboration Established

- The concept paper on the “Establishment of Research Group on Mountain Meteorology and Extreme Weather hazards at CIIT” has been proposed by CIIT, with support from ICCES and other international partners;
- The new collaboration between ICCES and KMUTT (King Mongkut’s University of Technology Thonburi), Thailand has been established, with the visit of Prof. Prugchan Wongwises to ICCES during October 15-17, 2012. And the Research Network on Seasonal Forecast in Thailand is being formed.
- Under the framework of ITRG, the joint research plan between ICCES and Iran, under the leadership by Mahmoud Molanejad- IROST, with participation from Atmospheric Science and Meteorological Research Center, and Soil Conservation & Watershed Management Research Institute, has been proposed.





3. New International Collaboration Established

- The joint research plan titled “Analytical and Simulation studies of Extreme Weather Events in Nigeria” has been proposed.
- At CIIT, a group on Climate Change entitled “CLIMATE CHANGE AND ECOSYSTEMS” has also been proposed. The group will be linked with the thematic group on “Climate Change and Environmental Protection” at ICCES, China in due course. Based on the expertise available at CIIT, the group is expected to explore the risks and hazards arising from the interactions between ecological systems and the changing climate. Apart from linking relevant strengths in the natural and social sciences within CIIT, the group will extend its collaboration to other relevant groups around the world





4. Joint Research Activities

- **Establishment of Data Center and its applications for climate research at COMSATS member countries**
- Transferring of IAP seasonal climate prediction system





● ***Climate Data Bank***

- ❑ Daily air temperature (maximum and minimum) and daily rainfall data of 25 stations in Nepal around 1980 to 2007 has been collected by HiCCDRC, Nepal. Moreover, extreme rainfall events of Nepal from 1960 to 2000 have also been identified.
- ❑ Monthly meteorological data over 47 stations in Thailand during 1961-2010 has been collected by HAI, Thailand, and preliminary analysis on the rainfall patterns over Thailand during 50 years have been conducted.
- ❑ Around 50 synoptic stations with 30= \leq years monthly meteorological data in Iran has been collected by ASMRC, Iran.
- ❑ Rain gauge measured data from Nigeria Meteorological Agency (NIMET) for six synoptic stations with variant climatic patterns namely; **Lagos**; Station Number (65201), Period 1910-2010, **Kano**; Station Number (65046) Period 1910-2010, **Maiduguri**; Station Number (65082) Period 1915-2010, **Owerri**; Station Number (65252), Period 1974-2010, **Ilorin**; Station Number (65101), period 1916-2010 and **Calabar**; Station Number (65264), Period 1910-2010 has been collected.





Climate Data bank - Nepal

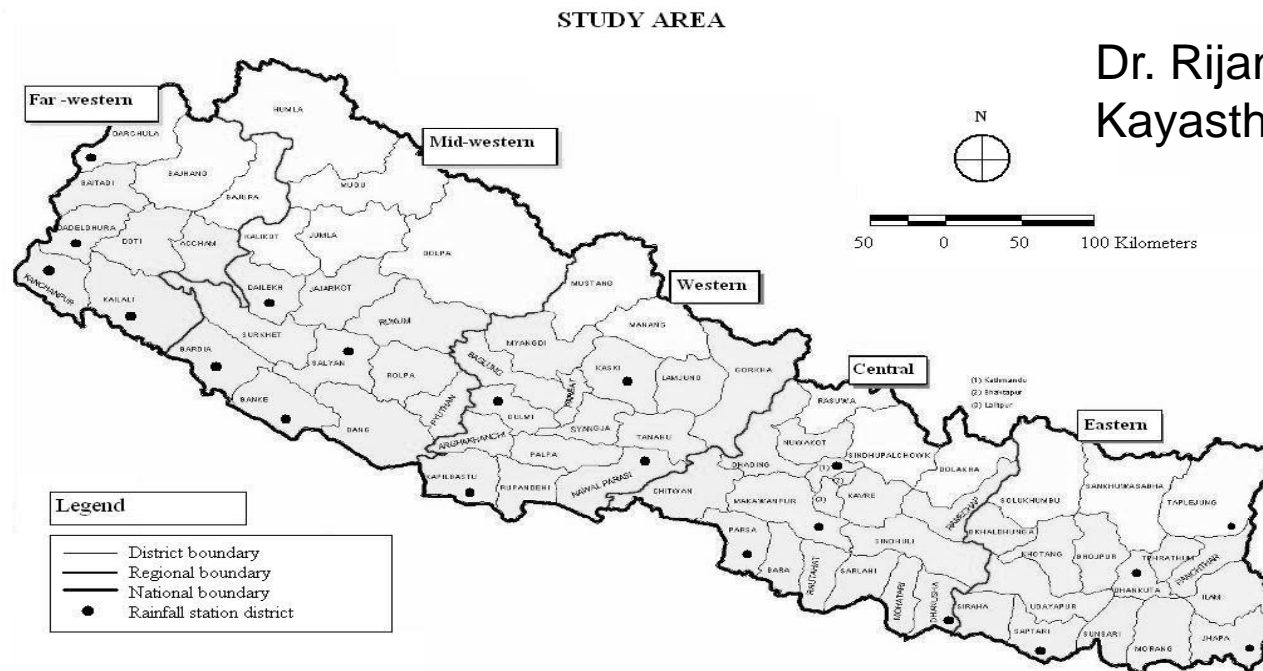


Figure 1: Map of Nepal showing the developmental regions, and corresponding districts from which the rainfall stations are chosen for the study.

Map of Nepal showing stations (25, black dots) from where air temperature and precipitation data are available.



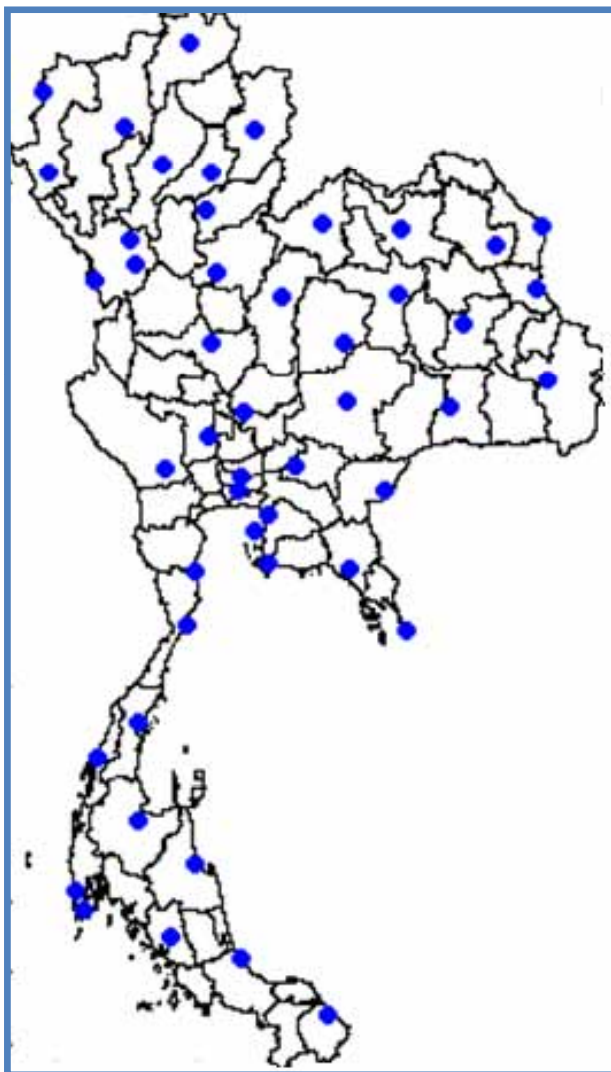
Selected extreme events over Nepal



Date	Recorded rainfall (mm)	Region /Stations
1960 29 July	503	Musikot
1968 25 August	505	Gumthang
1974 28 July	405	Barhakshetra
1978 15 July	322	Hariharpur Gadhi
15 July	301	Tiger Tops
16 July	304	Ramauli Bairiya
19 July	376	Hetauda
1997 10 August	319.2	Sitapur
1998 3 August	362	Bardhaghat
3 August	407.0	Padari
3 August	495.0	Parasi
1999 6 October	203	Katai
11 July	310.0	Dumkibas
2000 24 April	240.7	Jajarkot
8 June	236.2	Koilabas
3 August	319.3	Daman
3 June	339.5	Janakpur Airport

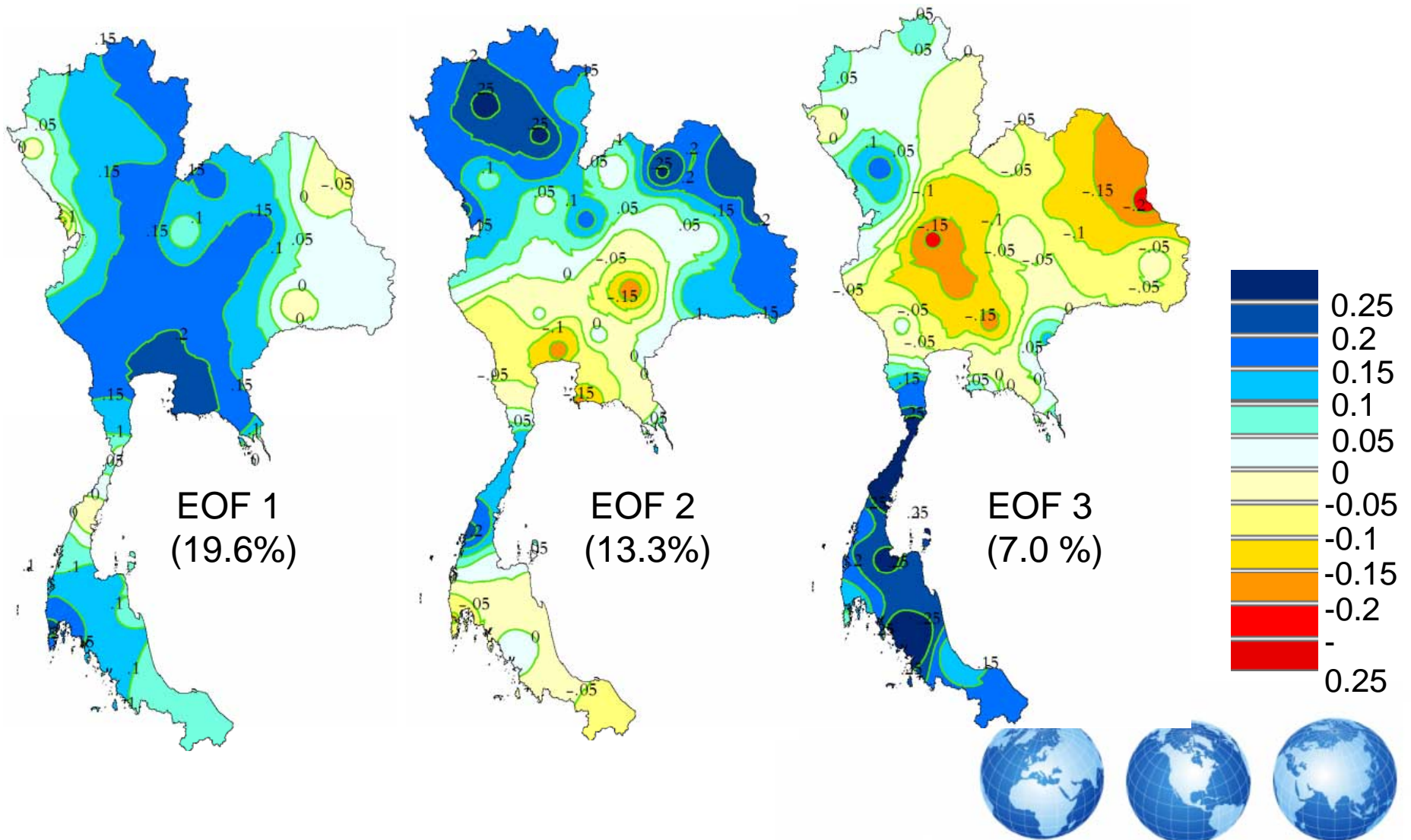


Climate Data bank - Thailand

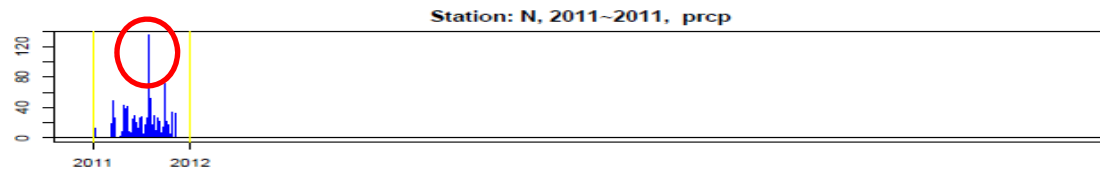
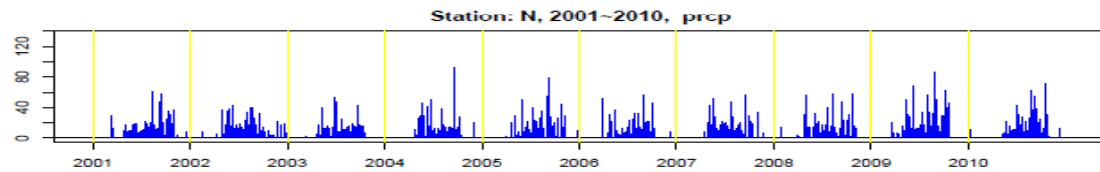
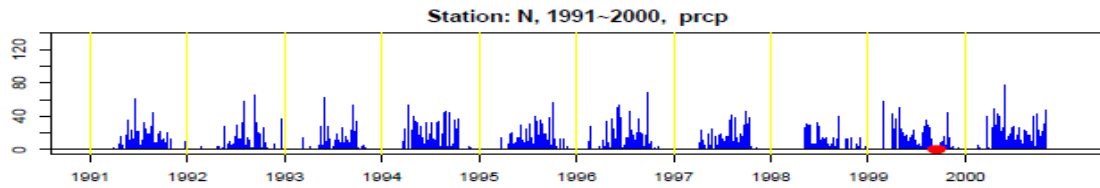
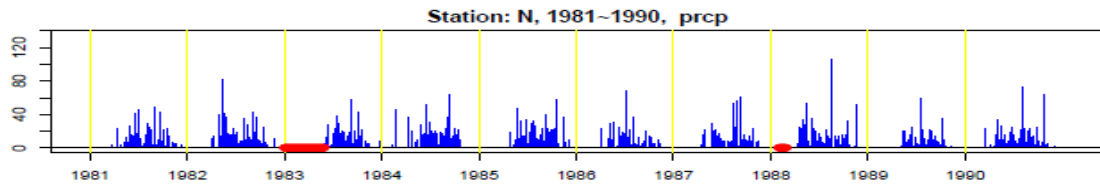
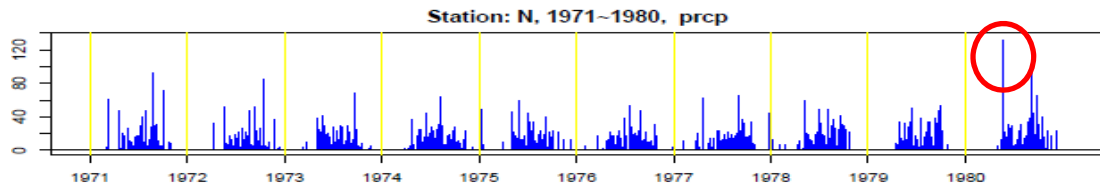
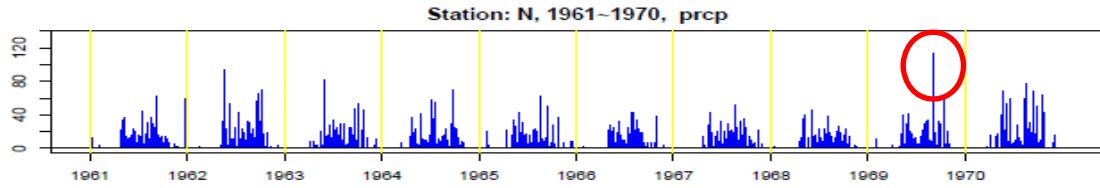


TMD
Precipitation Data
1961-2010
(48 stations)

Main rainfall pattern for June-July-August over Thailand during 1961-2010 with 48 stations



Daily Precipitation from RClimdex



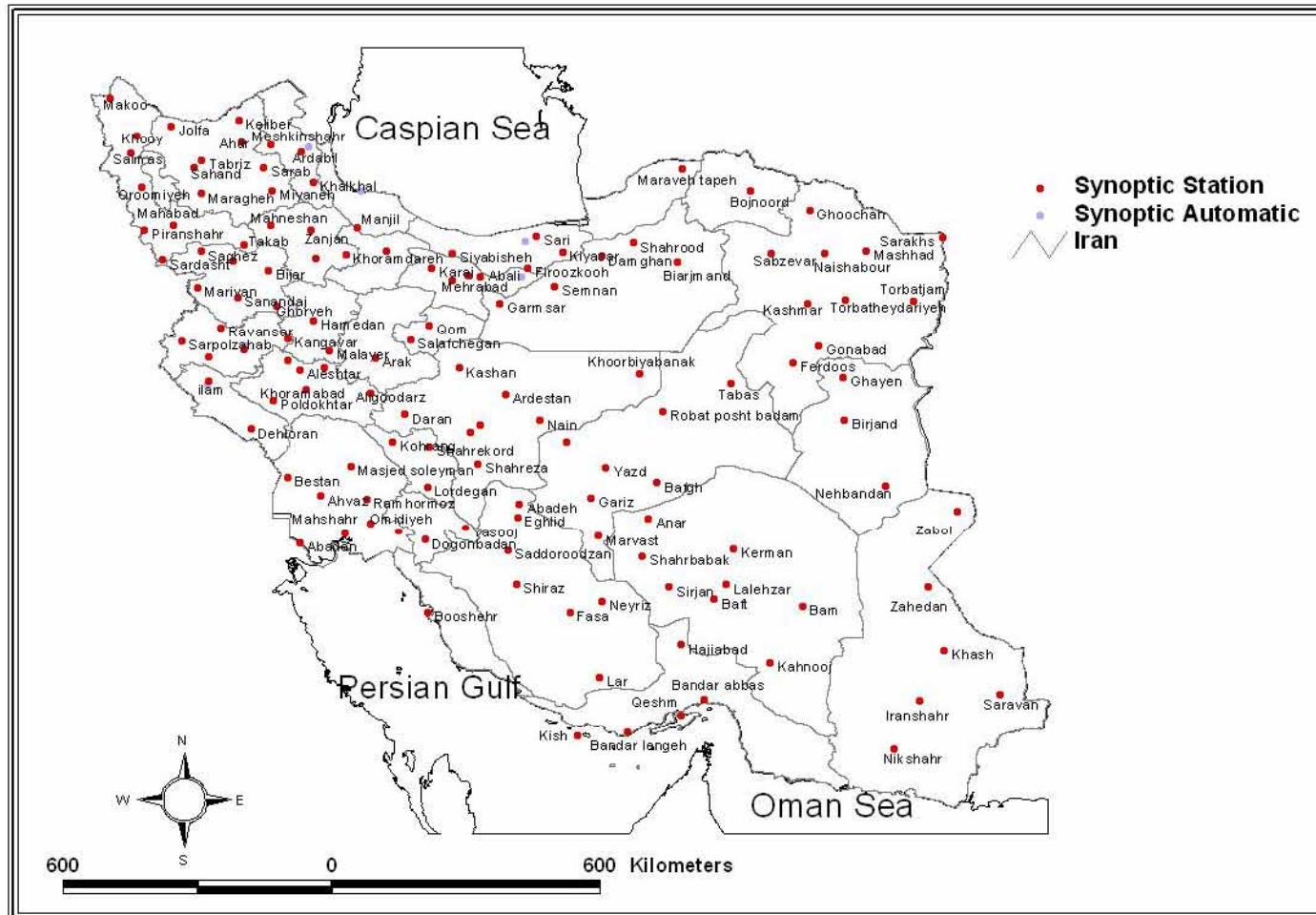
Precipitation
(mm/day)
1961-2010

Station: 300202
MAE SARIANG





Climate Data bank - Iran



More than 300 synoptic meteorological stations





4. Joint Research Activities

- Establishment of Data Center and its applications for climate research at COMSATS member countries
- **Transferring of IAP seasonal climate prediction system (IAP DCP-II)**



Details of IAP DCP II

Prediction system	IAP DCP
Climate model	IAP 2 layers AGCM (horizontal resolution: $2.0^{\circ} \times 2.5^{\circ}$ in latitude and longitude)
Atmospheric initial conditions	Wind, geopotential height, and relative humidity, taken from NCEP real-time analysis
Sea surface temperature	Combination of the observed Feb. SSTA and the predicted SSTA by IAP ENSO Prediction System
Hindcast period	29-year ensemble hindcast during 1982–2010
Ensemble size	28 members (from February 1st~28th)
Ensemble scheme	Arithmetic average
Duration of forecast	March to August

Transferring of IAP Seasonal Prediction

- Predict the climate anomalies (Rainfall, Temperature, wind, etc) several months (1-12 months) in advance
- Growing demand for reliable seasonal forecasts



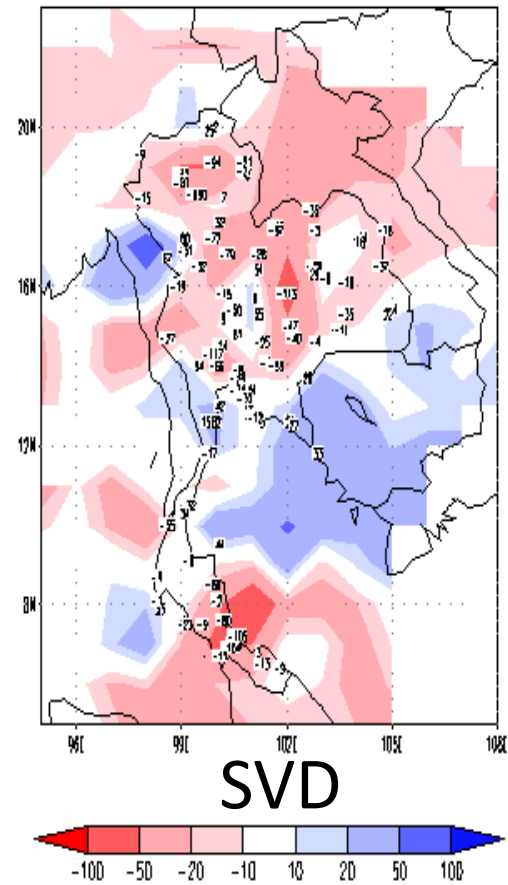
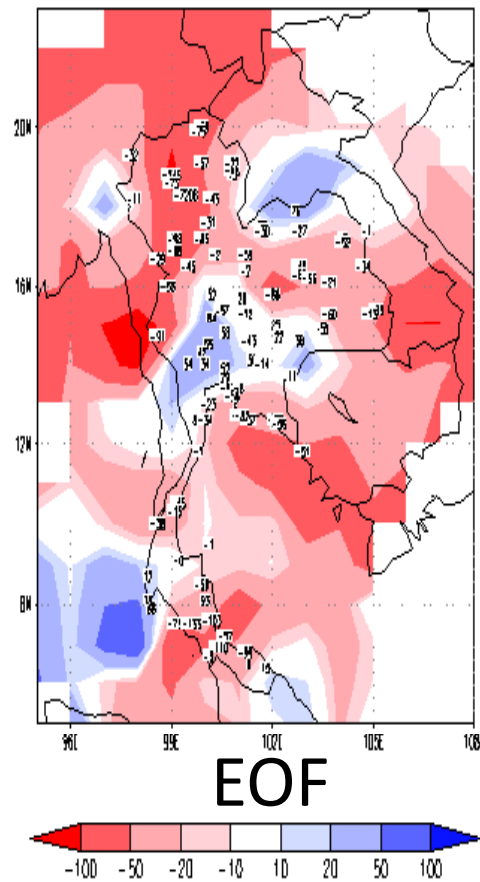
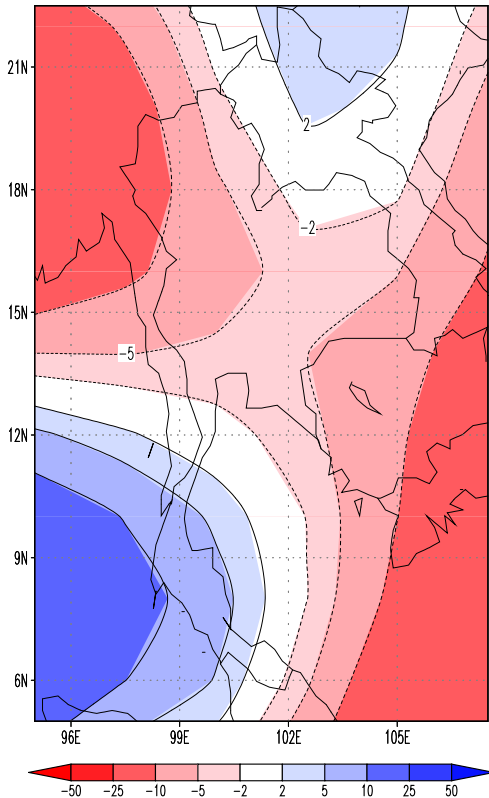
- **Verification** is needed by using local station observation data
- **Localization**
 - Install at super-computing system with different Computing environment at host institutions
 - Selection of physical processes parameterization
- **Bias correction system over specific country**

Implementation of IAP Seasonal Prediction System at Thailand

- Transferred IAP ENSO prediction system to HAll cluster
- Transferred IAP DCP II for seasonal prediction system from IAP to HAll cluster
 - IAP ACGM 2 Layer
 - Bias correction based on observed TMD monthly rainfall data between 1982-2010 using 2 different techniques
 - EOF technique
 - SVD technique
- Adapted the system to focus on Thailand precipitation
 - Experimented changing initial condition
 - Experimented predicting monthly precipitation

Predicted Anomaly Precipitation JJA 2012 Before and After Bias Correction

Predicted percentage rainfall anomaly in 2012 JJA



Bias corrections using observed data from Thai Meteorological Department, 96 stations during 29 years from 1982 to 2010 of June to August, based on the EOF and SVD analysis.

5、 Capacity Building

Visiting program

- 2 young scientists from Thailand worked at ICCES for 3 and 5 months respectively
- 3 young scientists from Brazil has been visiting ICCES
- 1 Russia scientists has been visiting ICCES
- 1 Postdoc from Thailand is now working at ICCES
- 1 young scientist from CIIT Pakistan have been applying to pursue doctorial degree at ICCES

III. Plan for Group Activities of TG-CCEP during 2013-2014 (After the 16th council meeting)



- 1. International training workshop on Extreme Events**
- 2. 2013 CTWF workshop on Operational Oceanography**
- 3. Capacity Building**



1、 International Training Workshop

Basic Information:

1. **Date:** July 14-23, 2013,
2. **Venue:** Beijing, China
3. **Theme:** Extreme weather and climate events: detection, monitoring, prediction and risk management for developing countries
4. **Organized by:** International Center for Climate and Environment Sciences
5. **Workshop Webpage:** <http://icces-trainingworkshop.csp.escience.cn>



Chinese Academy of Sciences (CAS)



The Academy of Sciences for the Developing World (TWAS)



The Commission on Science and Technology for Sustainable Development in the South (COMSATS)

International S&T Cooperation Program of China
(2011DFG23450)

1、 Training Workshop – General Information

Topics:

- Observation of extreme events and its detection
- Monitoring and prediction of extreme events
- Risk management of extreme events

Scientific Committee

Qingcun Zeng (ICCES/IAP, CAS)

Jinghua Cao (Bureau of international cooperation, CAS)

Tajammul Hussain (COMSATS, Pakistan)

Jiang Zhu (IAP, CAS)

Zhaohui Lin (ICCES/IAP, CAS)

Royol Chitradon (HAII, Thailand)

Ziniu Xiao (CMA Training Center, CMA)

Zhengyi Hu (University of CAS)

1、 Training Workshop – General Information

Lecturers:

Dr. Guoyu REN (Observations & Data Analysis)
National Climate Center, China

Dr. Quanxi SHAO (Extreme Value Detection)
CSIRO Mathematics, Informatics and Statistics, Australia

Dr. Fumin REN (Detection of Extreme Events)
Chinese Academy of Meteorological Sciences, China

Dr. Peng ZHANG (Satellite Monitoring)
National Satellite Meteorological Center, China

Dr. Lifeng LUO(Modeling and Predictability)
Michigan State University, USA

Dr. Jason LEVY (Risk Management)
Virginia Commonwealth University, USA

1、 Training Workshop – General Information

Financial Support:

Financial support (Including international travel and local expenses) is available for eligible candidates from developing countries.

Important Dates:

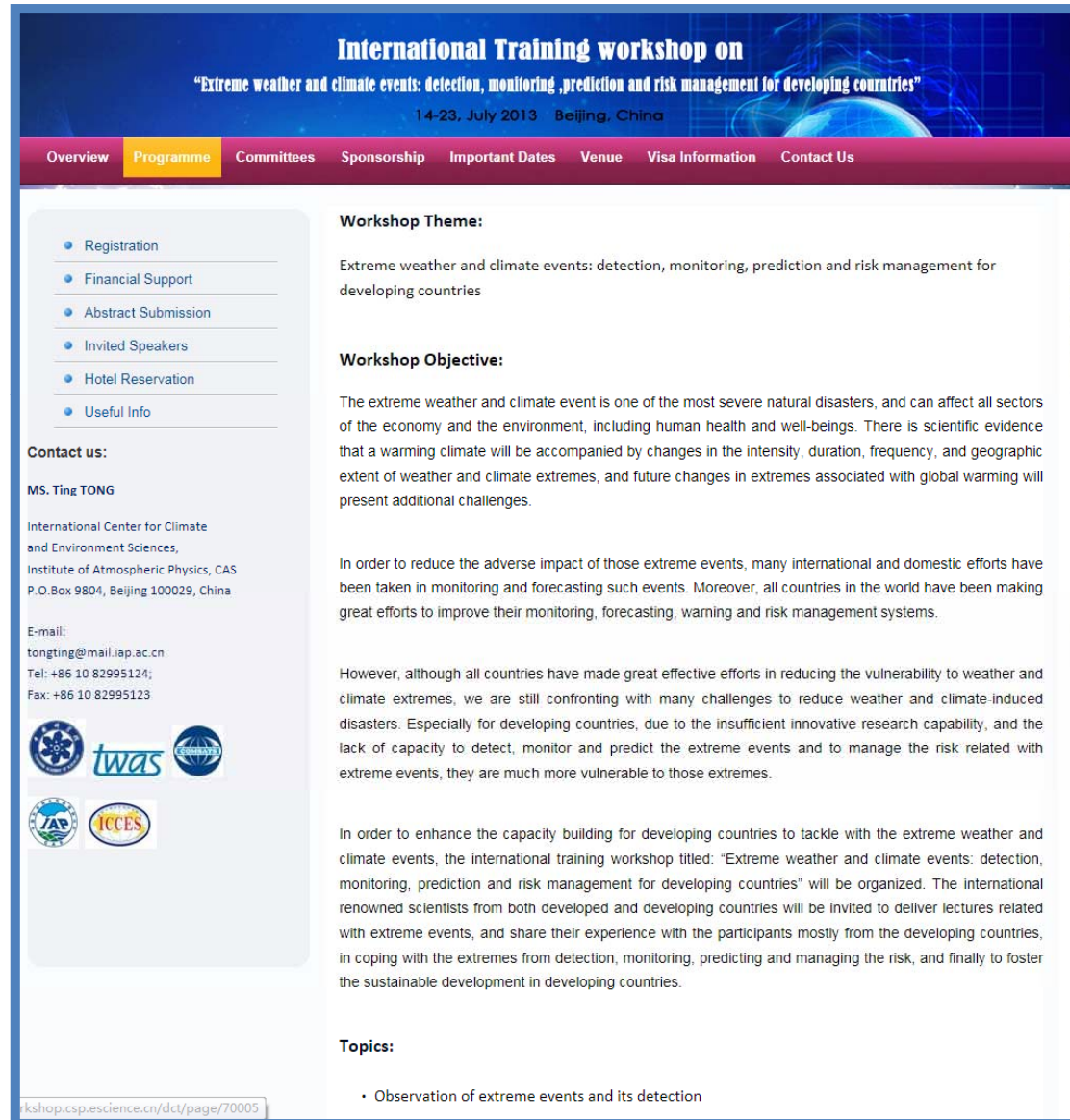
Deadline for Application Submission: **May 31, 2013**

Notice of Acceptance: **June 5, 2013**

1、 Training Workshop – General Information



- Participants from COMSATS member countries are welcome, and COMSATS and ICCES will provide financial support for selected young scientists.
- Please recommend candidates from Africa, South America to join with us.
- Please register in the workshop webpage and submit the application form for financial support.




A screenshot of the workshop website. The header features the title "International Training workshop on 'Extreme weather and climate events: detection, monitoring, prediction and risk management for developing countries'" and the dates "14-23, July 2013 Beijing, China". A navigation bar includes links for Overview, Programme, Committees, Sponsorship, Important Dates, Venue, Visa Information, and Contact Us. The main content area is divided into a sidebar and a main text area. The sidebar contains a list of links: Registration, Financial Support, Abstract Submission, Invited Speakers, Hotel Reservation, and Useful Info. Below this is contact information for MS. Ting TONG, including the address of the International Center for Climate and Environment Sciences, Institute of Atmospheric Physics, CAS, and contact details. Logos for COMSATS, TWAS, and ICCES are displayed. The main text area contains sections for Workshop Theme, Workshop Objective, and Topics. The Workshop Theme is "Extreme weather and climate events: detection, monitoring, prediction and risk management for developing countries". The Workshop Objective discusses the severity of extreme weather events and the need for international efforts. The Topics section lists "Observation of extreme events and its detection".



International Training workshop on
"Extreme weather and climate events: detection, monitoring, prediction and risk management for developing countries"
14-23, July 2013 Beijing, China

Overview Programme Committees Sponsorship Important Dates Venue Visa Information Contact Us

- Registration
- Financial Support
- Abstract Submission
- Invited Speakers
- Hotel Reservation
- Useful Info

Contact us:
MS. Ting TONG
International Center for Climate and Environment Sciences,
Institute of Atmospheric Physics, CAS
P.O.Box 9804, Beijing 100029, China
E-mail: tongting@mail.iap.ac.cn
Tel: +86 10 82995124;
Fax: +86 10 82995123

Workshop Theme:
Extreme weather and climate events: detection, monitoring, prediction and risk management for developing countries

Workshop Objective:
The extreme weather and climate event is one of the most severe natural disasters, and can affect all sectors of the economy and the environment, including human health and well-beings. There is scientific evidence that a warming climate will be accompanied by changes in the intensity, duration, frequency, and geographic extent of weather and climate extremes, and future changes in extremes associated with global warming will present additional challenges.

In order to reduce the adverse impact of those extreme events, many international and domestic efforts have been taken in monitoring and forecasting such events. Moreover, all countries in the world have been making great efforts to improve their monitoring, forecasting, warning and risk management systems.

However, although all countries have made great effective efforts in reducing the vulnerability to weather and climate extremes, we are still confronting with many challenges to reduce weather and climate-induced disasters. Especially for developing countries, due to the insufficient innovative research capability, and the lack of capacity to detect, monitor and predict the extreme events and to manage the risk related with extreme events, they are much more vulnerable to those extremes.

In order to enhance the capacity building for developing countries to tackle with the extreme weather and climate events, the international training workshop titled: "Extreme weather and climate events: detection, monitoring, prediction and risk management for developing countries" will be organized. The international renowned scientists from both developed and developing countries will be invited to deliver lectures related with extreme events, and share their experience with the participants mostly from the developing countries, in coping with the extremes from detection, monitoring, predicting and managing the risk, and finally to foster the sustainable development in developing countries.

Topics:

- Observation of extreme events and its detection

ksshop.csp.esience.cn/dct/page/70005

2、 CTWF workshop - overview

Basic Information:

1. Date: September 9-12, 2013,
2. Venue: Beijing, China
3. Theme: Operational Oceanography for developing countries
4. Organized by: **International Center for Climate and Environment Sciences**
5. Workshop Webpage: <http://2013ctwf-icces.csp.escience.cn>

Topics:

- Demands, Current Services and Challenges
- Capability Building
- Ocean Observations
- Modelling and Data Assimilation
- Operational Forecast: from short-range to ENSO

2、 CTWF workshop - overview

Scientific committee:

- Prof. Qingcun Zeng (Chairman), Institute of Atmospheric Physics/CAS;
- Prof. Jiang Zhu, Institute of Atmospheric Physics/CAS;
- Prof. Clemente Tanajura, UFBA, Brazil;
- Prof. Mauro Cirano, UFBA, Brazil;
- Prof. Hui Wang, National Marine Environmental Forecast Center, China;
- Dr. Bjorn Backeberg, Nansen-Tutu Centre for Marine Environmental Research, Department of Oceanography, University of Cape Town;
- Prof Michael J. Roberts, Oceans and Coasts, Department of Environment Affairs, South Africa;
- Dr. M. Ravichandran, INCOIS, India;
- Dr. Francis Pavanathara, INCOIS, India.

2、CTWF workshop - overview



12th CAS-TWAS-WMO Forum

International Workshop on Operational Oceanography for Developing Countries
September 9-12, 2013 Beijing

Welcome About CTWF Committees Important Dates Venue Visa Information Tour Information Contact Us

- Programme
- Invited Speakers
- Registration
- Payment
- Abstract Submission
- Hotel Reservation
- Useful Info

Welcome

On behalf of the organizing committee, We would like to cordially invite you to the 12th CAS-TWAS-WMO Forum, the international workshop on operational oceanography for developing countries, which will be held in Beijing, China, September 9-12, 2013.

Operational oceanography is an emerging research field devoted to the science, technology and applications on observing and forecasting our oceans and seas. It is important for improving the safety and efficiency of maritime transport and marine operations; enabling the sustainable exploitation and management of ocean resources, such as fisheries; supporting safe and efficient offshore energy related activities; mitigating the effects of environmental hazards and pollution spills; contributing to ocean climate variability studies and seasonal-to-interannual climate prediction.

Despite the fact that developing countries are more vulnerable to hazards in ocean region due to lack of capacity in operational oceanography, marginal and coastal seas around developing countries are much less studied than these regions around developed countries. Some large developing countries such as China, India, Brazil and South Africa have been building their own operational ocean forecasting systems in recent years along with their fast economy growth. As a result, the operational oceanography community in these developing countries is growing at high rates. Therefore, it is time to create a dedicated forum for operational oceanographers from developing countries.

The 12th CAS-TWAS-WMO Forum, the *International workshop on operational oceanography for developing countries* will be a starting point to strengthen collaboration among all developing countries interested in operational oceanography by discussing common scientific and infrastructure issues.

The topics of the workshop include:

- Demands, Current Services and Challenges
- Capability Building
- Ocean Observations
- Modelling and Data Assimilation
- Operational Forecast: from short-range to ENSO

The international workshop on operational oceanography for developing countries, is sponsored by CAS-TWAS-WMO Forum, and will be organized by International Center for Climate and Environment Sciences (ICCES), Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences (CAS).

We wish you all a pleasant stay and a fruitful meeting in Beijing. Looking forward to meeting you all.

Local Organizing Committee

Contact Us
Mr. Ting TONG
CTWF Secretariat
International Center for Climate and Environment Sciences
Institute of Atmospheric Physics
Chinese Academy of Sciences
No.40, Huayansi, Chaoyang District,
P.O.Box 9204, Beijing 100028, China
E-mail:
oovf@mail.iap.ac.cn
tongting@mail.iap.ac.cn
Tel: +86 10 52996124
Fax: +86 10 52996123

Meeting Date: September 9-12, 2013

Important Dates:

Deadline for Early Registration: July 5, 2013

Deadline for Abstracts Submission: July 10, 2013

Notice of Abstract Acceptance: July 20, 2013

3、 Capacity Building

- **Short-term visiting scholarship to ICCES**
 - ✓ 1 Application from Nigeria
 - ✓ 1 from Pakistan
- **Master/PhD program by University of CAS**
 - ✓ Currently 2 applicants from CIIT are applying for pursuing doctoral degree in ICCES
- **Postdoc fellowship by TWAS-CAS joint program**

From 2013, ICCES can provide the opportunity for 10 young scientists and/or students from developing countries to continue their degree study or conduct collaborative research at ICCES.



COMMENTS & QUESTIONS?

Thank You !