Capacity Building in Disaster Risk Reduction through Synergistic Approach

Indian Institute of Remote Sensing (IIRS)
Indian Space Research Organisation (ISRO)

www.iirs.gov.org

Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP)
(Affiliated to the United Nations)

www.cssteap.org

A. Senthil Kumar and Sarnam Singh

IIRS and CSSTEAP
IIRS: Mandate

Transfer technology through Capacity Building & Research in the field of RS & GIS technology and applications

......for ensuring efficient utilization of Earth Observation (EO) Systems and ISRO's forthcoming initiatives in the areas of Natural Resource Survey, Earth and Atmospheric Sciences and Disaster Management.

- Build capacity through education & training programmes at PG level;
- Host and conduct education & training programmes offered by CSSTEAP, affiliated to the United Nations;
- Participate in research programmes of ISRO/DOS and promote and undertake applied research in diverse thematic areas.
## Capacity Building: Training and Education Programmes

<table>
<thead>
<tr>
<th>S N</th>
<th>Programmes</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>• Postgraduate Diploma in Remote Sensing &amp; GIS (8 disciplines) • Natural Hazards and Disaster Risk Management (NHDRM)</td>
<td>10 months</td>
</tr>
<tr>
<td>2.</td>
<td>Postgraduate Diploma In Geo-information Science &amp; Earth Observation (with ITC, Netherlands - <em>Specializations in Geoinformatics</em> )</td>
<td>10 months</td>
</tr>
<tr>
<td>3.</td>
<td>International Programme – Certificate Course In Remote Sensing and Geoinformatics (<em>Sponsored under ITEC/SCAAP by MEA, Govt. of India</em>)</td>
<td>8 weeks</td>
</tr>
<tr>
<td>4.</td>
<td>Certificate Course In Remote Sensing (Remote Sensing &amp; Image Analysis (Indian User participants)</td>
<td>8 weeks</td>
</tr>
<tr>
<td>5.</td>
<td>NNRMS-ISRO Sponsored Certificate Course In Remote Sensing &amp; GIS For University Faculty (<em>sponsored by Govt. of India</em>)</td>
<td>8 weeks</td>
</tr>
<tr>
<td>6.</td>
<td>Awareness Programme – An Overview for Decision Makers</td>
<td>1 week</td>
</tr>
<tr>
<td>7.</td>
<td>Tailor-made On-demand Courses</td>
<td>1 - 8 weeks</td>
</tr>
</tbody>
</table>

| 1.  | **M .Tech. in Remote Sensing & GIS** – 8 specializations                                                                                | 24 months  |
| 2.  | **M. Sc. in Geo-information Science & Earth Observation** (with ITC, Netherlands) *Specialization in Geoinformatics*                          | 18 months  |
Postgraduate Diploma and Master Degree
Remote Sensing & GIS in Natural Resources Management

Module-I (4 months)
- Remote Sensing
- Photogrammetry
- DIP
- GIS & GNSS
- Statistics & Programming

Module-II (3 months)
- Specialisation
  - Satellite Image Analysis and Photogrammetry
  - Sustainable Agriculture
  - Forest Resources & Ecosystem Analysis
  - Geosciences
  - Human Settlement Analysis
  - Marine and Atmospheric Sciences
  - Water Resources
  - NHDRM

Module-III (3 months)

Project
PG Dipl.

Research Work (14 months)
M. Tech. Degree in RS & GIS
M.Sc. in Geo-information Science & Earth Observation (Specialisation – Geoinformatics)

<table>
<thead>
<tr>
<th>Block-1</th>
<th>Core Modules (1-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block-2</td>
<td>Domain Modules (4-10)</td>
</tr>
<tr>
<td>Block-3</td>
<td>Research Profile Modules (11-15)</td>
</tr>
<tr>
<td>Block-4</td>
<td>Research (Modules 16-23)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module</th>
<th>Duration</th>
<th>Module Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 Weeks</td>
<td>Geographic Information Science</td>
</tr>
<tr>
<td>2</td>
<td>3 Weeks</td>
<td>Earth Observation</td>
</tr>
<tr>
<td>3</td>
<td>3 Weeks</td>
<td>System Earth</td>
</tr>
<tr>
<td>4</td>
<td>3 Weeks</td>
<td>Databases, Mathematics &amp; Programming</td>
</tr>
<tr>
<td>5</td>
<td>3 Weeks</td>
<td>Principles of Spatial Data Quality</td>
</tr>
<tr>
<td>6</td>
<td>3 Weeks</td>
<td>Spatial Data Modelling &amp; Processing</td>
</tr>
<tr>
<td>7</td>
<td>3 Weeks</td>
<td>Base Data Acquisition</td>
</tr>
<tr>
<td>8</td>
<td>3 Weeks</td>
<td>Image Processing</td>
</tr>
<tr>
<td>9</td>
<td>3 Weeks</td>
<td>Web GIS &amp; Programming</td>
</tr>
<tr>
<td>10</td>
<td>3 Weeks</td>
<td>Visualisation &amp; Dissemination of Geospatial Data</td>
</tr>
<tr>
<td>11</td>
<td>3 Weeks</td>
<td>Research Skills</td>
</tr>
<tr>
<td>12</td>
<td>3 Weeks</td>
<td>Advanced modules, advanced group project, and finalisation and defence of research proposal by M.Sc. students</td>
</tr>
<tr>
<td>13</td>
<td>3 Weeks</td>
<td>M.Sc. research and thesis defence</td>
</tr>
<tr>
<td>14</td>
<td>3 Weeks</td>
<td>M.Sc. students</td>
</tr>
<tr>
<td>15</td>
<td>3 Weeks</td>
<td></td>
</tr>
<tr>
<td>16-23</td>
<td>6 months</td>
<td></td>
</tr>
</tbody>
</table>

Note: Module 1 to 10 are common for both M.Sc. and PG Diploma. PG Diploma students carry out project work during Module 11 to 14. Module 11 to 16 are offered at ITC for M.Sc. students.
Certificate Course for University Faculty

- 8 Weeks courses conducted every year during May-June in following 8 themes:
  - GIS Technology & Advances
  - Cartography and Mapping
  - Water Resources
  - Forestry/ Ecology/ Wildlife/ Environ. Sciences
  - Urban & Regional Studies
  - Geosciences
  - Soils & Landuse Planning
  - Coastal & Ocean Sciences

Remote sensing
GIS
Theme
Project

Module-1
Module-2
Module-3
Module-4
International Programme
MEA – ITEC/SCAAP Sponsored Courses

- Initiated in 2001 to share Indian development experience in Geospatial technologies to International community

- **Two courses** are conducted annually:
  - Remote Sensing with emphasis on Digital Image Processing
  - Short course on Geoinformatics

- **Target Group:** Middle level resource managers and professionals from Government, Universities, Research Institutions

- **468 participants** from **79 countries** are benefitted from this program
Special/ Customised Courses

- Customised courses for various User/Stakeholder departments, viz. Ministry of Environment & Forests/ Water Resources/ Home Affairs/ Railway and other Central & State Govt. departments
- Geospatial Technology for Smart City Planning
- UAV Remote Sensing & Applications
- ISPRS Summer School (Open Source GIS, Online sharing of data, algorithm & models, Research & teaching methodology for Master & PhD students)
- Basic course for Higher Secondary School Teachers
- ............
Map the Neighborhood in Uttarakhand (MANU)

- Development of appropriate tools for field data collection through crowdsourcing and integration with Bhuvan geoportal.
- **Capacity Building** for field data collection by students from the local region.
- **Geospatial analysis** of field data for understanding the major controls and patterns of damage.

**Area covered:** Alaknanda, Mandakini, Bhagirathi, Yamuna, Ganga, Pinder and Kali river valleys

**End use:** Inputs towards formulating guidelines for restoration & developmental activities

**Teams:** IIRS, NRSC, SOI, DST, WIHG, HNB Garhwal Univ, Kumaun Univ.
150 students were trained.
DLP: Internet / Satellite based Live & Interactive Courses
(http://iirs.gov.in/Edusat-News)

- **Four Weeks** Specialized course on different themes (Feb-March)
- **No course Fee**
- **About 25,000** participants benefited

**Network Institutions**
(303 till Dec., 2015)

**Target Groups**
- Central/ State Universities
- Research Institutions
- Central/ State Govt. organisations
- Individuals
DLP: Internet / Satellite based Live & Interactive Courses (http://iirs.gov.in/Edusat-News)

IIRS studio-end

Feedback Session

National Award by Govt. of India

https://www.youtube.com/channel/edusat2004

Receiving-end classroom
DLP: Internet Based e-Learning Courses
(http://elearning.iirs.gov.in/)

• Self-paced, any-time/any-where learning

• **Four months** Comprehensive Certificate Course on ‘Remote Sensing and Geo-information Science’

• **One month** fundamental Certificate Courses on (1) Remote Sensing; (2) GIS; (3) Digital Image Processing; and (4) Photogrammetry

• Registration – Free and Open to All

**Topics**

- Image Statistics
- Basic Remote Sensing
- Photogrammetry and Cartography
- Digital Image Processing
- Geographical Information System
- Global Navigation Satellite System
- Customization of Geospatial Tools
- Applications of Geospatial Technologies
DLP: Internet Based e-Learning Courses (http://elearning.iirs.gov.in/)

GLOBAL DISTRIBUTION OF IIRS E-LEARNING ENROLLMENTS
(As on February 12, 2016)

Legend

- 0
- 1 - 3
- 4 - 6
- 7 - 9
- 10 - 2071

Total Enrollments (Certificate-523 + Learner-1632): 2155
Contribution to WGCapD of CEOS

As a Vice Chair, Director IIRS is responsible for
• Jointly Organizing monthly telecom with Chair of WGCapD
• Participating in the monthly telecon to assess the current status and future directions

IIRS has coordinated the Webinar series on disaster risk management
• 8 Topics were covered
• 96 students from all 6 continents
• Teachers from Major space agencies including IIRS/ISRO

IIRS has also contributed in E-learning programme by delivering lectures
• Fundamental of Remote Sensing
• Flood disaster mapping, monitoring and modeling

Organized 3rd WGCapD annual meeting at Dehradun
• April 23-25, 2015
• Venue: IIRS, Dehradun
• ISRO/NASA/USGS/SEO/SANSA and other space agencies participated.
Research Facilities

Satellite Data Archives & Instrumentation Facility

• Map & Image Library (archives of Satellite Data, Topographical Maps, Aerial Photographs, Thematic maps, etc.)

• Ground-truth equipments
  (Spectroradiometer, Geodetic & hand-held GPS, Total Station, Photogrammetric Cameras, GPR, Soil, water & vegetation parameters measurement instruments)

In-house Labs

• DIP, Photogrammetry & GIS Labs

• Soil & Water Analysis Laboratory
Research Facilities Contd..

**Instruments and Field Laboratories**

- Atmospheric CO\(_2\) Measurement Network (Dehradun, Nainital, Gadanki, Mount Abu)
- Observatory for Aerosol Climatology (Dehradun)
- Flux Towers for Measuring Energy, Water Vapour & CO\(_2\) Exchanges (Haldwani, Barkot, Saharanpur)
- Field Observatories for Soil Erosion and Hydrology (Dehradun, Chamba)
- AWS in Uttarakhand/ Himachal for landslides, hydrological modeling, etc.
Instruments

- GNSS Receivers
- Resistivity Meter
- Laser Distance Meter
- High end GPS devices
- Vibrating wire type Piezometer
- Ground Penetrating Radar (GPR)
- Spectro-radiometer (ASD & FTIR)
- Single Point Borehole Extensometer
- Total Precession System (Total station)
- Direct Shear Test Electronic Equipment

Hardware/Software

- High end work stations and desktops
- ILWIS, ERDAS Imagine, ArcGIS, ENVI, SARSCAPE, SPSS, Bernese, Gamit, Pivot etc.

Field Instrumentation

- Continuous Operating Reference System (CORS) – 4
- Automated Weather Station (AWS) - 15
- Broadband Based Seismograph & Strong Motion Accelograph
Centre for Space Science and Technology Education in Asia and the Pacific
Establishment of First Regional Centre

- Realizing the importance of Space technology the UN General Assembly endorsed the recommendation of UN Committee on Peaceful Uses of Outer Space (UNCOPUOS) on Dec 1, 1990 and it said that

  “… effort to establish Regional Centres for Space Science and Technology Education in existing national/ regional educational institutions in the developing countries” be made

- To achieve this Capacity Building is the first step.

- UNOOSA established 1st Regional Centre as CSSTEAP in Dehradun, India in 1995

- Policies are guided by 16 Governing Board members from Asia Pacific and UNOOSA and Twente University (ITC), The Netherlands as observers
Six Regional Centres for Space Science and Technology Education in the World

Regional Centres for Space Science and Technology Education (Affiliated to the United Nations)

- Central America
  - Mexico (CRECTEALC) (1997)
- South America
  - Brazil (CRECTEALC)
- Asia
  - India (CSSTEAP) (1995)
  - China (2014)
- Africa
  - Jordan (2012)
Asia Pacific and Beneficiary Countries

I EAST ASIA
1. China
2. Hong Kong (ROC)
3. Japan
4. Korea, DPR
5. Rep. of Korea
6. Macao (ROC)
7. Mongolia
8. Taiwan (ROC)

II SOUTH-EAST ASIA
9. Brunei
10. Cambodia
11. Indonesia
12. Lao PDR
13. Malaysia
14. Myanmar
15. Philippines
16. Singapore
17. Thailand
18. Vietnam

III SOUTH ASIA
19. Afghanistan
20. Bangladesh
21. Bhutan
22. India
23. Islamic Rep. of Iran
24. Maldives
25. Nepal
26. Pakistan
27. Sri Lanka

IV CENTRAL ASIA
28. Armenia
29. Azerbaijan
30. Kazakhstan
31. Kyrgyzstan
32. Tajikistan
33. Turkmenistan
34. Uzbekistan

V PACIFIC
35. Australia
36. Comm. Of the N. Marianas
37. Cook Islands
38. Fed. States of Micronesia
39. Fiji
40. French Polynesia
41. Guam
42. Kiribati
43. Marshall Islands
44. Nauru
45. New Caledonia
46. New Zealand
47. Niue
48. Papua New Guinea
49. Rep. of Palau
50. Samoa
51. American Samoa
52. Solomon Islands
53. Tonga
54. Tuvalu
55. Vanuatu

GB Member nations

GOVERNING BOARD
- Representative from Member Countries
- UN-OOSA & ITC are Observers

ADVISORY COMMITTEE
- Chaired by UN-OOSA
- Subject matter experts of Remote sensing and GIS, Satellite Communication, Satellite Meteorology & Global Climate, Space & Atmospheric Science and Global Navigation Satellite Systems,

= GB Member Countries
*** = Non- GB Member Countries Beneficiary Countries

Stakeholders in Asia Pacific Region
CSSTEAP Headquarters and Host Institutes

CSSTEAP GB-2014
Meets once every Year

CSSTEAP Hqrs., Dehradun

CSSTEAP AC-2015
Meets once in three years

Centre Campuses, Host Institutes and Courses

Indian Institute of Remote Sensing, Dehradun

RS & GIS
Disaster Risk Reduction
Small Satellite Missions

Space Applications Centre, Ahmedabad

SATCOM, SATMET, GNSS & NAVSAT

Physical Research Laboratory, Ahmedabad

Space & Atmospheric Sciences

ISRO Satellite Centre, Bengaluru

Small Satellite Missions
Host Institutions

- **Indian Institute of Remote Sensing**: 50 years of experience in capacity building in EO application and 30 years in Geoinformatics.

- **Space Applications Centre**: 1972 Unique Centre with synergy of technology development and design of EO sensors/payloads, Communication, Meteorological and Navigation satellites and applications, Weather Forecasting

- **Physical Research Laboratory**: 1947 - theoretical and experimental Space and Atmospheric Sciences research (deep space)

- **ISRO Satellite Centre**: Ultra modern design, development, fabrication and testing facilities for communication, remote sensing, navigation and space science satellites – built 75 state-of-the-art satellites

- **National Remote Sensing Centre**: 1974, **National Disaster Support Centre**, EO data acquisition, dissemination, operationalization, capacity building, etc.
DRR: Thrust Areas of Research

Agriculture and Soils
• Crop yield forecasting
• Agriculture Drought
• Microwave RS data applications in crop

Geosciences and Geohazards
• Landslide hazard modeling
• Land subsidence/ground deformation assessment using SAR data
• Geodynamics and seismicity of Western Himalaya

Forestry & Ecology
• Biodiversity Characterisation
• Ecosystem vulnerability assessment
• Forest fire risk modeling

Marine and Atmospheric Sciences
• Coastal Geomorphology & hazards
• Indian Summer Monsoon Studies – Numerical Weather Prediction Modeling

Water Resources
• Hydrometeorological/hydrological parameters retrieval from RS data
• Flood monitoring
• Climatic extremes early warning system in NW Himalaya

Urban & Regional Studies
• Urban hazard & risk assessment
• 3D city modeling and visualization

Photogrammetry & Remote Sensing
• Close range Photogrammetry
• SAR/InSAR and PolInSAR data processing
• Terrestrial Laser Scanner

Geoinformatics
• 3D GIS (geo-visualisation & modeling)
• Crowd Sourcing Apps
• Mobile GIS and location based services
Advantage: Participants get to know first hand knowledge from scientists and engineers who are involved in the field of space science and technology development and applications.
Capacity Building Programmes

• Post Graduate Courses (9 months) – 4-5 months advance
• Short Courses (4 days to 1 month) – 2-3 months advance
• Masters Degree (9 month Post Graduate Course + One year research in home country)
• Ph. D. - facilitates advance research and analysis

Funding: Government of India support

• International and domestic to & fro travel for all courses
• UNOOSA - international travel for RS&GIS Courses
• Fellowships to all the participants (long and short courses)
• Master programme fellowships
• Book and Project allowance to all the participants
• Health care, insurance, etc.
• Also UNESCAP, UNDP, ICIMOD, IWMI, SAARC, ITC, etc.
Training & Educational Programmes – Post Graduate

Remote Sensing & GIS
Every yr.

Satellite Communication (Odd yr.)

Satellite Meteorology & Global Climate
Even yr.

Space and Atmospheric Sciences
Even yr.

Global Navigation Satellite Systems
(odd yr.)

Phase I

9 months

Award of PG Diploma by CSSTEAP

Phase II

1 year follow-up project in home country

CSSTEAP 1 Yr Fellowship in India

Award of Master degree (M. Tech.) by Andhra University
Training Programmes – Short Courses

RS&GIS
Disaster Risk Reduction
4 weeks
(IIRS, Dehradun)
UNOOSA, UNSPIDER, UNDP & UNESCAP, IWMI, SAARC DMC

Satellite Navigation & Positioning Systems (NAVSAT)
4 weeks
(SAC, Ahmedabad)
converted to 9 month PG Course of GNSS

Small Satellite Missions
15 days
(IIRS, Dehradun/ISAC, Bengaluru)

Space Weather
4 weeks
(PRL, Ahmedabad)

4 days to 4 weeks duration

For middle level managers & professionals having 5-10 years experience in relevant field

Fully funded either by DOS/GoI, UN Agencies or SAARC

Core Faculty from IIRS, SAC, PRL, ISAC and National and International subject experts
Linkages

India

**ISRO Host Institution** - Core funding, facilities, equipment, institutional support, student fellowship and international travel

Organizations/ Institutions - Guest faculty

International

UN Agencies (UN-OOSA, UN-ESCAP, and UN-SPIDER, UNDP, and other regional institutions IWMI, ICIMOD, SAARC, ASEAN)

Universities / Institutes - International travel for selected students
- Guest faculty (Australia, Japan, USA, UK, Europe and other Asia-Pacific countries)

Academic Cooperation

- Andhra University, India (1998)
- ITC, University of Twente, The Netherlands
- University of Illinois, Urbana-Champaign campus, Urbana, USA
Centre’s Publications

PG courses

Short courses
Publications - Course Announcement & Brochures
Newsletters, Memoirs and General Information Brochures
Achievements

Total: 1524 (49 AP countries*)
- 769 from PG courses
- 755 from short courses

* 16 countries from outside AP region

<table>
<thead>
<tr>
<th>Course</th>
<th>M.Tech. Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS &amp; GIS</td>
<td>66</td>
</tr>
<tr>
<td>SATCOM</td>
<td>35</td>
</tr>
<tr>
<td>SATMET</td>
<td>17</td>
</tr>
<tr>
<td>SAS</td>
<td>18</td>
</tr>
</tbody>
</table>
Capacity Building Regular Short Courses

- **High Resolution Aerospace Image Analysis for Geo-hazard Assessment**: Jan 25 - Feb 12, 2010
  - 18 participants from 6 countries

![Bar chart showing participant numbers by country](image1)

- **Application of Space Technology for Disaster Management**: April 12 – May 7, 2010
  - 14 participants from 10 countries

![Bar chart showing participant numbers by country](image2)
Capacity Building Regular Short Courses

- Workshop on Open Source Geospatial Tools: 12 - 14 January, 2011
- 18 participants from 6 countries

- RS&GIS Applications for Coastal Hazards Mitigation & Sustainable Development for Pacific countries: 5 - 16 December, 2011
- 11 participants from 5 countries
Capacity Building Regular Short Courses

- Microwave Remote Sensing & its Applications: 04 – 29 April, 2011
- 26 Participants from 16 countries

- Workshop on Open Source Geospatial Tools: April 2-4, 2012
- 31 participants from 12 countries
Capacity Building on Disaster Risk Reduction

Regular Courses

- Application of Space Technology for Disaster Risk Reduction April 9 – May 4, 2012
- 27 participants from 17 countries
- With UNOOSA/UNSIPDER, UNESCAP

Short course on Hyperspectral Remote Sensing: June 3-28, 2013
- 19 Participants from 07 countries
Capacity Building Regular Short Courses

Short course on Microwave Remote Sensing (SAR) & its Applications: May 5 –30, 2014
20 participants from 7 countries

- Geospatial Technologies for Coastal & Marine Disaster Management & Climate Change: May 4-31, 2015 jointly with UNESCAP
- 19 participants from 10 countries
Special Short Courses on DRR
Special Programmes with UN Agencies

- **Flood Risk Mapping & Modeling and Assessment using Space Technology:** July 22-26, 2013 (Hyogo Framework)
  - 19 participants from 11 countries
  - Funded by UNOOSA/UNSIPDER, UNESCAP and IWMI

- **Sub-regional training on development of Geo-referenced Information Systems for Disaster Risk Management:** 26-29, August 2013
  - 16 participants from 9 countries
  - Funded by UNESCAP
Special Short Courses on DRR
Special Programmes with UN Agencies

- **SAARC Regional Training Programme on GIS & RS Technology in Disaster Risk & Emergency Management in South Asia:** July 14-15, 2014
  - 21 participants from 6 countries
  - Funded by SAARC Disaster Management Centre

- **Expert Group Meeting & Specialized Training on Disaster Rapid Impact Assessment using Space-Based Information for SAARC Countries:** Dec. 1-4, 2014
  - 16 participants from 6 countries
  - Funded by UN-ESCAP
Special Short Courses on DRR
Special Programmes with UN Agencies

• Short course on ‘Earth Observation for Disaster Response, Recovery and Preparedness’ for Bhutanese Officials: April 13-17, 2015
• 19 Participants from Bhutan
• Organized by UNDP, CSSTEAP, and UNSPIDER at IIRS, ISRO, Dehradun
• Funded by UNDP Bhutan
<table>
<thead>
<tr>
<th>S.N.</th>
<th>Course</th>
<th>Year</th>
<th>Participants</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>International short course on Geoinformatics for Disaster Management</td>
<td>2002</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>2.</td>
<td>International short course on Geoinformatics for Disaster Management</td>
<td>2004</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>5.</td>
<td>International Training Course on Application of Space Technology For Disaster Management Support with emphasis on Geological Risk Mitigation</td>
<td>2010</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>S.N.</td>
<td>Course</td>
<td>Year</td>
<td>Participants</td>
<td>Course</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------</td>
<td>------</td>
<td>--------------</td>
<td>--------</td>
</tr>
<tr>
<td>6</td>
<td>Special Course on High Resolution Aerospace Image Analysis For <strong>Geo-Hazard Assessment</strong></td>
<td>2010</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Short Training Course on Remote Sensing and GIS Applications for <strong>Coastal Hazard Mitigation and Sustainable Development for Pacific Countries</strong> <em>(UNESCAP)</em></td>
<td>2011</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>International Training Course on Application of Space Technology for <strong>Disaster Risk Reduction</strong> <em>(UNESCAP, UNSPIDER)</em></td>
<td>2012</td>
<td>27</td>
<td>17</td>
</tr>
<tr>
<td>9</td>
<td>Development of <strong>Geo-referenced Information System for Disaster Risk Management</strong> <em>(UNESCAP)</em></td>
<td>2013</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>Expert Group Meeting &amp; Specialized Training on <strong>Disaster Rapid Impact Assessment using Space-Based Information</strong> <em>(UNESCAP)</em></td>
<td>2014</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td>SAARC Regional Training Programme on GIS &amp; RS Technology in <strong>Disaster Risk &amp; Emergency Management in South Asia</strong> <em>(SAARC)</em></td>
<td>2015</td>
<td>21</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>International Training Programme on Earth Observation for Disaster Response and Recovery Preparedness for <strong>Bhutanese Officials</strong> <em>(UNDP, Bhutan, UNSPIDER)</em></td>
<td>2015</td>
<td>19</td>
<td>1</td>
</tr>
</tbody>
</table>
CSSTEAP Programmes 2016
9 months: Post Graduate Diploma

<table>
<thead>
<tr>
<th>Programmes</th>
<th>Starting Date</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RS &amp;GIS</td>
<td>July 1, 2016</td>
</tr>
<tr>
<td>2</td>
<td>SATMET</td>
<td>August 1, 2016</td>
</tr>
<tr>
<td>3</td>
<td>SAS</td>
<td>August 1, 2016</td>
</tr>
<tr>
<td>4</td>
<td>SATCOM</td>
<td>August 1, 2017</td>
</tr>
<tr>
<td>5</td>
<td>SAS</td>
<td>August 1, 2017</td>
</tr>
</tbody>
</table>

Admissions open
<table>
<thead>
<tr>
<th>Programmes</th>
<th>Starting Date</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2  Navigation Satellite Positioning System (NAVSAT)</td>
<td>Oct-Nov. Every year</td>
<td></td>
</tr>
<tr>
<td>3  Small Satellite Mission (SSM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6  Disaster damage and loss assessment using satellite data including natural heritage and cultural sites with UNESCO C2C</td>
<td>July-August, 2016</td>
<td>July-August, 2016</td>
</tr>
</tbody>
</table>

Admissions open
Government of India Support to CSSTEAP

- Welcomes fully or partially self-sponsored candidates
- Centre provides to and fro international travel to all participants (also UNOOSA, UNESCAP, UNSPIDER, etc.)
- Fellowship to all the participants
- Book and Project allowance to all the participants
- Access to all the facilities, library, recreation, Gym, etc.
- International hostel (AC accommodation, kitchenette facility for cooking, Internet, etc.)
- Individual computer to all (computer and open source RS&GIS software)
Government of India Support to IIRS

MEA, Govt. of India under Indian Technical & Economic Programme (ITEC/SCAAP) provides financial support since 1954.

SCAPP (Special Commonwealth Assistance for Africa Programme), 161 countries in Asia & the Pacific, Africa, Latin America & the Caribbean and East & Central Europe

- Digital Image Processing
- Geoinformatics
- Geo-informatics for disaster risk reduction (2/4 weeks)
- ASEAN: Government of India will be funding Capacity Building activities for Long and Short-Term Programmes in synchronous with CSSTEAP programmes
International Cooperation

RCSSTEAP and Beihang University 2016

Hon. Minister, Government of Bangladesh 2015

Australian Consul General visit 2016
Educational activities in and out-side the campuses
An ISO 9001-2008 Institute

THANK YOU

www.iirs.gov.in