



**REPORT FOR THE
FIFTEENTH GENERAL ASSEMBLY MEETING
OF COMSTECH**

**ISLAMABAD
May 2016**

INTER ISLAMIC NETWORK ON SPACE SCIENCES AND TECHNOLOGY (ISNET)

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Executive Summary

1. ISNET was founded by nine OIC Member States: Bangladesh, Iraq, Indonesia, Morocco, Niger, Pakistan, Saudi Arabia, Tunisia and Turkey. Whereas Syria, Iran, Sudan, Azerbaijan, Senegal, Egypt and Jordan joined ISNET in the year 1997, 2004, 2004, 2009, 2011 and 2013 respectively, thus increasing the membership of ISNET to 16 countries.
2. To accomplish its objectives and assist in human resource development and capacity-building efforts of its member countries, ISNET continued to sponsored participants from member countries in attending the training courses. Since 2011 ISNET sponsored participants for sixteen training courses organised by Pakistan Space & Upper Atmosphere Research Commission (SUPARCO) and Institute of Space Technology (IST) of Pakistan
3. With the view to promoting international cooperation in space-related fields among OIC member countries, and in identifying potential joint projects of mutual interest; ISNET collaborated with the relevant space institutions of OIC member countries and UN to hold around 11 conferences/workshops and expert meeting, resulting in participation from around 20 Islamic countries.
4. To achieve recognition of ISNET as an international organization, ISNET became permanent observer of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) in 2013. ISNET's application as an Observer has also been accepted by The Group on Earth Observation's (GEO).
5. ISNET's focal host organisation SUPARCO and parent organisation COMSTECH have extended great support to the Network and made these activities possible. The generous funding of COMSTECH and Islamic Educational, Scientific and Cultural Organization (ISESCO) for the expert meeting in 2011 and Islamic Development Bank (IDB) for annual events of 2011 - 2015 has been a great support.
6. On behalf of ISNET, I owe my special thanks to the Government of Pakistan for releasing generous grants of USD 50,000/- each year. I also take this opportunity to thank the Governments of Azerbaijan, Bangladesh, Egypt, Jordan, Iran, Iraq, Senegal, Saudi Arabia and Sudan for continued membership contributions since 2011.
7. I also wish to thank COMSTECH for their recommendation of ISNET's events to IDB for its generous sponsorship of the annual events organised by the Network. Last but not the least I would like to thank SUPARCO for providing the human resources, office accommodation, and administrative and logistic support to the Network. Without the help and continued efforts of all our partners we would not have been able to achieve all that we have thus far.
8. I would like to avail this opportunity to request the Honourable delegates of the OIC member states to provide their political, moral and material support to the ISNET focal point institutions in their respective countries and through them to the activities of

the Network. I also request the distinguished delegates from OIC member states that are not yet members of ISNET to consider joining the Network through their national space coordinators. Let me assure you that the benefits of joining the Network greatly outweigh the nominal membership contribution.

9. May Allah Almighty crown our efforts with success for the benefit of the Muslim Ummah in particular and the whole humankind in general and may Allah bring peace, unity and stability to our ranks.

Haider Ali Khan
Executive Director, ISNET

Introduction

1. ISNET was founded by nine OIC Member States: Bangladesh, Iraq, Indonesia, Morocco, Niger, Pakistan, Saudi Arabia, Tunisia and Turkey. Whereas Syria joined in 1997, Islamic Republic of Iran and Sudan joined in 2004. Azerbaijan and Senegal joined the Network in the year 2009 and Egypt and Jordan in 2011 and 2013, thus increasing the membership of ISNET to 16 Islamic countries.

2. ISNET has been submitting its activity reports to COMSTECH since 1989. The activities of the Network are periodically brought to the attention of its member States as well as Headquarters of other Inter-Islamic Networks and relevant institutions in the OIC region through the publication of its periodic newsletter and the website. ISNET makes every effort to keep in touch with its constituent member States, seeks their cooperation and advice on important issues of interest and collaborates with them in the performance of its functions and activities to better serve their needs.

3. The main objectives of ISNET are:

- a) To collaborate and cooperate with OIC member States in the peaceful uses of outer space
- b) To exchange information, share experiences and maintain dialogue on the developments in space science, space technology and their applications among OIC member States
- c) To initiate joint projects of space sciences, space technology and their applications among OIC member States
- d) To coordinate consultancy and advisory services among member States
- e) To help and assist in training to develop the quality manpower of OIC countries (organisation of periodic short- and long-term training courses, training workshops/on the job trainings)

4. To accomplish its objectives and to help further human resource development and capacity-building efforts of its member States, ISNET sponsors participants from its member States and those of the OIC for various training courses arranged by SUPARCO and other focal point organisations.

5. These courses include a wide range of topics related to space technology and applications, upper atmosphere and environmental studies. These activities are attended by professionals of diverse backgrounds and from different institutions and countries, and present opportunities for experience-sharing and relationship-building among participants.

6. Since its establishment, ISNET has organised **71 seminars, conferences, workshops and specialised training courses** in collaboration with its focal point organisations and the United Nations Programme on Space Applications, benefiting around **600 scientists, researchers and engineers** from **25 countries** through financial

sponsorship. An additional **1,500 professionals and students** have been in attendance at these events. A summary of the aforesaid activities is at **Annex-A**.

Recent Activities and Achievements (January 2013 till April 2016)

7. For the period starting from January 2013 to date, ISNET has sponsored participants from paying member States to attend the following training courses organised by the Pakistan Space & Upper Atmosphere Research Commission (SUPARCO) and the Institute of Space Technology (IST), Pakistan:

- a) **Training Course on Remote Sensing applications to Land Administration;** 14-18 January 2013 in Karachi.
- b) **Advanced Training Course in Remote Sensing & GIS;** 25 February – 8 March 2013 in Karachi.
- c) **Training Course on Spatial Decision Support System;** 25-29 November 2013 in Karachi.
- d) **Training Course on Applications of Global Navigation Satellite Systems (GNSS);** 18-21 February 2014 in Islamabad.
- e) **Training Course on Remote Sensing and GIS Applications for Forestry;** 18-22 August 2014 in Karachi.
- f) **Training Course on Satellite-based Applications in Climate Change;** 22-25 December 2014 in Karachi, Pakistan
- g) **Training Course on Applications of Geospatial Techniques in Coastal Resource Mapping and Management;** 4-7 Aug 2015 in Karachi, Pakistan
- h) **Workshop on Antenna Design with HFSS Software;** 11-12 Aug 2015 in Islamabad, Pakistan
- i) **Training Course on Digital Image Processing using ENVI;** 17-21 Aug 2015 in Karachi, Pakistan
- j) **Training Course on Object Based Image Analysis (OBIA);** 14 - 18 Sep 2015 in Karachi, Pakistan
- k) **Training Course on RADAR Remote Sensing and Image Processing;** 21-24 Dec 2015 in Islamabad, Pakistan
- l) **Training Course on Spatial Decision Support Systems;** 25-29 April 2016 in Karachi, Pakistan

8. During the period, ISNET collaborated with the relevant space institutions of OIC member States to hold many scientific events. Such events are organised with the view to promote international cooperation in space-related fields among OIC member countries, to seek participation of subject specialists from a greater number of Islamic nations, to provide forum for establishing professional linkages between them, and to help identify potential joint projects of mutual interest. Following organised events resulted in participation from around 11 Islamic countries. The Network sponsored 60 of the more than 300 space-related scientists, researchers and students who benefited from these events.

- a) **International Workshop on Integrated Use of Space Technologies for Food and Water Security held on 11-15 March 2013** in Islamabad, Pakistan in collaboration with the United Nations Office for Outer Space Affairs (UNOOSA) and SUPARCO.
- b) **Workshop on Space Applications for Disaster Risk Reduction and Management held during 7-19 September 2013** in Tehran, Iran in collaboration with the Iranian Space Agency (ISA), COMSTECH and the Islamic Development Bank (IDB)
- c) **3rd International Conference on the Use of Space Technology for Water Management held on 1-4 April 2014** in Rabat, Morocco in collaboration with UNOOSA and Royal Centre for Remote Sensing (CRTS), Morocco.
- d) **ISNET/TUBITAK UZAY Workshop on Small Satellite Engineering and Design for OIC Countries held on 20-24 October 2014** in Ankara, Turkey in collaboration with The Scientific and Technological Research Council of Turkey (TUBITAK, UZAY), COMSTECH and the Islamic Development Bank (IDB).
- e) **ISNET/SUPARCO Workshop on Student Satellites from 02-06 November 2015 in Lahore, Pakistan** in collaboration with the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), COMSTECH and the Islamic Development Bank (IDB)

9. ISNET's General Body Meeting (GBM) is held biennially to review the activities undertaken in past two years and to discuss the financial and future activity plans. The tenth biennial GBM of ISNET was organised on 13 November 2014 at COMSTECH Secretariat, Islamabad, Pakistan.

10. ISNET became permanent observer of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) in 2013 vide para. 29 of the United Nations General Assembly resolution A/RES/68/75 titled, "International cooperation in the peaceful uses of outer space" adopted without a vote on 11 December 2013. The status of permanent observer with UN-COPUOS aims to provide following benefits to ISNET:

- a) Recognition of ISNET as an international organization
- b) To stay abreast with the latest developments and activities in the realm of space sciences, space technology and applications worldwide

- c) To develop linkages with other intergovernmental organizations
- d) To attract more OIC member states to consider membership of the Network
- e) To create awareness about ISNET and projection of its activities.

11. ISNET's application as an Observer has also been accepted by The Group on Earth Observation's (GEO) in 2015. Becoming an Observer of GEO shall not only benefit ISNET in staying updated with the latest developments in the realm of earth observation, but shall also help in further strengthening ISNET as an international intergovernmental organisation.

12. A detailed report of the aforesaid ISNET events is at **Annex-B**.

Challenges

13. ISNET currently faces the following challenges:

- a) Theoretically, ISNET enjoys the membership of 16 Islamic States. However, quite a few of these have been inactive for a long time. At present, Indonesia, Morocco, Niger, Tunisia and Turkey are inactive. The membership of Syria has been suspended by the OIC in the wake of the ongoing civil war in the country. The membership of Iraq also remained suspended but was later reinstated. It may be noted that the lack of activity on part of some of ISNET member States costs the ISNET Secretariat US\$ 24,000 in yearly membership contributions.
- b) Secondly, the contributions of the remaining active member States only amount to US\$ 77,000 per year, the bulk of which is provided by Pakistan i.e. US\$ 50,000 – details of contributions by each Member State are at **Annex-C**. The Secretariat is therefore unable to initiate meaningful joint projects due to lack of resources.
- c) Another challenge facing ISNET is the authority that vests with the delegates attending its Governing Body Meeting (GBM) – the decision-making body. At present, the GBM is attended by officials ranking between mid-level managers or departmental heads of research institutes to deputy chairmen of space agencies. These delegates apparently, if not certainly, do not possess the political and financial authority to support joint projects, particularly those projects which involve separate budgetary allocations exceeding their annual membership contributions.
- d) Unlike other international intergovernmental organisations, which have budget for human resources, administration, transportation, rent and utilities etc.; ISNET Secretariat has a part-time staff of only three, paid out of SUPARCO's budget and is housed at its premises. In the absence of an independent budget for the Secretariat, it cannot organise large events or perform complex tasks such as devising cooperation strategies and mechanisms; undertaking technical feasibility; formulating legal, financial and administrative reports; scientific publications and so on and so forth.

Recommendations

14. The Secretariat proposes the following to address the aforesaid challenges:
- a) The budget of ISNET Secretariat should be increased on the lines of other international intergovernmental organisations.
 - b) A high-powered committee should be formed to redraft the Charter and Statutes of ISNET in such a way as to render strong political and diplomatic strength to the Network.
 - c) Member States of ISNET should commit to show seriousness towards the Network and initiate meaningful joint projects.
 - d) A separate ISNET Secretariat should be set up and necessary financial support be provided thereto in a sustainable manner. In order to successfully undertake and follow up on projects of intergovernmental level, larger technical and administrative staff should be hired.

Conclusion

15. ISNET, with the active support of SUPARCO, COMSTECH and IDB has been fairly successful in meeting its objectives. There is increasing interest in, and appreciation of, the importance of space applications amongst members of the OIC. Realizing the benefits of the network, ISNET member countries are taking keener interest and participation in the activities of the network.

16. ISNET continues its efforts to create awareness of the benefits of space technology and its various applications to the development of countries. It is hoped, that realizing the benefits of space technology, a greater number of Muslim countries will strive to develop capacity in the use of space technology applications as well as conduct research for indigenous development of technologies in the field.

17. Since education and training in space related fields is costly and a major factor refraining developments in the field, ISNET provides an excellent platform for synergizing of efforts and resources for mutually benefiting from the knowledge, skills and expertise of member countries.

May Allah crown our efforts with success for the collective benefit of the Muslim Ummah.

SUMMARY OF ACTIVITIES OF ISNET

| S. No. | Title of Training / Seminar / Workshop / Conference / Meeting | Dates | Venue | No. of Sponsored Participants / Attendees | Co-organiser/ Co-sponsor |
|--------|---|---------------------|---------------------|---|---|
| 1. | International Training Course on Satellite Search and Rescue | Not available | Lahore, Pakistan | Not available | SUPARCO |
| 2. | Seminar on Satellite Communications | Not available | Lahore, Pakistan | Not available | SUPARCO Institute of Electrical and Electronics Engineering (IEEE), Pakistan |
| 3. | Seminar on Urban Planning and Environmental Monitoring Using Satellite Remote Sensing Data | Not available | Karachi, Pakistan | Not available | SUPARCO |
| 4. | Fourth APCMSTA Meeting | 30 Nov – 4 Dec 1997 | Islamabad, Pakistan | 10 | |
| 5. | International Course on Remote Sensing and GIS Applications | 24 Aug – 1 Sep 1998 | Islamabad, Pakistan | 15 | SUPARCO COMSTECH |
| 6. | International Workshop on Low Cost Space Missions | 24 Nov – 4 Dec 1999 | Islamabad, Pakistan | 20 | SUPARCO COMSTECH Islamic Development Bank (IDB) |
| 7. | International Seminar on Natural Hazards Monitoring | 7-11 Jan 2002 | Karachi, Pakistan | 15 | SUPARCO COMSTECH IDB |
| 8. | International Workshop on Satellite Imaging Technology and Applications | 22–28 Jan 2003 | Karachi, Pakistan | 7 | SUPARCO COMSTECH IDB |
| 9. | Short Training Course on Environmental Studies Using Satellites, Balloons and Ground Based Data | 12–23 Jan 2004 | Karachi, Pakistan | 8 | SUPARCO |
| 10. | Advanced Training Course on Applications of Satellite Remote Sensing (SRS) Technology and Geographic Information system (GIS) | 19-23 Apr 2004 | Karachi, Pakistan | 5 | SUPARCO |
| 11. | International Seminar on Satellite Technology Applications in Communications and Remote Sensing | 9-15 Oct 2004 | Tehran, Iran | 25 | SUPARCO COMSTECH Iranian Space Agency (ISA) |

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|-----|---|---------------------|---------------------|----|---|
| 12. | Training Course on Environmental Monitoring | 25-29 Jul 2005 | Karachi, Pakistan | 4 | SUPARCO COMSTECH IDB |
| 13. | Training Course on Remote Sensing Technology and GIS | 1-5 Aug 2005 | Karachi, Pakistan | 5 | SUPARCO COMSTECH IDB |
| 14. | International Workshop on Space Technology for Peace, Rehabilitation and Development | 26-29 Sep 2005 | Khartoum, Sudan | 25 | SUPARCO COMSTECH Remote Sensing Authority (RSA), Sudan IDB |
| 15. | Advanced Training on Remote Sensing & GIS | 13-24 May 2006 | Karachi, Pakistan | 2 | SUPARCO |
| 16. | Training course on Photogrammetry & Remote Sensing | 21-31 Aug 2006 | Karachi, Pakistan | 7 | SUPARCO |
| 17. | International Seminar on Space Technology & Applications | 11-15 Sep 2006 | Islamabad, Pakistan | 20 | SUPARCO COMSTECH Institute of Space Technology (IST), Pakistan IDB |
| 18. | Training course on Remote Sensing & Digital Image Processing | 18-29 Dec 2006 | Karachi, Pakistan | 3 | SUPARCO |
| 19. | Short Training Course on Impact of Solar Radiation on Earth, Ionosphere and Geomagnetic Field | 25-26 Jul 2007 | Karachi, Pakistan | 6 | SUPARCO |
| 20. | Seminar on Remote Sensing for Water Resources Management | 27-29 Aug 2007 | Damascus, Syria | 20 | SUPARCO COMSTECH General Organisation of Remote Sensing (GORS), Syria |
| 21. | Training course on Geographic Information System | 22 Oct – 2 Nov 2007 | Karachi, Pakistan | 4 | SUPARCO |
| 22. | Training course on Atmospheric Sciences | 27-30 Nov 2007 | Karachi, Pakistan | 3 | SUPARCO |
| 23. | Training Course on Remote Sensing & Digital Image Processing | 7-18 Apr 2008 | Karachi, Pakistan | 4 | SUPARCO |
| 24. | Training Workshop on Satellite Technology Applications in Communications and Remote Sensing | 5-8 May 2008 | Lahore, Pakistan | 20 | SUPARCO COMSTECH ISESCO |
| 25. | Training Course on Synthetic Aperture Radar Images: | 12-16 May 2008 | Damascus, Syria | 25 | SUPARCO GORS |

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|-----|--|---------------------|---------------------|----|---|
| | Acquisition, Characteristics and Applications | | | | North African Center for Remote Sensing (CRTEAN) |
| 26. | Training Course on Climate Change and Natural Resources Management | 15-18 Jul 2008 | Lahore, Pakistan | 3 | SUPARCO |
| 27. | Training course on Remote Sensing & Geographic Information System | 4-15 Aug 2008 | Karachi, Pakistan | 5 | SUPARCO |
| 28. | Training Course on Space Weather Monitoring | 19-21 Aug 2008 | Karachi, Pakistan | 3 | SUPARCO |
| 29. | International Seminar on Space Technology and Applications for Sustainable Development | 24-27 Nov 2008 | Tunis, Tunisia | 20 | SUPARCO COMSTECH CRTEAN IDB |
| 30. | Training course on Remote Sensing & Digital Image Processing | 13-24 Apr 2009 | Karachi, Pakistan | 6 | SUPARCO |
| 31. | Training course on Remote Sensing & GIS | 13-24 Jul 2009 | Karachi, Pakistan | 4 | SUPARCO |
| 32. | 1st International Conference on Aerospace Science & Engineering (ICASE - 2009) | 18 -20 Aug 2009 | Islamabad, Pakistan | 20 | IST |
| 33. | Workshop on SAR and Optical Data for Natural Resources and Environmental Management | 2-5 Nov 2009 | Damascus, Syria | 20 | SUPARCO COMSTECH GORS |
| 34. | Advanced Training Course in Remote Sensing and GIS | 5-16 Apr 2010 | Karachi, Pakistan | 3 | SUPARCO |
| 35. | Advanced Training course on Synthetic Aperture Radar (SAR) Data: Processing, Interpretation and Applications | 3-14 May 2010 | Tunis, Tunisia | 15 | SUPARCO COMSTECH CRTEAN IDB |
| 36. | Training Course on Remote Sensing & Digital Image Processing | 5-16 July 2010 | Karachi, Pakistan | 4 | SUPARCO |
| 37. | Training Course on Geological Applications of Remote Sensing | 27 Sep – 1 Oct 2010 | Karachi, Pakistan | 5 | SUPARCO |
| 38. | Seminar on Bridging the Gap through Satellite Technology | 18-21 Oct 2010 | Cairo, Egypt | 25 | SUPARCO COMSTECH National Authority for Remote Sensing & Space Sciences (NARSS), Egypt IDB |
| 39. | Hands-on Training Course on ArcGIS | 1-5 Nov 2010 | Karachi, Pakistan | 5 | SUPARCO |
| 40. | Advanced Training on Remote Sensing & GIS | 4-15 Apr 2011 | Karachi, Pakistan | 6 | SUPARCO |

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| 41. | Training Course on Environmental Monitoring & Impact Assessment using Satellite Remote Sensing & Ground-based Techniques | 4-8 Apr 2011 | Lahore, Pakistan | 5 | SUPARCO |
| 42. | Training Course on Scenario Development, Spatial Planning Support Systems and Collaborative Decision Support | 6 Jun – 15 Jul 2011 | Enschede, Netherlands | 1 | ITC, University of Twente |
| 43. | Hands-on Training Course on ArcGIS | 6-10 Jun 2011 | Karachi, Pakistan | 5 | SUPARCO |
| 44. | Expert Meeting for Development of Data-sharing Platform and Technical Experience-sharing for Cost-effective Operation and Maintenance of National Satellite Earth Stations | 12-15 Jul 2011 | Islamabad, Pakistan | 10 | SUPARCO COMSTECH ISESCO |
| 45. | Workshop on Applications of Satellite Technology in Water Resources Management | 18-22 Sep 2011 | Amman, Jordan | 25 | SUPARCO COMSTECH Royal Jordanian Geographic Centre (RJGC), Jordan IDB |
| 46. | Training Course on Integrating Ground-based Methods and Spatial Techniques for Environmental Monitoring | 24-28 Oct 2011 | Karachi, Pakistan | 3 | SUPARCO |
| 47. | Advanced Training Course on Applications of Satellite Radar Technology in Development | 29 Jan – 3 Feb 2012 | Cairo, Egypt | 5 | NARSS |
| 48. | 10th Arab Conference on Astronomy & Space Sciences | 5-8 Feb 2012 | Oman, Muscat | 1 | Oman Astronomical Society (OAS) |
| 49. | Training Course on Spatial Decision Support System | 27 Feb – 2 Mar 2012 | Karachi, Pakistan | 1 | SUPARCO |
| 50. | Training Course on Natural Hazards Modelling and Risk Assessment | 5 Mar – 4 May 2012 | Enschede, Netherlands | 1 | ITC, University of Twente |
| 51. | Training Course on Understanding Natural Resources and Climate Change using Geospatial Techniques | 12-16 Mar 2012 | Islamabad, Pakistan | 1 | IST |
| 52. | OIC Workshop on Geomagnetic Observatories and their Applications | 3-13 Apr 2012 | Islamabad, Pakistan | 7 | SUPARCO |

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|-----|--|---------------------|---------------------|----|---|
| 53. | Workshop on Applications of Space Technology for Food Security | 9-14 Jul 2012 | Dakar, Senegal | 20 | COMSTECH Centre de Suivi Ecologique (CSE), Senegal IDB |
| 54. | Training Course on Disaster Management using Remote Sensing and GIS Techniques | 17-21 Sep 2012 | Islamabad, Pakistan | 5 | IST |
| 55. | Training Course on Remote Sensing applications to Land Administration | 14-18 Jan 2013 | Karachi, Pakistan | 3 | SUPARCO |
| 56. | Advanced Training Course in Remote Sensing & GIS | 25 Feb - 8 Mar 2013 | Karachi, Pakistan | 7 | SUPARCO |
| 57. | UN/Pakistan International Workshop on Integrated Use of Space Technologies for Food and Water Security | 11-15 Mar 2013 | Islamabad, Pakistan | 8 | United Nations Office for Outer Space Affairs (UNOOSA) SUPARCO |
| 58. | Workshop on Space Applications for Disaster Risk Reduction and Management | 7-19 Sep 2013 | Tehran, Iran | 17 | COMSTECH ISA IDB |
| 59. | Training Course on Spatial Decision Support System | 25-29 Nov 2013 | Karachi, Pakistan | 3 | SUPARCO |
| 60. | Training Course on Applications of Global Navigation Satellite Systems (GNSS) | 18- 21 Feb 2014 | Islamabad, Pakistan | 7 | IST |
| 61. | 3rd International Conference on the Use of Space Technology for Water Management | 1-4 April 2014 | Rabat, Morocco | 9 | UNOOSA Royal Centre for Remote Sensing (CRTS), Morocco |
| 62. | Training Course on Remote Sensing and GIS Applications for Forestry | 18-22 Aug 2014 | Karachi, Pakistan | 7 | SUPARCO |
| 63. | ISNET/TUBITAK UZAY Workshop on Small Satellite Engineering and Design for OIC Countries | 20-24 Oct 2014 | Ankara, Turkey | 16 | COMSTECH IDB TUBITAK/UZAY |
| 64. | Training Course on Satellite-based Applications in Climate Change | 22-25 Dec 2014 | Karachi, Pakistan | 9 | IST |
| 65. | Training Course on Applications of Geospatial Techniques in Coastal Resource Mapping and Management | 4-7 Aug 2015 | Karachi, Pakistan | 4 | IST |

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|------------|--|------------------|---------------------|---|----------------------------|
| 66. | Workshop on Antenna Design with HFSS Software | 11-12 Aug 2015 | Islamabad, Pakistan | 2 | IST |
| 67. | Training Course on Digital Image Processing using ENVI | 17-21 Aug 2015 | Karachi, Pakistan | 3 | SUPARCO |
| 68. | Training Course on Object Based Image Analysis (OBIA) | 14 - 18 Sep 2015 | Karachi, Pakistan | 3 | SUPARCO |
| 69. | Training Course on RADAR Remote Sensing and Image Processing | 21-24 Dec 2015 | Karachi, Pakistan | 3 | IST |
| 70. | ISNET/SUPARCO Workshop on Student Satellites | 02-05 Nov 2015 | Lahore, Pakistan | 9 | COMSTECH IDB SUPARCO |
| 71. | Training Course on Spatial Decision Support Systems | 25-29 April 2016 | Karachi, Pakistan | 6 | SUPARCO |

DETAILED REPORT OF RECENT ACTIVITIES OF ISNET

• Training Course on Remote Sensing Applications to Land Administration

1. ISNET sponsored three participants from Azerbaijan National Aerospace Agency, Iranian Space Agency and Remote Sensing Authority, Sudan to participate in the training course on Remote Sensing applications to Land Administration organised by SUPARCO from 14-18 January 2013 at its National Center for Remote Sensing and Geoinformatics (NCRG) in Karachi, Pakistan.

2. The course was aimed at impart knowledge on Satellite Remote Sensing (SRS) and Geographic Information System (GIS) in land administration and management vis-à-vis development of digital land records and ensuring their security.

• Advanced Training Course in Remote Sensing & GIS

3. ISNET and SUPARCO jointly organised the Advanced Training Course in Remote Sensing & GIS from 25 February to 8 March 2013 at its National Center for Remote Sensing and Geoinformatics (NCRG) in Karachi, Pakistan.

4. The main aim of the training was to impart training on the concepts and knowledge of advanced techniques being used in GIS development and applications.

5. ISNET sponsored seven participants from Azerbaijan National Aerospace Agency, Royal Jordanian Geographic Centre, Remote Sensing Authority (RSA), Sudan, The Scientific and Technological Research Council of Turkey - Space Wing, and University of Karachi, Pakistan.

• International Workshop on Integrated Use of Space Technologies for Food and Water Security

6. The United Nations Office for Outer Space Affairs (UNOOSA) and the Government of Pakistan jointly organised the above Workshop to promote the use of space technologies for the benefit of developing countries.

7. The Workshop was held at COMTECH Secretariat in Islamabad, Pakistan from 11 to 15 March 2013. It was hosted by the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) on behalf of the Government of Pakistan. ISNET provided co-sponsorship for the Workshop.

8. The Workshop was to explore how present-day space technologies could help identify and monitor the relationships between mountain environment (as a source of water),

sustainable water resources and how these affect food security on an international and regional scale. It also linked to the Rio+20 Summit Declaration and to the evolving United Nations Post-2015 Development Agenda.

9. The Workshop comprised a series of technical presentations with sufficient time set aside for discussions. Technical sessions were followed by open discussions, which focused on specific topics of interest. The programme addressed topics such as, applications of space technologies that provided cost-effective solutions and essential information for planning and implementation use of space-related technologies in mitigating water-related emergencies, providing safe access to water and combating desertification; use of space technologies for food security research and early warning; use of space technologies for improved sustainable agriculture practices, and in the development of precision farming; capacity-building in water management and food security research; education and training required for various target groups on using space technologies for addressing water- or food-related challenges; international, regional and national initiatives and international and inter-regional cooperation in the domain of water or food security; and case studies on successful applications of space technologies for enhancing water resources management and improving food security in developing countries.

10. ISNET sponsored eight participants from Azerbaijan National Aerospace Agency, Tarbiat Modares University, Iran, Ministry of Science & Technology (MoST), Iraq, Centre de Suivi Ecologique (CSE), Senegal, Remote Sensing Authority, Sudan, and Ministry of Agriculture and Irrigation, Sudan, to attend the Workshop.

- **Workshop on Space Applications for Disaster Risk Reduction and Management**

11. ISNET, in collaboration with the Iranian Space Agency (ISA), with advisory support of COMSTECH and co-sponsorship of IDB, held a two-week Workshop on Space Applications for Disaster Risk Reduction and Management from 7-19 September 2013 in Tehran, Iran. The Workshop was held at the Iranian Space Research Centre (ISRC).

12. The Workshop comprised six thematic training modules, namely: floods, avalanches, cyclones, tsunamis, landslides, and earthquakes, which included lectures, demonstration and hands-on exercises. It centered on the sharing of subject knowledge and practical experience in the realm of disaster risk reduction and management in order to improve capability of undertaking disaster hazard assessment, disaster preparedness and disaster recovery activities through the use of space-enabled applications. It also served to update researchers and scientists from OIC countries on the various methodologies and techniques presently being used to manage disasters and to subsequently improve their ability to analyse various forms of disaster hazards.

13. The inauguration ceremony, presided over by His Excellency Dr. Ali Mohammad Nourian, Head of Iran Meteorological Organisation and Vice-Counselor to the President of

Iran, was attended by senior government officials, relevant experts and a large number of students from across Iran. In his address, the Chief Guest lauded the role of space technology and its applications for disaster risk reduction and management and dilated upon Iran's activities in this field in monitoring floods, tsunamis, earthquakes and droughts. Other speakers included Mr. Ahmed Bilal, President ISNET; Dr. Hassan Karimi, President ISRC and Executive Secretary of the Workshop; Dr. Hamid Fazeli, President ISA; and Dr. Muhammad Qasim Jan, Advisor COMSTECH. The speakers unanimously expressed the importance of exchange of experts among ISNET member States in undertaking further studies on disaster risk reduction and management. The ceremony was duly publicised by electronic and press media.

14. The Workshop began with a three-day training module on floods imparted by Mr. Zafar Iqbal of Pakistan, followed by a daylong module on avalanches given by Prof. Shahid Parvez of Pakistan. Dr. Majid Vazifedoust of Guilan University of Iran conducted one-day training on cyclones while Dr. Andreas Hoechner carried out training on tsunamis. Ms. Sigrid Roessner of Germany and Dr. Maryam Dehghani of Iran jointly gave training on landslides. The final training module on earthquakes was imparted by Dr. Mahdi Motagh of Iran. All the training modules were received extremely well by the participants.

15. At the end of the two-week intensive Workshop that featured over fifty presentations, practical demonstrations and hands-on exercises, an hour-long interactive session was held in which participants' feedback and Workshop recommendations were presented by the Executive Director of ISNET – Mr. Arshad H. Siraj. The recommendations, as formulated by the representatives of ISNET, ISA and ISRC, were unanimously adopted by the Workshop participants. The recommendations acknowledged the definition of Disaster Risk Management and Emergency Response as set forth by the UN-SPIDER Knowledge Portal. The organisation of the Workshop was welcomed as a forum to enhance the already existing knowledge and skills in the area of space-based data towards disaster risk reduction and management, and as a means of strengthening international cooperation in this field in order to benefit all OIC/ISNET member states collectively.

16. ISNET sponsored 17 participants and trainers from University of Rajshahi, Bangladesh, Bangladesh Space Research and Remote Sensing Organization, University of Tikrit, Iraq, The Libyan Center for Remote Sensing, Malaysian Remote Sensing Agency, SUPARCO, The Hong Kong Polytechnic University, University of Baluchistan, Pakistan, University of the Punjab, Pakistan, WWF, Pakistan, University of Peshawar, Pakistan, Centre de Suivi Ecologique (CSE), Senegal, Ministry of Water Resources and Electricity, Sudan, and GFZ German Research Centre for Geosciences, Germany to participate in the Workshop.

- **Training Course on Spatial Decision Support System**

17. ISNET in collaboration with SUPARCO organised a week-long hands-on training course on Spatial Decision Support System from 25-29 November 2013 at NCRG, SUPARCO Headquarters in Karachi, Pakistan.

18. The main objective of the course was to provide knowledge of Spatial Decision Support System (SDSS) to users of Geographic Information System (GIS) seeking to enhance their skills in application areas, namely: land use, transportation, water management, demographics, agriculture, climate, epidemiology, resource management or employment.

19. ISNET sponsored round-trip air travel, living accommodation and daily subsistence allowance of three international participants from Azerbaijan National Aerospace Agency, Bangladesh Space Research and Remote Sensing Organization and Royal Jordanian Geographic Centre.

- **Training Course on Applications of Global Navigation Satellite Systems (GNSS)**

20. ISNET sponsored seven participants from Azerbaijan National Aerospace Agency, Bangladesh Space Research and Remote Sensing Organization, Dijlra University, Iraq, Royal Jordanian Geographic Centre, University of Karachi, Pakistan, Institute of Space Technology (IST), Pakistan and Centre de Suivi Ecologique (CSE), Senegal, to participate in the training course on Applications of Global Navigation Satellite Systems (GNSS) held at IST Main Campus in Islamabad from 18-21 February 2014.

21. The main objective was to impart knowledge and training on Global Positioning System, Differential GPS, and Global Navigation Satellite System; their working principles and modern day applications.

- **3rd International Conference on the Use of Space Technology for Water Management**

22. The United Nations Office for Outer Space Affairs (UNOOSA), the Government of Morocco and Prince Sultan bin Abdulaziz International Prize for Water (PSIPW) jointly co-organised the above Conference to promote the use of space technology for benefits of the developing countries.

23. The Conference was held in Rabat, Morocco, from 1 to 4 April 2014. It was hosted by the Royal Center for Remote Sensing (CRTS) on behalf of the Government of Morocco and co-sponsored by ESA, ISNET and the GEO Secretariat.

24. The Conference was the third international event focusing on water-related issues in the series of meetings organised in co-operation with, and with financial assistance of, the Prince Sultan bin Abdulaziz International Prize for Water (PSIPW) and the European Space Agency (ESA). The first UN/UNESCO/Saudi Arabia International Conference on the Use of Space Technology for Water Management had taken place in Riyadh, Saudi Arabia, in April 2008, and the second UN/Argentina Meeting had been held in March 2011 in Buenos Aires, Argentina.

25. The Workshop was based on the realisation that space technologies, including satellite remote sensing technology in particular, have demonstrated proven capabilities in meeting challenges of water resource management, as rapid population growth and development pressures continue to impose additional stresses on scarce resources. Continuous Earth observations from space were crucial to manage water resources for the benefit of mankind and the environment, as well as to provide important forecasting services to prevent water-related disasters such as floods and droughts. The Workshop was aimed to discuss how space technology could contribute in better management of water resources, including combating desertification, ensuring access to safe drinking water and managing water-related emergencies in developing countries.

26. The Conference comprised a series of technical presentations with sufficient time set aside for discussions. Technical sessions were followed by open discussions, which focused on specific topics of interest and provided additional opportunities for participants to voice their opinions. The programme addressed topics such as, international initiatives to integrate space technologies in water resource management; space application for water productivity and economy; space applications for water security and risk management; geospatial information for ground water resources management; and capacity building and cooperation initiatives.

27. ISNET sponsored nine participants from Azerbaijan National Aerospace Agency, University of Rajshahi, Bangladesh, University of Jordan/Ministry of Environment, Jordan, Pakistan Council of Research in Water Resources (PCRWR), National University of Science and Technology (NUST), Pakistan, SUPARCO, and Institute of Space Technology, Pakistan to present their research papers at the Conference.

- **Training Course on Remote Sensing and GIS Applications for Forestry**

28. ISNET sponsored seven participants from Remote Azerbaijan National Aerospace Agency, Dijlla University, Iraq, Royal Jordanian Geographic Centre, Institute of Space Technology, Pakistan, Bahauddin Zakariya University, Pakistan and Centre de Suivi Ecologique (CSE), Senegal to attend the training course on Remote Sensing and GIS Applications for Forestry organised by SUPARCO from 18 to 22 August 2014 in Karachi, Pakistan.

29. The aim of the training course was to provide the basic understanding of Satellite Remote Sensing (SRS) and Geographic Information System (GIS), and their applications in Forestry. It progressed from digital image interpretation to identification of vegetated sites, followed by quantification techniques of selected forest parameters.

- **ISNET/TUBITAK UZAY Workshop on Small Satellite Engineering and Design for OIC Countries**

30. Inter-Islamic Network on Space Sciences & Technology (ISNET), in collaboration with the Scientific and Technological Research Council of Turkey (TUBITAK, UZAY), with advisory support of Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) and co-sponsorship of Islamic Development Bank (IDB), held a Workshop on Small Satellite Engineering and Design for OIC Countries from 20-24 October 2014 in Ankara, Turkey.

31. It is for the first time that ISNET had held a workshop related to space technology. Its objective was to offer an avenue for mutual exchange of knowledge and experience on small satellite engineering and design among the OIC member States. The workshop aimed to facilitate sharing of expert-level knowledge and experience on small satellite system and sub-system design and also provided hands-on training on advanced simulation software suites used in design, development and analysis of various satellite sub-systems.

32. The Workshop was divided into a two-day seminar on ‘Satellite Systems Engineering and Satellite Subsystems’ followed by lecture-based hands-on training course on ‘Satellite Mission Design’.

33. The event started with an inauguration ceremony presided by Dr Shaukat Hameed Khan, Coordinator General of COMSTECH. In his speech he stressed the importance of and need for technology sharing among OIC member countries. Dr. Lokman KUZU, Director, TUBITAK UZAY gave the welcome note in which he thanked ISNET for choosing Turkey as the host country for its annual workshop 2014. Mr Arshad H Siraj, Executive Director, ISNET addressed the gathering while outlining the importance of the workshop’s theme.

34. The two day seminar on “Satellite Systems Engineering and Satellite Subsystems” included series of oral presentations from ISNET member States (MS) on five thematic areas, namely: Systems Engineering; Payload; Communications; Structure; and AODCS. Apart from scientific papers that outlined the various uses of small satellite technology, there were a few on the status of small satellite technology in the member countries and how it can contribute to accelerated development.

35. The main highlight of the event however was a lecture by Professor Dr. Eberhard Gill a prominent German scientist, Chair holder of Space Systems Engineering (SSE) and Faculty of Aerospace Engineering from Delft University of Technology Netherland. Dr Gill’s lecture titled ‘Current Trends in Small Satellite Engineering and My Vision’ gave details of how small satellites can be cost effectively launched and how it is the most efficient way to move forward.

36. On the last day of the workshop TUBITAK UZAY had arranged a technical visit to Turkish Aerospace Industries (TAI). Participants were given briefing on research activities of

TAI, projects completed by TAI and its collaboration with local and international industry. Participants visited the Satellite Assembling, Integration and Testing facility developed by TAI with collaboration of Thales Alenia. The visit offered participants the opportunity to better understand satellite technology.

37. After the technical visit, a brief concluding ceremony was held at TUBITAK UZAY. The event formally commenced with a feedback and recommendations session where participants expressed their views about the event and suggested ideas for further cooperation between member countries. The participants recognised the immense potential of satellite technology in general and of small satellites in particular. The workshop concluded that small satellites were valuable tools in the development of a space infrastructure and scientific and application programmes for OIC countries. The exchange of information and practical expertise proved to be very valuable. It was noted that the modest cost involved in development of small satellites is an affordable means for the acquisition of space technology and building indigenous capability.

38. ISNET sponsored sixteen participants from Azerbaijan, Bangladesh, Egypt, Iran, Malaysia, Pakistan, Palestine, Sudan and Yemen for this workshop.

• **Tenth Governing Body Meeting (GBM) of ISNET**

39. The Inter Islamic Network on Space Sciences & Technology (ISNET) held its Tenth biennial Governing Body Meeting (GBM) on 13 November 2014 at COMSTECH Secretariat, Islamabad, Pakistan. The Meeting was chaired by President ISNET, Mr Ahmed Bilal who is also Chairman of Pakistan Space & Upper Atmosphere Research Commission (SUPARCO). The meeting was attended by the following officials from COMSTECH, focal point organisations and ISNET Secretariat:

| | | |
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| Dr. Shaukat Hameed Khan Coordinator General Organisation of Islamic Cooperation Ministerial Standing Committee on Scientific and Technological Cooperation (COMSTECH) | ... | Member |
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| Prof. Mamdouh Mahmood El-Sayed Abdeen Head Geological Applications and Mineral Resources National Authority for Remote Sensing & Space Sciences(NARSS) Egypt | ... | Member |
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| Dr Mohsen Shaterzadeh Vice President | ... | Member |
|--|-----|--------|

Iranian Space Agency (ISA)
Islamic Republic of Iran

Mr Reza Asgari ... Member
Expert
Iranian Space Agency (ISA)
Islamic Republic of Iran

Dr Maath Ismail Mahmood Alomari ... Member
Director
Ministry of Science & Technology (MoST)
Iraq

Mr Ibrahim Awwad Ibrahim Albaddawi ... Member
Director
Royal Jordanian Geographic Centre (RJGC)
Jordan

Mr Oumar SARR ... Member
Chief Financial Officer
Centre de Suivi Ecologique(CSE)
Senegal

Dr Amna Ahmed Hamid El Tom ... Member
Director
Remote Sensing Authority (RSA)
Sudan

Mr Zafar Iqbal ... Member
Director
Disaster Management
SUPARCO, Pakistan

Mr Arshad Siraj ... Executive Director
Executive Director
ISNET

Mr Abdullah Jamil Khan ... Rapporteur
Administrator
ISNET

Ms Sadaf Sajjad ... Rapporteur
Assistant Manager

SUPARCO, Pakistan

40. President ISNET, in his opening remarks, underscored the necessity for member States to carry out meaningful scientific and technical projects. He also highlighted the achievements of ISNET in the continued expansion of member States and grant to ISNET of Permanent Observer status of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). Delegates from member countries made statements and approved the agenda of the Meeting. Besides approving the activity plan and budget for the next biennium (2015-16), the Governing Body discussed ways and means to expand and enrich the scope of activities. Project proposals from Iran, Senegal and Pakistan were presented during the Meeting.

41. The Governing Body (GB), while appreciating the progress made by ISNET, discussed and agreed on the ways of reviving membership of inactive countries and of attracting non Member States to the ISNET forum. The GB agreed that for enhancing the role of ISNET, it is essential to double the annual membership fee.

42. Egypt, Iran and Pakistan were elected as the new members of the Executive Council of ISNET.

43. For improving the activities of ISNET and to gain maximum benefits from its limited budget, several ideas were discussed by the delegates. On the basis of the proposed suggestions, ISNET Secretariat shall conduct a number of studies.

• Training Course on Satellite-based Applications in Climate Change

44. ISNET, in collaboration with Institute of Space Technology (IST), organised a training course on *Satellite-based Applications in Climate Change* from 22 to 25 Dec 2014 at the National Centre for Remote Sensing and Geoinformatics at Karachi, Pakistan.

45. The course was aimed at acquainting participants on climate change, its drivers and mitigation including processing of satellite data, use of geo-spatial and ground-based monitoring techniques to address climate change issues. Similarly, it was also to familiarise and sensitise trainees on current environmental issues, climate change and environment-related issues through lectures, hands-on exercises and presentation of case studies by renowned field experts. Topics included introduction to satellite system and their applications; satellite-based climate change and environmental monitoring; GIS applications for water resources; hazard and disaster monitoring using satellite remote sensing; dynamics of snow and glaciers; and National Climate Change Policy – Challenges and issues from Pakistan's perspective.

46. ISNET sponsored nine participants from Bangladesh, Egypt, Iraq, Jordan, Pakistan and Sudan.

- **Training Course on Applications of Geospatial Techniques in Coastal Resource Mapping and Management**

47. ISNET, in collaboration with Institute of Space Technology (IST), held a training course on Applications of Geo-Spatial Techniques in Coastal Resource Mapping and Management from 04 to 07 Aug 2015 at the IST campus in Karachi Pakistan.

48. The purpose of this course was to provide a forum to share experiences amongst researchers/ scientists of coast related issues. This course also enhanced the capabilities of managers and technical staff in the use of remote sensing and GIS techniques. The course included hands-on exercises based on different topics.

49. A total of 28 participants attended the course. ISNET sponsored four participants from Egypt, Jordan and Pakistan.

- **Workshop on Antenna & Microwave Circuit Design with HFSS**

50. ISNET, in collaboration with Institute of Space Technology (IST), held a workshop on “*Antenna & Microwave Circuit Design with HFSS*” from 11-12 August 2015 in Islamabad, Pakistan.

51. The main purpose of this workshop was to provide an opportunity for engineering faculty from academic institutions, engineers from industries and post graduate students to get the exposure and interaction with the field experts, who are involved in the research and development activities in high frequency circuit design. In addition to giving exposure to recent topics of designing RF circuits using the EDA tool like HFSS, the workshop gave impetus to participants to do their research and development activities in the area of RF Design and related applications. Therefore solutions for the many real world problems were attempted in an efficient way using the EDA tool.

52. The course was attended by 13 participants from various institutions of Pakistan and abroad. Overall the audience was a mix of professionals and students. In general the participants were very satisfied from the content and learning from the course.

53. ISNET fully sponsored two participants from Institute of Space Research and Aerospace (ISRA), Sudan.

- **Training Course on Digital Image Processing using ENVI**

54. ISNET sponsored three participants from Royal Jordanian Geographic Centre, Govt. College University, Lahore, Pakistan, and Remote Sensing and Seismology Authority

(RSSA), Sudan to attend the training course on Digital Image Processing using ENVI organised by SUPARCO from 17 to 21 August 2015 in Karachi, Pakistan.

55. The course aimed at providing basic concept of remotely sensed satellite image analysis and extensive hands on experience of different image processing workflows using ENVI software. The training course schedule followed the generic workflow of remotely sensed satellite image processing which starts from the acquisition of satellite data or image, followed by image pre-processing, then image processing and analysis and finally the display of results.

56. The course was a well balanced amalgamation of theoretical concepts and hands on practical experience on the software. The course was well received by the participants with an appreciation of how the knowledge was transferred and how a non user of this software was transformed into a reasonably good user in a short span of time.

- **Training Course on Object Based Image Analysis (OBIA)**

57. ISNET sponsored three participants from Royal Jordanian Geographic Centre (RJGC), Jordan, National Aerospace Agency, Azerbaijan, and National Authority for Remote Sensing and Space Sciences (NARSS), Egypt to attend the training course on Object Based Image Analysis (OBIA) organised by SUPARCO from 14 to 18 September 2015 in Karachi, Pakistan.

58. The course aimed at providing basic concept of object based image analysis and extensive hands on experience of different object based image analysis workflows using various software packages. The training course schedule followed the generic workflow of object based image analysis which starts from the acquisition of satellite data or image, followed by image interpretation, then image segmentation, image analysis and finally the display of results.

59. The course was a well balanced amalgamation of theoretical concepts and hands-on practical experience on the software. It went swiftly from concept building of image analysis to comparative analysis of conventional image analysis methods and object based image analysis techniques and ended with performance of different image processing operations on the software.

60. The course was well received by both the local and foreign participants with an appreciation of how the knowledge was transferred and how a non user of this software was transformed into a reasonably good user in a short span of time.

- **ISNET/SUPARCO Workshop on Student Satellites; 02-06 November 2015; Lahore, Pakistan**

61. Inter-Islamic Network on Space Sciences & Technology (ISNET), in collaboration with The Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), with advisory support of OIC Ministerial Standing Committee for Scientific and Technological Cooperation (COMSTECH) and co-sponsorship of Islamic Development Bank (IDB), held a Workshop on Student Satellites from 02-06 November 2015 in Lahore, Pakistan. The Workshop was held at Falettis Hotel, Lahore.

62. The Workshop was divided into a two-day seminar followed by lecture-based hands-on training course.

63. The event started with an inauguration ceremony that was held on 2nd November 2015. It was attended by prominent government dignitaries, senior officials, media and participants of the workshop. The ceremony was presided by Mr Malik Muhammad Rafique Rajwana, Governor Punjab. In his speech he stressed upon the importance of student satellites and appreciated the role of SUPARCO in taking initiatives for such technological advancements. Maj Gen Qaiser Anees Khurram, Chairman SUPARCO/ President ISENT gave the welcome note while outlining the importance of the workshop's theme. The event was also addressed by two of the invited renowned keynote speakers:

- Dr Shufan Wu, Director of New Technology Department, Shanghai Engineering Centre for Microsatellites
- Prof. Dr. Alim Rustem Aslan, Project Manager, Istanbul Technical University, Turkey

64. The two day seminar included thirty oral presentations from ISNET member States. The Seminar included presentations/lectures on six thematic areas, mentioned above. Scientists, researchers and high officials from China, Iran, Jordan, Pakistan, Senegal, Sudan and Turkey attended this session. Apart from presentation of scientific papers, at the end of each day of seminar, discussions with keynote speakers were held. The focus in the discussion was how to use satellite technology for disaster management and exploring possible means for future collaboration/cooperation. The discussions proved to attract large audiences and inspire evocative, thought-provoking *dialogues* among attendees. More than one hundred and fifty participants including academicians and students from the local universities as well as pertinent local officials attended the seminar. The event was also covered by local newspapers and TV channels.

65. Nominated trainers from SUPARCO conducted the two day hands-on training session from 04-05 November 2015. The modules for training were requirements engineering,

satellite system & subsystem design, software verification and validation and spacecraft radiation analysis.

66. On the last day of the workshop SUPARCO had arranged a technical visit to its Satellite Research & Development Centre (SRDC-L) in Lahore. Before the visit a welcome address and presentation was given by Secretary SUPARCO/Executive Director ISNET, Mr Haider Ali Khan. The participants were briefed about SUPARCO's organization structure and the projects that have been completed or are under way. Later the participants were shown the facilities of SUPARCO.

67. After the technical visit, a brief concluding ceremony was held at SUPARCO. The event formally commenced with a feedback and recommendations session where participants expressed their views about the event. The Executive Director ISNET addressed the gathering in which he congratulated the participants on the successful completion of the Workshop and unanimous adoption of its recommendations. He also wholeheartedly thanked the organisers from SUPARCO and commended their dedication in making the Workshop a success. Mr Haider Ali Khan then distributed workshop certificates to participants.

- **Training Course on Spatial Decision Support Systems; 25-29 April 2016; Karachi, Pakistan**

68. ISNET sponsored six participants from its member states for SUPARCO organized training course on Spatial Decision Support Systems which will be held from 25-29 April 2016 at Karachi, Pakistan. Spatial Decision Support System (SDSS) is a computer information system which can help users flexibly generate decisions to spatial problems and choose the best solution for themselves with the spatial data, application models, software tools and expert knowledge, etc. This intermediate level course is aimed at providing knowledge of SDSS to individuals and professionals particularly the policy and decision makers who want to enhance their skills in this growing field.

69. A statistical summary of the above activities is compiled and is placed as an appendix to this annex.

STATISTICAL SUMMARY

Period: Jan 2013 to date

| S. No. | Training / Seminar / Workshop / Conference / Meeting | Dates | Venue | Participants/Attendees | Organisation | Co-organiser/ Co-sponsor |
|--------|--|---------------------|---------------------|------------------------|---|---|
| 1. | Training Course on Remote Sensing applications to Land Administration | 14-18 Jan 2013 | Karachi, Pakistan | Mr. Rustam Guluzade | Azerbaijan National Aerospace Agency (ANASA) | SUPARCO |
| | | | | Mr. Mohsen Ghamary Asl | Iranian Space Agency (ISA) | |
| | | | | Ms. Wedad Fadol | Remote Sensing Authority (RSA), Sudan | |
| 2. | Advanced Training Course in Remote Sensing & GIS | 25 Feb - 8 Mar 2013 | Karachi, Pakistan | Mr. Firuz Atakishili | Azerbaijan National Aerospace Agency (ANASA) | SUPARCO |
| | | | | Mr. Hani Al Kharabsheh | Royal Jordanian Geographic Centre (RJGC) | |
| | | | | Ms. Sara Khojali | Remote Sensing Authority (RSA), Sudan | |
| | | | | Mr. Mustafa Teke | The Scientific and Technological Research Council of Turkey - Space Wing (TUBITAK-UZAY) | |
| | | | | Mr. Saifullah | Department of Geography, University of Karachi, Pakistan | |
| | | | | Ms. Parveen Shams | Department of Geography, University of Karachi, Pakistan | |
| | | | | Ms. Sidra Ahmed | Department of Geography, University of Karachi, Pakistan | |
| 3. | UN/Pakistan International Workshop on Integrated Use of Space Technologies for | 11-15 Mar 2013 | Islamabad, Pakistan | Dr. Alchin Shirin-zada | Azerbaijan National Aerospace Agency | United Nations Office for Outer Space Affairs |
| | | | | Prof. Sayed Hamidreza | Tarbiat Modares University, Iran | |

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| | Food and Water Security | | | Sadeghi | | (UNOOSA) SUPARCO |
| | | | | Ms. Faten Ghanim Abed | Ministry of Science & Technology (MoST), Iraq | |
| | | | | Ms. Ehstar Nasser | Ministry of Science & Technology (MoST), Iraq | |
| | | | | Mr. Malick Diagne | Centre de Suivi Ecologique (CSE), Senegal | |
| | | | | Dr. Amna Ahmed Hamid | Remote Sensing Authority, Sudan | |
| | | | | Ms. Enaas Abdalla | Ministry of Agriculture and Irrigation, Sudan | |
| | | | | Ms. Nora Abdelraheim | Ministry of Agriculture and Irrigation, Sudan | |
| 4. | ISNET/ISA Workshop on Space Applications for Disaster Risk Reduction and Management | 7-19 Sep 2013 | Tehran, Iran | Prof. Md. Rejaur Rahman | University of Rajshahi, Bangladesh | COMSTECH Iranian Space Agency (ISA) Islamic Development Bank (IDB) |
| | | | | Mr. S. M. Humayun Kabir | Bangladesh Space Research and Remote Sensing Organization (SPARRSO), Bangladesh | |
| | | | | Prof. Ameera Ismael Hussain | University of Tikrit, Iraq | |
| | | | | Mr. Salem Ali Sola | The Libyan Center for Remote Sensing, Libya | |
| | | | | Ms. Bismawaty Binti Hassan | Malaysian Remote Sensing Agency, Malaysia | |
| | | | | Mr. Zafar Iqbal | SUPARCO, Pakistan | |
| | | | | Ms. Riffat Shamshad | SUPARCO, Pakistan | |
| | | | | Mr. Aamir Imran | SUPARCO, Pakistan | |

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| | | | | Mr. Majid Nazeer | The Hong Kong Polytechnic University, Hong Kong | |
| | | | | Prof. Din Muhammad Kakar | University of Baluchistan, Pakistan | |
| | | | | Prof. Shahid Parvez | University of the Punjab, Pakistan | |
| | | | | Ms. Urooj Saeed | WWF, Pakistan | |
| | | | | Mr. Syed Zaheer Hussain | University of Peshawar, Pakistan | |
| | | | | Mr. Malick Diagne | Centre de Suivi Ecologique (CSE), Senegal | |
| | | | | Dr. Nadia Babiker Shakak | Ministry of Water Resources and Electricity, Sudan | |
| | | | | Dr. Andreas Hoechner | GFZ German Research Centre for Geosciences | |
| | | | | Dr. Sigrid Roessner | GFZ German Research Centre for Geosciences | |
| 5. | Training Course on Spatial Decision Support System | 25-29 Nov 2013 | Karachi, Pakistan | Mr. Kamran Ahmadov | Azerbaijan National Aerospace Agency, Azerbaijan | SUPARCO |
| | | | | Mr. Abu Mohammad | Bangladesh Space Research and Remote Sensing Organization (SPARRSO), Bangladesh | |
| | | | | Mr. Audai Al-Qadri | Royal Jordanian Geographic Centre, Jordan | |
| 6. | Training Course on Applications of Global | 18- 21 Feb 2014 | Islamabad, Pakistan | Ms. Gultan Abutalibova | Azerbaijan National Aerospace Agency, Azerbaijan | IST |

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|----|---|----------------|----------------|-------------------------|---|---|
| | igation Satellite Systems (GNSS) | | | Ms. Taherun Nessa | Bangladesh Space Research and Remote Sensing Organization (SPARRSO), Bangladesh | |
| | | | | Ms. Fadia Al-Azawi | Dijlla University, Iraq | |
| | | | | Mr. Osama El-Asmar | Royal Jordanian Geographic Centre, Jordan | |
| | | | | Ms. Tahreem Omar | University of Karachi, Pakistan | |
| | | | | Mr. Saad Ul Haq | Institute of Space Technology, Pakistan | |
| | | | | Mr. Malick Diagne | Centre de Suivi Ecologique (CSE), Senegal | |
| 7. | United Nations/Morocco 3rd International Conference on the Use of Space Technology for Water Management | 1-4 April 2014 | Rabat, Morocco | Dr. Alchin Shirin-zada | Azerbaijan National Aerospace Agency, Azerbaijan | UNOOSA Royal Centre for Remote Sensing (CRTS), Morocco |
| | | | | Prof. Md. Golam Mostafa | University of Rajshahi, Bangladesh | |
| | | | | Prof. Mutaz Al-Alawi | University of Jordan/Ministry of Environment, Jordan | |
| | | | | Mr. Allah Ditta Khan | Pakistan Council of Research in Water Resources (PCRWR), Pakistan | |
| | | | | Prof. Ahsan Mehboob | National University of Science and Technology (NUST), Pakistan | |
| | | | | Mr. Jahanzeb Malik | SUPARCO, Pakistan | |
| | | | | Mr. Babar Shaikh | SUPARCO, Pakistan | |

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| | | | | Mr. Saad Ul Haq | Institute of Space Technology, Pakistan | |
| | | | | Prof. Mirza Waqar | Institute of Space Technology, Pakistan | |
| 8. | Training Course on Remote Sensing and GIS Applications for Forestry | 18-22 Aug 2014 | Karachi, Pakistan | Mr. Zaur Mehtiyev | Azerbaijan National Aerospace Agency, Azerbaijan | SUPARCO |
| | | | | Ms. Fadia Al-Azawi | Dijlra University, Iraq | |
| | | | | Mr. Emran Samara | Royal Jordanian Geographic Centre, Jordan | |
| | | | | Mr. Mirza Muhammad Waqar | Institute of Space Technology, Pakistan | |
| | | | | Mr. Shahbaz Baig | Institute of Space Technology, Pakistan | |
| | | | | Ms. Saira Batool | Bahauddin Zakariya University, Pakistan | |
| | | | | Mr. Samba Ndao | Centre de Suivi Ecologique (CSE), Senegal | |
| 9. | ISNET/TUBITAK UZAY Workshop on Small Satellite Engineering and Design for OIC Countries | 20-24 Oct 2014 | Ankara, Turkey | Mr. Fariz Aliyev | Satellite Operations Engineer | COMSTECH TUBITAK/UZAY IDB |
| | | | | Mr. Abu Mohammad | Bangladesh Space Research and Remote Sensing Organization (SPARRSO), Bangladesh | |
| | | | | Mr. Mizanur Rahman | Bangladesh Space Research and Remote Sensing Organization (SPARRSO), Bangladesh | |
| | | | | Dr. Mohammad Dabboor | Science and Technology Branch, Environment Canada | |
| | | | | Dr. Tamer Mekky Habib | National Authority for Remote | |

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| | | | | | Sensing and Space Sciences (NARSS), Egypt |
| | | | | Mr. Tamer Talal | National Authority for Remote Sensing and Space Sciences (NARSS), Egypt |
| | | | | Ms. Solmaz Dilmaghani | Iranian Space Agency (ISA), Iran |
| | | | | Mr. Hamid Salim | ANGKASA, Malaysia |
| | | | | Mr. Akmal Ashraf | Malaysian Remote Sensing Agency |
| | | | | Mr. Ahmad Minhas | Pakistan Space & Upper Atmosphere Research Commission (SUPARCO) |
| | | | | Mr. Muhammad Latif | Pakistan Space & Upper Atmosphere Research Commission (SUPARCO) |
| | | | | Mr. Amir Khan | Pakistan Space & Upper Atmosphere Research Commission (SUPARCO) |
| | | | | Mr. Noman Subhani | Pakistan Space & Upper Atmosphere Research Commission (SUPARCO) |
| | | | | Dr. Najam Naqvi | Institute of Space Technology, Pakistan |

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| | | | | Dr. Rizwan Mughal | Institute of Space Technology, Pakistan | |
| | | | | Dr. Ayoub Almhab | Ministry of Agriculture and Irrigation, Yemen | |
| 10. | Training Course on Satellite-based Applications in Climate Change | 22-25 Dec 2014 | Karachi, Pakistan | Mr. Ziaul Islam | Bangladesh Space Research and Remote Sensing Organization (SPARRSO), Bangladesh | IST |
| | | | | Mr. Ayman Mohamed Elsayed | National Authority for Remote Sensing and Space Sciences (NARSS), Egypt | |
| | | | | Mr. Araz Hussein Mustafa | Ministry of Science and Technology (MoST), Iraq | |
| | | | | Mr. Khaldoun Khaled Alwan | Ministry of Science and Technology (MoST), Iraq | |
| | | | | Mr. Laith Jamil Alzyadat | Royal Jordanian Geographic Centre (RJGC), Jordan | |
| | | | | Mr. Muhibullah, | Swiss Agency for Development and Cooperation, Pakistan | |
| | | | | Mr. Umar Jamil | COMSATS Institute of Information Technology, Pakistan | |
| | | | | Dr. Ameer Awad Mohammed | Wildlife Research Center, Sudan | |

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| | | | | Ms. Shahinda Abdelrahman Elkhalifa | Remote Sensing Authority (RSA), Sudan | |
| 11. | Training Course on Application of Geospatial Techniques in Coastal Resource Mapping and Management | 4-7 Aug 2015 | Karachi, Pakistan | Ms. Mona Fathy Mohamed Allam | Ain Shams University, Institute of Environmental Studies and Research, Egypt | IST |
| | | | | Ms. Entisar Ali El-hihi | Royal Jordanian Geographic Centre (RJGC), Jordan | |
| | | | | Mr. Ahmed Mohamed El-zeiny | National Authority for Remote Sensing and Space Sciences (NARSS), Egypt | |
| | | | | Ms. Tahira Zafar | University of Karachi (KU), Pakistan | |
| 12. | Workshop on Antenna Design with HFSS Software | 11- 12 Aug 2015 | Islamabad, Pakistan | Mr. Mujahid Abdulbagi Mohammed Ahmed | Institute of Space Research and Aerospace(ISRA), Sudan | IST |
| | | | | Mr. Mussab Abdulrahim Hassan | Institute of Space Research and Aerospace(ISRA) , Sudan | |
| 13. | Training Course on Digital Image Processing using ENVI | 17-21 Aug 2015 | Karachi, Pakistan | Ms. Aseel Isaa Aljada | Royal Jordanian Geographic Centre (RJGC), Jordan | SUPARCO |
| | | | | Mr. Mohaned Eltijani Elmardi | Remote Sensing and Sesimology Authority (RSA), Sudan | |
| | | | | Ms. Marriyum Wahlah Nasir | Government College University, | |

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|-----|---|------------------|-------------------|--|---|----------------------------|
| | | | | | Lahore, Pakistan | |
| 14. | Training Course on Object Based Image Analysis (OBIA) | 14 - 18 Sep 2015 | Karachi, Pakistan | Mr. Emil Volodya Gahramanov | National Aerospace Agency, Azerbaijan | SUPARCO |
| | | | | Mr. Taha Hussein Masarwah | Royal Jordanian Geographic Centre (RJGC), Jordan | |
| | | | | Mr. Kamel Fathi Gomaa Mansour | National Authority for Remote Sensing and Space Sciences (NARSS), Egypt | |
| 15. | ISNET/SUPARCO Workshop on Student Satellites | 02-06 Nov 2015 | Karachi, Pakistan | Mr. Ibrahim Awwad Ibrahim Baddawi | Royal Jordanian Geographic Centre (RJGC), Jordan | SUPARCO COMSTECH IDB |
| | | | | Ms. Solmaz BazarganDilmaghani | Satellite Research Institute, Iranian Space Agency | |
| | | | | Mr. Yousef Sadeghi | Satellite Research Institute, Iranian Space Agency | |
| | | | | Mr. Malick Diagne | Centre de Suivi Ecologique, Senegal | |
| | | | | Ms. Rayan Mohamed Elmubarak Ali Imam | Institute of Space Research and Aerospace(ISRA) | |
| | | | | Mr. Waleed BabikerElsedig Basheer Mohammed | Institute of Space Research and Aerospace(ISRA) | |
| | | | | Mr. Yasir Ahmed Idris Humad | Institute of Space Research and Aerospace(ISRA) | |
| | | | | Prof. Dr Alim Rustem Aslan | Istanbul Technical University | |
| | | | | Prof. Dr. Shufan Wu | Shanghai Engineering Centre for | |

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|-----|--|------------------|-------------------|------------------------------------|--|---------|
| | | | | | Microsatellites | |
| 16. | Training Course on RADAR Remote Sensing (SAR) and Image Processing | 21-24 Dec 2015 | Karachi, Pakistan | Mr Abdullah Nawaz Ahmed Khan | Center for Integrated Mountain Research, University of Punjab, Pakistan | IST |
| | | | | Ms Omnia Attala Mohamed | National Authority for Remote Sensing and Space Sciences (NARSS), Egypt | |
| | | | | Mr Ali Olimat | Royal Jordanian Geographic Centre (RJGC), Jordan | |
| 17. | Training Course on Spatial Decision Support Systems | 25-29 April 2016 | Karachi, Pakistan | Mr Ismayil Mukhtar Zeynalov | National Aerospace Agency, Azerbaijan | SUPARCO |
| | | | | Mr Alaa Ghadhban Khalaf | Iraqi Ministry of Science and Technology / Space and Communication Directorate | |
| | | | | Mrs Anwar SidAhmed Mohamed Abdalla | Remote Sensing and Seismology Authority (RSSA) | |
| | | | | Mr Ahmad Awn Ali Al-Khasawneh | Royal Jordanian Geographic Centre (RJGC), Jordan | |
| | | | | Ms Naglaa Atwa Hassan Zanaty | National Authority for Remote Sensing and Space Sciences (NARSS), Egypt | |
| | | | | Mr Mostafa Mansourpour Bonab | Iranian Space Agency (ISA) | |

Schedule of Annual Membership Contributions

The status and schedule of **minimum** annual membership contributions, as was laid down by COMSTECH in 2006, is as follows:

| S No | Member State | Status of membership | Annual Contribution (US\$) | Status of subscription |
|-------------|---------------------|---------------------------------|-----------------------------------|---|
| 1 | Azerbaijan | Active | 3,000 | Regular subscriber |
| 2 | Bangladesh | Active | 1,000 | Regular subscriber |
| 3 | Egypt | Active | 5,000 | Regular subscriber |
| 4 | Indonesia | Dormant | 3,000 | <i>Contributed until 2006</i> |
| 5 | Iran | Active | 5,000 | Regular subscriber |
| 6 | Iraq | Active | 1,000 | Regular subscriber |
| 7 | Jordan | Active | 5,000 | Regular subscriber |
| 8 | Morocco | Dormant | 5,000 | <i>Yet to contribute</i> |
| 9 | Niger | Dormant | 1,000 | <i>Yet to contribute</i> |
| 10 | Pakistan | Active | 50,000 | Regular subscriber |
| 11 | Saudi Arabia | Active | 5,000 | Regular subscriber |
| 12 | Senegal | Active | 1,000 | Regular subscriber |
| 13 | Sudan | Active | 1,000 | Regular subscriber |
| 14 | Syria | Temporary suspension by the OIC | 5,000 | <i>Contributed until suspension of membership</i> |
| 15 | Tunisia | Dormant | 5,000 | <i>Yet to contribute</i> |
| 16 | Turkey | Dormant | 5,000 | <i>Yet to contribute</i> |