

# Capacity Building for GNSS Education in Nepal

---

Krishna Prasad Bhandari  
Associate Professor  
Tribhuvan University, Institute of Engineering,  
Pashchimanchal Campus, Nepal

**ICG EXPERTS MEETING:  
GLOBAL NAVIGATION SATELLITE SYSTEMS SERVICES**

**15 - 18 December 2015 Vienna International Centre, Vienna, Austria**



# Outline

---

- **Introduction**
- **GNSS Education in Nepal**
  - Formal GNSS Education Programs
  - Short-Courses
  - Other GNSS Education Programs
- **GNSS Knowledge Generation**
- **Issues on GNSS Education in Nepal**
- **Conclusion**



# Introduction

- ▶ Nepal is land lock country with **Mount Everest Earth highest mountain (8848m)**.
- ▶ Country had Maoist war problem from 13 February 1996 – 21 November 2006 (10 years, 9 months, 1 week and 1 day)
- ▶ Earthquake of 7.8 rector scale killed more than 8,857 people and injured 22,304 and damages 80% houses and infrastructure of 18 districts in 25 April 2015
- ▶ Now fuel crisis and other logistic commodities due to the Unofficial Indian blockade



- 
- ▶ Although Nepal had series of problems it tried to adopt and develop the capacity building in space science technology
  - ▶ The first Geodetic activity was started in Nepal in 1970.
  - ▶ For the first time, topographical Survey a branch of Survey Department bought a pair of WM102 GPS receivers and used in Nepal-India boundary survey in 1988.
  - ▶ Lumbini Zone Topographic Mapping Project was funded by Government of Japan.



# Collaborative project work

---

- ▶ Trimble receivers were used for the topographical mapping works in 1988.
- ▶ During 1992-95 Eastern and Western Nepal Topographic Mapping Project, funded by Finland Government, also contributed to GPS receiver handling training with Ashtech receivers.



- ▶ University of Colorado and Massachusetts Institute of Technology (USA) work with new GPS station
- ▶ Trimble and Ashtech receivers were used station at 29 different locations covering Nepal.
- ▶ Satellite data were captured from those stations in 1991.
- ▶ University again tracked continuous data from those stations for few days for crustal movement studies in 1996 .





# Global Navigation Satellite System( GNSS) and its Application in Nepal

---

- Tourism
- Disaster management (earthquake, forest fire and flood )
- Search and rescue
- Forestry
- Military



# GNSS Education in Nepal

---

- ▶ GNSS education and training is lacking behind in Nepal.
- ▶ GPS has started in the middle 1980's
- ▶ There has been a shortage of skills in its use at several levels.
- ▶ Recently few Universities and government's institutions and agencies taking the initiation in GNSS Education.
- ▶ Few private industries such as GNSS vendors are also running specialized short courses, specifically hardware and software specific.



- 
- ▶ Those courses come from utility companies, the military and non-governmental organizations
  - ▶ There are very few GNSS and related textbooks from abroad at local book stall.
  - ▶ Now we have very little knowledge about the Use of GNSS bring serious threat of data quality and accuracy.



# GNSS Education Programs In Nepal

---

- ▶ GNSS education started in Geography and Civil Engineering Curricula with limited subject matter in Nepal .
- ▶ Lack of practical activities due to the limited budget for laboratory
- ▶ Few GNSS education and training programs appears under Geomatics field of study.



# GNSS Education Programs (Academic )

- ▶ First course in RS and GIS started in Private University and government collaboration
- ▶ University: Kathmandu University (KU), collaboration with Land Management Training Centre (LMTC),
- ▶ Intake: 24 students.
- ▶ Level: Bachelors in Geomatics Engineering
- ▶ Started: 2007
- ▶ Course : RS and GIS, Surveying and some credit course of GNSS



# Government University

---

- ▶ University: Trivubhan University , Institute of Engineering ,Pashchimanchal Campus
- ▶ Intake: 48
- ▶ Level: Bachelor in Geomatic Engineering
- ▶ Started:2011
- ▶ Course: RS , GIS, surveying and some credit of GNSS



## Future Course offer

---

- ▶ Campus has started Master in Civil, electrical and computer Engineering in 2015
- ▶ Center for Geomatics and space science research has initiate for the workshop for curriculum develop of master in Geomatics Engineering
- ▶ Campus and Dean administration agreed to start the course in 2016-2017



## Short-Courses

---

- ▶ Land Management Training Centre, Government of Nepal offers courses in one year long Senior and Junior Survey Training as a part of in-house HRD programs.
- ▶ They use limited study about GNSS during the survey period
- ▶ These courses are mainly focused on field Surveys.



- 
- ▶ Land Management Training Centre also offers specific short training courses for Survey Department personnel.
  - ▶ The training course is aimed at imparting the participants with knowledge about GPS/DGPS/GNSS, its working principles and modern day applications.
  - ▶ Local institutions also organize seminars and meetings on Space technology, GNSS and related field.



- 
- ▶ The other parties that offers short-courses, which on the other hand focuses on instrumentations – hardware and software – are GNSS related vendors.
  - ▶ Non Government Organizations such as Open Street Mapping Nepal and ICIMOD provide training to their staff about the use of GNSS



# GNSS Knowledge Generation

---

- ▶ In this era of the so-called GNSS era, it is well known fact that the innovative activity which, is the primary source of knowledge generation, concentrated only in a number of developed nations.
- ▶ Within these developed nations, these activities are only concentrated and dominated by only a small number of corporations.



- ▶ In developing nations, the primary mode of promoting technology advances is through technology acquisition.
- ▶ However, in this new era of economy, the focus hold direct towards on innovation and the creation of new technology and higher value-added activities by increasing basic and applied research.



# Issues of GNSS Education in Nepal

---

- ▶ Universities should focus on research, seminars and workshop related to GNSS.
- ▶ Training for Trainers
- ▶ Academic and Training institute should conduct survey camps which should focus not only in data acquisition but also in data processing
- ▶ GNSS topics should be introduced to student project.



- 
- ▶ University has to make Collaboration between national and international organizations
  - ▶ Continues leading academic and research activities is needed in this field instated of project oriented work



# CONCLUSIONS

- ▶ Capacity building is one of the important components in the development but capacity building of application of GNSS technology lack behind in Nepal.
- ▶ Developing of university course and operating for the human resource would benefit the society from the GNSS technology.
- ▶ Implementation the new teaching curricula and training trainers with international organization is essential in Nepal
- ▶ GNSS network with international cooperation and regional cooperation would give the valuable result for solving the emerging task



---

**Thank You  
for your kind  
Attention !!**

