

WHERE SPACE CAN PLAY A ROLE IN BHUTAN?

UNITED NATIONS/UNITED ARAB EMIRATES HIGH LEVEL FORUM
SPACE AS A DRIVER FOR SOCIO-ECONOMIC SUSTAINABLE
DEVELOPMENT

7TH NOVEMBER, 2017



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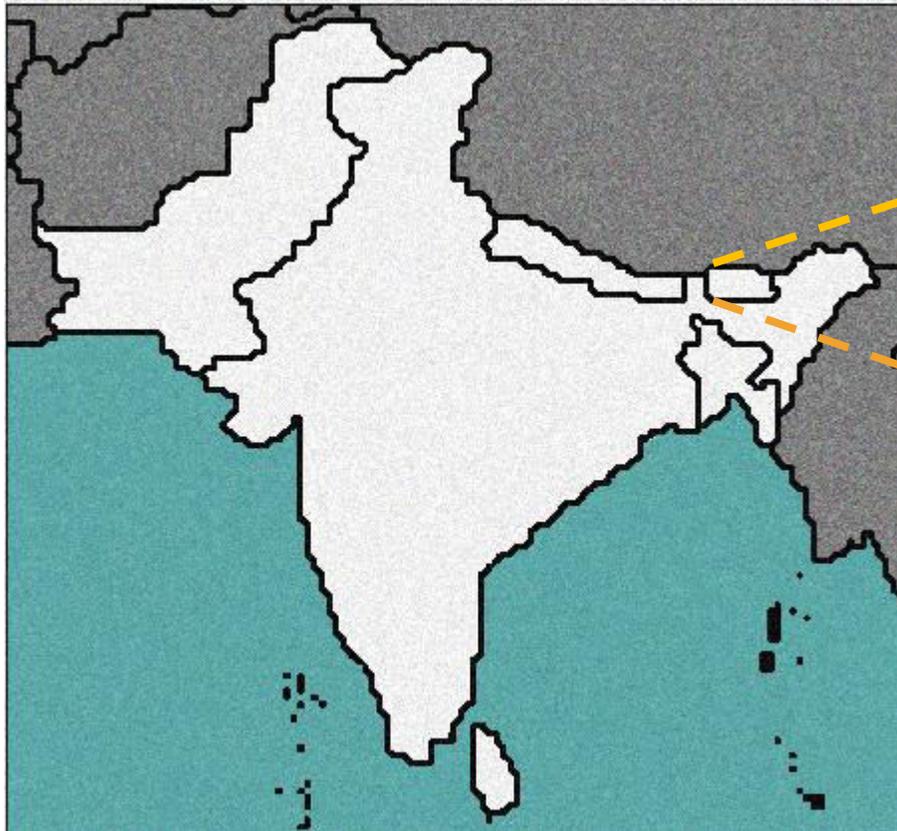
- MINISTRY OF INFORMATION AND COMMUNICATIONS, ROYAL GOVERNMENT OF BHUTAN
- KYUSHU INSTITUTE OF TECHNOLOGY, JAPAN



OUTLINE

- Introduction to Bhutan's space initiative
- Situation analysis
- Conclusion
- Recommendation

BHUTAN



Map of South Asia



- Area: 38,390 sq.km
- Population: 0.8 Million
- Government: Constitutional Monarchy

THE BEGINNING OF SPACE IN BHUTAN



His Majesty *Jigme Khesar Namgyel Wangchuck*, 5th King of Bhutan

- A vision of His Majesty the King of Bhutan
- Started in 2016
- Government taking the lead:
Division of Telecom and Space,
Ministry of Information and
Communications

CAPACITY BUILDING using BIRDS Project

- Joint Global Multi-Nations BIRDS Project
- BIRDS-1 : Japan, Ghana, Mongolia, Nigeria, Bangladesh (5 countries)
- **BIRDS-2** : Japan, **Bhutan**, Malaysia, Philippines (4 countries)
- Design, develop, test and launch 1U CubeSat at Kyushu Institute of Technology, Japan
- Hands-on experience and learning at low cost



Official logo of BIRDS Project



Example of 1U CubeSat

BHUTAN'S FIRST SATELLITE PROJECT

Objectives

- To enhance socio-economic development by using space science and technology
- To develop first satellite of Bhutan
- To develop capability in space science and technology



Members of BIRDS-2 project with faculty of Kyushu Institute of Technology, Japan

SITUATION ANALYSIS

Economy:

- Agriculture & Forestry, Hydroelectric power, Tourism, Construction
- Import (USD 1 bn) >> Export (USD 0.5 bn)
- Expenditure (USD 0.56 bn) >> Revenue (USD 0.26 bn)
 - Grants: USD 0.16 bn

Education:

- Adequate primary, secondary schools and teachers
- High enrollment rate at primary level: 98%
 - Transition rate: 92% Primary to lower, 87% lower to middle, 71% middle to higher
- Unemployment: 2.5% (youths: 10.7%)
 - Major employment: agriculture and forestry
 - Mismatch of skills

Health:

- Widespread health infrastructure across the country
- Shortage of health workers: 3.3 doctors/10,000 persons
- Telemedicine (pilot project)

Environment:

- Maintain 60% forest coverage at all times (constitution)
- Degradation of forest (forest fire, landslides, construction/mining)

Telecommunications:

- 2 Service Providers: 1 state owned & 1 private operator
- Heavily rely on terrestrial infrastructure : fiber optic cables network
- Satellite communications: minimal usage (remote connectivity)
- No international redundancy

Broadcast:

- 1 broadcaster: state owned
- Two channels
- National coverage
- Indian satellite service

Meteorology:

- Service from Japan Meteorological Agency (JMA)
- Part of WMO (World Meteorological Organization)

GLOF Early Warning systems:

- Commercial satellite services (Iridium)
- USD 0.02M/yr

Geospatial Information System:

- National Committee for coordination
- Origin: Land use
- Repository for GIS data
- Discovery and dissemination of data

Needs/ Requirements

- Technical skills development
- Conservation of environment by resource mapping and monitoring
- International redundancy for communication
- 100% coverage for broadcasting network
- Disaster risk mitigation by early warning system
- Reliable communication during emergencies/ disasters

CONCLUSION

Explore innovative (NEWSPACE) approaches :

- Space governance : the changing role of government
- Facilitate participation of private entities
- Cost sharing/reducing mechanism
- Realise new market potentials using space applications
- Build capacity in multiple space disciplines : Holistic
- Foster international cooperation : international organizations, countries

RECOMMENDATION

Develop an approach for establishing a sustainable and progressive space program that can be used in other “emerging developing countries” in the “NEWSPACE age”

Thank you

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