

**SPECTRUM MANAGEMENT POLICY FRAMEWORK
FOR MOBILE BROADBAND IN SRI LANKA**

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Degree of Master of Science in Telecommunication

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University of Moratuwa

Sri Lanka

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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

Spectrum Management Policy Framework for Mobile Broadband in Sri Lanka

Spectrum management has become an important aspect of regulation as part of industry broadband growth and foster innovation. The statutory framework that exists currently in Sri Lanka for mobile broadband spectrum management is elementary and outdated. Therefore, the current regulations fall short of driving the exponential broadband growth in the telecommunications industry, promoting investment and innovation in the provision of services which ultimately results the consumers to use poor quality broadband services and products.

This research is mainly focused to identify the most suitable spectrum policy changes required to foster the mobile broadband growth in Sri Lanka; solutions to the existing spectrum management problems, what steps need to be taken to avoid these problems in the future; What actions need to be taken to foster innovation and spectrum best practices around the globe. There are few steps used to gather information for the policy framework. A survey was conducted among the all mobile operators/TRCSL/Main equipment vendors covering the 360 landscape of the mobile telecommunication industry in Sri Lanka. Then a study was done about the already implemented broadband policy frameworks in south Asian developed countries. And also, it was thoroughly analyzed the spectrum policy frameworks introduced by ITU and regional regulators

Finally, spectrum policy recommendations to Sri Lankan industry context were suggested in three main pillars of spectrum policy concepts namely Spectrum Planning, Spectrum Management and Spectrum Licensing with each concept having three main areas of study.

Keywords: *Spectrum, Broadband, Mobile telecommunication, Policy*

DEDICATION

To my loving wife Uththara and my three little princesses – Sethuni/Sanumi/Keyara

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LIST OF ABBREVIATIONS

Abbreviation	Description
2G	2nd Generation
3G	3rd Generation
3GGP	3rd Generation Partnership Project
4G	4th Generation
5G	5th Generation
APT	Asia Pacific Telecommunity
ARPU	Average revenue per user
ASEAN	Association of Southeast Asian Nations
BB	Broadband
CA	Carrier Aggregation
CAGR	Compound Annual Growth Rate
CAPEX	Capital expenditures
CBD	Central Business District
CEPT	European Conference of Postal and telecommunication Administration
CITEL	Inter-American Telecommunication Commission
DAS	Distributed Antenna System
DECT	Digital Enhanced Cordless Telecommunications
DL	Downlink
DoT	Department of Telecommunications
E-GSM	Extended Global System for Mobile
eMMB	Enhanced Mobile Broadband
EU	European Union
FCC	Federal Communications Commission
FDD	Frequency Division Duplex
GDP	Gross Domestic Product
GSM	Global System for Mobile
GSMA	Global System for Mobile Association
GSR	Global Symposium for Regulators
HSPA	High Speed Packet Access
HSUPA	High Speed Uplink Packet Access
ICT	Information and Communications Technology
IMT	International Mobile Telecommunications
IoT	Internet of Things
ITU	International Telecommunication Union
KPI	Key Performance Indicator
LSA	Licensed Shared Access

LTE	Long Term Evolution
LTE-A	Long Term Evolution - Advance
MIMO	Multiple Input Multiple Output
NB	Narrow Band
NBCC	National Broadband Consultative Committee
NR	New Radio
OPEX	Operational expenditure
PEST	Political,Economical,Social,Technological
PIM	Passive Inter Modulation
QAM	Quadrature amplitude modulation
QOS	Quality of Service
RCC	Regional Commonwealth in the field of Communications
ROI	Return on Investment
RRU	Radio Resource Unit
RTWP	Receive Total Wideband Power
SAARC	South Asian Association for Regional Cooperation
SATRC	South Asian Telecommunication Regulators Council
SDCCH	Stand Alone Dedicated Control Channel
SMS	Short Message Service
TCH	Traffic Channel
TCP	Transmission Control Protocol
TDD	Time Division Duplex
TRAI	Telecom Regulatory Authority of India
TRCSL	Telecommunications Regulatory Commission of Sri Lanka
TV	Television
UE	User Equipment
UL	Uplink
UL	Uplink
UMTS	Universal Mobile Telecommunications System
UTRAN	Universal Terrestrial Radio Access Network
WCDMA	Wideband Code Division Multiple Access
Wi-Fi	Wireless Fidelity
WLL	Wireless Local Loop
WRC	World Radio-communication Conference