YANGON UNIVERSITY OF ECONOMICS
DEPARTMENT OF APPLIED ECONOMICS
MASTER OF PUBLIC ADMINISTRATION PROGRAMMED

A STUDY ON MYANMAR'S GOVERNMENT SUBSIDIES ON TELECOMMUNICATIONS INFRASTRUCTURE SERVICE THROUGH UNIVERSAL SERVICE

KYAW OO
EMPA -13 (18th BATCH, NPT)

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A thesis submitted as a partial fulfillment towards the requirement
for the degree of Executive Master of Public Administration (EMPA)

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This is to certify that this thesis entitled "**a study on Myanmar's government subsidies on telecommunications infrastructure service through universal service**" submitted in partial fulfillment towards the requirements for the degree of Executive Master of Public Administration (EMPA) has been accepted by the Board of Examiners.

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ABSTRACT

The government allowed four mobile carriers to tender in four townships (Sidoktaya, Hpasawng, Ann, and Minbya) to improve the development of Myanmar's telecommunication infrastructure with the help of Universal Service Fund subsidies, and the winner began working in 2019. This Thesis is to examine government's subsidies affected on improvement of telecommunication infrastructure service through Universal Service. A descriptive method is used based on secondary data to observe the people living in rural and remote parts of the country have access to use telecommunications service. During the tender process, the areas were peaceful, but when the tender was successful, they were not peaceful areas, so the tender had to be cancelled. In carrying out the USF model of Myanmar's infrastructure facing regional unrest, lack of electricity; Land use problems, etc. in comparison with India and Nigerian countries likes the same. According to the finding, Myanmar should use the USF Fund to continue ICT development projects like other Indian and Nigerian countries, not just infrastructure. Also, sharing and using the existing infrastructure without making any further work. It should be done by including not only 4 mobile operators but also other licensed niche operators.

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LIST OF ABBREVIATIONS

2G/ 3G	Second/ Third Generations Mobile Communications
4G / 5G	Fourth/ Fifth Generations Mobile Communications
BOT	Board of Trustee
CAPEX	Capital Expenditure
CTDP NER	Comprehensive Telecom Development Plan for North Eastern States
CTDP A&N	Comprehensive Telecom Development Plan for Andaman and Nicobar Islands
GIS	Geographic Information System
GSMA	Global System for Mobile Communication Association
IP	Internet Protocol
ITU	International Telecommunication Union
ICT	Information and Communication Technology
ISP	Internet Service Provider
LDC	Least Development Country
LWE-II	Left Wing Extremism- II
MCPT	Ministry of Communications, Posts and Telegraphs
MCIT	Ministry of Communications and Information Technology
MIMU	Myanmar Information Management Units
MOTC	Ministry of Transport and Communications
NCC	Nigeria Communication Commission
OSI	Online Service Index
OPEX	Operating Expenditure
PTD	Posts and Telecommunications Department
RDELs	Rural Household Telephones
SDG	Sustainable Development Goals
TCP	Transmission Control Protocol
TRAI	Telecom Regulatory Authority's India
UA	Universal Access
USO	Universal Service Obligation
US	Universal Service
USF	Universal Service Fund
WTO	World Trade Organization

CHAPTER I

INTRODUCTION

1.1 Rationale of the Study

Communication has become increasing important for societies. Voice communications or broadband internets have become indispensable for modern life. Communications are crucial for government, business and individuals alike, both for economic growth and social development. Fixed and mobile networks will be the enabling infrastructure drives for economic growth. Despite the meteoric growth of the Internet and broadband connectivity, about 49 per cent of the world's population, or 3.7 billion people, were still offline and excluded from the direct benefits of the global digital economy at the end 2019. Offline populations are particularly concentrated in least developed countries, where only 19 per cent of individuals were online in 2019. Regionally, in Africa and Asia-Pacific, less than half of the population is online (29 and 45 per cent, respectively). Over 750 million people (approximately 10 per cent of the global population) are not covered by mobile broadband (3G or higher). This lack of coverage is particularly concentrated in rural and remote areas. Myanmar is also a Least Development Country (LDC) and is in need of building communication infrastructure everywhere. About 70 percent of Myanmar's population is in rural and only 30 percent lives in urban areas. Topography of Myanmar difficulties in building telecommunication infrastructure depends on the availability of roads and electricity. In addition to the coverage gap, usage gaps exist in places with broadband coverage. There are several overarching reasons why billions of people remain offline, ranging from a lack of network infrastructure availability and affordable Internet services to gaps in skills and ability, the availability and cost of personal devices, and a perceived lack of relevancy.

Sustainable Development Goals (SDG) Target 9.C explicitly refers to providing universal and affordable access to the internet in least developed countries by 2020. There is also, however, a demand-side aspect to this Target since using the internet requires a certain level of skills. An indicator such as educational attainment might track this. Indeed, this is critical, since while some LDCs have reached a high

level of accomplishment with regard to supply-side indicators, they lag in terms of internet use, which suggests that other factors are at play, and not just broadband coverage and affordability. In contrast to relatively high mobile subscription penetration, Internet access remains low in the LDCs.

It is estimated that by the end of 2017, only 172 million of the nearly 1 billion people living in the LDCs will be using the internet, corresponding to a usage rate of about 17.5 per cent. This was an increase compared to 2010, when Internet penetration was just 4 per cent. However, progress is very slow, with an increase of less than two percentage points between 2016 and 2017. At that rate, it will take over 15 years for the LDCs to get over half their citizens online. It is estimated that over 800 million people in the LDCs are not online, and the five most populated countries (Bangladesh, Ethiopia, DRC, Tanzania and Myanmar) account for almost half that number. It is estimated that 30 per cent of young people (15-24 years old) in LDCs are using the Internet, and that 35 per cent of all individuals using the Internet in LDCs are young people (ITU, 2017a). There is a great variation between LDCs in terms of estimated internet use, from less than 2 per cent of the population to over 40 per cent.

Despite the overall low level of internet use for the group as whole, a few LDCs, mainly in Asia, are forging ahead. Their experiences have one factor in common: meaningful competition in the internet provision market is driving mobile broadband prices very low and greatly expanding coverage. Some of these countries also have successful programmed connecting schools to the internet, which has driven internet use among youth. In addition, Myanmar, like other countries, will be able to improve the country's telecommunications sector more quickly by developing Mobile Broadband more than Fixed Line Broadband. Myanmar, an LDC country, still needs a lot of communication infrastructure, where the mobile communication network coverage of many mobile operators is 66 percent geographically and 96 percent of the population in 2016. The government needs to support CAPAX to cover the losses incurred by mobile operators need for Communication infrastructure such as communication towers and fiber backbones to communicate anywhere in Myanmar. In order to partially or almost fully support the CAPEX and OPEX, it is necessary to establish a Universal Service Fund.

Chronic lack of network infrastructure is one of the principal reasons – a dearth of transport networks, access networks, the inability of end-users to acquire terminal devices and equipment, or even to pay for services if they are available – all translate into a lack of providers willing or even able to offer access and services. Putting in place the right regulatory arrangements, connectivity measures and appropriate tools to foster infrastructure deployment, particularly in rural and remote areas, is vital to promoting full digital inclusion through universal access to fast, reliable online technologies and services.

Telecommunications Infrastructure includes Telephone Wires, Cables (Fibers, Submarine Cables), Poles, Duct, Towers, Satellites, Microwaves, Mobiles technology Network (such as fifth generation - 5G). Old Models were based on build-out telecom infrastructure requirements in a monopoly environment. Traditionally, before market opening, the incumbent operator, often government owned, had the obligations to provide universal service (USO). In a liberalizing market, imposing USOs on the incumbent operator alone is contrary to the objective of creating a level-playing field. However, shortly after market opening, developed countries often introduced administrative, non-competitive procedures for designating a company to fulfill a USO.

Myanmar Telecom Sector Reform and Liberalization the telecom market on 2013. With the liberalization of the telecommunications market and foreign direct investment, the telecommunications operators who entered the country only want to operate in densely populated and convenient areas where they can get the most benefits and are not willing to operate in areas with high construction and installation costs and low profits. Commercial Mobile Service Operators will not choose the service areas where not possible for the return of investment. New technologies and competition in market for basic telecommunications market lead to Universal Service Obligation. Universal Service Obligations are commonly used in many of the Infrastructure sectors. Obligations are frequently defined narrowly in ways that disfavor new technologies and cause extensive waste. Financing for the non-commercial based obligation can often be raised in more efficient ways than through cross - subsidies. Government policy on telecom infrastructure service through Universal Service Obligation target for these difficult far flan area (not a commercially viable) and population groups will also be served.

Government have to do the development programs and project for construction of basic telecommunications infrastructure and to extend telecommuni - cations services in the unserved and underserved areas of the country. All government need a budget for Universal Service Obligation and mostly established Universal Service Fund which is contributed from Telecom Operators. Without the government subsidies to the operators, Service Providers might have been reluctant to invest for those commercially unavailable areas. In 2018, the regulation on the establishment of a fund to meet basic communication (Universal Service Obligation) needs was issued.

Before there was no fund to meet the basic communication needs, Myanmar government started with a loan from World Bank and the first government grant, and later after the funds are available, PTD will continue to support the government subsidies with the Universal Service Fund. Firstly, pilot project for Myanmar Universal Service area four townships were implemented by World Band Funded in 2018. The pilot project for Infrastructure roll-out started on Sidoktaya Township in Magway Division, Hpasawng Township in Kayah State, Ann Township and Minbya Township in Rakhine State. Total telecom service uncovered population in 67233 targeted for voice and internet data service in those pilot projects through the Universal Service. The main thing to study is how the government can provide subsidies for basic communication to further improve the communication sector and how rural people in remote areas can benefit. In addition, government clear policies are needed for selection on universal service program, universal service obligation, projects and without support the financial subsidies for Universal Service will not be sustainable in the future.

1.2 Objectives of the Study

The main objectives of the study are to examine Government's subsidies affected on improvement of telecommunication infrastructure service through Universal Service at 4 Townships. (Case study on Sidoktaya Township, Hpasawng Township, Ann Township and Minbya Township).

1.3 Method of Study

A descriptive method is used based on secondary data to observe the people living in rural and remote parts of the country have access to and are able to use telecommunications services through universal service in 2018.

Secondary data is collected in four different townships and analysis data from Posts and Telecommunications Department, Ministry of Transport and Communications, Myanmar Universal Service Fund Strategy (2019-2023), other publicly available information and data including journals, articles and research papers, reports from online sources.

1.4 Scope and Limitations of the Study

The study is focused on Universal Service area for four mobile operators (MPT, Telenor, Ooredoo and Mytel) telecom network services which are uncovered people about 19963 in Sidoktaya Township at Magway Division, people about 9751 in Hpasawng Township at Kayah States, people about 22674 in Minbya Township and people about 4845 in Ann Township at Rakhine State. The population data in this studies are used only by censes 2014 population data from MIMU.

1.5 Organization of the Study

This study is organized into five chapters. Chapter 1 includes the rationale of the study. Chapter 2 presents a literature review. Chapter 3 describes the background of Telecommunications Service in Myanmar. Chapter 4 presents comparative study on Universal Service Fund. Chapter 5 indicates the findings and recommendations.

CHAPTER II

LITERATURE REVIEW

2.1 Concept of Telecommunications

People have been communicating their needs and wants ever since the beginning of time**.** Due to a lack of appropriate communication tools in the past, communication was quite difficult**.** In the past, human beings were the only means of communication when someone wished to reach someone who lived far away. Pigeon post was utilized for greater distances and more comprehensive messages. These methods were all exceedingly expensive, uncertain, and time-consuming. Due to all of these factors, effective telecommunication methods were desperately needed to save time, money, and labor (MITSOT, 2011)**.**

Generally speaking, telecommunication is the act of delivering a signal across a long distance in order to send information. Today, it is accepted that a telecommunication system consists of three components: a transmitter, which transforms information into a signal, a transmission medium, which carries the signal, and a receiver, which receives the signal and transforms it back into information. Modern society is significantly impacted by telecommunications on a social, cultural, and economic level. (Study Mode Research, 2009). Communications used to be a major issue in poor nations because all available means of communication were only available to the wealthy. But now that this industry has undergone a revolution, people from the middle and lower classes, who are crucial to the expansion of any nation's economy, may also access all of these resources. Through the use of email, voice mail, faxing, file transfers, cellular phones, and teleconferencing, telecommunications technology can make geographic distance meaningless.

As the foundation of the digital economy, telecommunication infrastructure has recently attracted more attention in planning literature. Nevertheless, Australia lags behind the United States, Canada, Europe, and Asia in the amount of evidence-based study on the effects of this new infrastructure on urban and rural areas (Alizadeh 2013). (Frieden 2005; Grubesic 2006, 2010; Grubesic and Murray 2004).

2.2 Concept of Government subsidies

The definition of a subsidy, like that of beauty, can vary depending on the beholder whose eye is focused on the object under scrutiny, according to some who have claimed that "the concept of a subsidy is just too elusive" to even attempt to define (Houthakker, 1972). (U.S. Congress, House Committee on Agriculture, 1972). According to Break (1972), "although for most government spending programs just the benefits that are elusive and difficult to quantify, for subsidy programs it is typically both benefits and costs" are elusive and difficult to quantify. Any government support that (i) enables consumers to acquire products and services at prices lower than those given by a perfectly competitive private sector, or (ii) increases producers' incomes above those they would have earned without this intervention is considered a subsidy.

Although a wide range of government initiatives may involve subsidies, they can be divided into the following seven categories:

(1) direct government payments (cash subsidies or cash grants) made to producers or consumers;
(2) government guarantees, business interest subsidies, or soft loans (low-interest government loans);
(3) certain tax burdens are reduced (tax subsidies);
(4) engagement in equity by the government (equity subsidies);
(5) the government's sale of products and services at a discount (in-kind subsidies);
(6) government acquisition of products and services at costs above market rates;
(7) By government regulations that change market prices or access, there are implicit payments (regulatory subsidies).

At least three problems exist with the aforementioned categorization. The first is that each of the seven categories' various subsidies is not uniform. Tax exemptions, tax credits, tax allowances, special rate relief, tax deferrals, and the accumulation of tax arrears are only a few examples of how tax subsidies can be gained. Second, some subsidies might, at least initially, fit into more than one category. Consignment subsidies, or grants given to projects that are only repaid if the project proves to be commercially successful, may, for instance, be a cash grant if the project is unsuccessful or, if the project is successful, a credit subsidy when the interest rate is below the market rate. Third, it gives potential for measurement issues and

ambiguities. For instance, excessive exchange rates have an impact on market access and pricing even while they include subsidy components. Governments may opt to employ subsidies as a tool for policymaking for a variety of reasons. According to Houthakker (1972), vote dealing or logrolling is a major factor. The sharing of presents, even those that are pretty pointless, frequently helps to stimulate good fellowship and a sense of community, as we all know from birthdays and Christmas Eves, he says, even though this is unlikely to result in the optimal allocation of resources (Houthakker, 1972). From an economic standpoint, the primary function of subsidies is resource reallocation, or changing economic activity and behavior to produce an outcome that is "more desirable" than what would otherwise happen.

2.3 Universal Service Obligations

Universal service Obligation is a tool used by policy makers to redistribute these essential services through subsidized prices instead of other redistributive fiscal measures such as taxation and direct transfers. In that sense it is quite akin to policies of public provisioning of private goods or policies that use direct transfers to achieve redistribution goals. Universal Service Obligation has traditionally been envisioned as an obligation on private telecommunications service providers to provide basic voice services on fixed-line local loops at reasonable prices. In the recent past, this concept has widened in scope to keep pace with advancement in technology and consumer expectations. Universal Service Obligation with the objective are consolidating the learning so far and to identify gaps for future research. (Guru Acharya, 2013).

Different jurisdictions define Universal Service Obligation (USO) differently (Milne, 1998). Xavier (2006a) reviews definitions of USO in multiple jurisdictions and finds that there is no one standard definition of USO. However, he finds that the concept of USO broadly includes the goals of availability, affordability and accessibility. The variability in the definition of USO arises from the Reference Paper (WTO, 1996) to which commitments were made as part of General Agreements on Trade in Services (GATS). This reference paper provides the following limited guidelines with respect to USO: “Any Member has the right to define the kind of universal service obligation it wishes to maintain. Such obligations will not be regarded as anti-competitive per se, provided they are administered in a transparent, non-discriminatory and competitively neutral manner and are not more burdensome

than necessary for the kind of universal service defined by the Member" (WTO, 1996).

In the European Union, USO is primarily governed by the European Commission (EC) Directive 2002/22/EC, which was further amended as part of the EC telecom package in Directive 2009/136/EC. As part of these directives, USO is defined as the "minimum set of services of specified quality to which all end-users have access, at an affordable price in the light of specific national conditions, without distorting competition".

In the United States, USO was codified in the Telecommunications Act of 1996. The idea that all Americans should have access to communications services is known as universal service. In order to put this notion into practice, the FCC has created a fund and a category of programs and regulations called "universal service. The Communications Act of 1934, the legislation that created the FCC, places a strong emphasis on universal service."However, the term universal service has been informally used since 1907 by AT&T in the phrase "one system, one policy, universal service".

In India, USO policy was introduced in 2002 and was formally codified in the Telegraph Act in 2003, and has since then been amended in 2006. In this, USO has been defined as the obligation to provide access to telegraph services to people in rural and remote areas at affordable and reasonable prices. Specifically, USO in India has evolved into multiple streams, which include public access telephones in all villages, private access telephone lines for rural households, mobile infrastructure and broadband services (Raghuram & Jain, 2010).

2.3.1 Universal Access and Universal Service

Since the early 1900s, the idea of universal service has existed in some form or another. It calls for all people of a nation to have access to telecommunications services. The ICT-use gap, which is a knowledge and access to technology gap as well, is widening the gap between developed and developing nations. Therefore, closing the development gap and boosting the competitiveness of underdeveloped nations depend on addressing the digital divide. Some jurisdictions also differentiate between universal *service* and universal *access* (Xavier, 2006a). While universal *access* refers to public or shared access to telecommunication services at a community or village level, universal *service* refers to private access to households or individual

consumers. However, most literature does not differentiate between the two terms and uses them interchangeably.

As a result, developed and developing countries alike have begun to promote policies aimed at ensuring universal access to a variety of telecommunications services, taking into account the economic and social benefits of expanding the telecommunications network and the significance of closing the infrastructure gap. In order to supply telecenters and community telephones in rural areas, for instance, Colombia has committed a total of US$ 153 million over the last five years, according to Stern (2006). Guatemala has spent approximately US$ 8 million on telecenters, and Peru has invested US$ 59.3 million in similar technologies. Over US$ 6 billion was invested in the US during 2005, according to (USAC, 2006). These rules are referred to as universal telecom service rules.

2.3.2 Components of USO

Early definitions of USO were not technology and service neutral as a result they could not account for advancement in technologies and consumer demand for new services. Alleman, Rappoport, & Banerjee (2010) argue that any definition of USO should be as flexible as possible to account for not only changing technologies, but also the changing preferences and uses of the consumers. Clinging to a technology specific definition such as fixed line or fixed plus cellular is not realistic and all-encompassing. Given the limitations of technology at the time of conception, USO was limited to an obligation to provide basic voice services on fixed-line local loops at reasonable prices. Recognizing advancement in technology and convergence of services, networks and devices, national governments are now gradually refining USO to make it technology and service neutral while also widening its scope to include a number of additional dimensions. Specifically, inclusion of wireless and broadband services within the USO paradigm has received widespread attention. Additionally, USO has been expanded to include provision of services to disabled persons and to public institutions like schools, libraries and health centers. In some countries, USO has also been expanded to include creation of backhaul and core, subsidization of end user equipment, development of localized applications and content, creation of emergency services and infrastructure, and provision of directories.

Given the variability in the definition of USO across jurisdictions, USO comprises of different components in different jurisdictions. The following (table 2.1) highlights the academic literature for each of the different facets/components of universal service:

Table 2.1 The different facets/ components of universal service

No.	Component	Literature
1	Voice – Wired Local Loop • Individual Access • Public Access (Village, Community)	(Falch & Anyimadu, 2003, n. Ghana; Garcia-Murillo & Kuerbis, 2005, n. Latin America)
2	Voice – Wireless Local Loop	(Burkart, 2007, n. Mexico; Fosu, 2011, n. Ghana; Frieden, 1995, n. USA; Hauge, Chiang, & Jamison, 2009, n. USA; Kenny & Keremane, 2007, n. Chile)
3	Data, Broadband & IP based networks	(Abernathy, 2004, n. USA; Bohlin & Teppayayon, 2009, n. EU; Gabel, 2007, n. USA; Jordan, 2009, n. USA; Levin, 2010, n. OECD; Mitomo & Tajiri, 2010, n. Japan)
4	User Equipment	NA
5	Backhaul/Core	NA
6	Content/Information/Applications	(Compaine & Weinraub, 1997, n. USA)
7	Emergency	(Phillips, 2005)
8	Disabled	(Eijk & Poort, 2012, n. EU; Goggin & Newell, 2004)
9	Schools, Libraries, Health Centers	(Hausman & Shelanski, 1999, n. USA; Hudson, 2004, n. USA)

(Source : Guru Acharya, 2013)

USO has witnessed a paradigm shift due to liberalization of the sector, convergence of networks, services and devices, and diffusion of data centric broadband services. To account for this shift in paradigm, Jordan (2009) proposes a layered regulation model for universal services using the OSI and TCP layered approach. In this model, the author creates a distinction between communications infrastructure and communications services with the IP layer as the demarcating layer. The objective of this distinction is to make USO technology and service neutral. Jayakar & Sawhney (2004) introduce the concept of 'possibility space' delineated by two dimensions 'intervention' and 'locus'. On this plane, the authors plot different approaches to universal service and conclude that a heterogeneous universal service policy is likely to be more suited to the new telecommunications environment.

To determine what should constitute the bundle of services comprising USO, Nakamura (2013) uses contingent valuation to demonstrate that consumers are more willing to pay to retain voice communication services than data transmission services; and that even when mobile phone service is available, consumers will pay to retain fixed-line voice services. Therefore, it would be incorrect to assume that the preferred constituents of universal service would change with advancement in technology. Further, it was found that there is a serious dearth of literature outside of broadband and wireless based universal services, focusing on other components of USO like provision of services for disabled persons, subsidization of end-user equipment, creation of backhaul/core etc.

2.3.3 Justifications for USO

Justifications for USO can be categorized into two types of rationales (Xavier, 2006b) i.e. economic rationale and socio-political rationale. From the perspective of economics, one of the classical justifications is that state intervention in the form USO enables the internalization of network externalities arising from additional subscribers. Every additional person, otherwise excluded by the market, receiving benefit from USO adds to the network effects of the telecommunications network. In developed countries where penetration of basic voice services is already edging towards hundred percent, this justification no longer holds for voice services. It is claimed by many that USO is a failed policy initiative specifically in developed countries where additional subscribers do not enhance positive externalities (Crandall & Waverman, 2000). The network externality based justification now finds application in emerging broadband networks. Turner (2012) finds that network externalities are the primary economic justification for providing universal service of broadband. Market intervention in the form of USO also finds justification in the argument that telecommunications services have high positive externalities.

The second justification for USO is from a socio-political perspective. Left to market forces, there is a possibility of exclusion of the weaker sections of society from essential telecommunications services. As a result, the concept of USO has gained prominence with liberalization of the telecommunications sector and with privatization of state incumbents in order to ensure that no person is denied access to telecommunications services. Additionally, since many government services are electronic/ telephonic, such excluded persons are also denied access to public

services. In some jurisdictions there is a notable rural-urban divide, specifically reflecting low rural tele-density (Bhuiyan, 2004).

Households with low income are denied access and that such digital divide can be attributed to poverty (Turner, 2012). Since most services are designed without keeping the special needs of disabled persons in context, such disabled persons are also excluded from the benefit of these services (Eijk & Poort, 2012). Given the digital nature of this divide, not only do certain sections get excluded from telecommunication services, but they are also denied all such value added services provided over basic telecommunication services. The justifications for USO may differ from one component to another and may also differ for the same component from one country to another. Therefore, justifications for USO need to review in light of these differences between different components and different countries.

2.3.4 Impact of USO

Berg, Jiang, & Lin (2011) show that perverse incentives in USO scheme and result in some companies overstating costs (or incurring higher costs) as they approach the subsidy cutoff points. Jain (2012) finds that USO funding has had an insignificant impact on rural teledenisty while village electrification has had a significant impact on rural teledensity in India. Holt & Galligan (2013) includes research findings on how the economic incentives created by the federal universal service programs affect corporate investment and deployment decisions and consumer service and technology adoption decisions.

A framework for assessing a USO policy in developing nations is put forth by Jain and Das (2001). The breadth of the USO policy, which covers service types, target populations, service components, and budget levels, is the first pillar of this framework. The evaluation of allocation procedures like reverse auctions or incumbent cost regulation is done in the second dimension, which is the identification of the Universal Access Provider. The USO policy's funding structure makes up the third dimension. The selecting procedure makes up the fourth dimension. The level of private sector involvement makes up the fifth dimension. The final factor to consider when evaluating a USO policy is the outcomes and mechanisms for review.

2.4 Countries practice on Funding and Allocation of USO Funds

The funding for universal service can be through many means (Choné, Flochel, & Perrot, 2002). Universal service funding may adopt the form of levying a

charge on one market to subsidize another market (Armstrong, 2001). For example, long distance can subsidize the local access market; or the corporate customers can subsidize the household consumers; or the interconnection market can subsidize the local access market. Alternately, the regulator may require the network provider to give a percentage of the revenue as contribution to the universal service fund (Xavier, 2006b). For example, India and Nepal require telecom service providers to contribute 5% and 2% of their gross revenue to the universal service fund. Malaysia collects as 6% of the weighted net revenue for Universal Service Provision (USP). Cambodia collects as 2% of the gross revenue of the telecommunications operator and other source. Indonesia collects as 1.25% of the gross income of the telecommunications operator yearly. Thailand collects as 2.5% of the net income from telecommunications services and plus 7% Value added tax for operators. Vietnam collects as 1.5% revenue from telecom operators. Universal service may also be funded by general taxation, spectrum auction fees or direct levy on all consumers.

Like funding, the allocation of USO funds can also follow many methods (Choné, Flochel, & Perrot, 2000; Kelly & Steinberg, 2000; Milgrom, 1996). Traditionally, the USO funds have directly been allocated to the state incumbents or regulated monopolist for provision or services under cost of service regulation. However, the recent trend in most jurisdictions is to allocate funds through reverse auctions, which are considered a transparent allocation technique in a competitive market Weller, 1999). Alternately, beauty contests can also be help for distribution of USO funds. Further, these funds can be allocated to network service providers for building infrastructure or directly to consumers to subsidize their consumption (Belloc, Nicita, & Alessandra Rossi, 2012). Weller (1999), in his seminal paper on use of reverse auctions for USO, proposes the use of reverse auctions for selecting which carriers should undertake a USO, and what compensation they should receive for performing this function. From the regulator's perspective, the auction would provide an alternative to traditional cost-of-service regulation by introducing a transparent method for endogenously revealing carriers' valuations of the USO and determining the number of USO providers. Jon M. (1999) proposes a novel policy based on *tradable* USO to motivate private-sector operators of basic infrastructure to expand infrastructure into previously unserved regions at the least cost to society. In this, firms receive tradable universal service obligations in the form of rollout

obligations within specific deadlines. By trading its obligations, a firm can increase or decrease the rate at which it must expand infrastructure. The exchange of milestones and commitments does not diminish the obligations that must be met by industry as a whole while allowing each firm to develop the most cost effective business strategy possible. In most jurisdictions, USO is administered and monitored by the state or the market regulator. In some jurisdictions (like the United States), USO is administered through a private not-for-profit corporation (Holt & Galligan, 2013).

2.5 Concept of Comparison with other Countries Practice

Rural and isolated locations have higher capital costs associated with delivering telecom services, but they also produce less revenue due to lower population densities, lower incomes, and a lack of economic activity. Therefore, the telecom industry would not be sufficiently directed by conventional market forces to service underdeveloped and rural areas. The majority of nations in the world have put in place policies to provide Universal Access and Universal Service to ICT, taking into consideration the inadequacy of the market mechanism to serve rural and inaccessible areas on the one hand and the significance of providing vital telecom connectivity on the other. The low impact was caused by a lack of accountability brought on by the connection between the government-owned incumbent and the USOF administrator, inadequate USOF evaluation, non-ring-fencing of the money, and subpar project management. In Peru, severe penalties for not carrying out contracts resulted in more timely timetables (Cannock, 2001). The implementation of Universal Service Obligation and Universal Service Access varies from country to country, as does the success rate. In addition, the basic needs of countries such as literacy, personal and household income, ability to use of ICT, etc, it is necessary to have good government policy and the ability to effectively implement USF fund. In order to increase rural teledensities, USOF must be viewed as one tool among many, and initiatives should be taken to assist policy achievements on a number of fronts. (RekhaJainG. Raghuram, 2009)

2.6 Review on previous studies

Recent study of India researcher, Payal Malik, (2007) studied "India's Universal Service Obligation for Rural Telecommunications: Issues of Design and Implementation". She study aimed to critically analyze the design and implementation of the subsidy mechanism for the expansion of rural telephony in

India. She reviewed the Telecom Regulatory Authority's (TRAI) subsequent suggestions to address these shortcomings as well as the oddities of the USO regulatory and policy system since its start in 2002. It is crucial to discuss whether (1) the USO scheme introduces the least amount of distortion into a market that is otherwise functioning normally and (2) whether it supplied operators with an even playing field when competing in an auction to acquire the USO subsidy.

Given the economy of India's plethora of examples of misdirected and market-distorting subsidies due to the development ties of Information Communication Technology, this is a crucial factor to take into account when evaluating a subsidy structure (ICT). India cannot afford to repeat these mistakes. The primary conclusions of the article are that the initial mechanism of restricting USO funding to fixed lines was ineffective because it was anti-competitive and technologically biased. The corrective mechanism to support funding for mobile infrastructure and its subsequent distribution has solved some of the issues with the USO program's initial design, but it still raises concerns about how the program would affect competition for the delivery of rural services. Due to the incumbent's refusal to share its existing infrastructure, there are worries about needless duplication of backhaul infrastructure that would burden service providers beyond their required payment to the Universal Service Fund. In this study, the researcher suggested that India's Universal Service policy at the time was biased in favor of the dominant operator. The benchmark subsidy rates have significantly decreased as a result of the competitive bid procedure, falling to 65 to 70 percent in the case of RDELs.

Recent study of Nigerian candidates Peter Chukwuma Obutte & Joy Chineye Mgbeokwere (2017) studied “Reforms in the Nigeria Telecommunications Sector: Locating the Role of the Universal Service Provision Fund.” They study aimed to Nigerian governments and nations all around the world are embracing electronic government strategies. The goal of the twenty-first century is to close the knowledge and access gaps between rural and urban residents. From the study, to close the knowledge and access gap between rural and urban residents, the Nigerian government has implemented a variety of methods. The Nigerian Communications Act of 2003 includes the Universal Service Provision Fund as one of these methods. They want to assess how well the country's specified geographical entities' information gaps are being filled by the Universal Service Provision Fund. Due to the licensing of several telecommunications carriers to conduct business in Nigeria, the

reforms also increased competition in the communications sector. The researcher pointed out the Nigerian USF Board's failure to precisely define underserved and unserved areas and identify disadvantaged populations in the communities has presented a significant obstacle. It was in order to establish incentives that will encourage the rollout of sustainable ICT services in rural, unserved, and underserved areas, the Board is required to identify market efficiency and access gaps. The Nigerian government will improve the telecommunications services available in the rural area through collaboration with the private sector and major telecommunications key players. The researcher recommended in order fulfilling its goal to provide telecom services and access to everyone at lower costs, the USPF must take the initiative and find solutions to the identification problems. In order to help them meet their goals and enable the Fund to provide telephone services to everyone, it should cooperate with key industry stakeholders.

CHAPTER III

OVERVIEW OF THE MYANMAR GOVERNMENT SUBSIDIES ON TELECOMMUNICATIONS

3.1 Background of Telecommunication Services in Myanmar

Since the reign of the Myanmar King in the late 19th century, postal and telecommunications services have been available in Myanmar. It was established as the Oriental Telephone and Electric in 1884 following British annexation. In March 1884, it became the Rangoon Exchange, and then in 1924, it became the Rangoon Telephone Limited. Telephone, telegraph, and postal services have all been available in Myanmar since the time of the British occupation. The first telegraph lines were built in Myanmar in 1861, but it wasn't until 1884—eight years after Sir Alexander Graham Bell invented the telephone that the country saw the introduction of telephone services. There were roughly 1300 telephone lines in Yangon in 1884. In 1937, the Directorate of Posts and Telegraph was founded in Myanmar following its separation from India. Using open wire lines and open wire carrier systems, linkages to another 50 provincial towns were constructed the same year for telegraph and phone services. It was run as the Burma Telegraphic Communications Bureau from 1942 to 1945. After independence and during the British reoccupation, telecommunications were first rebuilt and restored. Telecommunications services kept expanding in the years following the war. In 1947, it split into two distinct departments: one for telegraphs and one for posts.

The Ministry of Transport, Posts, and Telecommunications was founded in 1948 during the post-independence era. Four crossbar switches were installed as part of the Yangon Automation project, which MPT began in 1956 and finished in 1962. The Posts and Telegraphs Department was created in January 1960 by combining the two prior major departments. By the end of 1962, there were 14,754 telephone lines and 80 exchanges nationwide, including 4 crossbar automated exchanges in Yangon. The number of telephones reached 21,444 in 1967 and has kept increasing ever since.

In 1960, the delta area saw the introduction of the first low capacity microwave transmission system for long-distance communication. At that time, there were also open wire carrier systems with 3 and 12 channels for long-distance communication. At that time, high frequency (H.F.) radio communication was primarily employed for both international telephone and telex services.

MPT operated with roughly 143 exchanges in Yangon up to the early 1970s. Six of them included automatic exchanges. At that time, there were around 17,400 telephones in Yangon and 22,000 nationally. The Ministry became the Ministry of Transport and Communications during the socialist era, especially in 1972. The Posts and Telegraphs Department was reformed as Posts and Telecommunications Corporation on March 15, 1972, in accordance with the Revolutionary Council's general directive to conduct business profitably in the state economic sector.
(formal yearly report to the Ministry from MPT).

The primary duties of the telecommunications sector in Myanmar are to provide the country's citizens with public communication services, establish communication centers and routers in accordance with standards, grant licenses to all communications businesses, collect license fees from interested parties, monitor communication services in accordance with laws, rules, and regulations, manage radio frequency resources, and assess the standard and quality of communication services. After 1988, Myanmar started making improvements in the communication sector. Myanma Posts and Telecommunications Enterprise were founded in March 1989 under the Ministry of Transport and Communications following the implementation of market-oriented reforms. According to notification 10/92 issued by the State Law and Order Restoration Council on January 29, 1992, the Ministry of Transport and Communications had been reorganized and restructured into three separate Ministries, namely the Ministry of Transport, the Ministry of Rail Transportation, and the Ministry of Communications, Posts, and Telegraphs. This restructuring process' major goal is to achieve efficient and effective development in economic, nation-building, and transportation and communication initiatives, as well as their corresponding tasks. The Ministry of Communications, Posts and Telegraphs was subsequently established on February 3, 1992, and it consisted of three main divisions. They were the Departments of Posts and Telecommunications, Myanma Posts and Telecommunications, and Meteorology and Hydrology. On August 20, 1999, the Meteorology and Hydrology Department was moved under the Ministry of Transport

for a better and more efficient execution of its duties. With the new arrangement, the Ministry of Communications, Posts and Telegraphs (MCPT) will have control over both MPT (the government operator) and PTD (the regulator). According to notification (83/2012) issued by the President Office of the Republic of Union of Myanmar on November 9, 2012, MCPT was renamed the Ministry of Communications and Information Technology (MCIT). On April 1, 2015, the Ministry of Communications and Information Technology changed its organizational structure to the following:

1. Union Minister office
2. Posts and Telecommunications Department (PTD)
3. Information Technology and Cyber Security Department (ITCSD)
4. Myanma Posts and Telecommunications (MPT)
5. Myanmar Posts (MP)

The Ministry of Transport and Communications has been combined with the Ministry of Communications and Information Technology, Ministry of Transport and Ministry of Railway by President Office Order No. (3/2016) on March 30, 2016.

3.2 Government budget on Telecommunications

In Myanmar, before 2013, only the government was in charge of telecommunications, and for undeveloped regions, only the government budgeted and the government was responsible. At that time, under the state-owned enterprises law, only the government was allowed to operate the telecommunications industry, and only one of the Myanma Posts and Telecommunications (MPT) provided telecom services in Myanmar over 130 years ago. In 2014, the government promulgated the Telecommunications Law, allowing the private sector to operate telecommunications services along with the liberalization of the telecommunications sector.

The government's goal of reforming the telecoms industry is being pursued by the Ministry of Transport and Communications (MOTC), with significant accomplishments include the 2014 Telecommunications Law and the deregulation of the market and the creation of important regulatory guidelines on connectivity, frequencies, access, licensing, and competition.

3.3 Telecommunications Reformed and Market Liberalization

Four mobile communication companies, including Telenor Myanmar Limited from Norway, Ooredoo Myanmar Limited from Qatar, MPT is collaborating with overseas Japanese companies KSGM with experience in the Myanmar telecommunications sector, and Mytel, which jointed with Myanmar Telecom International and Vietnam National Telecommunications Company (Viettel), entered the market and offered services following the restructuring of Myanmar's telecommunications sector.

State's communication requirements satisfied through fostering rivalry between (2) Operators from outside of the nation and (2) operators from local. Citizens may utilize high-quality lowest priced telecommunications services. Myanmar is developing its infrastructure for telecommunications, including international mobile carriers and complicated regulatory reform: a novel procedure mandating corporate social responsibility a commitment to uphold digital rights that could ultimately result in freedom of expression used for the nation. The situation of connectivity has drastically changed since the implementation of public policy reform, such as the liberalization on private engagement in the telecommunications industry. From (2.7) percent of GDP in 2012–2013 to (4.8) percent of GDP in 2014–2015, the telecommunications sector contributed. In 2015, the tele density was reached in 35.7 percent.

3.4 Policy Directive for the Universal Service Obligation

Telecommunications Law's Chapter 15, Section 53 states that the Ministry of Transport and Communications must develop plans to expand basic communication facilities and improve communication services in underserved areas in order to provide widespread access to communication services within the Republic of Myanmar. Furthermore, Section 54 mention the Ministry has been assigned to establish a Universal Service Fund for meeting basic communication needs in order to implement plans to meet basic communication needs in any location for the benefit of the public, and to supervise the fund. The Government of the Union of Myanmar's (Government) primary goals is to widen access to telecommunications, lower the cost of services, and build a communications infrastructure that will promote equitable socioeconomic growth and the eradication of poverty.

The Ministry of Transport and Communications, with the approval of the Union Government, has issued the Notification Order No. (9/2018) for the

establishment of the Universal Service Fund in accordance with the section 54 of the Telecommunications Law in order to carry out programs to meet the basic needs of communication in any location for the benefit of the public.

MOTC has developed a five year Universal Service Strategy (2019-2023) which describes key programs, and guides the development and implementation of specific projects to assist in achieving universal service, as well as required capacity development to promote wide telecom service usage across the whole population of Myanmar. And, the USF is an institutional and funding instrument designed to achieve key objectives of the Universal Service Strategy and to collect USF contributions from Licensees.

3.5. Board of Trustee for Universal Service Fund

The Ministry of Transport and Communication's by Decree No. (6/2019), established a supervisory team (five members of Board of Trustee USF) chairman by the Deputy Minister to ensure transparency and orderliness in the implementation of activities related to meeting basic communication needs and the establishment of funds, with the Post and Telecommunication Depart, Ministry of Commerce, Ministry of Finance and Planning and representative Operators' as members.

Main function of the USF Board of Trustees is to maintain the integrity of the USF and credibility among key stakeholders (industry, government, civil society). This means being seen as autonomous, and not beholden to any one stakeholder. Their objective is to further the achievement of Universal Service in Myanmar, and create positive impacts for all of the stakeholders, especially the people requiring universal service.

3.6. Role and Functions of Regulator

The relationship between the USF Board and the Regulator (Posts and Telecommunications Department) is one of mutual co-operation and interdependence. The USF Board has been given specific duties and important approval powers and reports directly to the Minister, while the Regulator has the regulatory function to ensure universal service. This co-operation and interdependence is signified through the Regulator being also a Trustee of the USF Board of Trustees. The Regulator has the USF Management Unit and appoints permanent, dedicated staff to the USF Management Unit. Other staff from the Regulator may also be directed to assist the

USF Management Unit from time to time, as needed to help carry out the responsibilities of the USF.

The greatest way to achieve the government's objectives of better access, more affordable services, and expanded network coverage across the nation is through sector reform and effective sector regulation. The Law gives MOTC the power to develop a variety of mechanisms to carry out Universal Service duties, including the creation of a Universal Service Fund, for places and communities outside the market reach (USF). The key functional duties of the Regulator shall include;

(a) Develop the USF high-level strategy and USF programs every three to five years, based on a universal service gap and needs analysis and guidance from the Board of Trustees;

(b) Initiate or propose for approval any necessary studies to identify the basis for the above strategic actions;

(c) Consult with and obtain recommendations from the various stakeholders such as government departments, civil society and industry in relation to USF strategy, programs and plans;

(d) Lead the design, prioritisation and preparation of universal service projects, in line with the Universal Service Strategy approved by the Ministry;

(e) Prepare the tendering processes;

(f) Inspect and audit the project implementation and approve milestone payments according to the contracts, for payment by the Board;

(g) Oversee the timely execution of the USF Program;

(h) Develop, implement, monitor and evaluate for each program and project;

The operator's license stipulates that mobile operators must contribute 2% of Relevant Revenue to the Universal Service Fund at a time specified by the regulator. Starting from the year when the mobile operators got their license, they have given promises to improve the telecommunication network on the geographic coverage area according to the relevant regions and states, and they have to fulfill it. However, when the Nationwide Telecommunication Service Operators tender was launched, the population stated by the ministry was much lower than the population that occurred at the time of the 2014 census, so the economic projections from the operators were missed. Therefore, permitted from regulator, the operators submitted to change from Geographical coverage to Population Coverage and agreed to pay the Universal

Service Fund included in the license for areas with low communication starting from the third year of the license term. Operators also do not want to cover remote areas because they are not sure how to recover the money invested in areas that are not economically viable.

3.7 Universal Service Strategy (2019-2023)

The Telecom Sector Reform Project adopts a comprehensive strategy for the growth of the ICT industry in Myanmar. It consists of three main, connected parts. While institutional reform of the government-owned incumbent MPT will enable separation of the policy and operational functions of Government in the sector, facilitating the establishment of a level playing field in the sector. These factors together will facilitate the establishment of a competitive telecommunications market and expansion of good quality and affordable communications in Myanmar.

The expansion of services to extremely remote villages will be made possible through the creation of a universal service plan and the execution of pilot projects. Finally, in order to promote the use of ICT for governance reforms and public sector modernization, the construction of major priority e-Government foundations will enable for common technical horizontals/shared services that government agencies will have access to. Support for the project's implementation is also included in the plan.

The Ministry of Transport and Communications (MOTC) is following the government's goal of reforming the telecoms industry, which includes the Universal Service Strategy. The objective of universal service is to guarantee that all citizens of a nation may access and utilize telecommunications services. This pays special attention to those who reside in rural and isolated areas of the nation, as well as impoverished households nationwide and people with disabilities. This Universal Service approach is included into a number of already in place and necessary regulations. It ought to be in line with broad government initiatives, such the nation's economic strategy. A National Digital Strategy, National Broadband Policy, or Telecommunications/ICT Master plan is a higher-level, all-inclusive policy statement that addresses ICT, digital technologies, and services on a national level. These documents are present in many nations. A legislative framework and a subset of the Telecommunications Master plan called universal service ensure that lower-income families and distant and difficult-to-reach locations are also served by the telecom

industry. Universal Service approach is intended to run from 2019 to 2023, a five-year timeframe. Instead, this Universal Service Strategy is focused on solving the most important recognized universal service needs over the following five years after creating a foundation of definitions, principles, and analyses. The three main programs record these. There are combining the general strategic objectives of universal service with the gaps and demands for universal service in Myanmar that have been highlighted.

Program 1 - Infrastructure deployment for voice and broadband services

Program 2 - Broadband connectivity and ICT training - Enabling the digital future

Program 3 - Special Projects incl. content, applications, pilots, disability

The top priority and investment stream will be Program 1. Program 1 will put a special emphasis on providing infrastructure to all areas of the nation and making sure that all recognizable communities can use the national telecommunications system. Additionally, this will close any sizable coverage gaps along a specified set of designated main national highways and roads.

Program 2 will provide broadband connectivity to various digital learning centers, as well as other community and public organizations, with a focus on the development of digital literacy and skills. More people will be able to use broadband Internet services, which will boost demand and lead to a rise in ICT usage. That is also advantageous for the sector and the nation at large.

Program 3 will concentrate on special projects. These special projects will be smaller in scale, but they will still support crucial facets of universal service, such as promoting pertinent local content and applications, particularly for rural and poorer populations, ethnic and linguistic minorities, and people with disabilities. Other projects, like connecting rural hospitals to broadband Internet, will also serve to highlight the advantages of ICT in important public sectors. (https:// ptd.gov.mm/ Uploads/OI/Attach/122020/168291514122020_USF_Strategy.pdf)

3.8 Myanmar Telecom Market Condition

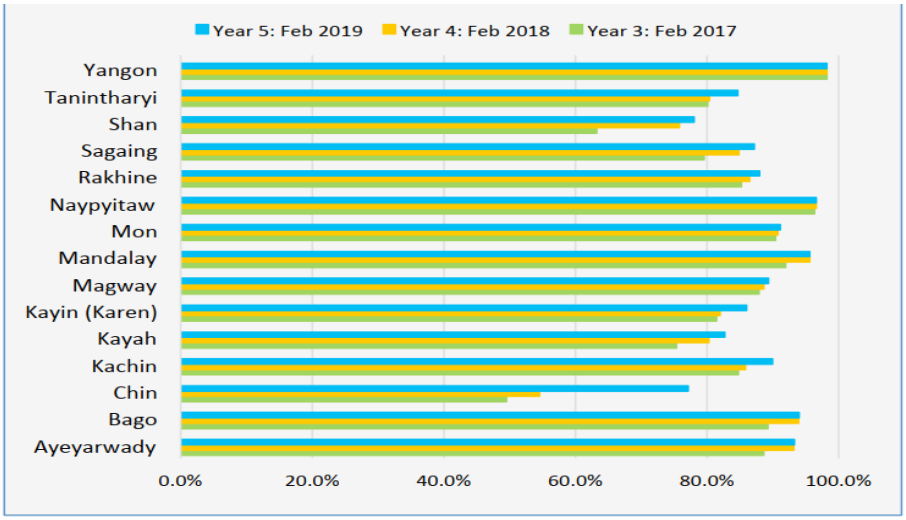
The market in Myanmar is remarkable in that it expanded by more than 100% in the first year after liberalization. Additionally, it has one of the highest rates of smart phone ownership in the world, averaging over two-thirds. Most estimates show

that 90% of new phone purchases nowadays are smart phones, with prices starting at less than USD 50. Although the three operators' plans for basic 2G versus 3G and 4G/ LTE build-out have differed greatly across the nation, there is a clear trend toward broadband services for every region in the operators' current coverage growth plans. The four mobile providers' networks have roughly 45.6 million subscribers. Active SIM cards are regarded as subscribers. Considering the 52 million people in the most recent census, 88% of the population has a SIM card. At least 33% of people hold multiple SIM cards, and it's possible to estimate that 30 million different users are served, giving it an effective penetration of about 57%. The Myanmar telecommunications sector is still expanding and growing quickly, supported by a number of wholesale and retail enterprises and increased competition. Myanmar people are also on the rise in internet usage and are willing to use high-speed internet in rural and urban area. (intelcon research & consultancy ltd, 2016)

3.9 Regional Distribution of the Networks in Myanmar

The states and regions in the East, West, and North are currently lagging in signal coverage, even though the country's total population coverage is currently over 80%, due to the country's population distribution being heavily concentrated in the central and southern regions and the liberalized mobile expansion progressing for less than two years. Over the next two and a half years, it is anticipated that both the geographical presence and relative penetrations of the present operators would alter dramatically. This is based on the two operators' planned license commitments, which are focused on population targets rather than their existing geographic coverage goals. (intelcon research & consultancy ltd, 2016). This is illustrated by the regional proposals offered in one of the sample operators' proposals in Figure (3.1) following:

Figure : 3.1 Operator Coverage Commitment



Source: from Post and Telecommunications Department)

The 2013 Telecommunications Law's Chapter XV on universal service deals with this topic. The MOTC may provide the PTD instructions to create programs to make sure that all of Myanmar, including as of yet underserved areas, receives basic telecommunications services. The MOTC can create a Universal Service Fund for that reason in order to carry out the programs for universal service. The PTD will make use of the USF and oversee how the USF programs are carried out. The PTD is responsible for identifying underserved areas, defining universal service targets, creating programs to attain universal service, and laying out the responsibilities of licensees with relation to universal service, all with the MOTC's permission. Based on the nationwide Uncover Population area calculated by the Department of Communications, 4 townships with the potential to succeed as a pilot project were selected and calculated. PTD choose to act in these (4) townships, the communication network is less than 80% and there is no economic development difficult transportation and currently in a peaceful situation.

CHAPTER IV

COMPARATIVE STUDY ON UNIVERSAL SERVICE FUND

4.1 Myanmar Government's Subsidies By Areas

The country of Myanmar, often known as Burma, is situated in the western part of mainland Southeast Asia. Myanmar, the northernmost nation in Southeast Asia, stretches from latitude 10° N to around 28° 30′ N. The area of Myanmar is (676,570 km^2). It is formed like a kite, with a long tail that flows south along the Malay Peninsula. The Andaman Sea and Bay of Bengal are to the south and southwest, Bangladesh is to the west, Laos is to the east, Thailand is to the southeast, China is to the north and northeast, Laos is to the south, and India is to the northwest. It measures around 1,275 miles (2,050 km) from north to south and is 580 miles (930 km) from east to west at its widest point, which is in the middle of the country near the latitude of Mandalay. Myanmar Population was 54,806014 and GDP Current US$ 65.07 Billion in 2021 (World Bank). GDP per capita was 1187.2 in 2021. The primary sector of Myanmar's economy is dependent on the kyat (the local currency), is agriculture, making it one of the least developed in the area. Overall telecom coverage in Myanmar was reached in 94% at 2019.

Sidoktaya Township is located under the Minbu district in Magwe Division. Township area is 1,083.254 km square miles and total population is 45,162. Situated in North Latitude 20° 17' and 20° 57', East Longitude 93° 49' and 94° 19' located above (320) feet of the water sea upper level. Township area is 0.273 km square miles and village group area is 1082.981 km square miles. There are 47 villages in Sidoktaya Township. Sidoktaya Township is an area with abundant streams, abundant hills and mountains, and is bordered by the forested Rakhine mountain range. It is an area with 67% forest cover and no economic development, and the local people are mainly engaged in agriculture. Sidoktaya Township is a place with difficult transportation, and the main products are sesame and various beans, which are mostly exported to Silin Township and Minbu Township. The literacy rate of the population living in Sidoktaya Township is 99.56%. As a telecommunication system, the coverage of mobile systems is 58% and the unconnected population is 19961 in 2019.

Hpasawng Township is located under the Ballakae district in Kayar State. Township area is 629.44 km square miles and total population is 23,485. Situated in North Latitude 18° 30' and 19° 15', East Longitude 96° 57' and 97° 45' located above (537) feet of the water sea upper level. Township area is 0.4 km square miles and village group area is 624.04 km square miles. There are 8 villages in Township. Hpasawng Township is a mountainous region, and only the plains of the Than Lwin River and the plains are flat, and the rest of the areas are hilly, mountain, ridges and cliffs. Hpasawng Township is a township with a good economy, and the residents are mainly engaged in agriculture. Transportation is also good condition. Hpasawng Township is located on Loikaw-Hpasawng -Mochi and Mae Se- Hpasawng -Loik Ka road, so the transportation is also no bad condition. The township's main products are lead and metal, which is exported to the Ministry of Mines. The literacy rate of the population living in Hpasawng Township is 19.48%. As a telecommunication system, the coverage of mobile systems is 62% and the unconnected population is 9751 in 2019.

Minbya Township is located under the Myauk Oo district in Rakhine State. Township area is 1338.46 km square miles and total population is 198,337. Situated in North Latitude 20° 5' 17" and 20° 55', East Longitude 93° 6' 15" and 93° 52' 30" located above (50) feet of the water sea upper level. Township area is 0.72 km square miles and village group area is 1337.74 km square miles. There are 64 villages in Township. The topography of the township is not flat and gradually descends from north to south. Minbya Township is an area rich in rivers, and the rivers flow from north to south. Minbya Township is a coastal area and is prone to natural disasters. Minbya Township is an economic focal region mainly engaged in agriculture and livestock farming. Minbya Township is located on the Yangon Sittwe Highway road, and is along to go Paktaw City, Sittwe City, Myay Pon City, Kyaukphyu City and Taungkot Cities at any time by waterway. So, it is an area with good transportation. The main products are rice, fish, shrimp, wood and bamboo which are export to other townships in the state. It is the region that exports the rice mostly to the mainland. The literacy rate of the population living in Minbya Township is 96.6%. As a telecommunication system, the coverage of mobile systems is 87% and the unconnected population is 22674 in 2019.

Ann Township is located under the Kyauk Phyu district in Rakhine State. Township area is 2316.87 km square miles and total population is 125,569. Situated in

North Latitude 19° 40' and 20° 30', East Longitude 90° 40' and 93° 22' located above (180) feet of the water sea upper level. Township area is 2.501 km square miles and village group area is 2314.369 km square miles. There are 30 villages in Township. Ann Township is a densely forested area with many hills and mountains. The prominent mountain in Ann Township is Rakhine Yoma Mountain. Ann Township is an area with slow economic development in Rakhine State because there have no industry zone. The people of Ann Township mainly work in agriculture and fishing. Ann Township is located near the land road, waterway and airport station, so the transportation is good. The literacy rate of the population living in Ann Township is 91%. As a telecommunication system, the coverage of mobile systems is 88% and the unconnected population is 14845 in 2019.

4.2 Government Subsidies Design

In this part, Geo-referenced subsidies model used to investigate the status of universal service area where the telecom service less than 80% population coverage in Myanmar. Firstly, PTD discussed with four mobile operators for the pilot project area according to the universal service strategy. Secondly was collecting four mobile operators' coverage map for Sidoktaya Township (Magway Division), Hpasawng Township (Kayah State), Ann Township (Rakhine State) and Minbya Township (Rakhine State) in Myanmar with a computer format.

The Department was using population based on 2014 Census data and population distribution within all townships via WorldPop dataset. Superimpose combined operators coverage map over population map. And used the GIS analysis for combined coverage map and calculated operator coverage, gap areas and unserved population for all mobile coverage in these four townships. (table : 4.1)

Table: 4.1 Sample of Survey Area

Lot	Sub-Lot	State /Region	Township	% of total population covered	Uncovered population	No. of Village Tracts (VTs) shown in the GIS maps	No of VTs conflicting with Census list	Est. no. of VTs with less than 80% covered population	Min. no. of these VTs required to exceed 80%
1	1-1	Kayah	Hpasawng	62	9,751	8	0	8	6
2	2-1	Magway	Sidoktaya	58	19,961	47	6	37	30
3	3-1	Rakhine	Minbya	87	22,674	64	n/a	4	4
4	4-1	Rakhine	Ann	88	14,845	30	n/a	3	3
					67,231	149	n/a	52	43

Source: data 2019 from Post and Telecommunications Department

4.3 Myanmar Government's Subsidies Finding Results

In this part, the mobile network coverage obtained from the operators used by the Post and Telecommunications Department to calculate the required townships and village tract using the GIS analysis software system. Then provide the quantity of necessary telecommunication tower stations for the villages.

4.3.1 Hpasawng Township Coverage Allocations

As a telecommunications system in Hpasawng, mobile system coverage is 62%, and in 2019, there are 9751 people who are not online. Hpasawng Township needs to construct minimum 6 Base Transceiver Station for less than 80 % population coverage. According to the survey's calculations, Hpasawng Township needed the maximum amount of subsidies, which was estimated at US$ 530,758. This included the cost of radio equipment, tower accessories, civil work construction, and all transportation expenditures. Appendix-I Pink highlighted area is telecommunication service available and the remaining areas are not available.

4.3.2 Sidoktaya Township Coverage Allocations

As a telecommunications system in Sidoktaya, mobile system coverage is 58%, and in 2019, there are 19961 people who are not online. Sidoktaya Township needs to construct minimum 30 Base Transceiver Station (BTS) for less than 80 % population coverage. According to the survey's calculations, Sidoktaya Township needed the maximum amount of subsidies, which was estimated at US$ 1044,323. This included the cost of radio equipment, tower accessories, civil work construction, and all transportation expenditures. Appendix –II Pink highlighted area is telecommunication service available and the remaining area are not available.

4.3.3 Minbya Township Coverage Allocations

As a telecommunications system in Minbya, mobile system coverage is 87%, and in 2019, there are 22674 people who are not online. Minbya Township needs to construct minimum 4 Base Transceiver Station (BTS) for less than 80 % population coverage. According to the survey's calculations, Minbya Township needed the maximum amount of subsidies, which was estimated at US$ 942,703. This included the cost of radio equipment, tower accessories, civil work construction, and all transportation expenditures. Appendix –III Pink highlighted area is telecommunication service available and the remaining area are not available.

4.3.4 Ann Township Coverage Allocations

As a telecommunications system in Ann, mobile system coverage is 88%, and in 2019, there are 14845 people who are not online. Ann Township needs to construct minimum 3 Base Transceiver Station (BTS) for less than 80 % population coverage. According to the survey's calculations, Ann Township needed the maximum amount of subsidies, which was estimated at US$ 1,459,953. This included the cost of radio equipment, tower accessories, civil work construction, and all transportation expenditures. Appendix –IV Pink highlighted area is telecommunication service available and the remaining area are not available.

In this finding results, according to create the "Universal Service Strategy, Universal Service Fund Manual, Implementation Procedures, and Design of Pilot Programs," the MOTC has secured a loan from the World Bank's International Development Agency (IDA). In addition to the technical assistance, the World Bank has provided of loan of USD 10 million to implement the pilot programs. The USF will concentrate on offering fundamental telecom services to underserved areas. This will be done in a way that a one-time initial subsidy is enough to encourage a private sector supplier to start offering services and to do so profitably going forward. Request for Bids (RfB) for Telecommunication Infrastructure Services Rural Pilot Project (Hpasawng, Sidoktaya, Ann and Minbya) was released at 2018. Tender selection and award process was done in 2019. A reverse auction system was used to select tenders, and only MPT and Telenor, which competed with the least support, won the bids for 2 Townships, and remaining 2 townships that exceeded the set price were cut off. Tender awarded to MPT for Minbya Township and Telenor for Ann Township at 2019. Rakhine State has not been at peace since the tender was successful, and difficulties have arisen in building a communication network. Therefore, the tenders were canceled due to the lack of regional peace in the two successful Townships.

4.4 India Government's subsidies on telecom Infrastructure through USO

The Republic of India, sometimes known as India, is a country in southern Asia that borders the Arabian Sea and the Bay of Bengal, between Myanmar and Pakistan**.** The length of the Union of India is 1,822 miles from east to west and 2,000 miles from north to south (between 8° 4° and 37° 6° latitude). The area of India is 3,287,263 $km^{2.}$ The Union covers 1,266,210 square miles in total. The shoreline is

3,535 miles long while the land boundary is 9,425 miles long. India is a nation that makes up the majority of South Asia. New Delhi, the nation's capital and administrative hub, was constructed in the 20th century south of Old Delhi, the city's historic center. Its population, which is made up of thousands of different ethnic groups and probably hundreds of different languages, is governed by a constitutional republic that serves a very diverse population. India, which follows China as the most populous nation, has around one-sixth of the world's population. India's border, which makes up around one-third of its coastline, is shared with six nations. It is bounded to the northwest by Pakistan, to the north by Nepal, China, and Bhutan; and to the east by Myanmar. India's border, which makes up around one-third of its coastline, is shared with six nations. The overall population of 1.2 billion people is mostly rural, with only about 30% living in cities. The urban population of India is predominantly concentrated in the cities of New Delhi (the capital), Mumbai (19.7 million), Kolkata (15.3 million), Chennai (7.4 million), and Bangalore (7.1 million). India Population was 1.39 Billion and GDP Current US$ 3173.4 Billion in 2021. GDP per capita was 2277.4 in 2021. (Source: World Bank 2021). Mobile broadband is available in over 93% of the India's villages.

India has emerged as one of the world's fastest expanding telecom markets, owing to recent deregulation and liberalization of telecommunications laws and policies. In 2010, the total number of telephone customers exceeded 800 million, with an overall teledensity of more than 65%, and subscribership is currently expanding at a rate of more than 20 million per month. Urban teledensity has surpassed 100%, while rural teledensity is around 30% and continuously increasing. Mobile cellular service was introduced in 1994 and is divided into four metropolitan areas and 19 telecom circles, each with multiple private service providers and one or more state-owned service providers; significant trunk capacity has been added in recent years in the form of fiber-optic cable and one of the world's largest domestic satellite systems. The main mobile operators are Bharti Airtel, RComm (Reliance), Idea/Spice and BSNL(government owned). A variety of statutes, rules, and regulations govern the Indian telecommunications market, including:

- Indian Telegraph Act 1885
- Prasar Bharti Act of 1990
- National Telecom Policy of 1994, amended in 1999 (NTP)

- Cable Networks Act 1995
- Telecom Regulatory Authority of India (TRAI) Act of 199
- Broadband Policy (2004)

According to the India New Telecom Policy of 1999 (NTP'99), everyone should be able to obtain basic telecom services for a fair price. A Universal Service Levy (USL), which would be a portion of the income collected by the operators under different licenses, would be used to fund the Universal Service Obligation (USO). With the exception of pure value-added service providers like internet service providers, voice mail, e-mail, etc., the Universal Service Levy is currently set at 5% of the Adjusted Gross Revenue made by all operators. The central government may occasionally participate by disbursing grants and/or loans. Both Houses of Parliament approved the Indian Telegraph (Amendment) Act, 2003, which gave the Universal Service Obligation Fund (USOF) legal status. Credits to the Fund must be approved by the Parliament. On 26.3.2004, notification of the Fund's rules for operation was also made.

According to the Indian Telegraph Rule (ITR) Amendment of 2004, and subsequent Amendments in 2006 and 2008, the USOF supports the following services in (Table 4.2):

Table: 4.2, India's USOF supports programmes

Stream I:	Operation and maintenance of Village Public Telephones (VTP) installation of VTP in additional revenue villages as per the 2001 Census.
Stream II:	Provision of household telephones in rural and remote areas as determined by the Central Government of India from time to time
Stream III	Creation of infrastructure for provision of Mobile Services in rural and remote areas
Stream IV:	Provision of Broadband connectivity to villages in a phased manner
Stream V:	Creation of general infrastructure in rural areas for development of telecommunications facilities
Stream VI	Introduction of new technological developments in the telecom sector in rural areas; pilot projects to establish new developments in the telecom sector

Source: GSMA 2013 report survey of USF

The USOF's purview includes rural and distant locations with public access telephones as well as private rural household telephones in areas with high net costs for such places. The building of High Speed Public Tele-Information Centers (HPTICs) in villages with a population greater than 2,000 is another effort to

implement universal public access to broadband services, according to Block headquarters. In light of this, it is intended to begin installing 5000 HPTICs in the first phase. In addition to voice telephony, data applications including as web surfing, faxing, and email will be handled by the building of Public Tele- Information Centers (PTICs) in all 76,000 villages with a population of more than 2000. The least quoted subsidy is used to determine how much money should be given to the service providers during a multi-layered reverse bidding process. The Indian Telegraph (Amendment) Rules, 2004, include the duties and authority of the USF Administrator. 90% of the eligible villages were covered by the financial assistance offered for meeting OPEX, which was extended to 5,20,000 VPTs in Census 1991 revenue villages to the owner operators. India's government raised the provision of mobile services in uncovered villages based on Census 2011. Total inhabited villages in the country as per Census were 642,517. Number of uncovered villages as per initial estimated was 27,721. India government's subsidies for telecom infrastructure for uncovered villages are being covered by various schemes such as LWE-II project (3465 towers) estimated project cost (Rs,7330 Cr) , CTDR NER project (5514 towers) estimated project cost (Rs, 8,121Cr) and CTDP A&N project (170 towers) estimated project cost (Rs,2021 Cr).

4.5 Comparative amount the subsidies: Myanmar and India

Table: 4.3, Comparison between Government subsidies on Telecom Infrastructure in India and Myanmar

Particular	India	Myanmar
Area	3,287,263 km^2	676,570 km^2
Population	1.39 Billion	54,806014
GDP Current US$	3173.4 Billion (2021)	65.07 Billion (2021)
GDP per capita	2277.4 (2021)	1187.2 (2021)
year of freedom from British colonial	1947	1948
Capital City	New Deli	Nay Pyi Taw
Rural : Urban population	70:30	70:30
Telegraph Act (Amend)	2003	2013
USO Policy in Law	1999	2013
USF regulation adopted	2000	2018
USF Fund Approved	Parliament	Minister
USF Project Control	Ministry	BOT
USF Fund Administration	Regulator	Regulator
Main Mobile Operator	Bharti Airtel, RComm(Reliance), Idea/Spice BSNL (government)	Telenor Ooredoo MPT (Government) Mytel
USF Levy	5% (Adjusted Gross Revenue)	2% (relevance revenue)
Mobile Subscriber	893.8 Million (2011)	44 Million (2011)
USF fund for rural mobile coverage subsidies per year	5 years	5 Years
USO Programs	Stream I to VI	Program 1 to 3
Government Subsidies for Infrastructure through Universal Service	LWE (Rs,7330 Cr) CTDP NE (Rs, 8,121Cr) CTDP A&N (Rs,2021 Cr)	Sidoktaya (US$ 1044,323) Hpasawng (US$ 530,758) Ann (US$ 1,459,953) Minbya (US$ 942,703)

Source: From World Bank,GSMA 2013 report and PTD

The reason for the comparison with India is that Myanmar and India were colonial countries under the British, and the India Telegraph Act 1885 and the

Myanmar Telegraph Act 1885 are the same. However, India was able to amend the Telecommunications Act in 2003, 10 years earlier than Myanmar. In addition, India and Myanmar have about 70 percent of their rural lives, and the speed of development in the telecommunications sector is also the same. India has more population than Myanmar. Although the border area is large, like Myanmar, the ratio of rural and urban population is the same. Therefore, the need for communication network for rural people is the same. There are 4 main mobile operators and BSNL is also a government-owned telecommunications company like MPT from Myanmar and also owns a lot of telecommunications infrastructure like Myanmar. However, since India has a larger population and a larger area than Myanmar, it needs much more communication infrastructure also. Why Myanmar not comparing with neighboring countries Thailand and Vietnam is that these countries are at the USO 2.0 stage, where communication infrastructure is no longer needed for villages, and other ICT development is focused on.

In case of Myanmar, USO was included in the Telecommunications Law 2014, and it is implemented in countries with low communication. The difference is that it was 10 years later than India and was able to fix the Myanmar telecommunications law, and the USO issue was also late. Myanmar set USF entry fee at 2% of relevant revenue and collected only from 4 mobile operators and not from all operators like India. It has been observed that since India collects USF Fee of 5%, it receives more money than Myanmar and can carry out many projects in India. The thing that India and Myanmar have in common is that the USF administration is the regulators TRAI (Telecom Regulatory Authority of India) and PTD (Posts and Telecommunications Department) of Myanmar, but the supervisory body is decided by the Parliament in India and BOT (Board of Trustee) in Myanmar.

India's first project is Public Tele - Information Center, which considers villages with a population of more than 2,000. At that time, Myanmar was operated by the government operator (MPT) served as a Public Access Center (PAC) in the some area. Myanmar's first USF project was Telecom Infrastructure for Mobile Broadband Communication, which considers villages with a minimum population of 3,000. The Myanmar USF Project aims to cover up to 80% of the population in the village with a telecommunications network and is a tender that only 4 mobile eligible operators can participate in. The year of government subsidies is the same for up to 5 years and the process of selecting the lowest bidder is the same. India has 10

remaining states to implement the USF and, like Myanmar, population calculations are based on the census. India is using USF subsidies for telecommunication network projects such as LWE, CTDP NE and CTDP A & N, worth several crores of rupees. In India, in calculating mobile communication coverage, it has been calculated many times like Myanmar, and some are still under way process. However, not every USF project has been successful in India, and it has been found that project design revisions and expected targets have not been achieved. Myanmar needs to focus on sharing basic and not to re-use the existing communication infrastructure like India

4.6 Nigeria Government's subsidies on telecom Infrastructure through USO

Nigeria, formally the Federal Republic of Nigeria, is a West African country. It is located in the Atlantic Ocean, between the Sahel to the north and the Gulf of Guinea to the south. It has a land area of 923,769 square kilometers (356,669 square miles) and a population of over 225 million people, making it the most populated country in Africa and the sixth-most populous country in the world. Nigeria is bounded to the north by Niger, to the northeast by Chad, to the east by Cameroon, and to the west by Benin. Nigeria is a federal republic made up of 36 states and the Federal Capital Territory, which includes the capital, Abuja. Lagos is Nigeria's largest city, with one of the world's largest metropolitan areas and the second-largest in Africa. Total area of Nigeria is 923,769 Km^2. Nigeria Population was 211,400,704 and GDP Current US$ 440.8 Billion in 2021. GDP per capita was 2085.0 in 2021. In Nigeria, mobile broadband coverage is expected to reach 70%.(World Bank)

The Nigerian Communications Act of 2003 covers the ideas of universal access and universal service, gives the Nigerian Communications Commission (NCC) direction on the creation of universal access/service policies, and specifies the creation of a Service Provision Fund. The USP Fund was established by the 2007 Universal Service and Universal Access Regulations (USPF). The Nigerian Universal Service Provision Fund (USPF) has been a separate organization since 2007 and is overseen by the USPF Secretary. Operators do not make direct contributions to the USPF. As a requirement of their license, operators must pay the NCC 2.5% of their net operating income on a quarterly basis (annual Operating Levy, or aOl). The USP fund must be supported in accordance with the 2007 Regulation using 1% of the licensees' net revenues (net of interconnection payments).

Depending on the USPF's proposal and after taking into account its operational costs, NCC may decide to increase or decrease its payment to the USPF. Other funding options for the USPF include: Money that the National Assembly has allotted for the USPF as well as gifts, loans, subsidies, and other assets of this nature. The 2003 Communication Act's goal is to promote the construction of network infrastructure as well as the delivery of network services and applications to institutions in unserved and underserved areas or for underrepresented groups. Universal service covers the following services:

- Individual mobile-cellular service
- Public mobile payphone service;
- Broadband
- Tele-centres
- Schools (primary, secondary post- secondary)
- health centres
- Emergency services
- Special services for persons with disabilities and elder persons
- Community Centres
- Government offices

The following project types are included in the USPF 2007-2011 Strategic Plan as being eligible for USPF financing:

- large scale ICT projects
- community communications centres (CCC) projects
- ICTs for all Nigerians projects
- accelerated mobile phone expansion project
- backbone infrastructure project
- enabling environment projects
- school and university access projects for digital lifestyle
- institutional development projects

The USP Secretariat must conduct an analysis to decide formally where fund money should be channeled and the exact service scope that will be used. Various techniques are used to assign projects through a competitive bidding process: competitive, combining quality and cost selection, requesting the least amount of subsidies from qualified bidders and proposal by qualified candidates & USPF

review. The USPF Board, which is chaired by the Minister and includes a representative from the NCC, oversees and sets general policy direction for the USPF's administration. Several pilot experiments are being conducted to restructure how the Fund runs as a result of a variety of operational issues and perceived inefficiencies in the Fund (as recognized by the fund administrators themselves). The USPF Secretariat was unable to carry out each program specified in the Plan for 2009 in full. In Nigeria, about USD 140 M of government funding is spent annually as the USF budget, and 51 Mobile BTS Projects have been successfully implemented as a Universal Coverage Program.

4.7 Comparative amount the Subsidies: Myanmar and Nigeria

Table : 4.4, Comparison between Government subsidies on Telecom Infrastructure in Nigeria and Myanmar

Particular	Nigeria	Myanmar
Area	923,769 Km^2.	676,570 km^2
Population	211,400,704	54,806014
GDP Current US$	US$ 440.8 Billion (2021)	65.07 Billion (2021)
GDP per capita	2085.0 (2021)	1187.2 (2021)
Year of freedom from British colonial	1960	1948
Capital City	Abuja	Nay Pyi Taw
Rural : Urban population	50:50	70:30
Communication Act (Amend)	2003	2013
USO Policy in Law	2003	2013
USF regulation adopted	2007	2018
USF Fund Approved	USP Board (Minister& NCC)	Minister
USF Project Control	USP Board (Minister& NCC)	BOT
USF Fund Administration	NCC	Regulator
Main Mobile Operator	MTN Glo Mobil Airte Etisalat	Telenor Ooredoo MPT (Government) Mytel
USF Levy	40% of the 2.5% AOL (Annual Operating Levy)	2% (relevance revenue)
USF Strategy	2007 to 2011	2019 to 2023
Mobile Subscriber	59.3 Million (2011)	44 Million (2011)
Government Subsidies for Infrastructure through Universal Service	BTS projects (USD 54,300)	Sidoktaya (US$ 1044,323) Hpasawng (US$ 530,758) Ann (US$ 1,459,953) Minbya (US$ 942,703)

Source: From World Bank, GSMA 2013 report and PTD

The reason for comparing Nigeria and Myanmar is that it came under the British colony and gained independence later than Myanmar. As with Myanmar, the telecom market has been opened up, foreign investment has taken place, and mobile communications have also improved. Myanmar telecom regulatory is also trying to

change the independence commission like NCC, which collects like a tax from the operators, The purpose of the USF mechanism for Myanmar and Nigeria are to make it possible to use the most suitable, efficient, and effective technologies to deliver universal service. Myanmar's USF project will enable the operators to select the most affordable and suitable technology to deliver communications services by providing a technology neutral approach during the competitive tendering process. However, only four (4) mobile operators are allowed to bid for Telecom Infrastructure in Myanmar, and others are not allowed to bid. The three program streams for Myanmar that will be the focus of the Universal Service Strategy are as follows:

- Program 1: Voice and broadband service infrastructure deployment.
- Program 2: Enabling the digital future through broadband connectivity and ICT training.
- Program 3: Special Projects, including Content, Apps, Pilots, and Disability

In Nigeria and Myanmar, the 5-year strategy is the same, and it is the same that it was not implemented until the 4th year. In addition, the infrastructure, ICT skill and school internet access are the same in the strategy. But Myanmar has only been able to start with Program 1 and other is underway process. Myanmar, like Nigeria, initially failed due to unavailability or inadequate public power supply, including power outages and security concerns. It is also difficult to acquire land for projects because of the prevalence of family and communal disputes over land ownership, as well as the absence of suitable structures to house network infrastructure and the lack of adequate public infrastructure, such as accessible roads in remote areas. Myanmar, like Nigeria, needs to continue with other projects with government's subsidies support.

CHAPTER V

CONCLUSION

The management of universal service/access funding can vary. While some government funds are managed by ministers (such as in Colombia), other funds are managed by regulators (such as in Peru) or by specific agencies (eg, South Africa). It is widely believed that funds managed by independent regulators and organizations are less likely to be influenced by political or governmental interests. Therefore, it is planning to form an independent telecom commission for Myanmar's telecommunications regulator.

While universal service is a doable policy goal in many developed nations, most developing nations place a higher value on universal access. Access to telecommunications services on a shared basis, such as at the community or village level, is increased via universal access rules. In order to provide a basic and initial link to the public telecom network, programs for universal access frequently encourage the building of public payphones or call centers in remote or rural communities as well as in low-income metropolitan neighborhoods.

Only if all of the bidders had equal, non-discriminatory access to the necessary facilities, i.e., the backhaul infrastructure, would the auction have resulted in the smallest amount of market distortions.

5.1 Findings

The WTO reference paper on telecommunications state that: "Any member of the WTO has the right to define the kind of universal service obligation it wishes to maintain. Such obligations will not be regarded as anti-competitive per se, provided they are administered in a transparent, non-discriminatory and competitively neutral manner and are not more burdensome than necessary for the kind of universal service defined by the member."

Myanmar, which is a member of the WTO, is also working towards USO's principles of transparency, non-discriminatory and competitively neutral manner and not burdening operators. Territorial unrest and disruptions also put a burden on operators to expand and build telecommunication infrastructure, and economic instability and foreign currency instability also have an impact on Myanmar's government subsidies tender's process. Therefore, even though the tender was successful, it was found that the project was not able to be carried out due to the

region's lack of peace and the tender was canceled. If the 4 townships implemented with the support of Myanmar's government subsidies project are successful, there will be a lot of relief for the rural people in these townships and the country economy will improve a lot. The biggest difficulty for Myanmar is not like with India, Nigeria and other countries which is that the country is not at peace.

Huge contributions have a negative impact on consumer welfare due to their significant deadweight efficiency loss, yet they are a huge barrier to entry, particularly for new players. 2% relevance revenue of the Universal Service Fund collected by Myanmar is the most suitable position in time, and if it is collected in large numbers, it may cause more burdens on the operators. As communication operators, if it were not for the country's unstable conditions, they would have been active in Universal service programs. This hinders local cooperatives and small businesses from launching projects for rural communications infrastructure provision that represent a locally oriented private/public demand pull paradigm of network growth. Moreover, the access technology must be neutral basic and not predefined in the tender because the price of technology can be distributed over various phone and data services. Therefore, it is crucial that universal service be implemented alongside regulators who place specific requirements on the dominant operators and enforce compliance, which will in turn balance their market dominance.

5.2 Recommendations

Imposing universal service requirements has numerous justifications. It is maintained that since utilities like power, water, and telephones are essential, everyone should have easy access to them. This argument can be strengthened by the notion that inadequate communications is one of the main roadblocks to development in its broadest definition, which includes eradicating poverty, as well as to rapid economic progress. Under these conditions, Universal Service Obligation can be viewed as a unique instance of re distributive pricing. Instead of employing conventional redistributing fiscal mechanisms like taxation and direct payments, policymakers use USO to redistribute these necessary services through subsidized prices. In that regard, it is very similar to public policies that provide private goods or to public policies that use direct transfers to achieve redistributive objectives.

In this research, The Myanmar government have established Universal Service funds, and communication infrastructures projects have been selected and implemented in 4 pilot projects like, and should continue to be implemented in the

future. It is found that countries such as India and Nigeria should expand not only their Telecom Infrastructure, but also ICT sector developments that support the Digital Economy in line with their own countries. Although Myanmar has implemented reforms late, it has the opportunity to do better by knowing the strengths and weaknesses of the countries that have implemented it before. It makes the case for the Myanmar universal service policy's eventual inclusion of open, non-discriminatory access to backhaul and other passive infrastructure. The benefits include cheaper universal service costs that will result in wider coverage for the same price and more neutral competition that will prevent incumbents from abusing the market. An unrestrained market would fail to take these externalities into account, resulting in under coverage of the network. These may be substantial positive network externalities related to communication.

The recommendations state that the subsidies' purview should be broadened to cover "niche" players as well as big licensed companies. Small and medium-sized service providers can thus take part in the markets for universal service initiatives. Making universal subsidy support clearer and less distorting is the appropriate route. According to these observations, Myanmar should further select and implement projects that will be directly supported subsidies by the government for the development of the telecommunications sector for the future.

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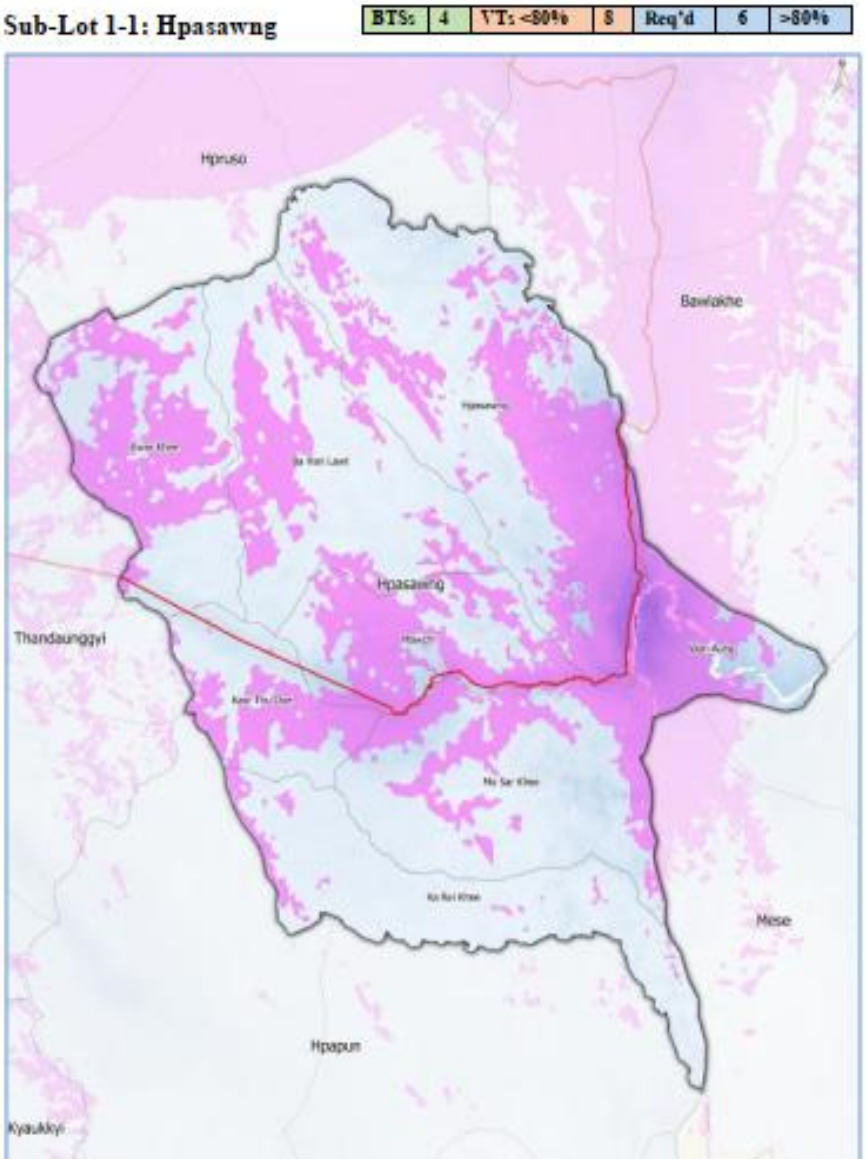
APPENDIX -I

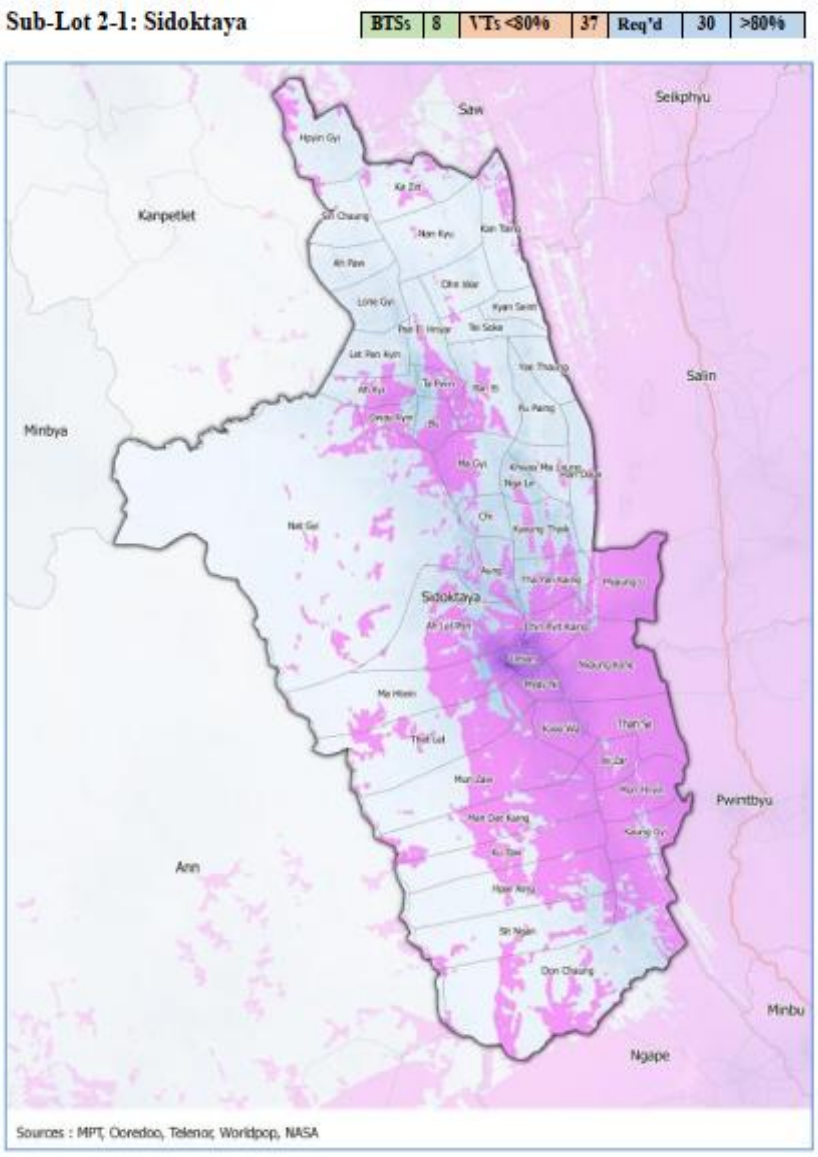
Hpaswng Township coverage allocations



Source: from Posts and Telecommunications Department

APPENDIX –II

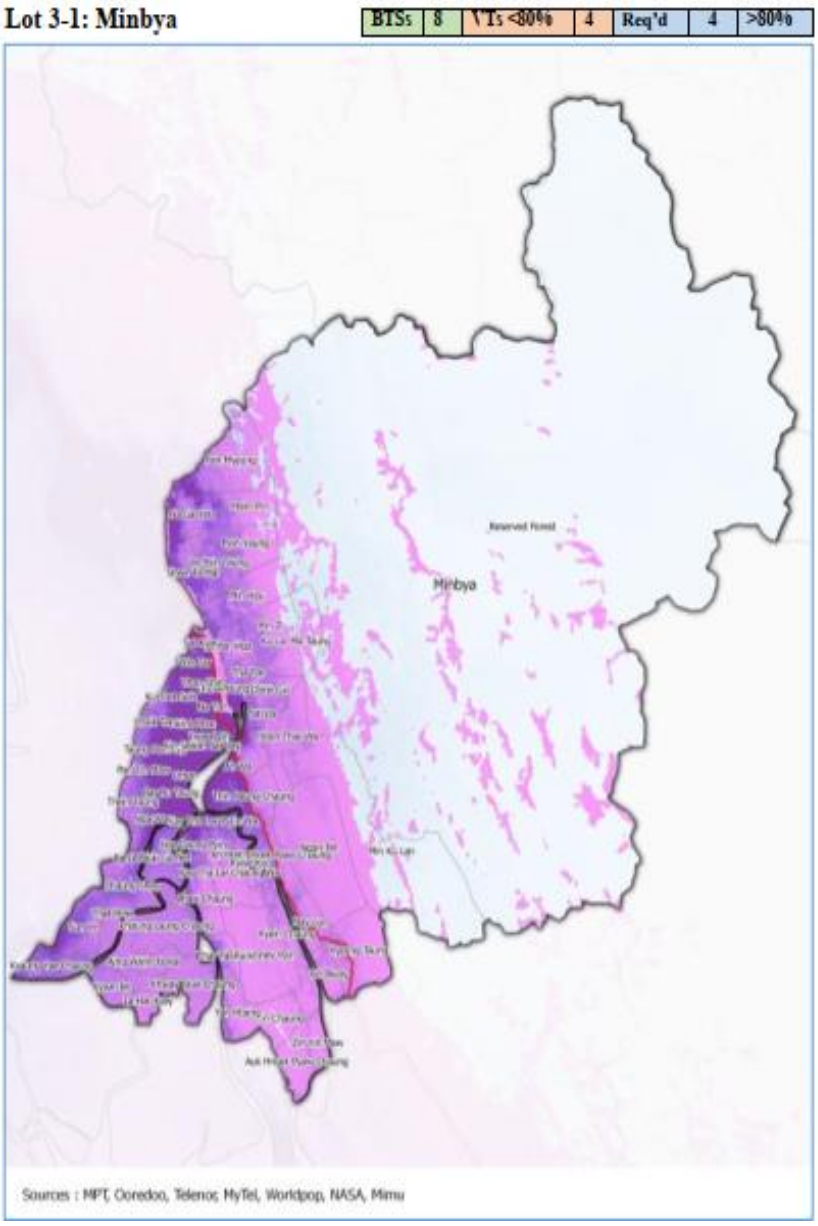
Sidoktaya Township coverage allocations



Source: from Posts and Telecommunications Department

APPENDIX –III

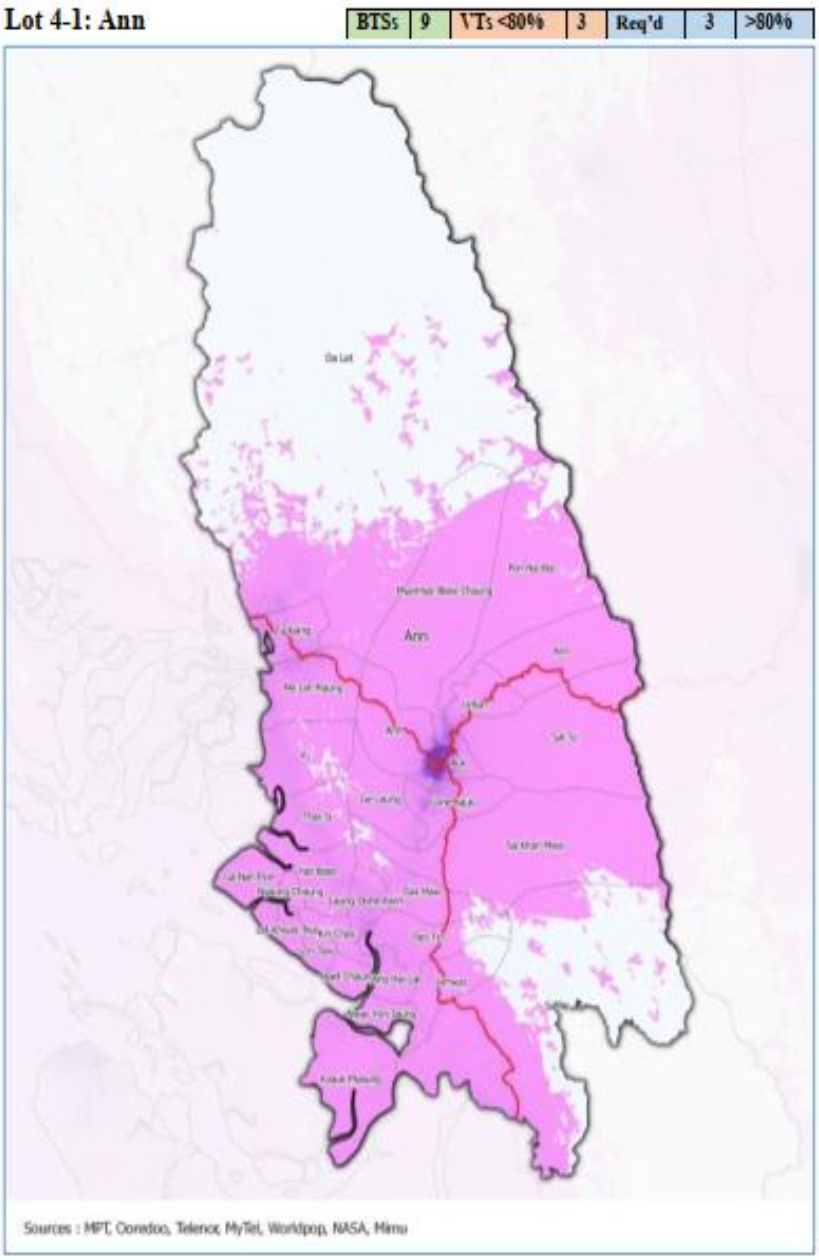
Minbya Township coverage allocations



Source: from Posts and Telecommunications Department

APPENDIX –IV

Ann Township coverage allocations



Source: from Posts and Telecommunications Department