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In the midst of rapid socio-political transition, Myanmar is building its telecommunications infrastructure by opening its market to international mobile companies and engaging in national regulatory reform. With one of the lowest internet and mobile subscriber rates in the world, Myanmar faces multiple challenges in building connectivity from both an infrastructural and a policy perspective. Telecom developments could play a significant role in modernizing the country as it emerges from decades of political repression, and although the domestic connectivity plan is moving forward, several challenges need to be dealt with quickly in order to ensure a safe and accessible digital environment. This paper explores connectivity developments in Myanmar, paying particular attention to the opening of the mobile market to international companies, the launch of the new national telecom law, and the development of policies securing digital rights.

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1. Introduction

Following decades of isolation, Myanmar is rapidly developing its telecommunication infrastructures and related policy framework. Although the process has just started, the list of both infrastructural and policy challenges is certainly long. Based on data obtained through fieldwork and interviews,[1] as well as by tracing the history of telecom reform, this paper will discuss: 1) opportunities and concerns for citizens related to the implementation of a national digital telecommunication infrastructure; 2) the connectivity building process in relation to "best practices" in telecom reform; and 3) the role of actors, both international and domestic, involved in this process.

2. Context

According to the International Telecommunication Union (ITU), Myanmar has the second-lowest number of internet users and mobile subscribers in the world, followed only by North Korea. In 2011, the ITU reported an internet penetration rate of 0.98% and 1.3 million mobile subscribers, representing 2.3% of the population. These mobile users subscribed to the only mobile company active in the country, which, together with its subsidiaries, is-controlled by the state-owned Myanmar Post and Telecommunications (MPT).[2]

Traveling in Myanmar reveals that the observed telecommunications reality varies significantly from the official data available about internet infrastructure and mobile penetration. In cities such as Yangon, Mandalay, and Bagan, internet and free WiFi are available, and mobile phone shops are multiplying rapidly. Although SIM cards are still costly and accessible only to a small portion of the population, the latest smartphones are widely used.

Despite recent telecommunications improvements, Myanmar has only begun to build its connectivity. It is expected that obstacles will continue to emerge as work progresses. For example, much of the infrastructure building will occur in Myanmar's vast rural territory, which is rife with landmines. Armed groups

[1] This research is based on field work conducted since August 2013, interviews with actors from mobile operators and international and domestic civil society organizations.
[2] ITU Global ICT Statistics: http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

control parts of this area, making these remote sections of Myanmar even more inaccessible and troubling to mobile tower suppliers involved in infrastructure construction. Additionally, Myanmar will face challenges in creating and implementing telecommunication and regulatory reforms.

For countries in political transition, increased connectivity, despite its benefits, has the potential to expose citizens to increased government surveillance and control. A regulatory framework ensuring the freedom of expression and citizens' right to privacy, should thus accompany the development of Myanmar's telecom infrastructure. International telecom operators involved in development will also play an important part in ensuring citizens' freedoms. With this in mind, the fast development of telecommunication infrastructure and international mobile operators' adherence to corporate social responsibility in Myanmar must be closely monitored. This paper examines the release of a new national telecom law and the role played by various actors involved in this multistakeholder approach.

2. Connectivity Plan

In the first months after the power shift in August 2011, the new Myanmar government identified the development of national mobile and internet connectivity as a key priority for modernizing the country. The various stages of the telecom reform reflect the government's dual-goal of both connecting the country quickly while respecting international standards of securing telecom reform through a fair and transparent process.

Connectivity Developments and Telecom Reform in Myanmar

	2011	August	**New government**
Licensing			
	2012	January-July	**Design the Call for Tenders**
		August	**Launch of the Call for Tenders**
	2013	June	**Announcement of the Awarded Companies**
Telecom Law		July-November	**Design of the Telecom Law**
		November-December	**Open Consultation**
	2014	January	**Licensing and start of the infrastructure building**
Independent Regulator	**2015**		**Launch of the Independent Telecom Regulator**
		November-December	**General Election and New Government**

Figure 1 - Timeline of the Telecom Developments in Myanmar

Figure 1 outlines the phases of the connectivity plan and telecom reform. From January 2012 to July 2012, before launching the international competition and assigning licenses, the Myanmar government set the bidding rules and designed the call for tenders. The international competition was launched in August 2012, and mobile operators were able to submit their proposals until January 25, 2013. In June 2013, the government announced the outcome of the competition and awarded licenses to two companies. Due to the lack of a national telecom law, however, mobile operators did not actually receive their licenses and were unable to operate in the country until the law was released. While drafting of the telecom law began in June 2013, a draft version of the law was only released for public consultation in November 2013. It was not until January 2014 that the government assigned the licenses, and operators started work in Myanmar.

The stages of connectivity building in Myanmar are clustered and described according to the following three-step approach influenced by three complementary yet parallel initiatives launched by the Myanmar government:

1) *Licensing*: A public and open international competition for the assignment and release of telecom licensees;

2) *Design and release of a national telecom law*: The formation of a set of rules guiding the development of telecom infrastructure, including: licensing regulations, securing an open market, and protecting investor and citizen freedoms;
3) *Establishing an independent telecom regulator*: Establishing a national telecom regulatory agency, independent from the Ministry and its political agenda, which monitored the application of telecom regulation.

While the above mirrors the sequence of the actual Myanmar connectivity plan, as explored in detail below, the experience of implementing these initiatives reveals that such a sequence may not be the most auspicious path to follow. . Below, we explore the connectivity plan along this three-step approach.

2.1 Licensing

Of Myanmar's three telecom development initiatives, licensing has seen the most activity. To this day, all national communication structures are owned by Myanmar Post and Telecommunications (MPT), a division of the government's Ministry of Communication and Information Technology (MCIT). MTP is the sole landline and mobile operator, as well as internet service provider.[3]). In this preliminary stage of the connectivity building, aware of its lack of credibility, the government did not attempt to maintain its state-controlled mobile operator in the domestic telecom market. Instead, the government launched a call for tender in August 2012, opening the international telecommunication market with the aim of enhancing connectivity in Myanmar. Among the more than ninety companies vying for the license, the government shortlisted twelve in April 2013. This short list included several Asian telecom companies, such as the Indian Bharti AirTel, the Singapore Telecommunications (SingTel), the Malaysian Axiata (one of the biggest Asian telco), the Vietnamese Viettel Group, a joint partnership between France Telecom-Orange and the Japanese Marubeni; single runner international companies such as the South Africa's Mobile Telecom Network (MTN) Group, the Swedish Millicom International Cellular mostly active in Latin America and

[3] Yatanarpon Teleport (YPT), which is controlled by MPT, is the only ISP in the country.

Africa, the Qatari Ooredoo, and the Norwegian Telenor; and consortium of companies involving local partners. Despite being shortlisted, Vodafone in partnership with China Mobile withdrew from the competition, after evaluating that the investment was not sufficiently justified by their estimated benefits.

a) Awarding Criteria

Conditions for the submission of the bid seriously limited the number of companies matching the eligible criteria, excluding *de facto* single running domestic bidders. The evaluation process consisted of 1500 points to be allocated across bidders, the majority of which (1000 points) were allocated in consideration of eight major criteria:

1) Quality of the network development plan, including the infrastructure plan offered, and coverage of the network (325 points)
2) Strength of the technical plan (125 points)
3) Quality of the marketing strategy, value-added services, and distribution commitment (125 points)
4) Foreseen tariff for all mobile services, including voice, data, and handsets (75 points)
5) Quality of the management of human resources, including its organization and plan to recruit and train local expertise (75 points)
6) Customer services and billing quality (50 points)
7) Corporate social responsibility of the company (50 points)
8) Robustness of the business plan and the financing plan (175 points)

An additional 500 points were assigned to the company with the highest spectrum fee offer, while other bidders were assigned points proportionate to their offers. Licenses were awarded to the two companies with the highest combined scores.[4]

[4] Telecommunications Operator Tender Evaluation and Selection Committee (2013). "Telenor Mobile Communications and Ooredoo selected as Successful Applicants in the Nationwide Telecommunications License Award Process", 27 June 2013.

As result, all Asian companies and companies biding in partnership with local partners did not gain sufficient points. The two new mobile phone licenses were eventually awarded to the Qatari company Ooredoo and the Norwegian company Telenor.

Ooredoo, formerly Qatar Telecom (Qtel), is a state-controlled mobile company that holds a monopoly on the mobile sector in Qatar. The Ooredoo Group also controls the main mobile operators in several other Middle Eastern companies including Kuwait (Wataniya), Oman (Nawras), Tunisia (Tunisiana), Palestine (Wataniya), Maldives (Ooredoo), and Iraq (Asiacell). Algeria it is also transferring from its former national mobile operator Nedjma to Ooredoo Algeria, and in Asia Ooredoo is primarily active in Indonesia (Indosat).[5]

Unlike Ooredoo, the Norwegian state-controlled Telenor already controls mobile operators across Southeast Asia, and is also active throughout Europe.[6]

Together, Ooredoo and Telenor have committed to connect more than 90% of Myanmar over the next five years. Despite the common commitment to expand connectivity to most of the country, their mission in Myanmar diverges in several other aspects, according to interviews conducted with the Ooredoo and Telenor CEOs.[7] Ooredoo has invested fifteen billion dollars in Myanmar, promising to develop a 4G high speed data transferring infrastructure. Telenor, however, has invested three billion dollars, aiming to develop a mostly 2G voice infrastructure in rural areas and a more geographically limited 3G data infrastructure covering mostly urban areas. Given the high resources invested, Ooredoo is also extensively engaged in campaigns to enhance the development of local telecommunications knowledge. By sponsoring the organization of public events

[5] Ooredoo. "Who We Are." http://www.ooredoo.com/en/company/who-we-are/our-global-team/ooredoo-qatar.html

[6] In Southeast Asia, Telenor controls operators in Bangladesh (Grameenphone), India (Uninor), Thailand (DTac) and Malaysia (DiGi). Telenor is also active in Sweden, Denmark, Hungary, and in the Balkan area, operating as Globul in Serbia, Montenegro, and Bulgaria. http://www.telenor.com/about-us/global-presence/

[7] Interviews to Ross Cormark (Ooredoo) and Petter Furberg (Telenor) consisted of *semi-structured interviews* conducted in both companies' headquarters in Yangon in February 2014.

and training initiatives (e.g. Hackathons), Ooredoo aims to support the development of projects from the bottom up. Telenor, on the other hand, is targeting rural areas, supporting initiatives that aim to overcome more traditional forms of digital divide.

b) Connectivity Development and Human Rights

The development of a digital communication infrastructure also raises some concerns about whether the country's connectivity building will respect human rights, notably the freedom of expression and right to privacy. Over the coming years, Ooredoo and Telenor will face the challenge of convincingly demonstrating their corporate social responsibility. The 2013 Human Rights Watch report "Reforming Telecommunications in Burma: Human Rights and Responsible Investment in Mobile and the Internet"[8] called for careful evaluation of the Myanmar's telecommunication policy development and of the potential consequences of telecom development on digital freedoms. Additionally, in the context of internet governance, private companies are often heralded as having a positive influence on regulations that support online freedoms. Myanmar's current telecom situation, in which international companies are developing connectivity infrastructure while the country develops relevant laws and regulations, is a key case and an important process to be followed carefully.

According to both the "UN Guiding Principles on Business and Human Rights"[9] and the EU Commission's "ICT Sector Guide on Implementing the UN Guiding Principles on Business and Human Rights,"[10] to prove their corporate social responsibility, telecom operators must create a public social responsibility policy that includes their commitment to respecting human rights. Ooredoo currently has neither a clear policy on corporate social responsibility related to freedom of

[8] Human Rights Watch, 2013. *Reforming Telecommunications in Burma: Human Rights and Responsible Investment in Mobile and the Internet*. New York, NY: Human Rights Watch. Available at: http://www.hrw.org/node/115497

[9] United Nations, 2011. *UN Guiding Principles on Business and Human Rights*, New York, NY: United Nations. Available at: http://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf

[10] EU Commission, 2013. ICT Sector Guide on Implementing the UN Guiding Principles on Business and Human Rights. Brussels: EU Commission. Available at: http://ec.europa.eu/enterprise/policies/sustainable-business/files/csr-sme/csr-ict-hr-business_en.pdf

expression and digital rights, nor consistent evidence of a commitment to human rights. In fact, Ooredoo has in the past accepted the Qatari government's internet censorship requests by blocking VoIP Skype services in the country and by using SmartFilter, an internet filter used also in autocratic regimes including Iran, United Arab Emirates, Oman, Sudan, and Tunisia,[11] to block websites deemed inappropriate for "national morality and customs." Ooredoo faces additional problems, as its perception as a "Muslim" company has been negatively received by Myanmar's Buddhist leaders.[12] As internal religious tensions between the country's 90% Buddhist population and 4-8% Muslim minority have caused an increasing number of violent episodes and conflicts, Ooredoo faces a serious challenge in easing this potential conflict.[13]

In contrast to Ooredoo, Telenor has an advanced, publicly-available policy for the protection of human rights.[14] Telenor is member of the Telecommunication Industry Dialogues,[15] a consortium of telecom companies,[16] which, in March 2013, released a joint document on "Guiding Principles on Freedom of Expression and Privacy."[17] The company also released a policy document in which it publicly commits to protecting its subscribers' freedom of expression and privacy, and avoiding shutting down its services. Telenor, however, does disclose that shutting down services may occur in "extraordinary events" due to national security threats,

[11] Deibert, R.J. et al., 2008. *Access Denied: The Practice and Policy of Global Internet Filtering*, Cambridge, MA: MIT Press

[12] "Responding to Buddhist nationalists, Myanmar looks to restrict inter-faith marriage." Human Right Watch, 3 July 2014. Available at: http://www.hrw.org/news/2014/07/03/responding-buddhist-nationalists-myanmar-looks-restrict-inter-faith-marriage ;

[13] The Dark Side of Transition: Violence Against Muslims in Myanmar, International Crisis Group, 1 October 2013. Available at: http://www.crisisgroup.org/~/media/Files/asia/south-east-asia/burma-myanmar/251-the-dark-side-of-transition-violence-against-muslims-in-myanmar.pdf

[14] Telenor Group. "Human Rights." http://www.telenor.com/sustainability/human-rights/

[15] Telecommunications Industry Dialogue. "About." http://www.telecomindustrydiaologue.org

[16] Including: Alcatel-Lucent, AT&T, Millicom, NSN, Orange, Telesoniera, Telefonica, Telenor, Vodafone

[17] Telecommunications Industry Dialogue, 2013. *Guiding Principles on Freedom of Expression and Privacy*. Available at: http://www.telenor.com/wp-content/uploads/2013/03/Telecoms-Industry-Dialogue-%20Principles-Version-1.pdf

without clarifying further what sort of national security threats would justify a shutdown. New concerns were raised in June 2014, when Telenor – the second largest telecom operator in Thailand – accepted the Thai military junta's request to stop its subscribers' access to Facebook.[18]

Regarding the protection of users' privacy and the disclosure of subscriber information, Telenor links its policy to the "UN Guiding Principles on Business and Human Rights."[19] The company, however, still keeps doors for collaborations with governments. Telenor is open to disclosing customer information when a governmental request is considered appropriate, though the company does not specify what conditions are deemed appropriate. With the political uncertainty following years of repression in Myanmar and, as described later in this paper, the lack of a national law regulating data retention, Telenor's policy documents may not be sufficient to secure the freedom of its services and the privacy of its customers.

In summary, as both companies are entering the Myanmar market while telecom law is in development, both companies may contribute to the telecom reform policy debate. This may be a good opportunity for both Ooredoo and Telenor to demonstrate their plans for corporate social responsibility in Myanmar.

Despite delays in launching their connectivity plans due to the absence of a national telecom law, both Ooredoo and Telenor began offering services in June 2014.

2.2 - Telecom Reform

[18]The Citizen Lab, "Information controls during Thailand's 2014 Coup", July 9, 2014. Available at: https://citizenlab.org/2014/07/information-controls-thailand-2014-coup/

[19] Telecommunications Industry Dialogue, 2013. *Guiding Principles on Freedom of Expression and Privacy*. Available at: http://www.telenor.com/wp-content/uploads/2013/03/Telecoms-Industry-Dialogue-%20Principles-Version-1.pdf

Before fully developing connectivity, Myanmar must set the rules for telecom infrastructure construction and the safeguarding of citizens' rights. Given the uncertain political climate and the need to establish necessary conditions for securing telecom developments, releasing a telecom law was a key priority that should have anticipated both the construction of connectivity infrastructure and the launch of mobile services.

Discussions about the new telecom law slowed down the country's connectivity agenda, but its release was still a key priority, and a milestone of the connectivity development in the country. Moreover, the process attached to the release of this law opened an unprecedentedly innovative, transparent, and inclusive process of reform in Myanmar, in line with telecom reform best practices.

a) A Multistakeholder Approach in Telecom Reform

A draft version of the new telecom law was developed with the close support of the World Bank, an organization highly involved in the country's connectivity plan.[20] It was released and circulated to stakeholders, allowing researchers to make some preliminary evaluations. Following one of the key best practices in telecom reform, the Myanmar government implemented the new telecom law through a transparent, public, and inclusive process, which involved multiple actors and welcomed their recommendations. In particular, the government launched an open consultation on this law in order to facilitate a public debate on new regulatory laws aimed at ensuring a free and open telecom market.

The draft law was made available online in English for public consultation from November 4-December 2, 2013. The publication of the law in English made it clear that the goal of the government was to enhance dialogues with international actors by creating an opportunity for third parties to access the law and submit their comments. However, the law was not published in Burmese, which

[20] "Myanmar Moves Toward Connectivity for All." World Bank, 6 February 2014. Available at: http://www.worldbank.org/en/news/press-release/2014/02/06/myanmar-moves-toward-connectivity-for-all

dramatically limited the ability of national actors to take part in the consultation, and excluded most of the population from understanding and partaking in this telecom reform. As a result, twenty-one different parties—including international telecom companies (e.g. Ericson), mobile operators (e.g. Telenor, Ooredoo, KDD, and Orange), international NGOs (e.g. Myanmar Centre for Responsible Business, LIRNEasia), local civil society organizations (e.g. MIDO), and foreign governments (namely the U.S. government)—submitted their policy recommendations.[21]

Submitted comments generally acknowledged Myanmar's efforts to open a public consultation and make the development of a telecom law a more transparent and open procedure. Myanmar's initiative is indeed no small feat. After years of an autocratic regime, this transparent and inclusive process opened up new spaces of dialogue between governments, citizens, and international companies. Moreover, development of the draft telecom law created an opportunity for parties to publicly commit to and position themselves within the Myanmar telecom reform discussion. This may be an opportunity to facilitate the eventual strengthening of collaborations among all actors, especially domestic ones, involved in this process. The debate on internet freedom in Myanmar has just begun, and this is an important first step in developing cooperation for future policy debates on telecom in the country.

b) Analysing the Telecom Law

With the release of the draft version of this law, the government has expressed its goals of establishing a fair, open, and transparent national telecom market. The process has so far been successful at creating open and transparent dialogue. In its current version, the law sets rules concerning five key issues:

[21] Republic of the Union of Myanmar. "Public Consultation Issued by the Ministry of Communications and Information Technology of the Republic of the Union of Myanmar." Retrieved from http://www.vdb-loi.com/vdb/wp-content/uploads/2013/11/1-MCIT-Public-Consultation-Document-11113.pdf

1. *Licensing*: Defining the process to be applied for each licensing category and identifying its criteria;
2. *Access and interconnection*: Setting the rules ensuring liberal and free networked connectivity and facilitating access to infrastructure and services;
3. *Spectrum*: Describing the criteria for the management and assignment of radio spectrum, including a variety of service such as mobile voices, broadband, and WiFi;
4. *Numbering*: Defining the criteria for the allocation of numbering according to area and operators;
5. *Competition*: Setting the rules of the internal market competition.

Most stakeholders responded positively to the proposed version of the telecom law. Some, however, have pointed out concerns, including the role paid by the World Bank.

In a document signed by sixty-one civil society organizations, the World Bank was criticized for having failed to secure the rights of freedom of expression and digital privacy before the telecom reform launch.[22] The document cites the World Bank's leading role in telecom development in Myanmar, calling on the World Bank to first secure digital privacy, regulate data retention, and secure the internet infrastructure before developing Myanmar's telecom sector.

Overall, given the variety of actors involved in Myanmar's connectivity reform plan, reactions to the telecom law are understandably diverse.

Amongst the *private companies* that submitted comments, recommendations differ depending on whether the company is an international mobile operator, such as Ooeredo and Telenor, or a hardware supplier, such as mobile towers suppliers. In particular, while mobile operators primarily commented on the licensing procedure and the management of their services, mobile tower supply companies

[22] "Civil Society Comments to World Bank Telecom Sector Reform Project in Burma." Available at: http://uscampaignforburma.org/images/Civil_Society_Comment_on_the_World_Bank_Telecom_Sector_Reform_Project_in_Burma.pdf

called for easier land assignment processes for tower construction. Land assignment for the construction of mobile towers is a key factor in overcoming geographical barriers and extending network coverage, especially in rural areas. As discussed in more detail below, this is one of the major challenges that both the government and mobile operators will face in the coming months. In particular, mobile tower builders demanded a feasible plan for the smooth assignment of land which takes into account the lack of a national register of land property. In addition to the fact that armed conflicts and landmines affect a significant portion of the territory, the issue of physical infrastructure might constitute a major challenge for the tower building process. It runs the risk of seriously slowing the development of connectivity infrastructure. Concerning the proposed telecom law, companies came to a general agreement on the rules already included in the law, with only minor comments and recommendations.

Similar to industry stakeholders, *foreign governments*, namely the United States, welcomed the telecom law and the transparent process of the open consultation. In a concise report, the United States government supports most of the points included in law, and encourages to Myanmar take further initiative to enhance transparent and open national telecom market competition.[23]

In contrast, *civil society* and *non-governmental organizations* (NGOs) disagreed on some points of the draft law. Groups within this sector indicate that the law primarily pleases international investors, establishing obstacles for the development of bottom-up local services by defining entry market conditions more easily met by big international companies but not by local investors. In particular, civil society raised concerns that the law provides parties able to offer infrastructure and hardware network platform, defined as Network Facilities Service, the ability to automatically receive licenses to provide downstream services. Stakeholders have expressed concern that local investors are hardly in the position to offer Network

[23] U.S. Government, 2013. "Comments on Telecom Law from U.S. Government". Available at: http://03861b4.netsolhost.com/Nov2013/wp-content/uploads/2013/12/19-US-Govt-comments.pdf

Facilities Service, creating unequal competition and making this stipulation in the law a serious obstacle for the development of bottom-up local online services.[24]

A major concern expressed by multiple parties involves the interconnection of national telecommunication bodies. In order to ensure a transparent and open telecom market, governments are supposed to withdraw from a regulatory role. According to best practices in telecom reforms,[25] an independent regulator must take over this role. The distinction between an independent regulatory body and the government's role in regulation has not yet been established. As a result, the Myanmar Posts and Telecommunications Department (MPTD), which is controlled by the Ministry of Communication and Information Technology (MCIT), still holds this role. The draft telecom law contains a design for a regulatory system composed of a complex hierarchical structure in which the government appears to be involved, especially in the licensing process. Here, although the licensing procedures are managed by the MPTD, its final outcome will still be communicated to and evaluated by the MCIT. This proposed hierarchical regulatory system exposes the licensing process to several weaknesses, including a complex bureaucracy machine, which will likely hinder its efficiency; and increased room for corruption. Most importantly, the proposed regulatory system maintains the central role of the Ministry of Communication and Information Technology, which could result in political control over the national telecom market, and the services of mobile operators.[26] The establishment of an independent regulator is considered therefore key to the success of Myanmar's connectivity building, and is the last step of the country's three step approach to telecom reform.

[24] MIDO, 2013. "Recommendations on Proposed Rules for Telecommunication Sector from Myanmar ICT for Development Organization". Available at: http://03861b4.netsolhost.com/Nov2013/wp-content/uploads/2013/12/12-Myanmar-ICT-for-Development-Organization-comments.pdf

[25] International Telecommunication Union, 2011. Telecommunications Regulation Handbook, Washington, DC: The International Bank for Reconstruction and Development / The World Bank / InfoDev / The International Telecommunication Union.

[26] LIRNEasia, 2013. Response to the "Public Consultation Issued by the Ministry of Communications and Information Technology of the Republic of the Union of Myanmar". Available at: http://03861b4.netsolhost.com/Nov2013/wp-content/uploads/2013/12/9-LIRNEasia-comments.pdf

2.3 - Independent Regulator

Concerns raised about the national regulator's lack of independence are justified, especially since an established independent regulator is still absent in Myanmar. Currently the regulatory body in Myanmar is the state controlled Posts and Telecommunications Department (PTD), a department within the Ministry of Communication and Information Technology (MCIT). [27] Before the telecom reforms, the country's public monopoly on telecoms partially justified the PTD as a regulator,[28] however, given the opening of the national market, the urgency to establish a new regulatory independent body is commonly shared among civil society parties and international observers.

Defining the separation between a regulatory body and the government is commonly considered to be necessary in order to secure the independency and the neutrality of the telecom market, and protect international investors and the citizens of Myanmar. In its 2011 *Telecommunications Regulation Handbook*[29], the ITU posits that an ideal regulatory structure must be divided into three main functions–policy development, market development, and regulation—that are overseen by parties independent from each other. This regulatory framework includes:

1) The executive branch of the government, which should hold a policy development function. In Myanmar, this is described as the second step in the connectivity process, and the government is indeed leading the discussion of the described telecom law;
2) Private telecommunication operators, which are in charge of developing the market and offering services to citizens. In Myanmar, this is described as the first step in the connectivity process, and is filled by both Ooredoo and Telenor;

[27] Myanmar Posts and Telecommunications Department. "About." http://www.mcpt.gov.mm/mcpt/about-01.htm
[28] International Telecommunication Union, 2011. Telecommunications Regulation Handbook, Washington, DC: The International Bank for Reconstruction and Development / The World Bank / InfoDev / The International Telecommunication Union.
[29] Blackman, C. & Lara S. (Eds.). (2011). *Telecommunications Regulation Handbook*. Retrieved from http://www.itu.int/dms_pub/itu-d/opb/reg/D-REG-TRH.01-2011-PDF-E.pdf

3) A separate regulatory authority, which should be in charge of monitoring and regulating the implementation of the telecom law, securing the efficiency of the market for investors, and guaranteeing the quality of services for citizens.

A separate regulatory authority, the third step in Myanmar's connectivity agenda, is still missing. Multiple parties are calling for this to be the key priority in facilitating a transparent telecom framework that is independent from the government and the government's political agenda. The current major challenge in establishing an independent regulator is the lack of local competence regarding the development of a national telecom regulator. The time required to launch an independent regulator would involve a great deal of training, which would slow down the implementation of the current connectivity plan. According to the time required to develop local knowledge, the draft law anticipates that the establishment of the regulatory body will happen within two years (by 2015). As the existence of a regulatory body is imperative in securing the efficiency of other steps in the reform process, criticism is raised on the fact that the "step three" will occur far later than steps one and two. Furthermore, in the draft law, the process of establishing the regulatory body is not fully detailed, and clarifications must be further addressed.

An independent regulator is critical for Myanmar, as the country's connectivity building and policy framework is highly controlled by a government that is still working toward full accountability. This is not necessarily a threat to the Myanmar telecom framework and its subscribers, but it should be considered a serious weakness to the overall reform process. Many other challenges, however, need to be surmounted in order to further strengthen the connectivity building process in the country.

3. Next Infrastructural and Policy Challenges

Though the current connectivity plan is moving forward, it is far from being finalized; several further challenges must be dealt with in the future stages of this

connectivity agenda. The challenges facing the on-going connectivity plan in Myanmar can be grouped into two major categories: developing connectivity *infrastructure* and developing connectivity *policy*.

Infrastructure Implementations

Building Mobile Towers: Land Ownership, Landmines, and War Zones

With its 676,000 square kilometers, Myanmar is one of the largest countries in South East Asia, second only to Indonesia. Only approximately seven million of its approximately sixty million inhabitants live in the three major cities—the capital Nay Pyi Taw, Yangon, and Mandalay. Developing telecom infrastructure in the wide rural territory of the country would thus have a significant impact on connecting a large portion of Myanmar's population. In order to fully connect Myanmar, an estimated eighty thousand mobile towers must be built.[30] As Ooredoo and Telenor did not agree to share mobile towers, eighty thousand towers will be built by each company, raising the estimated final number of mobile towers to be built to 160,000.

In Myanmar, *land ownership* is not rigorously tracked by the government, and land owners cannot provide evidence of their ownership of the land. According to the new telecom law, the government is in charge of mediating between mobile tower builders and land owners in order to release mobile infrastructure building licences. The lack of documentation surrounding land ownership will seriously hamper the government's ability to release mobile tower construction licenses. This will delay connectivity development in rural areas.

Moreover, there are landmines throughout a significant portion of Myanmar's territory. Although clean-up campaigns have been launched, these territories are not yet secure and are therefore excluded from the connectivity plans of both Ooredoo and Telenor.

[30] Figures gathered from interviews conducted in February 2014 with CEOs of Telenor and Ooredoo.

Finally, several armed conflicts are still ongoing in Myanmar, rendering several regions active war zones. Since the beginning of the democratization process, ceasefires have been signed, but these territories are still controlled by armed groups. Building mobile towers in rural areas consists of positioning towers on the highest peaks within those areas. In conflict regions, however, these are strategic points for military purposes, and are therefore controlled by local armed groups. This makes mobile operators unable to develop the telecom infrastructure in these regions without careful diplomatic action by the Myanmar government in the ceasefire negotiations.

Government Monopoly on the Internet Infrastructure

This paper has mostly addressed what has been done concerning the development of mobile infrastructure. The 4G and 3G services promised by Ooredoo and Telenor will increase mobile data transfer development and other internet services. Internet infrastructure should, however, be furthered develop in different areas.

The MPT fully controls internet infrastructure. In Myanmar, there are no Internet Exchange Points (IXs). Such a function is, however, substituted by a government-controlled national gateway, which keeps the data flowing domestically and keeps Myanmar independent from the Thai, Malaysian, or Chinese infrastructure, functioning *de facto* as an IX. As the government controls the only IX of the country, it is in the position to monitor all domestic data flows, exposing the national internet infrastructure to risks such as data filtering and digital privacy violation. New ISPs entering the broadband market will have to grapple with this situation until the government dismantles this control or new IXs are built. Under such infrastructural conditions, the internet in Myanmar cannot be considered fully secure for its citizens.

At the same time, broadband capability relies on only one submarine cable serving Myanmar. In order to increase the broadband capability of the country, in March 2014 the MPT joined the SEA-ME-WE-5 consortium, which will over the next two years construct a new twenty thousand kilometer submarine cable connecting

over seventeen countries between Europe and South East Asia.[31] With its 100Gbs technology, this will significantly improve the connectivity capability of the region, particularly in Myanmar. As the government will be the only controller of such infrastructure, potential new ISPs aiming to offer their services in the country will be forced to purchase broadband through the government, a condition that does not lay a foundation for more open and secure national internet infrastructure.

Policy Implementations

I have already discussed some of the criticisms facing the current telecom law, but there are some issues that the law fails to address, leading to the need for the implementation of new regulations.

Legislation for the governance of internet infrastructure

As mentioned above, new regulations should be implemented in order to decrease the government control of national broadband. This will facilitate new ISPs entering the market and secure their independence.

Right to Privacy

The new telecom law, and Myanmar legislation in general, lacks regulation regarding citizen privacy and data retention. The newly-licensed mobile operators, namely Telenor, state in their policies that they secure the privacy of their subscribers in accordance with local legislation. The lack of legislation in Myanmar, however, does not help companies respect their commitments to subscribers, and does not protect citizens. A new regulation concerning the right of privacy should therefore be developed.

Cybercrime laws

The 2004 Electronic Transaction Law (ETL) included legislation on cybercrime, but this law came before the democratization process and, therefore, before the

[31] TeleGeography. "Cable compendium: a guide to the week's submarine and terrestrial developments." Retrieved from http://www.telegeography.com/products/commsupdate/articles/2014/03/07/cable-compendium-a-guide-to-the-weeks-submarine-and-terrestrial-developments/

launch of the connectivity plan. The ETL was reviewed in October 2013, keeping the definition of cybercrime vague and characterizing much online behavior as cybercrime. In order to avoid abuse of the law, the release of a new ETL should better define which online behaviors can be considered violations.

Online Hate Speech

This paper has already mentioned the increasing conflict between Buddhists and the Muslim minority that has led to violent episodes across the country. The spread of connectivity and the use of social media are creating new ways of circulating information that serves to enhance this conflict. On July 2, 2014, following a rumor circulating on Facebook about a Buddhist woman raped by a Muslim, violent riots exploded in Mandalay, culminating in the deaths of two people. On the third day of riots, Facebook was shut down for almost twelve hours.[32] Although internet penetration in Myanmar is low, internet users use Facebook on a massive scale. The riots are evidence of the impact that social media has on society. New initiatives must be taken to control the spread of online hate speech in order to avoid the practice of internet shutdowns to prevent hate speech.

Corporate Social Responsibility

As a result of its transition, Myanmar has the opportunity to ensure that the development of telecom infrastructure goes hand in hand with implementing freedoms and digital rights for its citizens. Ooredoo and Telenor must play a role in both developing telecommunication infrastructures and ensuring this development follows a new regulatory policy agenda that prides itself on removing limits to freedom of expression and enhancing digital freedoms. In the coming years, Myanmar has the opportunity to establish real and sustainable change, and Ooredoo and Telenor are called to properly address their dual responsibilities in this telecom development process.

[32] Facebook Problems Coincide With Curfew in Burma, Irrawaddy, 4 July 2014. Available at: http://www.irrawaddy.org/burma/facebook-problems-coincide-curfew-burma.html

Developing Local Expertise

The general lack of local competence involved in the domestic telecom policy process is a major obstacle for development of a debate open to multiple parties. The lack of local expertise has been an obstacle in the path of setting an independent regulator and has prevented citizens from following developments. Lack of knowledge also affects the government by forcing it to depend wholly on the intervention of external actors such as the World Bank. For these reasons, the development of local knowledge through the cooperation of civil society organizations, high-level experts, companies, and international institutions is imperative for enhancing public debate on telecom developments in Myanmar.

4. Conclusion

This paper has explored the telecom developments in Myanmar along a three-step approach, paying particular attention to the mobile sector. Given the limited time since the start of the democratization process, one can conclude that the current national connectivity building plan is progressing at an unprecedented and effective rate. The initial stages of this process have been successful, shedding light on the Myanmar government's largely positive approach to telecom development. This paper also explores, however, that connectivity building in Myanmar must be addressed from both an infrastructural and a policy perspective. In particular, domestic broadband capability should be implemented in the near future, and the government should withdraw from its controlling and monopolistic role in the broadband marketplace.

The general election in 2015 may be a turning point for strengthening the democratic path down which Myanmar has already started. Approaching this critical event with an efficient telecom infrastructure and dramatically higher connectivity rate could facilitate the development of initiatives for voter mobilization and a fair and transparent election. When telecom reform is fully implemented, mobile operators will need to both adhere to standards of corporate social responsibility and any initiatives put in place to secure domestic internet

connectivity on both an infrastructural and a policy level. This will, in turn, allow Myanmar connectivity to be seen as an important tool of positive, democratizing change rather than as a means of government control.