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Digital Divides in Pacific Island Countries: Possibility of Submarine Cable Installation for Palau

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Abstract

The Republic of Palau is an island nation in the Pacific Ocean. Just like other island countries, Palau is faced with an issue of infrastructure development to provide reasonable communications services. Since satellite communication is expensive compared to submarine cable, Palau remains unable to fully meet the rising demand for the Internet. This article examined the issue of submarine cables, which are essential in solving the digital divide in Pacific island countries. Communications carriers are not willing to lay submarine cables to Pacific island countries due to poor prospects for sufficient demand and geographical isolation. Official development aid and other types of aid might not be available due to political and economic reasons.

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1. Digital Divides in Pacific Island Countries²

The Republic of Palau is an island nation in the Pacific Ocean, located approximately 3,200 kilometers south of Tokyo. Palau consists of about 200 islands that vary in size, and one of its sixteen administrative districts, which is called the State of Angaur, is known as the only place outside of Japan where Japanese is one of official languages in addition to English and Palauan. This is because Palau used to be a territory of Japan, as mandated by the League of Nations after the end of World War I until the end of World War II. After being put under the control of the United States by the United Nations following World War II, it became independent in 1994.

A look at Palau from a viewpoint of its communications service status brings us to see that it is - just like other island countries - faced with an issue of infrastructure development. After Palau became independent, it entered into a Compact of Free Association with the U.S. to receive aid in exchange for offering a base to the U.S. military forces; as, however, it was unable to receive any aid for submarine cable installation, the nation relies on satellites for international communications. Since satellite communication is expensive compared to submarine cable bandwidth, Palau remains unable to fully meet the rising demand for the Internet. Considering not only the demand from its own people but also the demand from the growing number of tourists, broadening its bandwidth is a desired course of action. However, it still remains an unsolved issue.

The purpose of this article is to examine, by using the example of Palau, the issue of Internet access that Pacific Island countries are faced with. A framework for grasping the issue of digital divide that island countries are confronting will be examined in section 2 below, which will be followed by an analysis of how the things stand in Palau in section 3.

² This paper is inspired by the discussion at the APT Workshop on Wireless Broadband for the Pacific from August 30 to September 2, 2010, in Palau. The author thanks APT (Asia-Pacific Telecommunity), the Ministry of Internal Affairs and Communication of Japan, Keio Institute of East Asian Studies, Keio Institute for Media and Communication Research, Prof. Minoru Sugaya, Prof. Yoshihisa Takada, Dr. Norman Okamura, Ms. Christina Higa, Ms. Rieko Hayakawa, Mr. Richard L. Misech and others. Japanese version of this paper is available at <<http://www.mediacom.keio.ac.jp/publication/index.html>>.

2. Digital Divide and Development

(1) The Missing Link

The United Nations designated 1983 to be the "World Communications Year," while the International Telecommunications Union (ITU), a U.N. specialized agency, set up the "Independent Commission for World Wide Telecommunications Development" (called the "Maitland Commission" after its chairman, Sir Donald Maitland). In January 1985, the Maitland Commission published a report entitled "The Missing Link." Below is an excerpt from its conclusion section:

Given the vital role communications play not only in such obvious fields as emergency, health and other social services, administration and commerce, but also in stimulating economic growth and enhancing the quality of life, creating effective networks world wide will bring immense benefits. An increase in international traffic will generate funds, which could be devoted to the further improvement and development of telecommunications services. The increased flow of trade and information will contribute to better international relationships. The process of creating effective networks worldwide will provide new markets for the high technology and other industries, some of which are already suffering the effects of surplus productive capacity. The interest industrialized and developing countries share in the worldwide development of telecommunications is as great as in the exploitation of new sources of energy. And yet it is far less appreciated. (Independent Commission for World Wide Telecommunications Development, 1985: 65)

This recognition by the Maitland Commission, which was written before the Internet became widely accessible to the public, still holds a lot of water today. No matter how technologies have changed, the impact that communications have on national development and international relationships remain unchanged.³

The winner of the U.S. presidential election in 1992 was the Clinton-Gore Democrat team, whose political pledges included the building of an information superhighway. After forming the

³ The Maitland Commission report proposed the establishment of the Center for Telecommunications Development (CTD). It was established as a quasi-independent body, but didn't work well. It was reorganized as ITU-D as the third pillar of the ITU.

government in 1993, the Bill Clinton administration articulated a vision for National Information Infrastructure (NII) and went on to urge the world to create Global Information Infrastructure (GII). Then in 1994, Vice-President Al Gore visited Buenos Aires, Argentina, for an ITU conference and gave a speech to the audience. Shumpei Kumon calls what Gore stated then the "Gore doctrines." Gore's first GII doctrine goes like this: "The GII will be the key to economic growth for national and international economies" (Kumon, 1994: 178). Vice-President Al Gore made the following remark during his speech before the International Telecommunications Union (ITU) on March 21, 1994:

There are those who say the lack of economic development causes poor telecommunications. I believe they have it exactly backwards. A primitive telecommunications system causes poor economic development (Gore, 1994).

The second doctrine is: "The GII will be the key to the construction of democracy." In the same speech, Gore stated as follows:

The GII will not only be a metaphor for a functioning democracy; it will in fact promote the functioning of democracy by greatly enhancing the participation of citizens in decision-making. And it will greatly promote the ability of nations to cooperate with each other. I see a new Athenian Age of democracy forged in the fora the GII will create.

Kumon regards highly "these two doctrines of Gore's," saying that they "can be seen as something that constitutes the axis of a new world order of the 21st century" (Kumon, 1994: 179).

On the other hand, some criticize that the Internet is made in a U.S.-centered fashion and does not necessarily serve as the global axis of information. In 1999, Kenneth Neil Cukier published a paper entitled "Bandwidth Colonialism?: The Implications of Internet Infrastructure on International E-Commerce" (Cukier, 1999). According to this paper, the Internet is centered around the U.S. when it is viewed on the infrastructure level. This is because the main backbone of the Internet has historically been located in the U.S. and also because network externality is at work, making it more efficient to connect to the U.S., which serves as the hub, than to make mutual connections between networks within a given region.

Therefore, in an era of networks that the 21st century epitomizes, it is critical to be connected to a network - more to the point, to be directly connected to a powerful hub. On the contrary, any nation or actor failing to be connected to a network will be left behind, unable to access information and falling behind in all spheres, including politics, economy and culture.

Anne-Marie Slaughter, a U.S. scholar who has also been involved with foreign policy issues in the State Department of the U.S., points out that we live in a networked society where war, diplomacy, business, media, society and even religions are all networked. She argues that in our time, the measure of power is "connectedness" and that, in this new networked society where "only the connected will survive," the U.S. has a clear and sustainable edge (Slaughter, 2009).

What, then, should a nation or actor not connected to a network do? Is there no hope left for a small country like Palau, whose only means to connect to the Internet is through satellites with limited bandwidths and which is devoid of any submarine cable?

(2) Aid and Self-Help in Communications Development

One way to save countries slipping through the GII might be official development aid (ODA). This is not necessarily easy, however. Figure 1 shows the percentage of the communication area in Japan's bilateral ODA. One can see that while the figure recorded 2.28% in 2000, it has followed a pattern of constant decrease, albeit intermittent with repeated ups and downs, to come down to as small as 0.26% in 2009.

This is attributable to the policy that ODA should not be used for a communications project, which can be expected to be profitable. The initial cost of laying submarine cables is substantial. Once they are done, however, the business of the recipient country would become able to earn operating profits. Hence, arguably, this is not compatible with the nature of ODA.⁴

⁴ However, as ODA-funded highways and airports could be profitable, this logic is not



Figure 1: Percentage of Communications Area in Japan's Bilateral ODA

Source: "Japan's ODA White Paper," Ministry of Foreign Affairs

Seeing as profits can thus be expected, will a submarine cable be laid for a country like Palau if the project is left up to private businesses to work on? As the traditional practice of submarine cable operation is to implement the installation, maintenance and operation without separation, it has been the business using the submarine cable that lays, maintains and operates it. Many of the submarine cable projects for establishing an overseas connection have involved the formation of a consortium of which members include businesses in the destination country (called "consortium cables"). Recently, however, what are called "private cables" – cables destined for in-company use or leasing purposes - have also made an appearance (Takasaki, 2003).

What factors does a business consider when laying a submarine cable? First: the installation interval of repeaters to be attached to the submarine cable (which is affected by, among other things, any undulation of the seabed). Repeaters are installed at certain intervals because signals transmitted through a submarine cable are subject to weakening. Occasionally, however, repeaters may not be installed without obtaining permits from a foreign business (or government).

always persuasive.

Second: environmental consideration that would come with the construction of a landing point. Although consideration of the environment did not pose a serious issue in the days when industrialization took precedence, development in harmony with the environment is now a must. Especially in Pacific Island countries, laying a submarine cable might cause damage to the preservation of coral reefs. Concerns like that might lead to a change in the submarine cable route or to the cancellation of the work of installation itself.

Third: the cost and human resources allocation to maintain the submarine cable. Submarine cables are not something that can be left as is once they are laid. They might be severed due to an earthquake, etc., and landing points must be manned as well. No company could afford to make a decision on laying a submarine cable unless there is an expectation for profits sufficient to get its money's worth.

Fourth: the demand itself. It would be meaningless to lay a submarine cable if there is nobody around to use it. Whether or not there is sufficient demand for the investment to be paid out will ultimately be a determinant in deciding to lay a submarine cable.

The question is: with those and other factors considered, would it be possible to have a cable laid by using ODA where no private business could do so?

With Palau becoming a mandated territory of Japan after World War I, the South Pacific Mandate was established in Koror, the largest city in Palau. Because of the influence from those days that still remains in Palau, also coupled with the fact that the U.S. control following World War II did not exactly go well, its people have friendly sentiments towards Japan. Palau is now a popular resort destination for the Japanese people.

There were days the Japanese government, motivated to push forward its desire to become a permanent member of the U.N. Security Council, attempted to approach Pacific Island countries. Starting in 1997, the Japanese government has been organizing a Pacific Islands' Leaders Meeting every three years; in 2000, the year the

G8 Kyushu-Okinawa Summit was held as well, it invited member countries of the South Pacific Forum (SPF) and issued the Miyazaki PALM (Pacific Islands Leaders' Meeting) Declaration. The Declaration confirmed that "the rapid progress in such areas as satellite communication and information technology (IT) and clean energy has the potential of offsetting the various disadvantages inherent to island countries including isolation and distance from major markets that SPF members are struggling to overcome."

The "Islanders' Hokkaido Declaration" from the fifth meeting of the Leaders of Japan and the Pacific Islands Forum (PIF) held in 2009 also articulated: "Responding to a call by the PIF Leaders to contribute to the development of sustainable economies in the region, the Leader of Japan committed to assisting Pacific island countries grow key sectors of their economies with a particular focus on supporting development of agriculture, fisheries and tourism sectors and improving transport and telecommunications infrastructure."

However, there has been no aid from Japan that was provided to any submarine cable project. As described above, the reason for this is the policy that ODA should not be used in the area of communications, which represents a profitable business.

If there is no aid coming from the U.S. or Japan, what about from other countries? Palau maintains a diplomatic relationship with Taiwan, and not with China. For that reason, the number of tourists from Taiwan is the second largest after Japan. However, Taiwan is not a member of the Development Assistance Committee (DAC) of the OECD and is not a leading aid donor country, either. Palau's diplomatic relationship with Taiwan also works as an impediment to any aid from China.

(3) Geopolitics of Submarine Cables

A study of the submarine cable history tells us that telegraphy was put to practical use in 1837 and the first-ever submarine cable was laid in the Straits of Dover between France and the U.K. in 1850. The transatlantic cable was then put into service in 1866, the point after which the use of submarine cables started to become widespread on a full scale. The British Empire owned 66.3% of the

world's submarine cables as of 1892, thus wielding substantial clout as a result. There have already been a large number of studies done on submarine cables in the era of the British Empire. For instance, Headrick pointed out that "cables were an essential part of the new imperialism" (Headrick, 1989: 163).

However, there has not been much work done on today's submarine optical cables. Modern-day submarine optical cables carry much more information, as a result of the explosive increase of information due to the interaction between rapid changes in technology and the rising demand. As, however, submarine cables are now laid under an agreement between private entities, governments are left with little space to intervene and information is therefore no longer made public.

Another point is that the Internet is a "network of networks" and how those networks are connected to each other can be roughly categorized into two types: peering and transit. Peering refers to a mutual connection between "peers" that involves no money changing hands – what changes hands is communications flows: traffic. When networks that differ in size are connected, however, that connection is more significant for the smaller one that connects to a larger network. This is because the scope of network externality that it can gain as a result will be greater. On the other hand, the advantage to be brought to the larger network connecting to the smaller one is not so big; in some cases, doing so might even mean a greater cost for it. This is where certain dynamics set in motion as a result, leading to the practice where the smaller network pays a fee to the larger network in implementing the connection: a transit fee. Thus, a mutual connection between networks is not simply a technical issue; rather, it represents a world of political power games.

From a standpoint of a smaller network, peering between smaller networks carries some level of significance. In order to gain greater network externality, however, it would be easier to connect to the largest network. This is the logic of preferential attachment presented by Barabási (2002): a large network tends to become even larger, which then leads to the generation of a hub.

An attempt to apply this idea in the real world – on the assumption that one nation represents one network - brings us to see that it is more efficient for a small country to connect directly with,

preferably, the U.S. than to create mutual connections within its own region. This leads to a situation where more and more countries try to have a submarine cable that directly connects with the U.S. An observation of relationships between the U.S. and Asia shows that although Asian countries do engage in connecting submarine cables within their region as well, they eventually develop a desire to have a submarine cable that connects directly with the U.S. The first Asian country that established a connection to the U.S. was Japan, while China wanted a submarine cable that does not go through Japan and actually succeeded in creating such a connection. When sending a message from one Southeast Asian country to another, it may sometimes be faster to go through the U.S. once.

While, as observed in the previous section, whether to have a submarine cable laid or not often depends on decision-making by businesses, there is still room left for governments to have a part in processing a landing permit application: a government would not just readily grant a landing permit in accordance with a request from businesses. In developing countries, or countries under an authoritative regime, the possibility of the government exerting some kind of political clout also remains because, in such countries, communications carriers may be state-run or operate under a monopoly. This implies that while submarine cable installation is in essence a project developed by private businesses, the possibility of political intervention is not quite zero. One can say that it is a geopolitical issue in that it involves the consideration of both geographical factors and political factors.

The Pacific Island nation region came under the strong influence of the U.S. after World War II. Therefore, political relationships with the U.S. would have no small impact on the installation of any submarine cables. This point will be elaborated below by drawing an example of Palau.

3. Case of Palau

(1) Palau's Submarine Cable During World War II

Looking back in history, a push for having a submarine cable laid between Japan and the U.S. was already beginning in the early 20th Century. Following the signing of the peace treaty to end the

Russo-Japanese war in September 1905, a communications agreement was entered into between the Japanese government and the "Commercial Pacific Cable Company" in the same month with respect to the installation of submarine cables between Tokyo and Guam. It was agreed then that the cables from mainland Japan to Ogasawara should be laid by Japan and the ones from Ogasawara to Guam should be laid by the U.S. Beyond Guam, the route would run through Midway and Honolulu, and connect all the way to San Francisco. Dated August 1 of the following year, or 1906, a celebratory telegraph message was exchanged between U.S. President Theodore Roosevelt and the Meiji Emperor (Ishihara, 1999: 156-157; Hanaoka, 1936: 201; KDD Corporate History Editing Committee, 2001: 5-6).

A historical case of submarine cables being laid in the vicinity of Palau can be found in the Yap Islands in the Taisho period. Those submarine cables were laid by Germany in 1916 but, after World War I, the use of the route between Shanghai and Yap was passed to Japan, which was then severed off the coast of Okinawa: thus, the route between Naha and Yap and the one between Yap and Manado (Indonesia) became available for use (Nippon Telegraphic and Telephone Public Corporation Submarine Cable Installation Office, 1971: 200).

As it was subsequently decided in 1940 that submarine cables should be used as a means to securing communications between Japan's mandated South Pacific islands, the construction followed to have cables laid. Submarine cables extending from Tokyo to Saipan Island, the Tinian Islands and the Truk Islands were constructed during the work done until spring 1941; they were yet to reach Palau at that point in time, however.

It was in 1942 when Palau was connected offshore via submarine cables. The cables between Yap and Manado were severed off the south of Angaur Island to have both ends of the cables landed into Palau so as to have the Yap-Palau route and the Palau-Manado route installed. The decision to use submarine cables was made because, previously, wireless communications between Palau and Yap had often been decoded by the U.S. The submarine cable route that had thus successfully been made became out of order as major buildings in Palau, including the naval communications unit, post office and the South Pacific Mandate, were destroyed as a result of the war (Nippon Telegraphic and

Telephone Public Corporation Submarine Cable Installation Office, 1971: 454-455). In May 1944, communications between Palau and Manado also became out of use due to malfunctions (Nippon Telegraphic and Telephone Public Corporation Submarine Cable Installation Office, 1971: 456). Then, Japan's defeat in the war resulted in Palau's submarine cable communications being discontinued up until the present.

(2) Submarine cable as missing link

The transmission capacity of submarine cables in early 20th Century was limited because they were single-core cables. During the chaotic times of the Second World War, many submarine cables were severed or became unusable. Furthermore, wireless communication, especially shortwave communication, became tactically more important.

In 1932, Shigeyoshi Matsumae invented non-loaded cable, which successfully improved communication quality. After the Second World War, however, the mainstream of international communication shifted to satellite, during which time marine cables drifted into a period of stagnation. Then in the 1980s, optical fiber marine cables came into practical use, enabling large-capacity communications across the Atlantic and Pacific Oceans. This was followed by the soaring demand for the Internet in the second half of the 1990s, when data communication exceeded voice communication by telephone. Demand for optical submarine cable continued to grow, and a number of optical submarine cables are laid across the oceans today. However, this does not mean all islands in the Pacific Ocean are connected to optical submarine cables.

Figure 2 shows the number of Internet users by country (island) in the Asia-Pacific island region. Those colored in black are countries (islands) that are connected to submarine cables, and countries (islands) that are not connected to submarine cables are shown in white. Although the population size is a significant factor, Internet user numbers are small across the board for the countries (islands) that are not connected to submarine cables.

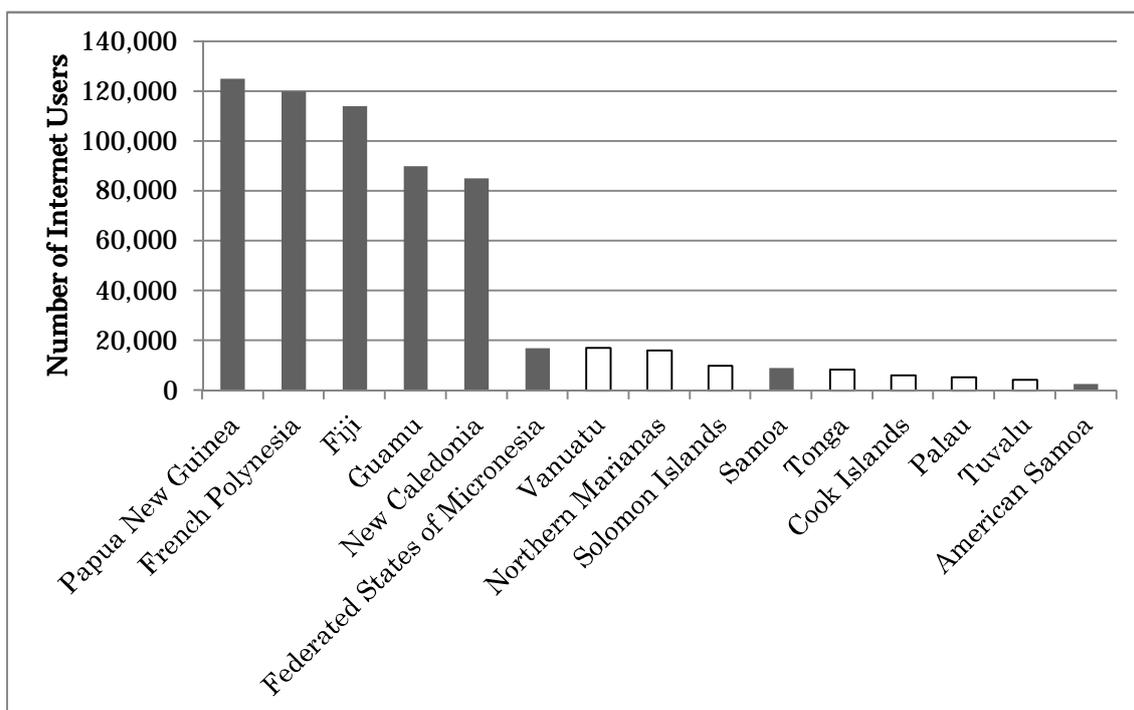


Figure 2 Number of Internet users in the Asia-Pacific island region

Source: Data was created from data on <http://www.internetworldstats.com/>

Note: Those colored in black are countries/islands connected to submarine cables, and those in white are not. Reference was made to

<http://www.telegeography.com/telecom-resources/submarine-cable-landing-directory/index.html>

for the connection status.

Two billion people worldwide used the Internet in 2010, of which Oceania/Australia accounted for only 1.0%. Of the 1.0%, Australian users accounted for 80.1% and New Zealand users 16.9%. The remaining 3.0% only (0.03% globally) are users in the Asia-Pacific island countries. Along with the sub-Saharan region, the Asia-Pacific island countries have yet to break away from the digital divide.

In view of this current situation, APT (the Asia-Pacific Telecommunity), which was founded on the joint initiatives of UNESCAP (the United Nations Economic and Social Commission for Asia and the Pacific) and ITU to improve information communication in the Asia-Pacific region, held a ministerial meeting in November 2009 on the island of Bali, Indonesia, to further strengthen regional collaboration toward broadband communication, and adopted the Bali Statement and Plan of Action. The statement lists the “widening of broadband connectivity” as its first aim, which is reiterated as

“regional collaboration to promote the establishment of affordable and reliable international broadband connectivity where appropriate” (Asia-Pacific Telecommunity, 2009).

However, as analyzed in the previous chapter, infrastructure winners and losers cannot be fully explained from the perspective of private businesses alone. This is because political issues exist. Political issues refer to, for example, that the U.S. island territory of Guam was connected to submarine cables fairly early on partially because it is a territory of the U.S., but also because it is a military base at a strategic location in the Asia-Pacific region.

Palau, on the other hand, about 1,300 km away from Guam, is not connected to submarine cables despite being under the compact with the U.S. to accept economic assistance in exchange for diplomatic and defense responsibilities. For example, considering that Asia-Pacific Cable Network 2 (APCN2) is 19,000 km long, it seems unlikely that 1,300 km is too far.

Palau's official languages are Palauan and English, which most people understand. The local currency is the U.S. dollar. The per-capita GDP is US\$ 9,000, which is on the high side among the Pacific island countries. After the Second World War in 1947, Palau was included as part of the U.S.-governed trust territory under the mandate of the United Nations. Palau conflicted with the U.S. government over bringing in nuclear weapons, but the compact with the U.S. was ratified after the eighth referendums in 1993. Palau gained independence in 1994, which was the last amongst the Pacific island countries. Under the compact, national security and diplomacy are the responsibility of the U.S., and youths from Palau are serving on active duty in Afghanistan and Iraq. If Palau has become important in terms of U.S. military strategy, it would not have been surprising if an optical submarine cable was laid to Palau. But Palau has yet to obtain such a cable. The bandwidth of satellite communications is no longer sufficient in the face of the increasing size of individual content on the Internet.

Telecommunication services in Palau are provided by the Palau National Communications Corporation (PNCC). PNCC is a member of the Communications Satellite Corporation (COMSAT) in the U.S., facilitating international communication (telephone, telegraph, telex and facsimile) (Association of Promotion of International Cooperation, APIC, 1996: 19). However, comparing satellite and optical submarine cables, the latter is almost overwhelmingly superior these days.

(3) Palau's plan to lay submarine cable has been set in motion

Palau's domestic information communication infrastructure already connects within and between the islands using optical cables (Mariano and Rishar, 1997). As for mobile phones, a Japanese communication equipment sales company, Family Telephone Co., Ltd., started providing service in 2000 in a joint venture with PNCC. This was later bought out by PNCC and PNCC has been providing the service. The issue of band frequency for international connection is via satellite (Figure 3), which is limited to no more than 30 Mbps for the entire country according to PNCC.

Internet connection with 128 Kbps in Palau costs US\$350 to US\$379 per month, using the service offered by PNCC. This is costly for the speed, considering that 100 Mbps (100,000 Kbps) is available for about US\$50 in Japan.

Due to the limited bandwidth available for the entire country, it would not be possible to provide services to meet increased demand if the usage fee was lowered, and therefore the reality is that the number of users needs to be curbed by the high usage fee. However, it is unlikely that 128 Kbps is sufficient to fully enjoy today's Internet.



Figure 3: Satellite antennas in Palau (photographs by the author in August 2010)

How much will it cost to lay an optical submarine cable to Palau? Let us assume connection to Guam, which is about 1,300 km away. It is possible to connect to Indonesia, the Philippines or Taiwan to the west, but as mentioned earlier, it is more advantageous to connect to the U.S. in terms of networking. Thus, connection to Guam, which is connected to the U.S. via Hawaii, will be meaningful, if not direct connection to the U.S. mainland.

The cost of laying submarine cables varies depending on the geographical conditions, and therefore it is not possible to simply calculate the unit cost. However, let us make a simple estimate based on the Asia-Pacific Cable Network 2 (APCN2) that was laid in the Pacific Ocean in 2001. APCN2, originally 80 Gbps and 19,000 km, was laid at a cost of about US\$1 billion (It has since been upgraded to 160 Gbps). Dividing US\$1 billion by 19,000 km, the cost per km works out to be US\$52,632. The distance between Guam and Palau is 1,311 km, so this works out to be about US\$69 million. Since Palau's estimated GDP for 2009 was US\$178.4 million, funding equivalent to 38.7% of the GDP will be needed.

Palau's submarine cable, which seemed beyond hope, started to develop rapidly since 2010. PNCC started a survey to lay a submarine cable in the autumn of 2010 and completed the feasibility study in December. President Johnson Toribiong of Palau places laying the submarine cable as the most important issue of his administration, and formed a task force in July 2011. The task force was chaired by the Special Assistant to the President, and the members included the General Manager of PNCC as well as House Speaker and Senate President. The task force held meetings with the Federated States of Micronesia Telecommunications Corporation (FSM Telecommunication Corporation) and the governor of Yap Island to achieve an agreement to establish the Caroline Cable Consortium (Island Times, 2011).

On August 9, 2011, PNCC exchanged a memorandum of understanding with the FSM Telecommunications Corporation to jointly procure, install, manage, operate, and maintain an optical submarine cable, with the FSM Telecommunications Corporation investing one third and Palau two thirds. The FSM Telecommunications Corporation has the advantage of providing broadband to Yap Island, which is part of the Federated States of Micronesia. In addition in September 2011, it was reported that President Toribiong met with the executives of the Asian Development Bank as

well as the World Bank while PIF (the Pacific Islands Forum) was being held to discuss the purchase and laying of a submarine cable (Pacific Daily News, 2011).

This consortium is not planning to lay a new optical submarine cable. Instead, it aims to purchase an existing submarine cable connecting Guam with Luzon in the Philippines from Guam-Philippines Cable Limited Partnership, and then rearrange it to connect Palau with Yap. This is similar to what Japan did in 1942. The cost is estimated at US\$35 million, including US\$5 million to purchase the submarine cable and US\$30 million for construction costs to make the cable usable. This is about half the cost of laying a new cable. The plan is to complete the work in 13 months once the project starts (Embassy of Japan in Palau, 2011; Oceania Television Network, 2011).

If the Caroline Cable Consortium succeeds, Internet speeds in Palau and Yap will increase and fees will come down, i.e., they can become “winners.” Needless to say, success depends on whether Palau and Yap can raise the necessary funds. US\$35 million is equivalent to 19.6% of Palau's GDP, which will be a heavy burden. Whether President Toribiong will be able to obtain loans from the Asian Development Bank and the World Bank will be a deciding factor. It goes without saying that the project will proceed more smoothly if support is obtained from Japan and the U.S.

4. Conclusion

This article examined the issue of submarine cables, which are essential in solving the digital divide in Pacific island countries. Communications carriers are not willing to lay submarine cables to Pacific island countries due to poor prospects for sufficient demand and geographical isolation. However, the existence of political reasons sometimes ensures submarine cable connectivity, or on the other hand, connection may not be secured due to political reasons.

The population of Palau is around 20,000. Obviously there would also be doubts whether it is necessary to consider support for a mere 20,000 people. It is certainly right to point out that the issue of communication is a luxury compared to people suffering from lack of food and water, environmental issues and human rights issues. The communication infrastructure in the Pacific island countries may be minute from a global point of view, however, it is a serious matter for those concerned, as lack of high-speed information and communication infrastructure in modern society means failing to stay current with advancing globalization. Missing out does not mean not being

able to survive, but it will become harder to hope for development. Younger generations will leave in search of educational and employment opportunities, leading to the collapse of society and culture in the long term.

Given this, a submarine cable is a long-term lifeline, but it is as serious an issue as short-term issues. Long-term issues should not be postponed because of their long-term nature, but dealing with the issue early on will avoid problems becoming serious. Securing information and communication infrastructure is a pressing issue in the same way as various issues in developing countries.

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