

**PLANNING AND DEVELOPMENT OF INDONESIA'S DOMESTIC
COMMUNICATIONS SATELLITE SYSTEM PALAPA***

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August 16, 1976 is a memorable day in the communication history of Indonesia. On that thirty-first anniversary of Indonesian independence, the country's PALAPA domestic communication satellite system was inaugurated by President Suharto. This occasion made Indonesia the first developing country to acquire its own domestic satellite. This article aims to trace back the decision making process that led Indonesia to acquire its domestic satellite system, far ahead of other developing countries, i.e., six years before India, and about a decade before China, Brazil, Mexico, and the Arab countries.

When the superpowers ventured into space technology—more specifically communication satellite technology—in the early 1960s, people in the developing countries just watched them with admiration:

We could not even dare to dream of it, because the enormous of cost involved in the same time we were still struggling to satisfy our basic needs of life such as adequacy of food, water, housing, electricity and improvement of the basic infrastructure.¹

However, only for years after EARLY BIRD was launched in 1965, Indonesia became a satellite user country by erecting an antenna in Jatiluhur. And, only a little over a decade

after that first commercial geostationary satellite was launched, Indonesia became a satellite owner country by acquiring PALAPA in 1976.

Physical and Socio-cultural Condition of Indonesia

Indonesia is the third largest nation in Asia and the biggest archipelago country in the world. It consist of five main islands and about 30 archipelagoes, all totaling 13,667 registered islands and islets, of which 1,000 are inhabited. These thousands of islands are characterized by dense forests, mountains, rough terrain and swamp. Indonesia's five main islands are Sumatra measuring 473,606 square kilometers; Java-Madura, 132,187 square kilometers; Kalimantan which is two-thirds of Borneo with about 539,460 square kilometers; Sulawesi, 189,216 square kilometers; and Irian Jaya which is part of the world's second largest island, New Guinea, an measures 421,981 square kilometers. The estimate area of Indonesia is 5,193,250 square kilometers which consist of water territory of 3,166,163 square kilometers and land areas of 2,027,870 square kilometers. This total land area of Indonesia is about 50 times the size of the Netherlands. This archipelago nation forms a crossroad between the Pacific and Indian Oceans and a bridge between the Asian and Australia continents. Land boundaries are shared with Malaysia and Papua New Guinea. The greatest distance north-south is 2,210 kilometers and east-west is 5,271 kilometers. Superimposed on a map of the U.S. map of these chain of thousands of islands would both New York and San Francisco.²

Indonesia is among 10 equatorial countries in the world, which include Brazil, Colombia, Ecuador, Republic of Congo, Zaire, Gabon, Somalia, Kenya and Uganda. In

fact, one-eighth of the equator line of the world goes through Indonesia. Indonesia has three time zones, each with a one-hour time differential. At that time, administratively Indonesia was divided into 27 provinces, 246 districts or regency, 55 municipalities, 3,539 sub districts, and 66,175 villages.³

In the 1970s, Indonesian population was over 175 million people, ranked as the fifth most populous country in the world after China, India, the Soviet Union and the United States. Indonesians are very unevenly distributed: Java, which has only about seven percent of the land area is inhabited by about 63 percent of the national population. In terms of natural resources, Indonesia has large deposit of valuable minerals: oil in Sumatra, Irian Jaya and Kalimantan, bauxite and copper in Irian Jaya, nickel in Sulawesi, to mention some. It has also large areas of fertile land as forest as well as large areas of water for fishing.⁴

The Indonesian population consist of over 250 ethnic groups, almost all of each with its distinct local language or dialect. The main groups are: Achenes, Batak, Sundanese, Javanese, Dayak, Bugenese, Makasssarese, Minahasa, Toraja, Ambonese and several Irianese. Fortunately, there is “Bahasa Indonesia,” which is used as the lingua franca to make communications possible between different ethnic groups. The majority of Indonesian—or about 70 percent—are rural dwellers.⁵

The early history of Indonesia shows the influence of the world’s major religions. Starting in A.D. 100, Indians came and spread Hinduism in Indonesia. The Chinese with Budhism arrived around A.D 140. In the 13th century, Gujarati and Persian merchants propagated Islam religion, and n 1511, the Portuguese cam and introduced Christianity.

Presently, 88 percent of the country's population is Muslim (making Indonesia the biggest Islamic country in term of population in the world), followed by Christians with 9 percent, then by Hindus, Buddhists, Confucianists and animists.⁶

Functions of Satellites as Perceived by Indonesians Decision Makers

President Suharto valued the application of telecommunications system in general and the satellite PALAPA in particular follows:

Through the Domestic Communications Satellite PALAPA, we can make fast, smooth and good quality connection, so that the exchange of news and information from and to distant places can be undertaken easily and in a short period of time. This fast and accurate transfer of information is very important for the efficient running of the government and for economic activities, trade activities, defense and security, as well as other activities that can speed up the development process. No less important is the role of the domestic communications satellite PALAPA in realizing the unity of our nation, which has vast areas and consists of thousands of small and big islands that are connected by hundreds of straits and wide seas.⁷ (underlines added)

The Broad Line of the State Policy, TAP MPR No.IV/MPR/1973, determined by the People's Consultative Assembly (Majelis Permusyawaratan Rakyat), stated:

The improvement in production of services in the communications and telecommunications sectors, will make the flow of goods and people smoother and also has a very important role in strengthening the national unity.⁸

From the two statements above one can infer that the role of the telecommunications network in Indonesia can conveniently be divided into two parts: As a means to unite the country, and as an infrastructure to support the national development in a broader sense.

For Unification of the Country

Unification of the country, which is also known as the concept of archipelago, has long been the main goal of the Indonesian people. On October 28, 1928, before independence, many of Indonesia's youth—originating from different ethnicities, languages, religious and cultural backgrounds—pledged: having one native country, Indonesia; belonging to one nation, the Indonesian nation; having one language of unity, the Indonesian language.⁹

The concept of *Wawasan Nusantara* (The Indonesian Archipelagic Outlook) symbolizes Indonesia's aspiration to unity and nationhood, that is, unity in political, socio-cultural, and economic views, and in defense and security.¹⁰ Political unity means that the national territory is a unified whole for its people; that the Indonesian people are a unified nation despite their differences in ethnic, language and religion affiliations; that Pancasila is the one and only state and the national philosophical ideology.¹¹

Socio-cultural unity means the Indonesian society is one, that Indonesian culture is essentially one; the diversity of culture just reflects its exuberance. Unity in economy means that the natural resources are the collective assets and property of the

nation; that economic development should be harmonious and well balanced through out the country.

Unity in defense and security means that any threat to any part of the country is essentially a threat to the whole nation; that all citizens have equal rights and obligations in the national defense.

The decision of naming PALAPA to the Indonesian communications satellite system can be seen as an endeavor toward unification. The name was given by President Suharto in July 1975. It was derived from the oath of Gajah Mada—the Prime Minister of the Majapahit Kingdom—proclaimed in 1334 in the ancient Javanese language:

*Lamun humus kalah Nusantara, isun amukti PALAPA, lamun humus kalah Gurun, ring Seran, Tanjungpura, ring Haru, ring Pahang, Dampo, Bali, Sunda, Palembang, Tumasik, Samana isun amukti PALAPA. [I will not rest until the archipelago has been united, when Gurun, Seran, Tanjungpura, Haru, Pahang, Dampo, Bali, Sunda, Palembang and Tumasik have been united, then, only then I will rest.]*¹²

If one takes into consideration the regional, ideological, and religious conflicts Indonesia experienced during the first two decades after independence, the crucial need for an adequate telecommunications network in Indonesia can be understood—not to mention the geographic, demographic and socio-cultural conditions of the country, which are very fragile without adequate transportation and telecommunications system.

A telecommunications system is viewed as capable of helping the national integration process. This is because it enables people from the northernmost parts of

Sumatra to get in touch with those on the easternmost parts of Irian Jaya. In other words, a telecommunications network is seen as an important means in keeping this country's population united, despite its different religions, languages, customs, and levels of economic.¹³

As Infrastructure to Support Development Programs

It is obvious that the Indonesia government saw the role of telecommunications system as an essential part of the infrastructure to support the Indonesian development process. In fact, the decision to use INTELSAT's satellite was taken at the same time that Indonesia embarked on its first Five Year Development Planning (FYDP) (1968-1972); and the decision to acquire PALAPA was taken at the second FYDP (1973-1979). In the first two FYDPs, the policy makers in Indonesia gave priority to the development of infrastructure, especially in the areas of transportation and telecommunications.¹⁴

It was viewed that to be able to make development programs successful in Indonesia, it was necessary to develop human resources and all natural resources of the country. This could only be done if all the people and all parts of the country could be reached by direct means of transportation and telecommunications. For this reason, Indonesia devoted a great amount of its development budget improving and developing the country's highways, rural roads, waterways, pioneer seaports, pioneer airports, and telecommunications system.¹⁵

More specifically, telecommunications services in Indonesia are viewed as an important means in supporting other development programs such as economic, political, socio-cultural, defense and security programs.

Economically, the telecommunications infrastructure is a basic instrument for private and government companies involved in the extractive industries such as mining, timber, and oil. It is very much needed for multinational corporations and banking, trade, and aeronautical activities.¹⁶

Politically, the telecommunications infrastructure, especially television, is viewed as an essential instrument for democratization and the political process.¹⁷

Telecommunications also can facilitate smoother operations of government administration. The lowest government hierarchy in the most remote area, for instance, can be reached easily can simultaneously, particularly in establishing government national policies.¹⁸ The need for this becomes more pressing realizing the fact over 70 percent if Indonesians are rural dwellers. A telecommunications system, therefore, enables the central government to reach villages and vice versa.

Socio-culturally, the telecommunications infrastructure, more specifically communications satellite PALAPA, is viewed very important instrument to introduce the national language, “Bahasa Indonesia through television. It can also introduce new values and will help other developmental programs, such as rural development, family planning, and public health.¹⁹

The communications satellite is also seen as very helpful for educational programs. In fact, one of the first proposals for the communication satellite was to

support education in Indonesia. President Suharto in his speech announcing the domestic satellite system as a national project clearly stated that: “Besides for telecommunications, the Indonesian domestic satellite will be used for radio and television and for educational television.”²⁰

Adequate telecommunication services are also needed to support defense and security programs.²¹ Telecommunications are viewed as the nerve center of the command because they can help facilitate contact to defense staff even in the remotest areas of the country. So any threat in any part of the country can be known quickly by the highest command in the capital city.²²

In sum, the telecommunications infrastructure is viewed by Indonesia’s policy makers as one of the essential instruments to unite the country and to support all other development programs.

Nevertheless, not all experts and policy makers agreed to the use of the communication satellite for domestic purposes in Indonesia in early 1970s. Some were skeptical about the idea and raised questions concerning the feasibility and economic assumptions of the project,²³ and also the justification for such a huge outlay by a developing country, the capability to cope with a great leap to high technology, and even the moral appropriateness of the decision.²⁴

The most protests came from social scientists who worried about “negative potential impact of the technology on society and culture, particularly the potential effects of satellite television on rural populations.”²⁵ Interestingly, some segments within the government, including those in the education and information sectors were reluctant

to accept the new technology. Education officials, for instance, compared the cost of the satellite system with that of building thousands of schools and training teachers.²⁶

Moreover, officials from the Department of Information and Television Republic of Indonesia (TVRI), as well as the Department of Education and Culture (i.e., The Center of Communication Technology for Education and Culture) appeared to be unprepared for educational television.²⁷

The initiative to a domestic communication system in Indonesia came from the Telecommunication Council,²⁸ the Directorate General for Posts and Telecommunications and PERUMTEL, the entities that are responsible for providing public telecommunications services in Indonesia. The project was successfully undertaken due to the full support from the President and the Parliament. The decision took place at the time Indonesia needed a nation-wide telecommunications infrastructure to support its national development program, while the existing conventional/terrestrial system was found to be limited.

Decision to Acquire PALAPA

In 1965, when EARLY BIRD successfully reached orbit, Indonesia arrived at a decision to study satellite communication systems closely. This can be seen from a government document (PP. 35/1965) which, among others, states that “. . . all effort and energy needs to be directed to following as early as possible the development in science and technology in the field of telecommunications, such as SATELLITE and others.”²⁹ (Capital is original).

Two years after this document was issued, Indonesia decide to build Jatiluhur earth station that facilitates international communication via INTELSAT satellite. While developing Jatiluhur earth station for international communications, the Minister of Communications³⁰ in the Five Years Development Planning I (FYDP I, 1968-1973), Frans Seda, formed a committee to study the national telecommunications system in Indonesia. The committee—headed by the Director General of Posts and Telecommunications, with a membership from the Directorate General of Posts and Telecommunications, Telecommunications Council, Department of Defence and Security, as well as telecommunications experts—recommended the satellite system as one of their preferences. The government’ desire to use a domestic satellite system, especially for educational purposes (using India’s experience with its SITE program), had also been mentioned earlier in 1968 to Robert McNamara of the World Bank, by Frans Seda.³¹

The satellite also received attention within academia. In 1968, Iskandar Alisyahbana, one of the prominent experts in the field of telecommunication in Indonesia, wrote *Telecommunications for Education and National Development*.³² Alisyahbana proposed the application of telecommunication systems via satellite for the national development of Indonesia and of Southeast Asia. This system, according to him, could be used to support education, information and news dissemination in the country. He particularly stressed the importance of the system in supporting educational programs in Indonesia.³³

After the inauguration of the Jatiluhur earth station in 1969, the desirability of using satellites for domestic system rose. This is understandable, for at that time, it was easier to make connections from Jakarta to capital cities of other countries around the globe than to reach provincial capital cities outside Java. As a matter of fact, President Suharto suggested at that inauguration that the domestic satellite system should be implemented in the second FYDP period (1974-979).³⁴ Based in this suggestion, data on telecommunication traffic in Indonesia began to be collected. Demand for telecommunications at that time was assessed, and future demand projected. Comparative studies were also done in the countries which were in the process of using communications satellite technology.³⁵

Meanwhile, in 1971 two Indonesian telecommunications officials, Suhardjono and Willy Munandir Mangoendiprodo attended the ITU meeting and Telecommunication Exhibition I (Telecom '71) in Geneva. In the exhibition, they were particularly interested in the Hughes Aircraft Company's exhibit that displayed the possibility of using communications satellites for domestic purposes.³⁶

Having learned about the availability of technology for domestic systems, serious discussions and further studies were consequently undertaken, e.g., the cost-benefit analysis of a domestic satellite system in Indonesia. In 1971, Aero Ford sent a team headed by Robert Beach to offer services for satellite construction in Indonesia. The ensuing discussion, however, was not conclusive. The Indonesian officials felt that Aero Ford "was apparently not convinced that Indonesia could finance that project, considering the economic situation of the country . . ."³⁷

The successful launching in November 1972 of ANIK-A, a Canadian domestic satellite, however, was significant in bringing the idea of using a domestic satellite system in Indonesia into a reality. Hughes Aircraft Company, the constructor of ANIK-A, offered in 1971 to make a complete presentation in the field of space and earth segments, as well as a financial analysis of a domestic satellite system that might be suitable for Indonesia.³⁸

The excitement of using satellite technology for communications was also shared by other countries in Southeast Asia. In fact, in 1973, the head of the Philippines Telecommunication Council, C. Careon, accompanied by officers from the Philippines Communications Satellite Corporation, visited Indonesia to discuss the possibility of forming an organization that would plan and operate EASAT (East Asian Satellite Communications System). The purpose of this multinational satellite system would be for general consumption by member countries. This system would cover nine countries, i.e., South Korea, Japan, Taiwan, Hong Kong, Thailand, Malaysia, Singapore, Indonesia, and the Philippines.³⁹

There was no agreement or firm decision on this regional system. On the contrary, the decision to launch a domestic satellite, owned solely by Indonesia, became more certain. This was manifested in President Suharto's advice in 1973 to the Directorate of Posts and Telecommunications, which said in part that a domestic satellite system that can cover the whole Indonesian archipelago should be acquired and operated within the following two to two-and-a-half years.⁴⁰

Accepting this challenge, on September 4, 1973, the Director General of Posts and Telecommunications appointed a committee to study the technical, operational and economic aspect of a domestic satellite system.⁴¹ The committee concluded that a domestic communications satellite, both in its technical and non-technical aspects, was suitable for Indonesia. The reasons given for this conclusion were that it will, particularly, enable the realization of an integrated national telecommunications system, and additionally, it will support the realization of the goal of National Archipelagic Outlook (*Wawasan Nusantara*). The result of this study was officially announced on April 3, 1974.⁴²

The proposal received a mixed response from government officials, telecommunication experts and the general public. Some were in agreement because they foresaw the suitability of the system for Indonesian needs. Others disagreed because of the lack of Indonesian experts in those fields. Yet others also saw it as too expensive and too advanced for the nation. Criticism also came from abroad.⁴³

Despite the ongoing debate among Indonesia experts on whether the system was suitable or not for the country, on July 5, 1974, PERUMTEL and Hughes Aircraft Company signed an agreement concerning the system definition of the Indonesian domestic communication satellite system. The agreement covered regulations of system engineering, satellite design, earth station design, and administrative assistance.⁴⁴

To ensure the full support of all parties for this government decision, and to discuss the possible applications of the domestic satellite system in Indonesia, a seminar was held on September 9-12, 1974 in Jakarta.⁴⁵ Simultaneously, a domestic

communication satellite exhibition was held too. Both national and foreign companies participated in this exhibition. On October 5-10, 1974, the Electronic Association of the Bandung Institute of Technology also conducted a symposium to discuss the technical aspects of the domestic communications satellite system.

Later, an Indonesian delegation visited the United States to study the possibility of obtaining loan for the project from Export-Import Bank. The result was an agreement from the Export-Import Bank and Consortium Bank of the United States in Washington D.C. to provide loans for the project.⁴⁶

The delegation also looked for the possibility of using the INTELSAT transponders for Indonesian domestic communications system (as Algeria and Brazil had done at the time). However, though three transponders were needed, only two could be allotted for Indonesia in 1975, without any assurance that another would be forthcoming in the following years. Therefore, Indonesia decided not to use INTELSAT services for its domestic communications but go on with its own domestic communications satellite system project.⁴⁷

President Suharto, in speech introducing the 1975-1976 state budget, on January 6, 1975, officially announced that:

In the field of telecommunications, preparation is being made so that in this period, 1975-1976, a domestic communications satellite can be launched. Besides telecommunications, this satellite will also be used for radio and television need and for educational purposes.⁴⁸

With this official presidential announcement before the Parliament assembly, the domestic communications satellite program was officially started as a government and national project.⁴⁹ The following discussion is a chronological development of the Indonesian Domestic Communication Satellite System PALAPA.

The First Generation of PALAPA (PALAPA-A)

Agreement with Contractors and Launchers.

Soon after the president announced officially the domestic satellite program as a national program for the 1975-76 budget year, negotiations commenced between the Indonesian government and the prospective contractors, i.e., the Hughes Aircraft Company, Aero Ford (Philco Ford), and Federal Electric, and affiliate of ITT. The negotiations covered the construction of pair satellites and earth stations.⁵⁰

Will Turk and R.L. Bowman of Hughes Aircraft Company was first appointed as project manager and vice project manager, respectively. However, they were later replaced by Llyod Harisson, who had previous experience as project manager for the Canadian satellite project.⁵¹

The contracts concerning the construction of the domestic satellite system were signed on February 15, 1975, with three American companies: (1) Hughes Aircraft Company was to build a pair of communications satellites, the main control station at Cibinong, and five major as well as four minor earth stations in Java, Bali and Nusatenggara. (2) Philco Ford Overseas Services was to build seven major and eight minor earth stations in Sumatra, Kalimantan, and part of Sulawesi; and (3) Federal

Electric International (ITT) was to build six major earth stations, and nine minor ones in Sulawesi, Maluku and Irian Jaya. As for the civil works construction of the earth stations, two domestic contractors won the tenders. They were C.V. Modern Jaya and P.T. Graha Gapura.⁵²

To ensure the launching of the satellite, a Memorandum of Understanding was signed in March 1975 between the Indonesian government and NASA. The memorandum was strengthened by the exchange of diplomatic notes signed by Indonesia's Ambassador to the United States, Roesmin Noerjadin, and Dixy Lee Ray, representing the United States. Finally, on May 1, 1975, the actual agreement for launching the satellites was signed by the Director General of Posts and Telecommunications, Soehardjono of Indonesia, and Noel W. Hinnners of NASA.⁵³

The agreement concerning the insurance of the satellites was made on April 28, 1975, between PERUMTEL and P.T. Asuransi Jasa Indonesia. On the same day, agreements relating to civil engineering were signed with the two local contractors previously mentioned.⁵⁴

Management and Funding

After contracts were signed, the project management was appointed. The project manager A. Ph. Djiwatampu, was to be assisted by two deputy project managers, Harjana Sutarja and Muhaimin. Saleh Bunawan was also appointed as PERUMTEL's representative in El Segundo, California, and was assisted by an American consultant. The later was to help in supervising the satellite construction. In order to construct the

earth stations, 12 project divisions, 40 heads of project sub-divisions, the telecommunications staff, and some civil engineers were appointed.⁵⁵

A total of US\$ 161.6 million was needed for the first generation of the Indonesian domestic satellite system. The Export-Import Bank of Washington D.C., provided US\$ 56.6 million, the U.S. Consortium Bank US\$ 89 million, and the Consortium Bank Commercial US\$ 15.8 million, while the Indonesian government paid the remaining US\$ 165.5 thousand.⁵⁶

According to Emil Salim, Minister of Communications, the total budget for the telecommunication system was US\$ 1.4 billion. Only 12.5 percent (US\$ 178.7 million) of the money was used to acquire and to launch the two satellites and to build the 40 initial earth stations. The biggest portion of the budget went to the telephone and telex expansion to all provinces of Indonesia, i.e., almost 80 percent.⁵⁷ The remaining 8 percent was used to modernize and/or build new radio and television stations.⁵⁸

Coordination with Other System

The International Telecommunications Union regulation state, among other things, that no new telecommunications system can begin operations until it has been coordinated with both Radio regulations, and the International Frequencies Registration Board (IFRB). It also need to be entered in the Master Register.⁵⁹ As a member of INTELSAT, Indonesia needed to coordinate its planned system with that of INTELSAT in order to operate its own satellite system.

Indonesian telecommunications officials at the time assumed that INTELSAT was disappointed with the fact that Indonesia had already gone too far by not only signing contracts with Hughes Aircraft and other companies, but also by signing agreements with the government of the United States concerning the launching of satellites before consulting INTELSAT.⁶⁰

At the XVI Board of Governors (BG) of INTELSAT meeting in 1975, Indonesia mentioned the reasons why it needed a domestic satellite, which INTELSAT found difficult to agree with. INTELSAT even contacted the U.S. State Department concerning the launching agreement. The Department affirmed its decision to complete its part of the agreement with or without INTELSAT's consent. NASA would by all means launch the Indonesian satellites. At that meeting, the General Secretary of INTELSAT issued a paper (BG-16-70 DS, July 14, 1975) about the coordination of the Indonesian domestic satellite. It stated that Indonesia's planned satellites can only be stationed 92 1 degrees on the eastern longitude or could be put 83 degreed on the eastern longitude for just two years. Indonesia would also be required to agree to abide by certain limitations set by INTELSAT on some transponders.⁶¹

The Indonesian delegations, together with other members of the ASIAN group, issued an answering paper the following day. It stated that there was a need for agreement about Indonesian satellites. However, if agreement was no reached, Indonesia would go on with the project without further negotiation with INTELSAT. On receiving the Indonesian response and seeing how strong it was, INTELSAT asked Indonesia to compromise situations—Indonesia should cancel its paper and INTELSAT, in turn, will

cancel its paper. Agreement and disagreement thus continued among INTELSAT delegates through the last day of meeting.⁶²

Realizing how uncertain things had become, especially at the last day's meeting, the Indonesian delegation urged that a decision ought to be made in the Indonesian satellite before 12:00 P.M. Their reason was that the nature of the decision was such that there was a need for agreement to occur at the highest levels at INTELSAT. Finally, INTELSAT agreed that Indonesia's satellite could be put in orbit at 83 degree on the eastern longitude. An agreement in the Memorandum of Understanding would be prepared in the future by both parties, and would be legalized at the next BG meeting. This agreement did not, however, take effect at the XVII BG Meeting in September. Indeed, the Indonesian satellite was not mentioned at all at this meeting.⁶³

At the XVIII BG meeting in November 1975, Indonesia which received support from ASPAC group (Singapore and Malaysia), the East African Group (Kenya, Uganda and Tanzania), as well as Brazil and Canada, finally received INTELSAT's consent. The Memorandum of Understanding between the Indonesian government and INTELSAT, was eventually signed on November 25, 1975. On November 26, 1975 the PALAPA system was registered to the IFRB in Geneva.⁶⁴

Specifications and Coverage

The pair of PALAPA-A satellites were identical to the early generations of ANIK and WESTAR satellites which Hughes Aircraft Company built for the domestic satellite systems of Canada and the United States (See picture of PALAPA A). PALAPA-A had

12 transponders with an average capacity of 6,000 voice circuits or 12 simultaneous color television channels, or any combination of the two. The satellites were 3.41 meters in height (including antennas), and 1.9 meters in diameter. Its launch weight was 574 kilograms, while its orbit weight was 297 kilograms. The design lifetime of the satellite in orbit was seven years. The location of PALAPA-A1 and A-2 are around 77 degree and 83 degree on the eastern longitude.⁶⁵

With specially designed antenna, the satellite's signal power was concentrated on all Indonesian islands as well as the surrounding areas of Southeast Asia: Singapore, Malaysia, Thailand, and the Philippines (See the coverage).⁶⁶ Located on all major islands of Indonesia, the original earth stations were 40 in number, with one master control, 19 major and 20 other minor stations.

The space and earth segments of PALAPA-A were controlled and operated by PERUMTEL. The 12 transponders of the PALAPA-A were allocated mostly for point-to-point telecommunication facilities. In fact, seven out of the nine transponders allocated for Indonesia, were used by PERUMTEL, one was used by the Television Republic of Indonesia (TVRI), and the other for the Ministry of Defence and Security. Three ASEAN countries were also using PALAPA-A transponders (the Philippines, Thailand, and Malaysia) at this time. Another PALAPA-A transponders was being used for occasional ASEAN Television programs.

The Launching, Naming and Inauguration

The PALAPA-A1 satellite was brought from El Segundo, California to the Kennedy Space Center, Cape Canaveral, Florida to be launched by Rocket Thor Delta 2914. This happened at 7:31 P.M. Florida time, on July 8, 1976, and/or at 6:31 am western Indonesian time, on July 9, 1976. Only 26 minutes into the launching, the PALAPA-A satellite traveled at a speed of 35,217 kilometers per hour, and entered its elliptical transfer at an apogee of 35,000 kilometers and perigee of 231.6 kilometers. When the satellite entered its orbit slot, the apogee engine was fired from the main control at Cibinong, Indonesia at 14.17 Western Indonesian time on July 12, 1976. In short, the launching procedure was successful.⁶⁷

After watching the launching process of the satellite via television in Jakarta, President Suharto mentioned his reason for naming the Indonesian satellite PALAPA. The president, among others, said the name of PALAPA was derived from the oath proclaimed in 1334 by Gajah Mada, the Prime Minister of Majapahit Kingdom. It is chosen as the name of the satellite because it shows that Indonesia had glorious eras before colonialism. Also with hope that the system can be used to unite the archipelago and to realize Indonesia's goals, especially to a prosperous and just society.⁶⁸

On the occasion of the thirty-first anniversary of Indonesian independence, on August 16, 1976, President Suharto inaugurated the domestic communications satellite system in Parliament House, Jakarta. After unveiling and signing the plaque to mark the official inauguration of the satellite, the President spoke by telephone via the PALAPA system with the Governor of Aceh, Muzakir Walad in Banda Aceh (the most western part of the archipelago), and to the Governor of Irian Jaya, Sultran, in Jayapura. Then the

Governor of Ach in his turn, made a telephone call to the Regent of Merauke, Jacob Pattipi, on the eastern-most part of the country.⁶⁹

Thus within a matter of two years after the President's announcement that the domestic satellite project would be a national project, and about 18 months after the contract had been signed, all of Indonesia islands was inked electronically with a high-technology telecommunications system from its western to its eastern extremities. This meant that the unification of the archipelago, at least in terms of telecommunications, had become reality for the first time since Gajah Mada declared the PALAPA oath to unite the archipelago six centuries ago.

AS with all other communications satellite system, a back-up system in orbit is a must. The PALAPA-A2, as the back up of the PALAPA-A1, was launched on March 10, 1977 at 6:16 P.M. Florida time, or at 6:24 A.M. Western Indonesian time, on March 11, 1977. The launching of PALAPA-A2 was also successful. It reached its geostationary orbit on the 77 degree eastern longitude side.⁷⁰

Conclusion

Virtually all developing countries have shared and participated in communications satellite activities. This technology available to developing countries primarily because of the diffusive nature of the technology. Stationed in the GSO, communication satellites with global beams ignore the national borders, ideologies, religions, races, and levels of economic development of the country they serve. In addition, communications satellites are available for developing countries because of the

existence of international, regional, and national systems that provide facilities to them. They include INTELSAT, INTERSPUTNIK and IMMARSAT international system, EUTELSAT and ARABSAT regional system; and PALAPA, INSAT, BRAZILSAT, MORELOS, and STW system that specifically serve developing nations.

Both internal and external factors and actors have contributed to developing countries becoming involved in communications satellite activities. External factors and actors were found to be dominant in the applications of communications satellites for international communications. On the other hand, internal factors and actors were found to be determinant in acquiring communications satellites for domestic purposes. PALAPA, for example, was the result of strong political commitment by the Indonesian government. The system has been used primarily for national unification programs and to facilitate the realization of the Archipelagic Concept (*Wawasan Nusantara*).

In fact, PALAPA has been, in part, responsible for the national integration of Indonesia, i.e., to link all the provinces, as well as the major industrial sites, with high quality of point-to-point communications; to broadcast national radio and television down to the village levels; and to support the armed forces communication networks. These were the initial goals for PALAPA; therefore the system is serving its purposes. Even though Indonesia is the pioneer in establishing a communication satellite system for domestic purposes in the developing world, it has done very little to employ this technology for community development programs. In other words, the potential uses of the technology for community developments (i.e., education, health, rural development, agricultural extensions) have not been employed on a large scale. Other community

programs have been integrated with, and sometimes overshadowed by, national news, cultural, sports, and entertainment programs.

In Indonesia, the basic hindrances to optimal usage of the satellite capacities for community development programming have been mainly the limited availability of programming facilities and personnel, and the lack of cooperation among the parties involved. Unlike the situation in the United States, where satellites came into being after other supporting means had been well established, e.g., studies, well-trained personnel, sophisticated equipment, etc., Indonesia obtained its satellite before other supporting systems were available. Therefore, under-utilization of the system, especially in the early stages, couldn't be avoided.

In fact, the under-utilization of satellites capabilities is also found in point-to-point communications. Even though, PALAPA has circled the globe for some time, Indonesian telephone density is still among the lowest in the world. This is caused partly by the fact that the supporting systems were still very fragmented, particularly the switching and terminal equipments. The shortage of funds, limited skilled manpower, rigid regulations, and lack of cooperation among major actors were found to be basic hindrances in speeding up the availability of telephone service in Indonesia.

Despite the limitations above, PALAPA was found to be very useful in integrating the country. It has effectively "united" the Indonesians six centuries after the Prime Minister of the Kingdom of Majapahit, Gajah Mada, declared PALAPA oath in 1334. If the United States was truly united with the invention of railways and the telegraph,

Indonesia is hopeful that its unification will come who the extensive use of airplanes, ships, and satellite communications.

* This paper is taken from the author's dissertation written in 1989, entitled *The Application of Communications Satellite in Developing Countries: The Case of Indonesia*.

¹ Willy Munandir Mangoendiprodjo, *PALAPA: A Satellite Communications for Development* (Bandung: PERUMTEL, 1981), 3.

² Republic of Indonesia, The Department of Information, *Indonesia 1987: An Official Handbook* (Jakarta: Percetakan Negara, 1987), 9.

³ *Ibid*, 70.

⁴ Frederica M. Bunge, ed., *Indonesia: A Country Study*, (Washington D.C.

⁵ The Department of Information, *Indonesia 1987*.

⁶ The Department of Information, *Indonesia 1987*, 25-30.

⁷ Post and Telecommunications, *Sewindu PALAPA*, 7. Similar statement was given by President Suharto in his 1976 state speech. See "Pidato Kenegaraan Presiden Republik Indonesia di Depan Sidang Dewan Perwakilan Rakyat 16 Agustus 1976" [State Speech of the President of Indonesia Soeharto before the Assembly of the People's Representative Council 16 August 1976], *Kompas*, 18 August 1976.

⁸ Republic of Indonesia, People's Consultative Assembly, TAP MPR No.IV/MPR/1973.

⁹ The Department of Information, *Indonesia 1987*, 7.

¹⁰ *Ibid* 104-105.

¹¹ Pancasila is the philosophical basis of the Indonesian State. Pancasila means Five Principles, which are: 1) Believe in the one supreme God, 2) Just and civilized humanity, 3) The unity of Indonesia, 4) Democracy led by the wisdom of deliberation among representatives, and 5) Social justice for the whole of the people of Indonesia. See The Department of Information, *Indonesia 1987*, 3.

¹² *Sewindu PALAPA*, 9.

¹³ Willy Munandir Mangoendiprodjo and Suprpto Martosuhardjo, *Indonesian Telecommunication Development: Its Role in the Pursuit of National Development Objectives* (Jakarta: n.p., 1979), 8-9.

¹⁴ In 1975, the year PALAPA was put as national project, significant transportation projects were also undertaken to reach isolated areas of the country. These include the development and improvement of 40 seaports and 62 airports. Pioneer shipping and flight services—serving areas that are not commercially viable—were introduced to many isolated places. See *Kompas* (7 January 1975).

¹⁵ *Ibid*.

¹⁶ According to Dahlan, business considerations are in fact the main motivation behind the Indonesian satellite program, at least in the preliminary stages. See M. Alwi Dahlan, "Indonesia's satellite Experience: Analysis of Policy and Implementation Problems in Telecommunications and Development Communications," Paper presented at the Communications Policy Research Agenda Workshop, East West Communications Institute, Hawaii, 17-23 January 1982, 5.

¹⁷ *Ibid*, 9.

¹⁸ *Ibid*.

¹⁹ See Alfian comment in "Sistem Komunikasi Satelit Domestik di Indonesia: Belum Diketahui Pasti Seluruh Efek Positif-Negatifnya" [Domestic Communications Satellite System in Indonesia: It Is Yet Known for Certain its Negative and Positive Effects] *Kompas*, 9 July 1976; also Godwin C. Chu, Alfian, and Wilbur Schramm, *Satellite Television Comes to Indonesian Villages: A Study of Social Impact*, (Jakarta nad Honolulu: Leknas/LIPI and East-West Center, 1985), 452; and Manngoendiprodjo and Martosuhardjo, 10-13.

²⁰ *Kompas* (7 January 1975)

²¹ "Pidato Kenegaraan," *Kompas* (18 August 1976)

²² *Sewindu PALAPA*, 61-62.

²³ The total cost of PALAPA project was Rp. 581 billion when the state budget in 1975/1976 was Rp. 2.734 billion. See "Presiden Resmikan Pemakaian SKSD: Halo Saudara Gubernur" [President Inaugurated SKSD: Hello Governor], *Kompas*, 18 August 1976; also *Kompas* (7 January 1975)

²⁴ Dahlan, "Indonesia's Satellite Experience," 2.

²⁵ Ibid.

²⁶ Ibid

²⁷ *Kompas* (9 July 1976).

²⁸ The council was defined as advisory to the President in the determination of the government's policy in the telecommunication field. The composition of the Council is: The Minister of Communications and Chairman., and representatives from several departments—Communications, Defense and Security, Information, Home Affairs, Foreign Affairs—and National Planning and Development Boards (BAPPENAS), State Intelligence Coordinating Body and Indonesian Science Institution as members. See “Case Study of Alternative Systems for Distribution of Educational radio in Indonesia,” prepared under contract with the Academy for Educational Development for the Office of Educational Technology Agency for International Development (Palo Alto: Edutel Communications and Development, 1980) 1-2.

²⁹ *Sewindu PALAPA*, 15.

³⁰ The department that administered Posts and Telecommunications matters was changed from the Department of Communication in the first two FYDP to the Department of Transport, Communications and Tourism in the third FYDP. Since the fourth FYDP, it has been the Department of Tourism, Posts and Telecommunications.

³¹ *Sewindu PALAPA*, 17.

³² To be delivered as an affirmation speech on the occasion of being honored as the electronics professor at the Bandung Institute of Technology. See Alisyahbana, *Telekomunikasi untuk Edukasi*, 1968.

³³ Alisyahbana later became a member of committee that was formed to study the national telecommunication system of Indonesia which proposed the utilization of satellite for domestic system.

³⁴ *Sewindu PALAPA*, 19.

³⁵ *History of Posts and Telecommunications*, 175; and *Sewindu PALAPA*, 19.

³⁶ At that time Hughes Aircraft Company was in the process of developing ANIK-A of Canada.

³⁷ *Sewindu PALAPA*, 26.

³⁸ The presentation delivered by Hughes Aircraft team in March 1983. Ibid.

³⁹ Directorate General and Post Telecommunications, *Laporan Tahunan 1973* [Annual Report 1973] (Jakarta: Ditjen Postel, 1974), 35 and idem, *Sewindu PALAPA*, 26.

⁴⁰ *Sewindu PALAPA*, 19.

⁴¹ Based on decree (SK/No.25/Dirjen/1973) on September 4, 1973, Ibid.

⁴² *Sewindu PALAPA*, 19.

⁴³ Ibid; see also Dahlan, *Palapa Project and Rural Development*, 1986, 2.

⁴⁴ *History Posts and Telecommunications*, 175; idem *Sewindu PALAPA*, 26.

⁴⁵ The organizers and participants of the seminar consisted of representatives from the Department of Transport, Communications and Tourism, the Department of Education and Culture, the Department of Information, LAPAN, the Directorate General of Post and Telecommunication, PERUMTEL, and the Bandung Institute of Technology, government institutions, and domestic and foreign companies.

The speakers were the Minister of Education and Culture, the Minister of Research and Technology, the Assistant of Communications and Electronics of the Department of Defence and Security, and Director General of Posts and Telecommunications, as well as telecommunications experts from UNESCO, India, and the United States. See “Seminar Sistim DOMestik Satelit [Seminar on Domestic Satellite System], *Kompas*, 9 Septemebr 1974; *History Posts and Telecommunicaitons*, 175; and idem *Sewindu PALAPA*, 20-21.

⁴⁶ *Sewindu PALAPA*, 26.

⁴⁷ Ibid.

⁴⁸ *Kompas* (7 January 1976).

⁴⁹ *History of Posts and Telecommunications*, 175.

⁵⁰ The negotiators on the Indonesian side were officials from the government such as the Department of Transport, Communications and Tourism, National Development Planning Board (BAPPENAS), the Department of Finance, the Bank of Indonesia, the Directorate General of Post and Telecommunications, PERUMTEL. See *History Posts and Telecommunications*, 180; and *Sewindu PALAPA*, 30.

⁵¹ *Sewindu PALAPA*, 30.

⁵² *History of Posts and Telecommunications*, 180.

⁵³ *Ibid*; and *Sewindu PALAPA*, 21.

⁵⁴ *History of Posts and Telecommunications*, 180.

⁵⁵ *Sewindu PALAPA*, 31.

⁵⁶ Information on the same amount of money for the PALAPA-A project was various. Press comment at that time said that information on the PALAPA project budget was fragmented and unclear and was not openly given. See Atmakusumah, "PALAPA: Bukan Sekedar Kebanggan" [PALAPA: Not Merely a Pride]. *Tempo* (Jakarta), 8 May 1976, 38.

⁵⁷ Including transmission and terminal facilities, cables, building central telephone offices, for education and training telecommunications personnel.

⁵⁸ See "Presiden Resmikan SKSD," *Kompas* (18 August 1976); and "Apa Untung, Jadi Gajah Mada 1976?" *Tempo*, 17 July 1976, 48-49.

⁵⁹ *History of Posts and Telecommunications*, 181.

⁶⁰ Discussion on this issue can be seen in *Sewindu PALAPA*, 35-36.

⁶¹ *Ibid*, 35.

⁶² *Ibid*.

⁶³ *Ibid*.

⁶⁴ Indonesia was represented by J. Sutanggar Tengker, head of Telecommunications Directorate, while the INTELSAT was represented by Santiago Astrain, the Director General of the organization. The Memorandum of Understanding stated that INTELSAT had no objection to the orbital location of Indonesian satellite in the 83 degree eastern longitude. See *Sewindu PALAPA*, 35.

⁶⁵ Hughes Aircraft Company, Space and Communications Group, "PALAPA Domestic Communications Satellite for Indonesia," *Fact Sheet* (El Segundo, CA: Public Relations of Hughes Aircraft Company) SCG 76011M 3/77

⁶⁶ *Ibid*.

⁶⁷ *Ibid*, 181.

⁶⁸ President comment given to press, see "Apa Untung," *Tempo* (17 July 1976), 48.

⁶⁹ *Sewindu PALAPA*, 41.

⁷⁰ *History of Posts and Telecommunications*, 185.