

NATURAL RESOURCES OF SOUTH-EAST ASIA

Ooi Jin Bee

THE PETROLEUM RESOURCES OF INDONESIA



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Preface

THE quadrupling of oil prices within a few months in late 1973 and early 1974 brought to an abrupt end the era of inexpensive oil. Since then the continuing increases in the price of oil traded in the international market and the higher prices of imports of manufactured goods have seriously disrupted the foreign exchange balances of many developing countries and forced them to replan their development programmes.

The impact of high oil prices is felt in every country, whether developed or developing, and has brought to world attention the fact that not only are petroleum resources in limited supply and exhaustible but also that substitutes cannot be found easily or quickly. In a world faced with the certainty of declining supplies of petroleum there is widespread interest and concern among all the oil producing countries to evaluate the extent of their petroleum resources and to examine more closely the problems of their development, rates of depletion and methods of conservation.

The present work reviews some of the above issues and problems in relation to Indonesia, an OPEC member, and the major oil producing country in South-East Asia. More specifically, it seeks to provide the reader with an overview of the petroleum resources of the country—their nature, extent, distribution as well as the problems of their development.

The study relies heavily on official data, both published and unpublished. Data gaps, where they exist, have been bridged by drawing upon diverse other sources of information such as regional and local journals, bulletins and newspapers.

I have discussed various aspects of my research with a number of

key officials and scholars, in Indonesia and Singapore, and have benefited from their comments and suggestions. I would like in particular to acknowledge my debt to Dr Luki Witoelar Kartaadipoetra, Head, Geological Evaluation and Development, PERTAMINA, for providing me with unpublished material and for his assistance on the chapter on the petroleum reserves and resources of Indonesia. Mr Leslie R. Beddoes, Jr., General Manager, Cities Service East Asia, Inc. Singapore, evaluated the chapter on the geologic setting of Indonesia's petroleum deposits, clarified some points, and gave me the benefit of his geological expertise and experience of the Indonesian petroleum scene. I have also benefited greatly from discussions with the following officials in the PERTAMINA Head Office, Jakarta: Ir. Atik Suardy, Senior Geologist; Mr R. H. Subijanto, Head, Public Relations; J. A. F. Masiruw, Public Relations Department; Mr J. F. Menayang, General Affairs Manager; Mr Sukastoyo, Ka Humas dan Peremintahan, Badan Koordinasi Kontraktor² Asing; and Mr D. L. Coutrier, Environment Protection Coordinator. Professor Dr Wahjudi Wisaksono, Director of Lemigas, Jakarta, was kind enough to spend time with me outlining some of the problems facing the petroleum sector in Indonesia. Ir. Soembarjono, Director of Exploration and Production, Directorate-General of Oil and Gas, Department of Mines and Energy, Jakarta, and Mr Fauzan Zailani Sh. of the same Department provided me with a great deal of useful information. My stay in Jakarta was made especially pleasant through the kindness of Mr Charles N. Silver, Cultural Office of USICA, American Embassy, who went out of his way to meet my requests for various documents and materials.

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The main body of this work was completed while I was a Visiting Fellow of the Institute of Southeast Asian Studies, on sabbatical leave from the National University of Singapore. I am grateful to the Institute for providing me with financial support for my field trip to Indonesia, and to the Director, Professor Kernial Singh Sandhu for

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Mrs Lim Kim Leng and Mrs Irene Chee of the Department of Geography, National University of Singapore, cheerfully provided me with all the typing and secretarial assistance I needed, while Mr Poon Puay Kee, Senior Cartographer, was responsible for drawing the maps and diagrams.

I am, of course, solely responsible for the errors, omissions and shortcomings in this book.

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OOI JIN BEE

GENERAL NOTE ABOUT STATISTICAL AND OTHER DATA

THE statistical data used in this book are drawn mainly from official sources.

The maps and diagrams were drawn by Mr Poon Puay Kee under the author's direction.

Values given in dollars refer to U.S. dollars.

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I

The Development of the Oil Industry

The Pre-war Phase

INDONESIA was famous for its mineral wealth long before its spices attracted the attention of European traders and adventurers and drew them to its shores. An early Chinese reference to Java mentions the working of salt in AD 13, whilst archaeological and other evidence point towards indigenous familiarity with gold, copper, bronze and iron in the pre-Christian era. During the early colonial period tin was the main metal of commercial importance but the systematic exploitation of tin and other minerals, including oil, did not begin until the second half of the nineteenth century.

Oil from seepages in the Aceh region in Sumatra was used as fuel in naval battles along the Sumatra coast as early as the eighth century AD. Some old Dutch journals contain references to a 'wondrous substance' in the Malay Archipelago that 'is deemed inextinguishable once it has been ignited and that burns upon the sea'. It was also used for medicinal purposes by both the local inhabitants as well as the Dutch, especially for treating 'stiffness in the limbs'. The Dutch East India Company's envoys at the court of the Sultan of Acin were ordered to obtain quantities of this 'earth oil' for such medicinal use.

It was not until two centuries later that new and more important uses were discovered for this raw material. In the mid-nineteenth century a process was discovered for refining petroleum, or 'rock oil' as it was then known, into illuminating oil for lamps, and into lubricating oil, paraffin wax, and naphtha. This new illuminating oil soon displaced all other oils used for lamps. The great demand for this new oil stimulated a search for petroleum, initially in the United States, and later on extended to the other parts of the world, including

Indonesia (then the Netherlands East Indies). The Head of the Mines Department, C. de Groot, was confident that petroleum could be produced in commercial quantities in Indonesia, and as a first step in this direction, drew up a provisional list of the locations in which petroleum occurred. This list, completed in 1865, enumerated a total of fifty-two oil seepages and their yields. Additions were made to the list in the course of the next few years, and by 1870 a full picture of oil occurrences in Indonesia had been built up (Gerretson, 1953).

The first attempt at petroleum exploitation in Indonesia was made by Jan Reerink, a general store owner who decided to try his hand at this new venture. In 1871 he began drilling at Tjibodas (Jibodas), located at the foot of the volcano Tjarema (Jarema), south of Cheribon (Ceribon) in West Java. Although he found some high quality oil on two occasions, the yield was too small to be commercially viable, and after five years he had to give up his search for lack of capital.

In 1880 A. J. Zijlker, the Dutch manager of the East Sumatra Tobacco Company, discovered by chance the existence of oil pools in the vicinity of his plantation. He was able to secure a concession to the oil-bearing land (officially named Telaga Said) from the Sultan of Langkat, and in 1884 began drilling at Telaga Tiga, the most accessible of the oil pools at the concession. The first well gave some promising results but the second well drilled at Telaga Tunggal in 1885 was an immediate success, producing oil in commercial quantities at a depth of only 121 m.

In 1890 Zijlker made over his petroleum concession to a newly formed company Koninklijke Nederlandsche Maatschappij tot Exploitatie van Petroleumbronnen in Nederlandsch Indie (Royal Dutch Company for the working of petroleum wells in the Netherlands Indies) which later changed its name to the Royal Dutch Petroleum Company. In the first year of its operation the Royal Dutch produced 1 200 metric tons of oil from its Telaga Tunggal field. This well provided the raw material for the company's first refinery, established at Pangkalan Brandan in 1892.

The discovery of oil in commercial quantities at Telaga Said provided a great stimulus to exploration and drilling in other parts of Indonesia. New fields were discovered in Kruka, East Java (1887),

Kampong Minyak, South Sumatra (1896), Sumpal, South Sumatra (1897), Sanga Sanga, East Kalimantan (1897), Perlak, North Sumatra (1900) and Ledok, East Java (1901). All the fields had payzones located in the upper regressive sands lying at relatively shallow depths, usually with oil seeps in the neighbourhood providing surface indications of the oil at depth.

During this pioneer phase there were as many as eighteen different companies exploring and drilling for oil in various parts of Indonesia. Among them was the Shell Transport and Trading Company, founded by an Englishman, Marcus Samuel. The company originally traded in shells and spices but went into the oil shipping business and eventually also into oil exploration and drilling. In 1894 the company discovered oil in East Kalimantan and in the same year, established a small refinery in Balikpapan. However it failed to advance from this base in oil production, losing ground, as did the other small companies, to the fast expanding Royal Dutch. In 1907 the Shell Transport and Trading Company found relief from its difficulties by merging with the Royal Dutch on a 40/60 basis, the new company being named the Royal Dutch/Shell Group. Three operating companies were created under this parent holding company: the Bataafsche Petroleum Maatschappij (B.P.M.), handling production and refining; the Asiatic Petroleum Company, handling marketing; and the Anglo-Saxon Petroleum Company, handling transportation.

The Royal Dutch/Shell Group through its operating company, the B.P.M., gained full domination of the Indonesian oil industry within four years of its founding when it absorbed the last independent oil company, Dordsche Petroleum Maatschappij, in 1911. The group held 44 concessions totalling 32 000 sq. km, of which 19 were in Sumatra, 18 in Java and 7 in Kalimantan. The total Indonesian production in that year was 13 million barrels (3.4 per cent of world production), divided as follows:

East Kalimantan 34 per cent (main field: Mahakam River delta)

North Sumatra 22 per cent (main field: Perlak, Aceh)

South Sumatra 20 per cent (main field: near Muara Enim)

North-East Kalimantan 14 per cent (main field: Tarakan)

East Java 10 per cent (main field: near Tjepu (Jepu) and Surabaya).

The year 1912 was marked by the formation of a new oil company, Nederlandsche Koloniale Petroleum Maatschappij (N.K.P.M.), a subsidiary of the Standard Oil Company of New Jersey (later to become the Standard-Vacuum Company, and after the Second World War, P.T. Stanvac Indonesia). Its initial efforts were unproductive and disappointing, and by 1920 it had a production of only 100 barrels per day, against the Royal Dutch/Shell's production of 48,000 barrels per day (Bartlett, *et al.*, 1972). However in 1919 N.K.P.M. obtained a seventy-five-year mining concession from the government of the Talang Akar area of South Sumatra, and after drilling some shallow wells, made a major discovery in 1922 when it found oil in the prolific lower transgressive sands, several hundred feet below any previously known producing horizon in Indonesia. Up to then all the payzones in Indonesia were in the upper regressive sands but after the Talang Akar discovery, augmented by a similar discovery in the adjacent Pendopo area in 1928, attention was focused on the bigger potential of the lower transgressive sands. All the other large oil fields—Minas and Duri in Central Sumatra, Limau in South Sumatra, and Tandjung (Tanjung) in South Kalimantan—that were subsequently discovered had payzones in these sands.

In 1921 the government decided to establish a new oil company, the Nederlandsche Indische Aardolie Maatschappij (N.I.A.M.), on a joint venture basis with B.P.M., the latter providing the operational management and marketing the products. The intention of the government was to redress the balance between the oil companies and the state, as it felt that the concession system operated too much in the favour of the companies. The new company obtained the exploitation rights of the oil basin in Djambi (Jambi), South Sumatra, a small area in North Sumatra, and the island of Bunyu in North-East Kalimantan. Of these Djambi proved to be the most important, producing over 60 million barrels between 1924 and 1940.

The oil industry in Indonesia expanded steadily and by 1924 the number of oil concessions had increased to 119, covering a total area of 6 400 sq. km. Total production had also increased to 22.6 million barrels, of which 95 per cent was from the Royal Dutch/Shell Group and the rest from the N.K.P.M. The relative importance of the regional output when compared with the situation in 1911 had also

changed significantly: East Kalimantan remained the largest producer with 36 per cent, but Tarakan in North-East Kalimantan jumped to second place with 32 per cent, while production in North Sumatra declined to 6 per cent of the total Indonesian output. South Sumatra produced 17 per cent and Java 9 per cent.

The competitive position of the Indonesian oil industry in this early phase was also partly due to a Mines Act which allowed for the granting of concessions covering entire oil structures, thereby permitting each oil company to develop its fields as economically as possible. Concessions were granted for seventy-five years, with few obligations to drill being imposed on the companies. But in 1928 the government altered the regulations governing concessions, making them less favourable to the oil companies. Under the new regulations the concession period was reduced to forty years; moreover the oil company had an obligation to drill, with however, the right to return those parts of the concession area that had no oil prospects. Furthermore the company was obliged to pay the state royalties for the concessions as well as a progressive profit share amounting to as much as 20 per cent of the net profit.

In 1930 the Standard Oil Company of California formed a subsidiary company in Indonesia, *Nederlandsche Pacific Petroleum Maatschappij* (N.P.P.M.), but was not able to obtain oil concessions until 1936, when it was granted an area in Central Sumatra and another one in West Java. In that year Standard of California entered into a joint partnership with the Texas Corporation to form the California Texas Oil Company (Caltex). The company initiated extensive prospecting work on their concession areas, and in 1939 spudded its first exploration well in Central Sumatra. Commercial production began just before the outbreak of the Pacific War.

Up to the 1930s Irian Jaya, then known as Dutch New Guinea, remained outside the interest of all the oil companies except the Royal Dutch/Shell Group. In 1935 a new company was formed to undertake the systematic exploration of this large territory. Named the *Nederlandsche Nieuw Guinee Petroleum Maatschappij* (N.N.G.P.M.), this company was a joint interest of the Royal Dutch/Shell Group and the Standard-Vacuum Company (Stanvac) through N.K.P.M., each with a 40 per cent stake, and Caltex with a 20 per cent stake. The