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INTERNATIONAL URANIUM RESOURCES EVALUATION PROJECT

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NATIONAL FAVOURABILITY STUDIES

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TAIWAN

C O N T E N T S

S U M M A R Y

Taiwan is an island of 36,000 sq km located 160 km east of mainland China. Geologically, the oldest rocks are Tertiary, and the only igneous rocks on the island are Quaternary andesites and basalts. Copper, gold, and silver are the only known metallic minerals produced.

Uranium occurrences and exploration efforts are unknown. The potential uranium resoure of Taiwan is considered a category 1 resource.

A. INTRODUCTION AND GENERAL GEOGRAPHY

Taiwan is an island separated from the southeast coast of China by by the 160 km wide Taiwan strait. Generally oval-shaped and with a north-northeast-south-southwest axis, it is 375 km long and 145 km wide at maximum; it lies between parallels 21° 54' N and 25° 20' N and meridians 120° 4' E and 121° 57' E. Its area, exclusive of the neighbouring Pescadores but including several other small offshore islands, is 36,000 sq km. To the northeast are the Ryukyus; to the south the Bashi channel and the Philippines.

Taiwan is a great fault block. Its eastern margin marks the edge of the continental shelf. The highest areas are in the Chung-yang, the crest of which lies east of the island axis. Numerous peaks rise above 3000 m. the highest being Yu Shan (3,950 m). Old, resistant sedimentary and metamorphosed rocks are exposed by erosion in the east, and younger softer sedimentary formations in the west. East of the mountains is a 160 km long narrow valley of fault origin, covered with alluvium and open at its northern and southern ends to the sea. Farthest east are the eastern coastal ranges of volcanic origin, rising to 2100 m.

West of the central highlands is a coastal alluvial plain, still being extended into the shallow Taiwan strait, 40 km at its greatest width, and the heartland of the island. This plain is broken by hills north of 24° N into a southwestern component and a lesser, fragmented northern portion, including the fertile T'ai-pei basin, to the north of which are volcanic highlands rising to 1125 m. Along the northeastern coast is an isolated alluvial lowland.

Rivers in general are short and subject to extreme variations in flow especially on the southwestern plain. Soils of alluvial origin cover about a fourth of the island and are its chief wealth. Upland soils are leached, acid and low fertility.

About 55% of the island is forested; another 12% is wasteland. Forests are graded altitudinally, from coniferous stands above 9,000 ft through mixed stands to about 2000 m of cedars, cypress, junipers, rhododendrons, maples and Japanese cedarto broad-leaved evergreen forests which include camphor trees. In the lowlands are mixed bamboo, evegreen and palm stands. Steppelike vegetation occurs in the drier southwest.

Climate

Lowland Formosa is frost free. The climate is ameliorated by the waters of the Japan current. The mean temperature of the coldest month, January, in the north is about 14.5° C. Summers are hot and humid, and in the south winters are warm to hot as well. Temperatures fall with altitude, however, and the central mountains are snow covered in winter. All areas receive 100 or more cm of rainfall, and the mountains receive up to five times that figure. The southwest, which lies in the winter lee of the central mountains, receives its rainfall almost entirely in the summer months. The northeast also receives winter precipitation in the mountainous areas.

Transportation and Access

There are 3,604 km of state (Taiwan Railway Administration) railway and over 17,000 km of roads. The ports of Keelung, Hualien and Kaohsiung handled nearly 46 million metric tons of cargo in 1975. There are international airports at Taipei and Kaohsiung.

There are also 2,232 km of private narrow-gauge railroads operated by the Taiwan Sugar Corporation, the Taiwan Forestry Administration and the Taiwan Metal Mining Corporation. These railroads are mostly used for freight but they also provide public passenger and freight services which connect with those of T.R.A.

There are 2 international airports at Taipei and Kaohsiung, which are served by the following foreign airlines: Cathay Pacific, Japan Asia Airways, Korean Airlines, Malaysian Airline System, North-west Orient, Singapore Airlines, Thai International.

Kaohsiung is Taiwan's chief port, handling over two-thirds of the country's external commerce. Keelung, near Taipei, is the country's second port.

Industry

Manufacture of electrical good is the main industry. Mineral resources include coal, marble, oil and natural gas. Gross National Product per capita is now amongst the highest in Asia.

Taiwan is strong in agriculture, and ranks 20th in world industry and trade . Industries include textiles, food processing, electronics, shipping, shipbuilding, machinery, oil refining, cement, and power. The economy is heavily dependent upon imported oil, and use of metals is rising. Cement is vital to the infrastructure.

Mineral imports and processing overshadow indigenous extraction. Large projects are often started by the State, and later turned over to private industry, such as coal mines, fertilizer plants, and cement plants. Taiwan has small coal mines, small - to medium - sized quarries, and medium to large industrial plants.

Taiwan's oil refining industry is a complex of downstream activities. The Kaohsiung refinery is rated at 230,000 bpd, and the new Taoyuan refinery at 250,000 bpd. CPC has six 100,000 - deadweight-ton tankers for importing mainly Middle East crude. The new CI&S KaohsiungSteelworks (fig 18), based upon foreign raw materials, will have an ingot capacity of 1.5 million tpy by 1977 and 6 million tpy by 1983. The 38,000 tpy integrated Taiwan Aluminum Works in Kaohsiung is being expanded to 70,000 tpy with the help of the French firm Pechiney.

Bauxite comes from Malaysia and Australia, and local caustic soda converts it to alumina. The cement industry with a dozen plants is booming, and output has risen 50% in 5 years. Annual capacity will top 11 million tons by 1977, to meet the needs of large construction projects. However, coal output has fallen from 5 million to 3 million tons in a decade.

Nonmetallics show fair prospects. Future coal supplies must come from abroad. Offshore oil has potential, but jurisdictional problems are difficult. Taiwan has good relations with Saudi Arabia. To cope with greater metal use, the policy has been to reduce import costs by smelting and processing foreign materials.

The geological Survey of Taiwan does geological research and mapping and publishes papers and maps and the bulletin of the Geological Survey of Taiwan. The address of GST is P O Box 1001, Taichung 400, Taiwan.

Mining, although relatively not an important industry (except for some quarrying) produces a fairly wide array of products including Coal, Gold, Silver, Copper pyrite, petroleum and natural gas, Salt Gypsum, Sulfur, Marble, Talo, Astutas, and Dolomite.

Population and currency

The population of Taiwan at the end of August 1976 was 16,353,000. Taipei, the capital and most important city has a population of 2,050,000. Three other cities, Kaohsiung, Taichung and Tainan have between one half and one million. Twelve others between 100,000 and half a million.

The unit of currency is the New Taiwan dollar and US$1.00 = NT$38.00.

B. GEOLOGY OF TAIWAN IN RELATION TO POTENTIALLY FAVOURABLE URANIUM BEARING AREAS

At the northern end of Taiwan is a small area of Quaternary andesite or basalt, and an even smaller outcrop of the same material appears almost in the center of the island. The island geology is characterized by a series of bands of geologic formation running more or less parallel to the long axis of the island and for its entire length. From west to east is a quaternary series, a series of Tertiary sediments, a Paleogene "Core" running the length of almost the center of the island.

A zone of undifferentiated Paleozoic metamorphic rocks, followed by another zone of various quaternary sediments parallelling the east coast of the island. A classic source rock is missing from the island, and gives the existance of a suitable classic host rock may be doubtful. However, there has been mineralization on the island, and even though conditions seem to be somewhat less than perfect, it is possible that some uranium mineralization also exists.

C. PAST EXPLORATION

There has been no known uranium exploration on Taiwan.

D. URANIUM OCCURRENCES AND RESOURCES

There are no known uranium occurrences on Taiwan and there have never been any uranium resources reported.

E. PRESENT STATUS OF EXPLORATION

No uranium exploration projects are known on the island.

F. POTENTIAL FOR NEW DISCOVERIES

There do not appear to be many places favourable for uranium deposition (all rocks are Tertiary or younger) but on the strength of existing mineralization on the island a category 1 (less than 1,000 tonnes U) is assigned for Taiwan.

Compiled by M V Hansen
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December 1977

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TAIWAN

AREA 35,980 sq km **POPULATION 16 million**