

The Mineral Industry of Burma

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Burma's mineral industry in 1967 showed but little growth despite potentially significant resources of some commodities and government plans for development of the industry. Recent statistics on production, trade, and reserves of mineral commodities have been sketchy. However, there was an increase in output of crude oil, one of the more important mineral activities although it fell short of the planned target, and imports of crude oil as well as some products were necessary to meet domestic demand. The Bawdwin lead-silver-zinc enterprise was undergoing mine and plant modifications during 1966-67 with a view towards increasing production and improving operations; meanwhile, output was at reduced levels. As a result of neglect of mining properties, tin and tungsten production continued to decline.

Overall mineral output in 1967 contributed about 1.5 percent to Burma's Gross National Product (GNP), compared with about 33 percent for agriculture. During fiscal 1966-67, the country's GNP was estimated at \$1,700 million.² Tax returns from minerals have been small; for minerals, the annual sum has been consistently less than \$1 million in recent years.

Approximately 52,000 workers out of a labor force of 10 million and a population of 25.8 million were reportedly engaged in mining during 1967. Burma has little power to support mineral industry activities; installed capacity at yearend 1966 reportedly was only 191,000 kilowatts.

Under the new 4-year national economic plan for 1966-67 to 1969-70, special attention was to be given to mineral developments, such efforts to be financed entirely from domestic sources. The outlook appeared uncertain, however, for any significant achievement in view of recent performance.

The fiscal 1966-67 budget for national mineral development showed increased

outlays by the Government: Expenditures planned for the People's Oil Industry were estimated at \$16.85 million in 1966-67 compared with \$9.56 million in 1965-66; for People's Bawdwin Industry Mines \$2.48 million in 1966-67 compared with \$270,000 in 1965-66; and for Mineral Development Corporation (MDC) \$2.3 million compared with \$1.18 million in 1965-66.

A large proportion of Burma's business sector is nationalized and only a little private foreign capital has been flowing into the country for industrial development. Nevertheless, the Government has shown a desire for foreign assistance, preferably multilateral aid under the Colombo Plan and/or from international organizations such as the United Nations, rather than bilateral aid. Total loans arranged for fiscal 1967-68 were reported at \$11.6 million, compared with \$6.66 million in 1966-67; while grants were \$1.85 million for 1967-68 compared with \$1.88 million in 1966-67. In 1967-68, the principal loans were expected to come from mainland China, East Germany, West Germany, and United States, and grants, from international organizations and the United States.

The Ministry of Mines formed a Geology, Petroleum, and Mining Advisory Council to last 2 years beginning January 2, 1967. Made up of the leading minerals men in Burma and headed by the Secretary of the Ministry of Mines, its primary functions are to advise the Minister of Mines on technical matters, submit long- and short-term plans for prospecting and extraction of oil, minerals and other resources, in accordance with available manpower, capital, and equipment.

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² Burma's fiscal year is October 1 to September 30. Where necessary, values have been converted from Kyats (K) to U.S. dollars at the rate of K4.73=US\$1.00.

PRODUCTION

Income from minerals in 1967, estimated at \$45 million, shows little change from previous record years. Output of some non-metallics and refined petroleum were at higher levels, whereas production of most nonferrous metals declined. Petroleum and natural gas accounted for almost half the 1967 mineral output value.

Most of the important mining firms were Government-controlled, and the few pri-

vate ones were handicapped by shortages of equipment and supplies. The ratio of public to private mine output was roughly \$19 million to \$6.3 million in 1965-66 and \$27.5 million to \$4.2 million in 1966-67. Thus, deemphasis of the private sector is further evident. The Government continued to maintain strict control of metal prices through marketing.

Table 1.—Burma: Production of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1963	1964	1965	1966	1967 ^a
Metals:					
Antimonial lead (18 to 20 percent Sb).....	578	530	560	^e 500	400
Copper matte (40 percent Cu).....	430	348	320	^e 236	340
Gold, refined.....troy ounces..	^e 200	^e 200	^e 200	^e 200	200
Iron and steel:					
Iron ore.....	4,250	5,000	5,000	10,000	NA
Steel ingot ^e	15,000	15,000	18,000	^r 21,000	NA
Rolled steel ^e	12,000	12,000	15,000	^r 20,000	NA
Lead:					
Concentrate (50 to 60 percent Pb).....	32,936	31,002	^r 32,253	NA	16,381
Refined metal (99.99 percent Pb).....	17,738	18,053	^r 16,000	^r 14,000	13,000
Manganese ore.....	200	NA	600	-----	NA
Nickel speiss (20 to 23 percent Ni).....	462	378	245	354	269
Silver, refined.....thousand troy ounces..	2,075	1,867	1,638	1,096	917
Tin concentrate (68 to 72 percent Sn) long tons..	795	830	664	355	346
Tin-tungsten concentrate (35 percent Sn and 30 percent WO ₃).....long tons..	1,284	957	606	^r 367	171
Tungsten concentrate (55 to 65 percent WO ₃).....	89	86	27	^r 45	95
Zinc concentrate (54 to 56 percent Zn).....	15,224	14,666	^r 14,255	^r 10,890	8,413
Nonmetals:¹					
Barite.....	1,930	NA	^r 1,760	^r 8,000	NA
Cement.....thousand tons..	124	131	^r 135	^r 141	140
Gypsum.....	8,350	9,150	450	^e 2,000	2,000
Limestone.....	97,300	107,000	116,500	^r 400,000	400,000
Marl.....	64,400	62,100	99,800	100,000	100,000
Salt.....	160,700	127,000	132,000	^r 118,000	169,000
Mineral fuels:					
Coal, bituminous ^ethousand tons..	^r 5	10	^r 15	NA	NA
Gas, natural.....million cubic feet..	597	NA	NA	NA	NA
Petroleum:					
Crude.....thousand 42-gallon barrels..	4,761	4,164	4,065	^r 4,255	4,500
Refinery products:					
Gasoline.....do.....	1,238	1,216	1,300	1,467	1,452
Kerosine.....do.....	854	923	1,050	1,478	1,398
Other ²do.....	1,280	1,356	1,450	3,021	3,402
Total.....do.....	3,372	3,495	3,800	5,966	6,252

^e Estimate. ^r Revised. NA Not available.

¹ Burma also produces a variety of semiprecious and precious stones, and minor quantities of talc, soapstone, fluorite, graphite, and clays.

² For 1963-65, diesel oil not included.

TRADE

Since 1963-64, the decline in overall exports has gone unchecked. Exports in 1965-66 were valued at \$194 million, 16 percent below the previous year, and those for 1966-67 declined 29 percent to roughly \$135 million. The mineral share for 1965-66 was about 5.4 percent of all exports, and that for 1966-67 was down to 4.3

percent, according to preliminary figures.

Data for 1964-65 showed that \$5.2 million of refined lead (about 14,900 metric tons), \$2.2 million of tin concentrate (about 800 tons), \$1.7 million of zinc concentrate (about 14,000 tons), \$1.5 million of refined silver (about 700 ounces), and \$1.3 million of mixed tin and tungsten

concentrate (about 780 tons) were exported. Almost all the zinc concentrate went to Japan, an important part of the lead went to India, and the bulk of the remaining commodities went to Japan, India, and various countries in East and West Europe. Breakdown data are not available after 1965. However, combined exports covering 1966 and designated as "metals and ores" were reportedly valued at just under \$10 million (K46.8 million) and totaled roughly 3,400 metric tons. According to similar 10-month figures for 1967, mineral exports had further declined rather sharply. A modernization program of the People's Bawdwin Industry during parts of 1966 and 1967 disrupted production and resulted in smaller quantities of most nonferrous metals to be available for export.

The level of imports into Burma, including minerals, has declined in line with government policies to conserve foreign ex-

change and to try, at least, to keep trade from becoming too unbalanced. The value of overall imports, at an alltime high of \$299 million in 1964-65, fell sharply to \$170 million in 1965-66. A further drop to \$141 million (provisional) was reported in 1966-67. Imports of mineral products during 1966-67, also generally less except for fuels according to preliminary figures, included \$11.1 million in base metals and manufactures thereof (compared with \$13.5 million in 1965-66), \$2.1 million in coal and coke (compared with \$1.28 million in 1965-66), and \$1.25 million in chemical fertilizers (compared with \$1.5 million in 1965-66). Data on fuel imports were not officially published in trade returns, but other sources indicated sizable imports of crude oil, lesser but significant imports of lubricants, and coal imports averaging 300,000 tons annually in recent years.

Table 2.—Burma: Exports of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1964	1965	Principal destinations, 1965
Metals:			
Copper:			
Matte.....	457	NA	(²)
Lead:			
Ore and concentrate.....	366	NA	(³)
Refined.....	* 16,000	* 14,000	India ⁴ 3,357; France 1,016; United Kingdom 356.
Silver..... thousand troy ounces..	1,619	901	United Kingdom 747; West Germany 125.
Tin and tungsten:			
Tin ore and concentrate long tons..	909	974	Spain 525; Netherlands 332.
Tin-tungsten concentrate..... do.....	59	231	All to Netherlands.
Tungsten ore and concentrate.....	415	376	West Germany 177; United Kingdom 127.
Zinc:			
Ore and concentrate.....	18,292	14,387	All to Japan.
Nonmetal:			
Gems, precious and semi-precious. kilograms..	1,135	307	Japan 224.
Mineral fuels:			
Petroleum:			
Crude..... thousand 42-gallon barrels..	NA	42	All to Italy.
Partly refined..... value.....	NA	\$552,000	All to Australia.
Refinery products:			
Lubricants.....	75	NA	(³)
Waxes.....	2,823	3,436	Italy 2,717.

* Estimate. NA Not available.

¹ Incomplete; compiled largely from import data of countries of destination.² All to West Germany in 1964.³ All to Japan in 1964.⁴ During April 1965 to March 1966.

Table 3.—Burma: Imports of mineral commodities ¹

(Metric tons)

Commodity	1964	1965	Principal sources, 1965
Metals:			
Aluminum:			
Unwrought.....	491	718	All from Japan.
Semimanufactures.....	1,953	292	All from Japan.
Copper:			
Unwrought.....	429	—	
Semimanufactures.....	351	890	West Germany 364; Japan 228.
Iron and steel:			
Primary forms.....	6,883	7,426	Japan 5,213; Italy 2,213.
Semimanufactures:			
Uncoated plates and sheets.....	5,027	12,432	Japan 8,311; United Kingdom 3,118.
Galvanized sheets.....	45,726	36,212	Japan 35,208.
Tinplate.....	13,124	13,097	All from Japan.
Other.....	13,750	21,852	Japan 16,004.
Zinc:			
Unwrought.....	300	712	All from Japan.
Semimanufactures.....	254	392	Belgium-Luxembourg 306.
Nonmetals:			
Asbestos.....	806	600	All from Canada.
Cement.....	2,165	1,280	All from West Germany.
Fertilizers, manufactured.....	9,425	25,500	All from Italy.
Sulfur.....	675	1,484	West Germany 775; Italy 609.

^e Estimate.¹ Compiled mainly from export data of source countries.

COMMODITY REVIEW

METALS

Iron and Steel.—Production of rolled products in fiscal 1965–66, at the Ywama steel mill in Insein, the country's only steel producer, was reported at 20,600 metric tons. Products included approximately 7,500 tons of bars and rods, 5,800 tons of sheets, and 4,000 tons of wire nails. The target for fiscal 1966–67 was some 29,000 tons of rolled products, but actual output probably was much below plan. Reported yearly capacity was 20,000 tons of steel ingots and 40,000 tons of rolled products.

Imports of iron and steel products in 1966 declined to approximately one-third the 1965 level. Japan accounted for the bulk of the imports, supplying 22,613 tons in 1966 and 77,830 tons in 1965.

An Iron and Steel Board was set up late in 1966 under the Minister of Mines for the express purpose of establishing iron and steel centers at suitable sites and to promote optimum use of Burmese resources, including iron ore reserves delineated in surveys by Krupp Industries of West Germany in 1963. At that time, known deposits were said to contain 66 million tons of iron ore; other deposits have been reported since then.

Lead, Zinc, Copper, and Silver.—Output from the People's Bawdwin Industry Mines,

Burma's sole significant producer of nonferrous metals, has been declining slightly in recent years. Output in 1967 from this world-famous, long-time producer of lead, zinc, silver, and byproduct copper matte, nickel speiss, and antimonial lead, was only about one-fifth the pre-World War II levels. Lead concentrates were shipped from the Bawdwin mine to nearby Namtu for smelting and zinc concentrates were exported, mostly to Japan. The bulk of the refined lead went to India and Europe.

Reserves as of October 1963 were reported at 2.26 million tons of ore averaging 15.1 percent lead, 9.2 percent zinc, 0.85 percent copper, and 11.2 ounces of silver per ton. Since then reserve figures have been revised various times, to take into account low-grade ores. The latest report, in 1967, indicated 6 million tons of ore analyzing 11.2 percent lead, 5.6 percent zinc, 0.3 percent copper, and 7.8 ounces silver. The tonnage may be of the right order, but actual grade may be lower than indicated.

As the result of recommendations from a United Nations Special Fund survey conducted by British, Canadian, United States, and Thai specialists, reserves were redefined (as noted above), operations were slightly improved, and suggestions were made for enlarging facilities. A program

for the expansion of the mill (from 160,000 tons of high-grade ore to 350,000 tons of lower grade ore annually) and the smelter was reportedly underway. It is not known, however, whether or not the smelter expansion plan was completed by the scheduled date of October 1, 1967.

Renewed interest was shown in copper deposits near Monywa in central Burma, about 110 kilometers west of Mandalay. Initial exploration begun in 1957 indicated large reserves (reportedly more than 100 million tons) of ore grading 0.5 to 1 percent copper. More recent studies are said to have confirmed 5 million tons averaging between 1 and 1.5 percent copper. The Burmese Government asked the Japanese Government and Japanese firms for assistance in developing the deposit and possibly for assistance in constructing a copper refinery on the basis of a joint venture. Japanese Overseas Mineral Resources Development Co. Ltd. was reportedly planning to make a study of the deposits. Other copper occurrences have been reported at Kalow and Bawsaing, in southern Shan State, but little data are available.

Nickel.—Nickel speiss production at the Namtu smelter in 1967 was much below the 348 tons reported for 1966.

Elsewhere, according to an unconfirmed report, a large nickel deposit of garnierite ore was said to have been discovered in the Mwehauk Mountain, Chin Hills. The ore zone is reportedly up to 300 meters wide and possibly 4.8 kilometers long. Reserves might be on the order of several tens of million tons of ore containing 0.5 to 3 percent nickel. Another nickel discovery with a large vein was reported for the Mawleik district, Snake Hill region, north of Kalembo. Both reports may be rumors, but Burma's nickel potential bears watching.

Tin and Tungsten.—Burma's output of tin and tungsten was hampered by lack of mining equipment and explosives, causing decreased output from the principal Government sponsored mines—Mawchi in southern Shan State, the Yawa lode tin mine, and the Kyaukmedaung mine. Only a few private, small tin and wolfram mines were in operation during 1967, and their leases will not be renewed. Miners had little incentive to develop mines owing to the Government policy of setting prices considerably below world market levels.

In mid-1966 the Government buying price was \$1,400 per long ton of concentrate compared with the average market value of \$2,330 per ton; in addition, there were often long delays in payments. Operating costs increased and replacement of equipment was difficult. Smuggling reportedly became rampant. The numerous routes across the border to the north and east made it difficult for the Government to control illicit traffic. Actual production of tin in 1966 and 1967 probably was considerably higher than officially reported.

NONMETALS

Fertilizer Materials.—Burma's fertilizer requirements for fiscal 1966-67 was about 100,000 tons (about three times the 1964-65 level), and the need in 1969-70 may be as high as 470,000 tons. Thus, sizable expansion of purchases and imports by the Government was anticipated. Major increases would come in ammonium sulfate, ammonium phosphate, urea, and superphosphate varieties. Hitachi Shipbuilding and Engineering Co. of Japan was awarded a contract in 1966 to build a natural gas based 40,000-ton-per-year ammonia and 60,000-ton-per-year urea plant at Pakokku; construction reportedly was underway in 1967. Another chemical fertilizer plant at Chauk was also being built with foreign assistance.

Gem Stones.—Burmese jade continued to be of some significance in world circles. Output in 1966 reportedly totaled 210,980 troy pounds (valued at K680,000 or \$144,000); production in 1967 was at least as much. Individual mines were licensed in areas where the Government was not able to operate. In theory, all privately-mined jade must be sold to the Government's Minerals Development Corporation; but many mines are in insurgent territory near the border, and some jade is presumably smuggled out of the country. The Government of Burma conducted its annual gem emporium in October, and stressed the fact that the marketing of jade, formerly held only in Hong Kong and Chinese gem centers, can also be done in Burma. In fact, much jade was cut and polished at a Rangoon plant built in early 1966.

Besides jade, Burma produced 36,600 carats of rubies, 61,200 carats of sapphires, and 27,000 carats of spinel in 1966, sub-

stantial increases over production of 1965. The combined value of these three gem stones increased from \$24,000 (K115,000) in 1965 to \$131,000 (K621,000) in 1966.

Other.—Burma is said to have several million tons of barite reserves and may be producing about 700 tons monthly; two veins in Pyittawye Camp, Kyaukse District may contain more than 100,000 tons.

During 1967, it was announced that beryl occurs in southern Shan States, bentonite in Myahnit of Shweb District, gypsum in Myingyan District, graphite near Mogok, and fluorspar near Bawhnington in southern Shan States. Several hundred tons each of clays, talc, soapstone, manganese ore, and fluorspar are said to be produced annually.

MINERAL FUELS

Coal.—The Kalewa coalfield in northwestern Burma produced 15,170 tons of low-rank coal during fiscal 1966. Geological studies in 1966 revealed several new occurrences, with initial reserve estimates totaling around 2.5 million tons. During 1967 government engineers were further assessing prospects at Kalaw and Inbyin areas of southern Shan State, and in Kyobin area of Katha district.

Petroleum.—Although Burma's oil production made a slight gain in 1967 to 4.5 million barrels, the country still relied on imports for an estimated one-fourth of requirements. A program was underway to achieve self-sufficiency by 1970, when requirements might reach 7.7 million barrels.

All production has come from fields in the central Burma basin (Chauk, Yenangaung, Prome, and Myanaung), with known combined reserves of 160 million barrels of oil as of October 1966, according to the chief geologist of the People's Oil Industry (POI). Individual field reserves were given as 105 million barrels for Prome and 26.5 million barrels for Myanaung. A new oil well near Myanaung was reported as producing 800 barrels per day, the highest figure for any well in Burma. Natural gas reserves of Burma were placed at over 4,000 million cubic feet.

POI continued to operate Burma's two oil refineries. The larger one, at Syriam, near Rangoon, is capable of refining 20,000 barrels per day on a 3-shift basis. In August 1966 it was reportedly refining crude oil at the rate of 11,900 barrels per day and principal products were gasoline (2,360 barrels per day), diesel oil (2,550 barrels), kerosine (1,900 barrels), and fuel oil (1,750 barrels). In March 1967 its daily crude processing rate reportedly was 13,400 barrels. As of August 1967, the refinery at Chauk was said to process 6,550 barrels of crude oil daily to produce gasoline (1,190 barrels), kerosine (1,180), diesel oil (1,750), fuel oil (1,070), and lesser quantities of other products. No aviation gasoline or lubricating oil was produced in 1967.

Although the Government does not publish information on crude oil imports, a report in June 1966 stated that the Government imported almost 1.5 million barrels of crude oil from U.S.S.R. and Indonesia in fiscal 1965. An August 1967 report stated that the POI called for bids for the supply of 130,000 barrels of crude oil and 600 tons of lubricating oils and greases. This presumably covers Burma's import requirements for fiscal 1968.

After the nationalization of the Burma Oil Company in 1963, the Government developed an oil exploration program for 1963-70, but this plan was abandoned because it was based on inadequate manpower and equipment and a new exploration plan was developed for 1966-80. The first objective of this plan is to make Burma self-sufficient in crude oil by 1970 through further developing existing fields. The second is to increase production to meet increased domestic requirements and provide a surplus for export (presumably primarily from existing fields). The third goal is to intensify exploration for new fields. In fiscal 1966, 16 wells were drilled for the total of 77,633 feet. Of the 72 wells planned for fiscal 1967, 55 had been completed as of August 1967. Accounts of the new plan stated that no foreign assistance will be used, although meanwhile Rumanian and Japanese advisers had been employed.