PAKISTAN

By S.A. Bilgrami Ph.D., AISM, FGS, FGS Am.
Associated Consulting Engineers-ACE (Pvt) Ltd, Karachi

Pakistan's GDP grew by 2.45% in 2002. Most sectors of the economy showed an upward trend although agricultural production continued to be affected by a severe, country-wide drought, and output declined by 2.64% compared with 2001, with production of some major crops falling by almost 10%. However, livestock production grew by 4.86% and forestry by 9.87%. Mining and quarrying output grew by 4.32% and manufacturing by 7.5%. Electricity distribution dropped by 11% but ownership of dwellings increased by 5.25%. The storage capacity of most dams (built 30-35 years ago) has decreased by about 30% owing to silting, but work on raising the Mangla Dam by 10 m has commenced in order to regain lost capacity.

The Geological Survey of Pakistan (GSP), geologically mapped an area of 18,635 km^2 on a scale of 1:50,000 in different parts of the country and the GSP carried out a 5,000 km^2 regional gravity survey in the Rahimyar Khan District. During the course of field investigations and metallogenic reconnaisance in South Balochistan, GSP geoscientists discovered several new and encouraging occurrences of manganese, chromite, iron ore, soapstone and magnesite in parts of Las Bela and Kuzdar Districts. These occurrences are to be investigated in detail.

Geological mapping of the Karachi metropolitan area on a scale of 1:100,000 has been published with a view to provide geological information on urban areas for land use, project planning, civil engineering, resources exploitation, assessment of natural and man-made hazards and other environmental aspects. A geological map of the Kalachitta Range in the northern Punjab has also been published on a scale of 1:100,000. The range occupies a very significant position in the lesser Himalayan foreland-fold and thrust-belt region in the collison zone between the Indo-Pakistan and Eurasian plates. The rocks and minerals of economic value that occur in the area include: fire clay, gypsum, laterite, dolomite, coal, limestone and building materials. Following the discovery of a good-quality aquifer in the Chiltan Limestone, the GSP has now extended its search for water work around the Quetta Valley in collaboration with the Balochistan Water and Sanitation Authority.

A shaft is being sunk in the Tharparkar Coalfield area to obtain a bulk sample of coal for combustion and geotechnical studies. The GSP selected four specific tracts, Blocks I-IV, for systematic evaluation of coal resources, and drilled 167 holes on a 1 km grid pattern. The GSP estimates that reserves in these four blocks are sufficient to generate 40,000 MW for 30 years.

Prospecting work on already identified base and industrial minerals areas in northern Pakistan is being continued by Pakistan Mineral Development Corp. (PMDC) which will soon undertake the development of soapstone and coal resources in the Kurram and Orakzai areas in collaboration with Frontier and

Tribal Areas Administration. A tourist resort has been developed at the more than 400- year-old underground Khewra Salt Mines. Details can be obtained from www.pmdc.gov.pk. During 2002, PMDC produced: 638,000 t of rock salt, 318,000 t of coal and 6,500 t silica sand.

In order to develop the zinc-lead deposits at Duddar in Khuzdar District, a Memorandum of Understanding (MoU) has been signed with Metallurgical Construction Corp. (MCC) of China which will have a 75% equity interest. Proven reserves at Duddar are estimated at 14.31 Mt averaging 8.6% Zn and 3.2% Pb.

Saindak Metals Ltd (SML) leased its copper-gold mines at Saindak in the Chagai District of Balochistan to MCC for ten yeas under an agreement signed in Beijing in November 2001. The assets of the project were transferred to the Chinese company, registered in Pakistan as MCC Resource Development Ltd (MRDL), on October 2, 2002, the date of the effective lease agreement. MRDL plans to start mining operations in early February 2003 after repairs and maintenance of heavy mining and workshop equipment. About 170 Chinese engineers, geologists, mining, and metallurgical engineers, equipment maintenance staff and miners, together with 400 former employees of SML, will operate the project. Ultimately 750 Pakistanis and 270 Chinese will be engaged in the project. Saindak has been declared an Export Processing Zone (EPZ) by the Government of Pakistan, thereby enabling the import of plant and equipment free of duty and taxes. Thus far, MRDL has imported two new 1 MW power-generating units, and has also started importing necessary spares for the mine, concentrator and smelter. Production of concentrates is expected to commence from March 2003 and blister copper by the beginning of June 2003.

Sindh Coal Authority (SCA) has commissioned Rheinbraun Engineering Co. of Germany to prepare a bankable feasibility for a 5 Mt/y mine and a 1,000 MW mine-mouth power plant in the Tharparkar Coalfield. The company will also undertake groundwater investigation for supplying the power plant. SCA has also invited pre-qualification applications from consultants to evaluate groundwater resources of the coalfield area for determining the quantity and suitability of this water for long-term domestic requirements of the project staff.

Exploration work by Shenhua Group of China in its prospective lease area of 50 km^2 in Block II of the Tharparkar Coalfield has commenced. The intention is to prepare a feasibility report for mining coal to serve two 300 MW coal-fired power plants. Exploration activity is being co-ordinated with the GSP and SCA. The Government of Sindh has signed a Memorandum of Understanding (MOU) with Middle East Link (Pvt) Ltd (MEL) of Australia for studying the possibility of underground gasification of Tharparkar coal. The company representatives have visited the site to collect available data and hold discussions with SCA.

Frontier and Tribal Area Development Corp. (FATADC) had to reduce its field exploration programme drastically last year because of financial constraints, and an area of only 135 km^2 was geologically mapped. However, efforts are

continuing to develop soapstone, marble, silica sand, dolomite and limestone deposits, all of which have been proved in economically workable quantities. A total of 59 mining leases and prospecting licences for various minerals were granted during the year, and 6,000 jobs were created as a result of the development of several quarries and underground mines for industrial minerals and coal. Expressions of interest have been invited through the local and international press to develop copper deposits in northern Waziristan, coal in Orakzai and soapstone in Kurram.

Bolan Mining Enterprises (BME), a 50:50 joint venture between the Government of Balochistan (GoB) and Pakistan Petroleum Ltd (PPL), has two projects, one for mining, grinding and marketing of barites from the Gunga deposits in Khuzdar District, and the other for developing the Dilband iron-ore prospect in Mastung District. During 2001-2002, BME sold 11,680 t of API grade barytes to petroleum exploration companies in the country. The first phase of evaluation of the Dilband iron-ore lease (13,660 ha) has been completed and 167 Mt of ore averaging 35-40% Fe content has been proved. Initially, the plan is to supply 100,000 t/y of selected, high-grade ore to Pakistan Steel Mills in Karachi, beginning in mid- 2003. A feasibility study for setting up a beneficiation plant will be undertaken shortly.

During the year, Azad Kashmir Mineral and Industrial Corp. (AKMIDC) carried out preliminary geological investigation of haematite mineralisation in the Rara-Muzaffarabad area. The work indicated lean ore and was abandoned. In the southern districts of Poonch, Sudhuntti and Bagh, geological mapping over an area of 2,400 km^2 has been completed and a final report is under preparation. As a result of detailed exploration and evaluation for precious and semiprecious stones in upper Neelum Valley, new zones of ruby mineralisation were discovered in the Nur Nari Gali, Doarian and Lawat areas. Further work is in progress. Small-scale mining of the Rangimali Ruby deposits in the upper Neelam Valley produced 20.8 kg of run-of-mine ruby which will be processed prior to auction. In April 2002, AKMIDC auctioned 51.7 kg of rough ruby and 6.5 kg of tourmaline. For the purposes of evaluation and reserve estimation of bentonite occurrences in the Dudial and Kathar areas of Mirpur District, 550 m of drilling were completed and 2,000 t were placed in the proven category.

Production

Of the 20 or so minerals for which production is officially reported, large increases were recorded in 2002 for bauxite (149%), chromite (225%), gypsum (35%) and soapstone (46.3%). Sulphur, produced by oil and gas refining, increased by 25%. Coal and rock-salt production increased by 6.4% and 46% respectively. Production falls were reported for gypsum (down 33.23%) owing primarily to the suspension of cement production for several months. Aragonite/ marble production declined by 14.2% owing to a lack of export orders. Demand for artificial fertilisers was drastically reduced because of the continuing drought throughout Pakistan. The production of urea, ammonium nitrate and nitrophosphate decreased by 9.06%, 18.8% and 12.8% respectively. Coke production declined by 30% but the output of steel billets rose by 6.67% as a result of higher imports of scrap iron.

Oil and Gas

During the year, 25 local and foreign oil and gas exploration companies were operative, and a total of 66 (32 exploration and 34 appraisal/development) wells were drilled for a total of 162,120.3m. Condensate was discovered in eight wells and gas in one. Six exploratory and three appraisal wells were being drilled at the end of the year.

Oil and Gas Development Corp. (OGDC) holds four concessions in its own name and 15 with other joint-venture partners. These 19 concessions are all operative. OGDC also holds 17 non-operated concessions with Pakistani and foreign joint- venture partners. During the year, OGDC carried out 2,282 line km of seismic survey and drilled 20 oil wells (49,062 m). Eight were abandoned and condensate was found in five. OGDC produced a little over 7.7 million barrels of oil 241,258 Mft^3 gas, 70,781 Mt of LPG and 18,488 t of sulphur from oil and gas refining.

The Hydrocarbon Development Institute of Pakistan (HDIP) continued its activities concerning quality control of petroleum products, and CNG assessed the development and petroleum potential of the Mubarik and Jhamat blocks of the Indus Basin. HDIP has established a national core repository aided by Canadian International Development Assistance (CIDA) along the lines of the Alberta Core Research Centre (ACRC). The aim is to extend geological and reservoir services to the industry in order to promote future exploration activities.

Table next page.

Mineral Production ('000 t)

Mineral	2000	2001	2002
Aragonite/marble	582.00	468.00	401.70
Agr. Clay	1,275.00	1,130.00	1,128.20
Barytes	21.23	27.15	26.10
Bauxite	8.67	5.88	8.76
Bentonite	13.85	10.65	11.22
Chalk	7.71	7.70	7.54
China Clay	49.57	55.57	54.36
Chromite	26.84	9.92	22.32
Coal	3,117.00	3,262.00	3,487.00
Dolomite	287.96	256.80	240.39
Feldspar	43.19	30.07	56.92
Fire Clay	143.64	152.92	153.55
Fuller's Earth	15.29	13.37	14.12
Gypsum	377.00	624.00	417.00
Limestone	9,884.00	9,607.00	1,481.00
Magnesite	3.61	3.03	4.43
Rock Salt	1313.00	1,393.00	1,387.00
Silica Sand	162.00	145.00	152.00
Soapstone	54.36	30.79	57.37
Sulphur	20.19*	17.18*	22.84*
Urea	3,887.63	4,162.03	3,747.60
Superphosphate	129.14	173.327	141.28
Ammonium Nitrate	377.44	360.43	292.81
Nitrophosphate	271.31	307.77	268.55
Cement	9,075.00	9,545.00	5,202.00#
Coke	725.30	713.55	681.95
Pig Iron	1,131.61	1,384.46	912.72
Billets	389.97	400.65	427.38

Source: Central Statistical Bulletin Vol.51. No.3. Figures for Calendar year. Jan-Dec.2002.

* From Oil and gas refining.

Six months production.