

COAL RESOURCES OF PAKISTAN

Well-developed coalfields of Pakistan are located in Punjab, Balochistan and Sindh and are situated in three distinct areas termed as coal provinces while there are coalfields in NWFP, which are being exploited on small scale. A chart showing position of reserves is at Annex-I.

1. SINDH COALFIELDS

Sindh province has total coal resources of 184 billion tonnes. The quality of coal is mostly lignite-B to sub-bituminous A-C. Brief description of two major deposits are given as under:

1.1 Thar Coalfield

A large coalfield, having a resource potential of about 175 billion tonnes, has been discovered at Thar in the eastern part of Sindh Province about 400 km South East of Karachi. The coalfield extends over 9,000 sq.km out of that 356 sq.km areas has been studied in detail by Geological Survey of Pakistan proving 9 billion tonnes coal in four blocks. The main coal bed thickness ranges from 12 to 21 meters at an average depth of 170 meters upper 50 meters being loose sand. The quality of coal has been determined on the basis of chemical analyses of more than 2,000 samples. The rank of the coal ranges from lignite-B to sub-bituminous-A. The weighted average chemical analyses of the coal samples from the entire Thar coalfield are as under:

Moisture (AR)	46.77%
Volatile Matter (AR)	23.42%
Fixed Carbon (AR)	16.66%
Ash (AR)	6.24%
Sulphur (AR)	1.16%
Heating Value (AR Btu./Lb.	5.774%
Heating Value(Dry)Btu./Lb	10,898
	*(AR; as received)

1.2 Lakhra Coalfield

The Lakhra Coalfield in Dadu District, Sindh lies 16 km to the west of Khanot railway station on the Kotri-Dadu section of the Pakistan Railways. It covers approximately an area of about 200 sq.km. It is well connected with Karachi and Hyderabad through roads and railways. Mining in the area is done underground. Three coal seams are established in the field but generally only the middle seam known as Lailian bed possesses the necessary persistence and thickness for consideration in large-scale mining. It shows a variation in thickness from 0.75 meter to 2.5 metres. Average thickness is 1.5 meter. Coal from Lakhra has an apparent rank of lignite – A to sub-bituminous C. The coal is dull black and contains amber resin flakes and about 30 percent moisture. Although it can be

extracted in large lumps, it dries to a moisture content of about 8 percent when brought to the surface. It tends to crumble on longer exposure to atmosphere and is often susceptible to spontaneous combustion. Analytical variations of the Lakhra coal are as follows:

Moisture	13.5 to 39.4 %
Volatile Matter	26.3 to 42.5 %
Fixed Carbon	20.7 to 39.2 %
Ash	7.4 to 25.0 %
Sulphur	1.8 to 6.5 %
Heating Value	2,570 to 4,260 K.Cal/Kg
	Average: 6,588 BTU/lb

Based essentially on the results of the initial exploratory work done by the GSP, more detailed exploration has been subsequently undertaken by PMDC, JICA, WAPDA and USAID. The total reserves of the deposit have been estimated to be 1328 million tonnes with 244 million tonnes measured 629 indicated and 455 tonnes inferred.

Average annual production of coal from Lakhra is over one million tonnes. Most of this production is used in the WAPDA power plant at Khanote, Sindh and in brick kiln industry.

1.3 Sonda-Jherruck Coalfield

Over one billion tonnes reserves of lignite quality coal have been assessed in Sonda-Jherruck coal field. Owing favorable location and developed infrastructure, two Chinese companies have expressed interest to conduct feasibility study for commissioning of 500 MW power generation units. The Govt. of Sindh has already issued LOI to a Chinese firm for conducting mining feasibility study whereas other Chinese consortium has visited the area and held negotiations with the Govt. of Sindh to acquire mining lease.

In case the feasibility study justifies commissioning of project, an investment of US\$ 500 million would be made by the Chinese consortium for establishment of coal fired power project of 500 MW. A quantity of two million tonnes coal annually would be mined to cater for the requirements of power generation units. A substantial income to the Govt. of Sindh would accrue in the form of royalty, besides, other economic activity.

3. BALOCHISTAN COAL FIELDS

The coal seams in Balochistan are found in Ghazig formation of Eocene age. The quality of the coal is sub-bituminous A to high volatile B bituminous. There are 5 known coalfields mostly lies around Quetta in Balochistan however, following are significant:

3.1 Sor-Range – Degari - Sinjidi

Sor-Range – Degari coalfield lies 13 to 25 Kms south east of Quetta covering an area of about 50 sq. kms. and is easily accessible through metalled road from Quetta. The

northern half of the field is known as Sor Range, Degari is situated at the southern end of the field. The thickness of the coal seam varies from 1.0 metre to 2.0 metres but in Sor- Range seam sections upto 5.0 metres have been encountered. The Sor-Range coal is of better quality with low ash and sulphur content. The quality of the coal is high sub-bituminous A to high volatile B bituminous. Following is average composition:

Moisture	3.9 to 18.9 %
Volatile Matter	20.7 to 37.5 %
Fixed Carbon	41.0 to 37.5 %
Ash	4.9 to 17.2 %
Sulphur	0.4 to 5.6 %
Heating Value	11,245 to 13,900 BTU/lb.

3.2 Chamalang Coal Deposit

These are the newly discovered coal fields which need detail exploration and development. Preliminary work done by GSP in these areas has indicated that it has a good potential. The quality of coal is also better as compared to the rest of Balochistan. The rank of the coal ranges from high volatile C bituminous to high Volatile A bituminous with a total resource of 6 million tonne. Its heating value is +12000 BTU/lb.

4. PUNJAB COALFIELDS

The Punjab coal provinces comprise the coalfields of eastern, central and western Salt Range between Khushab, Dandot and Khewra while Makerwal coalfield lies in Trans Indus Range (Sarghar Range). The rank of the coal is sub bituminous A to high volatile bituminous.

4.1 Salt Range

The Salt Range coalfield covers an area of about 260 sq. kms. between Khushab, Dandot and Khewra. The entire coal producing area is well connected with roads and railways. The top seam varies in thickness from 0.22 metre to 0.30 metre while the middle seam is upto 0.60 metre thick. The lower seam is upto one metre thick and is relatively of better quality. It is being mined in Dandot, Choa-Saiden Shah and adjoining areas. Punjab Mineral Development Corporation and several private companies are operating the mines in the area. Reserve of the deposit is 235 million tonnes. Average chemical analysis is following:-

Moisture	3.2% to 10.8 %
Volatile Matter	21.5% to 38.8 %
Fixed Carbon	25.7% to 44.8 %
Ash	12.3 to 44.2 %
Sulphur	2.6 to 10.7 %
Heating Value	9,472 to 15,801 BTU/lb.

4.2 Makerwal/Gullakhel

Makerwal/Gullakhel coalfield is situated in Sarghar Range (Trans Indus Range). The coalfield extends from about 3.2 kms west of Makerwal to about 13 kms. West of Kalabagh covering an area of about 75 sq. Kms. In Mianwali district. The quality of Makerwal/Gullakhel coal is better than that of Salt Range coal and is preferred by the consumers. Total reserves of the deposit is 22 million tonnes. Average chemical analysis is following: -

Moisture	2.8 to 6 %
Volatile matter	31.5 to 48.1%
Fixed Carbon	34.9 to 44.9%
Ash	6.4 to 30.8%
Sulphur	2.8 to 6.3 %
Heating Value	10,688 to 14000 BTU/lb.

COAL RESOURCES OF PAKISTAN

Province/ Coal field	Coal Resources (million tones)				
	<i>Measured</i>	<i>Indicated</i>	<i>Inferred</i>	<i>Hypothetical</i>	<i>Total</i>
<u>SINDH</u>					
Lakhra	244	629	455	--	1,328
Sonda-Thatta	60	511	2197	932	3,700
Jherruck	106	310	907	--	1,323
Others	82	303	1881	--	2266
Thar	3,407	10,323	81,725	80,051	175,506
Sub-Total	3,899	12,076	87,165	80,983	184,123
<u>BALUCHISTAN</u>					
Khost-Sharig-Harnai	13	--	63	--	76
Sor-Range/Degari	15	--	19	16	50
Duki	14	11	25	--	50
Mach-Abegum	9	--	14	--	23
Pir Ismail Ziarat	2	2	8	--	12
Chamalong	1	--	5	--	6
Sub-Total	54	13	134	16	217
<u>PUJNAB</u>					
Eastern Salt Range	21	16	2	145	235
Central Salt Range	29	--	--		
Makerwal	5	8	9		
Sub-Total	55	24	11	145	235
GRAND TOTAL	4,008	12,113	87,189	81,144	184,575