NEW COALFIELDS OF BALUCHISTAN, KHYBER PAKHTUNKHWA, FATA AND AZAD KASHMIR

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Abstract

Coal deposits are extensively developed in all the four provinces of Pakistan and also Azad Kashmir. Coal from different areas of Pakistan generally ranges from lignite to high volatile bituminous. These coals are friable, with relatively high content of ash and sulphur. Pakistan is ranked 7th internationally regarding lignitic coal reserves but unluckily importing coal. Due to energy crises and increasing population it is vital to discover new coalfields in order to meet requirements. As a result of research by Malkani in 2012 and Malkani and Mahmood in 2016 the total coal reserves of Pakistan increased upto 186,288.05mt with break up as Sindh 185457mt, Balochistan 458.72mt, Punjab 235mt, Khyber Pakhtunkhwa 126.74mt and Azad Kashmir 10.59 mt. Pakistan has huge coal reserves of 186,288.05 mt. Out of which 3479.86mt are proved, 12023.93mt are indicated, 56951.96mt are inferred and 113832.30mt are hypothetical. In **Balochistan** it is found in areas of Sor Range-Sinjidi-Deghari (54.5mt), Pir Ismail Ziarat (15.8mt), Khost-Shahrig-Harnai (86.4mt), Duki-Anambar (80.4mt), Mach-Abegum (22.7mt), Johan (0.5mt), and new coalfields of Chamalang-Nosham (100mt), Kingri K-T coal (81mt) and Eocene coal (1mt), Toi Nala-Ghoze Ghar (15.4mt) and Narwal (1mt). In Balochistan coal is mostly developed in a single stratigraphic position i.e., Toi Formation of Chamalang (Ghazij) Group of Early Eocene, except Aram-Kingri coalfields which are developed in Latest Cretaceous Vitakri Formation (coal, carbonaceous shale, green and red shale and quartzose sandstone). In **Khyber Pakhtunkhwa** coal is found in areas of Hangu-Orakzai (81mt), Cherat (7.74mt), and alongwith new coalfields like Gulakhel-Karak-Laki Marawat (30mt), Dara Adamkhel (3.75mt), Bagnotar-Kala Pani (3.75mt) and Shirani (0.5mt). In **Azad Kashmir** it is found in areas of Kotli-Tatta Pani-Nikial (8.72mt) and Seri Dara-Khila (new coalfield) Muzaffarabad (1.87mt). In Khyber Pakhtunkhwa and Azad Kashmir coal is developed in Latest Cretaceous-Early Paleocene Hangu Formation. Limited coal resources are also found in Permian strata of Western Salt Range and Jurassic strata of Reshit-Chapursun Valley of Gilgit-Baltistan.

The promising areas for new coalfields and foresight for further coal extension and exploration in Sindh (Kirthar Basin) represents that the deposition of coal slowly shifted toward east, so the Badin and Thar are most promising for both Paleocene and Eocene coal. Further the Precambrian, Paleozoic, Mesozoic and Paleocene of Indus basin was deposited under the influence of Paleo Vitakri river systems (east to west) while most of the Eocene and post strata of northern Kirthar (lower Indus), Sulaiman (middle Indus), Kohat-Potwar (upper Indus) and Khyber-Hazara-Kashmir (uppermost Indus) are deposited by Paleo Indus river systems (north to south or northwest to southeast). These river systems are main indicator for coal subsurface extensions. The Eocene coal of Sulaiman basin is originated from Paleo Indus River systems, so there are no chances of further eastward extension as into Punjab plain areas, however the K-T boundary coal of Vitakri and Hangu formations are significant for finding in the subsurface of Punjab Plain. In Multan a drill hole by Oil Company also shows 3m thick coal at depth of about 3km, this may be the K-T boundary Vitakri coal (Hangu coal). Further the Shinghar and adjoining areas of Karak, Laki Marwat and

Bannu basin of KPK and Isakhel-Mianwali plains in Punjab are significant for further subsurface Hangu (synonym of Patala) coal exploration.