Course: Natural Resources and Economic Development in Pakistan (6491)
Semester: Autumn, 2021

ASSIGNMENT No. 1

Q.1 Discuss physical division of the Indus Plains and highlight its agricultural potentials.

1. Land characteristics; which include the topography. Like, where and what types of certain mountainous regions, the deserts, green pastures etc exist in Pakistan.
2. Climate and atmosphere; which include wind types and patterns, heat budget of areas, Hydrological cycle and the distribution of precipitation.
3. Coastal characteristics; coastal length, see bed characteristics, mangroves, ports etc.
4. Finally, the environment; natural and man caused transformation, its conservation, types of pollution and its remedies, and severity of damage caused by environmental degradation, climate change, global warming to Pakistan and ways to ameliorate the situation.

The Northern and Western Highlands produced by the mountain building movement extended from the Makran Coast in the south to the Pamir Plateau in the extreme north. The Northern and Western Highlands cover most of Balochistan, NWFP, Northern Areas (Gilgit Agency) and parts of the Punjab. In the northern part of the country, the Hindu Kush mountains converge with the Karakoram Range, a part of the Himalayan mountain system. These ranges have a large number of peaks ranging from 6000 to 8611 meters above the sea level. Pakistan has the densest concentration of high mountains in the world: five peaks over 8,000 meters (26,000 feet) and 101 peaks over 7,000 meters (23,000 feet) above sea level within a radius of 180 kilometers (112 miles). Thirteen of the world's 30 tallest peaks are in Pakistan. The tallest include K2 (also known as Mount Godwin Austen), the second highest peak in the world at 8,611 m (28,251 ft), in the Karakoram Range; Nanga Parbat (8,125 m/26,657 ft) in the Himalayas; and Tirich Mir (7,690 m/25,230 ft) in the Hindu Kush. The western most parts of the **Himalayas** fall in Pakistan. The sub-Himalayas - the southern most ranges - do not rise to great heights (600 - 1200 masl). The Lesser Himalayas lie to the north of the sub-Himalayas and rise to 1,800 - 4,600 masl. The Great Himalayas are located north of the Lesser Himalayas. They attain snowy heights (of more than 4,600 m). The **Karakoram Ranges** in the extreme north rise to an average height of 6,100 m. Mount Goodwin Austin (K-2) - the second highest peak in the world - is 8,610 m and located in the Karakorams. The **Hindu Kush** Mountains take off the western side of the Pamir Plateau that is located to the west of the Karakorams. These mountains take a southerly turn and rise to snowy heights. Some of the peaks rise to great heights like Noshaq (7,369 m), and Tirich Mir (7,690 m). The **Koh-e-Safaid** Ranges have an east-west trend and rise to an average height of 3,600m. They are commonly covered with snow. Sikeram, the highest peak in Koh-e-Safaid Ranges rises to 4,760 m. Similarly, the elevation of **Waziristan Hills** ranges from 1,500 and 3,000 m. The **Sulaiman-Kirthar Mountain Ranges** extending from south of Gomal River, lie between Balochistan Plateau and the Indus Plains. On reaching the Murre-Bugti Hills, they turn northward and extend up to Quetta. Further south, they meet the Kirthar Mountains, which merge in to the Kohistan area of Sindh. The Sulaiman Mountains rise to an average height of 600 m that decreases southward. Takht-e-Sulaiman (3,487 m) and Takatu (3,470m) are the highest peaks of the Sulaiman Ranges. The **Balochistan**

Plateau is located west of the Sulaiman-Kirthar Mountains. Its western part is dominated by a number of sub-parallel ranges: the Makran Coast Range (600 m), and the Central Makran Range (900 - 1200 m). The highest peak Ras Koh, attains a height of 3010 m. The **Potwar Plateau** and the **Salt Range** region are located to the south of the mountainous north and lie between the Indus river on the west and the Jhelum river on the east. Its northern boundary is formed by the **Kala Chitta Ranges** and the **Margalla Hills** and the southern boundary by the Salt Ranges. The Kala Chitta Range rises to an average height of 450 - 900 m and extends for about 72 km. The main Potwar Plateau extends north of the Salt Range. It is an undulating area 300 - 600 m high. The Salt Ranges have a steep face towards the south and slope gently in to the Potwar Plateau in the north. They extend from Jhelum River up to Kalabagh where they cross the Indus river and enter the Bannu district and rise to an average height of 750 - 900 m. Sakesar Peak (1,527 m) is the highest point of the Salt Ranges. Many mountain passes cross Pakistan's borders with Afghanistan and China. Passes crossing over the mountains bordering Afghanistan include the Khyber, Bolan, Khojak, Kurram, Tochi, Gomal and Karakoram passes. The most well-known and well-traveled is the 56 kilometer long **Khyber Pass** in the northwest. It links Peshawar in Pakistan with Jalalabad in Afghanistan, where it connects to a route leading to the Afghan capital of Kabul. It is the widest and lowest of all the mountain passes, reaching a maximum elevation of 1,072 m (3,517 ft). The route of the **Bolan Pass** links Quetta in Baluchistan Province with Kandahar in Afghanistan; it also serves as a vital link within Pakistan between Sind and Baluchistan provinces. Historically, the Khyber and Bolan passes were used as the primary routes for invaders to enter India from Central Asia, including the armies of Alexander the Great. The **Tochi pass** connects Ghazni in Afghanistan with Bannu in Pakistan and the **Gomal pass** provides an easy access from Afghanistan to Dera Ismail Khan in Pakistan and the Punjab. Also historically significant is **Karakoram Pass**, on the border with China. For centuries it was part of the trading routes known as the Silk Road, which linked China and other parts of Asia with Europe.

Q.2 What do you know about major peaks, deserts, passes and Glaciers of Pakistan? Discuss.

Makran mentioned in some sources as Mecran and Mokrān, is the coastal region of Baluchistan. It is a semi-desert coastal strip in Balochistan, in Pakistan and Iran, along the coast of the Gulf of Oman. It extends westwards, from the Sonmiani Bay to the northwest of Karachi in the east, to the fringes of the region of Bashkardia/Bāšgerd in the southern part of the Sistān and Balučestān province of modern Iran. Makrān is thus bisected by the modern political boundary between Pakistan and Iran.

The southern part of Balochistan is called Kech Makran on Pakistani side and Makran on the Iranian side which is also the name of a former Iranian province. The location corresponds to that of the Maka satrapy in Achaemenid times. The Sumerian trading partners of Magan are identified with Makran. In Varahamihira's Brihat Samhita, there is a mention of a tribe called Makara inhabiting the lands west of India. Arrian used the term Ichthyophagi (Ancient Greek for "fish eaters") for inhabitants of coastal areas, which has led to a suggestion to derive Makran from the modern Persian term māhī khorān, meaning "fish eaters", but this derivation is considered "erroneous".

From the 15th century onward, the area was ruled by the Rind tribe which was headed by Mir Chakar Rind. Which led by Hooths and Khosags and in small particular part governed by Gorgeig and Sardarzahi. In the late 18th century, the Khan of Kalat is said to have granted sanctuary at Gwadar to one of the claimants for the throne of Muscat. When that claimant became Sultan, he kept hold of Gwadar, installing a governor, who eventually led an army to conquer the city of Chabahar some 200 kilometres to the west.

The sultanate held onto the Makran coast throughout the period of British colonial rule, but eventually, only Gwadar was left in the hands of the sultan. On the independence of Pakistan, Makran became a district within the province of Balochistan, with the exception of an area of 800 km^2 around Gwadar. In 1958 the Gwadar enclave was transferred to Pakistani control as part of the district of Makran. The entire region has been subdivided into new smaller districts over the years.

Pakistan has within its borders some of the world's highest and most spectacular mountains. Some of the famous mountain ranges of Pakistan are Himalayas, Karakoram, Hindu Kush, Sulaiman, Toba Kakar, Kirthar and Salt range.

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The Mountainous North covers the northern parts of Pakistan and comprises parallel mountain ranges intervened by narrow and deep river valleys. East of the Indus River, the mountain ranges in general run from east to west.

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Koh-e-Safaid and Waziristan Hills

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Sulaiman and Kirthar Mountains

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Balochistan Plateau

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Potowar Plateau and the Salt Ranges

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Mountain Passes

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historically significant is **Karakoram Pass**, on the border with China. For centuries it was part of the trading routes known as the Silk Road, which linked China and other parts of Asia with Europe.

Q.3 Discuss the natural resources of Pakistan and highlight its types and future potentials.

Resources like mineral, power, water and forest have a huge influence on the economic and social development of a country. Availability of natural resources is the necessary but not a sufficient condition of economic and social development. If a country is rich in resources and these resources are optimally used then there is more possibilities of economic and social development. Accordingly, there is positive relationship between natural resources and economic and social development.

MINERAL RESOURCES

The Pakistan Mineral Development Corporation (1974) is the responsible authority for the support and development of the mining industry. Gemstones Corporation of Pakistan Limited (1978) looks after the interests of stake holders in gem stone mining and polishing as an official entity. Baluchistan is the richest province in terms of mineral resources available in Pakistan. While recently Sindh discovered coal deposits in Thar. Khyber Pakhtoonkhwa is rich in terms of gems. Most of the mineral gems found in Pakistan exist here. Apart from oil, gas and some mineral used in nuclear energy purposes which comes directly under federal control mining of other minerals is provincial issue. Currently around 52 minerals are mined and processed in Pakistan.

1. Coal:

Coal which is also named as black gold is found into huge quantities in Thar, Chamalang, Quetta and other sites. Thar reserves are estimated 850 Trillion Cubic Feet. There is enough coal in Pakistan Thar area (though a part of coal is not of good quality) that it can be used for power generation for next 100 years without relying on other i.e. hydro / oil resources. Pakistan recently discovered one low and four low-to-medium quality coal seams in the Punjab. Low sulfur coal was recently reported at the Baluchistan and near Islamabad. Bituminous, sub-bituminous, and lignite coal have been found in Pakistan. About 80% of coal is produced by government and 20% is produced by private sector.

It is one of the oldest industries. Its major users are iron, steel and bricks industries. Coal reserves are estimated at 175 billion tons. This would equate to 618 billion barrels of crude oil. When compared to oil reserves this is more than twice the amount of the top four countries. If At KSA's current usage, the reserves would last more than 200 years.

2. Natural Gas:

Natural gas production is at a high level in Pakistan. Estimated reserves are 885.3 billion cubic meters (as of January 2009). Gas fields are expected to last for another 20 years. The Sui gas field is the largest, accounting for 26% of Pakistan's gas production. Gas deposits of Sui discovered in 1953. Daily production is 19 million cubic meters a day. Under the barren mountains of Balochistan and the sands of Sindh, there are untouched oil and gas reserves. Major users of natural gas areas are Karachi, Lahore, Faisalabad, Multan, Rawalpindi and Islamabad.

3. Crude Oil:

Pakistan's first oil field was in the late 1952 in Baluchistan near a giant Sui gas field. The Toot oil field was not discovered in the early 1960s in the Punjab. It covers 122.67 square kilometers (47.36 sq. mi). Pakistan Petroleum and Pakistan Oilfields explored and began drilling these fields with Soviet help in 1961 and activity began in Toot during 1964. Pakistan has more than 326 million barrels of oil the Senate was told on Wednesday 29 January 2009.

4. Uranium production:

Pakistan has a long history of exporting small amounts of uranium to the west. The Tumman Leghari mine in South Punjab, Baghalchur mine, Dera Ghazi Khan Mine and Issa Khel mines in, Mianwali District. Pakistan has recently used some in its own nuclear power and weapons programs. Pakistan produced about 45 tons of Uranium in 2006.

5. Mineral Salt:

Salt is being mined in the region since 320 BC. Khewra Salt Mines are among world oldest and biggest salt mines. Salt has been mined at Khewra since 320 BC, in an underground area of about 110 square kilometers. Khewra salt mine has estimated total of 220 million tons of rock salt deposits. The current production from the mine is 325,000 tons salt per annum.

6. Copper & Gold:

In Reko Diq, Baluchistan deposits of copper and gold are present. Antofagasta the company having possession of Reko Diqfield is targeting initial production of 170,000 metric tons of copper and 300,000 ounces of gold a year. The project may produce more than 350,000 tons a year of copper and 900,000 ounces of gold. There are also presences of copper deposits in Dasht -e- Kuhn, Nok Kundi, located in Chaghi district.

7. Iron Ore:

Iron ore found in various regions of Pakistan including Nokundi, Chinot and the largest one in Kalabagh (Less than 42% quality), Haripur and other Northern Areas.

8. Gems and other precious stones:

A number of precious stones are mined and polished for local as well as export purposes. The center point of this operation is Khyber-Pakhtunkhwa. These includes Actinolite, Hessonite, Rodingite, Agate, Idocrase, Rutile, Aquamarine, Jadeite, Ruby, Amazonite, Kunzite, Serpentine, Azurite, Kyanite, Spessartine (garnet), Beryl, Manganite, Spinel, Emerald, Moonstone, Topaz, Epidote, Pargasite, Tourmaline, Garnet (almandine), Peridot, Turquoise, Garnet (green, grossular), Quartz (citrin & others) and Vesuvianite. The export from these gems is more than 200 Million dollar.

Pakistan has modest quantities of petroleum and some large natural gas fields. The first oil discovery was made in 1915. Pakistan intensified the search for oil and natural gas in the 1980s and was rewarded with the discovery of a number of new oil fields in the Potwar Plateau region and in Sindh. A number of fields have been developed, particularly near Badin, in Sindh. Despite the continued search for new and richer fields (including

some offshore exploration and drilling), Pakistan has had to import increasing amounts of oil from abroad to satisfy growing consumption, making the country vulnerable to fluctuations in world oil markets. Most imports take the form of crude oil, which is refined into various products. Pakistan's refinery capacity well exceeds its domestic crude production. The oil sector is regulated by the Ministry of Petroleum and Natural Resources, and international oil companies are authorized to operate in Pakistan in cooperation with domestic companies.

The largest natural gas deposits are at Sui (on the border between Balochistan and Punjab), discovered in 1953. A smaller field, at Mari, in northeast Sindh province, was found in 1957. A number of smaller natural gas fields subsequently have been discovered in various areas. A network of gas pipelines links the fields with the main consumption areas: Karachi, Lahore, Multan, Faisalabad, and Islamabad. Although proven reserves are large, they have not kept pace with domestic consumption.

Coal mining is one of the country's oldest industries. The quality of the coal is poor, and the mines have been worked below capacity because of the difficulty of access; despite ample reserves, the country regularly imports coal.

Although energy production has grown faster than the economy as a whole, it has not kept pace with demand, and as a result there are shortages of fuel and electric power. The bulk of power requirements are provided by thermal plants (coal, oil, and natural gas), with most of the remainder provided by hydroelectric installations.

The generation, transmission, and distribution of power is the responsibility of the Pakistani Water and Power Development Authority (WAPDA), a public-sector corporation. WAPDA lost its monopoly over generation after Pakistan entered into an agreement in 1989 with a consortium of foreign firms to produce power from giant oil-fired plants located at Hub, near Karachi; the plants were completed in 1997.

Great progress, however, has been made in the development of the hydroelectric potential of Pakistan's rivers. A giant hydroelectric plant is in operation at the Mangla Dam, on the Jhelum River in Azad Kashmir (the part of Kashmir under Pakistani administration). Another such source is the giant Tarbela Dam, on the Indus River.

Pakistan has three nuclear power plants, the Karachi Nuclear Power Plant (completed 1972), the Chashma Nuclear Power Plant-1 (2000), and the Chashma Nuclear Power Plant-2 (2011). The Chashma plants are at Kundian, Punjab. Nuclear power provides only a tiny proportion of the country's total energy production.

Q.4 Write short notes on the following:

a) Human resources of Pakistan

Of all the resources in an organization, the human resource is one of the most important. In fact, it is arguably the most important. The development of this resource is necessary for the organization to grow.

In this sense, human resources development is about identifying, nurturing, managing, and using the abilities demonstrated by employees in order to help the company to attain its objectives. The human resources development management office in a company is in charge of this function and is there to create the right climate in the organization that the employees need to help them develop so that they can help the company to develop.

In the modern world, the human resource function of the organization, an entire industry, and the global workplace, in general, goes well beyond what happens in the office. While the human resources department will do its fair share of training employees, coming up with career development programs for them, planning for their success, and so on, there needs to be some kind of support in the education system to prepare candidates for the process altogether.

When a candidate receives some kind of training while in school that helps them to prepare for the job, then the job of the human resources department is made much easier because a lot less has to be invested in the training of an employee upfront when they join a company.

Obstacles Facing Potential Employees

There are two kinds of hurdles facing potential employees in the job market today. Either they do not have enough exposure to technology or they have too much exposure to technology. In the event that they do not have enough exposure to technology, they need computer education so that they are more comfortable with the kinds of technology that will be used in the modern workplace.

Human Resource Management in Schools

One of the greatest outcomes to come out of the economic recession of the years leading up to 2010 is the introduction of courses related to work readiness and human resource management in schools, both high schools, and colleges, across the country. Millennials and subsequent generations have grown up with social media and text messaging an so they tend to lack the necessary interpersonal skills they need in order to excel at interviews and when networking in social settings. Most HR departments today require candidates to complete their applications online and so the new basics of education are all about familiarizing students with computers and computer parts. Even government agencies have joined in by creating educational programs that make candidates ready for work.

The Impact of Human Resource Developments

Readiness for the Workplace

HRM education is finding inroads into the classroom, with high schools and colleges alike putting a lot of emphasis on the readiness of students for the workplace. Students who end up looking for jobs still need skills in English grammar and mathematics. However, they may find themselves failing despite having these skills if they are not adequately prepared for the sometimes harsh reality that is a rigorous work schedule.

These students have to be on time every day. They have to be ready to be criticized because their bosses won't be thrilled about every little thing they do, and they have to be ready to comply with a range of rules and policies set both within the companies where they will be working and by regulatory agencies.

Some school districts are going as far as forming advisory councils for career education. These councils are made of industry professionals and local businesses to help them create educational programs that are based on reality and are relevant to the kind of everyday work these students will graduate into when they are done with school.

Training for Soft Skills

Graduating at the top of your class is definitely a plus when you look for and finally get a job. You will be considered a first class employee. However, what if you're terrible at working with a team or you're such a perfectionist that you consistently get caught up in analysis paralysis and never get anything done? What if you can't compromise when you have to and so find it difficult to make hard decisions at your place of work? It goes way beyond the problems outlined above. Without the right soft skills, you may have trouble juggling many different projects at the same time and managing your time.

Soft skills are important in the workplace since they help you to effectively work with others and achieve a common goal. Human relations will happen wherever you go and students need to be educated on how to effectively relate with other humans. New employees should know how to interact with their colleagues and get along with them at their place of work.

Communication

With the internet a ubiquitous global tool, and other tools such as webinars, social media, Skype, Facebook, WhatsApp, and other forms of online communication being as rampant as they are, young people hardly understand person to person communication anymore. They don't understand the skills that used to underpin meetings and seminars, such as presentation skills, public speaking, making proper introductions and so on. And yet these are the very same skills that are still highly valued in the work environment of today and so the type that they need to know.

This isn't to say that the types of technology that young people are used to don't have their place in the workplace. They do, and millennials are more than qualified to use things like LinkedIn and collaboration software in their places of work. However, they also need to learn more traditional communication methods and skills in order to be more rounded employees at their places of work and therefore more versatile. Being skilled in many different methods of communication gives one candidate an advantage over another in the end.

Making Communities Work Ready

Local governments, as well as state governments, are using education as a tool to give them a competitive edge. The state of Georgia, for example, has the Ready to Work program, which it has used to assess the workforce in the state as well as train it in order to provide a pool of skilled labor that encourages organizations and businesses to move to the state for its talent.

Through such things as education, training, and job profiling, companies, individuals, and entire communities are now able to take advantage of assessments, training, and certification. The criteria and testing methods developed for the Ready to Work program can be used by schools to test students and certify them as ready for work long before they begin to look for employment. This certification brings comfort to human resources managers since they will know that a client went through the program and is ready to transition in the workplace environment.

b) Agriculture Resources of Pakistan

Pakistan is among the most urbanized countries of South Asia. As challenges mount, urban planning is gradually finding space in the policy discourse. This is the first of three blog posts on Pakistan's rapid urbanization. It discusses the pace of urbanization and the major problems associated with it. This will be followed by posts on how the government is responding to the challenges and how and whether the research community is engaged in seeking solutions.

With an urban population growing three percent per year, Pakistanis are flocking to cities faster than any other country in South Asia. By 2030, more than half of Pakistan's projected 250 million citizens are expected to live in cities.

The main drivers of Pakistan's urban growth are high birth rates and migration from rural areas. Migrants are attracted to cities for better jobs and improved access to basic services.

However, urbanization has inflated Pakistan's biggest cities so rapidly that they struggle to deliver public services and create productive jobs. Urban poverty is on the rise, **with one in eight urban dwellers living below the poverty line**.

As a result, Pakistan's cities contribute much less to the economy compared to other developing countries. Pakistani cities – inhabited by 38 percent of the population – make up around 55 percent of total GDP. India's urban population is 30 percent, with 58 percent of its GDP coming from cities. In Indonesia, urban population and urban share of GDP are 44 percent and 60 percent, respectively.

According to the World Bank, **Pakistan's urbanization is also 'messy and hidden'**: Messy from low-density sprawl and hidden as cities grow beyond administrative boundaries to include 'ruralopilises', which are densely populated rural areas and outskirts not officially designated as cities. Ruralopilises today are estimated to make up to 60 percent of urban Pakistan**[2]**. Such urbanization without an accompanying shift in economic patterns does not bode well.

Without better urban planning to accommodate rapid growth, cities have the potential to become hotbeds of discontent and unrest rather than engines of growth and innovation.

Following are the biggest challenges facing urban policymakers.

Q.5 Define the term 'coal resources of Pakistan'. How it contribute to the economy of the country?

Coal was first discovered across Pakistan and the rest of South Asia in the 1880s and was used by the British-owned railway companies under colonial rule. Later, post-colonial Pakistan had used coal to fule its industry from independence to the discovery of the Baluchistan's Sui gas field in 1952 and the Toot oilfield in 1964.

Pakistan's total coal resource is reported as some 185 billion tonnes, within which 'measured reserves' are 3.45 billion tonnes, 'indicated reserves' nearly 12 billion tonnes, 'inferred reserves' 57 billion and 'hypothetical resources' 113 billion. Clearly a high proportion of the quoted total resource has, at this point in time, a relatively low degree of geological assur- ance, being comprised of inferred reserves (lying within a radius of 1.2 to 4.8 km from a point of coal measurement) and hypothetical resources (undiscovered coal, generally an extension of inferred reserves in which coal lies more than 4.8 km from a point of measurement).

The World Energy Council in 2011 applied a recovery factor of 0.6 to the measured reserves, resulting in estimated recoverable amounts (in million tonnes) of 166 of subbituminous and 1904 of lignite.

Thar Coalfield

The discovery of low-ash, low-sulfur lignite coal reserves in the Tharparkar (Thar) Desert in Sindh province increase both domestic and foreign development interest in using the coal for a local coal-fired plant in Pakistan. President of Pakistan Economy Watch Dr Murtaza Mughal has said there are 185 billion tonnes of coal worth USD $25 trillion[7] In 2007, the Shenhua Group of China withdrew from a $1.5 billion Thar coal project because it considered the power tariff rate inadequate for power generation.[8]

In October 2009, the Sindh government set up a joint venture company — the Sindh Engro Mining Company —on a 40:60 ratio for exploration in Block 2 of the Thar area, done through international competitive bidding. The company planned to develop an open pit mine of 6.5 million tonnes per annum capacity initially which would be scaled up to 22.5 million tonnes per annum subsequently. Power generation would be carried out by Engro Power Gen. Initially, 1,200 megawatts would be generated and it would be raised to 4,000 MW. The first megawatt of electricity from Thar into the national grid was planned for 2015-2016. A licence had also been granted for an experimental project on coal gasification.[9]

In December 2009 the Karachi Electric Supply Company (KESC) signed a Memorandum of Understanding (MoU) with Oracle Coalfields, a company incorporated in England and Wales and primarily engaged in coal drilling, exploration, mining, and production, to set up a major coal-fired power plant fueled by coal to be mined at Thar Coalfields in Sindh. According to the MoU, Oracle Coalfields will own and operate the mine supplying coal to the power plant. A KESC release said the intention of KESC is to be one of the pioneers in tapping indigenous Thar coal reserves for power generation.[10]

The Sindh government in Pakistan signed a $30 million agreement with the World Bank for the Thar Coal and Power Technical Assistance Project (TCAP). However, in May 2010 Pakistani news outlets reported that the World Bank had withdrawn from the project. One anonymous government official stated that "major reasons for the World Bank's withdrawal from the project is lack of emphasis on Thar coal resources in our national energy policy and our failure to highlight these reserves as critical for our national security." One issue reportedly of concern to the World Bank was the resettlement of local people.[11]

In 2011, Sindh Engro Coal Mining Company's Chief Executive Officer Khalid Mansoor warned that delay in provision of infrastructure like water and transmission lines might jeopardise the $3.4 billion coal project at Thar. The joint venture between the Sindh government and Engro and is scheduled to produce 1,200-MW in the first phase by 2015-16 and 4,000-MW in the second phase by 2020. In a presentation on Thar coal to Prime Minister Syed Yousuf Raza Gilani in Karachi, Mr Mansoor said that lack of grant payment of Rs10 billion by the federal government had created financial difficulties for smooth running of the project. Thar Coal Energy Board Managing Director Ajaz Ali Khan endorsed the views of Mr Mansoor and said that the vital infrastructure projects for Thar coal development was needed by 2015, at an estimated cost of Rs148 billion.

Khan requested the prime minister to organise an international conference donors such as the World Bank, the International Finance Corporation and investors from China, USA, UK, Japan and the Middle East for attracting foreign direct investment in Thar coal projects.[12]

On May 14, 2011, Pakistan's Federal Finance Minister Abdul Hafeez Shaikh assured the Thar Coal Energy Board (TCEB) that the federal government would provide "all possible assistance and funding" for infrastructure development for the Thar coalfields. He gave this assurance at a meeting of the TCEB chaired by Sindh Chief Minister Syed Qaim Ali Shah, which gave an update on infrastructure development projects that included a water supply scheme of Makhi-Farash, transmission network, railway link, effluent disposal, etc. The meeting also discussed infrastructure projects that included a water supply scheme for Thar coalfields, a 296-kilometre-long road from Karachi to Islamkot via Thatta, and an airport at Islamkot with an estimated cost of Rs972 million.[9]

According to official sources, the chief minister emphasised that the development of Thar coal was the "central policy agenda of the government" and "indigenous resources could resolve the chronic energy problems of Pakistan for the next 100 years." TCEB, on the basis of recommendations of the committee, allocated coal blocks offered for bidding to various local and international bidding companies based upon the companies' financial strength, mining capabilities and project timelines. The chief minister noted that a fiscal incentives package for indigenous coal-based projects had been approved.[9]

On November 24, 2011, Science and Technology Planning Commission member Dr Samar Mubarakmand said the Thar coal project will become operational in December 2013 at a cost of Rs8.898 billion, with a foreign exchange component of Rs 5.847 billion.[13]

Type of coal found

Bituminous coal is a relatively hard and less sulfurus coal containing a tar-like substance called bitumen and would be burnt largely on domestic fires after being turned into coke fuel. Sub-bituminous coal is a coal whose properties range from those of lignite to those of bituminous coal and is used primarily as fuel for steam-electric power generation. It is set to fuel power stations and cement works in Pakistan.

Lignite is a low-grade, sulfurous coal that is generally used in modified industrial furnaces to generate heat for boilers, coke oven heaters, brick kilns, etc.

China to invest in Thar

Sino-Sindh Resources, a local subsidiary of Global Mining Company, is investing in Pakistan's Thar Coal Block-1 for coal mining and power generation of 900 Mega Watt (MW), signing an MoU with the government of Sindh for the project in September 2011. The company plans to invest US $4.5 billion until 2016. Thar Coal field would also be declared a Special Economic Zone, and mining would be started in April, 2012.[14]