

Physiographic region: The end product of south Asian structural and erosional history is summarized in the map of physiographic region which leaves in spate's work and accompanying key table. These regions provide a frame of reference for subsequent discussions.

1. **Baluchistan:** The arid basins and hills of Baluchistan from the eastern portion of the great Iranian Plateaus sharply marked off from the Indus plain by the kirthar and sulaman ramparts. In the north of the Gomol River may be taken as a rational limit beyond this the strongly trellised. Drainage patterns of Baluchistan are replaced by transverse direct to Indus, giving a distinctly different human astrologic emphasis.

1.1 **Intermountain Basin and ranges.** This plateau is uneven. Average height from sea level is 1000F to 3000F. In the central area the Quetta and Kalat hills are situated. This average height is 5000f. In the other side some hills in the direction of North West to south west. These are called chaghi and toba kakar hills. Hills are border line between Pakistan and Afghanistan. Prabvi and makran hills are in the central part of the plateau. In North West the famous desert Dushat is small tributaries flows towards Hamune Mashkhel. Its saltiest waters due to heavy evaporation many interior basins of the rivers Kuchi plain, lasbela and Dushat plain. This plateau is out of range from. Makran Coast Ranges is here and its average height 2000ft. Siahan range average height 1878ft. flow of water is underground Average rainfall 8'' annually due to cyclone. Important rivers Hub, Urali, Hengol and Dushat. Coal, Iron ore, gypsum, chromites are request. May out joint hotter month.

1.2

1.3 **Kirthar ranges:** there is marked contrast between ranges of either side of 66 E to the east massive lime stones, cretaceous Oligocene with some intrusion of Decan Lava age from great anticline bulges. Erosion has opened up anticlines but this arid climate and thirsty rock it has not progressed stage of inversion of relief. The most striking feature in the Kirthar wall rising from 4000ft in the south to nearly 8000 in the north and broken only by a few gorges such as those of the (Mula and Gaj) Mula remained in used Alexander's army with drawing. The capping of the kirthar is the massive spitangi limestone which also forms the Kalat plateau at 7000ft 8000ft. In the south ranges break down into the little scarps behind Karachi, and the triangular alluvial low lands the Purali occupied by Las Bela state.

2. **North west frontier Hill and sub mountain Indus:** In a broad sense the hills of the old "North west Frontier" are but the ragged fringe of Afghanistan. The clear trends of and massive structure of Baluchistan are absent north of the Gomal some extant there is corresponding human fragmentation. The majority of the people of north western frontier hills are of one ethnic stock, one language and one faith, Pathan, Pashto and Sunni Islam respectively.

The western boundary of the regions is of course arbitrary the Durand line the political boundary between Pakistan and Afghanistan, the eastern boundary from the Vale of Peshawar south ward is taken as Daman where the hills sinks under the basin along Indus. In the north spurs sunning down from the Hindukush/ Pamir/ Karakorum node.

The change of direction between the Karakorum and the Hindukush is presumably controlled at a direction, by the hidden out lines of the peninsular blocks. The long tongue of Afghanistan territory in the Oxus valley wahhan the buffer strip between Russia and Iran Empire.

Here the north boundary lies at 16000-24000ft on Hindukush watershed between yarkun and Chitral River and Gilgit. South from this watershed as far as Kabul river (220miles) the general trend is north east-south west of Tirich Mir in the north of chitral to 5000 to 6000ft. in the Mahamand Hills and Malakand ridge which separates the swat valley from vale of Peshawar. The far north is geologically Himalaya's territory.

This mountain area is garked by deep narrow valleys the town of chitral itself only 30 miles from Tirich Mir is less than 5000ft. the striking parallelism of the yarkhan, chitral-kunar, Punjkura and swat rivers to the middle Indus and their relation to the Kabul river.

South of Kabul river northeast/south west trend is intruded by the strong west/east laires of safedkoh ranges which reaches 15620ft. hills in the angle between the Kabul or Landai River and the Indus. This trend is perhaps a continuation of an outer Himalayas is from neighborhood of Jhelum gorge by the Kala Chita Dhār south of attack.

The whole area between the safeadKoh and the Tochi River is a triangle of arid hills up to Eocene limestone's and siwalic sand storm and up to Kurram valley.

In between Bannu and jamdola these seems to be an accurate arrangement to meet the spur of the north western Hills of the salt ranges nearly meet in the Pezu Gap between Bannu and D.I.Khan. In the eastern SouthWaziristan north/south trends of sulaman.

Sub mountain region Indus: This area describe as the sub-mountanec Indus range as

- a. Three plains of Peshawar, kohat and bannu
- b. Potwar plateau east of Indus
- c. Salt ranges

- I. The vale of Peshawar forms a semi circle of low land of some 2,200 sq miles hill-girt except in the east where only a low sandstone ridge separates it from the Indus.

The basin floor consist Attock slates, Vidhyan in age, but mainly buried deep in gravelly or clayey alluvium.

Perennial water from the two main rivers Kabul and Swat has long provided irrigation. The central basin is watered by upper and lower swat canals. The Peshawar areas is supplied by the Kabul canal and by the multipurpose Warsak Dam on the Kabul River which will ensure perennial.

The vale with its irrigated fields and famous orchards, its groves of willow, mulberry and tamarisk is a great oasis in the generally and northwest.

- II. The Kohat valley lies higher than Peshawar and Bannu around 1500ft and is much broken by west/east limestone ridges. The filling of the uneven lime stone floor varies from luestrike clays to gravel and boulder fans. There are many springs in the limestone, and the water table is generally high. The Tanda Dam on Kohat started in 11952 will allow perennial irrigation and supplement the small tanks formed by bunding the river heat watered by the relatively high rainfall 16” dominated in the past summer crops will be possible with extended irrigation.

- III. The Bannu lowland (500ft) covers some 1700 sq miles and entirely enclosed by hill except for the Kurram gorge through the section of the salt ranges west of the Indus and Pezu gap in the south into this basin connagethe Kurram. The Tochi and any hill streams, all much braided and with broad boulder stewnchannels.

Perennial irrigation is almost conforend to the tochi/kuram doab an oasis like the vale of Peshawar and supplied by a dam on Kurram above Bannu which was finished in 1962.

In the unirrigation parts of bannu, flat tailed sheep, camels and donkeys are reared, and wool is perhaps the most important commercial crop. Where mills have been

established to provide a local market for the wool-groves and yarn for the important cottage industry.

Potwar: Potwar plateau covers an area of 4000-5000 miles at about 1200-1900ft. there are a few outlying spurs of salt range in the south and in the north the Khair-e-Murat and the Kala Chita dhar with a very open cover of wild olives and bushes. But in general it is open undulating country developed on the merrily sandstone siwaliks and mantled by varying thickness of loessie silt most of hills and rivers are bordered by belts of intricately directed reverine land locally Khuddera. The stream is general deep owing to rejuvenation and of little or no use for irrigation; the agriculture is thus almost entirely depending on the rainfall of 15-25 inches. Soil of are often sandy or stony.

On the whole it is a hard land; symptomatic of gravel poverty is the fact that donkeys are often used for ploughing instead of bullocks. Irrigation is almost non-existent, but in many areas fields are carefully embanked to conserved soil moisture. The most favored are is the Chach a strip some 20 miles by 10 along the Indus northeast of Attack and really perhaps a continuation of Peshawar vale.

Here the soil is generally rich loamy and wells are numerous, wheat, maize, sugar cane and vegetation are grown and snuff tobacco is an extremely valuable cash crop. Prominent Pakistan oil, gas fields are here Khaur, Dhulian, Bilk sar, Mial, Tut are here. Rawalpindi and lowranepur have and expanding textile industry. Main rivers, Kurang, soan, Haro are here.

The Salt Ranges: The ramparts of the salt range, sinuous in outline the hills exceedingly complex in detail, sharply mark off the region from the cut of plains. They reach nearly 5000 ftat Sakesar, but in general are much over half that hight. The southern face is remarkably steep and dissected into jagged spurs and crasts separated by wild ravives for the most part an inteusly arid and for budding country, even through rain fall is higher than in the surrounding plains. North wards the hills sink more gently beneath the Potwar loess.

There are few picturesque lakes in solution or Aeolian hollows often very saline, Kalarkaharkhabaki and uchali. The north is divarsifi by scattered oleandess andwila olives but in south vegetation is spar. The salt range is flanked by the most intensely gullied khuddera bad lands; alternating with the overgrazed interfluves patches of torrent water rabi crops in a zone

transitional to the Thal. The main parts of salt mines are khewara, warchh, kalabaghetc are here; very prominent and famous for quality Katha, Dandot, and Maker wal are the chief producer of coal in Pakistan.

There is an ammonium sulphat factory at Daud Khel and emend plant. Some potash salts and large qualities of gypsum from the basin of the largest soda ash factories in subcontinent selica sand, chromites, Dolomite and iron ore is frequent in the range.