



YEAR BOOK

2020-21



GOVERNMENT OF PAKISTAN
MINISTRY OF ENERGY (PETROLEUM DIVISION)
GEOLOGICAL SURVEY OF PAKISTAN

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1. Introduction

Geological Survey of Pakistan (GSP) is an attached department of the Federal Ministry of Energy (Petroleum Division) with its headquarters office located at Quetta. As per charter, GSP is responsible for study of geology of the country in all pertinent details. With a balanced, efficient and competitive structure, GSP is capable to explore mineral resources and to undertake geological, geophysical, drilling and geo-technical investigations. During the recent years, the GSP's technical services were frequently availed by different organizations in public and private sector. The GSP also undertakes development projects to cater to immediate needs in the fields of geological mapping and mineral exploration.

1.1 Functions and Core Activities

- Geological mapping and other geoscientific surveys.
- Scientific investigations for an accurate understanding of the country's natural resources and their prudent management.
- Geotechnical investigations in connection with the construction of heavy civil engineering projects.
- Environmental and engineering geological studies.
- Geothermal energy.
- Description of onshore and offshore geological framework and understanding its formation, evolution and resource potential.
- Geo-hazard studies associated with earthquakes, volcanic activity, waste disposal, landslides, subsidence and recommendations for hazard prediction/mitigation.
- Provision of scientific support and technical advice for legislative, regulatory and management decisions of the federal, provincial and local governments.

1.2 Institutional Structure

The GSP was established in 1947 with the creation of Pakistan. The department is headed by a Director General. The technical and other activities of the department are planned and controlled by the Management Advisory Committee (MAC) with all Deputy Director Generals (BPS-20) and Directors (BPS-19) as its members under the Chairmanship of the Director General.

TABLE 1: REGIONWISE DISTRIBUTION OF GAZETTED AND NON-GAZETTED STAFF OF GSP.

S.No.	NAME OF OFFICE	GAZETTED	NON-GAZETTED	TOTAL
1.	GSP Headquarters Office, Quetta.	141	378	519
2.	GSP Regional Office, Lahore.	43	97	103
3.	GSP Regional Office, Karachi.	54	109	163
4.	GSP Regional Office, Islamabad.	26	53	79
5.	GSP Regional Office, Peshawar.	21	53	74
6.	GSP Regional Office, AJK.	4	13	17
7.	Geoscience Lab, Islamabad.	24	39	63
	TOTAL	313	742	1055

TABLE 2: CATEGORYWISE DISTRIBUTION OF GAZETTED AND NON-GAZETTED STAFF OF GSP

S.No.	CATEGORY	NUMBER
1.	Geologist	156
2.	Geophysicists	21
3.	Chemist	27
4.	Drilling Engineers	25
5.	Photogrammetrist	07
6.	Other Technical	08
7.	Administration and Accounts	09
8.	Technical Staff	313
9.	Ministerial Staff	132
10.	BPS 1-2 Staff	307
	TOTAL	1055

1.3 Budget and Finance

The GSP gets its annual budgetary allocation in the federal budget every year and additional allocation is gained from federal PSDP for executing development projects. The total budget of GSP for the year 2020-21 is 638.524 million.

FINANCIAL YEAR	2018-19	2019-20	2020-21
Rs. (In Millions)			
REGULAR BUDGET	582.296	582.00	612
DEVELOPMENT BUDGET	463.175	433.852	26.524
TOTAL	1045.471	1015.852	638.524

2. Activities, Progress and Accomplishments (2020-21)

Geological Survey of Pakistan (GSP) is an attached department of the Federal Ministry of Energy (Petroleum Division), collects and provides detailed information on the geology, & mineral resources of the country by carrying out different relevant surveys and exploratory drilling. The performance of GSP for the last Financial Year 2020-21, is given below.

2.1 Regional Geological Mapping on 1:50,000 Scale

Geology of Pakistan is characterized by the interaction of Indian, Arabian and Eurasian plates in different regions under different tectonic settings. This complex interaction has not only created sky scraping mountain ranges in the northern areas but concurrently fabricated significant geological and tectonic features in other regions of Pakistan.

GSP is the premier geoscientific organization of the country and has been implementing statutory obligation of geological mapping and other geoscientific surveys. During the year 2020-21, GSP has completed the regional geological mapping and mineral investigation (640 Sq.Km) on 1: 50000 scale of Sheikh Budin Quadrangle, Toposheet No 38 L/15 District Lakki Marwat and D. I Khan. (Completed).

2.2 Economic Geology

During this period investigations were carried out for the following Economic Geology project.

- Exploration of Rhenium and Rare Earth Elements Through optical and Geochemical studies from Porphyry Copper Deposit, Southern Balochistan, Pakistan.
- Evaluation of aggregate resources for construction material in Suleiman Range, District D G Khan.

2.3 Research Studies

- Geochemical Study of Soil, Road dust & ground water of Islamabad & its surroundings.
- Updating of geological map of Ranikot quadrangle, toposheet no 35 O/13 district, Jamshoro, Sindh.
- Updating & Digitization of the Mineral Map of Khyberpakhtunkhwa.

2.4 Geophysical Exploration

2.4.1 Magnetic & IP Survey

Exploration of Rhenium and Rare Earth Elements Through optical and Geochemical studies from Porphyry Copper Deposit, Southern Balochistan, Pakistan.

2.5 Chemical Analyses

Geological Survey of Pakistan has state of the art research facilities for geochemical analysis. Various methods have been developed for the analysis of different samples, ranging from solid fuel (coal) to water, ores to minerals and stream sediments.

Analyzed 258 samples by using XRD/DTA, ED-XRF, Scanning Electronic Microscope (SEM) EDS for 1491 estimations in GSP labs at Geoscience Lab, Islamabad, Quetta and Lahore.

2.6 Drilling Operations

Geological Survey of Pakistan undertakes drilling operations under PSDP and Annual Field Programs. During this period, GSP executed the drilling operation under PSDP project for coal exploration and completed Drilling of three boreholes (BNCP#01, 02 and 03) at Nosham area, District Barkhan has been completed to the cumulative depth of 778 meters, coal seams encountered at different depths. (under the PSDP project. Recently purchased new drilling rigs have been deputed on PSDP projects to boost the drilling operations.

2.7 Internships

Geological Survey of Pakistan is main stakeholder in mineral exploration and committed towards professional excellence, during, 2020-21, (10) internees have got internship in different offices of GSP.

2.8 Latest Publications

2.8.1 Technical Reports

- Raw Material Investigation and Evaluation of Limestone Resources for Cement Industry , Toposheet No 35 O/3, Lasbella and Malir Districts Balochistan and Sindh. (Information Release No. 1032).
- Morphology and Petrology of Columnar Jointed Basalts in Bela Ophiolites, Balochistan (Information Release No. 1033).

3. Public Sector Development Programmes (PSDP)

Following PSDP Projects executed during 2020-21.

3.1 Ongoing (PSDPs)

1. “Exploration and Evaluation of Coal in Nosham and Bahlol Areas, Balochistan” (2017-2021) (Total Cost: 42.318 Million).
2. “Geological Mapping of 50 Toposheets out of 354 Unmapped Toposheets of Outcrop Area of Balochistan Province” (2020-2023) (Total Cost: 127.595 Million).

1. “Exploration and Evaluation of Coal in Noshamand Bahlol Areas, Balochistan”

Objective: To prove the presence of coal, establish its grade and make a preliminary assessment of reserves through large-scale mapping, exploratory drilling and collection of representative samples for chemical analyses and petrographic studies in Nosham and Bahlol Areas.

Up to date Cumulative Progress:

Initial study of maps, toposheets, aerial photographs and satellite imageries has been completed. Data has been transferred from aerial photographs/satellite imageries onto toposheets. 100% Geological Mapping of Nosham area has been completed. Five stratigraphic sections have been measured. Purchased different field and lab items. Compilation of field data, analysed and integrated the data to prepare the required geological maps. Drilling of three borehole (BNCP#01, 02,03) at Nosham area, District Barkhan has been completed to the cumulative depth of 778 meters, coal seams encountered at different depths. Geological logging of exploratory borehole/logs has been completed. Geophysical Survey (Resistivity) has been completed in the project area. Compilation of geological maps and technical report is in progress and near to completion. The attained samples have been analysed. PC-IV has been completed and submitted to Ministry.

2. “Geological Mapping of 50 Toposheets out of 354 Unmapped Toposheets of Outcrop Area of Balochistan Province”.

Objective: To Geologically map the outcrop area in detail on 1:50,000 scale and to maintain database for future exploration of the occurrences of metallic and non-metallic mineral potential, dimension stones, aggregates and limestone reserves for the industry in targeted potential areas of Balochistan.

Up to date Cumulative Progress:

Initial study of maps, toposheets, aerial photographs and satellite imageries. Technical and Purchased committees constituted. Unmapped areas including parts of Chagai, Khuzdar and Lasbela Districts have been selected for detailed mapping based on mineral potential and geological complexity. Previous literatures and maps are being studied by the field parties about 40% technical work has been completed. Field Officers are busy to prepare the base maps of the areas. Field worthy vehicles are being checked/repared in the GSP workshop. Other preparations of geological field work are in progress. Reconnaissance

geological field work/mapping has been carried out in the District Khuzdar and surrounding areas. Sites have been identified on toposheets to collect geochemical stream sediments from Khuzdar. Shortly a field party will depart for field work in the Khuzdar District.

4. Future Plans

4.1 Major Activities are planned to be undertaken during FY 2021-22

4.1.1 Regular Field Projects 2021-22

- i. Regional Geological Mapping.
- ii. Mineral Exploration.
- iii. Geophysical Surveys/Exploration.
- iv. Geochemical Investigation.
- v. Engineering Geology/Geo-hazard studies.

4.1.2 Approved PSDP Projects 2021-22:

1. “Geological Mapping of 50 Toposheets out of 354 Unmapped Toposheets of Outcrop Area of Balochistan Province” (2020-2023) (Total Cost: 127.595 Million).
2. “Pakistan National Research program on geological hazards (earthquakes and landslides), data acquisition along active faults and identification of potential landslide hotspot zones” (2021-24) (Total Cost: 412.769 Million).

4.1.3. Proposed PSDP Projects 2021-22:

1. “3D Mineral Survey to Evaluate Potential Economic Mineral Resources of District Chagai, Balochistan.” (2021-2024) (Total Cost: 638.402 Million).
2. “Feasibility Studies for Up-Gradation of Geoscience Advance Research Laboratories (GARL), GSP, Islamabad.” (2021-2022) (Total Cost: 4.00 Million).
3. “Exploration of Mineral Resources and Geological Mapping of 25 Toposheets, Gilgit Baltistan.” (2021-2024) (Total Cost: 250.291 Million).