GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

RECORDS OF THE GEOLOGICAL SURVEY OF BANGLADESH

Volume I—Part 1

GENERAL REPORT FOR THE YEAR 1972–74

By

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Director General
Geological Survey of Bangladesh

1975

CONTENTS

	Pages.
INTRODUCTION	
ORGANISATIONAL MATTERS	1
Personnel	1
Development Schemes	1
Financial Allocations	2
Promotions	2
Education/Training Abroad	2
Resignations	3
Conferences and Delegations	3
Acknowledgements	3
REGIONAL GEOLOGY	4
Harargaj, Sylhet District	4
Surma Group	5
Bhuban	
Boka Bil	
Tipam Group	5
Tipam sandstone	
Girujan clays	
Dupi Tila Group	5
Lower sandstone	
Upper claystone	
Alluvium	6
Alikadam-Tuinkhiang, Chittagong Hill Tracts	6
Dacca-Tungi, Dacca District	7
Savar-Dhamrai, Dacca District	7
Chittagong	8
Cox's Bazar-Ramu, Chittagong District	9
GEOPHYSICS	10
ECONOMIC GEOLOGY	11
Glass Sand	11
Chauddagram, Comilla District	11
Noyapara-Chhatiain-Sahaji Bazar, Sylhet District	13
White clay	14
Limestone	15
Hard rocks	16
Miscellaneous	18
Co-ordinates of the places	18
APPENDIX I—Unpublished progress reports	19
APPENDIX II—List of Officers	20

GENERAL REPORT FOR 1972-73 AND 1973-74

INTRODUCTION

The Geological Survey of Bangladesh is an attached department of the Geological Survey Division, Ministry of Petroleum and Minerals, Government of the People's Republic of Bangladesh. The basic responsibility of the Geological Survey is to collect and disseminate geological information about the country so that the resources of the earth can be exploited and utilized by the people. To attain the above objective, the Geological Survey of Bangladesh carries out the following functions:

It undertakes systematic geological mapping of the country on suitable scales and conducts regional geophysical observations; carries out exploration activities including detailed geophysical studies and test drilling to find and assess deposits of minerals, industrial rocks, fuels and water resources; conducts geological investigations in connections with large construction projects; publishes the results of its activities in the form of maps and reports. The Geological Survey advises the Government in all matters relating to the geology and mineral resources of the country and also serves as the national repository of all data relating to these.

The Geological Survey of Bangladesh started functioning immediately after Liberation with the personnel and facilities of the Eastern Division of the then Geological Survey of Pakistan existing in Dacca. In some respects the facilities were better than those of many other 'Central' Government organisation branches at Dacca. The Geological Survey of Bangladesh had its own office Building—though inadequate for the requirements of the headquarters of a national geological survey department, and it had a reasonably well trained group of technical personnel in spite of some serious gaps in a number of specialized fields. In addition the then Eastern Division office had already started operating as an independent unit of the then Geological Survey of Pakistan, except for practically full laboratory support and limited administrative support from the headquarters office at Quetta. The serious shortcomings were the lack of laboratory facilities and the acute shortage of field equipment including transports.

The present general report relates to the activities during 1972-73 and 1973-74 (the operating year as also the fiscal year covers the period from 1st of July to 30th June). The very limited activities of the first half of calendar year 1972 are also covered. It is intended that from the next year, a general report will be issued annually. Technical reports will be published as and when a particular programme or project is completed.

In compilation of the present report, assistance was rendered by S. K. M. Abdullah and M. Rafiqul Islam, Senior Geologists, M. A. Maroof Khan and A. K. M. Shahidul Hasan, Geologists and A. Q. Khondaker, Research Officer

ORGANISATIONAL MATTERS

Personnel

It has been stated in the introductory remarks that the Geological Survey of Bangladesh started functioning with the personnel and facilities of pre-liberation Eastern Division of the Geological Survey of Pakistan available at Dacca. The office was headed by a Deputy Director-General and had a sanctioned strength in the gazetted rank of 32 geologists, 6 geophysicists, 5 chemists, 13 drilling engineers, 5 of other technical disciplines and 6 in administration, accounts and stores. It had another 298 supporting personnel—both technical and non-technical in the non-gazetted category. However, at the time of Liberation about 10 per cent. of the positions were vacant. In 1972 and early 1973 a series of discussions were held about reorganization of the existing set-up in order to have an effective national Geological Survey organisation with minimum of addition called for by resources constraint under the revenue head. In June 1973, the post of Director-General was created and in early 1974 the set-up of the Geological Survey of Bangladesh was approved with a strength of 38 geologists, 9 geophysicists, 7 chemists, 14 drilling engineers, 8 positions of other technical disciplines and 11 positions in administration, accounts, etc. in the gazetted category. The positions of supporting non-gazetted personnel were increased from 298 to 334.

Development Schemes

The Government recognised that the development of resources of the earth is a basic necessity for economic development of the country—and an important pre-requisite for development of such resources is the adequate geological knowledge of the country. It was realized that considerable geological work including of the country. It was realized that considerable geological work including exploration will have to be done on a priority basis—beyond the work to be covered under the routine programme of the Geological Survey of Bangladesh. Hence two development projects of the organization which had received the approval of the Government prior to Liberation was allowed to continue as on-going projects. The two projects are (1) Geological Exporation in Rangpur-Dinajpur Districts and (2) Geological Exploration in Bogra-Rajshahi Districts. The objective of the first one is to determine the potential resources like hard rock at shallow depth, economic mineral deposits in the basement rocks, and Gondwana coal basin with coal seams at mineable depth. The objective of the second project is also similar. In this area large coal deposits at 3000 feet depth from the surface and a very thick limestone bed at 1,600 feet depth have already been found. The proposed work will, besides other results, establish the geological control and extent of the deposits. The projects include procurement of some equipment and recruitment of the required personnel for the project work. Five other development schemes were also submitted to the Government for approval. The two high priority ones of these are (1) Development of Laboratory Facilities in the Geological Survey of Bangladesh, which as the name implies, aims at organizing the laboratory and field facilities essential for efficient operation of the organization, and (2) Geophysical Exploration in Bangladesh which has the principal objective of rapidly developing geophysical manpower and equipment facilities and accomplish regional geophysical coverage of an appreciable part of the country within a short time. The three other proposed projects are (3) Development of Exploration Facilities in Geological Survey of Bangladesh, for increasing the drilling capabilities of the organization; (4) Coastal Studies and Deltaic Research and (5) Geochemistry of Groundwater in Bangladesh.

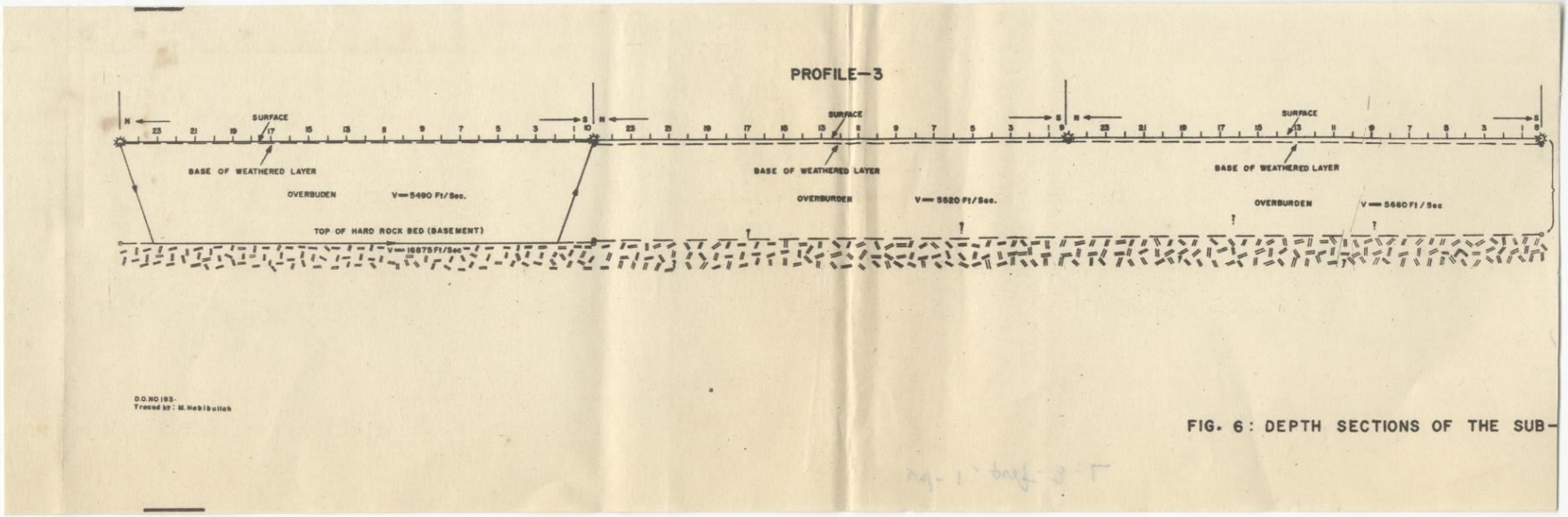

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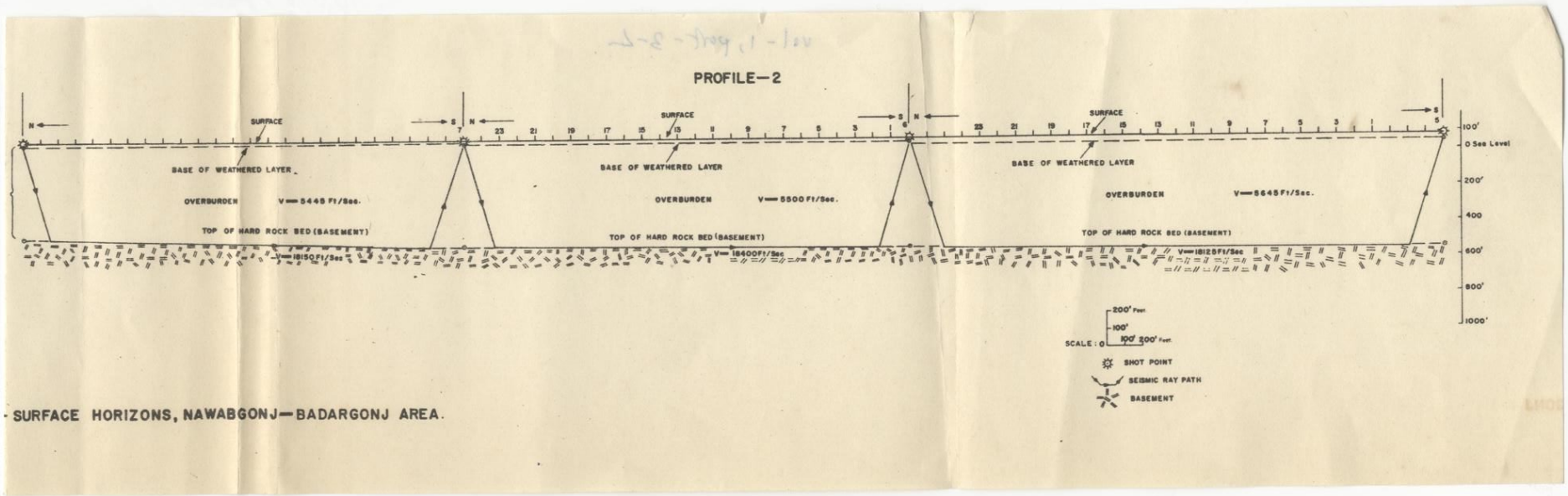
FIG. 6 : DEPTH SECTIONS OF THE SUB-



SURFACE HORIZONS, NAWABGONJ—BADARGONJ AREA.

PROFILE

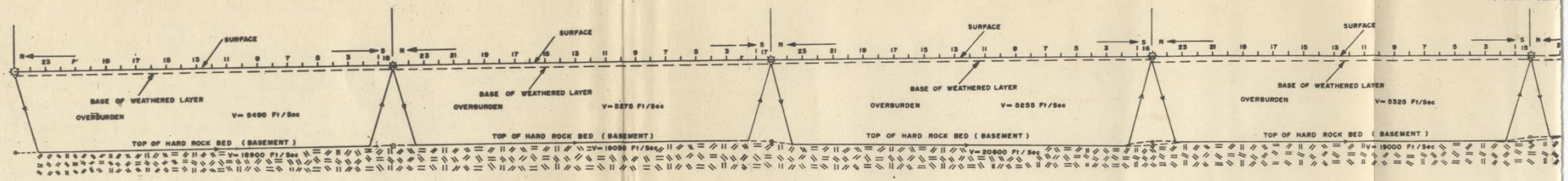


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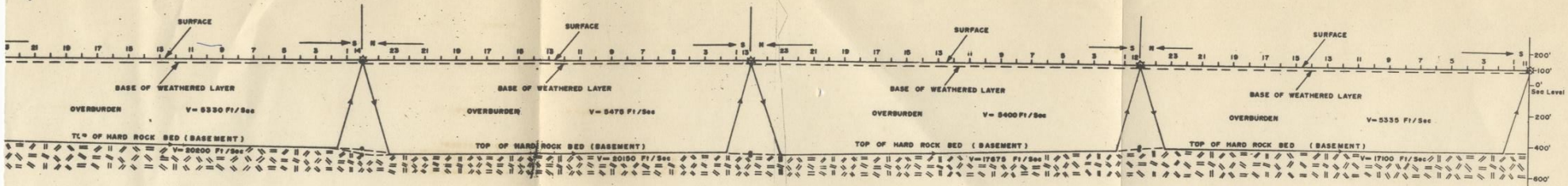
FIG. 7 : DEPTH SECTIONS OF THE SUB-SURFACE



HORIZONS NAWABGONJ—BADARGONJ AREA.

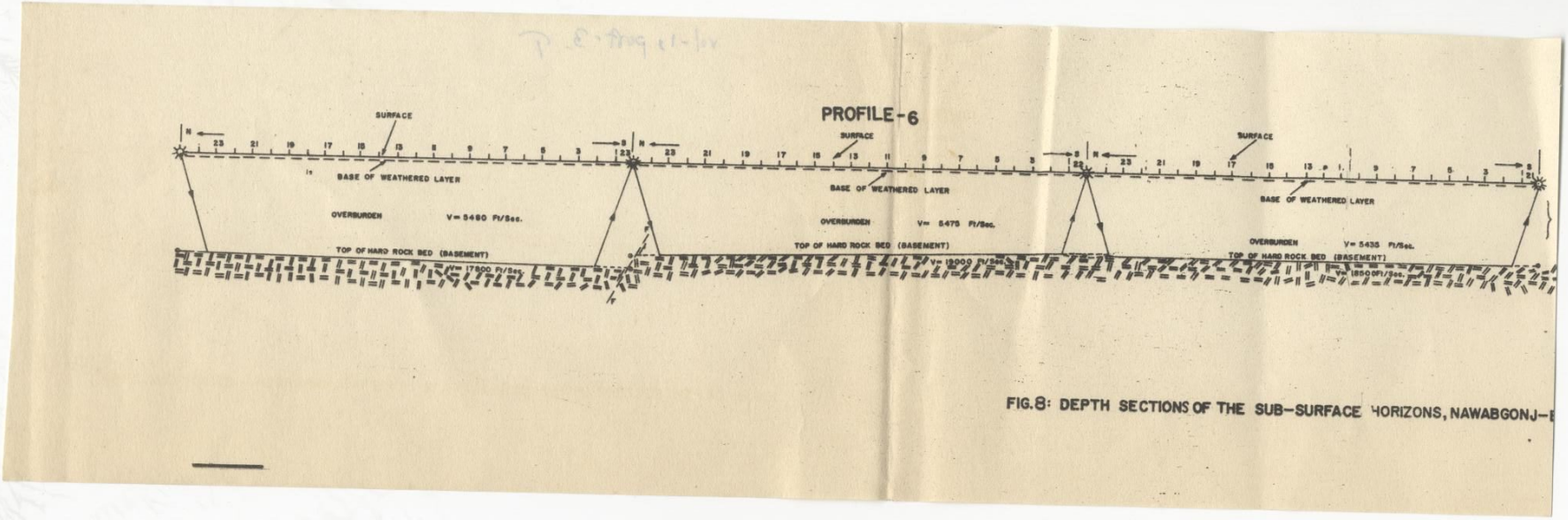
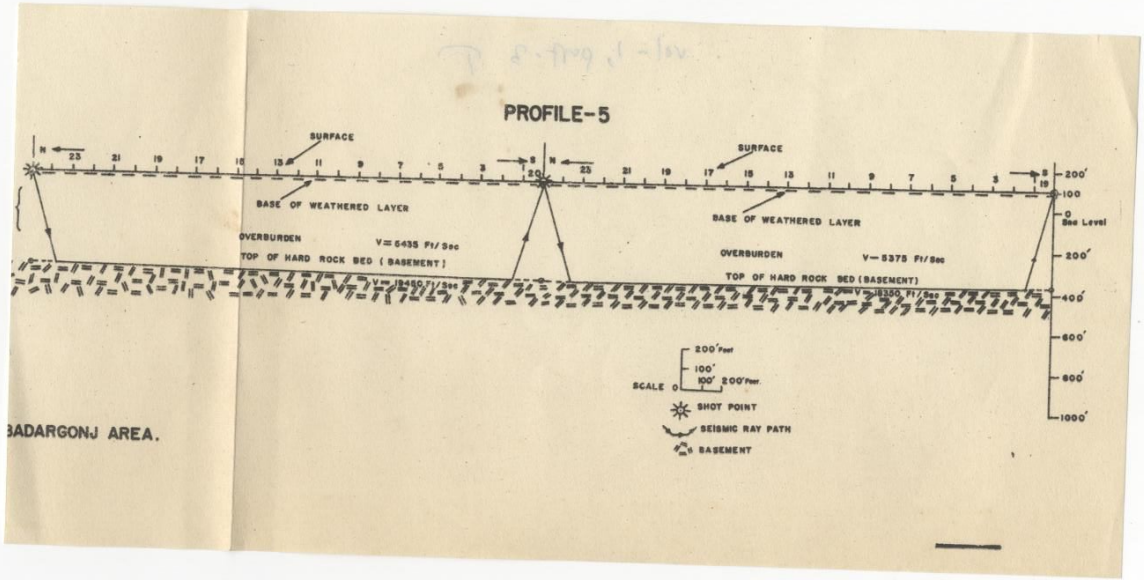


FIG.8: DEPTH SECTIONS OF THE SUB-SURFACE HORIZONS, NAWABGONJ-B



BADARGONJ AREA.

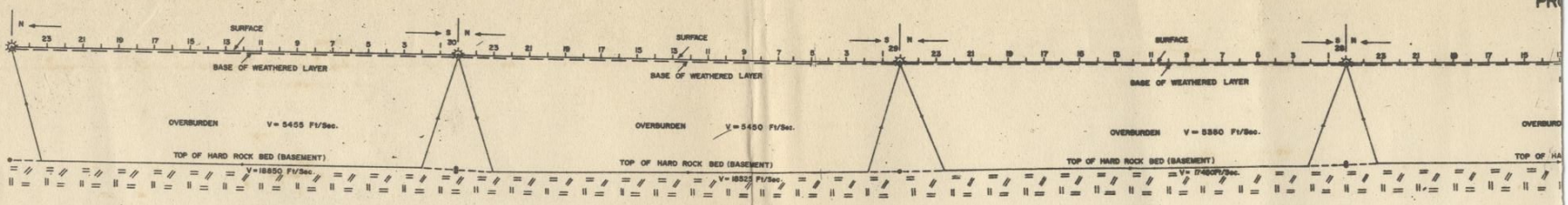
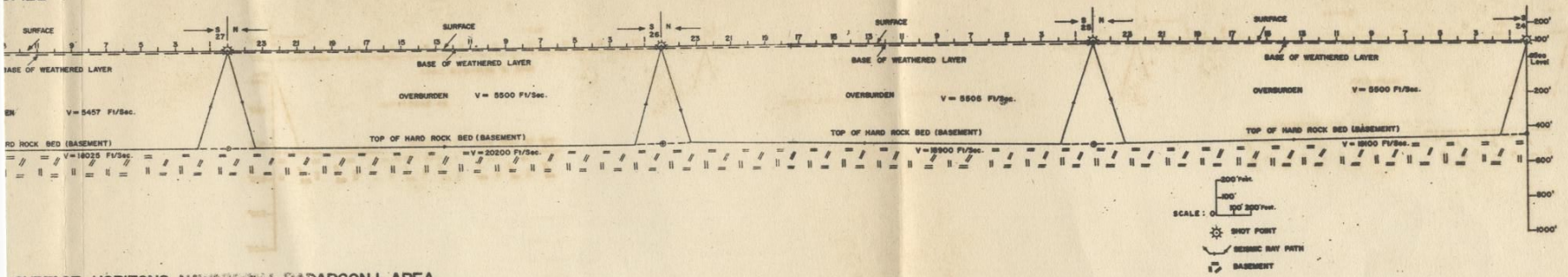


FIG. 9 : DEPTH SECTIONS OF THE SUB-



-SURFACE HORIZONS, NAWABGANJ-SADARGONJ AREA.

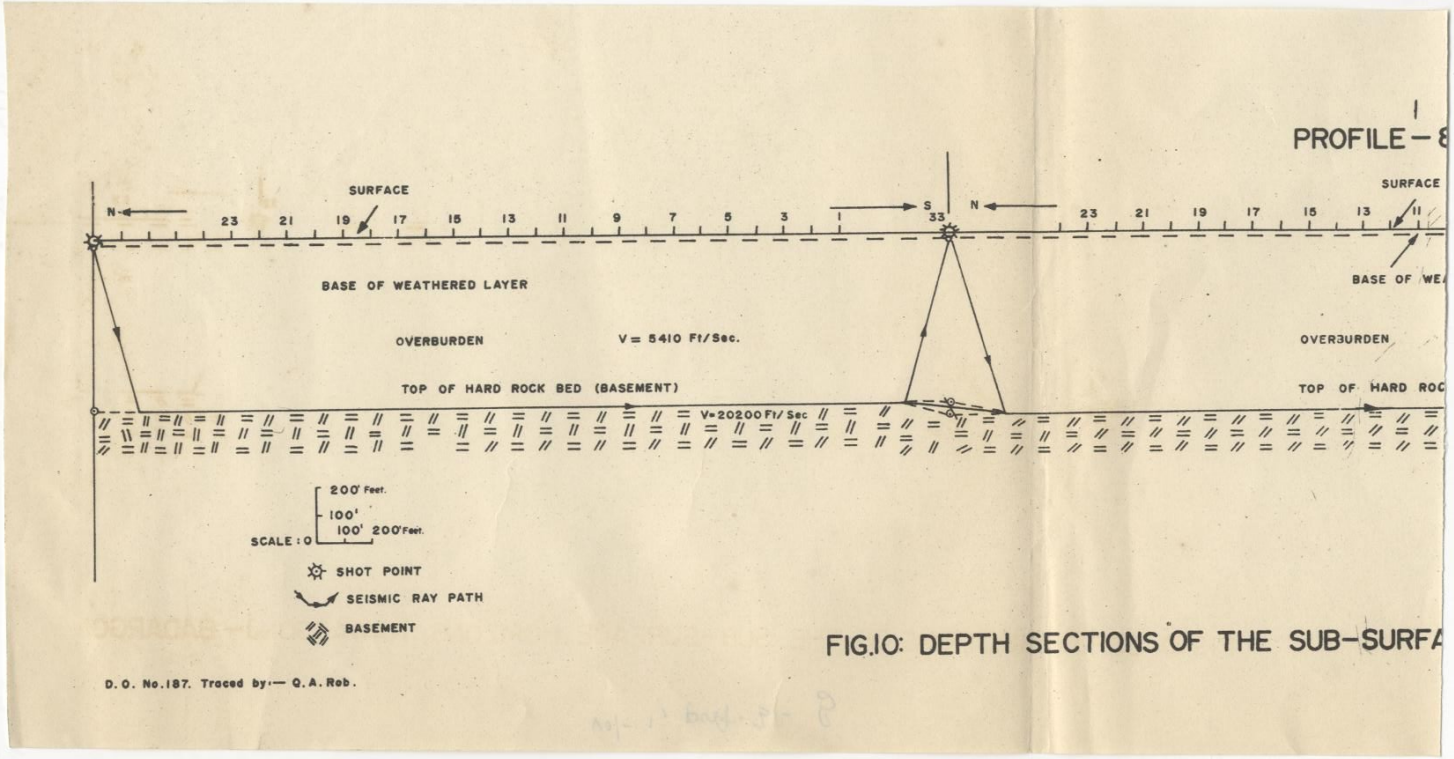
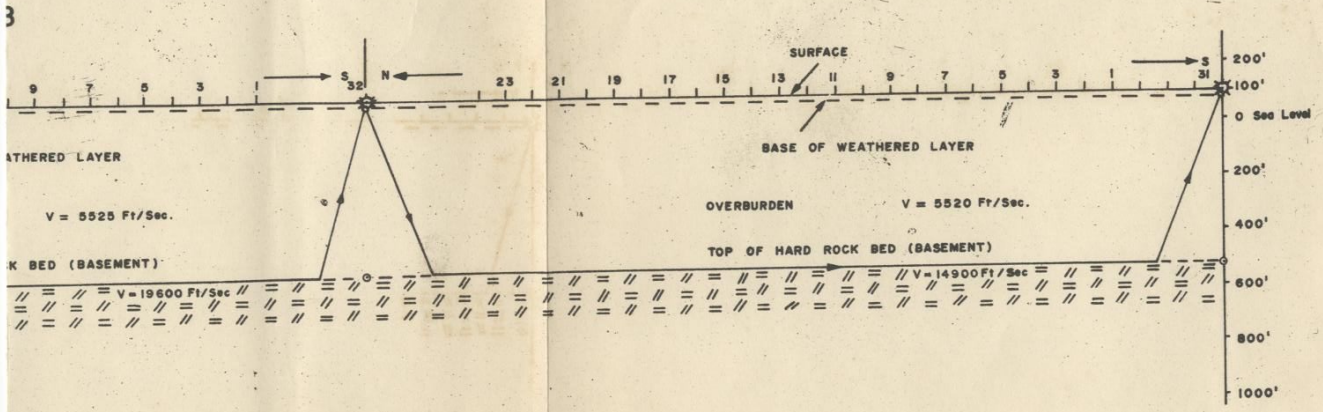


FIG.10: DEPTH SECTIONS OF THE SUB-SURFA



ACE HORIZONS, NAWABGONJ– BADARGONJ AREA.

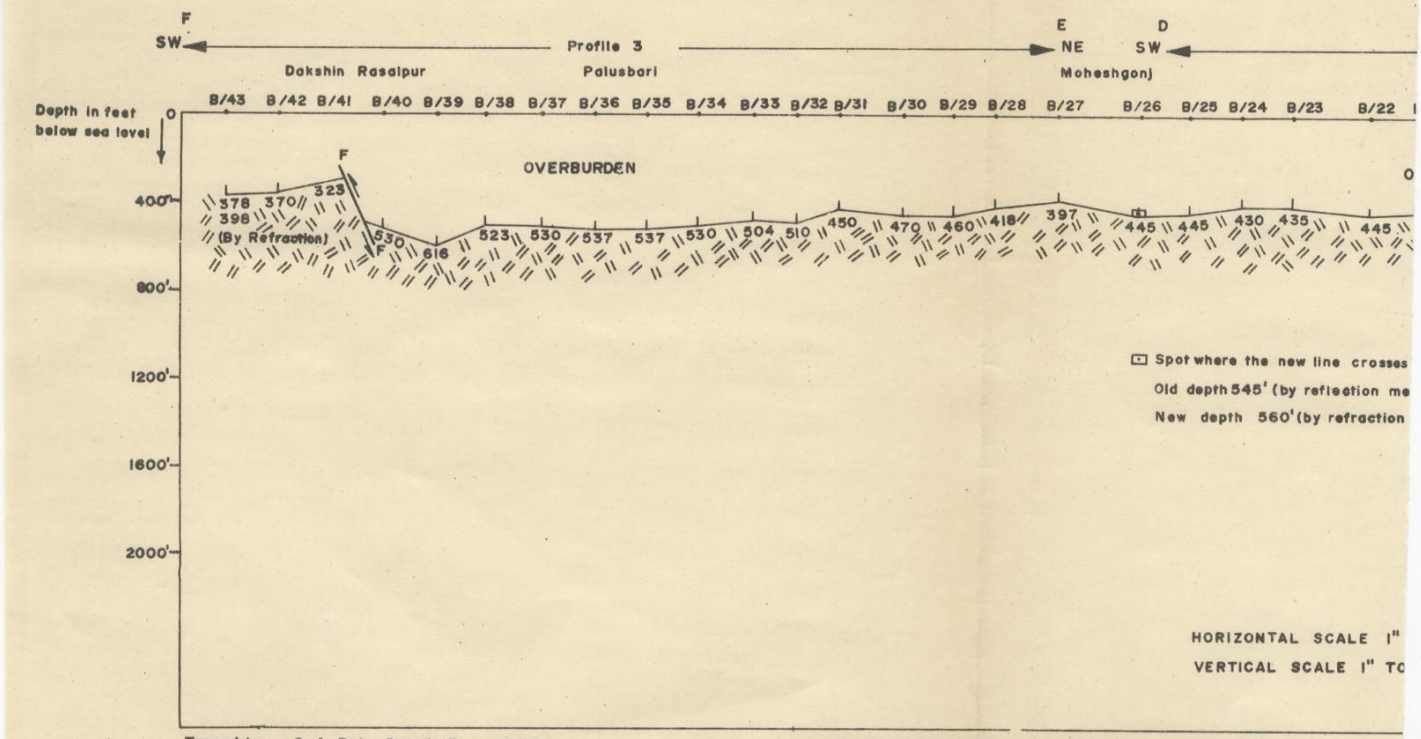


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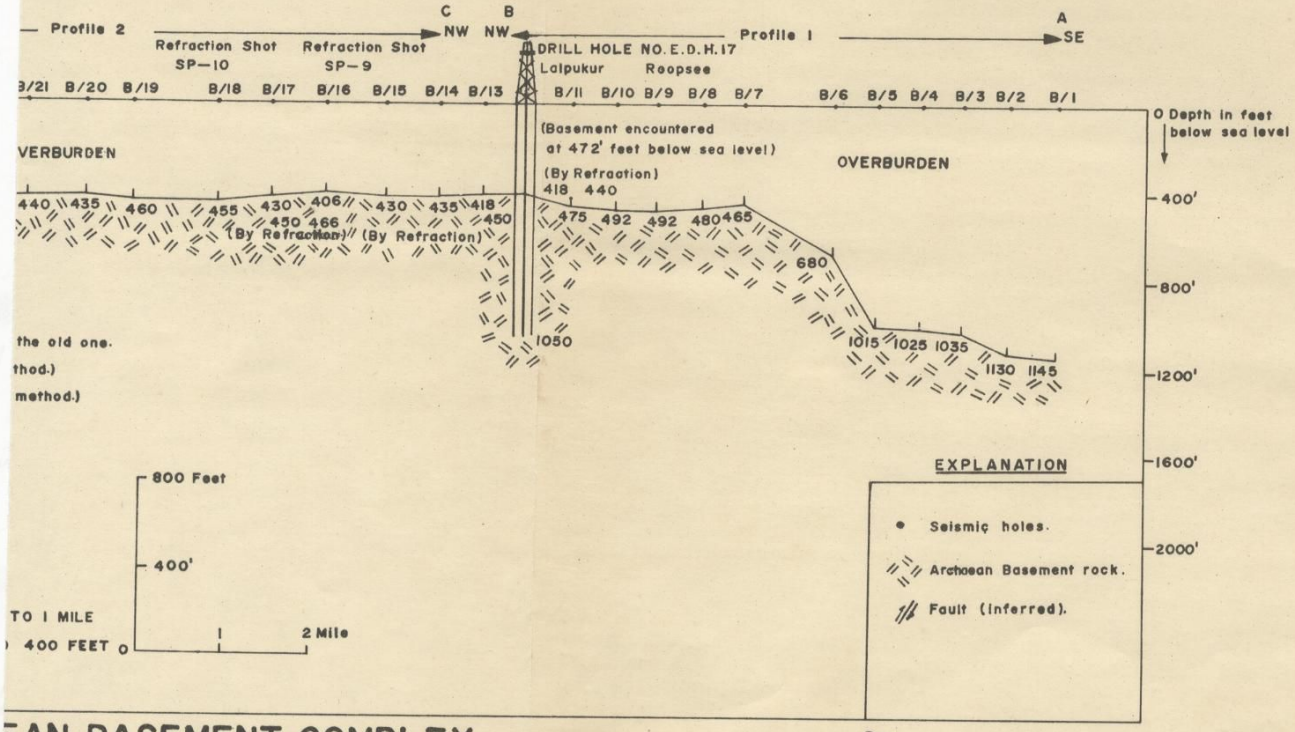
FIG. II-DEPTH SECTION OF ARCHAI
ALONG PROFILES A-B,



EAN BASEMENT COMPLEX,
, C-D AND E-F.

By:—
M. Anwaruddin Ahmed And
S.M. Nazrul Islam.
Surveyed in March, 68 to June 1968.
Prepared by:— M. A. Quader.

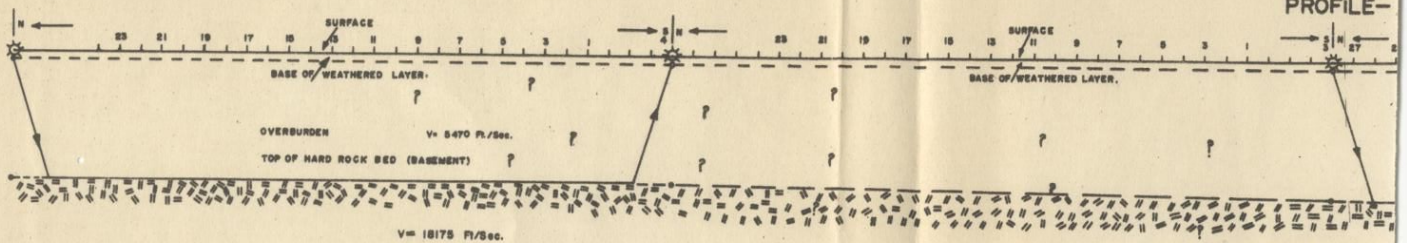


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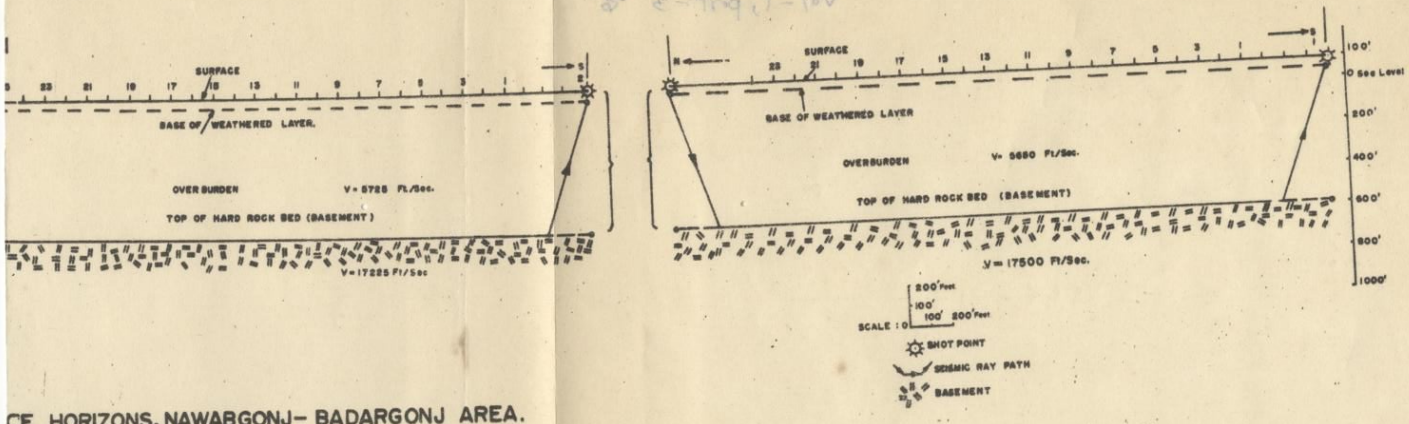
FIG. 5 : DEPTH SECTIONS OF THE SUB–SURFA



CE HORIZONS, NAWABGONJ– BADARGONJ AREA.

Financial Allocations

Allocations under the revenue head for the routine activities of the Geological Survey of Bangladesh were Taka 20,86,000 during 1972-73 and Taka 19,56,000 during 1973-74. The allocations for development schemes were however nominal. In 1972-73 Taka 5,00,000 cash foreign exchange allocation was received against the two on-going projects and was utilized for procurement of some geophysical and drilling equipment. Local currency allocation of 8,00,000 in late 1973-74 was utilized for customs duty and other charges in connection with the import of the above mentioned equipment.

Promotions

Mr. M. Ahmed who was holding charge of the organisation from the date of Liberation was appointed Director-General from June 5, 1973.

Mr. S. F. Bari was promoted to the post of Director/Superintending Geologist with effect from 10th October 1973.

Education/Training Abroad

Mr. Mujibur Rahman Khan, Geologist, was awarded a Government of Yugoslavia scholarship for post-graduate studies and left for that country on 25th September 1973.

Mr. M. A. Ghani, Geologist, remained in New Zealand throughout the period under review for completion of Ph. D. degree in Geology in the Victoria University, Wellington.

Mr. Mohammad Ismail, Assistant Geologist left for U.S.S.R. on 17th August 1972 for higher studies in Geology with a U.S.S.R. Government scholarship.

Mr. S. M. Nazrul Islam, Assistant Geophysicist returned from Canada on 9th September 1972 after obtaining a M. S. degree in Geophysics from the University of Manitoba, Winnipeg, and again left for Canada on 9th April 1974 on a two year study leave for completion of Ph. D. Course in the same University.

Mr. Jalaluddin Mondal, Chemist, left for Australia on 9th March 1974 for advanced studies in Analytical Chemistry with a Colombo Plan scholarship.

Mr. S. F. Bari, Superintending Geologist, attended the International Training Course on Mineral Exploration and Administration in Australia from 28th April 1973 to 17th July 1973.

Mr. M. Abu Bakr, Superintending Geologist, attended the short course on Remote Sensing and Earth Resources Technology Satellite Image Interpretation at EROS Centre, Sioux Falls, U. S. A. from 30th May, 1974 to 28th June, 1974.

Resignations

The following officers resigned from service in the Geological Survey of Bangladesh effective from the date shown against each :

1. Mr. Kabiruddin Ahmed, Deputy Director .. 11-10-1973
2. Mr. M. Azizul Islam, Geologist 24-1-1974
3. Mr. A. Z. M. Ishtiaq Hussain, Assistant Geologist 24-3-1973
4. Mr. Rafiqul Islam, Assistant Geologist .. 7-8-1973
5. Mr. Khalilur Rahman, Assistant Geologist .. 1-3-1974

Conference and Delegation

Mr. M. Ahmed, Director-General, visited India from 7th May, 1972 to 22nd May, 1973 as a member of Bangladesh Delegation for discussions on the proposed Jamalganj Coal Mines and allied matters.

Mr. M. Ahmed attended the 61st Session of the Indian Science Congress at Nagpur from 3rd January, 1974 to 9th January, 1974 as a member of the Group of Bangladesh Scientists invited by the Government of India. After the session of the Science Congress, the group visited a number of research laboratories/institutes in various parts of India up to 24th January, 1974.

Mr. M. Abu Bakr, Superintending Geologist, attended the Seminar on Fluvial Processes and Geomorphology of the Brahmaputra basin in Calcutta, India on 5th and 6th October, 1972 and the ECAFE Regional Conference on Geology and Mineral Development in Kuala Lumpur, Malaysia, from 4th October, 1973 to 15th October, 1973.

Mr. S. F. Bari, Superintending Geologist, attended the Conference on International Geological Correlation Programme in Tehran, from 12th May, 1974 to 16th May, 1974.

Mr. S. K. M. Abdullah and Dr. Rafiqul Islam attended the meeting of the Sub-Commission for Asia and Far East of the Commission for the Geological Map of the World held in Calcutta, India, in February, 1974.

Acknowledgements

The Geological Survey of Bangladesh, since its inception has received considerable assistance from a number of organisations and individuals outside the country in building up the departmental library. The Geological Survey of India has supplied a copy each of all its publications that are available and is continuing to supply a copy each of its new publication. The United States Geological Survey is regularly supplying its Bulletins, Professional Papers and Water Supply Papers. The Australian Bureau of Mineral Resources, Geology and Geophysics are supplying their Bulletins, Reports, and Mineral Industry Quarterly. Publications have also been received from Institute of Geological Sciences, London, United Kingdom; Bundesanstalt fur Bodenforchung, Hannover, West Germany, Bureau DE Recherches Geologiques Et Miniers; Paris, France; Sbornik Geologickych Ved, Czechoslovakia, and Geological Surveys of Japan and New Zealand. John A Reinemund, Chief, Office of International Geology, U. S. G. S., has donated nearly 1,100 issues of periodicals from his personal collection. We are grateful for the valuable assistance.

We express sincere thanks for the gift of three landrovers by the Australian Government that strengthened a great deal the meagre field transport facilities of the Geological Survey of Bangladesh.

REGIONAL GEOLOGY

Regional geological mapping is one of the most important functions of the Geological Survey of Bangladesh and forms the foundation or starting point for most other activities of the organization. A programme of covering the whole country by geological mapping on 1 : 50,000 scale has been going on for several years, but on a very limited volume. Thus, only a very small part of the country has been mapped on that scale so far. The mapping programme during the last two years has also remained very limited due to lack of requisite field and other facilities.

During 1972-73, about 100 square miles in Harargaj area of Sylhet district, approximately 100 square miles in the vicinity of Chittagong, about 110 square miles in Alikadam-Tuinkhaiang area of Chittagong Hill Tracts and over 250 square miles in Dacca-Tongi high land region were mapped on 1 : 50,000 scale. In 1973-74 the only mapping programme was in the Ramu region of Chittagong district.

Harargaj, Sylhet District

The area mapped in Harargaj region lies between latitude 24°23′ to 24°30′N and longitudes 92°00′ to 92°10′E and is covered by topo sheet 83 D/3. The Harargaj hill running NNE-SSW is the main topographic feature of the area. It is a symmetrical anticline with a 8° plunge towards N 10°E. Dips of 30° to 86° on the western flank and 20° to 85° on the eastern flank were observed. The geological succession in the area is as under:

Recent	Alluvium	Clay, sand, and silt. Unconsolidated surficial deposits.
	——————unconformity——————	
Pliocene to Late Miocene	Dupi Tila	Upper claystone....650′
		Lower sandstone....900′
	——————unconformity——————	
Middle Miocene to Early Miocene	Tipam	Girujan clay.....1200′
		Tipam sandstone....1800′
Early Miocene	Surma	Boka Bil.....3000′
		Bhuban.....800′

The rocks of Harargaj area are entirely devoid of fossils. Their subdivision into the above and correlation with the Tertiary succession in Assam have been done entirely on the basis of lithology.

A brief description of the geological formations in the area is given below:

Surma Group :

Both the units of Surma Group, the Bhuban and Boka Bil formations are exposed in Harargaj area.

Bhuban : The oldest formation exposed in the area is Bhuban. It consists of dark grey shale, sandy shale, and subordinate grey sandstone. Current bedding and ripple marks are common. The Bhuban formation is exposed in the axial region of the Harargaj anticline. The base of the formation is not seen but over 800 feet thickness of the formation is exposed.

Boka Bil: The Boka Bil overlying the Bhuban comprises gray silty shale and siltstone with calcareous sandstone concretions and subordinate massive sandstone. Ripple mark is common in the shale and siltstone. Boka Bil rocks are exposed on both the flanks and the thickness of the formation here is about 3000 feet.

Tipam Group:

Tipam sandstones and Girujan clays comprise the Tipam Group.

Tipam sandstone: The Tipam sandstone formation overlies the Boka Bil without any unconformity. It consists of brown to grayish brown, massive, coarse grained sandstone with minor argillaceous beds. Current bedding and ripple marks are common. The formation is exposed on both the slopes of the Harargaj anticlinal hill and the thickness is about 1800 feet.

Girujan clay : This formation is about 1200 feet thick and comprises light gray to light brown claystone and siltstone. Some minor light brown sandstone beds are also present. Cross-bedding is common in the sandstone beds. Girujan clays are exposed on both the slopes of the Harargaj hill.

Dupi Tila Group:

The uppermost unit of the Tipam Group is overlain unconformably by the lower unit of the Dupi Tila Group. The Dupi Tila of Harargaj area can be divided into two distinct units—the lower sandstone and the upper claystone.

Lower sandstone : This consists principally of massive ferruginous sandstone and siltstone of yellow, yellowish brown and pink colours, with subordinate light gray claystone bands. Fossil wood pieces are often found and cross-bedding is common. This unit has a thickness of about 800 feet.

Upper claystone : This formation comprises light gray and light brownish gray and mottled claystone. Minor amounts of light yellowish brown and light gray siltstone and sandstone are also present. Ferruginous bands are common in the formation. The thickness is about 650 feet.

The Dupi Tila rocks occupy the larger part of the Harargaj hill slopes.

Alluvium:

Alluvium, the unconsolidated surficial deposits of clay, silt, and sand, cover the north-western part of the mapped area and a narrow strip on the eastern margin consisting of stream beds and flood plains. Slightly indurated alluvium of perhaps earlier age than the flood plain and river bed deposits are found on some elevated areas.

Alikadom-Tuinkhiang, Chittagong Hill Tracts.

The area mapped in this region lies between latitudes 20°36′ and 20°45′N and longitudes 92°15′ and 92°25′ E and is covered by the topo sheet 84 C/6. The total area is roughly 110 square miles. The terrain is rugged, though the highest peak Tindu Raung is only 2944′ above sea level. Topographically the area consists of two prominent hill ranges—the Muranja and the Tindu and the valleys of the Matamuhuri and the Tuinkhiang rivers. Structurally also the area comprises the Muranja anticline on the western part, the Matamuhuri syncline in the central region and the Tindu anticline on the eastern side. The folds are elongated with NW trending axis and plunge. The only major fault observed in the area runs across the Matamuhuri valley. The geological successions of the area is given below. The succession has been established on the basis of lithology as the rocks of the area are devoid of fossils:

Recent	Alluvium	Unconsolidated sand, silt, and clay, with gravels in some places. Thickness varies between 0 to 15 ft.
	——————unconformity——————	
Early to Middle Miocene	Boka Bil	The Boka Bil in this area can be divided into three units. The upper part is mostly massive, medium grained light and grayish yellow sandstone, about 800 ft. in thickness.
		The middle part is about 1000 feet of bluish grey shale.
		The bottom unit, 2800 feet in thickness, is massive fine grained sandstone and siltstone of bluish gray colour.
Late Oligocene to Early Miocene	Bhuban	Bluish gray laminated shale with bands of compact sandstone. Exposed thickness is about 3000 ft. Base not seen.

DACCA-TUNGI, DACCA DISTRICT

Dacca-Tungi region, consisting of the southern part of the Madhupur upland and part of the flood plains of Sitalakhya, Balu and Burhiganga rivers was covred by 1,50,000 scale mapping as a part of the programme of detailed survey of the Madhupur pliestocene region. The area is located between latitudes 23°37′ to 24°00′N and longitudes 90°20′ to 90°30′ E and is covered by topo sheets 79 1/5 and 79 1/6. The Dacca-Tungi high land is bordered by the Turag and Burhiganga rivers on the west and south-west and by the Balu and Sitalakhya rivers on the east.

The highland part of the Dacca-Tungi region consist of older alluvium which is considered to be of Pliestocene age. Newer alluvium of Recent age cover the flood plains of the Balu and Sitalakhya. The general succession is as under.:

Recent	Alluvium	River bed sand. Fine to medium grained, gray to light brown in colour. Forms the point bars of the Sitalakhya and the Burhiganga
		Clayey silt. Mostly gray in colour. Forms the natural levees of the Sitalakhya and the Burhiganga.
		Clay and silty clay. Dark gray and bluish gray plastic clay. Contain peat and wood logs.
	——————unconformity——————	
Pleistocene	Madhupur clay	Red and mottled clay with patches of yellow, gray and white. Calcareous and ferruginous nodules common in some places. Attains thickness up to 60 feet.
	Sandstone	Yellow and gray medium to fine grained, poorly consolidated sandstone observed in wells only.

The Dacca-Tungi high land region constituting the southern extremity of the Madhupur Pleistocene block do not show much evidence of folding or tilting. However, several faults have been detected. Baimail-Palasna fault is a N—S trending fault that can be traced for a distance of about 10 miles. Evidences suggest that the block east of the fault has moved south in respect of the block west of the fault. The Demra fault running through Demra and Siddirganj along the western bank of the Sitalakhya can be traced for about seven miles. In this case also the eastern block has moved south relative to the western block. A fault perhaps exists along the Burhiganga river from Fatullah to Kasur a distance of about 10 miles. The three faults mentioned above are in an echelon pattern which is characteristic of the margins of the Madhupur Pleistocene block.

Savar-Dhamrai, Dacca District

The Savar-Dhamrai mapped area consists of the south-western part of the Madhupur block and the flood plains of Bansi, Dhaleswari, and Turag rivers. The area lies between latitude 23°56′ to 24°00′ N and longitude 90°05′ to 90°20′ E and forms part of topo sheets 79 1/1 and 79 1/5. The geological

succession here is generally similar to that of Dacca-Tungi region described earlier. However here both the Alluvium and the Madhupur Pleistocene strata can be sub-divided into several units based on lithological characteristics.

The oldest unit is a bed of friable sandstone in places pebbly, which is mostly met with at some depth in wells. The sandstone may be the equivalent of Dupi Tila of Assam of Pleistocene age.

The sandstone unit is overlain unconformably by the Madhupur Pleistocene rocks that can be divided into two units. The lower "mottled clay" consists of clay, mostly gray with patches of red, yellow and brown. Ferruginous and calcareous nodules are present in some places. The upper unit, "Red Clay", consists of mostly brick red to yellowish red clay with ferruginous and calcareous nodules and lateritic material in some places. The two units together attain a thickness up to 100 ft.

The Recent alluvium overlying the Pleistocene strata with an unconformity consists of dark gray and bluish gray clay occupying the back swamps and abandoned channels, sandy silt and silt deposits forming the natural levee and back slope, and sand and silt of the river beds.

The faults identified/postulated in the area are briefly described in the following lines. The Bansi fault runs in an approximate N—S direction along the Bansi river in the mapped area. It is perhaps a normal fault with a down throw of about 30 feet on the eastern side. Demra-Jamsin and Bagbari-Ulile faults run in NW—SE direction and the Baipail-Belma fault has an approximate N—S trend.

Chittagong

Mapping of about 100 square miles area was completed in the vicinity of Chittagong covered by toposheet 79 N/9. The Geological succession in the area is as follows:

Recent	Alluvium	Dark gray clay, silt and sand, unconsolidated.
		——unconformity——
Pliestocene-Pliocene	Dihing	Poorly sorted sand and mottled clay.
		——unconformity——
Pliocene-Miocene	Dupi Tila	Brown, pink and yellow, medium grained sandstone, pebbly in places, and with subordinate siltstone and clay. Contains petrified wood..1650'.
		——unconformity——
		Girujan clay. Shale and silty shale and siltstone with calcareous bands in some places .. 550.
Miocene	Tipam	Tipam sandstone—Brown, yellowish brown and gray massive sandstone with subordinate argillaceous beds .. 2000e
		Boka Bill. Gray siltstone sandy shall and thin bedded sandstone 1625'.
Miocene Late Oligocene	Surma	Bhuban. Gray sandy shale with massive sandstone in the upper part .. 2550.

The area forms a part of the Chittagong anticline. It is an asymmetric anticline with NNW trending axis, parallel to the regional strike in this part of the country. On the eastern limb, rocks of Tipam to Dupi Tila are exposed whereas in the western limb only Surma rocks are exposed. On the eastern limb the dips are gentle to moderate whereas the dips in the western limb are steep. The Surma rock of the western limb merge abruptly with recent alluvium. The scarp western face of the hills running in an almost straight line for some distance, absence of the younger formations, and several other factors suggest the presence of a major fault parallel to the axial trend along the Chittagong Sitakund coast.

Cox's Bazar-Ramu, Chittagong District

The area comprises the northern part of Barragi Tanug and Wayla Tanug Hill Ranges and flood plains of the Baghkhali the Bharukhali and Raju Khal and the coastal plain. The area falls between latitudes 21°15′ to 21°30′N and longitude 91°57′30″ to 92°9′E and is covered by toposheets 79 0/15 and 84 C/3. Arenaceous and argillaceous rock ranging in age from middle Miocene to Recent are exposed in the area. The succession is as under:

Recent	Alluvium	Unconsolidated clay, silt and sand. Gravels in some places.
	Beach sand	Medium grained sand with shell fragments.
	unconformity	
Pleistocene/ Pliocene	Dihing	Yellow and gray medium grained sandstone and clayey sandstone. Mottled clay and pebbly beds in some places. 80′+
	unconformity	
Pliocene	Dipi Tila	Alternation of light grey and purple massive sandstone and gray laminated shale. Cross bedding common in sandstone. 550′+
	unconformity	
	Girujan clay	Gray laminated shale and clay and subordinate sandstone beds .. 350′
	Tipam sandstone	Yellow and brown massive current bedded coarse to medium grained sandstone with some shale beds. Contains ferruginous concretions. .. 600′
Miocene	Boka Bil	Gray and bluish gray medium grained sandstone with ripple marks and-cross bedding and patches of argillaceous limestone and calcareous concretion and gray laminated shale. .. 340′+
		Base not seen.

Structurally the area forms the northern part of the Cox's Bazar anticline and the Umbkhali syncline. The Cox's Bazar anticline is symmetrical with NW—SE trending axis and gentle dips on the flanks. The axial trend of the Umbkhali syncline is also NW—SE. However, it is an assymmetrical structure with a gentle western flank and steep eastern flank. A transverse fault cuts across the Cox's Bazar anticline near Kalatali.

GEOPHYSICS

The existence of a subsurface basement relief in the Rangpur-Dinajpur region was indicated by geophysical studies in the late sixties by the then Geological Survey of Pakistan and the Oil and Gas Development Corporation. Shallow depth continuity of basement rocks through this part of Bangladesh, connecting the exposures of the Shillong Plateau with those of Bihar had been conjectured earlier also on the basis of geological investigation of the two regions mentioned. Though in some details the inferences from the geophysical surveys of the Geological Survey and the Oil and Gas Development Corporation differed, there was general agreement that in some parts of the Dinajpur-Rangpur region, basement rocks may occur at depths less than 600 feet from the surface. For confirmation of the inferences from geophysical data, a test hole was drilled by the Geological Survey at Ranipukur in Rangpur district and Precambrian rocks were found at 572 feet below the surface. To locate these rocks at still shallower depth and nearer the railway tracks, a programme of geophysical studies was carried out in 1970 for preparation of subsurface depth section between Badarganj in Rangpur district and Nawabganj in Dinajpur district.

Seismic refraction survey was carried out in the area between longitudes 88°55′ to 89°10′E and latitudes 25°25″ to 25°40″N. The Survey was conducted in north-south and east-west profiles. The north-south profiles were laid out between Badarganj and Nawabganj and along each continuous profile the seismic data were recorded by reverse shooting. The east-west profiles were laid out across the north-south profile and the seismic data were recorded by one way shooting. No continuity of the profiles were maintained. The reverse time distance curves of the north-south profiles were used for computing the depths, apparent dips, and the true velocities of the subsurface horizons.

Two sub-surface horizons are indicated by the time distance curves. The depth and the seismic refraction velocity of the first horizon suggest that it is the interface between the weathered and sub-weathered layers. The apparent southward dips of the second horizon are less than one degree and hence the depth points have been plotted vertically below the shot points for preparing the north-south depth sections. Comparison of the depth sections of the second horizon with the depth sections prepared in 1968 for adjacent areas revealed that it is the same sub-surface horizon—the top of the basement. The true seismic velocities obtained from the reverse time-distance curves further suggest that the basement rocks are granitic in composition. This interpretation is in conformity with the data obtained from drill hole EDH-17 at Ranipukur. The north-south section of the second sub-surface horizon (the basement surface) suggested that the minimum depth is about 455 feet at a point near Madhyapara in Dinajpur district. A test hole drilled at this site in 1974 proved the inferences reasonably accurate.

The prepared depth sections also suggested the presence of a fault across the profiles cross the inferred fault. The third one does not indicate the presence of the fault perhaps due to the fact that the observations were not extended far has been supported by a test drill hole in Madhyapara area completed in 1974. Three north-south gravity profiles were observed in 1974 across the fault line as inferred from the seismic data. The computed gravity data suggest that two of the profiles cross the inferred fault. The third one does not indicate the presence of the fault perhaps due to the fact that the observations were not extended far enough north to intercept the fault.

A number of new gravity base stations was established along the roads between Rangpur, Dinajpur and Phulbari.

ECONOMIC GEOLOGY

The economic geology investigation of the Geological Survey of Bangladesh during the last couple of years have been confined to assessment of glass sand deposits of Comilla and Sylhet districts, white (kaoline) clay deposits of Mymensingh district, and search of Archaean rocks at shallow depths in Rangpur and Dinajpur districts for possible use as aggregate, etc. Some engineering geology studies and investigation of reported occurrences of lignite lenses in Tertiary rocks of Chittagong have also been undertaken.

Glass sand

The glass making industry in Bangladesh, has, in recent years, progressed to the extent that local needs of inferior glass can be met by the local industry. Initially requirements of glass sand, the pricipal raw material, used to be met partly by import and partly from indigenous sources. Gradually it has become necessary to depend entirely on local material. The Geological Survey has, in the last few years, undertaken investigation for glass sand with the objective of qualitative and quantitative assessment of the known deposits and find new deposits in adjacent areas with similar environments so that the total potentialities are known and systematic development can be planned. The investigations have so far been cofined to the deposits of Chauddagram area of Comilla district and Noyapara-Shajibazar of Sylhet district.

Chauddagram, Comilla Districts.

During the last five years or so, glass sand needs of the glass making plants of Chittagong region have been mostly met from Chauddagram area. The Geological Survey has examined the area between Noapara in the north and Duttasar in the south in Chauddagram Police Station of Comilla District. It is a 10 mile long narrow belt bordered by Tripura State of India on the east and by the Dacca-Chittagong highways on the west except near the village of Batisa where it includes a small area west of the highway also.

The investigated area is a part of the piedmont alluvial plain of the Tripura hills. The area slopes westward and the elevation ranges from 17 feet to 30 feet above sea level. The drainage system of the area consists of a number of small streams that originate in the Tripura hills and flow westward to join the Dakatia river.