BPI REPORT # 8

BANGLADESH PETROLEUM INSTITUTE

PRELIMINARY REPORT

STRUCTURAL ANALYSIS OF SOUTHERN PART OF CHITTAGONG HILL TRACTS

DHAKA
JAN 1991

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NOTE: For references cited see BPI Report # 6

ENCLOSURES

Enclosure 1	Eastern Bangladesh and adjoining areas showing areas studied by BPI (Tectonic features interpreted in BPI on satellite pictures) - Scale 1:1,000,000
Enclosure 2	Structural Interpretation in SE Bangladesh and adjoining areas - Scale 1:250,000
Enclosure 3	Synthesis of Structural Development - Scale 1:1,000,000 (Preliminary Version) (also an extra transparency copy for overlay on Encl.1

INTRODUCTION

Until 1989, Bangladesh Petroleum Institute had been mainly involved only in organizing training courses for the petroleum industry in the country. The original mandate for the Institute, however, includes several other functions with the most important one being detailed studies of the oil and gas potential of the various parts of Bangladesh. The main objective for such studies is to provide the necessary basis for the Government to formulate national oil exploration strategies. It is this part of the work in BPI that is being supported by NORAD Project BGD 023.

As described in the Introduction to BPI Report No.6, the current work programme of the Institute is designed to fill the gaps in the regional study carried out earlier in Petro Bangla. For example, the Hydrocarbon Habitat Study Report of 1986, on which is based the exploration promotion brochure (Exploration Opportunities in Bangladesh), gives a summary of the different hydrocarbon systems in the country with an analysis of the various play concepts.

But, one of the most important areas for oil exploration, the complexly folded and thrust-faulted area of the hilly parts of NE Bangladesh and of the Chittagong Hill Tracts, is not covered at all in the promotion document. The mapping and assessment of the oil resources of the country would not be complete unless the vast area of the folded belt of the hilly tracts is studied in very great detail. A preliminary review of this area in order to focus future exploration in this very prospective area is, therefore, one of the most important tasks for Bangladesh Petroleum Institute.

Another area not covered by the Brochure is the southern part of the delta. With the installation of seismic processing facilities in BPI, the data quality enhancement work for the southern part of the delta would be taken up as a priority project.

As discussed in earlier reports, the discordant folding in the hilly areas totally precludes the use of seismic surveys as an exploration tool. The detailed study of the Patharia anticline (BPI Reports Nos. 4 and 5) showed that the actual surface structure is much more complicated than indicated by previous work and, therefore, the need to map these areas once again was clearly indicated. As shown in BPI Report No.7, the subsurface reconstruction of the Patharia fold is more closely matching the one included in BPI Report No.5 than the one used to prepare the drilling plan for the well Patharia 5. It is, therefore, clear that the work now being done in BPI is of vital importance even in the continued drilling of this extremely important test well.

This report is a continuation of the work started in 1989 by Bangladesh Petroleum Institute, with assistance from the Norwegian Petroleum Directorate, under Project BGD 023 with aid from the Norwegian Agency for International Development (NORAD). The main objective is to first map the main structural features on satellite pictures on a scale of 1:250,000. Selected anticlines are then to be mapped on aerial photographs (on 1:57,000 scale). Ground checks and in some areas re-mapping on the ground would be in the third phase of the work.

Earlier work on this subject is covered in four reports issued by BPI:

(1) BPI Report No.4 (Stavanger, October 1989) on the "Structural Interpretation of the Patharia Anticline".

(2) BPI Report No.5 (Dhaka, May 1990): "Structural Analysis of NE Bangladesh".

(3) BPI Report No.6 (Dhaka, July 1990): "Structural Analysis of Northern Part, Chittagong Hill Tracts".

(4) BPI Report No.7 (Dhaka, Sept.1990): "Review of Drilling Programme of Patharia well No.5".

CONCLUSIONS

The arrival, in the early 'sixties, of digital seismic recording and processing permitted for the first time good quality marine seismic work. The cost of exploration has always been much lower offshore than on land. The much higher development and operating costs in the offshore area has been largely offset by avoiding development of smaller fields unless as satellites to very big ones already on production. The development of 3-D techniques reduced risks while assessing reserves and while preparing field development plans. 3-D surveys in the offshore area are not too costly and is economically justifiable even for large natural gas discoveries.

The new digital seismic techniques also did improve chances of discoveries on land as well. Land based 3-D seismic is too costly in comparison with the relatively low costs of drilling a larger number of appraisal wells and is economically advisable only when developing giant oil discoveries.

The main push for oil exploration globally has been, for the last thirty years, in the offshore areas. Land exploration, paradoxically, has been much more difficult and even costlier.

But there are some land areas where oil exploration still requires use of some of the oldest exploration techniques. However, over the last 30 or 40 years, the purely geological skills of field mapping and structural modelling have remained largely unitilized. As we now see, these are the very skills needed for exploration in eastern Bangladesh. As a result, geologically difficult areas such as eastern Bangladesh have been accorded a very low priority for a number of years. In the current climate of the industry it should be presumed that areas such as the Chittagong Hill Tracts would now receive attention from oil companies even if the most advanced type of seismic

surveys, as currently known to the industry, cannot be used. BPI's efforts in improving the data-base of the folded belt could serve the Government well while promoting exploration in the area.

Giasuddin Ahmed
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