

NATURAL GAS POTENTIALS IN THE TWO DELTAS OF THE NILE RIVER

Farouk El-Baz
Center for Remote Sensing
Boston University, Boston, MA 02215 USA

The present-day Nile Delta remains not fully understood and its oil and gas potentials largely unexplored. The Nile River drains some 2,850,000 square kilometers or one-tenth of the continent of Africa. From this bountiful river, deltaic sediments with a plethora of brackish-water organisms and of organic matter provide a source for natural gas to form. In the meantime, fluvial sediments with numerous sand channels and locally cross-bedded mixtures of gravel, sand and clay provide traps for the gas to accumulate. Thus, the potential for natural gas in the present-day Nile Delta is only limited by our ability to interpret its intricate depositional history and to locate the natural gas trapped in its sediments. This is true not only in the delta plain but also in the intradelta, all the way to its front on the continental shelf of the Mediterranean basin. Recent exploration efforts and increased interest, on-shore and off-shore, are visionary steps that will ultimately assure increased benefits from the natural gas deposits of the present-day Nile Delta.

In addition, the ancestral delta of the Nile offers a potential source of vast amounts of natural gas. This ancestral delta was confirmed and mapped by satellite data including Apollo-Soyuz photographs and Landsat images. The vast delta-shaped area is nearly three times larger than, and located to the southwest of, the present-day Nile Delta. Its surface outcrops as well as sub-surface layers are terrigenous in nature and all its deposits belong to fluvio-marine facies. It is most probably of middle Paleogene to early Neogene age. From the southern border of Egypt to the city of Assiut, the river followed a course similar to that of the present-day Nile. At the end of the early Miocene, a sudden lengthening of its course occurred and the river ceased depositing sediments in the ancestral delta northwest of Assiut. Probably guided by faults associated with the regional uplift during middle Miocene time, the river flowed northward to its present position. The expanse of the ancestral delta encompasses most of the major natural gas fields of the Western Desert of Egypt, such as Abu Gharadiq.

It is therefore prudent to carefully map the ancestral and present-day deltas to evaluate their overall potential of natural gas. When the two deltas of the Nile River reveal their hidden reservoirs of natural gas, it can be said that "modern Egypt is the gift of the two deltas of the Nile."