Aswan Dam

The **Aswan Dam** may refer to either of two dams situated across the Nile River in Aswan, Egypt. Since the 1950s, the name commonly refers to the **High Dam**, which is the larger and newer of the two. The **Old Aswan Dam**, or **Aswan Low Dam**, was first completed in 1902 and then was raised twice, during the British colonial period. Following Egypt's independence from the United Kingdom, the High Dam was constructed between 1960 and 1970. Both projects aimed to increase economic production by regulating the annual riverflooding and providing storage of water for agriculture, and later, to generate hydroelectricity. Both have had significant impact on theeconomy and culture of Egypt. The Old Aswan Dam was built at the former first cataract of the Nile, and is located about 1000 km up-river and 690 km (direct distance) south-southeast of Cairo. The newer Aswan High Dam is located 7.3 km upriver from the older dam.

Before the dams were built, the River Nile flooded each year during late summer, as water flowed down the valley from its East Africandrainage basin. These floods brought high water and natural nutrients and minerals that annually enriched the fertile soil along thefloodplain and delta; this made the Nile valley ideal for farming since ancient times. Because floods vary, in high-water years, the wholecrop might be wiped out, while in low-water years widespread drought and famine occasionally occurred. As Egypt's population grew and conditions changed, both a desire and ability developed to control the floods, and thus both protect and support farmland and the economically important cotton crop. With the reservoir storage provided by these dams, the floods could be lessened, and the water could be stored for later release.

Construction History

The earliest recorded attempt to build a dam near Aswan was in the 11th century, when the Iraqi polymath and engineer Ibn al-Haytham(known as *Alhazen* in the West) was summoned to Egypt by the Fatimid Caliph, Al-Hakim bi-Amr Allah, to regulate the flooding of the Nile, a task requiring an early attempt at an Aswan Dam. After his field work convinced him of the impracticality of this scheme, and fearing the Caliph's anger, he feigned madness. He was kept under house arrest from 1011 until al-Hakim's death in 1021, during which time he wrote his influential *Book of Optics*.

Aswan Low Dam

Following their 1882 invasion and occupation of Egypt, the British began construction of the first dam across the Nile in 1898. Construction lasted until 1902, and it was opened on 10 December 1902, by HRH the Duke of Connaught and Strathearn. The project was designed by Sir William Willcocks and involved several eminent engineers of the time, including Sir Benjamin Baker and Sir John Aird, whose firm, John Aird & Co., was the main contractor.[3][4]

The Old Aswan Dam was designed as a gravity-buttress dam; the buttress sections accommodate numerous gates, which were opened yearly to pass the flood and its nutrient-rich sediments, but without retaining any yearly storage. The dam was constructed of rubble masonry and faced with red ashlar granite. When constructed, the Old Aswan Dam was the largest masonry dam in the world. The design also included a navigation lock of similar construction on the western bank, which allowed shipping to pass upstream as far as the second cataract, before a portage overland was required. At the time of its construction, nothing of such scale had ever been attempted. Despite initial limitations imposed on its height, due to concern for the Philae Temple, the initial construction was soon found to be inadequate for development needs, and the height of the dam was raised in two phases, 1907–1912 and 1929–1933, and generation of electricity was added. With its final raising, the dam is 1,950 m in length, with a crest level 36 m above the original riverbed;[5] the dam provides the main route for traffic between the city and the airport. With the construction of the High Dam upstream, the Old Dam's ability to pass the flood's sediments was lost, as was the serviceability provided by the

locks. The previous Old Dam reservoir level was also lowered and now provides control of tailwater for the High Dam.

Aswan High Dam Politics and Funding

After the Low Dam was almost over-topped in 1946, the British administration decided that rather than raise the dam a third time, a second dam should be built some 7 km upriver. The post-war years saw major changes in Egypt, including the growth of nationalism, the abrogation of the Anglo-Egyptian Treaty of 1936, and the overthrow of the monarchy, led by the Free Officers Movement, and its ultimate leader, Gamal Abdel Nasser.

Planning for the "High Dam" proper began in 1954, following the revolution, and changed development priorities. Initially, both the US and USSR were interested in the development of the dam, but this occurred in the increasingly tense readings of Cold War happenings, as well as growing intra-Arab rivalries.

In 1955 Nasser was trying to portray himself as the leader of Arab nationalism, in opposition to the traditional monarchies, especiallyHashemite Iraq following its signing of the 1955 Baghdad Pact. At that time the US feared that communism would spread to the Middle East, and saw Nasser as a natural leader of an anti-communist Arab league. The US and Britain offered to help finance construction of the high dam with a loan of US$270 million in return for Nasser's leadership in resolving the Arab-Israeli conflict. While opposed both to communism and imperialism, Nasser presented himself as a tactical neutralist, and sought to work with both the US and USSR for Egyptian and Arab benefit.

After a particularly criticized raid by Israel against Egyptian forces in Gaza in 1955, Nasser realised that he could not legitimately portray himself as the leader of pan-Arab nationalism if he could not defend his country militarily against Israel. In addition to his development plans, he looked to quickly modernise his military, and turned first to the US.
US Secretary of State John Foster Dulles and US President Dwight Eisenhower told Nasser that the US would supply him with weapons only if they were used for defensive purposes and accompanied by US military personnel for supervision and training. Nasser did not accept these conditions and then looked to the Soviet Union for support.

Although Dulles believed that Nasser was only bluffing, and that the USSR would not aid Nasser, he was wrong; the USSR promised Nasser a quantity of arms in exchange for a deferred payment of Egyptian grain and cotton. On 27 September 1955, Nasser announced an arms deal, with Czechoslovakia acting as a middleman for the Soviet support. Instead of retaliating against Nasser for turning to the Soviets, Dulles sought to improve relations with him. This explains the later offer of December 1955, in which the US and UK pledged $56 and $14 million respectively towards the construction of the dam.

Though the "Czech arms deal" actually increased US willingness to invest in Aswan, the British cited the deal as a reason for withdrawing their funding. What angered Dulles much more was Nasser's recognition of communist China, which was in direct conflict with Dulles' policy of containment. There are several other reasons why the US decided to withdraw the offer of funding. Dulles believed that the Soviet Union would not fulfill its commitment to help the Egyptians. He was also irritated by Nasser's neutrality and attempts to play both sides of the Cold War. At the time, other western allies in the Middle East, including Turkey and Iraq, were irritated that Egypt, a persistently neutral country, was being offered so much aid.

In June 1956 the Soviets offered Nasser $1,120,000,000 at 2% interest for the construction of the dam. On 19 July the US State Department announced that it deemed American financial assistance for the High Dam "not feasible in present circumstances."

On 26 July 1956, with wide Egyptian acclaim, Nasser announced the nationalization of the Suez Canal as well as fair compensation for the former owners. Nasser planned on the revenues generated by the canal helping to fund construction of the High Dam. The Suez War broke out, The United Kingdom, France, and Israel were mainly successful in attaining their immediate military objectives, but pressure from the US and the USSR at the United Nations and elsewhere forced them to withdraw.

In 1958 the Soviet Union provided funding for the dam project.

In the 1950s archaeologists began raising concerns that several major historical sites were about to be under water. A rescue operation began in 1960 under UNESCO. The Great Temple of Abu Simbel was preserved by relocating 22 monuments and architectural complexes to the shores of Lake Nasser under the UNESCO Nubia Campaign. Other monuments were granted to countries that helped with the works (such as the Debod temple in Madrid, the Temple of Taffeh in Leiden and the Temple of Dendur in New York). The remaining archeological sites have been flooded by Lake Nasser, among others the Buhen fort.

Construction and filling 1960-1976

The Soviets also provided technicians and heavy machinery. The enormous rock and clay dam was designed by the Soviet Hydroproject Institute along with some Egyptian engineers. 25 thousand Egyptian engineers and workers formed the backbone of the workforce required to complete this tremendous project which deeply changed many aspects in Egypt.

On the Egyptian side, the project was led by Osman Ahmed Osman's Arab Contractors. The relatively young Osman underbid his only competitor by one-half.

1960: Start of construction
1964: First dam construction stage completed, reservoir started filling
1970: The High Dam, *as-Sad al-'Aali*, completed on 21 July
1976: Reservoir reached capacity

Specifications

The Aswan High Dam is 3,830 metres long, 980 metres wide at the base, 40 metres wide at the crest and 111 metres tall. It contains 43 million cubic metres of material. At maximum, 11,000 cubic metres per second of water can pass through the dam. There are further emergency spillways for an extra 5,000 cubic metres per second and the Toshka Canal links the reservoir to the Toshka Depression. The reservoir, named Lake Nasser, is 550 km long and 35 km at its widest with a surface area of 5,250 square kilometres. It holds 111 cubic kilometres of water.

Benefits

Periodic floods and droughts, known since Biblical times (Genesis 41:35-36), caused devastating effect on the population in the Nile Delta. The dam mitigated the effects of these dangerous floods, such as in 1964 and 1973, and the effects of droughts in 1972-1973 and 1983-1984 that devastated East Africa and Somalia. Also, a new fishing industry has been created around Lake Nasser, though it is struggling due to its distance from any significant markets.

The High Dam increased the farmland 500% since 1970.

The dam powers twelve generators each rated at 175 megawatts, producing a hydroelectric output of 2.1 gigawatts. Power generation began in 1967. When the dam first reached peak output it produced around half of Egypt's entire electricity production (about 15% by 1998) and allowed most Egyptian villages to use electricity for the first time.

Aswan High Dam	

The Aswan High Dam as seen from space

Official name	Aswan High Dam
Locale	Egypt
Coordinates	23°58□ 14□ N32°52□ 40□ ECoordinates: 23°58□ 14□ N 32°52□ 40□ E
Construction began	1960
Opening date	1970
Dam	
Length	3830 m
Height	111 m
Base width	980 m
Impounds	River Nile
Discharge capacity of spillway	11,000 m³/s
Reservoir	
Creates	Lake Nasser
Capacity	111 km³
Surface area	5,250 km²
Installed capacity	2,100 Megawatt
Power station	
Turbines	12

Aswan Low Dam

Aswan Low Dam

Official name	Aswan Low Dam
Locale	Egypt
Coordinates	24°02□ 02□ N 32°51□ 57□ ECoordinates: 24°02□ 02□ N 32°51□ 57□ E
Construction began	1898
Opening date	1902
Owner(s)	Egypt

Dam

Type of dam	gravity buttress
Length	1,950 m
Height	36 m
Impounds	River Nile
Type of spillway	floodgates

Reservoir

Creates	tailwater of Lake Nasser