

Energy

ASWAN
DAM



Context: Aswan Dam

The Aswan Dam is an embankment dam situated across the Nile River in Aswan, Egypt. Since the 1950s, the name commonly refers to the High Dam, which is larger and newer than the Aswan Low Dam, which was first completed in 1902. Construction of the High Dam became a key objective of the Egyptian Government following the Egyptian Revolution of 1952, as the ability to control the flood waters, and harness the hydroelectric power that it

could produce, were seen as pivotal to Egypt's industrialisation. The High Dam was constructed between 1960 and 1970. It aimed to increase economic production by further regulating the annual river flooding and providing storage of water for agriculture, and later, to generate hydroelectricity. The dam has had a significant impact on the economy and culture of Egypt.

Before the dams were built, the Nile River flooded each year during

late summer, as water flowed down the valley from its East African drainage basin. These floods brought high water and natural nutrients and minerals that annually enriched the fertile soil along the floodplain and delta; this made the Nile valley ideal for farming since ancient times. Because floods vary, in high-water years, the whole crop might be wiped out, while in low-water years widespread drought and famine occasionally occurred. As



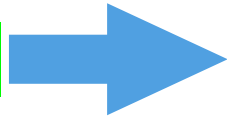
Egypt's population grew and conditions changed, both a desire and ability developed to control the floods, and thus both protect and support

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.

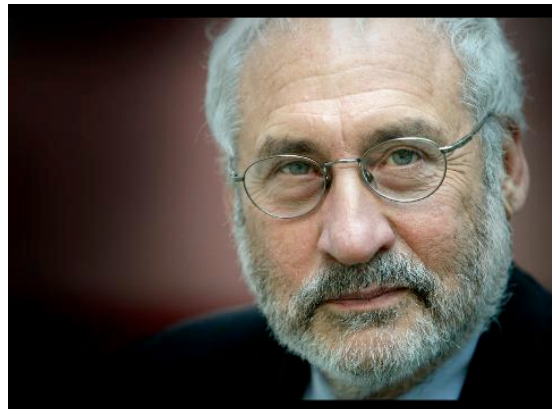


Watch the movie about the dam



Modern_Marvels_-_Aswan_Dam.mov

American Nobel Prize Joseph Stiglitz in Economics ?



According to the American Nobel Prize in Economics, the cost of U.S. military operations in Iraq already exceeds the cost of the Vietnam War and more than double of what it cost the Korean War

At least 3000 billion dollars. This is what will cost the Americans the war in Iraq as the American Nobel laureate in economics Joseph Stiglitz, who recently co-published with Linda Bilmes, a Harvard professor, a book on this subject. According to the book "The War at 3000 billion dollars," "the cost of U.S. military operations - without taking into account expenses such as long-term care for veterans - already exceeds the cost of the Vietnam War, longer than 12 years, and represents more than double what it cost the Korean War. "

<http://archives.lesechos.fr/archives/2008/lesechos.fr/03/11/300248711.htm>

The problem

The Aswan Dam has a surface of 5000 km^2 with an annual production of 10^{10} kW.h . Suppose you want to replace the dam production by solar cells whose yield is 14%. The average sunshine is 290 days per year with an average power of 900 W/m^2 .

- a) What area of solar cells would be needed to achieve the same production with "solar" (solar cells)?
- b) For 2570 kW.h / year requires an investment of 14,000 € (for individual house). Search the price of equivalent facility for the production of the Aswan Dam? Is it very expensive ? (read the American Nobel Prize Joseph Stiglitz in Economics)
- c) Calculate the power dam in Watt?

