Questions and Answers About Large Dams

Q. What is a large dam? How many large dams are there?

A: A large dam is defined by the dam industry as one higher than 15 metres (taller than a four-story building). There are more than 57,000 large dams worldwide. There are more than 300 major dams - giants which meet one of a number of criteria on height (at least 150 metres), dam volume and reservoir volume.

Q. Which countries have the most large dams?

A: China has over 23,000 large dams. The US is the second most dammed country with some 9,200 large dams, followed by India, Japan, and Brazil.

Q. How many are being built today?

A: The rate at which large dams are completed has declined from around 1,000 a year from the 1950s to the mid-1970s to around 260 a year during the early 1990s. More than 1000 large dams were under construction at the beginning of 1994. The countries with the most large dams under construction are currently China, Turkey, South Korea and Japan.

Q. Why is there so much opposition to large dams?

A: Large dams have provoked opposition for numerous social, environmental, economic and safety reasons. The main reason for opposition worldwide are the huge numbers of people evicted from their lands and homes to make way for reservoirs. The livelihoods of many millions of people also suffer because of the downstream effects of dams: the loss of fisheries, contaminated water, decreased amounts of water, and a reduction in the fertility of farmlands and forests due to the loss of natural fertilizers and irrigation in seasonal floods. Dams also spread waterborne diseases such as malaria, leishmaniasis and schistosomiasis. Opponents also believe that the benefits of dams have frequently been deliberately exaggerated and that the services they provide could provided by other more efficient and sustainable means.

Q: How many people have been displaced by dams?

A: Between 40 and 80 million, the majority of them in China and India.

Q: Aren't people displaced by dams fairly compensated?

A: In nearly every case which has been studied the majority of people evicted - usually poor farmers and indigenous people - are further impoverished economically and suffer cultural decline, high rates of sickness and death, and great psychological stress. In some cases people receive no or negligible compensation for their losses. Where compensation is given, cash payments are very rarely enough to compensate for the loss of land, homes, jobs and businesses and replacement land for farmers is usually of poorer quality and smaller than original holdings.

Q: What happens when people refuse to move to make way for dams?

A: In many cases people have been forced out of their homes at gunpoint, in others they have

simply been flooded out when the dam authorities started to fill the reservoir. In Guatemala in 1982, 369 Mayan Indians, mainly women and children, were murdered after their community refused to accept the inadequate compensation offered for the loss of their homes to the Chixoy Dam.

Q: How much land has been flooded under reservoirs?

A: More than 400,000 square kilometres - the area of California - have been inundated by reservoirs worldwide. This represents 0.3 per cent of the world's land area, but the significance of the loss is greater than the figure suggests as river valley land provides the world's most fertile farmland, and most diverse forests and wetland ecosystems.

Q: Have many people been killed in dam collapses?

A: More than 13,500 people have been swept to their deaths by the roughly 200 dams outside China which have collapsed or been overtopped during the 20th century. Two large dams which burst when a massive typhoon hit the Chinese province of Henan in August 1975 left an estimated 80,000 to 230,000 dead. This disaster was kept secret by the Chinese government and was only revealed to the outside world in 1995. People have also died in earthquakes caused by the great weight of water in large reservoirs. A magnitude 6.3 earthquakes caused by Koyna Dam in India in 1967 killed around 180 people.

Q: What are the benefits provided by large dams?

A: The majority of large dams are built for irrigation; almost all major dams are built for hydropower. Nearly one-fifth of the world's electricity is generated by dams. Dams also provide flood control, supply water to cities, and can assist river navigation. Many dams are multipurpose, providing two or more of the above benefits.

Q: Surely we need dams to produce cheap and clean electricity?

Hydroelectricity is cheap to produce -- once dams are built. The problem is the huge costs of building dams and the long time it takes to build them. Itaip&#65533; Dam, for example, cost $20 billion and took 18 years to build. Actual costs for hydropower dams are also almost always far higher than estimated costs - on average around 30 per cent higher. Dam designers are often very optimistic about how much power their dams will produce and often fail to account for the impacts of droughts meaning that dams often produce less power than promised. Itaip&#65533; generates around 20 per cent less electricity than predicted.

When these high costs, delays and risks of low river flows are factored into calculations of the costs of electricity it can be seen that hydropower is now an expensive form of power generation. Hydropower should not be considered as clean power because of the destruction of river ecosystems and its many social impacts. Internationally private investors in power projects are largely avoiding large dams and prefer to invest in cheaper and less risky gas-fired power plants.

Q: What forms of power generation do large dam critics support?

A: Electricity use in most parts of the world is extremely wasteful. The priority before building new power plants should always be to improve the efficiency of existing energy supply and

use. When new power plants are clearly needed, most environmentalists favor the use of solar and wind power, which are now on the verge of becoming commercially viable. Until these renewables are viable, gas-fired generation is cost-effective and has a far lower environmental impact than coal or oil-generation. Small dams can be a sustainable and economic source of electricity, especially in rural areas.

Q: Are dams an effective method of stopping flood damage?

A: Dams can stop regular annual floods but often fail to hold back exceptionally large floods. Because dams lead people to believe that floods are controlled, they lead to increased development of floodplains. When a large flood does come, damages caused are often greater than they would have been without the dam.

Q: Are there other ways of supplying water to farmers and cities?

Most water from large dams goes to farmers - only a very small percentage goes to cities. Irrigation systems around the world are in general very wasteful of water. The cheapest and most effective way of providing more water to cities is therefore to increase the efficiency of irrigated agriculture. The benefits of irrigated agriculture have in any case been seriously overstated - many large irrigation schemes have displaced huge numbers of small landholders and replaced traditional farming systems with agribusiness plantations producing expensive crops for cities and for export, increasing landlessness and rural hunger. Improving leakage and waste in urban water supply systems is also important.

Q. Do critics of large dams oppose all dams?

In general, opponents of large dams do not believe that no dam should ever be constructed. They do believe that dams (and other development projects) should only be built after all relevant project information has been made public, the claims of project promoters of the economic, environmental and social benefits and costs of projects are verified by independent experts, and when affected people agree that the project should be built.