People Are Attracted to Rivers and Floodplains

- Water Supply
- Fertile land
- Flat land
- Transportation Arteries often follow floodplains
- Water Supply
- Cities are often located at the confluence of major rivers, like Pittsburgh, PA
Flooding Takes Lives, Destroys Property and Transportation Arteries
Construction of Dams Is Only Partially Effective at Mitigating Losses Due to Flooding

In spite of all the money spent on dams and other structures to control flooding, damages from flooding continue to increase, so land use controls are also used. Most cities have zoning ordinances that prohibit building on the floodplain. A typical river will flood every 2-3 years. This minimal flood is called a standard flood. The floodplain is divided into different zones based on the estimated frequency of flooding. Construction is prohibited on any land within the 100 year floodplain; land that will be under water once in a hundred years.

Zoning/Floodplain Map for Austin, TX
Civil Works and Pork Barrel Politics

Civil works are construction projects paid for by the federal government currently called “ear marks”. Every member of congress wants to “bring home the bacon” from Washington, D.C. Spending federal dollars can have a huge impact on the local economy. Examples are dams, levees, harbor facilities, military bases and defense industries. Often these are funded by the process of “pork barrel politics” summarized by the term “back scratching”, or you vote for my pet project and I’ll vote for yours.
The Cost – Benefit Analysis Was Developed to Eliminate Some of the Politics from the Funding Process. The Long-term Benefits Must Out-weigh the Near-term Costs

- **Costs**
  - **Construction** includes, design, moving dirt, legal, land acquisition, environment impact.
  - Destroy prime farm land
  - Destroy wildlife habitat
  - Disrupt transportation
  - Displace people

- **Benefits**
  - Flood mitigation
  - Enhanced navigation
  - Water supply
  - Hydroelectric (if feasible)
  - Recreation
Colorado River Flows Through Desert S.W. into Mexico and Is the Principal Water Resource for the Region.

Since the 1930s, Not a single drop of water from the Colorado has flowed into the Pacific Ocean. It is all used up for irrigated agriculture and to provide water to the rapidly growing cities of the region.
Construction of Hoover Dam in Black Canyon.
Hoover Dam from Water Level.  
This Was the Tallest Dam in the World.  
It Is About 600 ft. Tall.
Aerial View of Hoover Dam
Power Station at Hoover Dam
An Important Benefit Is the Electricity Generated
Electricity Generators Inside Hoover Dam
Turbine Shaft Weighs over 200 Tons
Art Deco at Hoover Dam
The Tennessee Valley Authority (TVA) Was One of the Most Ambitious of New Deal Programs

The TVA had both economic and social goals and represented a fundamental change in attitudes about the role of the federal government in U.S. society. It was called “Social Engineering”.

- Bring a poor, backward part of the U.S. in to the mainstream
- Mitigate flooding on the Tennessee River
- Generate Hydroelectricity providing power to the rural south
- Develop the economy of the region by attracting industry
One of the Principal Goals of the TVA Was Simply to Provide Employment in a Very Poor Part of the Country

Parts of the TVA were completed before World War II. Many industries moved there during the war to take advantage of the cheap electricity. The materials for the atomic bomb were processed at the plant in Oak Ridge Tennessee. After the war, the economy continued to develop and the New South arose.
The Tennessee River Is a Nearly Continuous Series of Lakes
TVA Facilities, Red are Dams, 47, Yellow are Coal Fired Power Plants, 16, Purple are Atomic, 3
98% of Egypt’s Population Live within 10 miles of the Nile River
The Nile Delta is one of the most densely populated places on the earth.
The classic problem with irrigated agriculture in desert environments is that salts build up in the soil eventually making it impossible to grow food.

So, there has to be something very special about the Nile valley for crops to be grown there continuously for millennia.
The Nile Floods Every Year.
This Leaches the Salts Out of the Soil and Applies a New Layer of Silt Keeping the Soil Fertile.

On almost any other river, flooding is a disaster destroying lives and property. However, the Nile floods every year, so the people are used to it and it has obvious benefits.

The Nilometer measured the height of the annual Nile flood in cubits.

- 18 = Disaster
- 16 = Abundance
- 15 = Security
- 14 = Happiness
- 13 = Suffering
- 12 = Hunger

From the Roman scholar Pliny
The Egyptian Government Decided to Build a Dam Across the Nile at Aswan and Eliminate the Annual Flooding and All of Its Benefits
The Aswan High Dam is primarily Earth Fill. The Soviets Built It.
The Egyptian Government Realized That There Were Numerous Costs Associated with the Dam

Problems
- Loss of soil fertility
- Eliminate the fishery in the eastern Mediterranean
- Cause the Nile delta to erode
- Possible increase in disease
- Flood antiquities and archaeological sites

Benefits
- Generate ½ of Egypt’s electricity at the time
- Improved irrigation and control of water
- Grow two crops per year instead of one
- Use power to produce modern chemical fertilizers
Ancient Egyptian Monuments Relocated to Higher Ground
The Yangtze River Was Called “China’s Sorrow” Because Periodic Flooding Has Killed Tens of Thousands of People at a Time and Left Millions Homeless.
Three Gorges Dam in China Has Been Called the Biggest Structure Ever Built

It will help control flooding on the Yangtze River and generate ¼ of the China’s electricity.

It is an extremely controversial project because of its size, expense, environmental and human impact.
Displaced People and Village Destroyed in China. The 3 Gorges Dams Will Displace Well Over a Million People
Three Gorges is One of the Most Scenic Regions in China and Has Attracted Visitors for Hundreds of Years. Parts of Will be Flooded
Three Gorges Dam Under Construction
Visitors Center at the Dam
Locks at Three Gorges Dam Are Some of the Larges in the World and Have to Raise and Lower Boats 200 ft.
The Biggest Dam in the World
7500 ft. Long and 331 ft High
About 1/3 of Dam