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Task 1: Project Description and Detailed Outline

Three Gorges Dam

I. Description

A. Largest hydroelectric dam in the world

- 1) Generating capacity of 18,200 MW from 26 generators
- 2) 2 kilometers across
- 3) 185 meters above Yangtze River
- 4) Reservoir over 600 kilometers upstream
 - 1) Holds as much water as Lake Superior
- 5) Largest concrete structure in the world
 - 1) Over 5 times the size of Hoover Dam

B. Controversial

- 1) Project met much opposition
- 2) Displaced over 1 million people
- 3) Ruined scenery and archaeological sites
- 4) Environmental concerns

C. So far a success

- 1) Many overseas investors
- 2) Over 30 billion kwh of electricity generated in 2004

II. Problems to be solved

A. Flooding

- 1) Occur every 10 years
- 2) Flooding disaster areas

B. Exploitation of resources

C. Inefficient power

D. Difficult waterway navigation

III. History

A. 1918 Sun Yat-Sen

1) “Strategy for State, Part II: Industrial Plans

a) Dam needed to let ships go downstream

b) Use water for power

B. 1945 Dr. John Lucian Savage

1) “Preliminary Report on Development Plans of Three Gorges”

C. 1950 Changjiang Water Resource Commission founded to manage river

D. 1955-1957 Yangtze drainage area to control flooding, dam research started

E. 1982 TGD listed in China’s national plan

F. 1989 “Feasibility Report of Three Gorges Project...”

G. 1992 “The Resolution to Construction of Three Gorges Project” entered into executive process

1) Original Design

a) 175 x 156 meters initial storage

b) 185 meters above sea level

c) 100,000,000 cubic meters of stone

d) 30,000,000 cubic meters of soil

e) 28,000,000 cubic meters of concrete

f) 260,000 tons of metal structures

H. 1/1993 State Council TGP Construction Committee founded

1) Defined project management system

2) Financing sources

3) Approved regulations for TGP relocation

I) Project entered into preparation stage for construction

J) China Yangtze Three Gorges Development Corporation founded

IV. Process

A) Phase I (1993-1997)

1) Advance work

2) Excavation of channel

3) River close off

B) Phase II (1998-2003)

1) Construction of spillway

2) Power house

3) Ship lock

4) Initial water storage

5) Commercial operation of first batch of generators

C) Phase III (2004-2009)

1) Construction of right-bank dam

2) Construction of right-bank powerhouse

V. Available Alternatives

A) Do nothing

1) Still flooding

2) Still resource exploitation

B) Many smaller dams

1) Supply less energy

2) Environmentally friendly

VI. Cost of Design

A) Initial estimate of \$25 billion

1) Based on 1980's prices

2) Didn't include inflation

3) Errors in calculations ignored to ensure passage

B) Now estimated at over \$100 billion

1) Most expensive construction project in the history of China

2) Should pay for itself through electricity generation

VII. Technical Data

A) 102.59 million cubic meters of stone and earth removed

B) Replaced with 29.33 million cubic meters of stone and soil

C) 27.15 million cubic meters of cement mixed and poured

D) 281,000 tons of metal structures erected

E) 354,000 tons of reinforcing bars made and erected

- F) 231,000 square meters of leak-proof concrete walls built
- G) 250,000 workers employed in construction
- H) 26 turbine generator sets
 - 1) 700,000 kilowatt capacity per unit

VIII. Non-technical Data

- A) When completed, will be the world's biggest hydropower plant
 - 1) Installed capacity
 - 2) Annual average power generation volume
- B) Will take 17 years to complete
- C) Won't affect navigation of Yangtze river

IX. Problems and Costs

- A) By April 2006, \$15.75 spent on construction
- B) "Western estimate" between 40 and 50 billion US dollars
- C) Endangered species
 - 1) 47 botanic
 - 2) 26 animals
 - a) Chinese paddlefish
 - b) Chinese river dolphin
 - c) Harming fisheries
- D) Slower water flow will increase pollution
 - 1) 1.35 billions tons of sewage discharged into the river per year
- E) 530 millions tons of sediment entering reservoir will influence function and decrease life of the reservoir
- F) Corruption
 - 1) Contractors
 - a) Bribes
 - b) Tasks not performed as agreed
 - c) Poorly built structures have to be redone
 - 2) Head of Three Gorges Economic Development Corp.
 - a) Sold jobs in company
 - b) Took out project related loans and disappeared with money

3) Officials from Three Gorges Resettlement Bureau caught embezzling funds

G) Build up of silt could result in erosion and sinking of coastal areas

X. Estimated net savings

A) Flood control

1) 10 year flooding will be 100 year flooding

2) 15 million people and 1.5 million hectares of farmland relieved

3) Less threat of plagues and massive death

B) Electricity generation

1) Decrease emissions

a) 100 million tons of carbon dioxide

b) 2 million tons of sulfur dioxide

c) Tons of solid and water waste

C) Over 100 billion kwh of electricity generated has earned over 3 billion dollars

D) Budget

1) Low inflation shaved over 1.75 billion off the budget

2) Will come in under budget of 25.2 billion at 22.5 billion

XI. Conclusion

Upon its completion, the Three Gorges Dam on the Yangtze River in China will be the largest hydroelectric dam in the world. Although at first seen as controversial, it seems as though the benefits provided by the dam by far outweigh the costs of construction, both economically and environmentally. The many years spent on design and construction will be well worth the effort when the dam is completed in 2009.

Sources

<http://www.china-embassy.org/eng/zt/sxgc/t36512.htm>

<http://www.answers.com/topic/three-gorges-dam>

<http://www.china-hiking.com/ThreeGorges/content.htm>

<http://american.edu/ted/threedam.htm>

<http://www.ctgpc.com/cn>

<http://www.irn.org/programs/threeg/>

<http://www.threegorgesprobe.org/tgp/index.cfm?DSP=content&contentID=15281>

<http://darwin.bio.uci.edu/~sustain/state/kmin.html>

* Advantages can be found under “ Estimated net savings”

*Disadvantages can be found under “Problems and costs”

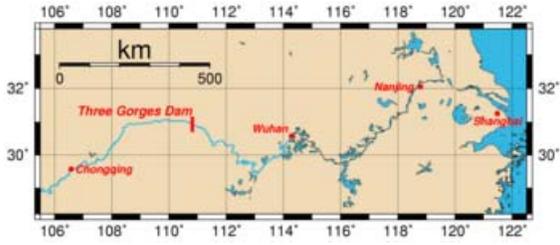
*Most topics were covered and there are no additional areas of interest

Dam Model



Maps

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Pictures

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