IJFEAT
INTERNATIONAL JOURNAL FOR ENGINEERING APPLICATIONS AND TECHNOLOGY

THREE GORGES DAM

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Abstract

This study reviews the literature and updates qualitative and quantitative impact based on research and applies a partial greenhouse gas emission cost benefit analysis to the Three Gorges Dam Project. Also the very impressive technique use in the construction of this dam. 2005-2011 global energy consumption increased by 12.8% The U.S. Energy Information Administration projected that world energy use will increase 53% by 2035. So the main purpose is to generate electricity on large scale. This study extends the construction of the TGD and the numbers of technique use in the dam. Also the advantages of by building the dam like TGD in our Indian river like Ganga, Indus, Koshi and generate more electricity which is necessary in future and not only to built the dam but also improve the existing one and make it more impressive, generative and attractive project.

.***Index Terms:*** Greenhouse, Dam, TGD

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INTRODUCTION

The 1st hydroelectric dam was built in 19th century in West Europe and U.S. In year 2000 there are 45,000 large hydroelectric dam and 8, 00,000 small hydroelectric dam are built for the purpose of navigation, flood control, irrigation, and other use. Also the construction of the large dam is to become a 1st order policy for the expected fast economic growth. The originally idea of constructing a huge dam on the Yangtze River is the Mao. In year 1919 "A plan to developed industry" sun Yat-Sen mention the possibility to build the series or large dam on Yangtze River. This dam is more popular for it hydroelectricity generation capacity also it is more popular for tourist attraction. It is the world largest hydroelectric dam in the world.

TGD has been very controversial topic among scientists, economic, environmentalist and journalist. Some people are against to build the TGD because of this dam create some problems like it could cause landslides and pollution in the surrounding area. Also disturb the bio-diversity of 300 species of fish and two popular marine animals of Yangtze River that the river dolphin and sturgeon fish. Another reason is that 1.2 millions of peoples from the area around the TGD were being relocated to another citizen of land.

But many people have supported this project. They said the T.G.D. was a good lead as it has created hydroelectric energy on mass scale. Also it is great way to achieve both economic and environmental goals simultaneously. It has replace the coal power plants and reduces the emission of 100 million tons ofcarbon dioxide, 1million tons of sulphur dioxide per year, 370,000 tons of nitric oxide and 10,000 tons of carbon monoxide. Also provide the same amount of energy while not having the negative environmental impacts as a non-renewable coal power plant. Also the Yangtze Riverknown for its deadly flood occurs every decade. Recording of flooding most of the area including 140 towns, 1350 villages, 13 cities. Therefore the government put forward the T.G.D. as a solution for flooding an deco-friendly energy.

1. PROJECT WORK

This is the new bench mark for hydroelectric project. It is built in three parts. 1st two parts are built by constructing the coffer dam by using rock and precast concrete block and 3rd section is built by using concrete coffer dam. The project is completed in 17 years i.e. from 1993 to 2009. Is the biggest concrete structure in the world having 60 storey height and 2335 m length and width at the base is 115m and at the crest is 40m. This dam use more concrete than the other dam i.e. 27.2 million cubic meter of concrete and 463000 tons of steel used which is enough to build 63 Eiffel towers and 102,600,000 cubic meter of earth is removed. The dam create reservoir of 660km long having capacity of 39.3 billion cubic meter of water. It has 46 spillway gets having discharging capacity of each is 116,000 cubic meter per second and the whole dam discharges 960 billion cubic meter of water annually. It is world largest hydroelectric dam having installed capacity 22,500 mw.

Annual Production of Electricity			
Year	Number of installed units	TWh	
2003	6	8.607	
2004	11	39.155	
2005	14	49.090	
2006	14	49.250	
2007	21	61.600	
2008	26	80.812	[54]
2009	26	79.470	[55]
2010	26	84.370	[56]
2011	29	78.290	[57]
2012	32	98.100	[58]
2013	32	83.270	[59]
2014	32	98.800	[60]
2015	32	87.000	[61]
2016	32	93.500	[62]

Figure 1: production of energy annually

Figure 2: picture of the three gorges dam

2. TECHNIC USE

To create impermeable concrete curtain they drive the 100 km tube down onto the ground and then grout 2000m3 of concrete when they turn to solid the leaky rock turns to solid and water proof base for the dam is made to stop the erosion of the river bed when the water came out from the spillway at a high velocity the engineers provide the concrete ram. So the water falls on the ram and then water slowly enters the river bed.

As the water level rises at that time water forces to foundation. To prevent this engineer provides concrete shoe.

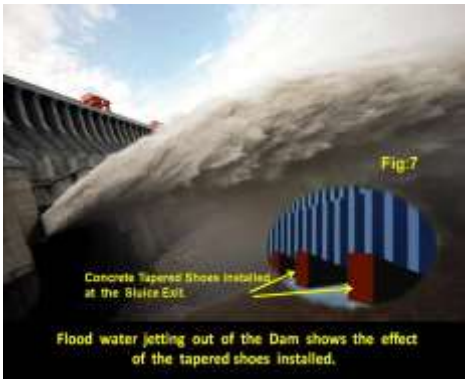

Figure 1: concrete shoe

Whenthe flood water stop flowing nutrition particle, silt settle down and sediments occurs. To remove the sediment from the dam the engineers provide the sluice gates.

The Yangtze River is important for its waterway navigation. To pass the ship from upstream to downstream the dam is provided with the ship lift. The ship lift allows the 30000 tons of passengers and cargo ships. The engineers fit the series of massive contra weight to lift the ship. 61000 tons of concrete blocks are connected by cable to the steel scruff carry the ship above 169m. 256 ropes of 74 mm diameter are use to lift the ship

3. PURPOSE OF THE DAM-

3.1 To generate clean and renewable energy:

The design goal of the T.G.D. is to generate 1000 TWh of electricity per year of electricity. 32 main turbines engines generating 700MW of energy and design to generate more than 700 MW of water. These turbines are placed in room called as powerhouse having length 700m. 14 turbines are placed in one room, like these three power hose are there, one in northern side one in southern side and one is under ground. The cost of one turbine is 50 million dollar and weight of one turbine is 6000 tonnes.

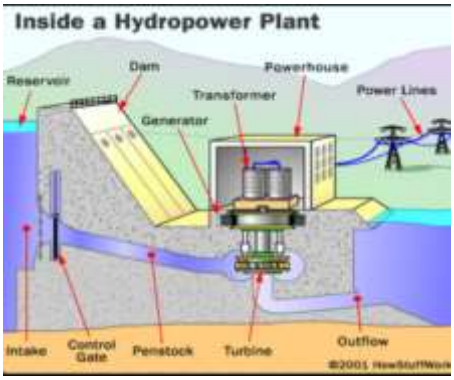

Figure 2: electricity generation.

Fig.1. Shows how electricity generate. As river water rises above the river bed water is channel down concrete gigantic tube towards the generator. The turn water heat the turbine and this motion is turn to transfer the later towards generator which is fitted with massive magnet which moves the copper coil and casing generate electricity. And generate much electricity for 16 millions peoples.

Figure 3: Powerhouse

3.2 To control the flood:

Control of flood is one of the most important functions of the T.G.D. and flooding use to be major problem for seasonal Yangtze River. When the flood occur to the

Yangtze River 632 km2 of land get submerge into the flood which is enough to submerge the whole Sighapur. Also the unstable water pressure causeslandslides and earthquakes. The dam holds 22.15 billion m3 of water during flood and released through the 46 spillway gets and avoid the much destructive loss to be done by the flood.

Figure 4: flooded water discharges through the spillway

3.3 Navigation

Yangtze River is important for waterway navigation. 117 number of ships day over passes through the dam. The ship lift allows the 3000 tons of passengers and cargo ships. The engineer fit the series of massive contra weight to lift the ship; 61000 tons of concrete blocks are connected by cables to the steel stuff and carry the ship above 169 m.

Figure 5: ship lift

3.4 Tourism

After the completion of the project, visitors will be delighted to see a wonder in the Yangtze River where calm lake sits among the steep gorges. As the rising of water. Many scenic spots which originally hard to enter are now reachable.

Figure 6: visitors visit the dam

ADVANTAGES AND DISADVANTAGES:

Advantages

1. The TGD has tourist attraction.
2. The dam produces clean and renewable energy.
3. The dam improves the navigation.
4. Flooding further downstream is prevented.
5. The dam creates lots of job during building the dam and now they are permanent jobs of operating and maintaining the dam.
6. Reduction in carbon dioxide, nitric-oxide, carbon monoxide, etc.

Disadvantages

1. Disturb the biodiversity of marine animal located in or near the river.
2. Cost of the dam is too high.
3. The dam built near fault line so vulnerable to earthquake.
4. Millions of peoples are relocated.
5. Farm land downstream of the dam will become less fertile as less alluvium is deposited.

4. LITERATURE SURVEY

India rank third in the world after China, USA, and Russia in terms of number of dam. The country has about 4710 completed large dams.With ever increasing population and ever increasing demand for water for various use. It has become necessary not only to construct the new dam but also rehabilitate and maintain existing ones. The dam provide storage to tide over the temporal and spatial variation in rainfall for meeting the year round requirement of drinking water supply, irrigation, hydropower, and industry in the country which leads to development of the national economy. Biggest dam in India have helped immensely in attaining self sufficiency in food grain production besides flood control and drought migration. At a time when the hydro power sector has taken a beating in India, power major NTPC is planning to set up the country biggest hydro project in Arunachal Pradesh. Below are the 10 hydroelectric dam in India in terms of power generation.

- The Tehri Dam in Uttarakhand
- The Koyana Hydroelectric Dam
- The Srisailam Dam.
- NathpaJhakri DAM.
- The SardarSarovar Dam
- The Bhakra-Nangal Dam
- The KarchamWangtoo Dam
- The Indirasagar dam
- Nagarjuna Dam

India is the 7th largest producer of hydroelectric power in the world. As of 30 April 2017, India's installed utility scale hydroelectric capacity was 44,594 mw or 13.5% of It's total utility power generation capacity. Additional smaller hydroelectric power unit with a total capacity of

4380 mw at 60% load factor. In the fiscal year 2016-17 total hydroelectric power generated in India was 122.31 TWh with an average capacity factor of 33%.

There are many river in India who flooded more like Koshi River, Brahmaputra River, Mahananda River, Ghaghara River, etc. so India should built the dam like TDG to overcome the all the problems to be face in future. Also to control the flood water through and built the dam like TGD over the river like koshi, Ganga, Indus river, etc the longest and deepest river. So to build like most impressive and largest structure in India it will leads to development in national economy.

CONCLUSION

The Three gorges Dam will have significant cost and benefit. Among the most significant benefit are the generation of electricity without emission of greenhouse gas, improvement in navigation, potential reduction of flood risk.Among the most significant cost are the massive dislocation of millions of people to make way for the dam and reservoir, further ecological degradation of Yangtze River ecosystem and fisheries.

According to the U.S. Energy Information Administration projected that world energy use will increase 53% by 2035 so to overcome these situation, the India should have to be increase the generation of electricity without emission of greenhouse gas and also to rank first in largest producer of hydroelectric power in the world.

ACKNOWLEDGEMENT

I would like to express my greatest gratitude to those people who have contributed and supported me. I would like to thank my sir Prof. Nalamvar sir for his continuous support for this study. I would like to thank my parent and friends for their support without them I would have been unable to complete the study.

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