

Improving and Sustaining Economic Growth in Africa. A Case Study of China's Three Gorges Dam

Richard Amoasi¹, Ivanrich Asamoah², Tyse Adwoa Acquah³, Francisca Aborh⁴, Winifred Serwornu⁵, Margaret Asamoah⁶

¹PhD Student, Hebei University of Technology, School of Economics and Management, Tianjin, China

²Tianjin Chengjian University, China.

³Hebei University of Technology, School of Economics and Management, Tianjin, China

⁴Jiangsu University, School of Economics and Management, Jiangsu, China

⁵Kwame Nkrumah of Science and Technology, Kumasi, Ghana

⁶University of Winneba, School of Distance Education, Koforidua, Ghana

Abstract: Strategic alliance in the area of hydro dams' construction will serve as a major mechanism for curtailing high cost of living and the high unemployment rates in Africa. Food shortage is normal in most African countries and prices of food is very high preventing many within the lower income groups from making any meaningful savings. Farmers depend on rainfall and in most times of the year, farmers do not obtain water for farming. Dams with excess water are spilled causing destruction of lives and properties without saving the water for any particular purpose in most African countries. Constructing similar dam like the Three Gorges Dam in Africa through strategic alliance with high hydro power production will increase electricity supply to sustain manufacturing companies, water supply as well as promote tourism to increase the Gross Domestic Product (GDP) of the nations. The 4 years full cost recovery instead of the projected 10 years is a sign of efficiency, transparency and a sense of accountability lacked by African governments.

Keywords: Gross Domestic Product, Strategic Alliance, unemployment, Construction, Mechanism.

I. INTRODUCTION

The inability to harness and store water for use in the future is a major problem in Africa. Rising cost of food due to farmers' inability to farm year round because of the long hamattan periods prevent many people in the lower income groupings to make any meaningful savings for the future. The importation of food by nations in Africa does not only lead to high prices because of the need for foreign exchange, transportation and import duties but also cause these countries' currencies to depreciate against the countries where the food import was made. There is the need for the leaders in Africa to develop long term measures to curtail the hardships suffered by their citizens. There is also the need to make farmers better off through the supply of water for year round farming to be able to make it attractive and to encourage many youth to participate but not leave farming for the old aged and the uneducated, a norm in Africa which must stop.

According to the China Three Gorges Project Corporation in 2020, the TGP since its completion in 2009 has supplied water to irrigate large portions of farmlands along the Yangtze River promoting year round cropping and ensuring year round food supply. The Three Gorges Dam which is the world's largest hydropower station with a total capacity of 22.5 million kilowatts and the annual power generation of 100 billion

kilowatt hours, greatly meets the electricity demands in middle and eastern China and in other provinces like Anhui, Henan, Hunan, Hubei, Jiangxi, Jiangsu, Chongqing, Shanghai, Zhejiang, and Guangdong. If three rivers in China was used to construct the TGP with enormous benefits to the Chinese people, it's equally possible for some countries in Africa with the possibility of joining the rivers or three countries with a main river to collaborate through strategic alliance to construct giant dams which output will increase the countries' economies.

Egypt, Sudan and Ethiopia on the Nile River the longest in the world in a strategic alliance to construct a hydro dam can eliminate any potential conflict, flooding, irrigation and other unforeseen threats that may arise from any one country trying to build a dam upstream to disadvantage the countries downstream or constructing the dam middle stream to disadvantage the country in the lower stream. Further investigations should be conducted into the possibility of mega projects such as the TGP on the Zambesi, Orange, Congo and Niger Rivers. The economies in Africa will do great if similar projects are strategically carried out. Building.

II. LITERATURE REVIEW

The Three Gorges Dam which is presently the largest hydroelectric dam in the world is located in the middle of the three gorges on the Yangtze River, the third longest in the world, in the Hubei Province of China. This dream project of the Peoples Republic of China was first thought around the 1920's, given a new impetus in 1953 and a detail plan in 1955. As a sign of good leadership, having the interest of posterity and continuity of governments' dreams and visions revived the project, a drive lacked by almost all African leader. The project was finally approved by the Chinese government in 1992 but construction begun in 1994. The about \$31 billion project was completed in 2009 and was funded by the Chinese Government, TGP tax, and support from some foreign countries, companies and banks; According to chinatravelguide.com (2020)

"Controversy about the project on grounds of human rights due to the relocation of some 1.3 to 1.9 million and non-feasibility of the project was speculated by some Western countries. (Ma Yue, 2008) but the China Three Gorges Project Corporation (2018) states 1.13 million people relocated" (TGD,2014). Many countries from the Western World argued

that the TGP was a too dangerous project and could spell more risky floods as well as huge silt accumulation suggested, could collapse the dam. “The TGP hydropower station with a total capacity of 22.5 million kilowatts and annual power generation of 100 billion kilowatt hours per annum, is enough to ensure adequate power supply to the Middle, Eastern and Southern China, within a 400 to 1,000 km economic transmission distance of the load, including the provincial regions of Henan, Hubei, Hunan, Jiangxi, Chongqing, Shanghai, Jiangsu, Zhejiang, Anhui and Guangdong”. “The dam is 185 meters high and store 39.3 billion cubic meters of water”. (Three Gorges Dam Hydro Electric Power Plant, China, 2018). According to Qing D., Thibodau J.G., Williams M.R., et al” (2016). “TGP generates 100 billion kWh clear power each year which has been transmitted to almost 1/3 provinces of China. The Three Gorges hydropower station reduce the emissions of hundred million tons of carbon dioxide, 1-2 million tons of sulfur dioxide, 300,000 to 400,000 tons of oxynitride, 10,000 tons of carbon monoxide and 150,000 tons of dust every year”.

The TGP began hydroelectric power production began in 2003 and gradually increased when additional turbine generators came online over the years until 2012, when all of the dam’s 32 turbine generator units were operating. (Zhan et al 2016) states that since the full operation of the TGD was implemented in 2008, the benefits of flood control and exploitation of water resources have been further amplified. Besides playing an important role in flood control, the TGD helps to produce major economic benefits via power generation, irrigation of cropland and navigation, etc (Pradeed T.,1997) states that the reservoir's flood storage capacity is 22 cubic kilometres (5.3 cu mi; 18,000,000 acre-ft) and that the capacity has reduced the frequency of major downstream flooding from once every 10 years to once every 100 years. The dam is expected to minimize the effect of even a "super" flood. According to Morioka M, Abrishamkar A. (2017), the dam was intended to protect millions of people from the periodic flooding that plagued the Yangtze basin, but the effectiveness of this function has been greatly debated. The UN-Water International Conference (2011) indicated that with the Three Gorges Dam in operation, the embankments in the middle reaches of the Yangtze River and along the main course of the river withstand floods of a magnitude that occurs once every 100 years. As compared with its previous 10 years ability to protects the areas across the Jing River from devastation and ensuring the safety of the 20 million residents and 1.533 million hectares of farmland in the Jiangnan Plains and towns along the river. The Three Gorges Dam scenic area particularly consists of Tanzi Mountain, 185 Dam Viewing Point and a Memorial Garden which covers an area of 15.28 square kilometres (about 5.9 sq mi). It’s been established that over 20 million tourists have visited the TGP so far, with 3 million tourists visiting the GTP in a single year of 2019 (Xinhua news 2019). Considering the level of investment and the determination, the Chinese government has shown great leadership in mega projects especially in the area of hydro dam construction. . “The dam consists of three parts: the dam

itself, ship locks, and shiplift. The ship locks are located on one side of the dam. There are two in total, one to manage traffic upstream and one to manage traffic downstream. The installation of ship locks is intended to increase river shipping from 10 million to 100 million tonnes annually, has reduced transportation costs of between 30 and 37%, and has made Shipping safer, since the gorges were notoriously dangerous to navigate”. “There are two series of ship locks installed near the dam (30°50'12"N 111°1'10"E). Each of them was made up of five stages, with transit time of around four hours. Maximum vessel size is 10,000 tons. The locks are 280 m long, 35 m wide, and 5 m deep (918 × 114 × 16.4 ft). That is 30 m (98 ft) longer than those on the St Lawrence Seaway, but half as deep”. Before the dam was constructed, the maximum freight capacity at the Three Gorges site was 18.0 million tonnes per year. “From 2004 to 2007, a total of 198 million tonnes of freight passed through the locks. The freight capacity of the river increased six times and the cost of shipping was reduced by 25%. The total capacity of the ship locks is expected to reach 100 million tonnes per year. There are five locks, used to transport large ships, twelve at a time, over the dam. The shiplift became fully operational in 2009. The third part of the dam is the shiplift which is an elevator used to raise smaller ships over the dam. The dam is 600 feet high and 1.3 miles across” (CTGPC 2018).

III. METHODOLOGY

To be able to draw the comparison between the Three Gorges Dam in China and other dams in Africa and to determine their performances, seventy-five (75) articles were reviewed with thirty-five (35) focusing on the TGD and the other 40 looking at other dams in Africa. Fifty-eight (58) sites were also visited for some critical information including the United Nations Department Economic and Social Affairs Population Division. Tables were used to illustrate the capacity of the TGP in China and the 10 (ten) top dams in Africa and their performances.

Comparing Top 10 African Dams and the Three Gorges Dam in China

Table 1: Illustrating the installed capacity of the TGD and the top 10 Dams in Africa.

Name of Dam and Country	Installed Capacity	Name of Dam and Country	Installed capacity
Akosombo Dam of Ghana	1020 MW	Three Gorges Dam in China	22,500MW
Aswan Dam of Egypt	2100 MW		
Cahora Dam of Mozambique	2,070 MW		
Gilgel Gibe III Dam of Ethiopia	1,870 MW		
Kainji Dam of Nigeria	760 MW		
Kariba Dam of Zambia & Zimbabwe	1,626		
Inga Dam of DRC	1775 MW		
Merowe Dam of North Sudan	1250MW		
Tekeze Dam of Ethiopia	1200 MW		
Renaissance Dam of Ethiopia	6,450 MW		
Total Capacity for Africa	20,121 MW	Total capacity for China	22,500MW

Source: CTGPC 2018; Energycapitalpower.com 2021.

The table shows the best 10 hydro dams in Africa with their installed capacity in comparison with China’s Three Gorges Dam. The largest among the dams in Africa is the Renaissance Dam with an installed capacity of 6,450MW located in Ethiopia with the least among the dams been the Kainji Dam of Nigeria with the installed capacity of 760MW. Though these dams are not large enough, some of them supply electricity to more than two countries in addition to the owning country.

Table 2: comparing the Top 10 dams in Africa and the TGD, areas supplied with electricity and the population served.

Name of Dam, Country(s) served	Population	Name of Provinces in China served	Population
Akosombo Dam: Ghana, Benin, Togo	31,826,025million 12,123,200million 8,503,357million	Jiangsu (TGD)	80.7million
Aswan Dam: Egypt	104,560,473million	Anhui (TGD)	63.65million
Cahora Dam: S. Africa Mozambique	60,178,305million 32,261,058million	Henan (TGD)	109.52million
Gilgel Gibe III, Tekeze and Renaissance Dams: Ethiopia	118.267,291million	Hunan (TGD)	66.44million
Inga Dam: DRC	105,000,000million	Hubei (TGD)	57.75million
Kainji Dam: Nigeria	212,052,977million	Jiangxi (TGD)	45.2million
Kariba Dam: Zimbabwe, Zambia	14,862,924million 18,383,955million	Chongqing (TGD)	32.05million
Merowe Dam: Sudan	45,073,373million	Shanghai (TGD)	27.03million
		Zhejiang	64.6million
		Guangdong	126million
Total Population served	763,092,938	Total Population served	672.94million

Source: commonwealth of Nations.org; World Population Prospects; UN Dept. of Economic & Social Affairs Population Division (2015).

The table illustrates the population available in the Provinces where the Three Gorges Dam supply electricity as compared to the top ten (10) dams in Africa and the population they serve. The Three Gorges Dam supply electricity to nine (9) Provinces and 2 Regions and the ten (10) dams in Africa serve twelve (12) countries across the continent.

Comparing the manufacturing companies within China and Africa served by the Three Gorges Dam and the Top 10 Dams in Africa.

Table 3: Illustrating the manufacturing companies in China served by the TGD and the manufacturing companies served by the Top 10 Dams in Africa.

China Province(s)	Manufacturing Companies	African Country(s)	Manufacturing Companies
Anhui	178,691	Benin	18
Chongqing	74,818	Egypt	1,491
Guangdong	798,064	Ethiopia	180
Henan	174,197	Ghana	246
Hubei	119,884	Mozambique	73
Hunan	86,347	Nigeria	823
Jiangsu	645,092	South Africa	31,389
Jiangxi	96,328	Sudan	48
Shanghai	139,209	Zambia	102
Zhejiang	1,465,996	Zimbabwe	66
Total manufacturing Companies-China	3,778,626	Total manufacturing Companies-Africa.	34,436

Source: Dun & Bradstreet Inc, 2021; listcompany.org, 2020.

Table 3 seeks to compare the number of manufacturing companies in ten (10) Provinces in China assigned for the supply of electricity supply and ten (10) countries within the catchment area of the top 10 dams in Africa. Though the installed capacity of the Three Gorges Dam is 22,500MW and that of the top 10 dams in Africa is 20,121MW, there seems to be a sharp deviation from the total number of manufacturing companies in these two areas.

IV. DISCUSSION

Strategic alliance suggestively to African nations is the most possible for solving electricity crisis been experienced by some of the African countries. The water disagreement between Egypt and Ethiopia can peacefully be handled when Renaissance dam under construction is reengineered and extended to cover some portions of Egypt to curtail the fear exercise by Egypt as a result of Ethiopia trapping the waters upstream and allowing a certain percentage of flow and or open the dam for spillage when the renaissance dam reservoir if full. Expanding the dam to cover some portions in Egypt could also afford the opportunity of creating ports for movement of goods on large quantities and promoting trade between the two countries and establishing partnership for the countries. In China, the installation of ship locks has increased river shipping from ten million to 100 million tonnes annually, transportation costs has been cut between 30 and 37% and shipping has become safer presently, previously the gorges were notoriously dangerous to navigate. Before the dam was constructed, the maximum freight capacity at the Three Gorges site was 18.0 million tonnes per year but between 2004 and 2007, a total of 198 million tonnes of freight passed through the locks and that the freight capacity of the river increased six times and the cost of shipping has been reduced by 25%. Reducing the cost of moving goods especially raw materials and other semi-finished goods by the construction of such gigantic dams with multi-purposes will aid production and reduce cost of production hence lower prices of goods will enable the African people to consume quality goods but at reduced prices. The cost of the Three Gorges with its numerous benefits is around \$31billion far lower than the Renaissance Dam in Ethiopia which costs over \$80billion when completed but lacks major components of the Three Gorges such as the ship locks making the TGD much cost efficient than the Renaissance Dam. Reengineering the Renaissance Dam and constructing similar dams in Africa will promote bilateral trade, reduce the cost of moving goods between the two countries including other neighbouring countries.

Table 2 illustrates the ten (10) top dams across Africa but serve about twelve (12) countries whilst the Three Gorges Dam serves nine (9) Provinces and 2 Districts in China. Comparison indicates similarity in terms of population served but the TGD is efficient and effective than the dams in Africa. Ghana experienced power crises between 2012 and 2016 and it led to the collapsed of many medium and small scaled companies with the multi-nationals not spared. The economy dwindled and prices of food and other related and unrelated

products such as cement and other soared. The situation showed itself again in the early parts of 2021 but by the earlier intervention by the government, it was restored. South Africa and many other countries in Africa experiences power shortages sometimes seriously affect all manner of firms especially manufacturing companies thus dwindling the economies of such countries whilst the economies dwindle, and cost of living increases putting the citizens in difficult situations, the economies within the areas serve by the Three Gorges Dam keep improving- a clear case of efficient generation and distribution of power than those within the countries with the top 10 dams in Africa. Considering the land size of farms they irrigate. The farmers in Africa within the countries of the dams and most farmers in Africa depends on the natural rains for farming and thus produces food in the rainy season but finds it difficult to grow food in the dry season but most of these dams such as the Bagre Dam in Burkina Fasso have their reservoirs spilled and causes flood destroying lives and properties with no use for the water that flows out of these dams. The TGD discharges its reservoir during the dry season between December and March each year. This increases the flow rate of the river downstream and supplies fresh water for agricultural and industrial purposes. Beginning 2003 after the filling of the reservoir, the TGD with a dam volume of 36.6 million cu yd. has supplied an extra 11km³ (2.6 cu mi) of fresh water to downstream cities and dams during the dry season. According to the Ministry of Environmental Protection, as at 2007, over 50 new plants treats 1.8million tonnes of water per day indicating 65% of the total needed.

Comparing the installed capacity of the Three Gorges Dam (22,500MW) and that of the Top 10 Dams in Africa (20,121MW) and the number of manufacturing companies within these regions though each of this region has complementary sources of energy leaves the TGD much to be desired. According to Dun & Bradstreet Inc. 2021 a total of 34,436 manufacturing companies in 12 countries having the top 10 dams in Africa represents 0.911% of 3,778,626 manufacturing firms in the 10 Provinces in China. With manufacturing firms struggling for power supply for production and inadequate power preventing foreign direct investment into Africa shows ineffective and inefficient power generation and distribution in Africa where about 40% of the power generated are lost in distribution. Africa, the continent with much of the world's natural resources have more services companies than the manufacturing companies leaving the raw materials to be exploited to other foreign countries without added value and thus obtain very little foreign exchange from the raw materials exported, a situation that has led to high unemployment situations coupled with low incomes and wages resulting in low standard of living by the people. From table 3 it is clearly shows that the total manufacturing firms contributing to GDP of the 12 African countries is twice lower than the lowest manufacturing companies among Provinces (Chongqing). Considering the average cost of creating a manufacturing company among the 53 countries in Africa been 33.35% of per capita GNI and between the range of 0.20

% GNI (South Africa) to 106% of GNI (Mozambique) a report from the World Bank 2019, suggests that with little transparency and attempt to stop corruption among the political leaders and heads of public institutions can lead to astronomic increase in establishing businesses, creates employment and improve the living standards of the common people. With deliberate attempt by African leaders to construct similar projects such as the Three Gorges Project which has a reservoir surface area of over 417 square miles (1,080 sq km) and extends 370 miles (600km) along the Yangtze River upstream allows oceangoing freighters to navigate 2,250 km (1400 miles) inland from shanghai on the East China sea to the inland city of Chongqing (CTGPC 2018) will help transport goods from long distances across African countries at cheaper rate since waterways transport is the cheapest means of transporting goods. This as a result will also ensure similar prices of goods irrespective of distance and to improve the economies of these areas. Africa with an attempt to crucify corruption can build about 3 projects similar to the TGP (\$31 billion) each year since \$148 billion is lost to corruption a report issued by the African Union in 2013 and VanguardNews 2018.

V. CONCLUSION

With tourism been one of the major contributors of a nations GDP and the Three Gorges Dam alone attracting about three million (3million) visitors in 2019 alone is a proof that the economies of Africa could improve upon constructing similar projects. Determination to ensuring the realisation of vision and projects of successive governments is the propensity for Africa's development since many such projects has been left uncompleted due to differences in political ideologies but to the disadvantage of the common citizenry. It has almost become a norm in Africa where project costs are astronomically increased to enable politicians' cash in. A situation leading to high cost of projects and thus increasing the percentage of GDP to debt ratio. With transparency, accountability, leadership, determination and vision driven demonstrated by the Chinese Government not in the construction of the TGP alone but in other mega projects, doing same by African leaders will make Africa the biggest investment hub in the world based on the resources nature has bestowed on the continent. It is incumbent on the leaders of Africa to emulate the examples in china to ensure employment provision for its rising youth and adopting other mechanisms at ensuring sustainable economic growth.

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REFERENCES

- [1] Adams, Jerry. "Three Gorges Dam". Electronic Data Interchange. Awesome Library. Archived from the original on July 22, 2009. Retrieved June 3, 2021.
- [2] Annual report on the military power of the People's Republic of China (.pdf) (PDF). US Department of Defense. Archived (PDF) from the original on August 6, 2009. Retrieved July 8, 2021.
- [3] Beijing Environment, Science and Technology Update". U.S. Embassy in China. March 7, 2003. Archived from the original on October 11, 2007. Retrieved July 20, 2021.
- [4] Beyond Three Gorges in China". Water Power Magazine. January 10, 2007. Archived from the original on June 14, 2011. Retrieved August 23, 2021.
- [5] China dam to displace millions more". MWC News. October 13, 2007. Archived from the original on October 14, 2007. Retrieved June 23, 2021.
- [6] China Completes Three Gorges Dam". CBS News. May 20, 2006. Archived from the original on July 18, 2008. Retrieved June 23, 2021.
- [7] China's Three Gorges dam 'breaks world hydropower record'". Archived from the original on March 3, 2016. Retrieved July 15, 2021.
- [8] China's Three Gorges project increases power output in 2017". GBTimes.com. January 4, 2017. Archived from the original on March 3, 2018. Retrieved June 2, 2021.
- [9] China's Three Gorges sets new production record". Hydro World. January 10, 2013. Archived from the original on January 15, 2013. Retrieved June 10, 2021.
- [10] "China Completes Three Gorges Dam". CBS News. May 20, 2006. Archived from the original on July 18, 2008. Retrieved July 23, 2021.
- [11] China Three Gorges Project Corporation. August 22, 2008. Archived from the original on December 7, 2008. Retrieved August 6, 2021.
- [12] C. Michael Hogan. Andy Burnham (ed.). "Shen Nong Gorge Hanging Coffins". The Megalithic Portal. Archived from the original on June 10, 2011. Retrieved July 20, 2021.
- [13] Dai, Qing (1994). Yangtze! Yangtze!. Earthscan. p. 184. ISBN 978-1-85383-187-4.
- [14] Chetham, Deirdre (2002). Before the Deluge: The Vanishing World of the Yangtze's Three Gorges. Palgrave Macmillan. ISBN 978-1-4039-6428-1.
- [15] Collins, Peter (November 15, 2007). "Falling here, rising there". The Economist. ISSN 0013-0613. Retrieved July 8, 2021.
- [16] Ctgpc.com.cn. August 7, 2009. Archived from the original on July 28, 2011. Retrieved August 16, 2021.
- [17] Gerin, Roseanne (December 11, 2008). "Rolling on a River". Beijing Review. Archived from the original on September 22, 2009. Retrieved May 28, 2021.
- [18] Guo Jinjia; Yang Shanyin (November 16, 2007). People's Daily. Archived from the original on November 19, 2007. Retrieved August 10, 2021.
- [19] Hb.xinhuanet.com. Archived from the original on February 28, 2009. Retrieved August 1, 2021.
- [20] Its Buildings with Biggest Indices". China Three Gorges Project. 2002. Archived from the original on November 21, 2008. Retrieved July 23, 2021.
- [21] Jan Akkermann; Thomas Runte; Dorothea Krebs (2009). "Ship lift at Three Gorges Dam, China – design of steel structures" (PDF). Steel construction 2. Archived (PDF) from the original on October 6, 2016. Retrieved August 19, 2021.
- [22] Liang Chao (July 15, 2004). "More bid farewell to Three Gorges". China Daily. Archived from the original on December 4, 2007. Retrieved July 20, 2021.
- [23] Li, Long (1989). Environmental planning of large-scale water projects: The Three Gorges Dam case, China (MA thesis). Wilfrid Laurier University.
- [24] MacKie, Nick (May 4, 2005). "China's west seeks to impress investors". BBC. Archived from the original on November 24, 2008. Retrieved August 23, 2021.
- [25] Morioka, Matthew; Abrishamkar, Alireza; Kay CEE 491, Yve. "Three Gorges Dam". Archived from the original on March 7, 2012. Retrieved July 2, 2021.
- [26] NASA Details Earthquake Effects on the Earth". NASA/JPL. Archived from the original on August 10, 2017. Retrieved August 10, 2021.
- [27] Project Management Institute (2008). A guide to the project management body of knowledge (PMBOK guide) (4th Edition). Newtown Square, PA: Project Management Institute.
- [28] People's Daily. Archived from the original on July 24, 2010. Retrieved August 1, 2021.
- [29] Regine Debatty (December 9, 2007). "Flotsam, Jetsam and the Three Gorges Dam". World Changing. Archived from the original on July 6, 2008. Retrieved July 20, 2021.
- [30] Three Gorges Dam will meet the first large-scale flood since being completed". easyseosolution.com. July 10, 2010. Archived from the original on July 23, 2010. Retrieved July 8, 2021.
- [31] Three Gorges Dam". Missouri Chapter American Fisheries Society. April 20, 2002. Archived from the original on November 18, 2008. Retrieved July 23, 2021.
- [32] Three Gorges Dam Case Study". American University, The School of International Service. Archived from the original on December 6, 2000. Retrieved January 20, 2008.
- [33] Theuerkauf, Ethan (October 2, 2007). "Three Gorges Dam: A Blessing or an Environmental Disaster?". The Flat Hat. Archived from the original on February 22, 2008. Retrieved June 21, 2021.
- [34] The Wall Street Journal. Archived from the original on December 6, 2008. Retrieved August 1, 2021.
- [35] Three Gorges Dam". International Rivers. Archived from the original on May 5, 2015. Retrieved September 5, 2021.
- [36] Three Gorges Dam exceeds cargo target set for 2030". South China Morning Post. May 23, 2014. Archived from the original on October 16, 2015. Retrieved August 12, 2021.
- [37] Tower columns for Three Gorges shiplift to be built". Yichang, Hubei Province: Xinhua. February 27, 2012. Archived from the original on September 27, 2013. The entire shiplift will be completed in 2015.
- [38] Toy, Mary-Anne (September 27, 2007). "Three Gorges Dam 'could be huge disaster'". The Age. Retrieved July 8, 2021.
- [39] Wang Yichen (February 17, 2016). "China shifts from follower to leader in hydropower development". China Economic Net. Archived from the original on February 18, 2016. Retrieved August 12, 2021.
- [40] World's largest shiplift starts operation at China's Three Gorges Dam". Shanghai Daily. September 18, 2016. Archived from the original on September 18, 2016. A permanent shiplift on the Three Gorges Dam in central China's Hubei Province began trial operation on Sunday.
- [41] Wu, J.; Huang, J.; Han, X.; Xie, Z.; Gao, X. (2003). "Three-Gorges Dam – Experiment in Habitat Fragmentation?". Science. 300 (5623): 1239–1240. doi:10.1126/science.1083312. PMID 12764179. S2CID 128845721.
- [42] Xie, P. (2003). "Three-Gorges Dam: Risk to Ancient Fish". Science. 302 (5648): 1149b–1151. doi:10.1126/science.302.5648.1149b. ISSN 0036-8075. PMID 14615514. S2CID 31587732.
- [43] Yangtze as a vital logistics aid" (in Chinese). China Economic Review. May 30, 2007. Archived from the original on August 7, 2010. Retrieved June 3, 2021.
- [44] Yang, Sung. "No Casualties in Three Gorges Dam Landslide". Xinhua News Network. CRIEnglish.com. Archived from the original on May 23, 2009. Retrieved June 3, 2021.
- [45] Zhang, Jie (December 21, 2018). "Three Gorges Dam generates record amount of power – Chinadaily.com.cn". www.chinadaily.com.cn. Archived from the original on March 21, 2019. Retrieved March 21, 2019.