Science Fair Log Book

Jasmine Shields

Oct 7 School Registration Opens

Oct 7 Project Registration Opens

Dec 13 School Registration Closes

Dec 16 Independent Registration Opens

Jan 13

Judging Registration Opens

Feb 7 Independent Entry and Project Registration Closes

Mar 21 Project must be completed online

Apr 10 Project Setup at the Olympic Oval

*** School science fair March 17, 18, 19???

Jan 17, 2025

Topic – Yarlung Tsangpo Dam

Problem – What will the long term effects of China's Yarlung Tsangpo Dam be? Good? Bad?

Project Type – Research/Study

Project Topic – Chemical & Physical Sciences

Project Category – Earth Science

Jan 20, 2025

Basic Info:

- Source : https://www.bbc.com/news/articles/crmn127kmr4o
- Source : https://thediplomat.com/2025/02/whats-driving-chinas-controversial-mega-dam-in-tibet/
- Video source : https://www.youtube.com/watch?v=i-ShOGTbK-Q
- Source : https://www.yahoo.com/news/china-tells-india-yarlung-tsangpo-093000927.html
- Video Source : https://www.youtube.com/watch?v=FgqmTYsLOt4

Key Features and Significance:

- **Location:**

The dam will be built on the lower reaches of the Yarlung Tsangpo River in the Tibet Autonomous Region, near the border of India.

- **Size and Capacity:**

The project is expected to generate 300 billion kilowatt-hours of electricity annually, which is three times the output of the Three Gorges Dam, currently the world's largest hydropower plant.

- **Cost:**

The project is estimated to cost around 1 trillion yuan (approximately $137 billion).

- **Purpose:**

China has stated that the dam will help the country achieve carbon neutrality by 2060 and boost local prosperity.

- **Controversy:**

The project has sparked concerns in India and Bangladesh regarding potential impacts on downstream water resources, displacement of communities in Tibet, and environmental damage.

Concerns and Counterarguments:

- **Downstream Impacts:**

India and Bangladesh worry about the potential for water shortages and flooding due to the dam's operation.

- **Environmental Concerns:**

Experts have raised concerns about the project's potential to disrupt ecosystems and negatively impact the river's natural flow.

- **Geopolitical Tensions:**

The project has the potential to further strain relations between China and India, as well as other neighboring countries.

- **China's Response:**

Chinese state media has described the project as "a safe project that prioritizes ecological protection" and claims it will boost local prosperity and contribute to Beijing's climate neutrality goals.

- **Transparency:**

Some critics argue that China has been lacking in transparency regarding the project's details and potential impacts on downstream countries.

Jan 20, 2025

Background research: **3 Georges Dam**

General

- Currently world's largest hydropower plant
    - Earths rotation slowing (use evidence from 2 Gorges Dam)
- Holds 40 billion cubic meters of waters
- Causing a significant redistribution of mass on earth
- Changes the distribution of weight across the planets surface altering its rotational dynamics
- Benjamin Fong Chao (NASA scientist) ***more research
- Slowed rotation by 0.06 milliseconds per day

Problems

- Displacement re-settlement of 1.4 million people
- If not for the dam, what would they use instead
- Effects on environment

Good

- Renewable energy à Hydroelectricity
- How much energy it creates ~ 22,500MW of electricity

- 2020 produced 111.88 terawatt hours
- Average: 95-112 TWn every year

Jan 20, 2025

Background research: **Yarlung Tsangpo Dam**

General

- Estimated to create 300 TWh/year
- Enough to serve 300 million people in China
- Equation? Ask Mr. Thompson
    - What is TWh vs MW
    - 1TW = 1,000,000,000MW (1 billion)
- Approved by China's government December 25, 2024
-

Potential problems

- Sociology à affects india and bangledseh
- Caused riots in Tibet
- People feeling uneasy about China's secrets (in case they don't share all of their information)

Good

- 3 times the energy of the 3 gorges dam

Jan 27, 2025

Scientific Method breakdown

- ~~Intro~~ Problem
- Hypothesis

- Research
- ~~Materials~~
- ~~Variables~~
- ~~Procedure~~ Method
- ~~Analysis~~
- ~~Observation~~
- Conclusion
- Application
- ~~Sources of error~~
- Citations
- Acknowledgement
- ~~Presentation~~
- Attachments
- Declarations

Feb 2, 2025

<u>What are the *Long term?* effects of China's Yarlung Tsangpo Dam?</u>

The purpose of my research project is to explore the long term effects of China's Yarlung Tsangpo dam on the earth's atmosphere, the effects it will have on china's energy usage and the renewable energy it could provide, the effects the dam will have on neighboring countries and their citizens (sociology), and displacement of animals and human.

March 17 show mr thompson
PROJECT LOCK: MARCH 21 (safety 20)

-Online Access Gone

- ➔ **-written work**
- ➔ **-graphs**
- ➔ **-data**
- ➔ **-research**

APA referencing: Google how to? Owl purdue
Word for word quote: Mr. Thompson says, ". . . . . ." (Thompson, 2024)
Summary of what is said: Science is often found to be cool. (thompson 2024)

WHAT IS THE NAME OF THE DAMMM???? Kam Tok dam

THREE GORGES DAM
Atmosphere
-Slows the earth's rotation by 0.06 microseconds
-Holds roughly 39 billion cubic meters (10 trillion gallons of water)
http://large.stanford.edu/courses/2022/ph240/yang2/#:~:text=Spanning%20more%20than%202.3%20kilometers,10%20trillion%20gallons)%20of%20water.
-

Fact check

River name is Yarlung Tsangpo river in china and in india it is known as the Brahmaputra

Problem
What is the dam?
-On December 25, 2024, China's government approved the construction of what will become the world's largest hydroelectric dam. (3)
Facts about it / production / cost / size / etc
-the cost will be $137billion USD or 1 trillion Yen
Research inspiration (What have the impacts of other dams been?)
What you will be investigating
-approved dec 24, 2025 (4)

Method
Describing your research
1) research and organizing information
2) Looking for common themes / patterns

Research
Split into distinct topics - each section has a different paragraph.
"This quote said this" (1)

Yarlung Tsangpo Dam

DETAILS/FACTS

-Name: Kam Tok dam/medong (motuo)/gangtuo?

-the cost will be $137billion USD or 1 trillion Yen

-Size or amount of water it can hold

- ➔ The dam is estimated to hold over 100 million cubic meters of water
- ➔

-On December 25, 2024, China's government approved the construction of what will become the world's largest hydroelectric dam. (5)

- ➔ Caused riots in tibet because damages to their temples and heritage (13)
- ➔

-The Yarlung Tsangpo dam's location at the "Great Bend" in Tibet, where the river experiences a steep 2,000-meter drop over 50 kilometers, allows it to harness significant hydropower potential from the river's gradient

-The annual flow of the Yarlung Tsangpo into India and Bangladesh is estimated at 600 billion cubic meters (15)

ATMOSPHERE

-Earths rotation slowing

- ➔ Use evidence from *Three Gorges Dam*
- ➔

RENEWABLE ENERGY/HYDROELECTRICITY

-How much energy does it create?

- ➔ Estimated to create 300 twh/year (3)
- ➔ Which is enough to serve 300 million people
- ➔ 1tw=1 000 000 000 mw

-(EXTRA) if not the dam what would they use and what would the effects on the environment be

SOCIOLOGY

-Dam effects india and bangladesh

- ➔ If someone damaged or did anything to our (chinas) water supply that would start a nuclear war

DISPLACEMENT/(DAMAGE?)

Three Gorges Dam for reference

DETAILS

-Holds 40 billion cubic meters of water

ALL TOPICS

TIMELINE

RENEWABLE ENERGY/HYDROELECTRICITY

-How much energy does it create?

- ➔ Creates approximately 22500 mw of electricity per day
- ➔ 2020: produced 111.88 terawatt hours
- ➔ Average: 95-112 twh per year

-(EXTRA) if not the dam what would they use and what would the effects on the environment be? Effects on the environment?

SOCIOLOGY

DISPLACEMENT/(DAMAGE?)

-Affects on the environment?

-affects on citizens?

- ➔ Required the resettlement of 1.4 million people (9)

ATMOSPHERE

-Holds 40 billion cubic metres of water

- ➔ Causes a significant redistribution of mass on earth's surface
- ➔ Changes the distribution of weight across the planet's surface altering its rotational dynamic
- ➔ Slows the earths rotation by 0.06 microseconds?

Yarlung Tsangpo Dam

ALL TOPICS

(1) https://www-voachinese-com.translate.goog/a/china-to-build-world-s-largest-hydropower-dam-in-tibet-20241226/7914531.html?_x_tr_sl=zh-CN&_x_tr_tl=en&_x_tr_hl=en&_x_tr_pto=sc

-Chinese authorities have not disclosed the specific location of the Yarlung Zangbo River super hydropower project, how many local residents will be forced to relocate, or how it will affect the local ecosystem (1)

-But according to Chinese officials, the hydropower project in Tibet has more than one-third of China's hydropower potential and will not have a significant impact on the environment or downstream water supply.(1)(youtube)
-Voice of America quoted Indian experts' analysis in early January 2021, saying that for India, the primary concern is China's unilateral actions to try to control the flow of transnational rivers.(1)
-The Chinese Embassy issued a statement on the hydropower project in December 2020, saying that "any development plan must be scientifically planned and demonstrated, taking into full consideration the impact on the downstream areas and the interests of upstream and downstream countries."(1)
-However, China's statement did not reassure New Delhi. "Written statements are of no use," said Jagannath Panda, an expert on East Asian affairs at the New Delhi think tank Manohar Barrikar Institute for Defense Studies and Analysis (1)
-. He added that during the tense border military standoff between the two countries in 2017, Beijing did not provide New Delhi with any relevant hydrological data that is crucial for predicting flooding in northeastern India.(1)
-India and China have no formal treaty to share water resources, but the two countries have signed an agreement to share information about water flows. Beijing has built about a dozen small and medium-sized dams on the Yarlung Zangbo River.(1) find actual agreement

- ➔ Memorandum of Understanding (MoU)
- ➔ The MoU has expired on 05th June, 2023 and is under process of renewal through diplomatic channels.

-In addition, human rights organizations have warned that these dams will completely change the natural landscape of Tibet, destroy fragile local ecosystems, and displace local communities.(1)
-In addition, the Post said that Chinese researchers are also worried that such large-scale excavation and construction in the steep and narrow Yarlung Zangbo Gorge will increase the frequency of landslides in this earthquake-prone area. Even if the dam itself is built to withstand seismic activity, landslides and mudslides caused by earthquakes are often uncontrollable and will pose a huge threat to the project.(1)

(2) https://tibetpolicy.net/wp-content/uploads/2014/11/damming-Yarlung-Tsangpo-edit.pdf

-Several memorandums of understanding (MoU) have been signed between the two nations, in which China shall provide the “hydrological information on the Yarlung Tsangpo/Brahmaputra River in flood season to India”
-Thus, the greatest risk to a large dam at the Great Bend of Brahmaputra in Metog County is seismic activity. The Metog County in the Nyingtri Prefecture of the TAR had a moderate earthquake in 2008 before the disastrous Sichuan Earthquake that killed over

90,000 people in 2008. Earthquakes collapse dams, which can be exemplified by the 2010 earthquake of 7.1 magnitude in Yushu County, Qinghai province destroyed the town of Yushu Tibetan Autonomous Prefecture and damaged three dam complexes, the Xihang, Dangdai, and Changu dams, all located on theYangtze tributary. This is a nerve-wracking example for people living downstream in India and Bangladesh, given the proximity of the Great Bend to India

(3) http://jalshakti-dowr.gov.in/india-china-cooperation/

-In the year 2002, the Government of India had entered into a Memorandum of Understanding (MoU) with China for five years upon provision of Hydrological information on Yaluzangbu/Brahmaputra River during flood season by China to India. In accordance with the provisions contained in the MoU, the Chinese side is providing hydrological information (Water Level, Discharge and Rainfall) to Indian authorities on regular basis during monsoon season(15th May to 15th October every year). MoU in this connection was further renewed in 2008, 2013 and 2018. The MoU has expired on 05th June, 2023 and is under process of renewal through diplomatic channels.

➔ Which is why china hasnt been updating india and india got mad

-The Indian government has been continuously pressuring China for "transparency, greater hydrological data sharing, and a commitment not to redirect the natural flow of any river or diminish cross-border water flow

-The demand of energy and carbon reduction emission might push China further to build the world‟s largest hydropower station on the Brahmaputra in Metog.

(4) https://www.power-technology.com/data-insights/power-plant-profile-medog-project-china/?cf-view

-The project construction is likely to commence in 2029 and is expected to enter into commercial operation in 2033

Project details	
Total Capacity (MW)	60000
Project Type	Hydropower
Project Status	Announced
Project Location	Tibet Autonomous Region, China

Project Developer	Power Construction Corporation of China
Pipeline Capacity (MW)	60000

-The project is expected to generate 300,000 GWh of electricity.

(5) https://freetibet.org/chinas-hydropower-battlefield-in-tibet/ *******

TIMELINE

(6) -https://www.perplexity.ai/search/when-will-the-yarlung-tsang-po-RhyMRplER8ifaO1VyKCPKg?login-source=oneTapThread

-Project approved on december 25, 2024

SOCIOLOGY

(7) https://www.bbc.com/news/articles/c1d37zg1549o

-In response to our queries, the Chinese embassy in the UK did not confirm nor deny the protests or the ensuing crackdown.
-But it said: "China is a country governed by the rule of law, and strictly safeguards citizens' rights to lawfully express their concerns and provide opinions or suggestions."
-Claims of the arrests and beatings began trickling out shortly after the events in February. In the following days authorities further tightened restrictions, making it difficult for anyone to verify the story, especially journalists who cannot freely travel to Tibet.
-Once built, the dam's reservoir would submerge an area that is culturally and religiously significant to Tibetans, and home to several villages and ancient monasteries containing sacred relics.
-The Gangtuo dam would also displace thousands of Tibetans. The BBC has seen what appears to be a public tender document for the relocation of 4,287 residents to make way for the dam
-From the start, residents were not "consulted in a meaningful way" about the dam, according to the letter. For instance, they were given information that was inadequate and not in the Tibetan language. They were also promised by the government that the project would only go ahead if 80% of them agreed to it, but "there is no evidence this consent was ever given," the letter goes on to say, adding that residents tried to raise concerns about the dam several times.

-Some Chinese academics have found the pressure from accumulated water in dam reservoirs could potentially increase the risk of quakes, including in the Jinsha river. This could cause catastrophic flooding and destruction, as seen in 2018, when rain-induced landslides occurred at a village situated between two dam construction sites on Jinsha.

CULTURAL/CITIZEN IMPACT

(8) https://www.perplexity.ai/search/why-was-there-wiots-in-tibet-2-VI0h0Ht8Qy2QbXA_qvHLRA (tibet riots 2024-2025)

(9) https://savetibet.org/taming-the-drichu-chinas-derge-dam-threatens-tibetan-culture-and-communities/

Landslide Hotspot

-Changes in precipitation patterns, climate change, glacial lake outburst floods and landslides in the high-altitude Tibetan areas along the Drichu are all factors relevant to flooding in China.

-Along the Drichu, several historical landslide-flood events have occurred, causing significant damage. More recently, in October 2018, a massive landslide occurred in Po (Bolo) Township in Jomda county on the west bank of the river. The landslide formed a barrier lake, rapidly raising water levels to approximately 5,600 meters in length, 200 meters in width, and 70 meters in height.[18] This geological disaster prompted the local government to evacuate over 6,000 people, with more than 20,000 residents affected by the barrier lake. The situation escalated on November 3, 2018, when the initial landslide was reactivated at the same site, blocking a section of the river once again. The resulting barrier lake led to the relocation of 67,449 people in Tibetan areas in Sichuan and neighboring Yunnan province. Two days later, when the water was discharged through a man-made floodway, the ensuing flood devastated several townships, including Drichukha, Kardze, Po and others. The 900-year-old Po Monastery, a significant religious and historical site, was completely submerged, with its invaluable relics ruined beyond repair.

-The Drichu landslide mass remains a persistent threat, with no guarantee that a similar catastrophic event will not occur again. This geological event showed the vulnerability of communities and infrastructure along the Yangtze River basin to disasters exacerbated by human activities and climate change.

-The upper Drichu area is a hotspot of landslides, with most of the area landslides located between the Kamtok dam and the immediate downstream Yanbi dam

-Using remote sensing technologies, optical satellite remote images and UAV images, Chinese scientists in a December 2023 study of active landslides in upper Drichu region identify 246 active landslides of which 27 are specifically located in the Kamtok Reservoir area.

-In a detailed study of the reservoir area of ten dams (planned, under construction or operational) between Tashi Rangkhar (Benzilan) in Dechen (Deqin) county in Yunnan

Province and Kamtok in Jomda county in the Tibet Autonomous Region, the researchers identify the presence of three zones of concentrated active landslide areas. Zone III, situated within the planned Kamtok dam and the immediate next downstream Yanbi dam, had 127 landslides or 61.4% of all the 207 landslides in the three zones of study between Kamtok in the TAR and Tashi Rangkhar in Yunnan.
-The researchers acknowledge that due to the high elevations and steep terrain, which make the entire area inaccessible to humans, traditional geological surveys using monitoring equipment have not been extensively carried out to study the landslides
-Merely identifying the occurrence of landslides is not enough; it is imperative to uncover the root causes that trigger these geological events. Factors such as soil composition, tectonic activity, deforestation, and activities like hydropower dam construction and mining can all contribute to the destabilization of slopes and the subsequent occurrence of landslides. Serious studies seem lacking to identify the causal factors for the landslides, their correlation with climate change, or measures to mitigate further landslides or damage due to them. It is crucial to complete comprehensive, inclusive environmental impact assessments to ascertain the causal factors, climate change correlations, and mitigation measures necessary to safeguarding communities and protecting the environment.
Investigating the correlation between climate change and landslide occurrences in the upper Drichu region is vital for developing long-term adaptation strategies and mitigating the potential consequences of a changing climate. Building dams is not a solution to combating landslides to protect dam infrastructures

-In a 2020 study titled “Flood Routing Process and High Dam Interception of Natural Discharge,” Chinese scientists argue that high dams are effective in reducing the inundation area of downstream farmlands and extending the evacuation time for downstream Chinese residents during floods.

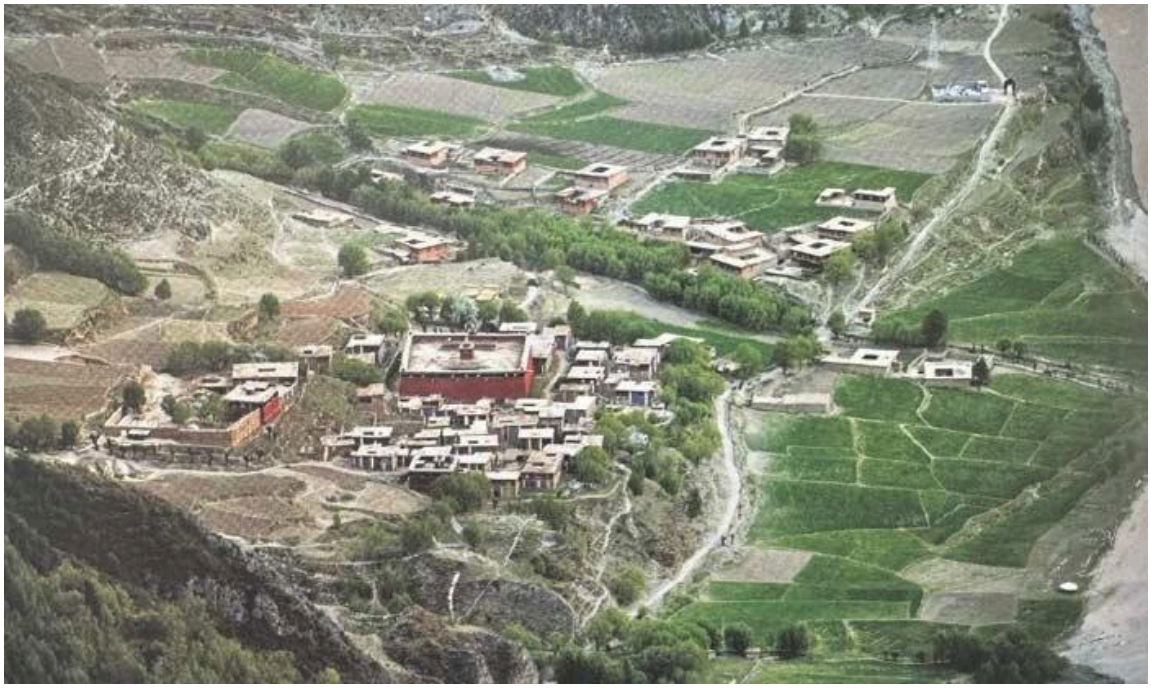
-It is important to study the long-term runoff as global climate change has changed the precipitation and snowmelt process in Tibet.

-Another group of Chinese researchers studying water storage in the upper Drichu region identify that the water storage in the region has two peaks within a year with the highest peak in August or September and the lowest between March and May.[27] They also note in their study dataset from 2003 to 2012 that the runoff peak occurs earlier than storage each year due to the steep topography in the upper Drichu region.[28] However, anomalies do occur as happened in 2006 between the 2003 and 2012 study period. Although precipitation has played the main role in runoff variations in the past decades, the researchers acknowledge that other research scientists attribute supra permafrost melt as the dominant factor for the runoff from June 2016 to May 2018.[29] Some other Chinese researchers like Gao et al. and Li et al. have found that the upper

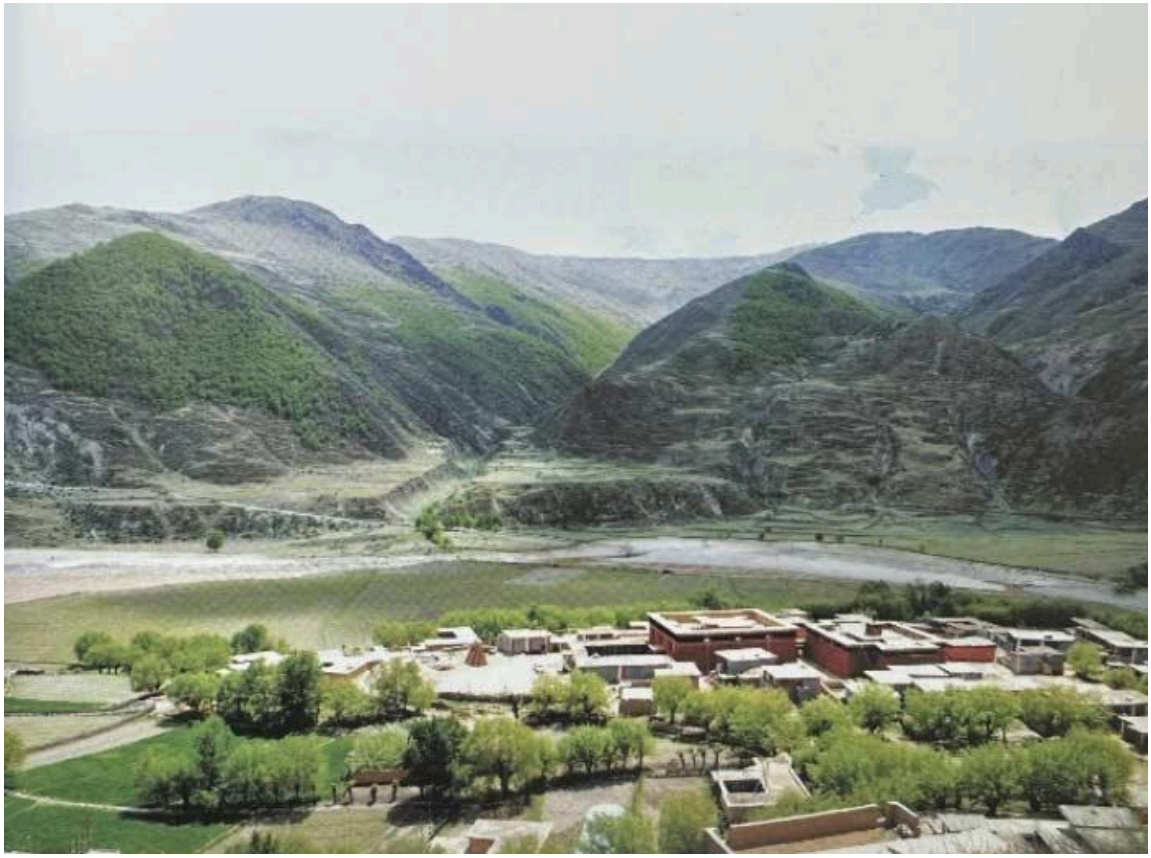
Drichu region has experienced permafrost degradations due to global warming for the past few decades. Thus the runoff in the upper Drichu region is not only due to the precipitation but also due to permafrost and glacier melt. A 2015 study of permafrost melt jointly led by Yingkyui Li of the University of Tennessee and the Chinese Academy of Sciences also identified permafrost melt as the central driver of environmental hazards potentially causing flooding due to the expansion of high-altitude lakes.

-Monasteries Destroyed:

- ➔ Wonto Monastery



➔ Yena Monastery



➔ Khardo Monastery

Three Gorges Dam for reference

ALL TOPICS

(10) -https://www.bbc.com/news/articles/crmn127kmr4o

-Chinese state media has described the development as "a safe project that prioritises ecological protection", saying it will boost local prosperity and contribute to Beijing's climate neutrality goals.

-Among them are fears that the construction of the dam - first announced in late-2020 - could displace local communities, as well as significantly alter the natural landscape and damage local ecosystems, which are among the richest and most diverse on the Tibetan Plateau.

-Reports indicate that the colossal development would require at least four 20km-long tunnels to be drilled through the Namcha Barwa mountain, diverting the flow of the Yarlung Tsangpo, Tibet's longest river.

-The project could cost as much as a trillion yuan ($127bn; £109.3bn) according to estimates by the Chongyi Water Resources bureau.

-"Earthquake-induced landslides and mud-rock flows are often uncontrollable and will also pose a huge threat to the project," a senior engineer from Sichuan provincial geological bureau said in 2022.

TIMELINE

(11) https://economictimes.indiatimes.com/news/science/nasa-says-this-enormous-construction-in-china-is-slowing-down-earth/articleshow/117013223.cms?from=mdr

-**How the Dam Affects Earth's Rotation**

The Three Gorges Dam's reservoir holds an immense 40 billion cubic metres of water, causing a significant redistribution of mass on Earth. As this water accumulates, it changes the distribution of weight across the planet's surface, altering its rotational dynamics. Benjamin Fong Chao, a NASA scientist, explained, "Redistribution of mass within the Earth's system produces an effect on Earth's rotation. While the delay of 0.06 microseconds per day may seem negligible, it is a measurable consequence of this redistribution." The effect follows the principle that moving mass closer to the poles speeds up Earth's rotation, while shifting it toward the equator slows it down.

-Earth's moment of inertia is a measure of its ability to spin, which depends on the distribution of its mass relative to its axis of rotation. When mass shifts toward the equator, the planet's rotation slows; conversely, moving mass toward the poles accelerates rotation. The Three Gorges Dam's vast reservoir exemplifies how human engineering can influence this delicate balance. Such changes, while small, are significant in understanding the interplay between anthropogenic activities and natural ..

-Human Activities Reshaping Natural Systems

The impact of the Three Gorges Dam is part of a broader trend of human activities altering Earth's physical properties. Large-scale infrastructure projects, such as dams and groundwater extraction, can influence sea levels, tilt Earth's axis, and redistribute mass. For example, the 2004 Indonesian tsunami, a natural event, shifted the North Pole by 2.5 centimetres, illustrating how both natural and human-induced phenomena interact with Earth's d ..

-The subtle slowing of Earth's rotation highlights the intricate relationship between human engineering and planetary systems. "This effect of the dam on Earth's rotation is as inevitable as it is subtle," Chao remarked, emphasising the importance of recognising humanity's growing influence on natural processes. Such projects call for careful consideration of their broader implications, ensuring sustainable and responsible development.

SOCIOLOGY

(12) https://newatlas.com/energy/yarlung-tsangpo-hydroelectric-project-china/#:~:text=The%20project%20is%20slated%20to,renewable%20energy%20and%20fight%20pollution.

-The Yarlung Zangbo River, which later turns into the Brahmaputra when it enters India, is one of the highest rivers in the world, originating from

the Angsi Glacier in the Tibet Autonomous Region. The river is only partially responsible for carving out the Yarlung Tsangpo Grand Canyon. The region sits on tectonic plates and suffers regular earthquakes. It's also one of the deepest canyons in the world, reaching 19,714 ft (6,009 m) at its deepest. It's also 313.5 miles (504.6 km) long, making it longer than the Grand Canyon in the US.
-All of this gives the Yarlung Zangbo River a drop of roughly 25,152 ft (7,667 m) from its highest point down to India, making it one of the most "hydropower-rich" rivers in the world. In particular, a 31-mile (50-km) stretch near the Namcha Barwa mountain has a 6,562-ft (2,000-m) drop, making it an ideal candidate location for a hydroelectric power station.
-Installation of a dam in that location would require drilling multiple 12.5-mile (20-km) tunnels to divert the river, which flows around 70,600 cubic feet per second (2,000 cubic meters), enough to fill about three Olympic-sized swimming pools per second.
-Source: South China Morning Post
-

DISPLACEMENT

(13) https://www.britannica.com/topic/Three-Gorges-Dam

-Three Gorges Dam is 2,335 metres (7,660 feet) long with a maximum height of 185 metres (607 feet). It incorporates 28 million cubic metres (37 million cubic yards) of concrete and 463,000 metric tons of steel into its design. Submerging large areas of the Qutang, Wu, and Xiling gorges for some 600 km (375 miles) upstream, the dam has created an immense deepwater reservoir allowing oceangoing freighters to navigate 2,250 km (1,400 miles) inland from Shanghai on the East China Sea to the inland city of Chongqing.

(14) https://organiser.org/2025/01/11/272870/world/chinas-super-dam-or-a-super-water-bomb/

-Official CHinese estimates in 1999 placed the water flowing from the yarlung tsang po every year to india and subsequently bangladesh at 600 billion cubic meters

(15) https://www.youtube.com/watch?v=XiUOBdEUqjY

(16) https://freetibet.org/latest/un-raises-concerns-over-kamtok-dam/

-Once completed, the basin of the Kamtok (Gangtuo) dam will submerge a historical area now split across the Kardze (Ganzi) Tibetan Autonomous Prefecture, incorporated

into the Chinese Sichuan Province, and Chamdo (Changdu) Prefecture in the Tibet Autonomous Region. Two villages will be submerged, Wonpotoe (Wangbuding) township in Derge (Dege (Kardze)) County and Shepa village in Jomda (Jiangda) County (Chamdo (Changdu)), as well as six monasteries situated along the riverbanks, namely Yena, Wontoe, Khadho, Rabten, Gonsar and Tashi Monasteries. In addition, the dams would cause significant, and possibly irreversible, environmental (biological and climate) negative impacts to the Tibetan plateau, impacting one of the largest rivers on Earth, and an important and strategic area to guarantee water and food security, as well as ecosystem health and climate stability.

-Hydropower dams also have significant negative impacts on the environment, as they can increase negative climate impacts including methane and other emissions, the risk of earthquakes, landslides and flash floods, and further fragilize biodiversity, including by affecting aquatic life, soil and nutrient flows downstream. It is reported that in 2011, an impact assessment was conducted for the whole area of the upper reaches of the Drichu (Jinsha) river, which was followed in 2018 by a pre-feasibility study. However, there are no indications that any environmental impact assessment that specifically considered the Kamtok (Gangtuo) project was ever conducted.

(17) https://www.wearewater.org/en/insights/water-tilts-the-earth/

-Groundwater extraction and large dams affect the tilt of the Earth's axis and the rotation speed. These are irrelevant phenomena, but they invite us to reflect on our accumulated power.

-The Earth's rotation axis moves slowly but steadily. As the globe rotates, it wobbles slightly on its axis, like an off-center spinning top, the so-called "precession" motion. This wobbling is due to the tidal forces caused by the gravitational influences of the Sun and the Moon.

-In 2018, NASA detected a variation in the Earth's rotation following the construction of the Three Gorges Dam on the course of the Yangtze River in central China. The enormous hydraulic work, which involved the construction of a dam 185 meters high and 2,310 meters long, forms a reservoir with a capacity of about 39.3 billion m^3 and occupies an average area of 632 km2. More than 100 million m^3 of earth had to be removed, and about 1.5 million people were displaced. Scientists and environmentalists have criticized the

gigantic reservoir, which has altered the area's climate and caused considerable environmental damage.
According to NASA experts, the Three Gorges Dam has caused the Earth to alter its rotation, increasing daylight hours by 0.06 milliseconds. Returning to the simile of the spinning top, geophysicists explain that the variation of a large volume of mass dispersed over a large territory tends to reduce the rotation speed. In contrast, the mass concentration at a specific point would increase it.

(18) https://www.rivermixer.com/chinas-dam-on-tibets-yarlung-tsangpo-river-a-risky-bet/

The planned mega-dam on the Yarlung Tsangpo (Brahmaputra) River in Tibet will be called the Medog Hydropower Station.

Here's a more detailed breakdown:

- **Project Name:** Medog Hydropower Station
- **Location:** Lower reaches of the Yarlung Tsangpo (Brahmaputra) River in Medog County, Tibet.
- **Geopolitical implications**: The river flows into India and Bangladesh, where it is known as the Brahmaputra and Jamuna rivers, respectively.
- **Purpose:** To generate a massive amount of hydroelectric power, potentially three times more than the Three Gorges Dam.
- **Capacity:** The project is expected to have a capacity of 60GW.
- **Cost:** The project would cost about 1 trillion yuan ($127bn; £109.3bn).
- **Environmental Concerns**: The construction of the Medog dam poses substantial ecological risks.

(19) https://www.benarnews.org/english/news/bengali/china-approves-construction-of-mega-dam-in-tibet-12302024134252.html

(20) https://www.lowyinstitute.org/the-interpreter/china-s-medog-county-mega-dam-bad-news-india-bangladesh#:~:text=The%20construction%20of%20the%20Medog,a%20decline%20in%20fish%20populations.
(21) https://savetibet.org/derge-protests-put-dams-back-on-the-agenda/
(22) https://www.power-technology.com/marketdata/power-plant-profile-medog-project-china/?cf-view
(23) http://large.stanford.edu/courses/2022/ph240/yang2/#:~:text=Spanning%20more%20than%202.3%20kilometers,10%20trillion%20gallons
(24) -https://www.icanw.org/catastrophic_harm

-If a nuclear weapon detonates, what happens?

Short Term Effects

-A single nuclear weapon can destroy a city and kill most of its people. Several nuclear explosions over modern cities would kill tens of millions of people. Casualties from a major nuclear war between the US and Russia would reach hundreds of millions.

-It takes around 10 seconds for the fireball from a nuclear explosion to reach its maximum size. A nuclear explosion releases vast amounts of energy in the form of blast, heat and radiation. An enormous shockwave reaches speeds of many hundreds of kilometres an hour. The blast kills people close to ground zero, and causes lung injuries, ear damage and internal bleeding further away. People sustain injuries from collapsing buildings and flying objects. Thermal radiation is so intense that almost everything close to ground zero is vaporized. The extreme heat causes severe burns and ignites fires over a large area, which coalesce into a giant firestorm. Even people in underground shelters face likely death due to a lack of oxygen and carbon monoxide poisoning.

Long Term Effects

In the long-term, nuclear weapons produce ionizing radiation, which kills or sickens those exposed, contaminates the environment, and has long-term health consequences, including cancer and genetic damage. Their widespread use in atmospheric testing has caused grave long-term consequences. Physicians project that some 2.4 million people worldwide will eventually die from cancers due to atmospheric nuclear tests conducted between 1945 and 1980.

-The use of less than one percent of the nuclear weapons in the world could disrupt the global climate and threaten as many as two billion people with starvation in a nuclear famine in the long-term. The detonation of thousands of nuclear weapons could result in a nuclear winter, which would destroy our fragile ecosystem.

-Physicians and first responders would be unable to work in devastated, radioactively contaminated areas. Even a single nuclear detonation in a modern city would strain existing disaster relief resources to the breaking point; a nuclear war would overwhelm any relief system we could build in advance. Displaced populations from a nuclear war will produce a refugee crisis that is orders of magnitude larger than any we have ever experienced.

-The existence of nuclear weapons has a strong impact on the environment. Nuclear war would mean a climate disruption with devastating consequences. The world would fall under a nuclear winter, be subject to a deadly global famine and exacerbated effects of global warming.
The socio-economic impacts would also be terrible, with developing countries and marginalized groups the ones that will suffer the most. Nuclear weapons are also a vacuum for financial support: in their development, maintenance and dismantlement. This is money that could be better spent funding assets such as green technologies and health facilities.

(25) http://ascelibrary.org/doi/10.1061/9780784483695.014#:~:text=Evidence%20shows%20the%20Yarlung%20Tsangpo%20River%20as,resulted%20in%20huge%20floods%20and%20impacted%20large

-The Yarlung Tsangpo River Grand Canyon is the most precipitous place in the Yarlung Tsangpo River, has a length of 504.6 km, a slope of 0.155%, and a valley bottom elevation difference of 2,755 m. Evidence shows the Yarlung Tsangpo River as well as its tributaries are frequently blocked by landslides, avalanches, and debris flow. The breaching of some large landslide dams, such as the 2000 Yigong landslide dam and the 2018 Gyalha landslide dam, resulted in huge floods and impacted large downstream areas.

(26) https://www.aljazeera.com/features/2025/1/24/dam-for-a-dam-india-china-edge-towards-a-himalayan-water-war#:~:text=Deepak%20agreed.,century%20occurred%20in%20the%20Himalayas.

Energy

(27) https://fiscalnote.com/blog/chinas-energy-law-2025
(28) https://climatecooperation.cn/climate/china-releases-its-first-energy-law/

Renewable energy
-Create
As a part of chinas first energy law China has planned to create many new dams energy reserves to reach peak carbon use in 2030 and hopefully reach carbon neutrality by 2060. As previously stated, the Kam tok dam is estimated to generate 3 times the amount of electricity as the Three Gorges dam, this number is anticipated to be 300 terawatt-hours (TWh) which is enough to serve up to 300

million people, almost one fifth of China's 1.4 billion population. This immense amount of energy that will be generated can exponentially reduce chinas carbon footprint, along with helping to reach carbon neutrality.

Environment

-downstream effects

-Earths atmosphere, rotation slowing

-Landslides

With all the advantages of the dam

Sociology (temples, displacement)