# चीन ने ब्रह्मपुत्र नदी पर शुरू की सबसे बड़ी पनबिजली परियोजना

## जल आपूर्ति बाधित होने की भारत की आशंका को किया दरकिनार

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चीन ने एक बार फिर भारत की चिंता बढ़ा दी है। उसने तिब्बत में ब्रह्मपुत्र नदी पर बनी अपनी सबसे बड़ी पनबिजली परियोजना 'जम हाइड्रोपावर स्टेशन' की सभी छह इकाइयों को पावर ग्रिड से जोड़ दिया है। भारत ने इस परियोजना से जल आपूर्ति बाधित होने की आशंका जताई थी, लेकिन चीन ने इसे दरकिनार कर दिया।

चीन की प्रमुख पनबिजली कंपनी चाइना गेझोउबा ने बताया कि केंद्र की सभी इकाइयों को पावर ग्रिड से जोड़ दिया गया है। इसके बाद दुनिया की सबसे ज्यादा ऊंचाई पर डेढ़ अरब डॉलर की लागत से बना इस ह्यइड्रोपावर स्टेशन ने काम करना शुरू कर दिया है। जम हाइड्रोपावर स्टेशन एक साल में 2.5 अरब किलोवाट बिजली उत्पादन करेगी। कंपनी ने कहा है कि यह मध्य तिब्बत की बिजली की किल्लत दूर करेगी और बिजली की कमी वाले क्षेत्र में विकास लाएगी। इस परियोजना की पहली इकाई ने पिछले साल नवंबर में अपना संचालन शुरू कर दिया था।

शन्नान प्रिफेक्चर के ग्यासा काउंटी में स्थित जम ह्यइड्रोपावर स्टेशन में ब्रह्मपुत्र नदी के पानी का इस्तेमाल होता है। यह नदी तिब्बत से भारत आती है और फिर बांग्लादेश जाती है। भारत को चिंता है कि अगर पानी बाधित किया गया तो ब्रह्मपुत्र नदी की परियोजनाएं, खासतौर पर अरुणाचल प्रदेश की अपर सियांग और लोअर सुहांस्त्री परियोजनाएं प्रभावित हो सकती हैं।

## बाढ़ आने का खतरा

हालांकि चीन कह रहा है कि ये 'रन ऑफ द रिवर' परियोजनाएं हैं, जिनका डिजाइन पानी के भंडारण के लिए नहीं किया गया है। मगर भारत को चिंता है कि संघर्ष के समय चीन पानी छोड़ सकता है, जिससे बाढ़ आने का गंभीर खतरा होगा। ब्रह्मपुत्र पर भारत के एक अंतर-मंत्रालय विशेषज्ञ समूह (आईएमईजी) ने 2013 में कहा था कि ये बांध ऊपरी इलाके में बनाए जा रहे हैं। समूह ने निचले इलाकों में जल के प्रवाह पर इनके प्रभाव के मद्देनजर इनपर निगरानी का आह्वान किया था।

# CHINA'S DAM MAY BE INDIA'S ANGST

## CONSIDERED HIGHEST-ALTITUDE HYDRO PROJECT

PRESS TRUST OF INDIA
Beijing, 13 October

China today operationalised its USD 1.5 billion Zam Hydropower Station, the largest in Tibet, built on the Brahmaputra river, which has raised concerns in India over the likelihood of disrupting water supplies.

Operationalising the dam, China said it will take into consideration India's concerns and will remain in contact with New Delhi on this.

All six of the station's units were incorporated into the power grid today, the China Gezhouba Group, a major hydropower contractor based in Wuhan, capital of Hubei Province in central China, told state-run Xinhua news agency.

Located in the Gyaca County, Shannan Prefecture, the Station harnesses the rich water resources of Brahmaputra known in Tibet as Yarlung Zangbo River, a major river which flows through Tibet into India and later into Bangladesh.

The dam - considered to be the world's highest-altitude hydropower station and the largest of its kind - will produce produces 2.5 billion kilowatt-hours of electricity a year.

Asked about India's concerns over the dam, Chinese Foreign Ministry spokesperson Hua Chunying told a media briefing here that the two countries are in touch with each other over the river water issues during high level visits. Also the experts from both sides are in touch with each other.

"We will take into consideration the concerns of the Indian side and will remain in contact with them," she said.

"It will alleviate the electricity shortage in central Tibet and empower the development of the electricity-strapped region. It is also an important energy base in central Tibet," the company said. Officials said that when the electricity is ample in the summer season, part of the electricity will be transmitted to the neighboring Qinghai province, Xinhua reported.

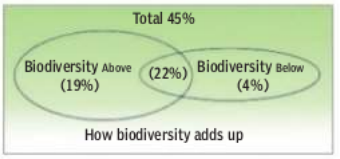
Investment of the hydropower station, about 140 kms from Tibetan capital Lhasa, totalled 9.6 billion yuan (about USD 1.5 billion). The first unit began operations last November.

Reports in the past said that besides Zangmu, China is reportedly building few more dams. China seeks to ally Indian fears saying that they are the run-of-the-river projects which were not designed to hold water. The dams also raised concerns in India over their ability to release the water in times of conflict which could pose serious risk of flooding.

An Indian Inter-Ministerial Expert Group (IMEG) on the Brahmaputra in 2013 said the dams were being built on the upper reaches and called for further monitoring considering their impact on the flow of waters to the lower reaches. The IMEG noted that the three dams - Jiexu, Zangmu and Jiacha - are within 25 kms of each other and are 550 kms from the Indian border.

# Conducting an ecological choi

## UNDERGROUND BIODIVERSITY HAS BEEN FOUND TO BE IMPORTANT IN HOW THE ECOLOGY RESPONDS TO CLIMATE CHANGE, WRITES **S ANANTHANARAYANAN**

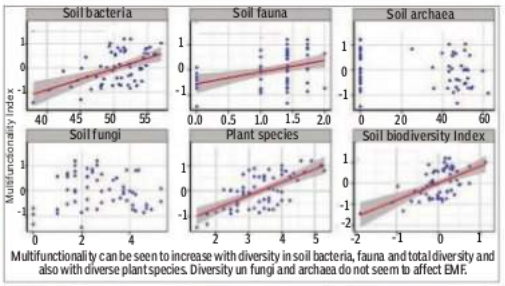



Biodiversity is now recognised as a vital factor in the resilience of the environment. The nine "planetary boundaries", or the limits within which the world would have to stay to avoid irreversible environmental damage, developed by the Stockholm Resilience Centre in 2009, listed the *loss of biodiversity* as one, along with climate change, chemical pollution and land use. Biodiversity has, however, been understood more in terms of the plant and animal species in forests and grasslands and even in agriculture and aquaculture. A paper in the journal *Nature Communications* now turns the focus on lesser studied varieties of life forms to be found underground and within the soil. Xin Jing, Yu Shi, Haiyan Chu, Ke Zhao, Litong Chen, Yue Shi, Youxu Jiang and Jin-Sheng He from the University of Peking and the Chinese Academy of Sciences at Nanjing, Xining and Beijing, and Nathan J Sanders and Aimée T Classen from the University of Copenhagen report that soil bacteria and below-ground plant and animal species form an important part of a complex that regulates relations between parts of the ecosystem and how it responds to climate change.

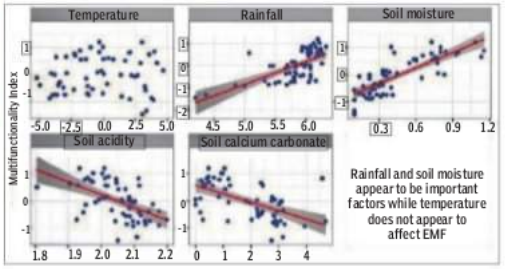

Nathan J Sanders and Aimee T Classen, University of Copenhagen.


The Peking University team

Although there is debate regarding the mechanism of the action of biodiversity, the fact that a variety of species living together makes for stability and efficient recycling of resources in an ecosystem is understood with some clarity. The studies, however, have been in the form of measuring the productivity, for instance, of a group of plants when grown either together or separately in small plots to demonstrate the value of diversity. But an ecosystem is seen as consisting of several different inter-related functions, a property that is termed *Ecosystem multifunctionality*, or EMF, and studies have shown that this EMF is dependent, even more than individual functions, on biodiversity, or the presence of a variety of species. Within biodiversity, however, analysis and separation of the effect of a variety of species either above or below ground has not been possible, the paper in *Nature Communications* says, perhaps because of the great complexity and variability underground, even within a short distance.



Multifunctionality can be seen to increase with diversity in soil bacteria, fauna and total diversity and also with diverse plant species. Diversity un fungi and archaea do not seem to affect EMF.




"… Pick up a handful of soil and you might find more species there than all of the vertebrates on the planet," says co-author Aimée T Classen in a news release from the university. The study, in fact, cites an 1881 paper, "The Formation of Vegetable Mould, Through the Action of Worms, with Observations on Their Habits" by Charles Darwin, to illustrate that the diversity and importance of underground species has been long recognised.

There have also been a number of investigations, the study says, of the effect that climate has on the constituents of an ecosystem, like plants, animals, earthworms, microbes and, hence, the composition of biotic communities. There have even been studies that combine variations of climate with different levels of biodiversity to see how these affect different things, like the productivity or resilience and the way the whole, integrated ecosystem works. The studies have made use of changes in climatic conditions as one moves over a landscape, and also the changes in the kind of vegetation, but mainly the over-ground plant cover. Carrying out a study of how changing geographic, climatic and also biodiversity, both above and below ground, affect the ecology would help identify and quantify the effect of different components, the *Nature Communications* paper says.


Soil Biodiversity regulates a suite of functions in ecosystems.


Pic: XIN JING
The Tibetan plateau in China where the study was carried out at 60 different sites

The study hence covered 60 sites spanning a gradual variation of climate along alpine grasslands on the Tibetan plateau, spread over nearly 1,000 km, to examine how the EMF, the combined "suite" of environmental functions, behaved under different levels of climate as well as biodiversity, both above and below ground. For quantification of multifunctionality, eight key ecosystem features: (1) over-ground biomass, (2) root biomass, (3) soil organic carbon, (4) soil nitrogen, (5) soil available nitrogen, (6) soil phosphorus, (7) plant nitrogen (nitrogen po aboveground biomass), and (8) plant ph rus (phosphorus pools in aboveground bio were estimated at each of the sites and aged. As for the levels of biodiversity same sites, estimates were made of the dif kinds of (1) bacteria in the soil, (2) anothe ety of living cells called archaea, (3) of othe mal life in the soil, (4) of fungi in the soil plant species to compute a "s diversity index". The metho to count the kinds of soil orga was by analysis of DNA ext from soil samples.

The levels of multifunctio at the various sites, as the fi ments and the combined in biodiversity increased or fell then analysed statistically a results are shown in the grap played. The levels of EMF c seen to increase with the in in diversity in soil bacteri fauna, and total soil biodiv while diversity in fungi and a do not seem to have an effect.

Non-biotic influences wer assessed by relating EMF with rainfall, temperature a soil content of moisture, a and calcium carbonate (lim or chalk). The relationship is in the second picture and, o ther statistical analysis, it is that the strongest single dri EMF is soil moisture.

Plant species' richness below-ground biodiversity ar to have about an equal effect a two factors, taken together, ac ed for a large fraction, about cent, of the variation in EMF across site finding, overall, is that non-biotic conditi rainfall, moisture and soil chemistry infl the effects of biodiversity, which, in turn, ate the effect of non-biotic conditions on

The study represents investigation int different conditions affect the way an ecos responds to climate change. The finding gest ways of influencing levels and the nat the components of the ecosystem to he system adapt to changing conditions, the says.

A significant finding, for instance, wa soil biodiversity may have stronger effe the ecosystem in areas of higher rainfall. is important because scientific studies focus on temperature – not precipitation – predicting how ecosystems will respo future changes such as climate change," Classen said. "As climates change and s are lost and gained from ecosystems, pred how ecosystems will function in the futu require experiments and observations tha biodiversity above and below ground to the paper says.

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BACK PAGE

The Tribune
CHANDIGARH | WEDNESDAY | 14 OCTOBER 2015

## China's dam on Brahmaputra gets going

BEIJING: China on Tuesday operationalised its $1.5 billion Zam Hydropower Station, the largest in Tibet, built on the Brahmaputra, which has raised concerns in India over the likelihood of disrupting water supplies. China said it would take into consideration India's concerns and would remain in contact with New Delhi on this. All six of the station's units were incorporated into the power grid on Tuesday, the China Gezhouba Group, a hydropower contractor based in Wuhan, capital of Hubei Province, told state-run Xinhua news agency. — PTI

# केदारनाथ-बदरीनाथ में पहली बर्फबारी

**केदारनाथ, बदरीनाथ.** केदारनाथ धाम में मौसम ने मंगलवार को करवट बदल ली। हल्की बूंदाबांदी के बाद हल्की बर्फबारी भी हुई, जो एक घंटे तक जारी रही। केदारनाथ में सर्दियों के सीजन की शुरुआत की पहली बर्फबारी है। बदरीनाथ में भी दोपहर में हल्की बारिश शुरू हुई और शाम को बदरीनाथ की ऊंची पहाड़ियों पर बर्फबारी हुई।

**The Times of India**
**Title : RS 150-crore Dahisar river revamp project revived**
**Author : Bhavika Jain & Chittaranjan Tembhekar TNN**
**Location :**
**Mumbai:**
**Article Date : 10/13/2015**

Two years after a proposal to widen and beautify Dahisar River was mooted, chief minister Devendra Fadnavis on Monday gave the Rs 150 crore project a fresh lease of life.

Fadnavis also wants tourist atractions like backwater boating and kayaking at along the river. The state administration has drafted a plan for the same. “A 4.6-km patch of the river from Abhinav Nagar to Sudhindra Nagar where it meets the Manori creek will be augumented to 45m,“ said a senior official.

“Plans are afoot to construct a 9.2-km retaining wall and landscaping its embankments. The slums encroaching the banks will be removed and the residents will be rehabilitated,“ he added. Fadnavis, who conducted a review meeting to check the project's progress, said that the beautification plan should be given priority and all phases should be completed in time.For several years, residents and environmentalists have been complaining about pollutants entering the river and wrecking havoc on mangroves and its marine life.

The project, which is being handled by the BMC, en tails creation of a mangrove lagoon. “The CM has also said that pedestrian bridges should be constructed over the river,“ the official said.

There is also a plan to build a sewerage treatment plant for the river.

THE HINDU

CITIES » CHENNAI

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# Connecting rivers through national waterways proposed

- K. Lakshmi and

According to the proposal, a system will be designed to network rivers in Tamil Nadu, along with those in neighbouring States.— File Photo

Linking various States through National Highways is well-known. Have you heard of linking various rivers through national waterways?

Now, an engineer, who is known to be an expert on interlinking of rivers, is trying to break new ground – he has come up with a proposal to connect rivers through national waterways. The proposal comes with the promise of insulating Chennai against drought. According to the proposal, a system will be designed to network rivers in Tamil Nadu, along with those in neighbouring States, using floodwater that would otherwise drain into the sea.

A. C. Kamaraj, member of Expert Committee on Interlinking of Rivers, has proposed national waterways that will be a long elevated channel, which will sometimes run 250 metres above mean sea level, and carry floodwater from one river to another. “This way, we can store water, which could be used for irrigation and drinking throughout the year. We will also have navigable waterways. For instance, Palar and Cauvery can be linked and whenever there is a flood, water can be transported to the other river. Similarly, water from the Godavari can be linked through the Pennar to the Palar and finally brought to Chembarambakkam reservoir,” said Mr. Kamaraj who has come up with this proposal, whose objective is to link rivers across the nation into the Himalayan Waterways, Central Waterways and Southern Waterways.

In contrast to the ‘interlinking of rivers’ project, this proposal does not involve pumping, and land acquisition will be minimised.

To get it going, he has been meeting several officials and political leaders, including Andhra Pradesh Chief Minister N. Chandrababu Naidu. Mr. Kamaraj, along with members of the South Chennai District unit of National Waterways Project, presented a memorandum to officials at the Chennai Collectorate recently.

Social activist V. Rama Rao said the project , if implemented, would close the gap in drinking water supply. Moreover, power production could see a significant improvement and it would provide employment for 150 lakh people.

According to V. Subramani, district unit president of NWP, the project will create additional waterways running for 900 km. Senior officials in the Water Resources Department said the team headed by Mr. Kamaraj submitted the project outline to the government involving linking of 17 rivers in the State.

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# Rains hit 25 districts in Tamil Nadu; dams get more water

**CHENNAI:** Normal life in Tamil Nadu was hit by isolated heavy rains that lashed almost the entire state since Sunday night except Chennai.

Heavy rains hit more than 25 districts as the southwest monsoon, which has been active in the southern region, intensified to trigger further rains in the next two days, according to weather forecasts. The downpour has increased the water levels in several important reservoirs critical to irrigate farmlands.

"Due to convective activity over the entire State, heavy rain is expected to occur across many districts in the next 48 hours," a senior Meteorological department official said.

A weather bulletin released on Monday evening said thundershowers would occur over southern Tamil Nadu, while isolated rains may occur over Kerala.

Venbavur in Perambalur district and the whole of Thanjavur region received 14 cm rains in the last 24 hours, while Odanchatram in Dindigul district recorded 13 cm rains.

Rains are rapidly filling up reservoirs close to or on the Western Ghats, with important ones such as Mullaperiyar, Vaigai, Sholayar and Aliyar recording healthy inflow, while arrival of water at Manimuthar dam across Tamirabarani in Tirunelveli is steady.

## Inflow

The inflow in other dams in southern region, including Bhavanisagar, Papanasam, Sholayar and Parambikulam, has also increased in the last couple of days.

Inflow into the Mettur dam, however, has declined in the last few days with the water levels at the Stanley dam standing at 70 feet.

The prevailing rains and gusty winds have also uprooted banana crops due for cultivation across several acres in Erode district, causing substantial loss to farmers.

Rains this year have given a wide berth to Chennai, leaving important water bodies supplying drinking water to the city dry and depleted.

## Low water levels

Water levels in Poondi, Sholavaram, Redhills, Chembarampakkam and Veeranam continue to remain lower than levels seen during the last season. Meanwhile, the depression over east-central Arabian Sea seen on Sunday moved west-northwest and weakened into a well-marked low pressure over the same area.

"It will move in west-northwesterly direction away from the Indian coast and weaken gradually further," the Met official said.

The Met department advised ports in Karnataka and Kerala to hoist storm warning signals.

**DH News Service**

NBT
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# बारिश के साथ ठंड का वेलकम

■ **नस, नई दिल्ली :** 15 और 16 अक्टूबर को दिल्ली में हल्की बारिश होने की उम्मीद है। मौसम वैज्ञानिकों का कहना है कि सुबह और दोपहर के वक्त हल्की बूंदाबांदी हो सकती है। इससे तापमान में गिरावट आने की संभावना है। इससे दिल्ली वालों को दोपहर के वक्त गर्मी से राहत मिल सकती है। मैक्सिमम टेंपरेचर 3 डिग्री सेल्सियस तक गिर सकता है। मंगलवार को मैक्सिमम टेंपरेचर नॉर्मल से दो डिग्री सेल्सियस ज्यादा के साथ 35 डिग्री दर्ज हुआ। मिनिमम टेंपरेचर नॉर्मल से पांच डिग्री ज्यादा के साथ 25 डिग्री दर्ज हुआ। मौसम वैज्ञानिकों ने कहा है कि दिल्ली में दो दिनों से काफी ज्यादा उमस महसूस हो रही है। ह्यूमिडिटी का अधिकतम लेवल 85 पर्सेंट से ज्यादा दर्ज हो रहा है। मंगलवार को मैक्सिमम ह्यूमिडिटी 88 पर्सेंट दर्ज हुई।

# China activates big dam on Brahmaputra

**Sutirtho Patranobis & Jayanth Jacob**
spatranobis@hindustantimes.com

**BEIJING/NEW DELHI:** China's largest hydropower facility in Tibet built on the Yarlung Zangbo river — the Brahmaputra in India — got fully operational on Tuesday, raising concerns in New Delhi over the possibility of disruption in water supply.

All six units of the $1.5-billion Zam hydropower project had been completed and connected to the grid, state media said, quoting an official from the

before entering Bangladesh and merging with the lower section of the Ganges, when it empties into the Bay of Bengal.

Though there was no reaction from New Delhi, a government official said on condition of anonymity that China had told India it was a run-of-the-river project not designed to hold water.

Concerns, however, remain. "If the water is diverted, the projects on the Brahmaputra on the Indian side could suffer. India is the lower riparian state," the official said.

Upper Siang and Lower Suhansri projects in Arunachal

## INDIA WORRIED ZAM HYDROPOWER PLANT, THE BIGGEST IN TIBET, COULD DISRUPT WATER SUPPLY TO NORTHEAST

which says it has no intention of obstructing water flow into India, agreed to provide more flood data on Brahmaputra.

Asked about India's concerns, Chinese foreign ministry spokesperson Hua Chunying said the two countries were in touch over

quoted her as saying.

The Zam plant will produce 2.5 billion kilowatt-hours of electricity a year, enough to meet the needs of more than 600,000 residents.

While China says projects on the Brahmaputra are not a strategic move, India worries that the dams could be used to regulate and control water in times of conflict that could pose serious risk of flooding or scarcity in the country's Northeast.

"It (Zam) will alleviate the electricity shortage in central Tibet and empower the develop-

**The Times of India**
**Title : China opens huge Brahmaputra dam**
**Author : Saibal Dasgupta**
**Location :**
**Beijing:**
**Article Date : 10/14/2015**

A 510MW Chinese hydroelectric dam became operational on the Brahmaputra on Tuesday . Official Xinhua news agency said electricity from all units of the Zangmu Hydropower Project in Tibet, just 550km from the border and regarded as the highest in the world, had been connected to China's national power grid.

While an Indian official said the government wasn't concerned as China has assured it was a run-of-the-river project, visiting Indian ministers and officials have repeatedly expressed unease over dams on the Brahmaputra. The discomfort emanates from the possible impact on Upper Siang and Lower Subansiri projects in Arunachal Pradesh if the dam in Tibet reduces the Brahmaputra water flow. While Indian officials said China has as sured this dam will have little impact on environment or water flow downstream, the Zangmu Hydropower Project has turned out to be massive: the dam, 390m long and 116m high in Gyaca County of Shannan Prefecture in Tibet, will generate 2,500MW.

“As if to underscore the contrast between an autocracy and a democracy , China's announcement that Tibet's largest dam project is fully operational coincided with protesters stalling Lower Subansiri, India's sole large dam project under construction,“ said Brahma Chellaney , professor of strategic studies at the New Delhi-based Centre for Policy Research.

“China is now racing to complete five other dam projects on the Brahmaputra. China's frenzied dam building on the Brahmaputra and other Tibetan rivers flowing to India is a reminder that Tibet remains the core issue in Sino-Indian relations,“ Chellaney said.

For the full report, log on to http:www.timesofindia.com

**The Times of India**
**Title : China plant to generate 2500MW**
**Author :**
**Location :**
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A 510MW Chinese hydroelectric dam became operational on the Brahmaputra on Tuesday . Official Xinhua news agency said electricity from all units of the Zangmu Hydropower Project in Tibet, just 550km from the border and regarded as the highest in the world, had been connected to China's national power grid.

While an Indian official said the government wasn't concerned as China has assured it was a run-of-the-river project, visiting Indian ministers and officials have repeatedly expressed unease over dams on the Brahmaputra. The discomfort emanates from the possible impact on Upper Siang and Lower Subansiri projects in Arunachal Pradesh if the dam in Tibet reduces the Brahmaputra water flow. While Indian officials said China has as sured this dam will have little impact on environment or water flow downstream, the Zangmu Hydropower Project has turned out to be massive: the dam, 390m long and 116m high in Gyaca County of Shannan Prefecture in Tibet, will generate 2,500MW.

“As if to underscore the contrast between an autocracy and a democracy , China's announcement that Tibet's largest dam project is fully operational coincided with protesters stalling Lower Subansiri, India's sole large dam project under construction,“ said Brahma Chellaney , professor of strategic studies at the New Delhi-based Centre for Policy Research.

“China is now racing to complete five other dam projects on the Brahmaputra. China's frenzied dam building on the Brahmaputra and other Tibetan rivers flowing to India is a reminder that Tibet remains the core issue in Sino-Indian relations,“ Chellaney said.

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