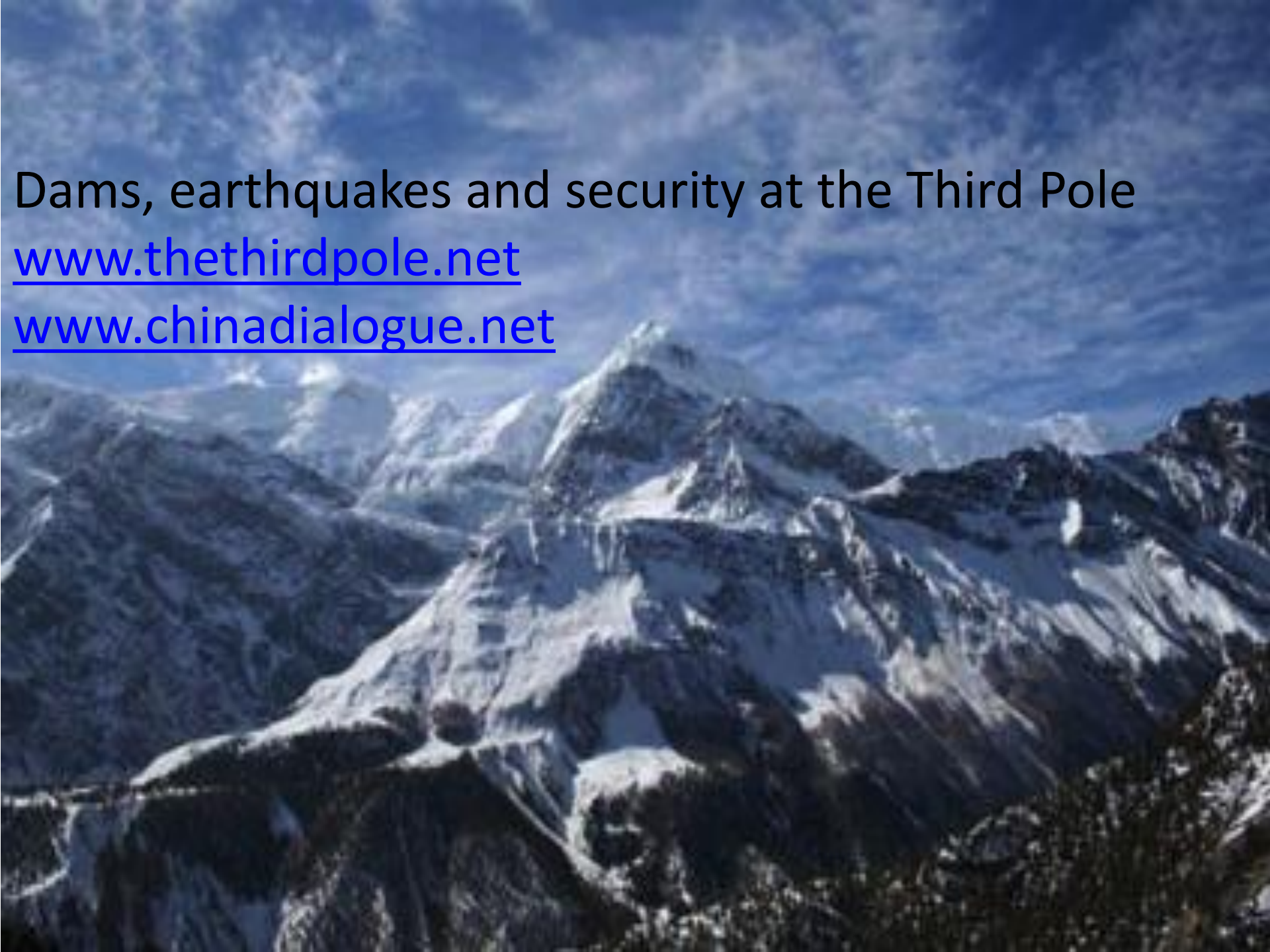
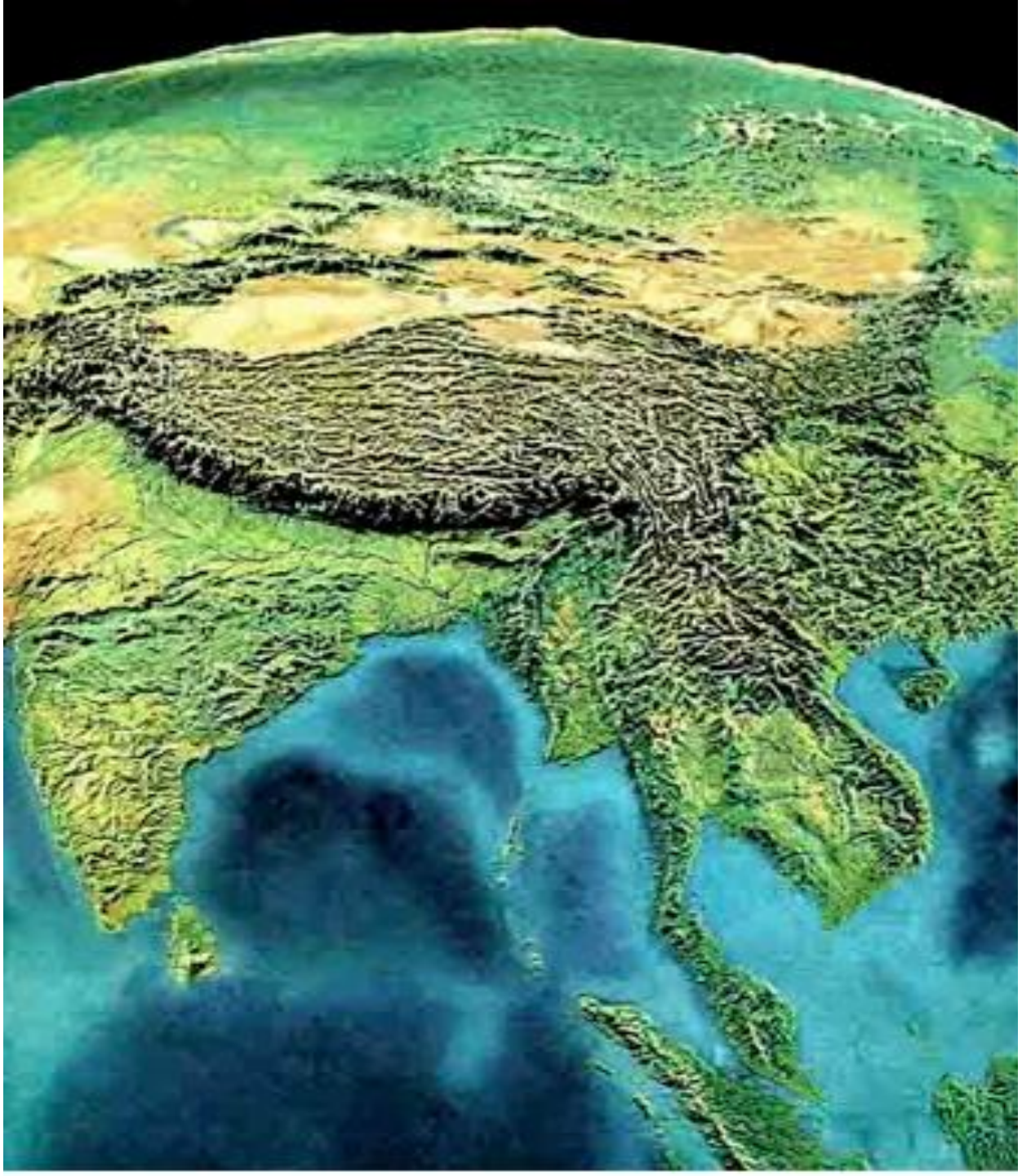

Dams, earthquakes and security at the Third Pole
www.thethirdpole.net
www.chinadialogue.net



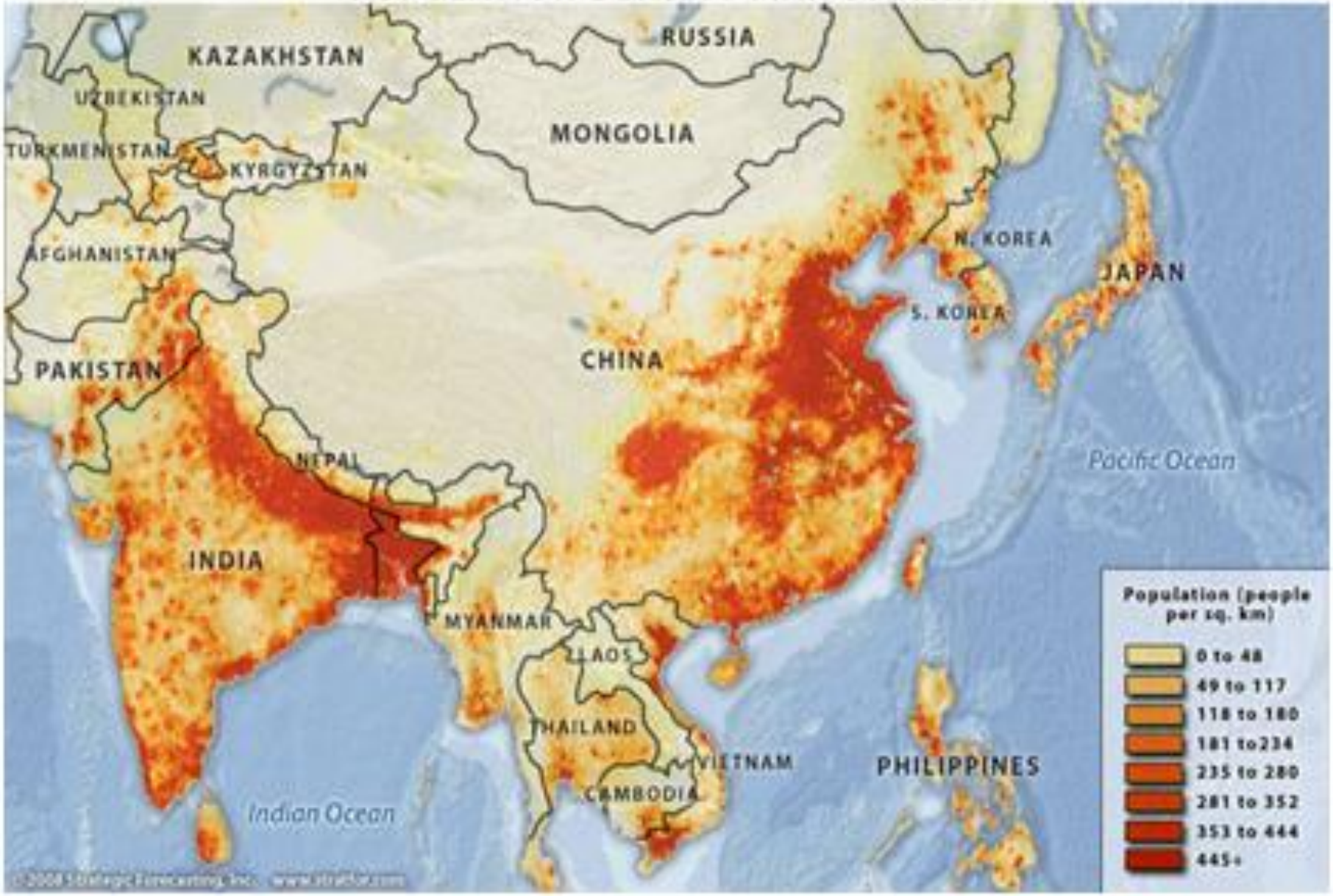

Glaciers
Kazakhstan
Uzbekistan
Turkmenistan
Mongolia
Tarim
Afghanistan
KUNLUN SHAN
China
TIBETAN PLATEAU
Pakistan
Ganges
India

Ten river basins of the Hindu Kush Himalayan region

HKH Map with major river basins

Note: The HKH region as defined by ICIMOD (www.icimod.org/?page=43). The region extends from 58–122°E and 9–43°N. Downloaded 7 October 2010.

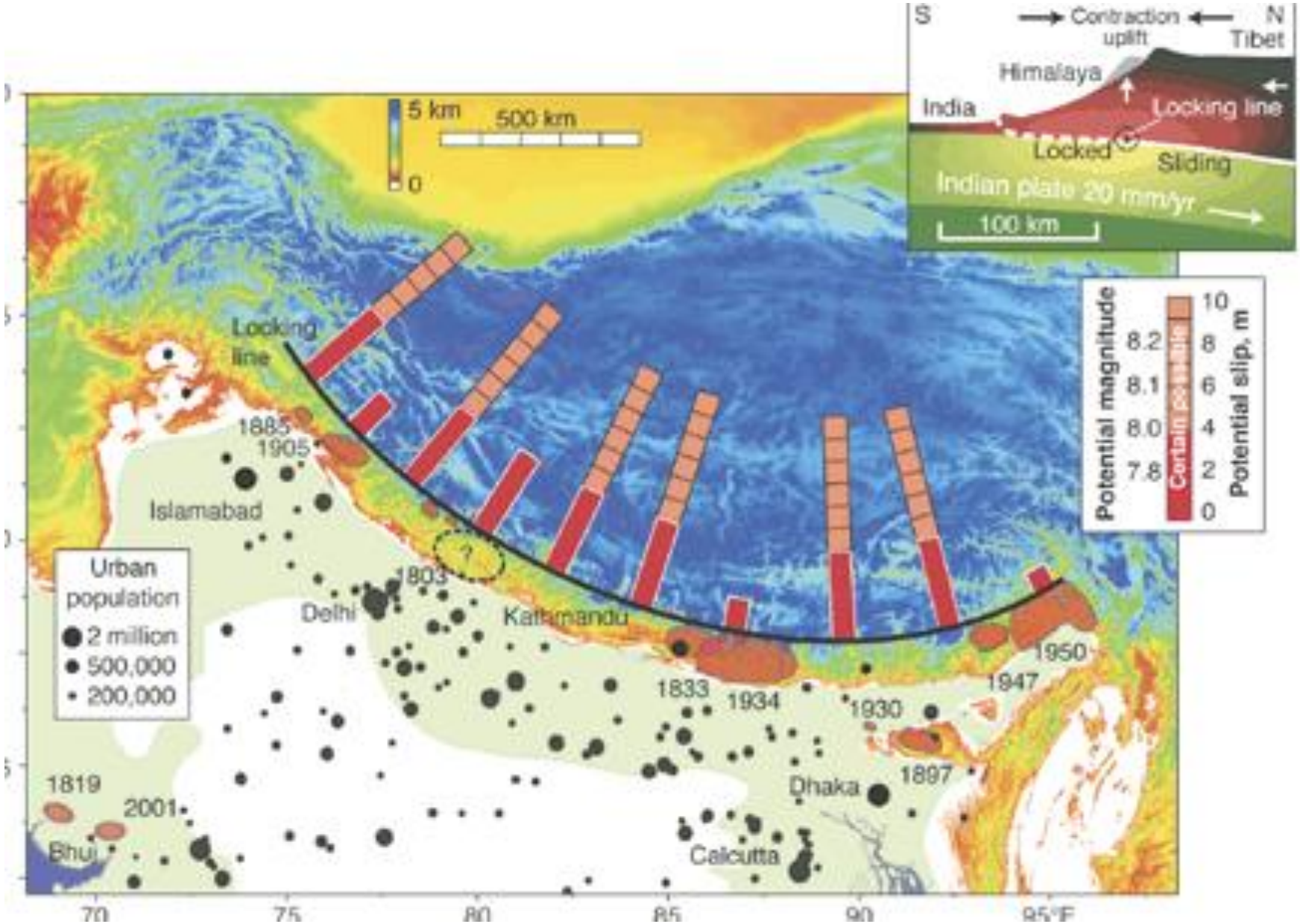
POPULATION DENSITY MAP OF ASIA

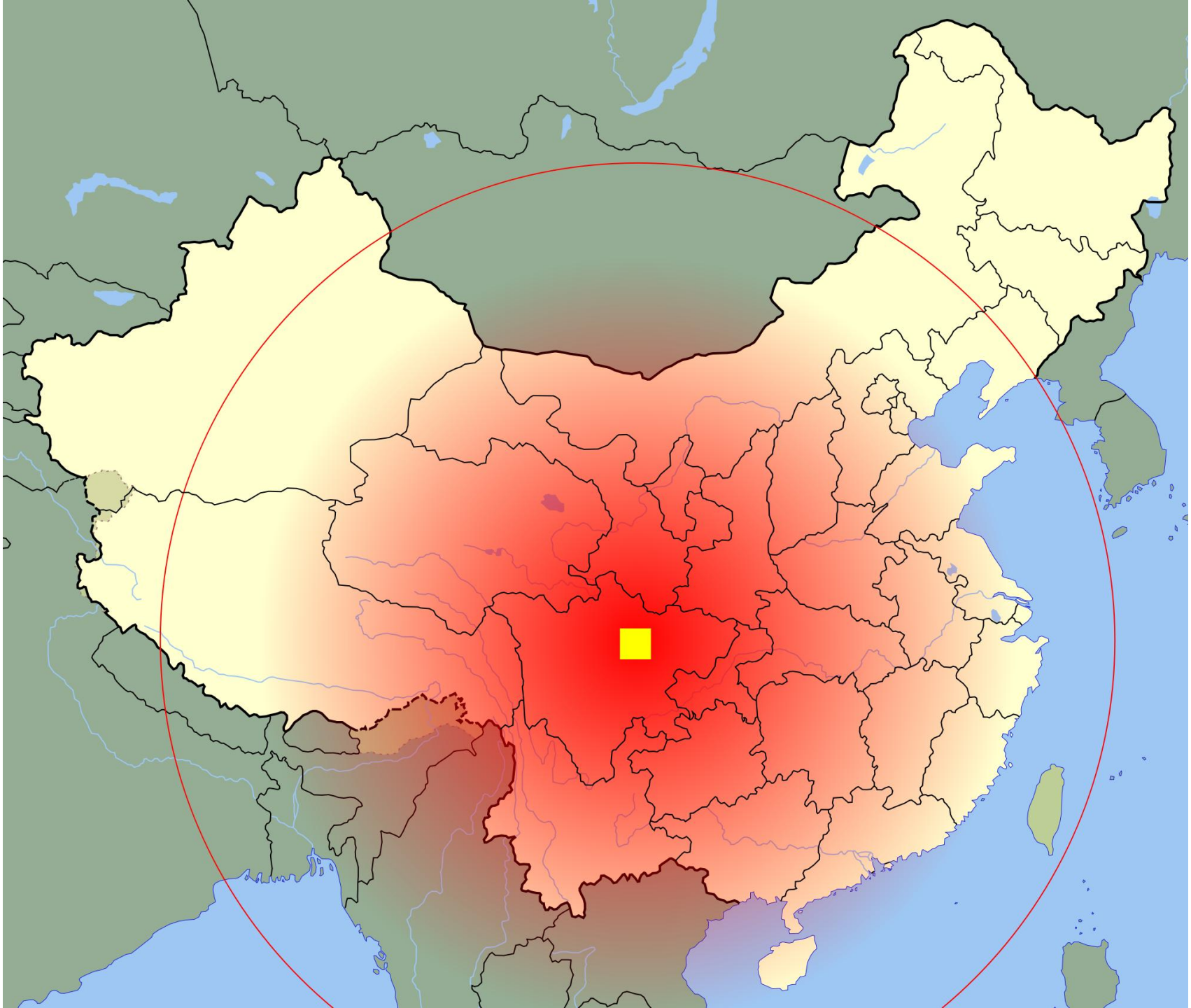


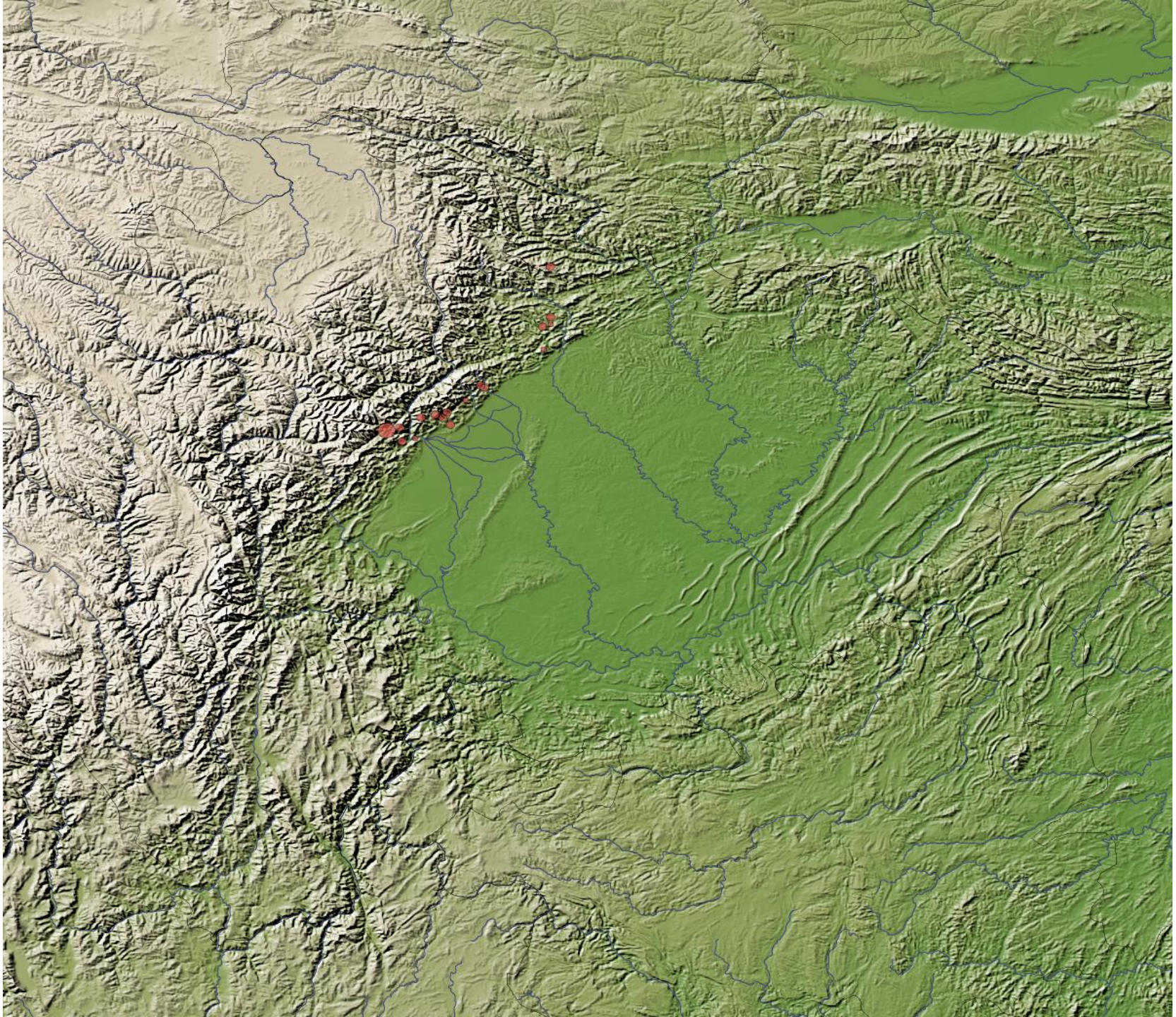
Also available in Table form: Projected growth of the Asian mega-city to 2025

Water stress

- *516 million people in China*
- *526 million people in India and Bangladesh, 178 million people in Pakistan and northern India*
- *49 million people in Central Asia, including Xinjiang are at risk from water shortages. (source: ICIMOD 2010)*


S
Contraction
uplift
N
Tibet
Himalaya
India
Locking line
Locked
Sliding
Indian plate 20 mm/yr
100 km
5 km
0
500 km
Locking line
1885
1905
Islamabad
1803
Delhi
Kathmandu
1833
1934
1950
1947
1930
1897
Dhaka
Calcutta
1819
2001
Bhuj
Urban population
2 million
500,000
200,000
Potential magnitude
8.2
8.1
8.0
7.8
Certain potential
10
8
6
4
2
0
Potential slip, m
70
75
80
85
90
95°E



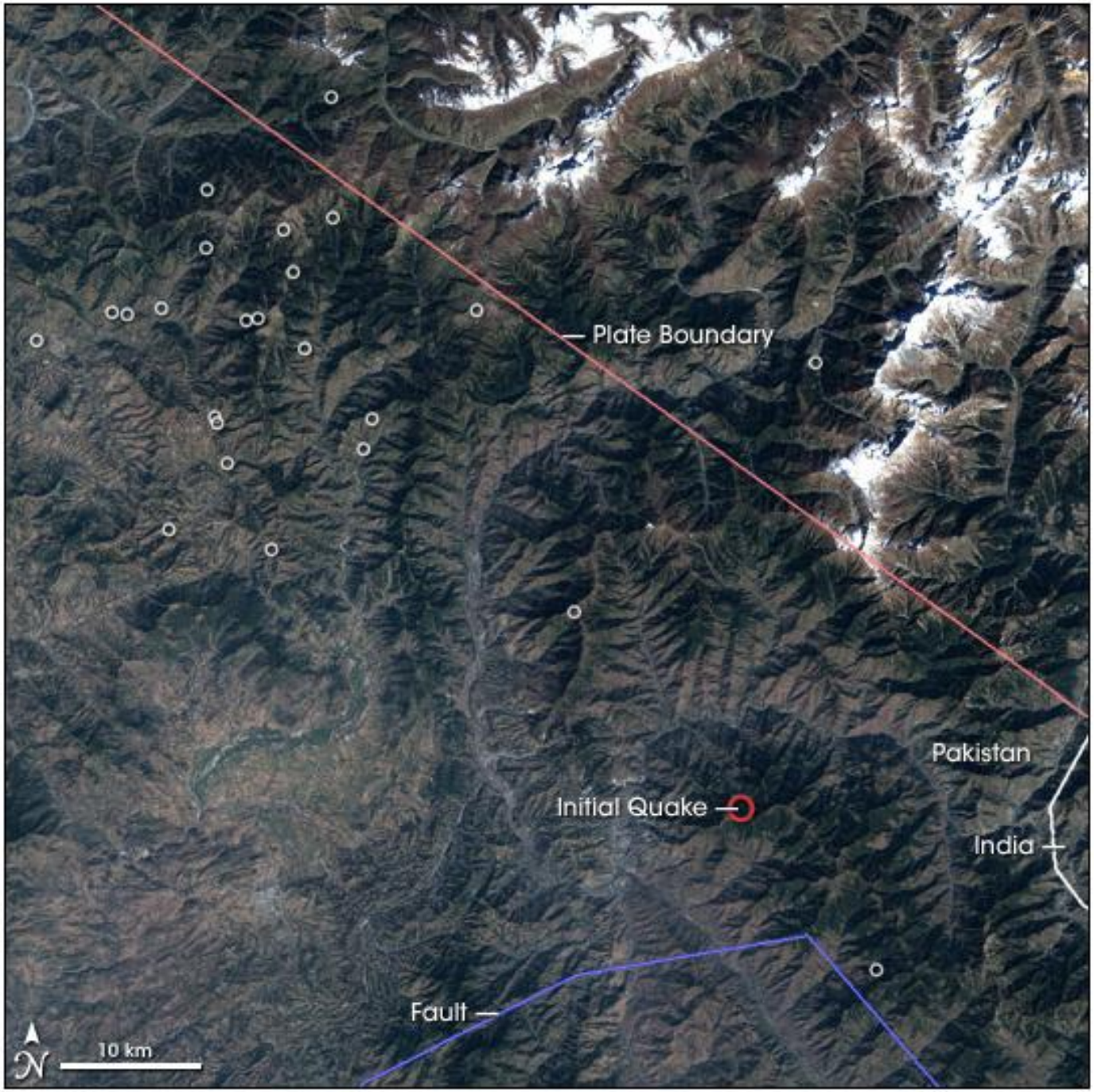


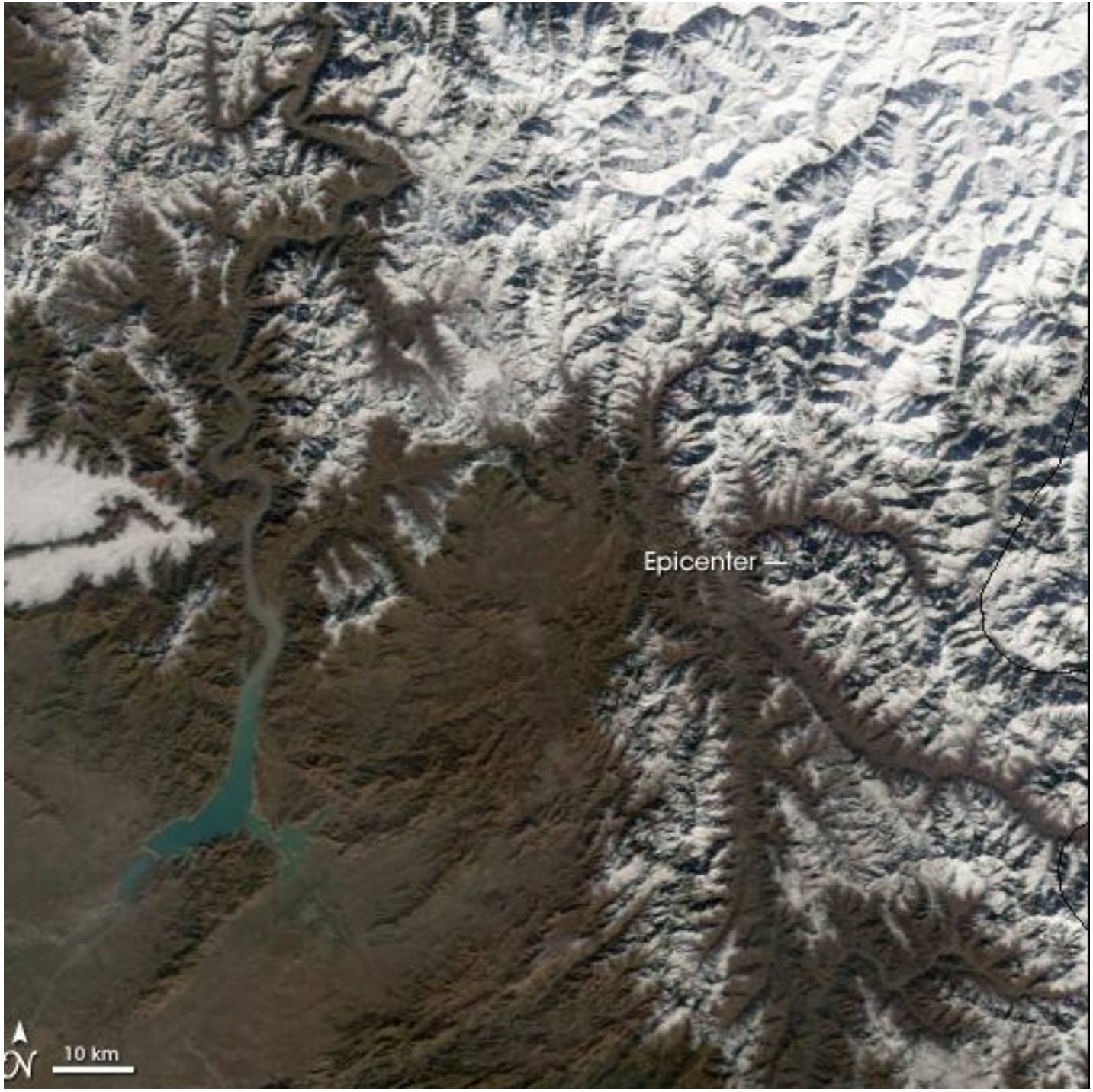

Loncin
隆鑫摩托中国驰名商


CHINA
AFGHANISTAN
PAKISTAN-
CONTROLLED
KASHMIR
Kabul
Jalalabad
Muzaffarabad
Srinagar
Uri
Islamabad
INDIAN-
CONTROLLED
KASHMIR
PAKISTAN
INDIA
NEPAL
Delhi

Strong Earthquake in Northern Pakistan

Posted October 12, 2005

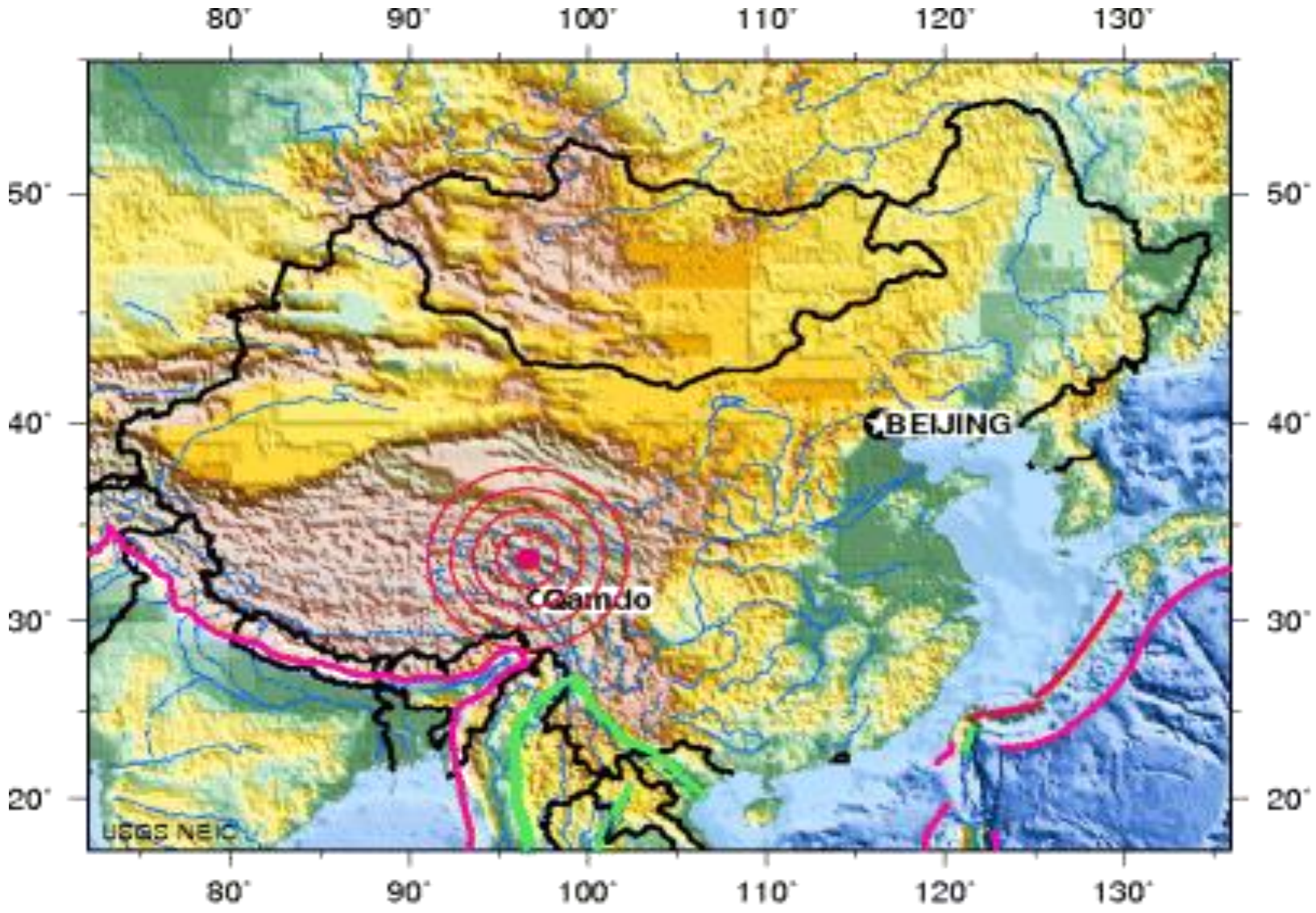



Epicenter
N
10 km

Earthquake Hits Hindu Kush, Afghanistan

Posted March 29, 2002

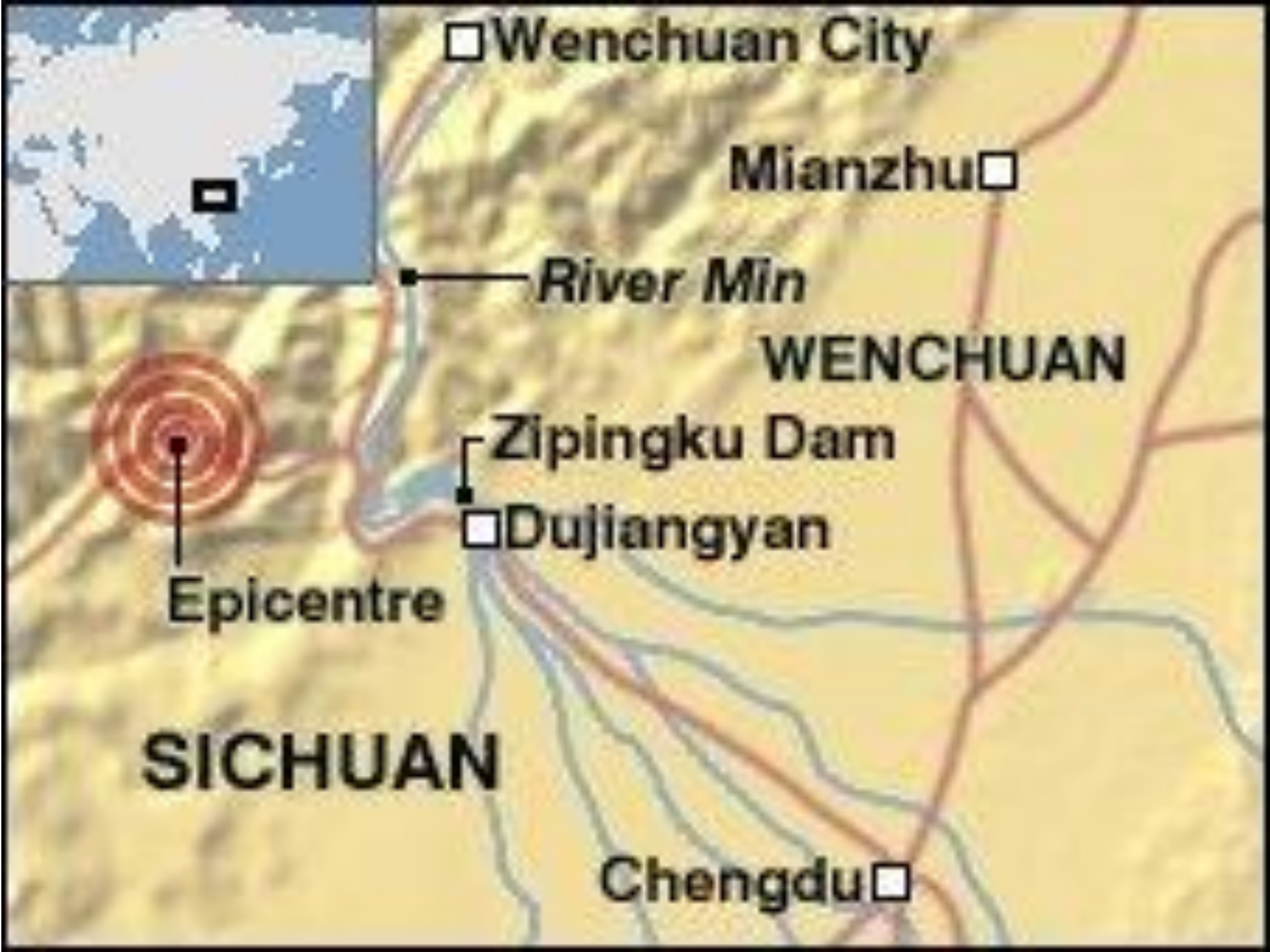
download large image (1 MB, JPEG)



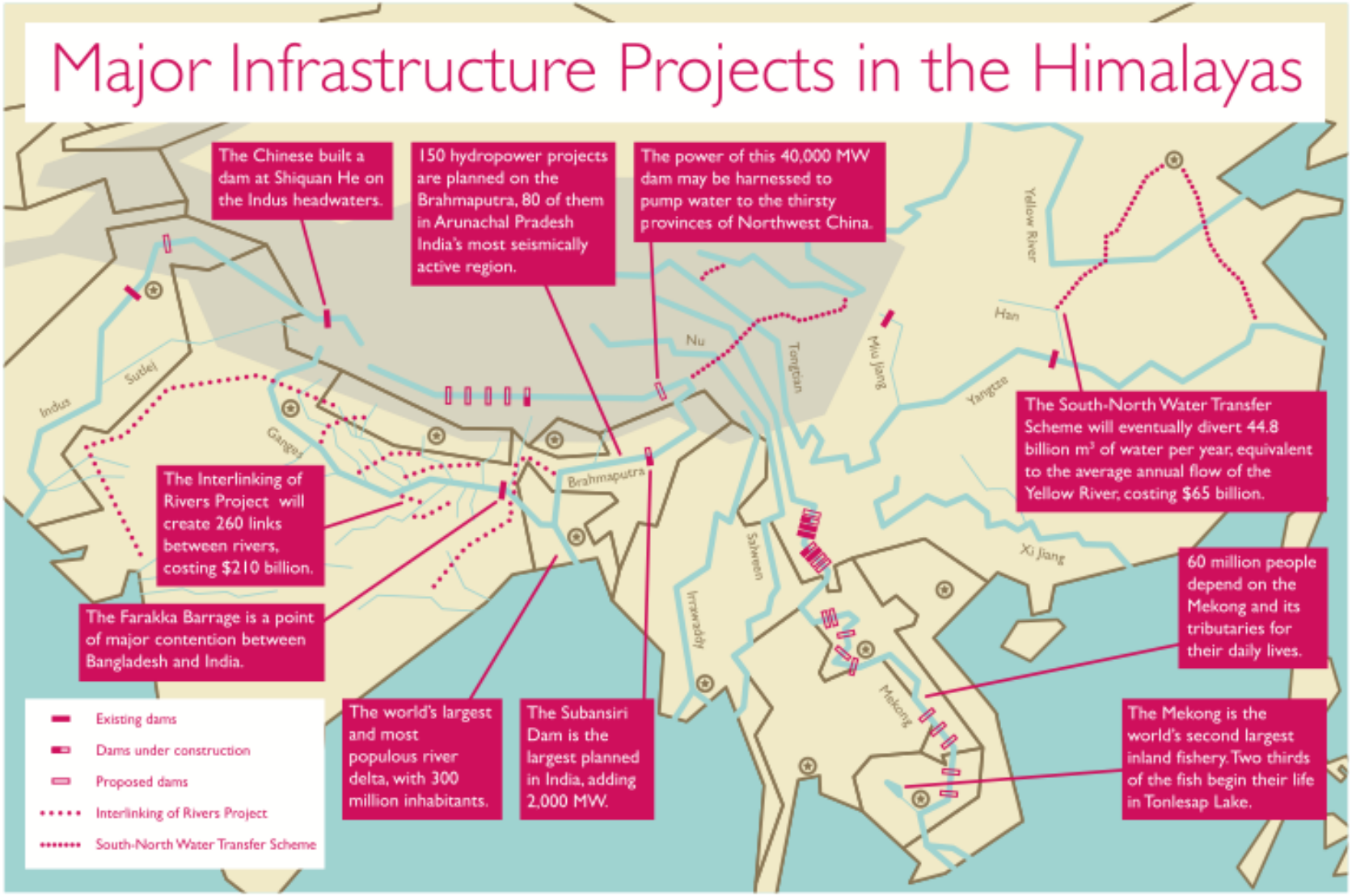
SOUTHERN QINGHAI, CHINA

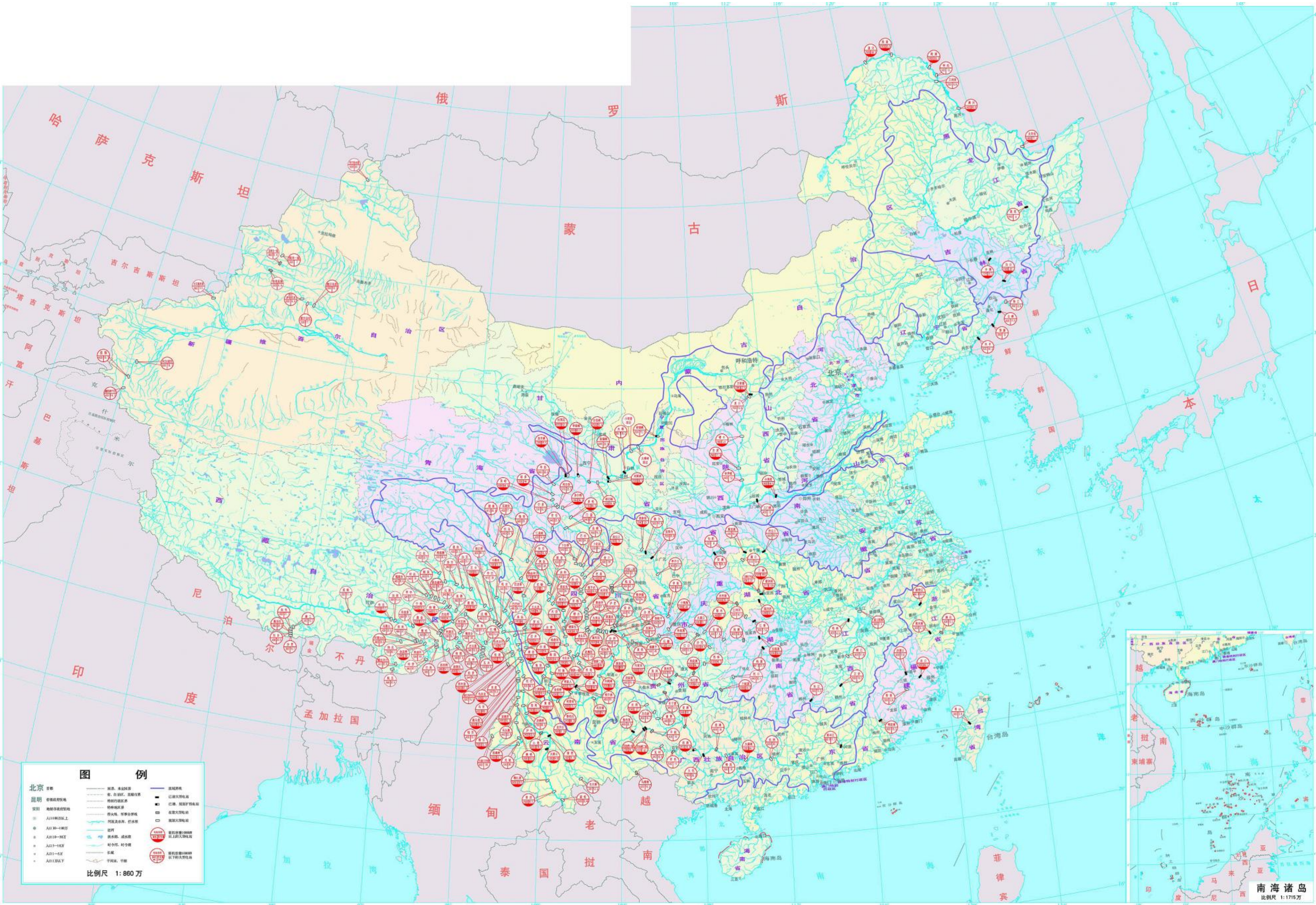
2010 04 13 23:49:37 UTC 33.27N 96.63E Depth: 10.0 km, Magnitude: 6.9

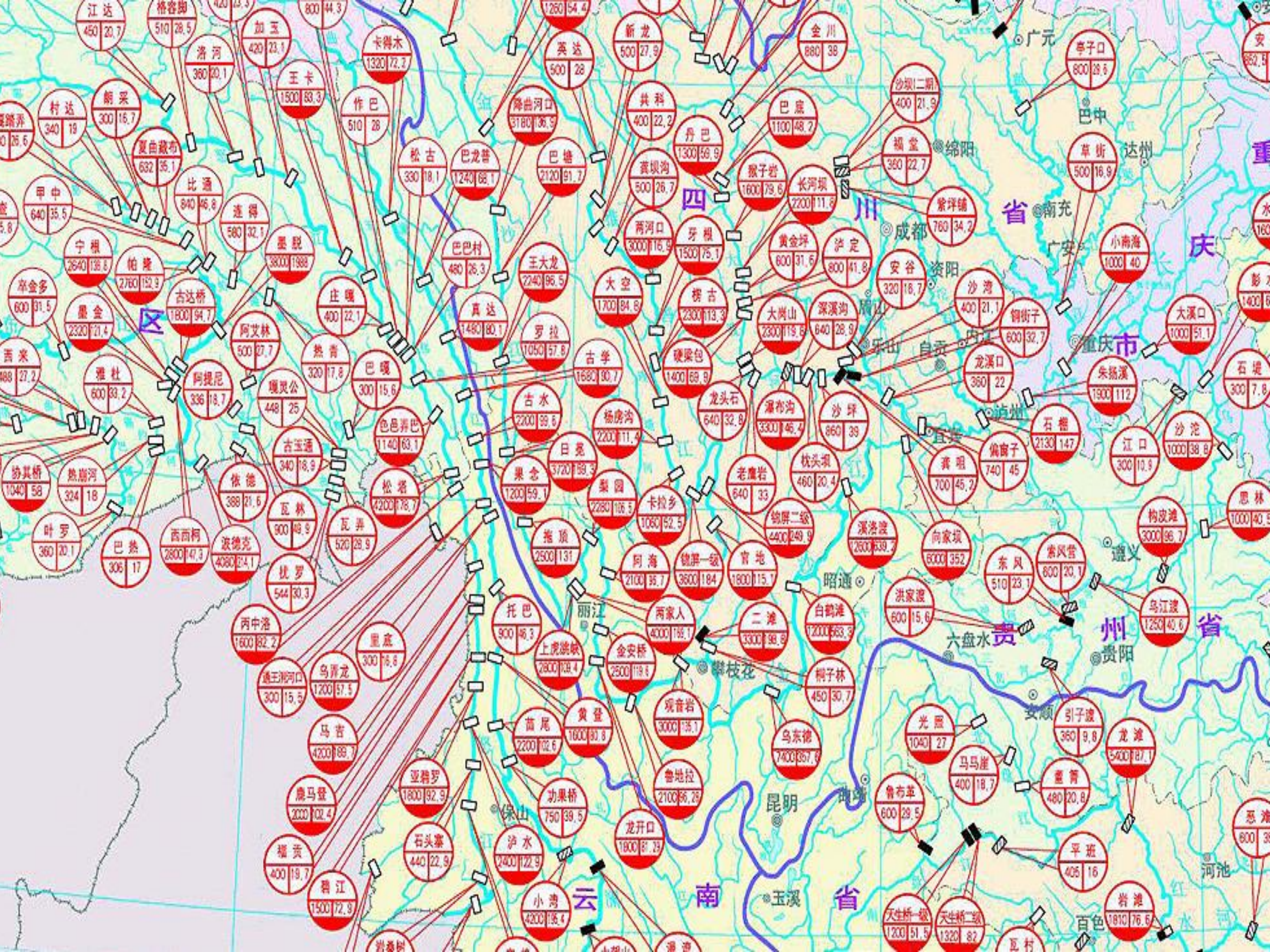
Earthquake Location


Wenchuan City
Mianzhu
River Min
WENCHUAN
Zipingku Dam
Dujiangyan
Epicentre
SICHUAN
Chengdu

Major Infrastructure Projects in the Himalayas




哈萨克斯坦
俄罗斯
蒙古
吉尔吉斯斯坦
塔吉克斯坦
阿富汗
巴基斯坦
印度
尼泊尔
不丹
孟加拉国
缅甸
老挝
越南
泰国
菲律宾
朝鲜
韩国
日本
新疆维吾尔自治区
西藏自治区
青海省
甘肃省
内蒙古自治区
黑龙江省
吉林省
辽宁省
河北省
山西省
陕西省
山东省
河南省
江苏省
安徽省
湖北省
四川省
重庆市
贵州省
湖南省
江西省
浙江省
福建省
云南省
广西壮族自治区
广东省
海南省
台湾省
北京
呼和浩特
台湾岛
海南岛
图例
北京 首都
昆明
比例尺 1:860 万
南海诸岛
比例尺 1:1715万


江达 450 20.7
加玉 420 23.1
洛河 360 20.1
卡得木 1320 72.3
英达 500 28
新龙 500 27.9
金川 880 38
亭子口 800 28.8
王卡 1500 83.3
作巴 510 28
降曲河口 3180 136.9
共科 400 22.2
巴底 1100 48.2
沙坝(二期) 400 21.9
朗采 300 16.7
村达 340 19
复曲藏布 632 35.1
松古 330 18.1
巴龙普 1240 68.1
巴塘 2120 91.7
丹巴 1300 59.9
福堂 360 22.7
草街 500 16.9
甲中 640 35.5
比通 840 46.8
连得 580 32.1
黄坝沟 500 26.7
猴子岩 1600 79.6
长河坝 2200 111.8
紫坪铺 760 34.2
宁根 2640 138.8
帕隆 2760 152.9
墨脱 38000 1988
巴巴村 480 26.3
两河口 3000 116.9
牙根 1500 75.1
王大龙 2240 96.5
黄金坪 600 31.6
泸定 800 41.8
安谷 320 18.7
小南海 1000 40
卓金多 600 31.5
古达桥 1800 94.7
庄嘎 400 22.1
真达 1480 80.1
大空 1700 84.6
楞古 2300 113.3
大岗山 2300 119.8
深溪沟 640 28.9
沙湾 400 21.1
铜街子 600 32.7
大溪口 1000 51.1
墨金 2320 120.4
阿艾林 500 27.7
热青 320 17.8
罗拉 1050 57.8
古学 1580 90.7
硬梁包 1400 68.9
巴嘎 300 15.6
龙溪口 360 22
朱杨溪 1900 112
石堤 300 7.8
吉来 488 27.2
雅杜 600 33.2
阿提尼 336 18.7
嘎贝公 448 25
古水 2200 99.6
杨房沟 2200 111.4
龙头石 640 32.8
瀑布沟 3300 146.4
沙坪 860 39
色邑弄巴 1140 63.1
石棚 2130 147
江口 300 10.9
沙沱 1000 38.8
古宝通 340 18.9
3720 169.3
老鹰岩 640 33
枕头坝 460 20.4
700 45.2
740 45
协其桥 1040 58
热崩河 324 18
依德 388 21.6
松塔 4200 178.7
果念 1200 59.1
梨园 2280 106.8
卡拉乡 1060 52.5
锦屏二级 4400 249.9
溪洛渡 12600 639.2
向家坝 6000 352
构皮滩 3000 96.7
思林 1000 40.5
叶罗 360 20.1
巴热 306 17
2800 147.3
4060 214.1
瓦林 900 48.9
瓦弄 520 28.9
拖顶 2500 131
阿海 2100 95.7
锦屏一级 3600 184
官地 1800 115.1
东风 510 23.1
索风营 600 20.1
扎罗 544 30.3
丙中洛 1600 82.2
托巴 900 46.3
两家人 4000 189.1
二滩 3300
白鹤滩 12000
洪家渡 600 15.6
乌江渡 1250 40.6
里底 300 16.8
上虎跳峡 2800 129.4
金安桥 2500
桐子林 450 30.7
300 15.5
乌弄龙 1200 57.5
观音岩 3000 135.1
引子渡 360 9.8
光照 1040 27
乌东德 7400
龙滩 5400 187.1
马吉 4200 189.3
苗尾 2200 102.6
黄登 1600 80.8
马马崖 400 18.7
董箐 480 20.8
亚碧罗 1800 92.9
功果桥 750 39.5
鲁地拉 2100
鲁布革 600 29.5
鹿马登 2000 102.4
石头寨 440 22.9
龙开口 1800
平班 405 16
福贡 400 19.7
泸水 2400 122.9
小湾 4200
碧江 1500 72.9
天生桥一级 1200 51.5
天生桥二级 1320 82
岩滩 1810 76.6
广元
巴中
达州
绵阳
南充
成都
广安
资阳
眉山
乐山
自贡
内江
重庆市
泸州
宜宾
遵义
昭通
丽江
攀枝花
六盘水
贵阳
安顺
昆明
保山
玉溪
百色
河池
四川省
贵州省
云南省
区

Drichu (Yangtze), Zachu (Mekong) and Gyalmo Ngulchu (Salween) Hydropower Projects

Name	Size(MW)
Biru	n/a
Chalong	10.8
Jinhe	60
Lagong	6
Longqingxia	2.52
Nieqiahe	n/a
Ahai	2160
Boluo	960
Chalongtong	10.5
Gangtuo	1100
Guoduo	150
Huangdeng	1600
Jinganqiao	465
Lawa	1680
Lidi	300
Liyuan	2400
Longkaikou*	1800
Ludila*	2280
Angsai	n/a
Baiyu	1500
Batang	740
Cefanggou	158
Changbo	1060
Charikou	36
Dequkou	276.5
Dongba	510
Dongjiula	400
Dongzhong	108
E'nan	900
Genzhou	612.5
Gushui	2200
Guxue	2800
Hutiaoxia*	4200
Jiabi	1200
Jiayu	420
Jiangquhekou	3200
Kademu	1320
Leyi	112.8
Liangjiaren	4000
Lichang	72
Longpan	2000
Lumari	72
Maji*	4200
Mariji	10.4
Nabacun	n/a
Nujiangqiao	800
Reqin	200
Rimian	3720
Rumei	3000
Ruyi	114
Sewu	560
Shabucun	n/a
Suwalong	1160
Tuoba	900
Tuoding	2500
Wangdalong	2800
Wunonglong	1340
Xiangda	66
Yabiluo*	1800
Yage	63.6
Yanbi	300
Yebatan	1980
Babacun	480
Balonggu	1240
Bijiang*	1500
Bingzhongluo*	1600
Danuaqiao	n/a
Fugong*	400
Gerongban	510
Jiangda	450
Longpan	4000
Lumadeng*	2000
Luohe	360
Luola	1050
Seyinongba	1140
Songgu	330
Songta*	4200
Tongla	420
Wangka	1500
Zhuangga	400

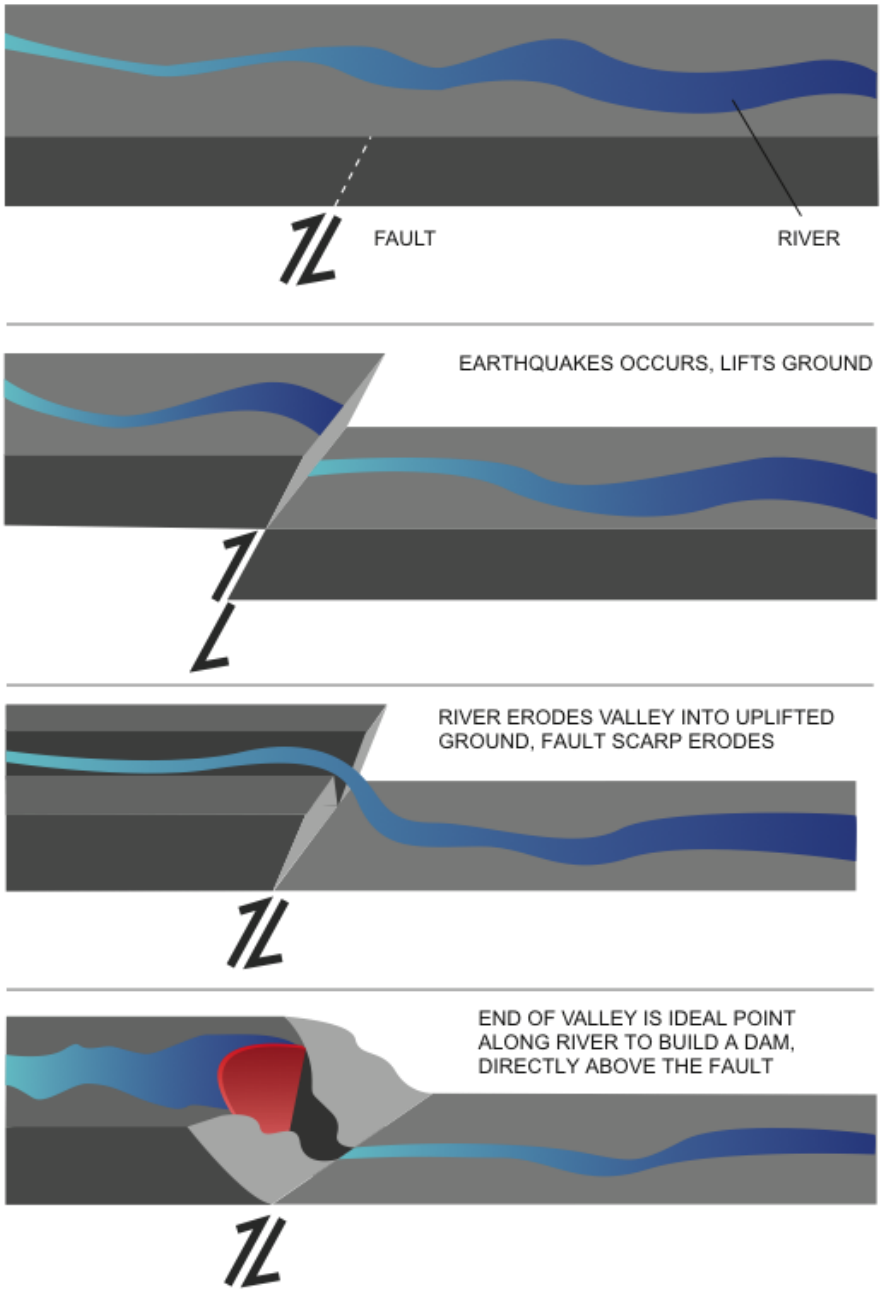
Province
Country
City
River/Lake

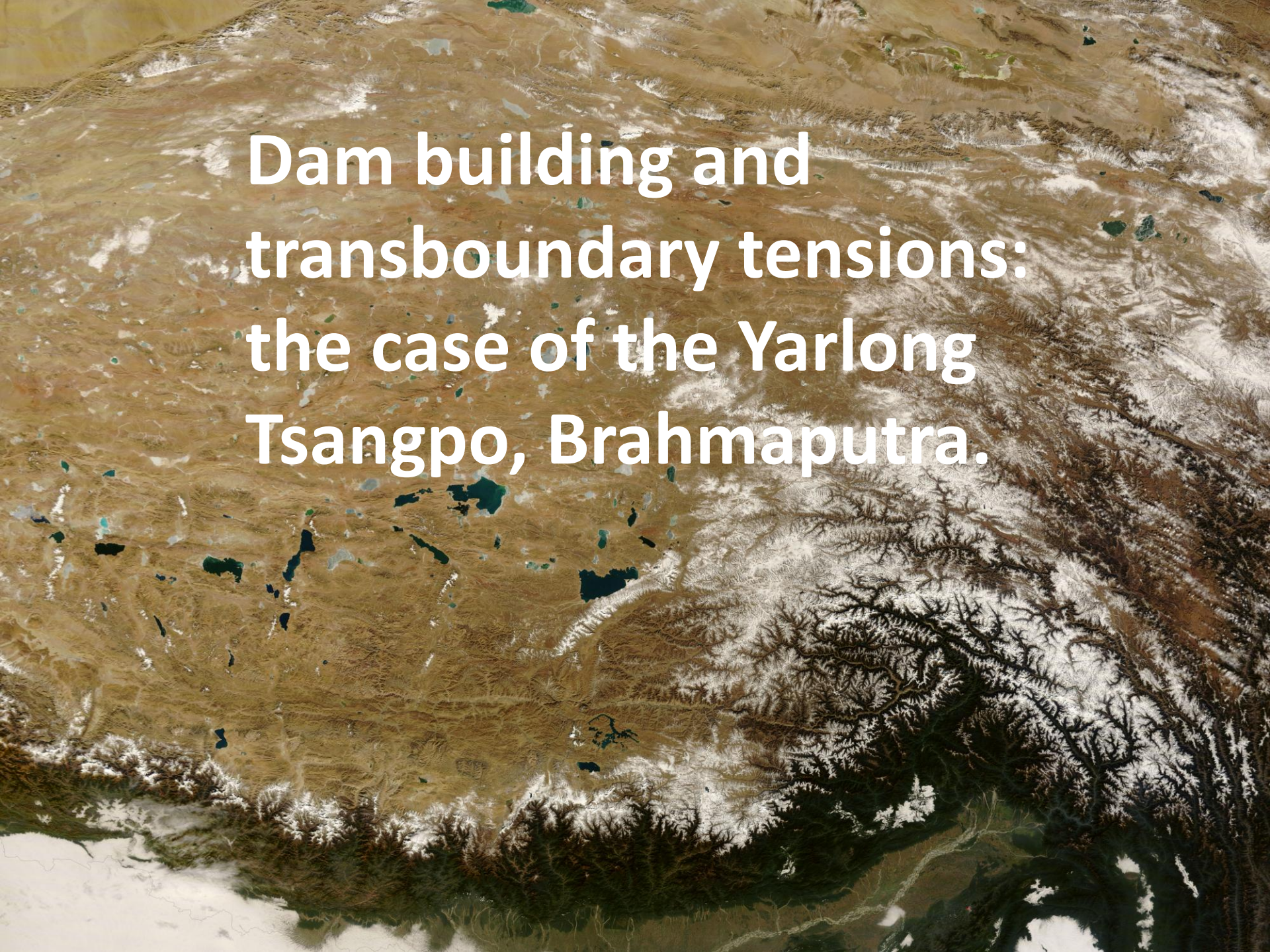
Built/Operational
Under Construction
Under Active Consideration
Proposed
'*' On Hold

Tongjia: Western Route of the South-North Water Diversion

http://tibetanplateau.blogspot.com/ Version 1.00 17/02/10

WHY DAMS ARE OFTEN BUILT ABOVE FAULTS



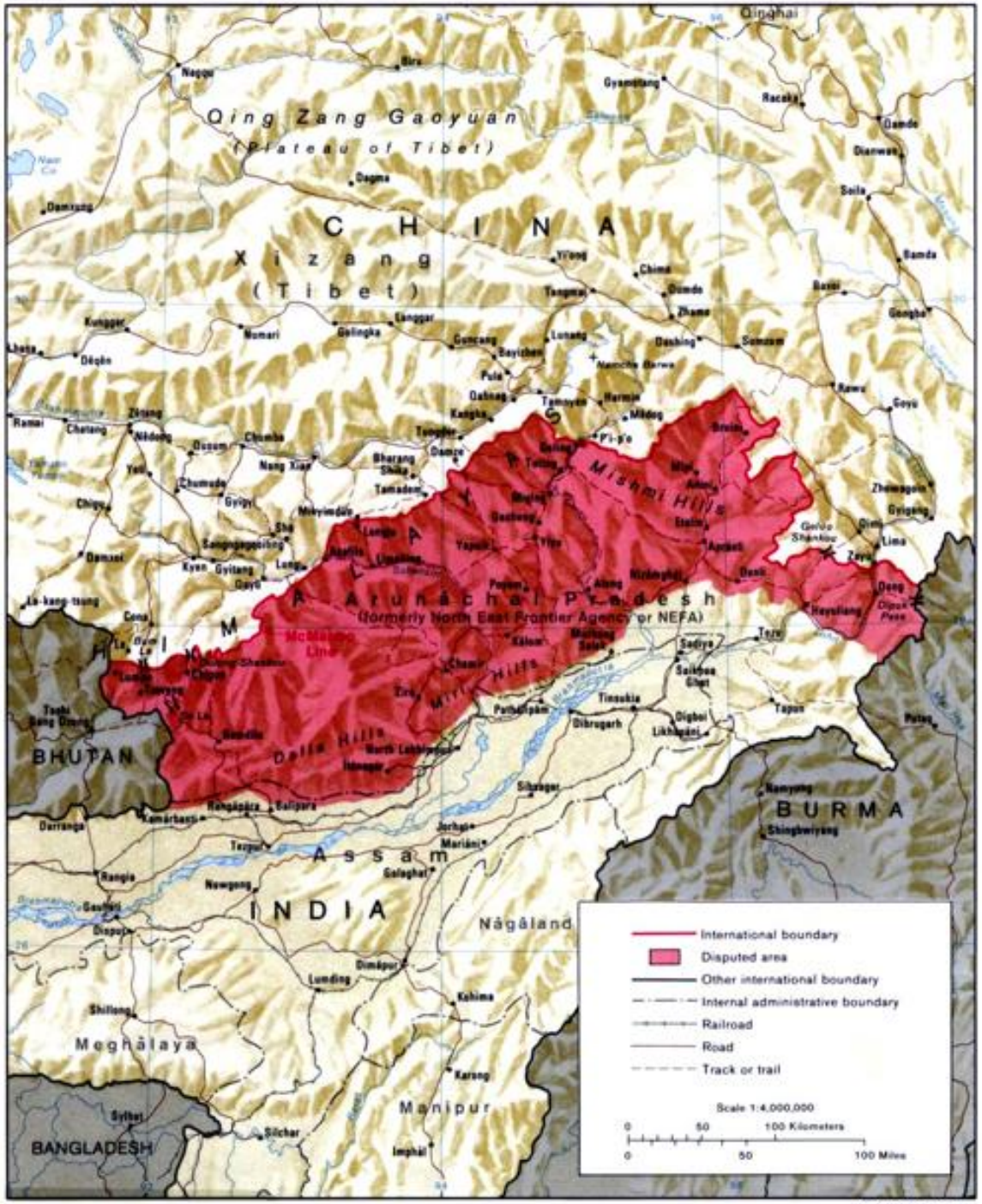


Dam building and transboundary tensions: the case of the Yarlong Tsangpo, Brahmaputra.

ISS003E6632 2001/10/13 08:36:36

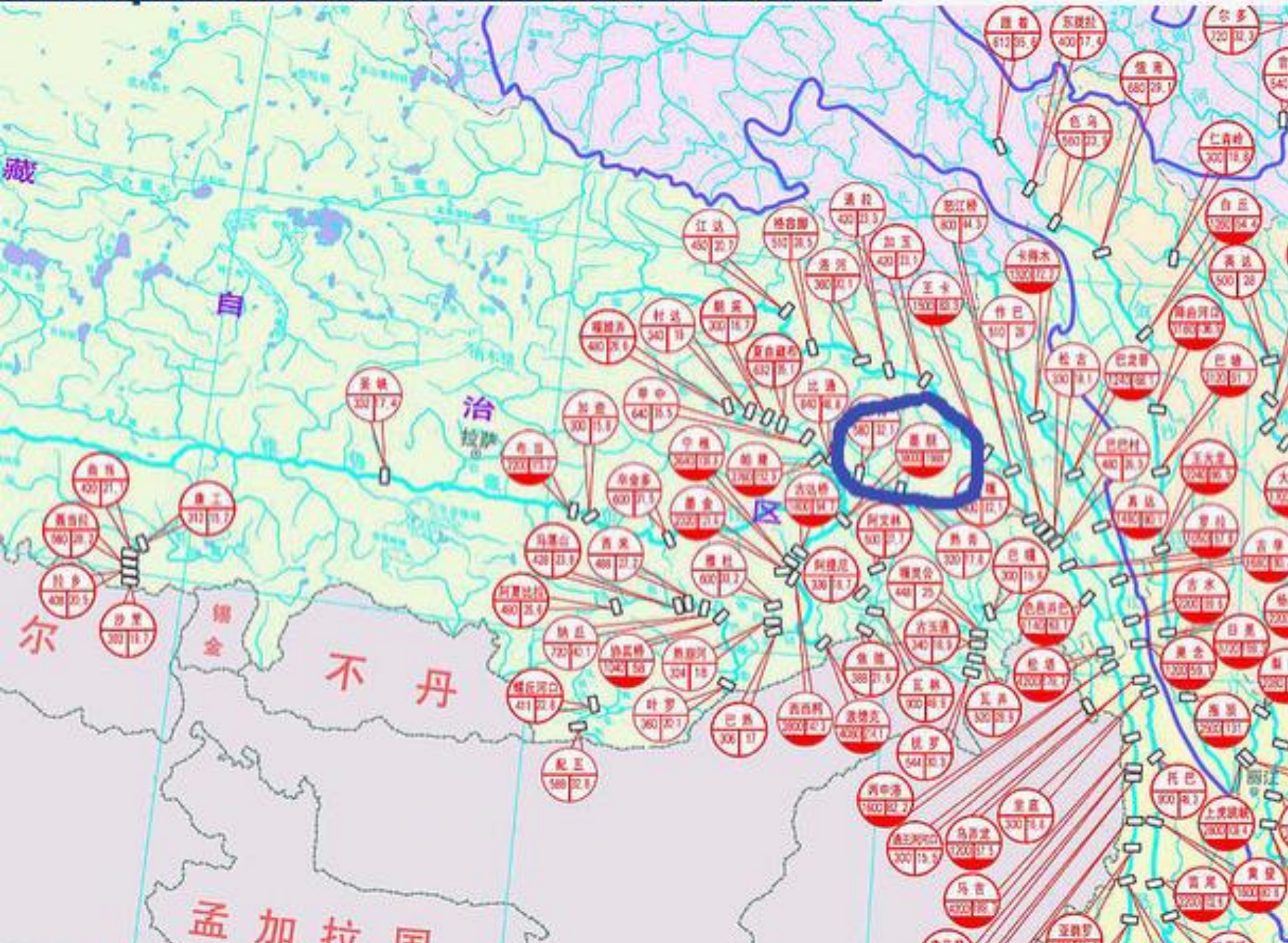

Lhasa
拉萨市
Nyingchi
林芝地区
Shannan
山南地区
Arunachal
Pradesh
Dambuk
Jonai
Saikhoa
Ghat
Cheman
Kulong Chu
Wildlife
Sanctuary
Jakar
Dibrugarh
Tinsukia
Naungmun
Jairampur
Duliajan
North
Lakhimpur
Moranhat
Town
Radi
Black Mountain
National Park
Sibsagar
Gaurisagar
Bhairabkunda
Masaman
Badulipara
Teok
Pathsala
Town
Alisinga
Bihugun
Jorhat
Numaligarh
Tuli
Assam
Hajo
Nagaon
Merapani
Tuensang
Changsari
Roha
Nagaland

China-India Border: Eastern Sector



800912 (A06001) 9-88

China plans for dams in Arunachal Pradesh




Russian Steppes
Western China
Tien Shan
Kunlun & Karakoram Mts
Tarim Basin
Gobi Desert
Gobi Mts
Altyn - Tagh Mts
Tibetan Plateau
Yellow River
Indus Basin
Yarlong
Sichuan Basin
Himalayas
Ganges Basin
Yangtze
Mekong
Salween
India

Chinese hydropower lobbyists are calling for construction of the world's biggest hydro-electric project on the upper reaches of the Brahmaputra river as part of a huge expansion of renewable power in the Himalayas

The Guardian, May 2010

a dam on the great bend is the ultimate hope for water resource exploitation because it could generate energy equivalent to 100m tonnes of crude coal, or all the oil and gas in the South China sea.

(Zhang Boting.. Senior Chinese official)

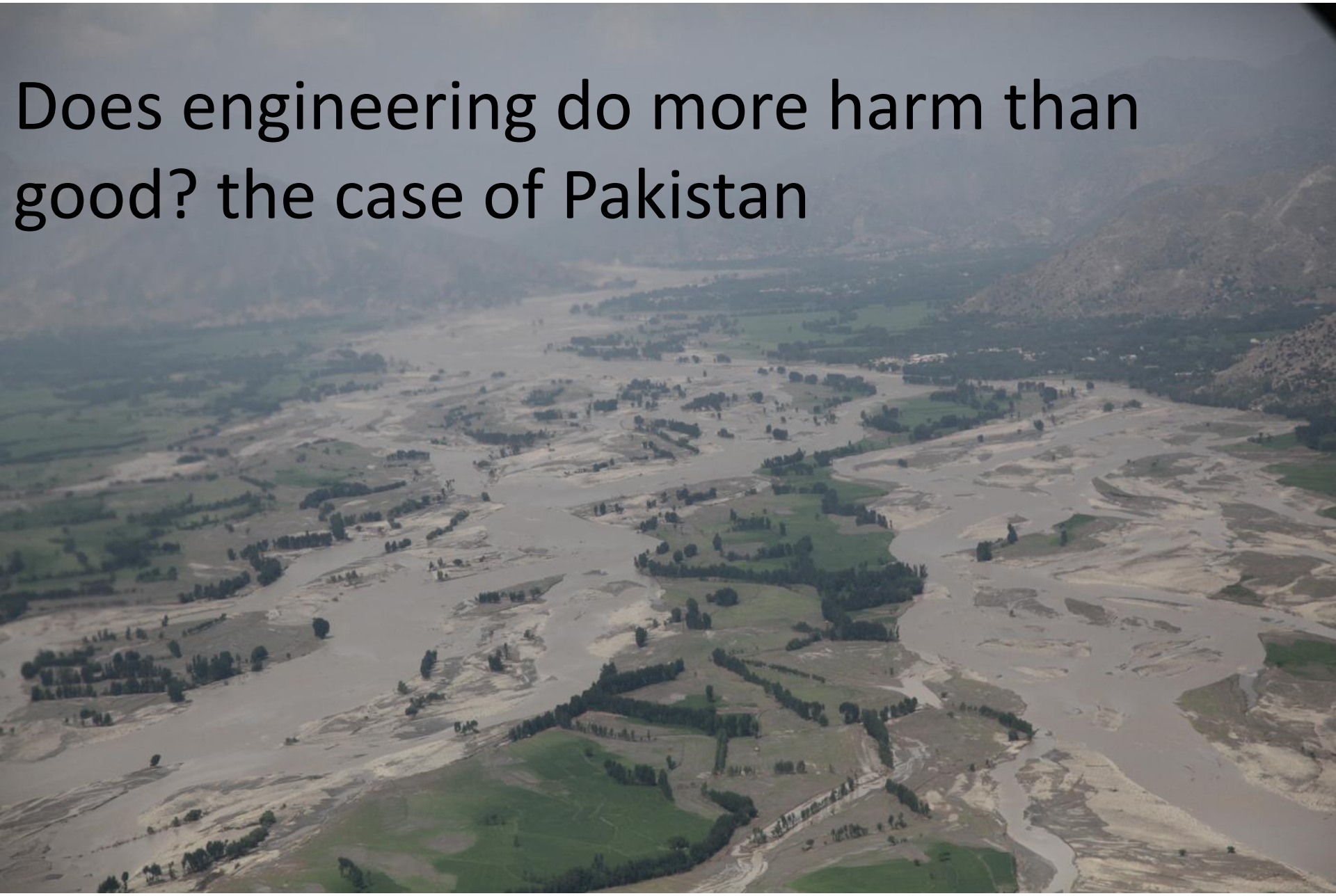
delay would allow India to tap these resources and prompt "major conflict"

"We should build a hydropower plant in Motuo ... as soon as possible because it is a great policy to protect our territory from Indian invasion and to increase China's capacity for carbon reduction.."

(Zhang Boting)

South Asian dam building

- 46 dam projects under construction in the Himalayas (37 in India)
- 396 planned (318 in India)
- India's Himalayan hydroelectric generating capacity will go from 15,000 MW to 126,000 MW
- Nepal's from 500 MW to 27,000 MW
- Bhutan's from 1,500 MW to 17,000 MW
- Pakistan's from 6,400 MW to 42,000 MW



Does engineering do more harm than good? the case of Pakistan


AFP

Pakistan Floods

$9.7 billion, twice the cost of the Kashmir earthquake (World Bank)

- 1,700 people dead
- 20 million displaced
- 700,000 cases of acute diarrhoea
- 800,000 acute respiratory infections
- 1,000,0000 cases of skin disease
- 183,000 suspected malaria cases

"the worst natural disaster the United Nations has responded to in its 65-year history." *Ban Ki-moon*
$2 billion required for for post-flood relief and recovery

- 17 million acres fertile crop land submerged
- 200,000 head of livestock lost
- Loss of planting season
- 700,000 acres (2,800 km2) of lost cotton crops,
- 200,000 acres (810 km2) of sugar cane
- 200,000 acres (810 km2) of rice
- 500,000 tonnes of stocked wheat
- 300,000 acres (1,200 km2) of animal fodder
- 70% of Pakistan's population do not have adequate access to proper nutrition.
- 2,433 miles of highway ($158 million)
- 3,508 miles (5,646 km) of railway ($131 million)
- Public building damages ($1 billion)
- 5,000 schools destroyed.

40 per cent of the world's population in a highly tense and vulnerable region

Unpredictable consequences of political and economic results of water stress: several nuclear powers, old enemies and religious and political tension

Managing water requires cooperation across many boundaries – international, disciplinary, technical and scientific..

It is cheaper and better to plan ahead than to mop up the consequences of a disaster, but our politics don't reward prevention. We have to change our thinking.

Thank You!

Isabel.hilton@chinadialogue.net
www.thethirdpole.net
www.chinadialogue.net