‘Global Choke Point: Exploring Water-Energy-Food Confrontations in the United States of America, China and India’

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Envisioned as a platform for private and governmental actors to discuss and project their views on the increasing confrontations between the need for water, food and energy, the global ‘Choke Point’ initiative analyses the transitions in China, India and the United States of America (USA), three of the world’s most resource hungry economies, through each of its chapters in these specific countries. Financed and supported by the China Sustainable Energy Program, the Rockefeller Brothers Fund, USAID among others, the Choke Point global initiative by the Wilson Center’s China Environment Forum and the Pacific Institute affiliated Circle of Blue, engages the hard choices challenging the water, food and energy triad.

An alumnus of Indiana University, Dr. Jennifer Turner’s forte lies in the areas of energy and environmental policy in China. As director of the China Environment Forum (CEF) at the Woodrow Wilson International Center for Scholars for over a decade, she has facilitated several discussions between the governments of China and the USA to tackle the issue of air pollution, water conservation and, cooperation in the dissemination of clean energy technology to tackle the former.

The outsourcing of food production from Saudi Arabia to Africa; the relegation of agriculture in the competition for water, against new coal and gas discoveries in interior Australia; the expansion of acreage devoted to the growth of corn for fuel in the US mid-west; the unbridled drive to exploit more coal and divert scarce water resources to this water intensive industry in China are all indicators of the change in the primary needs of human society. During the course of her discussion at the ICS, Dr. Turner outlined the crux of her study as one that examines the position of the relentless push for unhindered energy supply in the Chinese and Indian political economy and its impact on food production as well as on the dwindling supply of fresh water.

Energy versus water: Who wins?

The US energy sector consumed 45% of the water supply to maintain the running of coal fired power plants as well as nuclear plants. This requirement is steadily dwindling as the switch to shale gas is amplified. But there is little reason to rejoice as the process of extraction of shale gas is not only water intensive but also highly polluting, contributing

further to the vicious cycle. Dr. Turner highlighted the fact that although energy uses water, one overlooked fact is that water is also dependent on energy. Transportation, sanitisation and desalinisation of water are all severely water intensive. In fact, 13% of all water is used for the aforementioned purposes. In states with an increased predicament of salinity and hard water, that requirement jumps to almost 20%.

But according to the speaker, until a few years ago, the Chinese government at the central and provincial level was clearly unaware of the impact of energy needs on water. The expansion of infrastructure projects in the urban areas of North China that compelled the local governments to seriously push for a wider network of thermal power plants in the coal rich region did not ring any serious alarm bells until the resulting smog descended onto the nerve centre of China – Beijing. While it certainly did bring the issue of air pollution to the fore, water pollution and more importantly the scarcity of water were pushed to the fringes of public scrutiny. It is in this sphere that Dr. Turner, through the Choke Point initiative, has focussed her efforts.

In Ningxia province, the supply of water to farmers was cut by 30% since 2008. 'Water pollution induced scarcity' is only a new phenomenon gaining acceptance. The speaker claimed that 30% of the water in China is heavily polluted and not fit for human consumption. To complicate matters further, it is the agricultural sector and not the energy sector which is the biggest polluter of water sources. Along with the runoffs from farms, the untreated waste from animal husbandry establishments is another player. Treatment of waste also consumes large amounts of energy and many cities in China simply abandon their water treatment facilities in the face of grappling power shortages. A figure quoted by the speaker pointed out that Saudi Arabia consumed nearly 1.5 million barrels of oil to keep its coastal desalination plants running. The trifling numbers of desalination plants that pepper the Chinese coast are set to increase with the possibility that the water emanating from these plants will be transported to Inner Mongolia and even Xinjiang for the use of the coal industry. The 'South-North Transfer Project', consisting of several aqueducts many hundreds of miles long, is being constructed to move large quantities of water from the water rich south to the parched north so as to exploit the coal reserves in China's north-west. This phenomena of 'water serves coal' i.e. the use of large amounts of energy to produce clean water which in turn will be used to obtain more energy is a nexus that indicates the almost pariah status appended towards agriculture and food production.

China is already beginning to import food grains despite record domestic harvests. All that this does is import more environmental dangers as a result of the energy expended in transportation of these imports and the indirect use of energy and water creating a ripple effect. The proximity of polluting industries to Chinese rural farmlands is disconcerting to the residents of urban areas whose initiative caused these very industries to move in the first place. Not quite free of polluted air, urban residents now have to contend with contaminated food stuffs too. Agriculture is at its most efficient in central China but plans are afoot to move this vast breadbasket due west through irrigation. Will the shift guarantee it the water it

requires in a region where the bulk of the supply of water is devoted towards the mining of coal?

An alternative path:

An interesting twist to this unrelenting saga of hard choices is the Chinese impulsion in dampening the ill effects of coal consumption through the introduction of renewable energy sources like wind and solar energy in the energy mix. Although coal is still the 'king', the Chinese government's push has placed China as the leader in the installation of solar panels with a capacity to produce 12 gigawatts of power in 2013. The US in comparison has 10.25 gigawatts of installed solar panels. India has also been proactive in promoting the solar energy sector through an ambitious plan to produce 100 gigawatts of solar power by 2020. Five years ago wind turbines produced 40 gigawatts of power. The government aims to raise this to an astonishing 230 gigawatts by 2020.

A distant second to coal comes hydropower, with efforts to raise its stake in the energy mix from 150 gigawatts in 2010 to 400 gigawatts in a decade. Unlike India where large hydro projects have met vehement opposition by locals, dam construction in China has been relatively obstacle free. Along with the 'South-North Transfer Project', the government aims to build at least 60 dams the size of the Hoover dam in the US. Again this is not aimed at feeding the breadbasket that the government intends to shift to the west (much more closer to the water sources) but to accelerate the pace of extraction of coal. Another issue concerning hydro power is regarding the shortfall of water beginning from 2010 when China was drought stricken. This shortfall compelled local governments, committed to supplying power to the coastal cities, to construct thermal power plants, as a result of which China has witnessed massive coal burning in the heartland of dam building negating any efforts to reduce carbon emissions or which the dams were constructed in the first place.

A shift to natural gas as a remedy to China's ailing cities and rural landscape entails skyrocketing costs of investments and energy use coupled with a truncated national economic performance. Can the Chinese society withstand such fast shifting scenarios? Or has it reached its tipping point?

China's central government aims to cap the consumption of coal to 65% in the total energy mix by 2017, down from a peak of 69% in 2013. The resulting vacuum will be satisfied by China's broadening infrastructure focussed on the exploitation of both conventional and non-conventional sources of natural gas. To put it in perspective, the government will expand the dependence on natural gas to 10% by 2020 which indicates a 178% increase in production volume in eight years. In comparison, the US natural gas sector, riding on the shale gas boom grew by a modest 31.2% in the last eight years. A stream of pipelines like the China-Central Asia gas pipeline, the China-Myanmar Gas pipeline and the recently finalised China-Russia pipeline have transformed China into the third largest importer of natural gas.

A plethora of natural gas substitutes have now entered the Chinese energy market. The Chinese government has been on the offensive in exploiting every possible source. But hurdles do exist at every level in the process, stretching from the upstream process of extraction to the downstream course of supply to domestic markets. High import costs of gas from Qatar and Australia make it an expensive proposition when compared to coal. The issue of energy security through domestic production also plays a major role. Insufficient government subsidies, the minefield of overlapping mining rights and the dependence on coal prevents the expansion of Coal Bed Methane (CBM). Water guzzling Synthetic Natural Gas' (SNG) emissions are detrimental to its claims of 'clean coal technology'. But these obstacles are miniscule when gauged against the vertical market monopoly controlled by China's energy behemoths that smother private investors whose involvement is key to unlocking China's abundant gas reserves. According to the literature presented to the audience, a 58% increase in total energy consumption is projected by 2020, indicating that Chinese energy consumption has nearly tripled since 1990. However, the fall in prices of coal has resulted in decreasing power generation costs of coal fired power plant. The resulting savings could be employed in developing natural gas.

Conclusion

What we are witnessing today is indeed unprecedented in human history. The water-food-energy triad has in modern times come to be represented into a top heavy lopsided pyramid model of the priorities of the modern day welfare state, where energy is at the top most level followed by food and water. Even with its mega engineering projects China does not have sufficient water resources to feed its population's hunger for energy as well as food.

The US-China discussions on the climate that have resulted in the setting up of a cap on the consumption of coal by 2030 has been viewed as a baby step in the course towards creating a sustainable environment. Dr. Turner interprets it as a victory given the fact that China has been an introvert on the environment front. For the first time in as many years coal use fell by 2%, which is a small but encouraging number.

Replacing coal with gas and nuclear energy is only postponing the inevitable. A continuously reinforced caveat according to the speaker is, in a confrontation between energy and water, the winner is usually energy. Water sipping and not water guzzling energy is the need of the hour. India looks to China as a model for its development. Awareness and opposition to land takeovers for mining are very common. But despite these initiatives, the BJP led government in India has announced an increase in coal extraction from 558 million metric tonnes in 2013 to 1 billion metric tonnes in five years, which invalidates any stride made by renewables in reducing carbon emissions.

The discourse on 'security' has come to envisage the security of shipping routes, storage facilities, transportation hubs, refineries, dams etc. But what kind of protection have the areas encompassing the very resources these establishments cater to warrant? What about the native populations? Has the lexicon of our language surpassed conventional connotations of

security to achieve reckless short term targets, softened only by a forlorn hope to reconcile climate change with modernisation?

Discussion

In response to a question from the audience regarding the sources of her data the speaker answered that all the data collected by the Choke Point initiative originated from data provided by the Ministry of Water Resources, the Energy Resource Institute under the National Development and Reforms Commission (NDRC), Tsinghua University and the Sandia National Laboratories.

Another question was directed at the wisdom behind the terming of the Asian countries as choke points when all that India and China were attempting to pursue was economic development that would trickle down to the their citizens. Dr. Turner cleared the air by stating that even the US was included in this description simply to act as an example of 'what not to do' and 'what should be done instead.' This platform was not about pointing fingers but to create a momentum to achieve energy efficiency, demand side management etc.

One of the major points of discussion echoed the forewarning given by the father of the Nuclear Navy, Admiral Hyman Rickover, in the 1950s about the inability of non-fossil based technology to provide sufficient amounts of power for consumption by a population growing by leaps and bounds. "Can we feel certain that when economically recoverable fossil fuels are gone science will have learned how to maintain a high standard of living on renewable energy sources?" He predicted that such technologies could supply barely 15% of the global demand for power. Dr. Turner on her part was also cautious in her approach when asked about the role of renewables in energy security. She suggested renewables taken in combination with gas can make a flexible energy system more reliable but again storage of electricity produced from renewables is primitive. But what impressed the speaker was the increasing political will witnessed within the upper echelons of the Communist Party. Capping of coal emissions, implementation of large and small scale solar projects, increasing fuel efficiency of automobiles are all illustrations of the Chinese government's action plan to reduce the drawbacks of its path to development.

About the Speaker

Dr Jennifer Turner has been the director of the China Environment Forum at the Woodrow Wilson Center for 14 years where she creates meetings, exchanges and publications focusing on a variety of energy and environmental challenges facing China, particularly on water, energy and climate challenges and US-China clean energy cooperation. Dr. Turner also serves as editor of the Wilson's Center's journal, the *China Environment Series*. Her research focuses heavily on water-energy nexus issues and environmental activism in China.

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