DEFENCE AND DIPLOMACY

IN PURSUIT OF NATIONAL SECURITY

VOL. 10 NO. 2 ISSN 2347 - 3703 JANUARY-MARCH 2021

JOURNAL OF THE CENTRE FOR AIR POWER STUDIES

CHINA'S ENVIRONMENTAL SECURITY

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INTRODUCTION

In late July 2001, the lush Huai River Valley (China's breadbasket) was the home of an environmental calamity. Heavy rains flooded the tributaries of the river discharging more than 38 billion gallons of severely polluted water into the Huai. Downstream, in Anhui Province, the water of the river was thick with yellow foam, garbage, and dead fish. However, the Chinese authorities immediately brought the grim condition under control; the event portrayed a remarkable failure of China's leadership. The account of Huai River over the past five decades summarises the chronicle of environmental modifications in China. It is a contrasting tale, one that carries the guarantee of notable change in the future, at the same time uncovering the demerits of China's environmental policies, many of which are embedded in the country's old traditions. China's leadership by the Communist Party showed exceptional economic growth and security for the Chinese people, the widespread Chinese control throughout the Asia-Pacific and beyond, and back to Chinese supremacy of Macao, and Hong Kong. All these achievements come at a very hefty cost. Neglected for

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decades, China's environmental threats have the potential to bring the country to its limits economically.[1]

Currently, China is facing four main stressors—soil degradation, air pollution, water security, and climate change—that are impacting security in China. These stressors require policy reforms and more adaptability is vital since the country is facing emerging threats such as climate change. Beyond this lies the essential question on China's future of the economic and political system and its inclination toward the rest of the world. Availability of resources for industrial and domestic use, recovering public health, and persistent economic development are all resting on Beijing's preparedness to decrease the footprint of environmental degradation. This chapter assesses China's environmental security challenges by submitting the four stressors—land, air, water, and climate change—that are hampering the economic growth of the country. Moreover, policy measures adopted by the government in securitising the environmental issue are also highlighted.

HISTORY OF ENVIRONMENTAL SECURITY IN CHINA

While China's industrial boom has hastened the exploitation of its land and other natural resources, the roots of its environmental issues go back centuries. Nation-building, economic growth, and war have together exerted implacable stress on water, land, and forests over the country's history. As early as the seventh century, China's population also started to put pressure on the environment. China's present environmental issues are the cause of a deeply rooted cultural tradition that gave little priority to some of the fundamental elements of efficient ecological governance: responsible leadership, unconstrained scientific inquiry, and transparent political system. In 1949, during Mao's time, the succession to power of the rural-based Chinese Communist Party brought some early relief to the economy and the environment. During the first seven years of Communist rule, the leadership of the Chinese showed the same patterns of the imperial leaders and began reconstructing the economy after a terrible war. Both industry and agriculture multiplied and, simultaneously, some soil and water rules were implemented. The Communists also came up with significant

1. Elizabeth C. Economy, *The River Runs Black: The Environmental Challenge to China's Future* (Ithaca and London: Cornell University Press, 2004), pp. 1-25.

projects for tackling natural disasters, afforestation, and water conservation. Not all of these projects were impactful. In 1956 the Minister of Forestry, Liang Xi, mentioned: "As everyone knows, our afforestation statistics are not really based on actual measurements, but are fixed on the basis of mere eyeballing or guesswork. Consequently, there are mistakes, overestimates, and even totally unfounded reports." Power plants were constructed along the rivers, and the wastewater was released without any treatment facilities. Mao's approach to the environment was that natural science can be used to mould and conquer nature. This approach of Mao launched the Great Leap Forward in 1958, where factories were constructed carelessly without considering any environmental protection. In the wake of the havoc wrought by the Great Leap Forward, cases of ecological depletion increased to a horrifying degree.

In 1972, three significant events clicked a new environmental consciousness in Beijing. The first two were environmental disasters. The beach turned black in the northeastern coastal city of Dalian. Millions of fish died, and the port choked from polluted shells. That same year, infected fish from the Guanting Reservoir outside Beijing surfaced in the city's market. These incidents provoked then-premier Zhou Enlai to organise a small leading group of officials to grapple with the problem of protecting the water resources of reservoirs. The year 1972 also witnessed the most crucial United Nations' first international environmental conference, the UN Conference on the Human Environment (UNCHE). This conference sowed the seeds of environmental transition in China and was a turning point in China's perspective on environmental governance. Premier Zhou Enlai sent a delegation to Stockholm, Sweden in 1972 to open the door to a fresh understanding of China's environmental crisis and possible solutions. In 1973, China's first National Conference on Environmental Protection was organised. One year later, the State Council came up with a top-level inter-ministerial Environmental Protection Leading group to study ecological protection problems. As to China's legal system, which was highly criticised for its limited transparency and poorly trained advocates, the year 1993 saw a change when leaders accepted some of the demerits in the lawmaking process, especially on issues related to agriculture. Under Qu Geping (a member of the

9th National People's Congress) seven environmental laws were passed in 2001 including Water Pollution Prevention.

During 2007, the National Climate Change Program (NCCP) was introduced to conserve the environment of the country and ensure sustainable economic development. Equivalent findings were proposed in the White Paper such as "China's Policies and Actions for Addressing Climate Change" in 2008. The main lawmaking body, the Chinese Legislature, sanctioned a draft on climate change within the reference of environmental obstacles in 2009. Due to global concerns related to smog issues, a zero-tolerance policy towards carbon emissions was adopted in late 2016 to January 2017. The fear was raised by South Korea and Japan that presumably toxic air pollution from China was spreading transnationally and was affecting Japanese and South Korean cities.[2] China's development may have brought millions out of poverty and generated a booming middle class, but its environmental footprint tops the list of carbon emissions which starts from the exploitation of land, air, and water.

LAND SECURITY

China's land faces the challenge of large-scale industrialisation. Roughly 28 per cent of China's landmass has been spoilt due to soil erosion, deforestation, desertification, and acid rain. Solid waste disposal has also been a major issue in urban parts of China. Pollution of toxic substances and heavy metals has become a public health hazard. China holds 1.404 billion people but has comparatively less fertile land and even little water. The issue of soil erosion is not something new to the Chinese people. In Northern China, people have suffered from dust storms emerging from the dry Loess Plateau in Central China, an issue which the government identified and addressed in the 1980s through an arrangement of environmental conservation projects. People in China do know that not all the food they consume is healthy, but they do not know the extreme level of soil degradation. The reason for this is that the Chinese government has constantly denied making extensive data on soil pollution

2. Mehran Idris Khan and Yen-Chiang Chang, "Environmental Challenges and Current Practices in China—A Thorough Analysis", MDPI Sustainability Foundation, July 20, 2018, at https://www.coursehero.com/file/82430975/sustainability-10-02547pdf/. Accessed on September 6, 2019.

public.[3] In 2013, a lawyer in Beijing, Dong Zhengwei, demanded data on soil pollution from the Ministry of Environmental Protection, along with the details on the causes and techniques for tackling the issue. The demand was rejected on the grounds that the soil pollution statistics was kept confidential by the state, although the government did disclose some data by the end of 2013, probably on account of the strong public pressure against the rejection. It emerged that in Guangdong—China's most populated region—there were extremely high levels of cadmium (which is poisonous) in over 40 per cent of the rice distributed in its capital Guangzhou.[4] The released data created widespread concern.[5] In April 2014 the Chinese government circulated a more fundamental report on the country's soil condition in which it stated that 16.1 per cent of the samples of agricultural soils were polluted with chemical and organic toxins, including heavy metals such as arsenic, cadmium, and lead.[6]

Chinese officials mentioned that an area the size of Taiwan is so contaminated that farming should not be allowed there.[7] Polluted soils with a heavy volume of toxic metals can create a phototoxic reaction in plants, diminishing crop yields. Furthermore, the roots of plants can take in these heavy metal contaminants which collect in the crops and affect the health of people by causing lung diseases, abnormalities in the skeletal system and cancers.[8] Cadmium (Cd) is the most common metal found in soil among all the toxic metals in

3. Claudio O. Delang and Zhen Yuan, *China's Grain for Green Program* (Heidelberg: Springer International Publishing, 2015).
4. Timothy Chilman, "In China, an area as large as Belgium is too polluted to be farmed", *Sustainable Business Toolkit*, January 3, 2014, at https://www.sustainablebusinesstoolkit.com/land-pollution-in-china-facts/. Accessed on September 6, 2019.
5. He Guangwei, "Special Report: The Legacy of Hunan's Polluted Soils", *China Dialogue,* July, 7, 2014, at https://www.chinadialogue.net/article/show/single/en/7076-Special-report-the-legacy-of-Hunan-s-polluted-soils. Accessed on September 6, 2019.
6. He Guangwei, "Special Report: The Victims of China's Soil Pollution Crisis", *China Dialogue,* June 30, 2014, at https://www.chinadialogue.net/article/show/single/en/7073-Special-report-The-victims-of-China-s-soil-pollution-crisis. Accessed on September 6, 2019.
7. Edward Wong, "One-Fifth of China's Farmland Is Polluted, State Study Finds", *The New York Times,* April 17, 2014, at https://www.nytimes.com/2014/04/18/world/asia/one-fifth-of-chinas-farmland-is-polluted-state-report-finds.html. Accessed on September 7, 2019.
8. Guannan Liu, Juan Wang, Erxi Zhang, Jing Hou and Xinhui Liu, "Heavy metal speciation and risk assessment in dry land and paddy soils near mining areas at Southern China", *Environmental Science and Pollution Research,* 23 (9), January 12, 2016. DOI 10.1007/s11356-016-6114-6. Accessed on September 7, 2019.

China. Many provinces possess Over Limit Sites (OLSs), but they are highly widespread in the provinces of Hunan, Guizhou, and South of Yangtze River. Field surveys carried out in eight towns in Youxian (Hunan province) depicted that in 90 per cent of the examined area the Cd composition in the soil of rice paddies surpassed the permissible limit. The highest amount was found at Weining (Guizhou Province) which houses the world's biggest germanium mine. Cd OLSs were also present in Henan, Tianjin, and Shandong, all of which have significant economic activities with a dense population, including a heavy metal industrial region of Liaodong in northeastern China. Another major threat to the ecology and to citizens of China is from high quantities of lead (Pb) that is released from vehicle exhaust, tire wear, and smelting. Shanghai and Hezhang County (Guizhou Province) have a high density of lead OLSs.[9]

China's land is also facing a threat of soil pollution from coal mining. Coal has been in plenty as an energy resource in China. During its 12th Five-Year Plan China advanced the creation of sixteen coal power stations to fulfil the growing demand for energy. Regrettably, coal power requires a lot of water, and most coal mines in China are located in the drier region of the North. The coal mines in the dry area of Inner Mongolia Autonomous Region, Ningxia Hui Autonomous Region (NHAR), and Shaanxi Province are evaluated to amount to 250 billion tonnes. The coal mine of Xinjiang Uyghur Autonomous Region (XUAR) contains 35 per cent of the coal reserves of China and Inner Mongolia, which is the largest coal-producing region, constitutes 26 per cent of China's coal mines. In these regions coal contests with agriculture for water.[10] The coal reserves are bringing critical problems for the ecology of China. The State Council published a soil pollution action plan on May 28, 2016 which proposed short and long-term targets for preventing soil pollution with relevant control measures, but the Chinese

9. Qiannan Duan, Jianchao Lee, Yansong Liu, Han Chen and Huanyu Hu, "Distribution of Heavy Metal Pollution in Surface Soil Samples in China: A Graphical Review", *Bulletin of Environmental Contamination and Toxicology*, 97(3), 303-309, June 24, 2016. DOI: 10.1007/s00128-016-1857-9. Accessed on September 7, 2019.
10. "Thirsty Coal: A Water Crisis Exacerbated by China's New Mega Coal Power Bases", Greenpeace East Asia, August 14, 2012, at http://www.greenpeace.org/eastasia/publications/reports/climate-energy/2012/thirsty-coal-water-crisis/. Accessed on September 8, 2019.

government has faced difficulty in coming up with incentives and financing techniques to pay for the clean-up, specifically in old industrial rural areas where prices of property are low. A new study led by Greenpeace and the Institute of Ecology and Environment at China's Nanjing University stated that the dependence on land transfers to gain revenues meant less motivation for local governments in ensuring proper treatment of soil pollution. A campaigner with Greenpeace, Beijing mentioned that "Chinese cities rely heavily on land transfer fees to generate revenue and they have a clear incentive to redevelop land on quick turnarounds. Even a city with deep commitment to properly handling toxic land will, in the end, need money."[11] To fix soil pollution a longer period of time is required; if the Chinese authorities are aiming to rush the transaction it will cut down the time period necessary for land to recover. Soil pollution is a persistent problem in China, where 40 years of rapid industrial growth have infected a large size of urban and rural land. Cleaning up the polluted areas may show more complications, with local governments in China confronting strict budgets as the central government minimises taxes for businesses.[12]

AIR SECURITY

China is experiencing a crisis of air pollution, which already had a negative effect on the health of the Chinese people. Over the last 40 years, China has undergone the fastest economic development but has also paid a massive environmental price. China has the world's most polluted cities and is first in ranking in emitting greenhouse gases. The Beijing-Tianjin-Hebei region called Jing-Jin-Ji has the country's annual average minute particulate matter (PM 2.5) density of 93 micrograms per cubic metre ($\mu g/m^3$) in 2014, far surpassing the national PM 2.5 standard of 35 $\mu g/m^3$ and the limit set by the World Health Organization (WHO) of 10 $\mu g/m^3$. Coal is the single largest air polluter and the source of greenhouse emissions in China. In 2014

11. David Stanway, "China soil pollution efforts stymied by local governments: Greenpeace", Reuters, April 17, 2019, at https://www.reuters.com/article/us-china-pollution-soil/china-soil-pollution-efforts-stymied-by-local-governments-greenpeace-idUSKCN1RT04D. Accessed on September 8, 2019.
12. Danson Cheong, "Study: 20% of China's Polluted Land Cleaned Up", April 19, 2019, at https://www.straitstimes.com/asia/east-asia/study-20-of-chinas-polluted-land-cleaned-up. Accessed on September 8, 2019.

China absorbed approximately 4 billion tonnes of fuel, more than the rest of the countries combined. Half of China's coal is utilised for localised boilers in the residential and industrial domains. In the Jing-Jin-Ji area, usage of coal attained almost 1.8 billion tons in 2014, which accounted for 40 per cent of coal usage in China, and is comparable to the coal usage of most Organisation for Economic Cooperation and Development (OECD) countries combined.

Limiting coal consumption by improving energy efficiency is the way to clean air. The Datong Coal Mining Group—the third-largest state-owned coal organisation in China—with financial assistance from Wangping Power Company installed two heat renewal units and a 21-km heat pipeline to Huairen County (Shanxi Province). The unwanted heat from electrical fabrication that was previously released into the air is now trapped and used again to heat homes. This process eliminated ten small coal boilers which used to provide residential heat and decreased CO_2 by 420,000 tonnes, Sulphur dioxide (SO_2) by over 1,300 tonnes, and nitrogen oxide (LP1) by 6,330 tonnes annually.[13] The Innovative Financing for Air Pollution Control in Jing-Jin-Ji Region Program, launched in September 2016, has made an excellent advancement. This project for China is lessening carbon emissions by raising energy efficiency (EE) and clean energy. The Program for Result (P for R) creates value-added additions to the government. "The program has financed 13 subprojects with a total investment of US$ 660 million, including US$ 290 million from the World Bank and the Hua Xia Bank. These projects have achieved good benefits by reducing coal consumption by 560,000 tonnes and a significant amount of sulfur dioxide and nitrogen oxide."[14]

Additionally, air pollution in China has been high due to a road population of more than 300 million cars. Motor vehicle exhaust has brought changes in urban air pollution. There were 17 million new vehicles on the road in 2014, contributing to China's rising emissions.

13. "Helping China Fight Air Pollution", The World Bank, June 11, 2018, at https://www.worldbank.org/en/news/feature/2018/06/11/helping-china-fight-air-pollution. Accessed on September 9, 2019.
14. "China—Innovative Financing for Air Pollution Control in Jing-Jin-Ji Project", The World Bank, February 16, 2019, at http://documents.worldbank.org/curated/en/488161468187136819/pdf/102272-PAD-P154669-R2016-0031-1-OUO-9.pdf. Accessed on September 9, 2019.

According to China's Ministry of Public Security, car ownership rose up to 154 million in 2014 itself.[15] The advancement of vehicular pollution prevention in China is divided into the following areas:

- The Standing Committee of the National People's Congress has renewed the old version (1987) of the Prevention and Control Law of Atmospheric Pollution twice. These changes made vehicular emission standards more strict as well as switched to non-leaded gasoline across the country, which limited the pollutants from cars on a large scale.
- China's State Council announced the 2014-2015 Low Carbon Development Plan for Emission Reduction and Energy Saving. The plan directed that six million "yellow label" cars and old vehicles should be phased out by the end of 2014.

A green and sustainable transportation system has updated emission standards in China, even though upcoming challenges are not to be ignored in implementing tight policies.[16]

WATER SECURITY

With growing socio-economic progress, China has been encountering severe water scarcity which threatens the sustainability of the country. On the one side, China's per capita water attainability is less and not evenly supplied, both temporarily and geographically, which are incompatible with the rising demand for water; on the other side, ineffective utilisation, wastage, and pollution of land and air are common, which has adversely affected the sufficiency of water systems to endure China's socio-economic growth.[17] The overall volume of China's domestic renewable freshwater reserves

15. Eleanor Albert and Beina Xu, "China's Environmetal Crisis", Council on Foreign Relations, January 18, 2016, at https://www.cfr.org/backgrounder/chinas-environmental-crisis. Accessed on September 9, 2019.
16. Jin Wang, Qiuxia Wu, Juan Liu, Hong Yang, Meiling Yin, Shili Chen, Peiyu Guo, Jiamin Ren, Xuwen Luo, Wensheng Linghu and Qiong Huang, "Vehicle emission and atmospheric pollution in China: problems, progress, and prospects", National Center for Biotechnology Information, U.S. National Library of Medicine, May 16, 2019, at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6526014/. Accessed on September 10, 2019.
17. Yong Jiang, "China's water scarcity", *Journal of Environmental Management*, vol. 90, issue 11, August 2009, pp. 3185-3196, at https://www.sciencedirect.com/science/article/pii/S0301479709001339. Accessed on September 10, 2019.

on average is about 2,813 billion cubic metres (m^3) per year.[18] Geographically water resources in China can be separated into ten water reserve zones. The Yangtze River is the largest and the longest river in China, representing the political and cultural recognition of the nation. Enveloping nine provinces bridging two municipalities (Shanghai and Chongqing), the river supplies water to nearly 600 million people residing in the Yangtze River Economic Belt (YREB). But the Yangtze is not just vital for China; the river remains at the nucleus of global supply chains.[19] Accordingly, water availability in the Northern part of China is about 904 m^3 per capita per year, which is in acute contrast to the level of 3,280 m^3 per capita per year in the Southern part. The condition is miserable even at the catchment point. Water capacity in the Hai River basin, for instance, is only 314 m^3 per capita per year which is also at the bottom of the threshold level of 500 m^3 per capita per year, usually an accepted level for warning of complete water shortage.[20]

With limited water across time and space, how to use water wisely becomes fundamentally important. China's water management model, however, heightens exposure to the risk of critical water scarcity, especially in North China. World Resources Institute (WRI) invented a China-specific baseline water stress measure (BWS-China) applying freshwater withdrawal data from over 300 prefectures and spatial grid data (that is, industry data, population, and irrigated area). The analysis from the BWS-China showed that China is going through a high and extremely high-water-stress that soared from 28 to 30 per cent, which means 678 million people are facing high water-stressed conditions.[21] Overall, water stress throughout 54 per cent of China's whole land area

18. *AQUASTAT*, Food and Agricultural Organization of the United Nations, 2015, at http://www.fao.org/nr/water/aquastat/data/query/results.html. Accessed on September 10, 2019.
19. "Yangtze Water Risks, Hotspots and Growth", *China Water Risk*, August 2019, at http://www.chinawaterrisk.org/wp-content/uploads/2019/09/CWR-Yangtze-Water-Risks-Hotspots-Growth.pdf. Accessed on September 10, 2019.
20. *International Decade for Action "Water for Life" 2005-2015*, United Nations Department of Economics and Social Affairs (UNDESA), November 2014, at https://www.un.org/waterforlifedecade/scarcity.shtml. Accessed on September 10, 2019.
21. Jiao Wang, Lijin Zhong, and Ying Long, "Baseline Water Stress: China", World Resources Institute, June 2016, at https://wriorg.s3.amazonaws.com/s3fs-public/Baseline_Water_Stress_China_0.pdf. Accessed on September 10, 2019.

deteriorated from 2001 to 2010, while 8 per cent of the country's entire land area, an area somewhat bigger than the US state of Texas, shifted into a higher category of water stress.[22] There are diverse reasons for severe water stress conditions for these catchments, but urbanisation and industrialisation are significant. For instance, one of the catchments in the Yellow River Basin—where water stress rose by 55 per cent—is near one of China's coal bases. In the southeastern coast of China, in the Pearl River Delta, which is one of the major economic zones, the urban population grew by 56 per cent, while industrial GDP increased 4.8 times between 2001 and 2010.[23] Some local governments took the initiative to encourage more water-sustainable industrial practices. For example, Shandong Province closed inefficient steel factories and paper-making since 2006, which brought a drop of 12.49 per cent in the industrial water withdrawal per unit between 2001 and 2008.[24]

Agriculture in China witnessed excessive water usage in 2013 after which it again experienced a decrease in water use. Decrease in agricultural water usage takes place when other sources of water are either drying up or are heavily polluted, and the agricultural sector in China faces water shortages.[25] Water scarcity and water pollution in China are two sides of the same coin. China's three great rivers, the Yellow River, Pearl and Yangtze River are the most toxic in the country. The legendary river, the Yangtze, is now better known for its pollution with 40 million tonnes of sewage and industrial waste from the 20,000 petrochemical factories located at the riverbank, of which about 20 per cent of waste is cleaned beforehand. Industrial pollution released

22. Francis Gassert, Matt Landis, Matt Luck, Paul Reig, and Tien Shiao, "Aqueduct Meta Data Document", World Resources Institute, April 2015, at https://theasiadialogue.com/wp-content/uploads/2018/05/Aqueduct_Global_Maps_2.1.pdf. Accessed on September 10, 2019.
23.. "Water Management in China's Coal Sector: Policy Review", World Resources Institute, 2016, at https://theasiadialogue.com/wp-content/uploads/2018/05/coal20water20policy_CN_S.pdf. Accessed on September 10, 2019.
24. Jiao Wang, Lijin Zhong and Charles Iceland, "China's Water Stress is on the Rise", *Asia Dialogue,* May 25, 2018, at https://theasiadialogue.com/2018/05/25/chinas-water-stress-is-on-the-rise/. Accessed on September 11, 2019.
25. Thomas Bilaliib Udimal, Zhuang Jincai, Emmanuel Caesar Ayamba and Samuel Mensah Owusu, "China's water situation; the supply of water and the pattern of its usage", *International Journal of Sustainable Built Environment*, vol. 6, issue 2, December 2017, pp. 491-50, at https://www.sciencedirect.com/science/article/pii/S2212609017300924. Accessed on September 11, 2019.

in the Pearl River which flows through Guandong Province has created a problem for clean drinking water.[26] Climate change is one of the serious concerns for China's water security problem; it is an emerging challenge and is affecting the water resources and hydrological cycle. The Hindu Kush Himalaya (HKH) ice sheet in the Tibetan plateau is known as the world's "Third Pole", and holds more than 46,000 glaciers, which is 14.5 per cent of the world total. These glaciers give rise to Asia's great river arrangements, including the Yangtze, Mekong, and Yellow rivers. The report on HKH by International Centre for Integrated Mountain Development (ICIMOD) showed that due to global warming at least one-third of the HKH glaciers would diminish by 2100 even if global warming is stopped at 1.5 degrees Celsius.[27] Due to glacial run-off, the reduction of water levels of Yangtze and Yellow rivers has already reduced, leading to water scarcity. In addition to global warming, the unchecked establishment of Chinese dams might further intensify the problem of water shortage.[28]

As China faces the brunt of climate change, water shortages, and pollution, the central government has increased efforts in tackling these threats by turning cities into giant sponges. Thirty major cities in China are trying to trap more water to combat flooding, extreme pollution, and drought. The innovative tactic launched by President Xi Jinping in 2015 can resolve some of the environmental issues plaguing China. Pilot cities, including Beijing, Shanghai, and Shenzen, receive practical assistance and funds to re-innovate their urban places in a water-sensitive way, to turn 80 per cent of China's urban cities into sponges by 2030.[29] For upgrading urban sewage facility, the 13th Five-Year Plan in 2016 aimed at limiting water consumption by 23 per cent from 2015 levels by 2020. It also focused on reducing

26. "Water Pollution in China", *Facts and Details,* April 2014, at http://factsanddetails.com/china/cat10/sub66/item391.html. Accessed on September 11, 2019.
27. "Unravelling Climate Change in the Hindu Kush Himalaya: Rapid Warming in the Mountains and Increasing Extremes", *The Hindu Kush Himalaya Assessment*, Springer, 2019. DOI: https://doi.org/10.1007/978-3-319-92288-1. Accessed on September 11, 2019.
28. Dechen Palmo, "The World's Third Pole is Melting", *The Diplomat,* March 28, 2019, at https://thediplomat.com/2019/03/the-worlds-third-pole-is-melting/. Accessed on September 11, 2019.
29. Astrid Zweynert, "Sponges, urban forests and air corridors: how nature can cool cities", Reuters, September 26, 2017, at https://www.reuters.com/article/us-heatwave-cities-nature/sponges-urban-forests-and-air-corridors-how-nature-can-cool-cities-idUSKCN1C100Q. Accessed on September 11, 2019.

pollutants from agriculture by decreasing the use of fertilisers and pesticides.[30]

FINAL EVALUATION

China's environmental history portrays a long, intensely rooted tradition of maltreating the environment for man's needs, with scant knowledge of the constraints of man's or nature's ability to restore the Earth's resources. Institutions, perceptions, and policies originated in, and were assisted by, traditional ideas and philosophies such as Confucianism that cultivated man's wants to overcome nature to use it for his own interest. Furthermore, China's history shows a striking flow in the techniques which leaders chose to handle their natural resources. Today, with an evolving Chinese economy charged by large state-owned ventures, environmental policies continue to be difficult to operate at the local level, where officials often lay emphasis on achieving economic targets over environmental protection. Coming to the concerns about soil pollution in China, the state of soil raises deep worries because of the limited agricultural land per capita. Natural factors affect the soil degradation process as many regions are vulnerable to wind erosion and water scarcity. Moreover, soil pollution in China is happening because of man-made activities where farmers use industrial water which contaminates the soil and impacts the quality of food grown. As land pollution is not easy to manage due to a variety of causes, addressing it requires reformation of industrial activities, which are the backbone of the Chinese economy. China's air pollution is a threat to public health, and coal is the main culprit. Chinese leaders face a complicated choice between economic growth and environmental welfare; though the government has taken considerable measures in tackling air pollution. The Jing-Jin-Ji region saw a 25 per cent drop in PM 2.5 levels during winter from 2017 to 2018.[31] The Chinese government also announced in September 2018 that the blanket ban which provided cleaner air in winter would be

30. Prof. Michael Webber, "Tackling China's water pollution", *Global Water Forum*, October 9, 2017, at http://www.globalwaterforum.org/2017/10/09/tackling-chinas-water-pollution/. Accessed on September 11, 2019.
31. Orange Wang, "China eases up on winter smog fight as it battles American trade war headwinds", *South China Morning Post*, September 27, 2018, at https://www.scmp.com/economy/china-economy/article/2166073/china-eases-winter-smog-fight-it-battles-american-trade-war. Accessed on September 11, 2019.

restored by a more innovative approach. This move will help local officials to set their pollution limit targets that will be reviewed by the central administration.[32] Lastly, the actual key to solving water scarcity in China lies not in policymaking but rather in the decisions of the local government. Depending on each catchment's distinctive water-stress and water-use conditions, corporate approaches can assist by more effective and sustainable water usage by cultivating fewer water-intensive crops; upgrading water-use proficiency in water-intensive industries such as coal-mining, and encouraging water-conserving methods amongst consumers.

Booming industries and manufactured goods come with a heavy environmental price in China. Environmental security has inflicted massive damage to the country, which has seen growing civil unrest. Protests have multiplied as citizens gain knowledge of health threats. In urban and rural areas such as Kunming, Ningbo, Shanghai, and Guangdong the frequency of protests has increased.[33] Climate activism and responsible solutions by local officials can give rise to a slow but continuous movement in recovering from the environmental crisis.

32. "Notice on Printing and Distributing the Action Plan for Comprehensive Management of Air Pollution in the Autumn and Winter of 2018-2019 in Beijing-Tianjin-Hebei and Surrounding Areas", Ministry of Ecology and Environment of the People's Republic of China, September 21, 2018, at http://www.mee.gov.cn/gkml/sthjbgw/sthjbwj/201809/t20180927_630570.htm. Accessed on September 11, 2019.
33. Eleanor Albert and Beina Xu, "China's Environmental Crisis", Council on Foreign Relations, January 18, 2016, at https://www.cfr.org/backgrounder/chinas-environmental-crisis. Accessed on September 11, 2019.