

War Over Resources: India's Economic Success and Commodity Competition with China

REPORT DOCUMENTATION PAGE				<i>Form Approved</i> OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 26-02-2021		2. REPORT TYPE FINAL		3. DATES COVERED (From - To) N/A	
4. TITLE AND SUBTITLE War Over Resources: India's Economic Success and Commodity Competition with China				5a. CONTRACT NUMBER N/A	
				5b. GRANT NUMBER N/A	
				5c. PROGRAM ELEMENT NUMBER N/A	
6. AUTHOR(S) Peter O. Gustafson				5d. PROJECT NUMBER N/A	
				5e. TASK NUMBER N/A	
				5f. WORK UNIT NUMBER N/A	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Writing & Teaching Excellence Center Naval War College 686 Cushing Road Newport, RI 02841-1207				8. PERFORMING ORGANIZATION REPORT NUMBER N/A	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A				10. SPONSOR/MONITOR'S ACRONYM(S) N/A	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S) N/A	
12. DISTRIBUTION / AVAILABILITY STATEMENT Distribution Statement A: Approved for public release; Distribution is unlimited.					
13. SUPPLEMENTARY NOTES A paper submitted to the faculty of the NWC in partial satisfaction of the requirements of the curriculum. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.					
14. ABSTRACT China and India have three things in common, an extremely large and growing population, limited natural resources, and growing economies. As these factors increase and both countries compete economically will they initiate conflict as a result of shrinking resources? The paper examined this question using journal, news articles, research organization, government, and multi-national organization data sources to answer the following arguments. First, India's economic success will lead to conflict with China as both countries' food demands exceed their domestically available resources. Second, India's growing industrialization will increase competition with China over limited domestic and global mineral commodity sources, leading to conflict over trade route security. And third, India's growing economy will further increase competition with China over shrinking domestic energy commodities, heightening the likelihood of conflict as they compete over limited global supply chains. As a result of this study, conflict is likely over food, raw materials, and energy as both countries compete not only over these resources but also over security of their overlapping logistic routes. India must take action to secure resources and the Indian Ocean while securing concrete and resilient support by the US and its allies.					
15. SUBJECT TERMS (Key words) India, China, Commodities, Economic Competition, Indian Ocean Region, Imports, Industrialization, Petroleum, Food Security, Agriculture, Iron Ore, Steel, Bauxite, Aluminum, Water, SLOC					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT N/A	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON Director, Writing Center
a. REPORT UNCLASSIFIED	b. ABSTRACT UNCLASSIFIED	c. THIS PAGE UNCLASSIFIED			19b. TELEPHONE NUMBER (include area code) 401-841-6499

Introduction

Commodity competition has directly or indirectly been the cause of many wars throughout history. Rome's conquest of Egypt, Japan's attack on Pearl Harbor, and Iraq's Kuwait invasion are a few examples. The current global population is over seven billion and growing while food and natural resources are shrinking. China and India make up 17.9% and 17.2% of the population, respectively,¹ both with growing economies that require an immense amount of domestic and imported resources. While China is arguably a developed economy that will not have dramatic resource surges in the future. India is a developing economy that will likely mirror, to some extent, China's economic rise while simultaneously overtaking China as the most populous country by 2027.² Combined, these events will cause friction with China over global supply chains and increased commodity competition. By the very nature of their size and proximity, China and India are already rivals. Adding shrinking domestic and international resources with an inverse demand, increases pressure on this competition. A rising Indian economy will increase the likelihood of conflict with China in the Indian Ocean Region or along their shared land borders due to commodity competition and domestic resource shortages related to food security, raw industrial materials, and energy.

¹ U.S. Census Bureau, *International Data Base: World Population*, (Washington, DC: U.S. Department of Commerce, 2020), accessed 9 January 2021, https://www.census.gov/data-tools/demo/idb/#/country?YR_ANIM=2021&FIPS_SINGLE=*&dashPages=DASH.

² United Nations, Department of Economic and Social Affairs, Population Division, "World Population Prospects: The 2019 Revision," (New York, NY: UN, 2019), accessed 9 January 2021, <https://ourworldindata.org/grapher/historic-and-projected-population?tab=chart&stackMode=absolute&country=CHN-0~CHN-1~IND-0~IND-1®ion=World>.

Background

China, the second-largest economy in the world,³ has experienced an unprecedented average annual growth rate of 9.4% from 1980 to 2019.⁴ China's one-party political system and hegemonic goals require the Chinese Communist Party (CCP) to maintain this economic growth to keep their people satisfied with the status quo and remain in power. Economic prosperity has fostered a growing middle class with more disposable income and changing consumption patterns that have most notably increased pressure on their limited food supply. China is an industrial giant that consumes enormous amounts of resources and energy, requiring substantial imports due to limited domestic sources. China needs to import food, raw materials, and energy commodities to sustain its economy. The CCP will increase its focus on securing sources and trade routes to ensure their supply chains are undisturbed and avoid political crisis caused by shortages in commodities.

On the border with China, India is a rising power that can potentially threaten China economically. India is currently the fifth-largest economy⁵ and growing. India expects to exceed China's annual GDP growth in 2021 by 0.7%. More significantly, from 2022 to 2025, India is projected to increase its annual GDP growth to 7.6% versus China's declining growth of 5.7% over the same period.⁶ This sustained four year period of growth, exceeding China's, may support assertions that India will be the next China, economically, because India has topped

³ The World Bank, *Gross Domestic Product: 2019*, (Washington, DC: The World Bank, 2020), accessed 9 January 2021, <https://databank.worldbank.org/data/download/GDP.pdf>.

⁴ International Monetary Fund, *World Economic Outlook: Real GDP Growth, China, India*, (Washington, DC: IMF, October 2020), accessed 7 January 2021, https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/CHN/IND.

⁵ The World Bank, *Gross Domestic Product: 2019*, 2020.

⁶ International Monetary Fund, *World Economic Outlook: Real GDP Growth, China, India*, October 2020.

China's GDP growth only six times in the past forty-five years.⁷ With a growing economy, some experts estimate that by 2030, India's middle class will increase from 50% of the population today to 80% and account for 75% of consumer spending.⁸ India's middle class will likely mirror that of China and change its consumption habits, demanding higher quantities of commodities such as food. Additionally, a growing Indian economy will consume more energy resources and raw materials as it becomes further industrialized. Like China, India will need to increase its imports of food, energy, and raw materials to sustain its economic rise. Competition for specific commodities and an increase in the importance of regional and logistical security will add to the existing friction within Southeast Asia.

Tension between China and India is a historical fact that has culminated with armed conflict. A border dispute resulted in war in 1962 and deadly armed conflicts in 1967 and 1974.⁹ Today, India is often considered a passive actor who avoids conflict. Contrary to this, in 2020, India demonstrated a willingness to engage in deadly conflict to protect its sovereignty.¹⁰ The Galwan valley skirmish, on top of an Indian perception that China is attempting to encircle India via its Belt and Road Initiative,¹¹ has altered India's view and approach to China as definitively adversarial. India is now accelerating military modernization and security agreements to counter China more aggressively while limiting China's economic, technological, and educational

⁷ The World Bank, *GDP growth (annual %) - India, China*, (Washington, DC: The World Bank, 2020), accessed 8 January 2021, <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2019&locations=IN-CN&start=1980&view=chart>

⁸ Nikhil Prasad Ojha and Zara Ingilizian, "How India will consume in 2030: 10 megatrends," *World Economic Forum*, 7 January 2019, accessed 9 January 2021, <https://www.weforum.org/agenda/2019/01/10-mega-trends-for-india-in-2030-the-future-of-consumption-in-one-of-the-fastest-growing-consumer-markets/>.

⁹ Bill Spindle, "India-China Conflict Has a Decadeslong History," *Dow Jones Institutional News*, 17 June 2020, accessed 9 January 2021, ProQuest.

¹⁰ BBC News, "Galwan Valley: China and India clash on freezing and inhospitable battlefield," 17 June 2020, accessed 9 January 2021, <https://www.bbc.com/news/world-asia-india-53076781>.

¹¹ Dipanjan Roy Chaudhury, "China's BRI, not Delhi's Indo-Pacific vision is an encirclement strategy," *The Economic Times*, 18 June 2020, accessed 9 January 2021, ProQuest.

activities within the country.¹² India's willingness to confront a hegemonic-focused China through multiple dimensions of national power and engage in a zero-sum conflict with severely deteriorated diplomatic relationships is setting the stage for war.

Increased Food Demands

India's economic success will lead to conflict with China as both countries' food demands exceed their domestically available resources. While it's unlikely that India and China will fight over the same farms or food commodities, they will likely compete for water and agricultural trade routes. The first issue driving this potential conflict is demand. Historically, as nations become wealthier, their caloric levels and food quality increase with a more diverse, protein- and vegetable-focused diet.¹³ This shift has been realized in China and is emerging in India. Since 2000, China has experienced a consistently increasing trend in per capita consumption across all protein categories, while India, with a more vegetarian diet, has experienced an increasing trend in poultry.¹⁴ India has experienced an increase in all protein categories amongst individuals moving to higher income levels and overall increased consumption of vegetables, edible oils, and dairy products.¹⁵

This leads to the second issue concerning food security, a lack of capacity to support demand. From a per capita perspective, arable land in both India and China is limited and

¹² Tanvi Madan, "Testimony," *Hearing on U.S.-China Relations in 2020: Enduring Problems and Emerging Challenges*, U.S.-China Economic and Security Review Commission, 9 September 2020, accessed 10 January 2021, https://www.uscc.gov/sites/default/files/2020-09/Madan_Testimony.pdf.

¹³ Claudia Ringler & Mark W. Rosegrant, "Sustainable Food Security under Land, Water, and Energy Stresses," *Global Hunger Index*, October 2012, accessed 30 December 2020, <https://www.globalhungerindex.org/issues-in-focus/2012.html>.

¹⁴ Organization for Economic Co-operation and Development, *OECD-FAO Agricultural Outlook: Meat Consumption Index*, (Paris, France: OECD, 2020), accessed 9 January 2021, <https://data.oecd.org/agroutput/meat-consumption.htm#indicator-chart>.

¹⁵ Praduman Kumar, Mruthyunjaya and Madan M. Dey, "Long-Term Changes in Indian Food Basket and Nutrition," *Economic and Political Weekly* 42, No. 35 (2007): 3567-3572, accessed 30 December 2020, JSTOR.

shrinking. The UN estimates that land needed to feed one person per year is 0.55 acres per capita.¹⁶ China, in particular, is in a much more dire situation than India, with only 0.2 acres of arable land per capita, 20% of which is polluted,¹⁷ while having a diet that is increasingly protein-dominant, which requires more cropland. This combination of issues makes it impossible for China to be food self-sufficient, dropping from 94.5% self-sufficient in 2015 to an expected 91% by 2025, mainly due to soybean demand for livestock feed.¹⁸ Despite having the world's largest amount of arable land—8 million acres more than the U.S.—India has only slightly more cropland per capita than China, at 0.28 acres. Experts estimate that at current agricultural yield growth, India will only be able to provide 59% of its food needs by 2030.¹⁹ With growing economies and populations with improved diets, both China and India will need to import food.

The need to import food creates logistical security concerns and potential for conflict as India and China secure their trade routes. Due to land shortage and increasing demand, China has purchased, leased, or is negotiating for nearly nine million acres of global agricultural land since 2006, with 44% of it in Africa and Eastern South America.²⁰ Indian firms have also invested heavily in foreign agriculture, purchasing or leasing over five million acres since 2003, mostly

¹⁶ The Food and Agriculture Organization of the United Nations, *The State of The World's Land And Water Resources For Food And Agriculture*, (Rome: FAO, 2011), 24, accessed 30 December 2020, <http://www.fao.org/3/i1688e/i1688e.pdf>.

¹⁷ Shuping Niu, Emma O'Brien, Lulu Yilun Chen, Borges Nhamire, Christina Larson, "Farming the World: China's Epic Race to Avoid a Food Crisis," *Bloomberg News*, 22 May 2017, accessed 31 December 2020, <https://www.bloomberg.com/graphics/2017-feeding-china/>

¹⁸ Ji-Kun Huang, Wei Wei, Qi Cui, Wei XIE, "The prospects for China's food security and imports: Will China starve the world via imports?" *Journal of Integrative Agriculture* 16, no.12 (2017): 2933–2944, accessed 28 December 2020, ScienceDirect.

¹⁹ Global Harvest Initiative, *2014 Global Agriculture Productivity Report*, 2014, accessed 29 December 2020, https://globalagriculturalproductivity.org/wp-content/uploads/2019/01/2014_GAP_Report.pdf.

²⁰ Combined data from GRAIN, *GRAIN releases data set with over 400 global land grabs*, 23 February 2012, accessed 4 January 2021, <https://grain.org/en/article/4479-grain-releases-data-set-with-over-400-global-land-grabs>; Johns Hopkins School of Advanced International Studies, China Africa Research Initiative, *Chinese Agricultural Investments in Africa 1987-2016*, July 2018, accessed 4 January 2021, <http://www.sais-cari.org/data-chinese-agricultural-investments-in-africa>.

located in Africa.²¹ Shipping lanes for agricultural imports from these locations require passage through the Indian Ocean Region (IOR). As India and China become more reliant on food shipments through the IOR and, to some extent, the South China Sea (SCS), their naval footprints will increase in these regions to maintain security of their trade routes. An increased overlap of maritime forces in these regions will elevate tensions and the likelihood of conflict.

India and China may also engage in armed conflict along their land border over shared water sources needed for agriculture production. Globally, 70% of water consumption is dedicated to agriculture, while only 11% is for drinking water. Over the past two decades, China's water availability per capita has decreased by 23%, while drinking water demand has increased by 15% on top of having 90% of its aquifers contaminated.²² Continued dwindling of available water is forcing China to look toward Tibet for additional water supplies, many of which also supply a large amount of India's surface water. India's largest concern is the potential impact on water flow from several dam projects China is planning along the Brahmaputra River. This one river provides nearly a third of India's total river water supply,²³ 90% of it supporting agriculture.²⁴ China claims all water rights to Tibetan rivers and has used its upstream control over water to punish India following border disputes in 2017 and 2020.²⁵ With a critical need for water to support food production and increased friction between both countries, any impact to their shared water sources could initiate armed conflict.

²¹ GRAIN, *GRAIN releases data set with over 400 global land grabs*, 23 February 2012.

²² Jin H. Pak, "China, India, and War over Water," *Parameters* 46, Issue 2 (2016): 54, 57-58, accessed 5 January 2021, ProQuest.

²³ Jin H. Pak, "China, India, and War over Water," 59.

²⁴ Food and Agriculture Organization of the United Nations, "Transboundary River Basin Overview – Ganges-Brahmaputra-Meghna," *FAO AQUASTAT Report*, (Rome, Italy: FAO, 2011): 10, accessed 5 January 2021, <http://www.fao.org/documents/card/en/c/CA2138EN/>.

²⁵ Ameya Pratap Singh and Urvi Tembey, "India-China relations and the geopolitics of water," *Lowy Institute*, 23 July 2020, accessed 5 January 2021, <https://www.lowyinstitute.org/the-interpreter/india-china-relations-and-geopolitics-water>.

Some may argue that India has not maximized their agricultural yield potential; therefore, increased food demand will be absorbed through improved farming techniques, negating the potential for armed conflict with China over food commodities. Michael Finnin of the Defense Analysis Institute states that “India has adequate room for increased production this century through double-cropping and increasing the crop density.”²⁶ While there is room for improving yields in India, this does not mitigate the fact that China has maximized its farming yields and must import food. Mr. Finnin goes on to say that “China has already increased yields and cropping intensities to what is considered [its] technological and resource limits.”²⁷ Despite India’s potential to offset some of its food imports from improved farming, China will still have to import agricultural products through the IOR, which will cause friction and potential naval conflict with India as China secures these sea lanes.

Increased Demand for Minerals

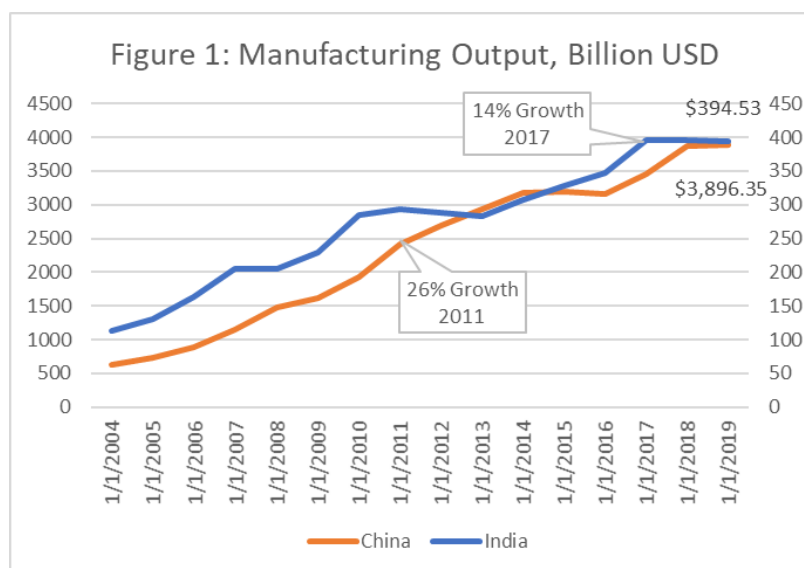
India’s growing industrialization will increase competition with China over limited domestic and global mineral commodity sources, leading to conflict over trade route security. India’s manufacturing sector is growing faster than that of China. India’s annual manufacturing output growth has outpaced China over the past six years at 6% compared to China's 5%. India's recent year-over-year growth spike of 14% in 2017 has exceeded China's single-year growth since 2011, see Figure 1.²⁸ These indicators, along with GDP and energy consumption,

²⁶ Michael S. Finnin, “Food Security in India, China, and the World, Institute for Defense Analysis,” *Institute for Defense Analyses*, June 2016, 4-6, accessed 30 December 2020, ProQuest.

²⁷ Michael S. Finnin, “Food Security in India, China, and the World, Institute for Defense Analysis,” 2-10.

²⁸ Figure 1, created by the author, The World Bank, *Manufacturing, Value Added (current US\$) - India, China*, (Washington, DC: The World Bank, 2020), accessed 6 January 2021, <https://data.worldbank.org/indicator/NV.IND.MANF.CD?end=2019&locations=CN-IN&start=2004>.

demonstrate that India is a rising industrial power, which some experts argue could become the next China in terms of economic growth.²⁹



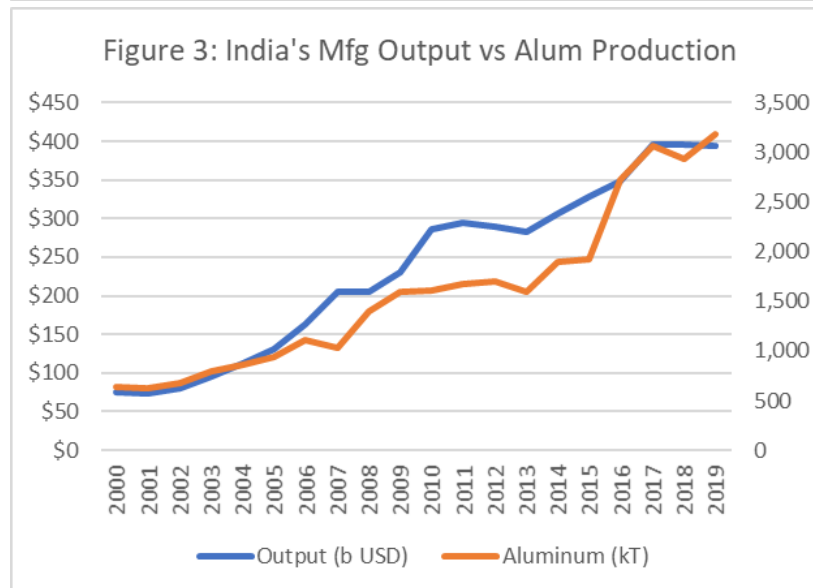
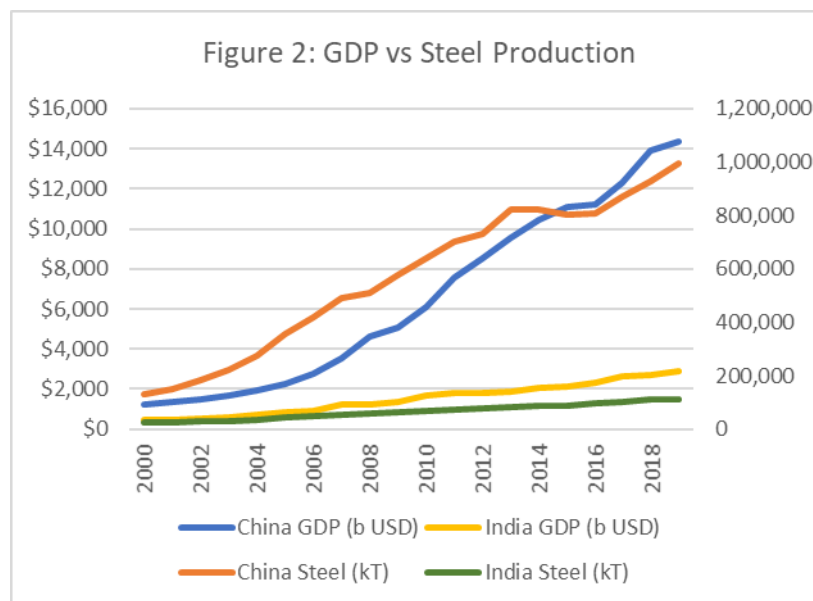
Iron and Bauxite ore are critical, high consumption commodities for industrialized economies with consumption rates correlated to manufacturing output and GDP. Studies have found a direct correlation between increased manufacturing output and aluminum demand,³⁰ while other studies have found that steel production has a consistently high correlation with GDP.³¹ China's growing GDP trends with its steel production, while India has also demonstrated a correlation between increased steel production and GDP growth, see Figure 2.³² Increases in India's aluminum production have trailed manufacturing output growth for much of the last two decades, likely related to its stage of industrialization, which would explain increases since 2016,

²⁹ Geoffrey Garrett, "3 Reasons India Isn't the 'Next China'," *Wharton Magazine*, 3 December 2015, accessed 30 December 2020, <https://magazine.wharton.upenn.edu/digital/3-reasons-india-isnt-the-next-china/>.

³⁰ Martin Stuermer, "Industrialization and the Demand for Mineral Commodities," *Journal of International Money and Finance* 76 (2017): 16-27, 30 December 2020, ProQuest.

³¹ Chung Cheol-Ho, "The Decoupling of GDP and Steel Demand: Cyclical or Structural?," *Asian Steel Watch* 5, Seoul, Korea: Posco Research Institute, (June 2018): 72, accessed 10 January 2021, https://www.posri.re.kr/files/file_pdf/59/342/6932/59_342_6932_file_pdf_1531111599.pdf

³² Figure 2, created by the author, The World Bank, *GDP (current US\$) - India, China*, (Washington, DC: The World Bank, 2020), accessed 8 January 2021, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=CN-IN>; World Steel Association, *Total Production of Crude Steel, India, China*, (Brussels: World Steel Association AISBL, 2021), accessed 8 January 2021, https://www.worldsteel.org/steel-by-topic/statistics/steel-data-viewer/P1_crude_steel_total/IND/CHN.



see Figure 3.³³ Some experts have found that aluminum demand increases over the duration of industrialization as manufacturing shifts toward high-tech products.³⁴ With these facts in mind, the IMF expects China's GDP to maintain an average annual growth rate of 6.2% through 2025,

³³ Figure 3, created by the author, The World Bank, *Manufacturing, Value Added (current US\$) - India, China*, (Washington, DC: The World Bank, 2020), accessed 6 January 2021, <https://data.worldbank.org/indicator/NV.IND.MANF.CD?end=2019&locations=CN-IN&start=2004>; Madhumitha Jaganmohan, "Production volume of refined aluminum across India from 2010 to 2019," *Statista*, 16 November 2020, accessed 6 January 2021, <https://www.statista.com/statistics/859307/india-production-volume-of-aluminum/>.

³⁴ Martin Stuermer, "Industrialization and the Demand for Mineral Commodities," *Journal of International Money and Finance* 76 (2017):16-27, accessed 30 December 2020, ProQuest.

while expecting India's GDP to grow by an average of 7.8% annually over the same period³⁵ translating to rising consumption of ore in both countries.

China has a limited amount of domestic iron and bauxite ore, which requires it to import large amounts of both commodities to sustain its massive production demand of steel and aluminum. At current estimated consumption rates, without imports, China would deplete its entire bauxite reserves by 2028 and iron ore by 2035, see Table 1.³⁶ India, on the other hand, is

	Estimated Consumption	Domestic Production	Domestic Reserves	Years Remaining
Iron				
China	1,494	350	20,000	57
India	165	210	5,700	27
Bauxite				
China	140	76	1,000	13
India	14.8	26	660	25

Table 1: 2019 Country Ore Data (Million Tonnes)

currently a net exporter of both commodities. However, their anticipated industrialization will likely flip this trend within the decade. As India's economy grows, more ore will be needed domestically, expecting iron ore consumption to rise to 250 million tonnes by 2030.³⁷ As India

³⁵ International Monetary Fund, *World Economic Outlook: Real GDP Growth, China, India*, October 2020.

³⁶ Table 1 created by the author, U.S. Geological Survey, *Mineral Commodity Summaries 2020*, (Washington DC: Department of the Interior, 2020), accessed 26 January 2021, <https://pubs.usgs.gov/periodicals/mcs2020/mcs2020.pdf>; World Steel Association, "Steel Statistical Workbook 2020," (Brussels: World Steel Association AISBL, November 2020), accessed 26 January 2021 https://www.worldsteel.org/steel-by-topic/statistics/steel-data-viewer/P1_crude_steel_total/IND/CHN; Statista.com, *India Aluminum Production 2010-2019*, accessed 26 January 2021, <https://www.statista.com/statistics/859307/india-production-volume-of-aluminum/>; International Aluminum Institute, *China Aluminum Production 1979-2020*, (London, U.K.: IAI, 2020), accessed 26 January 2021, <https://www.world-aluminium.org/statistics/#data>. Table Note: Calculation of years of production remaining are based on reserves divided by 2019 domestic production, Calculations of Bauxite consumption are based on USGS ratio guidance of 1:4 for aluminum/bauxite and 1:1.5 for steel/iron ore.

³⁷ Carrie Bone, "SSS 2020: India steel growth rate to continue rise but 2030 output forecast unlikely - Tata Steel," *Metal Bulletin*, 28 October 2020, accessed 30 December 2020, <https://www.metalbulletin.com/Article/3958075/SSS-2020-India-steel-growth-rate-to-continue-rise-but-2030-output-forecast-unlikely-Tata-Steel.html>.

expands economically on top of current Chinese imports, it will increasingly rely on imports to meet demand, further elevating competition and crowding trade routes for this commodity.

The largest proven deposits of iron and bauxite ore are in Guinea and Australia, see Table

2. Australia has the highest quality of iron ore globally, and China is their largest export market.

Country	Reserves	2019 Production
Guinea	7,400	82
Australia	6,000	100
Vietnam	3,700	4.5
Brazil	2,600	29
<i>China</i>	1,000	75
<i>India</i>	660	26

Table 2: Largest Bauxite Reserves (million tonnes)

China is over-reliant on Australia and is concerned about rising costs. Guinea has an enormous untapped deposit; however, it is in an undeveloped and challenging location, estimated to take \$16B in infrastructure investment to begin mining.³⁸ China has secured the rights to mine it but is hesitant to invest further because of the risk to prices as more supply enters the market.

Regardless, with a more hostile relationship with Australia and a sense of over-reliance, China is poised to pivot its iron ore supply toward Africa, further elevating the importance of secure sea lanes.

While India and China will likely never engage over specific mines or ore supplying ports, competing or overlapping trade routes will create an environment for conflict. India's national defense strategy identifies control over the IOR as a key strategic objective, recognizing the risk China poses to India's national security.³⁹ Due to limited domestic ore commodities and an over-reliance on Australia, China will in the next decade shift their primary sourcing of these

³⁸ "Guinea approves infrastructure plan for Simandou iron mine," *Reuters*, 12 November 2020, accessed 31 December 2020, <https://www.reuters.com/article/ozabs-uk-guinea-simandou-idAFKBN27S1RM-OZABS?edition-redirect=uk>.

³⁹ David Brewster, "India's Defense Strategy and the India-ASEAN Relationship," *India Review* 12, no. 3, (2013): 151-164, accessed 30 January 2021, Taylor & Francis Online.

resources toward Africa and Brazil, making the IOR an even more significant strategic domain for them while India competes for access to similar markets. China will increase its naval presence in the IOR, threatening India's security and trade routes, which has a high potential of culminating in armed conflict.

Some may argue that because China is building a port and logistics network through Pakistan, conflict with India may be avoided. Experts at the U.S. Naval War College have stated that the Gwadar port and the land route to Western China offers “an alternative, protected channel for flows of vital resources and trade.”⁴⁰ This trade route will allow China to avoid the vulnerable sea-lanes around the Indian subcontinent and through the Strait of Malacca, thus reducing the necessary naval presence across the IOR.

However, the Gwadar Port's throughput and ability to support China's import requirements are unlikely. Gwadar may provide an alternate route for oil via a pipeline, but its total planned capacity would not support a significant amount of raw materials like iron or bauxite ore. The port's current annual capacity is 1.6 million tonnes of bulk cargo, with a future expansion plan adding an ore handling facility that will process 20 million tonnes per year.⁴¹ China has imported over one billion tonnes of iron ore each year since 2016,⁴² Gwadar would absorb less than 2% of total ore imports. At best, Gwadar will be a temporary trade route for

⁴⁰ Isaac Kardon, Conor M. Kennedy, and Peter Dutton, “Gwadar: China's Potential Strategic Strongpoint in Pakistan” (China Maritime Report No. 7, U.S. Naval War College, China Maritime Studies Institute, Newport, RI, 1 August 2020): 7, accessed 15 January 2021, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1006&context=cmsi-maritime-reports>.

⁴¹ UN Economic and Social Commission for Asia and the Pacific, *Gwadar Port Profile*, (Bangkok, Thailand: UNESCAP), accessed 26 January 2021, https://www.unescap.org/sites/default/files/1.12_Country%20presentation_Pakistan_Naseer%20Khan%20Kashani.pdf

⁴² Min Zhang, Tom Daly, “China's 2019 iron ore imports rise to second-highest ever,” *Reuters*, 13 January 2020, accessed 26 January 2021, <https://www.reuters.com/article/us-china-economy-trade-ironore/chinas-2019-iron-ore-imports-rise-to-second-highest-ever-idUSKBN1ZD09H>.

crises in the IOR and potentially a limited regular trade route for Western China. China will continue to rely on the IOR sea-lanes for trade and increase its naval presence to protect them.

Increased Energy Consumption

India's growing economy will further increase competition with China over shrinking domestic energy commodities, heightening the likelihood of conflict as they compete over limited global supply chains. While achieving the title of the world's manufacturing superpower, China has simultaneously exceeded its domestic energy production capacity. Professor Arthur Dong of Georgetown University states that "China's energy needs far exceed their own ability to produce their own energy."⁴³ While India is a rising industrial economy that already has to import large amounts of energy commodities, which will continue to grow over the coming decades. Crude oil is currently the largest commodity import for China and India, with China being the biggest global importer at 22.4% of total oil imports, whereas India is third at 9.6%.⁴⁴ Some experts predict that between 2010-30, demand for oil in China will increase by 73% and in India by 108%.⁴⁵

Competition between China and India over petroleum will be intense because it is the most limited domestic energy commodity in both countries. Whereas India and China have decades of coal and gas reserves, oil is a bit more problematic. Global oil consumption versus proven reserves gives the world roughly 50 more years of production.⁴⁶ This fact adds intense

⁴³ Evie Fordham, "What are China's major imports and exports?" *Fox Business*, 17 February 2020, accessed 30 December 2020, <https://www.foxbusiness.com/money/china-trade-exports-to-us-imports>

⁴⁴ International Trade Centre, *Petroleum oils and oils obtained from bituminous minerals, crude*, (Geneva, Switzerland: ITC, 2019), accessed 26 January 2021, <https://www.trademap.org/>.

⁴⁵ Subir Gokarn, Anuradha Sajjanhar, Rohan Sandhu, Siddhartha Dubey, "Energy 2030," (Report presented at The Brookings Institute India, Petrotech 2014's CEO Conclave, 17 December 2013), accessed 21 January 2021, <https://www.brookings.edu/wp-content/uploads/2014/05/Energy-2030-Brookings-India-Backgrounder.pdf>.

⁴⁶ British Petroleum, *Statistical Review of World Energy*, (London, UK: BP PLC, 2020), accessed 25 January 2021, <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>.

	Consumption/ Year	Production/ Year	Domestic Reserves	Years Remaining
China	5.1	1.4	26	18
India	1.9	0.3	4.7	15

Table 3: 2019 Country Petroleum Data (billion barrels)

pressure to countries like China and India with growing demand and few domestic reserves, see Table 3.⁴⁷ Without imports China would have just over five years of domestic production, whereas India would have 2.5 years. If China successfully transitions to a consumption-focused economy, its oil needs will increase due to additional transportation activity, further reducing its remaining years of domestic production. India will have similar increases as its infrastructure improves with more vehicle transportation demand.

Because China and India both need to import oil and both have similar termination points of their domestic reserves, exploring new sources and retaining strategic trade routes will cause friction. The majority of oil, nearly 80%, is held by only eight countries, most of which are in the middle east. In 2019, India and China had overlapping sources that accounted for around a quarter of their total imports. More important is the overlap of trade routes; over 80% of China's oil imports passed through the IOR while only 11% of India's passed through the SCS.⁴⁸ Because of the risks of over-reliance on middle-east sources, India and China are focused on finding new wells through exploration, specifically in the SCS, which creates another friction point. According to the U.S. Energy Information Agency there are 11 billion barrels of proven or probable oil and another 12 billion barrels of undiscovered oil in the SCS.⁴⁹

⁴⁷ Table 3 created by the author, BP, *Statistical Review of World Energy*, 2020.

⁴⁸ Note: Percentages are based on geographic location of China and India's petroleum import sources in 2019, BP, *Statistical Review of World Energy*, 2020.

⁴⁹ Center for Strategic and International Studies, *South China Sea Energy Exploration and Development*, (Washington, DC: CSIS, 2020), accessed 30 December 2020, <https://amti.csis.org/south-china-sea-energy-exploration-and-development/>.

India and China will have to import energy commodities to meet demand. As described for food and minerals, this focus on imports will increase the strategic importance of trade routes for China and India, elevating the likelihood of conflict. China and India both see the IOR as a strategic domain. India has identified its importance in their defense strategy, while China is signaling their long-term intent of control in the IOR with increasing naval deployments and basing agreements.⁵⁰ China has already exhibited naval harassment that could lead to conflict with India. In the South China Sea, Indian oil companies have been operating in partnership with Vietnam for over 17 years, conducting surveys and exploring oil reserves in Vietnam's Economic Exclusion Zone (EEZ). China has more recently contested this activity as illegal as part of their SCS claims and has intimidated Indian ships operating in Vietnam's EEZ.⁵¹ Competition over energy commodities, especially petroleum, will likely lead to conflict as India's economy grows and demand from both countries increase.

Some experts argue that oil consumption will drop considerably because renewables will expand significantly in the coming decade, reducing the likelihood of conflict over this commodity. Industry consensus amongst major oil companies is that "wider adoption of electric vehicles or stricter regulation on emissions could see [oil] demand peak between 2030 and 2035."⁵² However, there are significant barriers to mass adoption of renewables in the near term for China and India. In general, renewables have not seen widespread adoption yet due to economic-related barriers of "high initial capital, lack of financial institutes, lack of investors,

⁵⁰ "Could the India–China Border Conflict Lead to a Naval War?" *The Maritime Executive*, 29 June 2020, accessed 30 December 2020, <https://www.maritime-executive.com/editorials/could-the-india-china-border-conflict-lead-to-a-naval-war>

⁵¹ SD Pradhan, "Expanding Chinese aggressive activities from South China Sea to Indian Ocean: containment a necessity," *The Times of India*, 18 December 2019, accessed 31 December 2020, <https://timesofindia.indiatimes.com/blogs/ChanakyaCode/expanding-chinese-aggressive-activities-from-south-china-sea-to-indian-ocean-containment-a-necessity/>.

⁵² David Sheppard, "Pandemic crisis offers glimpse into oil industry's future," *Financial Times*, 3 May 2020, accessed 27 January 2021, <https://www.ft.com/content/99fc40be-83aa-11ea-b872-8db45d5f6714>.

competition from fossil fuels, and fewer subsidies compared to traditional fuel.”⁵³ India's current average gross national income per capita is \$2,100, China is \$10,410, while the U.S. is \$65,850.⁵⁴ With a substantially higher average income in the U.S., electric car sales still only made up around 2% of U.S. sales in 2019.⁵⁵ Widespread adoption in lower-income countries is less likely by 2030 without a dramatic decrease in unit price or government offsets.

Assuming this projected drop in oil consumption materializes, a growing demand for petroleum in plastics manufacturing will offset this reduction. The International Energy Association estimates that the global share of oil consumption due to plastics manufacturing was 12% in 2015 but expects it to account for a third of oil demand growth by 2030.⁵⁶ Much of this growth will happen in the developing world, particularly the growing consumers in India and China, further impacting oil demand in these countries. Friction over shared sources and sea routes will intensify as oil reserves diminish, adding to tensions between India and China in the IOR and SCS.

Conclusion

The possibility of a resource war within the next decade is high. Causes of such a conflict between India and China would not just be hegemonic or economic, but also the survival of their people. China will feel the results of a stronger Indian economy by having to compete over agricultural, mineral, and energy commodities that will be in higher demand. Dwindling

⁵³ Krishna Seetharamana, Nitin Moorthy, Saravanand Patwac, Gupta Yash, “Breaking barriers in deployment of renewable energy,” *Heliyon* 5 (1), January 2019, accessed 27 January 2021, <https://www.sciencedirect.com/science/article/pii/S2405844018354240>.

⁵⁴ The World Bank, *Gross National Income: China, India*, (Washington, DC: The World Bank, 2020), accessed 23 January 2021, <https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?locations=CN-IN-US>.

⁵⁵ Russ Mitchell, “Car buyers shun electric vehicles not named Tesla. Are carmakers driving off a cliff?” *LA Times*, 17 January 2020, accessed 23 January 2021, <https://www.latimes.com/business/story/2020-01-17/ev-sales-fizzle>.

⁵⁶ International Energy Agency, *Report: The Future of Petrochemicals*, (Paris, France: IEA, October 2018), accessed 25 January 2021, <https://www.iea.org/reports/the-future-of-petrochemicals>.

domestic arable land and natural resources in both countries will add pressure on their governments to secure limited global sources via increasingly crowded trade routes, elevating the risk of conflict. To mitigate this risk, India, with the U.S.'s support, must take action to ensure its access to vital resources.

India must use a whole of government approach to tackle this challenge. It must invest in domestic agriculture by modernizing farming techniques to increase yields that will improve food security. They must secure a water-sharing treaty with China to ensure uninterrupted water supplies from Tibet. India must secure access to mineral and petroleum sources through foreign direct investment, government-backed contracts, and trade agreements. To maintain security and dominance in the IOR, India must increase their naval budget and modernization efforts, while working with the U.S. and other major regional powers to strengthen the QUAD or create another alliance or mutual defense treaty to prevent China's encroachment into the IOR.

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