

The Weight of China's Nuclear Projects May Lead to Global Spondylosis

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Introduction

China launched its most ambitious plan in 2013 in form of the Belt and Road Initiative. In the coming decade China is planning to establish and finance thirty nuclear reactor projects in BRI countries, which will have regional as well as global political implications. Since China is investing in nuclear projects it will have more dominance and interference in the global nuclear market, and in international nuclear governance. Eventually this will lead to the dependence of the BRI host countries on China.

Since these host countries often don't have rigorous regulations and necessary institutions to follow the rule of law and adhere to international standards, the technology, infrastructure and know-how to deal with radioactive material, they will have to depend largely on China, and that might lead to compromised negotiations on the part of local stakeholder's interests. In this situation the application of laissez-faire method by Beijing for the developmental support will easily procure for China the project deals while completely exempting them from the environmental, social and legal consequences. It may also allow them to make profits by cutting corners.

This paper will explain the socio-political impact assessment, along with technological and legal bottlenecks on the part of BRI host countries for these nuclear projects and weigh the potential benefits for China in comparison to those countries hosting the nuclear projects. The second part will deal with the potential global threat posed by the Chinese strategy of bringing the nuclear trade down to a level of open retail commerce. While China's know-how and technology enable and ensure national nuclear development, grave ramifications loom large globally for its misuse or abuse.

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By March 2022, at least 139 countries had signed a Memorandum of Understanding (MoU) with China to join the Belt and Road Initiative. This included 43 Sub-Saharan African states, 34 states in Europe and Central Asia, 25 in

East Asia and the Pacific 6 in South Asia, 20 in Latin America and the Caribbean, and 18 in the Middle East and North America.

BRI Countries and China's Nuclear Energy Project:

S.no	BRI Countries	Plant/Projects	Project Details	Protection of the Facilities based on NTI Report Since 2018
1.	Pakistan	Chashma	\$2.37 billion	
2.	Argentina	Unit IV -Atucha Candu 6 Unit V- Hualong One	\$ 15 billion-85% Chinese investment	Drop by (-3) since 2018 in Risk Environment and (-4) in Global norms NTI
3.	Iran	Makran Coast	2x100 MWe(agreement July 2015)	Drop by -5 points in political stability Environmental risk drop by -1
4.	Turkey	Igneada	AP1000 And- CAP1400- Exclusive negotiations involving Westinghouse, 2014 agreement	Drop since 2018 in illicit activities by non-state actors(-25) points
5.	South Africa	Thyspunt CAP1400	Prepare for submitting bid	International Assurances (-12)
6.	Kenya	Hualong 1 CGN	MoU July 2015	Low Ranking in: Effective Governance Pervasiveness of Corruption Illicit Activities by Non-State Actors
7.	Egypt	Hualong 1	CNNC MOU May 2015	Global norms (-3) Political Stability (-10) Effective Governance (-13)

8.	Sudan	ACP600?	Framework agreement May 2015	Political Stability (-15) Risk of Environment-1
9.	Armenia	Metsamor 1 reactor	CNNC-Discussion underway	Global Norms (-3) International Assurance (-12)
10.	Kazakhstan	Fuel plant JV	CGN-December 2015	Low Ranking in: Effective Governance, Political Instability, Corruption

Source: NTI and DIIS report 2016

China came out with its national strategy of expanding its nuclear energy goals in 2013. Since then Beijing has been preparing for a 'Go Out' strategy for nuclear industry expansion through its Belt and Road Initiative. With this initiative China actively wants to define its nuclear role under a narrative of 'Decarbonisation Push'. China's nuclear program fosters infrastructure establishment deals with the host countries. This strategy also prioritizes China's goal of strengthening its high-tech industries through the Made in China 2025 initiative.

The principal goal set up by the Chinese nuclear power giants is to participate in overseas markets. Presently twenty eight countries along the Belt and Road route are hosting Chinese companies for nuclear power deals. China's National Nuclear Corporation is the protagonist in almost twenty countries. Currently China is planning thirty nuclear reactors to be built in the upcoming decade. China seeks two major political advantages from these ventures: Firstly, its nuclear industry has the potential to shape global geopolitics and define the competencies of international relations. Secondly, nuclear power projects are long term engagements giving China an opportunity and space to build long term relationship with these countries. Since energy security plays a crucial role in developing a country's policy-making capacity, Beijing may have a key role in almost all layers of nuclear policy-making. This dominant role of China in the host country will have positive implications for its own civil and military sectors. China's vigorous entry into these nuclear ventures across Asia, Africa, South America, Middle East and Europe determines Beijing's unfolding strategic posture in the nuclear energy sector.

China's overseas investments expansion also leads to their critical involvement in the business and political machinery of host countries. This involvement could further escalate into tempering of the established or perhaps not so established settlements of the host countries. The irregular settlements, policy gaps in the government machinery and un-structured regulation in the nuclear energy industry of the host countries would attract China's

strategic moderations in the host country for its own favour. All these possibilities manifest even faster when a host country has an unstable government, intermittently occurring civil wars and an environment of defiance of law and order.

This becomes extremely sensitive when the investment projects are in nuclear energy. The host countries view it as an opportunity for the development of their energy sector but also at the same time it raises alarms as these Chinese nuclear engagements entail challenging consequences for the host countries. China's exponential growth and experience in their homegrown nuclear programs (with lower cost investments in labour and machinery) make it more enticing for international customers to accept the deals. Once the deals are finalized the Chinese intrusion begins for deeper penetration and profit seeking ventures marginalising the native interests.

Belt & Road Initiative Countries	China's Projects	Threat Indicators International & Domestic Compliances	Threat Indicators Political Stability And Corruption	Threat Indicators Illicit Activities Civil unrest
Iran	Makran Coast	Low	(-5)	Low
Sudan	ACP600	Low	(-15)	(-1)
Turkey	Igneada	(-6)	(-6)	(-25)
Egypt	Hualong-1	(-5) & (-10)	(-13)	Low
Kenya	Hualong-1	Low	Low	Low
Argentina	Atucha-3	(-6) & (-4)	(-5)	(-5)
Kazakhstan	Fuel plant JV	Moderate	Low	Low
Armenia	Metsamor	(-3) & Low	Low	Low
Pakistan	Chasma 3&4	(-5)	Low	Low

Source: NTI index 2020

The Chinese nuclear energy matrix in BRI countries over the next decade might be an alternative to the concerns of climate change but this has significant implications for global politics and for the security environment of the BRI states participating in this. The socio-political ecosystem, legal and technological bottlenecks of the host countries and their synchronization with Beijing's administrative control will have a deeper impact. According to the assessments made by NTI (Nuclear Threat Index 2020), there is reason for concern regarding some BRI

countries.¹ Argentina's report on its current nuclear establishments indicates that there has been a 6 point decline in cooperation with global norms since 2018. There has also been a decline in two other categories: risk environment and political stability. In context to the country's efforts to safeguard from insider threats, the score remains consistently in the low category (18/100) since 2018. Nuclear Threat Index (NTI) data for Argentina suggests that there is little to no data availability with regard to the registry of radioactive sources. With regard to the political stability of Argentina the risk of violent social unrest and labour unrest is highly possible in the upcoming two years. There also exists a moderate level risk from organized crime against the government and the business houses. The country's profile for illicit activity by non-state actors shows very high tendency, as a large number of firearms were seized during the restricting the weapons trafficking. The overall report of Argentina is relatively lower than the 2018 report. Without proper domestic regularisation or regular political establishment, and given the lack of cooperation with global norms, the security of Argentina's nuclear cooperation with China remains questionable.

Another case is Armenia, where there has been a significant drop of 3 points in the score with respect to abidance by global norms since 2018. The country's profile also shows low scores in effective governance and pervasiveness of corruption. Moreover, there has been a significant rise of 5 points since 2018 in illicit activities by non-state actors. There are also probable chances of armed and sporadic conflicts in Armenia. The socio political impact assessment of this state reveals the inefficacy of its bureaucratic machinery and its inability to carry out government policy, and the bureaucracy is replete with corruption. An OECD report says that a crucial challenge before Armenia is that political statements and domestic laws are not properly executed. Attempts to investigate and prosecute crimes of corruption are also limited (OECD. IAP Report).² The report recommends the involvement of civil society in anti-corruption policies and actions, stable political leadership and ensuring a transparent and impactful public procurement policy, all of which are currently lacking.

Egypt's Nuclear Power Plant Authority (NPPA) and the China National Nuclear Company (CNNC) signed an agreement in 2015 to launch their nuclear energy cooperation wherein China will become an official partner in Egypt's nuclear project. Bilateral trade relations between China and Egypt have grown over the years. China and Egypt have a double tax agreement, China will be able to use Egypt to access European Union and Egypt has a free trade agreement with EU, hence China's presence in Egypt will give it the benefit from free trade agreements that Egypt has with EU. However the status of domestic nuclear security legislations is weak and even the status

¹ Nuclear Threat Index Report.2020 <https://www.ntiindex.org/country/india/>

² Organization for Economic Cooperation and Development, <https://www.oecd.org/about/members-and-partners/>

of effective governance and political stability has dropped 6 points in NTI reports since 2018. Egypt's adherence to Global norms and commitment to International assurances is not promising. In the presence of the given situation where the internal political instability, corruption, non-commitment to global norms, illicit and presence of organised crimes raises lot of apprehensions regarding nuclear establishments in Egypt backed by China.

Recently, China has been seen actively working towards a Sino-Iranian nuclear deal by restoring the Joint Comprehensive Plan of Action (JCPOA) in Vienna. However, China sees Iran as just one part of a bigger strategy of economic engagement. The socio-political and security concerns vis-a-vis Chinese nuclear establishment in the context of Iran is complex. For instance Iran did not make a political commitment and did not inform the IAEA of its intent to abide by the Code of Conduct on the safety and security of radioactive sources (NTI Nuclear Security Index Report 2020). Nor did they notify IAEA of any intention to abide by regulations governing the import and export of radioactive sources (NTI Report 2020). According to the same NTI report Iran has not even nominated any point of contact to facilitate the import and export of radioactive materials, neither did they make any commitment to the IAEA regarding implementation of the guidelines on the management of the disused radioactive sources.

There is a global need to go to net zero on carbon emissions. But the maintenance and management of nuclear waste over the life cycle of the radioactive materials should also be an important concern. Beijing may be desperate to promise the long term geo-political relations focused on nuclear energy, but the commitment to global norms, abidance to the international law and order, and security and control measures of the host states are the major concerns that at any cost cannot be ignored or moderated. Domestic commitments and capacity and risk management are some of the significant concerns that require people's participation and political will. The probability of civil unrest is high making it completely vulnerable to any nuclear deals, since a small spark of dissent could lead to civil clashes possibly including the nuclear deals. The NTI report also reveals the rampant spread corruption among public officials. A country's political system, its policy making, execution, bureaucratic system its capacity and efficiency plays key role in proper functioning of the nuclear establishments.

Problematic socio-political situations are prevalent in Kazakhstan which has signed a nuclear deal with China General Nuclear Power Corporation (CGNPC) and has various nuclear engagements. There is pervasive corruption in Kazakh society, numerous scandals involving government officials and limited systemic cleansing of corruption. Moreover the national companies are opaque in functioning and hence remain unaccountable.³ These

³ Economic Times. <https://economictimes.indiatimes.com/industry/energy/oil-gas/on-energy-prowl-india-to-dig-into-kazakh-oil->

situations will perhaps throw challenges before the state for proper, accountable and efficient working of the nuclear establishments in collaboration with China. The NTI report reveals that illicit activities by non-state actors have grown since 2018, and lack of effective governance and pervasive corruption have been increasing continuously. The report further reveals non-commitment to the international regulatory bodies regarding adherence to global norms, like conduct of the state on safety and protection of the radioactive material. Another case is Kenya, which has not even notified the IAEA of its intent to abide by the IAEA guidance on import and export of radioactive sources.

All these issues are serious when a state has to deal with nuclear establishments, not only from the security point of view of the state itself but also in terms of global security and environmental concerns. In the case of South Africa a major concern is the lack of domestic nuclear security legislations which certainly forms one of the major shortfalls. Absence of clear regulatory and financial facilities with lack of sufficient risk coverage in case of long construction period and unpredictable demand of energy are the compromising points when it comes to making nuclear deals with China.⁴ Moreover, this makes the project life-cycle ambiguous and delays the schedule of the project development. Sudan and China signed a deal on May 2016 for one or two 600 MWe nuclear power reactors and also formulated a roadmap for another ten years (WNN. 2019)⁵. However looking into extreme political instability, corruption in the society, lack of technical advancement, the recent visit of Integrated Nuclear Infrastructure Review Committee (INIR) suggested finalising a national policies to support the nuclear power program in first place, strengthening future plans to abide and join the international legal instruments. In order to do so Sudan will firstly need to develop its own domestic legal and regulatory framework.⁶ The concern arises here when a state is weak in terms of political and regulatory capacity, but still engaging in nuclear deals with much more powerful states, it is likely that there would be tempering and moderations done by the powerful state for its own advantage, moreover the host state won't be in position to safeguard its self-interests.

The question also arises that in order to surpass the United States in nuclear cooperation China seems to be in too much hurry to negotiate with BRI country without considering the limits and constraints they have.⁷ This also

treasure/articleshow/7989244.cms?from=mdr

⁴ Can Nuclear hit its Stride in Africa. Kleinman Centre for Energy Policy.

<https://kleinmanenergy.upenn.edu/research/publications/can-nuclear-hit-its-stride-in-africa-power-to-the-people-evaluating-nuclear-as-a-bridge-to-sustainable-energy-in-africa/>

⁵ World Nuclear News <https://www.world-nuclear-news.org/Articles/IAEA-reports-on-Sudan-s-nuclear-power-infrastructure>

⁶ <https://www.world-nuclear-news.org/Articles/IAEA-reports-on-Sudan-s-nuclear-power-infrastructure>

⁷ (Ellis.2021) China and Egypt Strengthens Belt and Road Collaboration Including the Suez Canal ILZ

<https://www.silkroadbriefing.com/news/2021/07/23/china-egypt-strengthen-belt-and-road-collaborations-including-the-suez-canal-international-logistics-zone/>

indicates China's negligible concern for global security and international regulations. China and Pakistan currently enjoy an "all-weather relationship," and the nuclear cooperation between both the countries date back to 1986. In September 2021, this agreement actually expanded. China progressively added more nuclear plants, financing for nuclear research, support for facilitating nuclear fuel, waste management and application of advanced nuclear technology.⁸ Pakistan's nuclear program is a source of concern globally due to political instability and its engagements in illicit proliferations and continuous terrorist activities over the years and the political instability in Pakistan.⁹ In addition, with the Talibanization of the Afghanistan; the dynamics of nuclear cooperation between China and Pakistan becomes significantly important. The risk environment according to NTI within Pakistan in terms of security of radioactive material is quite high. Policy formulation and its execution at government level is ineffective, and the possibility of civil unrest and vulnerability to international disputes and conflicts is extremely high.¹⁰ All of these issues make clear, therefore, that Pakistan's nuclear security architecture is not conducive to the global security environment. Yet China is in hurry pushing these ventures. The recent Talibani attack on Kamra military base already raised concerns in the international community about nuclear security; however these military installations were not nuclear material bases. From the global security point of concern the increased terrorist movement in Pakistan, the political instability and with that Pakistan's growing nuclear engagements whether civil or military all these are increasing Pakistan's nuclear security challenges for itself and also for the region.¹¹

Adherence to the Global Norms

The International Atomic Energy Agency is the nuclear watchdog of the United Nations. The objective of this agency is to foster peaceful use of atomic energy for civil purposes and to ensure that nuclear energy is not used for military purposes. Its role in the international community is to monitor compliance and adherence to international norms among states, which also includes the Non-Proliferation Treaty (NPT), signed in 1968. In recent years it has been watchful of Iran, North Korea and Iraq. Today amidst the advancement in the nuclear energy field especially in the 'Decarbonisation Push', and with the commercialising of this market, there is a new array of challenges. Recently, the international community has experienced a number of nuclear non-compliance issues, although IAEA is continuously enhancing its safeguard structure. IAEA is conventionally equipped with safeguard measures like fissile material accountability, verification, containment and surveillance measures. However, IAEA works on an implicit understanding that the state has provided them with all the necessary

⁸<https://www.aninews.in/news/world/asia/china-pakistan-new-nuclear-deal-may-push-world-towards-renewed-arms-race-conflict20210918062533/>

⁹ <https://www.nti.org/analysis/articles/china-pakistan-nuclear-deal-realpolitique-fait-accomplir-1/>

¹⁰ <https://www.ntiindex.org/wp-content/uploads/2020/06/Pakistan.pdf>

¹¹ <https://www.armscontrol.org/act/2013-02/challenges-pakistan%E2%80%99s-nuclear-security>

information required to safeguard the nuclear establishments.¹² Transparency in revealing the specific locations in nuclear establishments largely depends upon states. A purposeful denial of access to a declared or suspected location along with not providing the environmental samples to the authorized IAEA agency under the safeguard agreement constitutes non-compliance to the safeguard measure of IAEA. States that are involved in clandestine affairs related to unregulated nuclear activity tend to either cover up or do not inform about their activities to the IAEA, and it becomes challenging for the agency to trace the foot print of the suspected nuclear activity.

For instance potential non-compliance has been reported on the part of Tehran since 2005,¹³ wherein Iran denied facilitating the design information which appeared to be inconsistent with the state's safeguard obligation.¹⁴ Article 39 of Iran's safeguards agreement says that mutual agreement between IAEA and Iran subsidiary arrangements could be made but not on the grounds of unilateral arrangements. The concern is that when Iran is not transparent with IAEA, it may be prudent for China to make nuclear deals with Iran. Recently Iran and China signed a \$400 billion deal wherein Iran will provide China with a steady flow of fuel for the next 25 years in return for Beijing's investments. This deal will surely impact China's presence in the Middle East which may also downsize US efforts to keep Iran isolated. Similarly China and Pakistan are engaged in at-least six civil nuclear deals, raising concerns due to the lack of transparency and lack of complete IAEA safety guidelines. China has increased its nuclear commercialisation with Pakistan while contending its transparency and compliance however which is not convincing as according to the NTI report on Pakistan.

China's nuclear belt and road initiative is a potential and broad project geographically and commercially, but adherence to the safety measures according to the IAEA guidelines and strict abidance to them will increase credibility. China's presence in the region has surely brought socio-economic opportunities for the small states of Belt and Road project. The nuclear belt and road host countries need sophisticated industrial infrastructure and rigorous domestic regulations and adherence to IAEA guidelines in order to avoid any catastrophic accidents. The role of China in sponsoring the nuclear energy projects for these nations at this large scale demands fulfilment and compliance with IAEA guidelines by these host countries and China. Beijing must enforce abidance to these

¹² <https://www.iaea.org/newscenter/statements/major-challenges-currently-facing-international-nuclear-non-proliferation-regime>

¹³ See, CRS Report 2022. In the case of Iran, the September 24, 2005, IAEA board resolution (GOV/2005/77) stated that the board found that Iran's many failures and breaches of its obligations to comply with its NPT Safeguards Agreement, as detailed in GOV/2003/75 [a November 2003 report from then Director General El Baradei], constitute non compliance in the context of Article XII.C of the Agency's Statute; According to the resolution, the board also found that the history of concealment of Iran's nuclear activities referred to in the Director General's report [GOV/2003/75], the nature of these activities, issues brought to light in the course of the Agency's verification of declarations made by Iran since September 2002 and the resulting absence of confidence that Iran's nuclear programme is exclusively for peaceful purposes have given rise to questions that are within the competence of the Security Council, as the organ bearing the main responsibility for the maintenance of international peace and security.hi

¹⁴ Congressional Research Service Report.(May 2022) <https://sgp.fas.org/crs/nuke/R40094.pdf>

measures and guidelines according to the international norms since IAEA is an authoritative promulgator of internationally agreed standards and guidelines.¹⁵ As this study reveals, there are many host countries which do not adhere to the norms and do not disclose their details regarding the nuclear projects, designs or specific locations. China should play a greater role and take on more responsibility by rising above the mere commercial aspect.¹⁶ Moreover, the role of the IAEA is extremely vigilant and strict in its observance and actions; however China can surely play an important role here in helping and guiding the small host nations for international compliance and adherence to the norms.

Conclusion

The Chinese nuclear investments and cooperation in the BRI states and its strategic expansion could potentially mutate into nuclear security threats across the globe. The viability of host countries to handle the nuclear material in the absence of proper protective systems is highly questionable with respect to theft, sabotage and unauthorized ceding of the radioactive material to the illegal recipients. Through its great power status China is pulling down the gravity of the Nuclear energy to a level of a retail market commodity, making it available to the countries that primarily require proper, stable governments, appropriate domestic regulations for nuclear deals and proper technology and infrastructures to protect the atom. Principally China as a big promoter of nuclear energy and as a responsible nation must work upon the compliance issues with host nations. As a key party working towards solutions for climate change in the region, China needs to balance business and international compliance to IAEA by the host countries as the primary requirement for eligibility. The domestic issues like political instability and corruption in host countries are also sensitive concerns, as these issues have direct impact on nuclear energy projects. These are not any highway or infrastructural projects but nuclear projects which demand political stability, transparency, and compliance to international rule of order. The principal issue here is that when the host countries with weaker and limited institutional capacity take on nuclear deals it becomes extremely important for China to provide them with all the compliances and sharing of responsibility and required guidance.

¹⁵ Hibbs, M. (2017). Why Does the IAEA do What it Does. Carnegie Endowment for International Peace. <https://carnegieendowment.org/2017/11/06/why-does-iaea-do-what-it-does-pub-74689>

¹⁶ Alterman, J.B. (2021). China Headaches for Iran Deal. Center for Strategic and International Studies. <https://www.csis.org/analysis/china-headaches-iran-deal>

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