



Introduction of Nuclear Power Plant in Bangladesh – Modern Diplomacy



Nargis Akter Dolly*

Introduction

Science diplomacy is the use of scientific collaborations among nations to address common problems and to build constructive international partnerships. Many experts and groups use a variety of definitions for science diplomacy. However, science diplomacy has become an umbrella term to describe a number of formal or informal technical, research-based, academic or engineering exchanges. (TWAS, 2015)

We know that nations and cultures have long built relationships based on science. Science can support diplomatic efforts, as when researchers provide insight to support a new treaty on protecting oceans. Diplomacy may help play the foundation for a multi-national science projects or scientific cooperation can begin with the explicit intention of improving relations. Countries, which used these innovations and adapted them to their social conditions, changed their levels from developing countries to developed ones. (AAAS, 2018). With this prelude, the paper attempts to elucidate on the case of Nuclear Power Plant in Bangladesh, as a manifestation of Science Diplomacy, emphasising on the importance of Science Diplomacy in Bangladesh.

Role of Science Diplomacy to Ensure Economic Growth in Bangladesh

Bangladesh has emphasized on ‘science diplomacy’ to ensure economic growth through innovations and knowledge sharing. In the national science and technology policy and the seventh

* Deputy Secretary, Ministry of Science & Technology, Bangladesh.

five-year plan from 2016 to 2021, focus has been on finding solutions to the emerging problems in agriculture, food, health, environment and climate change through application of science and technology. We have devised science diplomacy to ensure partnership for sustainable economic development through knowledge and learning.

The country is committed to acquiring scientific and technological capability, in order to reach socio-economic goals. Concerted efforts are being made to foster scientific and technical co-operation with developed and developing countries, for building a sound science and technology base in the country. It is asserted that common goals can be effectively addressed by pooling both material and intellectual resources particularly with countries that share common problems. International collaboration (bilateral agreements and MOUs) in science & technology can be deployed for furthering national interest as an important component of foreign policy initiatives. (MoS&T, 2018). Science Diplomacy is the way forward to realize aforementioned goals. Interestingly, the nuclear power plant in Rooppur is one such site, which can be seen as a case of science diplomacy, in practice.

Rooppur Nuclear Power Plant- Blessings of Science Diplomacy

Bangladesh is strongly involved in achieving three consecutive development milestones: (i) a middle income country by 2021 (ii) a zero poverty level nation by 2030 and (iii) to produce at least 11-12% of its electricity generation from nuclear sources by 2041. It aims to secure sufficient supply of electricity to derive the desired level of economic growth for the three targeted socioeconomic development of our nation. Over the last several years, Bangladesh has made a significant progress in the development of the power sector. Government has undertaken various projects to increase the generation of electricity to cope with the rapid increases in the demand to support the economic development. (MoPE&MR, 2016).

Presently, Bangladesh is implementing a master-plan to produce 24,000 MW, 40,000 MW and 60,000 MW in the year 2021, 2030 and 2041, respectively. The Power System Master Plan (PSMP), 2016 aims to ensure supply of electricity to all citizen and economic sectors at affordable costs at all times through a well-balanced power generation environment that maximizes the respective advantages of different types of power generation methods, including nuclear power, thermal power, hydropower generation and power imports from neighbouring countries (MoPE&MR, 2016).

Bangladesh, where only 60% of the population has access to electricity, has a science-diplomacy engagement with Russia. The Prime Minister Sheikh Hasina of Bangladesh visited Russian President Vladimir Putin in Moscow in 2013, and the two countries signed a deal providing a loan to build a nuclear plant in our country. HPM stresses Science Diplomacy for sustainable growth at Vienna conference of the International Atomic energy agency. Russia is also planning to train the Bangladeshi staff and cooperate on the use of its reactors for research. (MoS&T, 2018)

The Early Phase of National Nuclear Power Programme and Rooppur NPP Project

The NPP construction is a complex activity which requires huge preparation and years of preparatory works. It is a highly capital-intensive undertaking and financing for such a huge project is not that easy to manage. The NPP project also requires early selection of NPP technology and the vendor which is one of the big challenges for a newcomer country. The history of nuclear power in Bangladesh dates back to early 1960s. The proposal for introduction of nuclear power plant (NPP) was made in 1961. Among potential twenty sites, the Rooppur NPP site was selected based on the then international practices and the plant was approved in 1963. Rooppur NPP site is located in the People's Republic of Bangladesh, on the eastern (left) side of the river Padma (the local name for the lower reaches of the Ganges River), 160 km north-west of the capital -the city

Dhaka, 21 km north-west from the city of Pabna, at a distance of about 8 km from the center of the sub-district Ishurdi. Site territory is located between 89° 02' and 89° 03' East longitude and between 24° 03' and 24° 04' North latitude.

Before liberation war and after the independence of Bangladesh, several feasibility studies for implementation of Rooppur NPP project were conducted but none were successful. In 2007, the Bangladesh Atomic Energy Commission (BAEC) proposed two 500 MWe nuclear reactors for Rooppur by 2015. In April 2008, the government reiterated its intention to work with China in building the Rooppur plant and China offered funding for the project. The International Atomic Energy Agency (IAEA) approved a technical assistance project for the Rooppur nuclear power plant to be initiated between 2009 and 2011, it then appeared that a 1100 MWe plant was envisaged.

Russia, China and South Korea had offered financial and technical help to establish nuclear power in the country. In March 2009, Russia made a formal proposal to build a nuclear power plant. In April 2009 the government approved the Russian proposal to build a 1000 MWe AES-92 nuclear plant at Rooppur for about \$2 billion and a bilateral nuclear cooperation agreement was signed by the two countries in May 2009. In 2010 an intergovernmental agreement was signed with Russia, providing a legal basis for nuclear cooperation in areas such as siting, design, construction and operation of power and research nuclear reactors, water desalination plants, and elementary particle accelerators (IAEA, 2010). An agreement with Rosatom was signed in February 2011 for two 1000 MWe-class reactors to be built at Rooppur for the Bangladesh Atomic Energy Commission (BAEC). Rooppur is close to a HVDC link with India and on the route of a planned 600 kV HVDC link running up the western side of the country. Another intergovernmental agreement was signed in November 2011 for the project to be built by AtomStroy Export. A nuclear energy bill was introduced into parliament in May 2012, which outlined the establishment of the Bangladesh Atomic Energy Regulatory Authority.

The beginning of construction at Bangladesh's first nuclear power reactor dated on 30 November 2017, marking a significant milestone in the decade-long process to bring the benefits of nuclear energy to the world's eighth most populous country. An intergovernmental agreement for provision of a \$500 million Russian loan to finance engineering surveys on the site, project development and personnel training was signed in January 2013. The \$500 million loan will be repaid in 12 years with five years' grace period. In June and October 2013, AtomStroyExport signed contracts with BAEC to prepare documentation related to the construction and environmental impact assessment for the Rooppur plant, as well as providing for necessary engineering studies, including site preparation and detailed design documentation. AtomStroyExport said that this represented a transition to long-term cooperation. Site works started in October 2013.

The IAEA has been supporting Bangladesh on its way to becoming the third 'newcomer' country to nuclear power in 30 years, following the United Arab Emirates in 2012 and Belarus in 2013. Bangladesh government has taken a practical step for implementation of nuclear power programme from the beginning of 2009. The early activities included a detailed road map addressing all infrastructure requirements. We adopted the IAEA's Milestones approach and followed the steps required for each of the 19 infrastructure issues to build Rooppur NPP. Bangladesh established its NEPIO (Nuclear Energy Programme Implementing Organization) in 2010 based on the IAEA concept to monitor progress of nuclear power programme and Rooppur NPP project and coordinate all the required activities among the various implementing organizations/ministries involved in nuclear infrastructure development. Bangladesh started preparatory construction activities of its first NPP, the Rooppur NPP in 2013 which was completed in June 2018. It stepped into the main construction on 30th November 2017, through the First Concrete pouring Ceremony inaugurated by the Hon'ble Prime Minister Sheikh Hasina.

With the financial and technical assistance of the Russian Federation, RNNP is going to be built as safe, reliable, cost effective and environmentally friendly power plant which will play a vital role in the socio-economic development of our country. The IAEA has been supporting Bangladesh in developing its nuclear power infrastructure, including in establishing a regulatory framework and developing a radioactive waste-management system. This support has been delivered under the IAEA technical cooperation programme and is partially funded through the Peaceful Uses Initiative.

On the otherhand, an inter-governmental agreement between the Government of the Peoples Republic of Bangladesh and the Government Of the Republic of India on 'Cooperation in the Peaceful Use of Nuclear Energy' and a Inter-Agency Agreement between Global Center for Nuclear Energy partnership, Department of Atomic Energy of the Government of India And Bangladesh Atomic Energy Commission (BAEC) on 'Cooperation Regarding Nuclear power plant projects in Bangladesh was signed on April 08,2017.

Earlier in May 2015 Bangladesh sought India's help with training its nuclear staff and in April 2017 BAEC announced the appointment of India's Global Centre for Nuclear Energy Partnership (GCNEP) as the consultant for construction and operation of the Rooppur project. GCNEP is a Department of Atomic Energy R&D facility strongly supported by Russia and designed to strengthen India's collaboration internationally. In March 2017, the IAEA agreed to provide staff for the centre and use it for training professionals throughout the region (MoS&T, 2018).

Fuel cycle

All fuel for Rooppur is being provided by Rosatom, and all used fuel is to be repatriated to Russia, in line with standard Russian practice for such countries. A draft agreement on used fuel was signed in March 2017, totaling about 22.5 t/yr from each reactor (42 fuel assemblies, each with 534 kg of fuel). A further agreement

for repatriation of used fuel for reprocessing was signed in August (MoS&T, 2018).

Second nuclear power plant

In June 2014 the government and BAEC invited the Japan Atomic Energy Agency to explore the possibility of building a second 2000 MWe nuclear power plant in the south of the country. Site selection focused on several islands in the Bay of Bengal, notably Mazher Char in Barguna, Muhurir Char in Feni, Boyar Char in Noakhali and Gangamati in Patuakhali. Four other potential sites are in Khulna, close to the Sundarbans. In August 2018 it was reported that the site would be in the Rangamati district, near a new deep-water port. China's Dongfang Electric Corporation (DEC) has expressed interest in building the second nuclear power plant.(Financial Express, 2018)

Organisation and Regulation

Bangladesh's development strategy to see the country becoming a middle-income nation by 2021, in large part by emphasis on its science and technology sector to drive economic growth. The ministry of science and technology (MOST) estimated in 2014 that \$6.2 billion will be needed in the next decade to achieve the goals of Vision 2021. The Science and Technology Act 2010 is helping to boost this initiative and now allocating over \$150 million per year to nuclear technology development as gas reserves become depleted. In February 2012 the MOST signed an agreement with Russia's Rostekhnadzor related to regulation and safety and the provision of advisory support to the Bangladesh Atomic Energy Regulatory Authority (BAERA) on regulation, licensing and supervision. The staff will be trained in Russia. In April 2017 BAERA signed an agreement with India's Atomic Energy Regulation Board (AERB) on the exchange of technical information and cooperation in the regulation of nuclear safety and radiation protection. Hopefully, the two units of Rooppur NPP will go into operation by 2023 and 2024, respectively (MoS&T,2018).

Conclusion

Bangladesh is working to diversify its energy supply to enhance energy security, reduce its dependence on imports and on its limited domestic resources also. Nuclear energy these days are safe, reliable and on the content of Bangladesh capable of reducing the gap between demand & production significantly. The 3rd generation pressurized water reactors with automated and it built safely features intake nuclear energy reliable sources of massive electricity production. On basis of present scenario of Bangladesh, the Rooppur Nuclear Power Plant will provide not only a stable base load of electricity, but it will enhance our knowledge and allow us to increase our economic efficiency. The construction of Rooppur NPP is going to accelerate socio-economic development, enhance scientific and technological potential of the country and promote Bangladesh to become a member of the elite Nuclear Club of the countries, which have nuclear technologies for power generation. For long sixty years ,our cherished the dream for building its own NPP.I think it's a gift and benefits of modern science diplomacy. The scientific and technical bilateral relations with Russia and India will reap benefits in enhancing the nuclear energy landscape of Bangladesh.

References

- AAAS. 2018. 'New Frontiers in Science Diplomacy'. Retrieved on January 11, 2019 from https://www.aaas.org/sites/default/files/New_Frontiers.pdf
- Financial Express. 2018. 'Chinese company willing to build second nuke power plant in Bangladesh'. Retrieved from January 03, 2019 from <https://thefinancialexpress.com.bd/economy/chinese-company-willing-to-build-second-nuke-power-plant-in-bangladesh-1526788964>
- IAEA 2018. 'Electricity Information 2018:Overview'. Retrived on January 3, 2019 from <https://webstore.iaea.org/electricity-information-2018-overview>
- MoPE&MR.2016. 'Power System Master Plan(PSMP)2016: A Final Report'. Retrieved on January 3, 2019 from <http://www.powerdivision.gov.bd/user/brec/112/58>
- MoS&T. 2018. 'First Concrete Pouring Ceremony Rooppur Nuclear Power Plant Second Unit. Government of Bangladesh'. *Report by Ministry of Science and Technology(MoS&T) of Bangladesh.*
- TWAS. 2015. The power of science diplomacy: A view from the South. Retrieved on January 4, 2019 from https://twas.org/sites/default/files/nl26-3_2014_web.pdf