

India's Defence Exports: Unravelling the Potential of the BrahMos Missile

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Abstract

India's domestic defence industry is witnessing a significant transformation, evolving from an import-dependent structure to an indigenous and notable exporter of advanced military equipment. Central to this evolution is the BrahMos supersonic cruise missile, a product of Indo-Russian joint-venture collaboration. This article explores the export potential of the BrahMos missile system. Highlighting its technical specifications and multi-platform versatility, the article presents an analysis of BrahMos variants, emphasising the indigenous advancements that have increased its self-reliance. The export journey of BrahMos, particularly its landmark deal with the Philippines, underscores India's burgeoning role in the global arms market. Despite challenges such as geopolitical sensitivities and potential sanctions, the article argues that the BrahMos missile symbolises India's strategic prowess and its capacity to contribute significantly to global defence exports. The findings suggest that with continued innovation and strategic diplomacy, India can enhance its defence exports, bolstering both its economic growth and international strategic influence.

Introduction

Historically, India relied heavily on imports to meet its defence requirements in the post-independence era. Successive wars

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and geopolitical challenges compelled India to move towards defence modernisation via the indigenous route. In the 1980s, India launched the Indigenous Guided Missile Development Programme to acquire self-sufficiency in missile technology. A major spinoff of this programme was the decision to develop supersonic cruise missiles. Under the guidance of Dr APJ Abdul Kalam, an inter-government agreement between India and Russia was signed in Feb 1998, to that effect. The aim of the project was to design, develop, manufacture, and market the world's first supersonic cruise missile (and its associated systems). A joint venture company was, thus, setup, named BrahMos Aerospace, with India holding a share of 50.5 per cent and Russia 49.5 per cent in the company. Officially, the project work started in 1999 and the first launch of the missile was conducted in Jun 2001. The successful maiden launch and the display of the missile at an international exhibition in Moscow, in Aug 2001, brought it widespread attention. Since then, the BrahMos missile has been successfully tested multiple times and has been inducted in service by all three branches of the Indian Armed Forces.

Technical Specifications of the BrahMos Missile

Named after the Brahmaputra and Moskva rivers, the BrahMos missile is a symbol of Indo-Russian collaboration¹, combining Indian propulsion and guidance systems with Russian expertise in missile technology. What sets the BrahMos apart is its supersonic speed, precision targeting capabilities, and launch versatility across multiple platforms, including land, sea, and air. With a minimum range of 290 kms and speeds exceeding Mach 3, the BrahMos is among the fastest cruise missiles in the world², making it a formidable asset for both offensive and defensive operations. Initially, Russia supplied 65 per cent of the components, including its radar seekers and the ramjet engine. During the initial phases of the project, the missile was only 13 per cent indigenous, today it is 76 per cent.³ This was possible because of public-private partnership. More than 200 companies and Micro, Small, and Medium Enterprises today are vendors of the BrahMos Aerospace.⁴

The airframe, propulsion systems, and other important components have been indigenised – but this has increased the per unit cost of the missile. Currently, the BrahMos missile can function on the United States' (US) GPS, India's GAGAN and

Europe's GLONASS navigation systems. The missile can be launched from a ship, an aircraft, and also a surface-based launcher. On the other hand, the missile can hit any target based on land and in water. All the above variants of the missile are being upgraded for better range and accuracy, though the warhead capacity has been kept constant. Hypersonic version of the missile is under development.⁵

Despite these developments, India will not be exporting the advanced versions of the BrahMos. The variant sold to Philippines is the 290 kms variant, since India is now a member of the Missile Technology Control Regime (MTCR) whose members are not allowed to sell or share technologies which can carry a payload of 500 kg beyond the range of 300 kms, with non-members.⁶ Due to this conditionality, until India joined MTCR, it could not increase the range of the missile— since Russia is a project partner, as well as an MTCR member. The membership of this regime has now enabled India to get missile technology from other members and also upgrade the range and lethality of the missile.

The Indian military has successfully inducted, integrated and deployed multiple variants of the BrahMos missile. The following Table 1 mentions all the BrahMos variants:

Variant	Range	Speed	Warhead	Total Weight	Cost per unit (approximately USD)
BrahMos JP-10	290 kms 400 kms version developed	Mach 3	200-300 kg	3000 kg (land and ship-launched) 2650 kg (air-launched)	USD 3.2-3.5 mn (surface-launched) USD 5.5 mn (air-launched)
BrahMos-NG	290 kms	Mach 3.5	200-300 kg	1200-1500 kg 1330 kg (air-launched)	USD 2.6 mn
BrahMos-ER	800-900 kms (ship-launched)	Mach 2.8	200-300 kg	2650 kg (air-launched)	USD 4.85 mn (surface-launched) USD 11 mn (ship-launched)
BrahMos-II (under development)	1500 kms	Mach 6-8	-	-	USD 5.6 mn
BrahMos-A	300 kms	Mach 2.8	200-300 kg	2500 kg (air-launched)	-

Table 1

As mentioned elsewhere, there is always a trade-off among the price, range, warhead, fuel capacity, etc., when it comes to missiles.⁷ More range requires more fuel carrying capacity– this puts a limitation on the weight of other components. Similarly, more weight leads to lesser speed and reduced range. Due to these dynamics, multiple variants of a missile are made to cater for various missions and operational roles. For example, the most light-weight version of the BrahMos is the one launched from fighter jets, weighing around 1,330 kg so that the jet can carry other weapons and fuel. The heaviest variant is the BrahMos JP-10, which is surface-launched. Similarly, if the missile has to be fitted inside a submarine, its weight and length will have to be reduced. Completing the abovementioned processes indigenously takes a tremendous amount of time and effort. It also increases the per unit cost of the end product since cheaper imported components are sought to be replaced by indigenous ones. Nevertheless, the BrahMos missile is a formidable element in India's arsenal due to its 'Fire-and-forget' capability, requiring no additional input from the operator once the missile is launched. The high speed of the BrahMos likely gives it better target-penetration characteristics than lighter subsonic cruise-missiles like the Tomahawk. Being twice as heavy and almost four times as fast as Tomahawk, the BrahMos has more than 32 times the on-cruise kinetic energy of a Tomahawk missile, although it carries only 3/5th the payload and a fraction of the range. Also, due to high speeds and lower cruising altitude, the BrahMos technically cannot be intercepted by any existing missile defence systems, especially if fired in a salvo mode. Because of the low reaction time from the launch of BrahMos to its impact, it is difficult for any surface-to-air missile to intercept it.

Export Status and Potential of the BrahMos Missile

In Jan 2022, BrahMos Aerospace signed an export contract with the Philippines government for around USD 375 mn.⁸ In this case, it is interesting to note that the 'Request' for the procurement was made by the Philippine government to the Indian government, which then considered the proposal extensively before finalising the contract. The deal includes at least two missile batteries as part of the agreement. A battery will have three mobile firing units, plus attached command and control, radar, and support vehicles, and units. Each mobile firing unit has three ready-to-fire BrahMos

anti-ship supersonic missiles, with the export variant having a maximum range of around 290 kms. The batteries will be operated by the Shore-Based Anti-Ship Missile Battalion of the Philippine Marine Corps Coastal Defence Regiment.

India successfully delivered the last batch to the Philippines in Apr 2024. Philippine Marine Corps personnel have also completed their mandatory operator training under the supervision of BrahMos Aerospace and the Indian Navy. India had offered the Philippines a line of credit of USD 100 mn for defence purchases, a part of which may have been used to finance this deal. The following Table 2 gives a comparative overview of the same:

Missile	Range (kms)	Warhead Capacity	Speed	Launch Platform	Price (approximately in USD)
AGM-158 JASSM (USA)	370	450 kg	Subsonic	Land, Air	USD 0.5-1 mn
BrahMos	290	200-300 kg	Mach 2.8-3.0	Land, Sea, Air	USD 2-3 mn
Exocet (France)	180	165 kg	Mach 0.9	Sea, Air	USD 0.5-1 mn
Kh-35 (Russia)	130-260	145 kg	Mach 0.7-0.8	Land, Sea, Air	USD 0.5-1 mn
Tomahawk (USA)	1,600-2,500	450 kg	Mach 0.7	Land, Sea, Air	USD 1-1.5 mn
YJ-18 (China)	540	300-500 kg	Mach 2.5-3.0	Sea	USD 0.5-1 mn

Table 2

The BrahMos missile is a proven technology. It has been integrated onto Indian fighter jets, ships, and now submarines. Since it has received the best technologies from India and Russia, the product, per se, is efficient and reliable. The only remaining validation, if any, for the BrahMos, is its performance in actual combat—that is for the future. Today, no other cruise missile comes close to BrahMos, especially on the pricing and speed factor.

In Sep 2016, it was revealed that the Russian Defence Ministry is interested in purchasing the air-launched BrahMos to arm their Su-30SM fighters.⁹ But so far, Russia has not made any official request to that effect. The CEO and managing director of BrahMos Aerospace, mentioned in an interview, “The Company has been continuously looking at Russia as a potential market for the air-launched BrahMos supersonic cruise missile, since Russia has no equivalent currently in service”.¹⁰

The Philippine Army is also known to have shown interest in procuring two systems for its missile defence force. BrahMos Aerospace has mentioned on multiple occasions that many countries in Southeast Asia, West Asia, and Latin America have expressed interest in the system, especially in the naval and air versions.¹¹ The prospective buyer countries may include: Argentina, Brazil, Chile, Egypt, Brunei, Indonesia, Vietnam, Malaysia, Oman, Saudi Arabia, South Africa, Venezuela, etc. While the North Atlantic Treaty Organization countries have been eagerly watching the development of the missile, a procurement order from them is not expected. The BrahMos system is expensive; the buying country has to, therefore, deliberate whether it needs the weapon, and also decide on whether there is a need to show a bigger alignment with the selling country.

India's defence exports, including the BrahMos missile, hence, present a dual opportunity: it enhances India's strategic influence on the global stage and bolster the growth of its domestic defence industry. The export potential of the missile extends beyond India's traditional allies to include countries seeking advanced defence capabilities. Moreover, India's commitment to non-proliferation norms and responsible defence trade enhances the credibility of its exports, fostering trust among partner nations.

Challenges for India's Defence Exports

One of the major issues regarding exports of the missile is that the nations looking to buy it may have stressful relations with Russia. Since it is a joint venture project, every export case requires authorisation from India as well as Russia. Due to geopolitical compulsions, either country may hold back proposals for future exports.

The second challenge is China's perception of these trades. While India, as a sovereign nation, is fully justified in its export deals, such high value defence deals always create a 'Security Dilemma' for the adversaries. Pakistan and China share a common concern on BrahMos and may make moves to counter it by making a similar product. China may view the sale of these missiles as an act of belligerence and interference in its neighbourhood. The Philippines and Vietnam have been conscious of this factor while making the ask for the missile. Vietnam has been more apprehensive and this is one of the reasons behind its reluctance to sign a deal with India.

Thirdly, the ominous shadow of the US sanctions on Russian defence entities looms over India's plans to fast-track the export of BrahMos cruise missiles. The Countering America's Adversaries Through Sanctions Act (CAATSA) of the US covers all major Russian defence entities including the NPO Mashinostroyeniya (NPOM), which has the BrahMos joint venture with the Defence Research and Development Organisation. Crucial systems like the ramjet engine and radar seekers are provided by NPOM and are, hence, technically liable to sanctions under CAATSA. "Enforcing CAATSA on the potential export of BrahMos by the US would be disastrous for the Ministry of Defence's plans, in addition to adversely impacting other critical aspects of bilateral ties strategic and security between Delhi and Washington", said Amit Cowshish, former Defence Ministry Acquisitions Advisor.¹² The potential buyers of the missile would also be concerned with the sanctions, especially those countries that have friendly relations with the US. This factor also constrains the export possibility of the missile to countries in Europe and Southeast Asia.

Lastly, India will also have to guard against the potential misuse of such sophisticated technologies from the end user's side. It has to be ensured that neither the end product nor any of its sub-systems or components are sold to any third-party or any other entity. Export contracts also need to factor in that such systems are dual-use and, hence, can be employed in an offensive role by the end user – probably against a third country with whom India has friendly relations. All such contingencies need to be accounted for while considering proposals for export orders. However, India's proactive engagement with potential buyers through defence exhibitions, joint exercises, and diplomatic channels can mitigate these challenges and pave the way for successful exports.

Conclusion

The BrahMos missile stands as a testament to India's growing capabilities in the defence sector, symbolising the nation's transition from a defence importer to an exporter of cutting-edge military technology. The missile's supersonic speed, precision, and versatile launch platforms make it a formidable weapon in modern warfare, enhancing India's strategic military strength and offering significant export potential.

Despite the inherent challenges, including geopolitical sensitivities, regulatory constraints, and the threat of sanctions, the successful export of BrahMos to the Philippines marks a significant milestone. It showcases India's ability to deliver advanced defence solutions and underscores the missile's attractiveness to countries seeking robust and reliable military assets.

The collaborative effort behind BrahMos, incorporating indigenous advancements and strategic international partnerships, exemplifies a successful model for future defence projects. By maintaining high standards of non-proliferation and responsible trade practices, India can further build trust and expand its market share in the global arms industry. Looking ahead, the potential for BrahMos exports is substantial, with interest from several countries. As India continues to innovate and upgrade the BrahMos system, including developing hypersonic versions, the missile's appeal is set to increase, positioning it as a cornerstone of India's defence export strategy.

The BrahMos missile not only strengthens India's defence capabilities but also contributes to its strategic and economic objectives. Through sustained efforts in innovation, collaboration, and strategic diplomacy, India can maximise the export potential of BrahMos, solidifying its position as a key player in the global defence market.

Endnotes

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