ORF ISSUE BRIEF
SEPTEMBER 2019
ISSUE NO. 311

Israel's Arms Sales to India: Bedrock of a Strategic Partnership

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ABSTRACT A paradigm shift in India-Israel ties came in July 2017 when Prime Minister Narendra Modi went on a state visit to Israel, becoming the first Indian prime minister to do so. The two countries have since elevated their ties to a strategic partnership; a pillar of this relationship is defence. Such is a function of their respective national interests: India's long-sought goals of military modernisation, and Israel's comparative advantage in commercialising its arms industries. Although the ambit of India-Israel cooperation has widened more recently, Israeli arms sales to India continue to be the cornerstone. This brief surveys the arms trade between the two countries in the last decade (2009-2018) and underlines the applicability of imported defence technology from Israel.

Attribution: Harsh V. Pant and Ambuj Sahu, "Israel's Arms Sales to India: Bedrock of a Strategic Partnership", *ORF Issue Brief No. 311*, September 2019, Observer Research Foundation.

ISBN 978-93-89094-78-7

INTRODUCTION

Bilateral relations between India and Israel today stand at a unique juncture. The paradigm shift occurred two years ago, when Prime Minister Narendra Modi in July 2017 became the first Indian PM to embark on a state visit to Israel[1] and the two countries elevated their ties to a strategic partnership.[2] In January 2018, Israeli Prime Minister Benjamin Netanyahu reciprocated the signal with a visit to New Delhi.[3] It is clear that both New Delhi and Tel Aviv are according priority to strengthening bilateral ties, a pillar of which is defence. This is driven by their respective national interests—i.e., India's long-sought goals of military modernisation, and Israel's comparative advantage in commercialising its arms industries. India was the largest arms customer of Israel in 2017 with sales worth US$715 million.[4]

To be sure, the ambit of India-Israel defence cooperation has widened to include other domains like space, counter-terrorism, and cyber security; however, the cornerstone remains Israeli arms sales to India.[5] This brief surveys the arms trade between the two countries over the last decade (2009-2018), explains the specifications of the imported defence technology from Israel, and examines their applicability to India.

The first section summarises the origins of arms sales from Israel against the backdrop of wider crests and troughs in India-Israel relations. The brief then looks into the defence imports data of India over the last two decades (1999-2018) and scrutinises the trends vis-à-vis the country's arms trade with Israel. The third part analyses the defence technologies imported by India from Israel in the past ten years (2009-18) and highlights their relevance. The penultimate section explores the reasons for Israel's emergence as a key arms supplier to India. The brief concludes by making specific policy recommendations for taking the strategic partnership between the two countries beyond arms transfers.

INDIA-ISRAEL RELATIONS: A TORTUOUS COURSE

Israel has always been an outlier in India's foreign policy. Both India and Israel emerged as independent states around the same time, in August 1947 and May 1948, respectively. Although India recognised Israel in 1950, it took both countries a long time to establish formal diplomatic ties. In India's pursuit to mobilise the support of Arab states after independence, it voted against UN membership of Israel in 1949.[6] Relations between the two countries have vacillated for years, primarily because of India linking its ties with Israel to the question of Palestine.

For the next four decades, three broad factors would shape India's Israel policy. First, successive Indian governments were wary of establishing links with the Jewish state because of the country's having a large Muslim population, which has implications on its domestic politics.[7] Second, it may be said that any early potential of India-Israel ties, was sacrificed on the altar of Cold War politics. The Jewish lobby in France and the United States (US) supported Israel in its mission of defence modernisation, which was crucial for the state to survive in a hostile neighbourhood.[8] New Delhi's commitment to the non-aligned cause implied freezing relations with Israel that was

increasingly seen as leaning towards the Western bloc. Third, India's dependence on Arab states for oil imports led to a pro-Arab tilt in its West Asia Policy, further constraining the country's options in the region.[9] The Palestinian question had also played an important role, and it was hardly surprising that India began normalising its relations only when Israel-Palestine peace negotiations showed progress (eventually culminating in the Oslo Accords of 1993).

Blarel has underscored two main motivations for India seeking to normalise relations with Israel in January 1992.[10] First, the goal of self-reliance in producing military equipment was essential to achieve strategic autonomy in Indian foreign policy. Israel was an embodiment of a state that managed to nurture an indigenous military-industrial complex from scratch using state-of-the-art technology. It had a singular reputation in the defence sector and was keen on its commercial expansion to other countries. Israel was a ripe market for buying new weapons, transferring technology and upgrading the existing machinery. Second, after the collapse of the Soviet Union, India was devoid of a benevolent great power acting as a strategic partner. Since the signing of the Treaty of Friendship with the USSR in 1971 up until its dissolution in 1991, it was India's largest arms supplier and contributed to 72.46 percent of the Trend Indicator Values (TIV)[11] of total arms imported.[12] As the Cold War ended, New Delhi recognised the need to diversify its sources of arms imports. It also sought partners for developing joint research and development (R&D) projects to indigenise the defence sector. For the first time in many decades, India's outlook towards Israel was being shaped by pragmatism rather than ideology, leading to a thaw in their bilateral ties.

Defence relations between India and Israel are longstanding. The strategic communication between the two countries began during the Sino-India War of 1962 when PM Jawaharlal Nehru wrote his Israeli counterpart David Ben-Gurion for shipments of arms and ammunition.[13] In 1965, Israel supplied M-58 160-mm mortar ammunition to India in the war against Pakistan.[14] It was one of the few countries that chose to not condemn India's Pokhran nuclear tests in 1998.[15] It continued its arms trade with India at a steadily increasing rate even after the sanctions and international isolation that followed the nuclear tests (See Fig. 1). For India, the credibility of Israel as a reliable defence partner was reinforced during the Kargil War of 1999 when it supplied the Indian Air Force (IAF) with the Unmanned Aerial Vehicle (UAV) 'Searcher' and surveillance systems for Jaguar and Mirage squadrons.[16] It also upgraded the MiG-21 combat aircraft for the IAF.[17] The Indian Army also received Laser Guided Bombs (LGB) and 160-mm mortar ammunition.

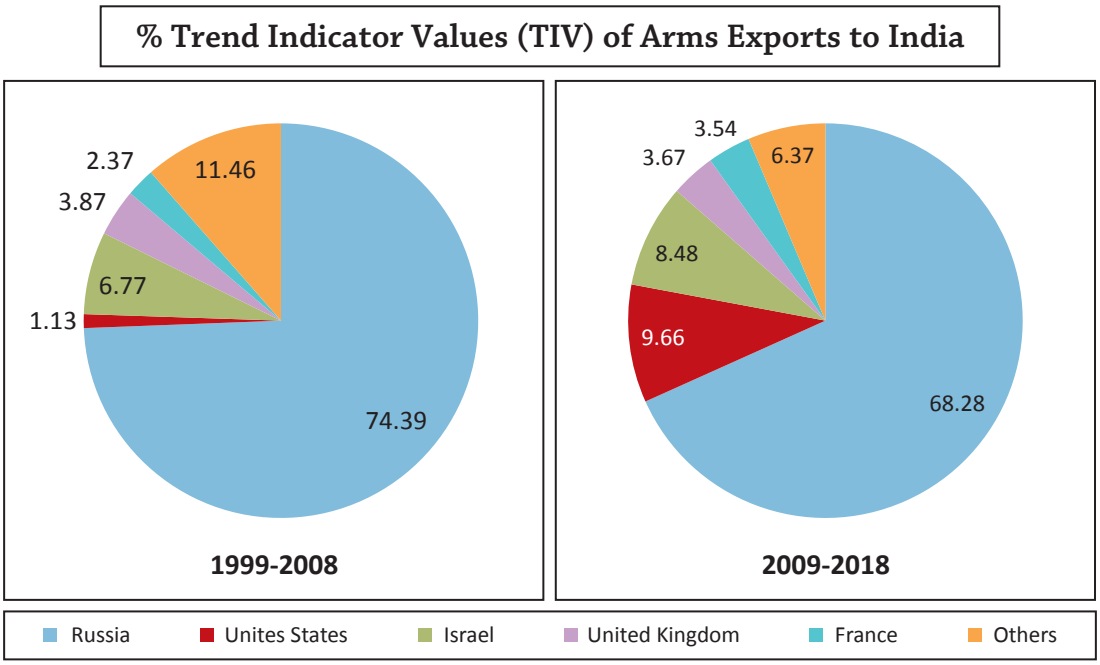
In the 2000s, the India-Israel arms trade mostly involved surveillance and intelligence-related equipment – notably Super Dvora-class patrol vessels and the airborne early warning and control (AEW&C) system EL/M-2075 Phalcon.[18] India also purchased 98 Searcher and 50 Heron UAVs.[19] Israel supplied Barak surface-to-air missile system with the Vertical Launching System (VLS) module for the modernisation of the Indian Navy during the period 2003-2006.[20]

INDIA's DEFENCE IMPORTS (1999-2018): KEY TRENDS

India has been the world's largest arms importer for decades now; its top suppliers are Russia, the US, Israel, the United Kingdom (UK) and France. Figure 1 summarises the country-wise distribution of arms imported by India in the two decades of 1999-2008 and 2009-2018, respectively. Despite having diversified its arm imports after the Cold War, India still buys the most volumes of arms from Russia. Overall, in the last decade, Russian share in the Indian defence market was 68.28 percent. It was followed by the US at 9.66 percent, which showed a steep rise from the last decade's 1.13 percent. This can be attributed to increasing strategic proximity between the two countries in the last few years, especially as Washington started viewing India as integral to the changing balance of power in the Asian region.[21]

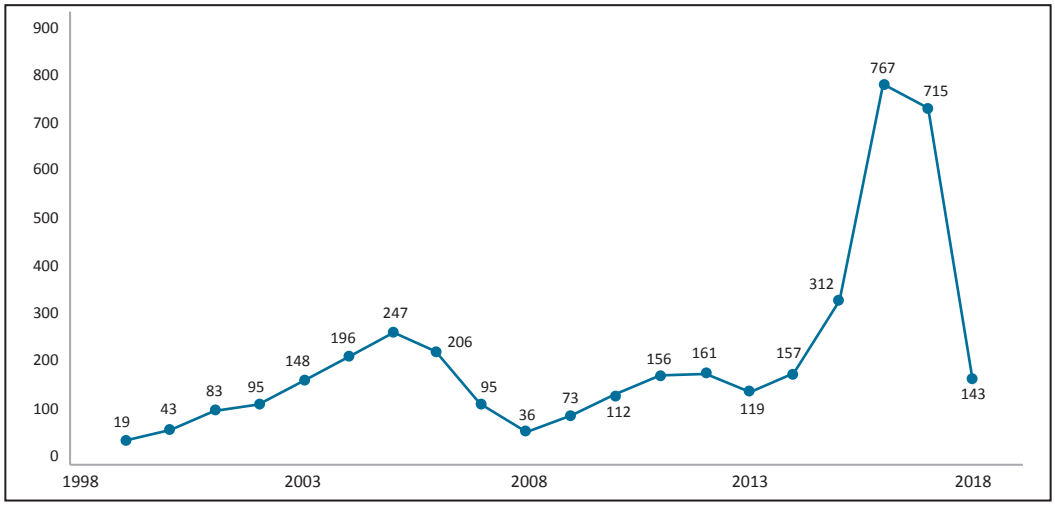
Israel has remained among the top arms suppliers to India in the past two decades. Figure 2 shows the TIV values of the arms exported from Israel to India between 1999 and 2018. This is the period when, as briefly discussed earlier, Israel established its reliability following the Kargil War in 1999. The arms trade between Israel and India was brisk despite US sanctions following the Pokhran nuclear tests.[22] This is evident in the increasing trend in Fig.2 throughout the years 1998-2003, after which the US lifted most of its sanctions on India.[23] Israeli arms exports saw a sharp fall after 2006, when India's Central Bureau of Investigation (CBI) registered a corruption case against Israel Aerospace Industries (IAI) and Rafael Advanced Defence Systems in relation to the procurement of Barak missiles.[24] Both companies were placed under restricted procurement categories and debarred from filing tenders except in extraordinary circumstances such as during a threat to national security. The Modi Government lifted the ban on both the companies in April 2018.[25]

Figure 1: Country-wise Distribution of Arms Imported by India (1999-2018)



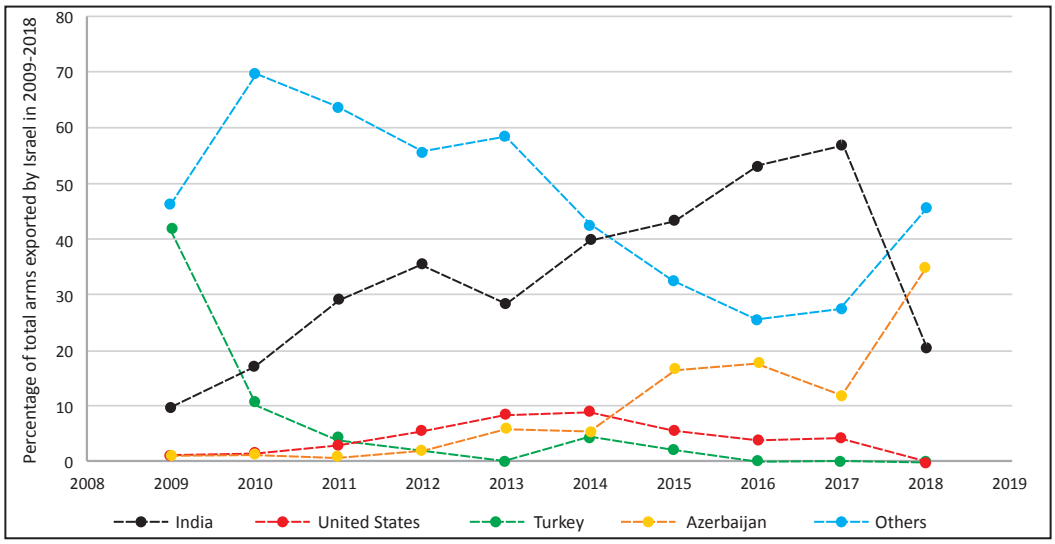
Source: SIPRI Arms Transfer Database

Figure 2: TIV Values of Arms Exported from Israel to India (1999-2018, in US$ millions)



Source: SIPRI Arms Transfer Database

Figure 3: Country-wise Export Distribution for Israel (2009-2018, in percentage)



Source: SIPRI Arms Transfer Database

After 2014, the share of Israel in India's arms market shot up, signifying healthy relations between both governments as well as Israel's suitability to create its niche in the 'Make-in-India' oriented defence sector. Figure 3 shows the largest export markets for Israeli arms in the years between 2009 and 2018: India, the US, Turkey and Azerbaijan. In recent years, India has emerged as the largest among them all.

DEFENCE TECHNOLOGIES IMPORTED BY INDIA FROM ISRAEL (2009-18)

Aircraft

Heron is the Medium Altitude Long Endurance (MALE) unmanned aerial system used for intelligence, surveillance, target acquisition and reconnaissance purposes.[26] It is a high-endurance drone that can fly to

heights of up to 35,000 ft. for more than 45 hours at a time. It has a visual line-of-sight (LOS) range of 350 km and beyond line-of-sight (BLOS) range of 1,000 km. For the BLOS operations, the visual feed is transmitted to the control room via satellite communication (SATCOM). As India shares a long border with its potential adversaries in both the western and eastern fronts, the use of drones for intelligence gathering makes this highly efficient. Moreover, harsh weather and complex terrain in conflict-prone regions in India's north hinders manual operations. An all-weather aircraft like Heron can provide an edge in these conditions. In 2009, 16 such drones were ordered by India for US$239 million; these were delivered in 2012-13.[27] In 2016, the government also approved a US$400-million plan to procure the Heron TP-XP[28] variant which is specially designed to cater to the needs of international customers using a variety of payloads.[29] As of February 2019, India was in talks for buying Heron-1 long endurance reconnaissance UAVs.[30]

Searcher is a multi-mission tactical UAV for surveillance, reconnaissance, target acquisition, artillery adjustment and damage assessment.[31] Capable of real-time gathering and data transmission, it can continuously fly for up to 20 hours within a range of 300 km. Apart from the smaller size and reduced radar detection, the four-stroke silent gasoline engine ensures audio stealth that makes it stand out from Heron. In 2010, India procured two Searcher Mk-II drones from Israel.[32]

In December 2018, Adani Defence and Elbit systems inaugurated the first India-Israel joint venture in defence at Hyderabad.[33] This facility will manufacture high-technology, cost-effective **Hermes 900** to be deployed in all-weather terrains. Hermes 900 is also a multi-use MALE UAV.

Air Defence Systems

In 2008, India ordered the **SPYDER-MR** air defence system from Israel. SPYDER is a low-level quick reaction missile (LLQRM) system developed by Rafael Advanced Defence Systems, an Israeli defence-technology company.[34] It is used to protect critical infrastructure in ground-to-air missions from wide-spectrum of incoming air-borne threats ranging from aircrafts, helicopters, UAVs, precision-guided munitions (PGMs). It offers both lock-on before launch (LOBL) and lock-on after launch (LOAL) capabilities with I-Derby and Python-5 missiles. The Medium Range (MR) version of SPYDER (Surface-to-air Python-5 Derby) purchased by India offers target interception through vertical launch, thereby creating a protective dome of 80 km radius. It uses electro-optic payloads and wireless data link communications to ensure all-weather, multi-launch and network-centric capabilities. India successfully test fired the SPYDER-MR system in May 2017.[35]

The surface-to-air missile **BARAK** can also be deployed as low-range air defence (LRAD) interceptor. In India, the BARAK-LRAD version is known as BARAK-8 (for naval vessels) or Medium Range Surface-to-Air Missile (MRSAM) system (for land-based launchers). It has vertical launch capabilities till 70 km height and supports 360° manoeuvrability. Imbibed with an active high-end RF seeker for targets, BARAK also has low launch signature.[36] In 2018, the Cabinet

Committee on Security headed by Prime Minister Narendra Modi approved the project worth INR 170 billion (US$2.5 billion) for procuring MRSAM for the army.[37] These missiles will be jointly developed by Israeli Aerospace Industries (IAI) and Defence Research and Development Organization (DRDO) in a boost to Make-in-India in defence.

Missiles

Although Israel is not a leading exporter of heavy weaponry like combat aircraft, battle tanks and naval vessels, it is one of the best in providing technology and ammunition for such systems. In the last 10 years, India has imported a diverse range of missiles from Israel, including beyond visual range air-to-air Missile (BVRAAM), guided bombs, loitering ammunition and surface-to-air (SAM) missiles. These missiles are multi-purpose and are launchable from all land, water and air-based platforms.

The BVRAAM arsenal of IAF includes the Rafael-produced missiles Python-5 and Derby. **Python-5** is a full-sphere infrared air-to-air missile,[38] i.e. it can be fired in any direction and azimuthal angle. Endowed with a unique LOAL and LOBL feature, it is a dual-use missile which can also be fired from the surface. Fitted in the SPYDER air defence system. Python-5 has a unique ability to be adaptable in a plethora of aircraft. It is especially useful for IAF due to its diverse fleet consisting of Mirage-2000, Jaguar, MiG-21, MiG-29, Su-30 with Tejas light combat aircraft (LCA) soon to join.[39]

Python-5 is complemented by **Derby**, an active radar air-to-air missile which can be used for both short ranges and Beyond Visual Range (BVR) interceptions.[40] India placed an order for 750 Python-5 and Derby missiles each in 2008; they were delivered by 2017,[41] since then constituting the backbone of India's air defence system. It was a Derby that shot down the Pakistani patrolling drone after the Balakot air strikes in February 2019.[42]

The IAF combat squadrons are supported by Israeli guided bombs SPICE-2000 and Griffin. The Spice guidance kits upgrade the general missile warheads into lethal automation-guided precision strike bombs. They can be adapted to different aircrafts and can bomb up to 60 km range. Produced by Rafael Advanced Defence Systems, the **SPICE-2000** is a highly advanced bomb that uses a unique image-matching algorithm to hit its targets.[43] The algorithm compares the real-time electro-optic imagery of the mission site with the already fed information (in the bomb) of the target acquired through surveillance. Once these images match, the Spice automatically launches the warhead into the target with high precision (up to 95-percent accuracy). For instance, SPICE-2000 were fitted into Mirage-2000 fighter aircraft that performed the Balakot air strikes in February 2019.[44] IAF bought 100 Spice-kits from Israel in 2008-09 and again signed an INR 3-billion deal in June 2019 to procure another batch that is expected for delivery in the last quarter of 2019.[45,46]

The IAI-made **Griffin** uses a laser-guided module, especially for combat aircrafts to conduct high-precision strikes (with CEP < 1.5 m) [47] against ground targets.[48] It can take several trajectories to counter the air defence system of the adversary. Griffin can also be launched from ground-based platforms.

Loitering munition (or kamikaze/suicide) drones combine the features of UAVs and guided bombs. They loiter around the target area for some time after which they lock on to their targets and destroy them. Developed by IAI, **HAROP** is an electro-optically guided weapon that is highly suited to shoot down moving targets.[49] It operates within a range of 200 km and can endure more than nine hours of flight on one refuelling. India inducted 50 Harop suicide drones in 2013-14 as part of a US$100-million deal.[50] New Delhi further approved the purchase of 54 more drones in February 2019.[51]

The **Crystal Maze** is an Indian variant of the air-to-surface (ASM) missile AGM-142A Popeye – jointly developed by the Israeli-based Rafael and US-based Lockheed Martin.[52,53] It can be used to strike targets at a distance of 75-80 km – both on land as well as sea – with high precision (CEP < 3 m).[54] Owing to its high range, the carrier aircraft does not have to approach the surface and thus protected from enemy air defence systems. In 2010, India imported 30 Crystal Maze from Israel which were also used in the Balakot air strikes alongside SPICE-2000 PGBs.[55]

Sensors

India has purchased numerous sensors from Israel for reconnaissance and intelligence purposes for its naval vessels and aircrafts. Most of them are EL/M-series radars are constructed by ELTA systems with IAI and used for ground surveillance, multi-purpose, air search and fire control radars.

The major naval radars imported from Israel in the last 10 years include EL/M 2248 MF-STAR and EL/M-2221 STGR. The **EL/M 2248 MF-STAR** is a digital active electronic-scan array (AESA) multi-function radar used for maritime surveillance.[56] With a range greater than 250 km (corvette version) and 450 km (frigate version), 360° azimuth coverage and elevation coverage of -20° to +85°, it can be used for blue water and littoral warfare support. In 2013, the government approved four more radars to deployed on the INS Visakhapatnam (Project-15B) destroyers.[57] In 2016, India imported the multi-function radar for the indigenous Kolkata-class (Project-15A) destroyer.[58]

The **EL/M-2221** STGR (Search Track and Guidance/Gunnery Radar) is a fire control radar that guides the warhead to air or sea-based targets.[59] From 2015 to 2017, India imported the STGR radar from 2015-2017 to make INS Kolkata, INS Shivalik and Kamorta-class frigates compatible for deploying BARAK-8 SAM missiles.[60] In 2014, India placed an order of the four STGR radars that will be fitted in the INS Visakhapatnam.

The **EL/M-2032** is multi-mode airborne fire control radar is designed for strike missions in air-to-air combat and air-to-sea combat.[61] In 2016-18, nine EL/M 2032 were imported from IAI for the Tejas LCA Mk-I combat aircraft.[62]

The airborne warning and control system (AWACS) **EL/M-2075 Phalcon**, also hailed as IAF's "eyes in the skies"[63] was first inducted in 2009 after a US$1.1-billion deal with IAI. Three AWACS were installed on the Russian transport aircraft IL-76 in a trilateral agreement.[64] Phalcon performs the surveillance and intelligence gathering beyond the visual range to warn against the incoming missiles or aircrafts in the airspace.

Table 1: Value Estimation of select weapons purchased from Israel

	Weapon Designation	#	Description	Year of Order/Delivery	Valuation
Aircrafts	Heron	16	UAV	2009/2012-13	$239 m
	Heron	2	UAV	2010/2011	
	Searcher	2	UAV	2010/2011	$12 m (est.)
	Heron	10	UAV	2016/y.t.d.	$400 m
	Heron	10	UAV	2018/y.t.d	$200 m
Air Defence Systems	SPYDER	18	SAM system	2008/2015-17	$395.4 m
	BARAK-LR	5	SAM system	2009/y.t.d.	$2.5 b (inc. production in India)
Missiles	BARAK-8	800	SAM	2009/2016-18	
	Derby	750	BVRAAM	2008/2015-17	$940 m (est.)
	Python-5	750	BVRAAM	2008/2015-17	
	SPICE-2000	100	Guided Bomb	2008/2009	$5-6 m (est.)
	Griffin	250	Guided Bomb	2008/2012-13	$8-9 m (est.)
	Harop	50	Loitering Ammunition	2009/2013-14	$100 m
	Crystal Maze	30	ASM	2010/2013-14	$60 m
	Barak-1	131	SAM	2017/y.t.d	$72 m
Sensors	EL/M 2075 Phalcon	3	AWACS	2004/2009-11	
	EL/M 2032	9	Combat aircraft radar	2005/2008-11	$110-137 m
	EL/M 2248 MF-STAR	3	Multi-function Radar	2006/2014-16	$200 m
	EL/M 2032	20	Combat aircraft radar	2007/2016-18 (9 delivered)	
	EL/M 2221 STGR	6	Fire Control Radar	2007/2010-12	
	EL/M 2221 STGR	6	Fire Control Radar	2009/2014-16	
	EL/M 2221 STGR	4	Fire Control Radar	2010/2014-17 (3 delivered)	
	EL/M 2248 MF-STAR	4	Multi-function Radar	2013/y.t.d.	
	EL/M 2221 STGR	8	Fire Control Radar	2014/y.t.d.	
	EL/M 2248 MF-STAR	1	Multi-function Radar	2015/y.t.d.	
	EL/M 2075 Phalcon	2	AWACS	2018/y.t.d.	$800 m

Source: SIPRI Arms Transfer Database (data compiled by the authors) Note: y.t.d. - yet to be delivered

WHAT MAKES ISRAEL A GOOD ARMS SUPPLIER TO INDIA?

India suffers from many constraints in defence production and acquisition including lack of technical expertise, complex bureaucracy, lack of manufacturing infrastructure, inadequate funding, cost overruns, and project delays.[65] Israel fills these shortcomings by supplying ready-to-use critical technologies, even on short notices. Instead of manufacturing-intensive heavy weaponry, Israel has created its niche in the market with its innovation-backed technologies such as UAVs, missile defence systems, avionics, precision-guided munitions and surveillance radars.[66]

The Israeli imports are instrumental for India in patrolling and surveillance purposes in peacetime and eases the operational ability of armed forces in wartime. For instance, the missile defence systems, PGBs, and ammunition provided by Israel played a crucial role in controlling the escalation between India and Pakistan post-Balakot air strikes.[67] The export-oriented Israeli defence industry and its openness to establishing joint ventures complement both 'Make in India' and 'Make with India' in defence.

After the end of the Cold War, India managed to significantly diversify its list of suppliers (See Fig. 1). Indian armed forces need technologies and ammunition that are adaptable to different weaponry. Israeli arms can be flexibly deployed to various wings of the military, which simplifies the operation during mission time. As its defence industry forms a vital part of the Israeli economy, it has developed the expertise to customise its arms according to the requirements of its customers.

Israel has always been a 'no-questions-asked supplier', i.e., it transfers even its most advanced technology without placing limits to its use. Some of the Israeli technologies utilise US components because of which the US has veto powers over the sale of those technologies.[68] With improving strategic understanding between India and the US – especially as the US sees a major role for India in maintaining the balance of power in the Indo-Pacific– more technologies are likely be transferable in the future. These factors make Israel a potential 'all-weather' defence partner for India.

BEYOND ARMS TRANSFERS

In the last two decades, strategic cooperation between Israel and India has expanded from arms trade to space and counter-terrorism and intelligence sharing. For instance, the Indian Space Research Organization (ISRO) has teamed up with the Israel Space Agency (ISA) for joint programmes in space cooperation. ISRO launched TecSAR – the Israeli Synthetic Aperture Radar (SAR) satellite – in January 2008, which was followed by the launch of the IAI-assisted India's own radar imaging satellite RISAT-2.[69]

India and Israel also signed a Memorandum of Understanding (MoU) on cyber security during the state visit of Prime Minister Netanyahu to New Delhi in January 2018.[70] The MoU seeks to promote cooperation in skill development and training programmes in the field of cyber security. The booming industry expertise in Israel can compensate for the lack of cyber infrastructure in Indian industries. For instance, the total amount of funding secured by Israeli cyber

security-based start-ups in 2018 was US$1.03 billion.[71] The large market for cyber operations in India can help these incubating start-ups. The MoU also envisions to promote B2B operations in cyber security operations and organising summits. The Indian company Tech Mahindra is collaborating with the Israel-based ELTA systems to provide cyber solutions to government and enterprise customers in the country.[72]

The strategic cooperation between India and Israel carries immense potential and is only set to grow further. The arms trade will remain the bedrock of this bilateral engagement as the two nations seek a wider convergence. The arms trade between New Delhi and Tel Aviv has ensured that bilateral ties—which may have wavered in the past—have become sustainable in recent years. With the ideological and leadership winds blowing in favour of a burgeoning partnership, the time is ripe for India to harness the technological expertise from Israel to modernise an ailing indigenous defence industry. ORF

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ENDNOTES

1. "India-Israel Joint Statement During The Visit Of Prime Minister To Israel (July 5, 2017)". *Ministry of External Affairs, Government of India*, 2017, www.mea.gov.in/bilateral-documents.htm?dtl/28593/IndiaIsrael_Joint_Statement_during_the_visit_of_Prime_Minister_to_Israel_July_5_2017.

2. Elizabeth Roche, "Modi In Israel: India-Israel Ties Elevated To Strategic Partnership". *Livemint*, July 6, 2017, https://www.livemint.com/Politics/bgztcozlDhK3MOIJ7UhFDL/India-Israel-ink-7-pacts-during-Narendra-Modis-historic-vi.html

3. "PM Netanyahu's State Visit To India", *Israel Ministry of Foreign Affairs*, 2018, mfa.gov.il/MFA/PressRoom/2018/Pages/PM-Netanyahu%27s-official-visit-to-India-14-January-2018.aspx.

4. "India Largest Purchaser of Israel Arms In 2017", *Middle East Monitor*, May 4, 2018. www.middleeastmonitor.com/20180504-india-largest-purchaser-of-israel-arms-in-2017/.

5. Richard A. , "Israeli Arms Transfer to India: Ad Hoc Defence Cooperation Or The Beginnings Of A Strategic Partnership?", *RSIS Policy Brief* (2013), Singapore: S. Rajaratnam School of International Studies.

6. P. R. Kumaraswamy, *India's Israel Policy*. (New York: Columbia University Press, 2010), 188-190.

7. Ibid., 11-18.

8. Yaakov Katz and Amir Bohbot, *The Weapon Wizards: How Israel Became A High-Tech Military Power* (New York: St. Martin's Press, 2017).

9. Nicolas Blarel, *The Evolution Of India's Israel Policy: Continuity, Change And Compromise Since 1922* (New Delhi: Oxford University Press, 2015), 14.

10. Ibid., 279-280.

11. "To permit comparison between the data on such deliveries of different weapons and to identify general trends, SIPRI has developed a unique system to measure the volume of international transfers of major conventional weapons using a common unit, the trend-indicator value (TIV). The TIV is based on the known unit production costs of a core set of weapons and is intended to represent the transfer of military resources rather than the financial value of the transfer." Read more on www.sipri.org/databases/armstransfers/background#TIV-tables

12. SIPRI Arms Transfer Database – Importer/Exporter TIV values, *Armstrade.Sipri.Org.*, 2019, armstrade.sipri.org/armstrade/page/values.php

13. Santosh Chaubey, "India-Israel Relation Over The Years: Ten Defining Developments". *India Today*, July 4, 2017. www.indiatoday.in/india/story/india-israel-relations-narendra-modi-kargil-independence-1022258-2017-07-04

14. N. A. K. Browne, "A Perspective On India–Israel Defence And Security Ties", *Strategic Analysis* 41, no. 4 (2017): 325-335, doi:10.1080/09700161.2017.1330934.

15. SIPRI Arms Transfer Database - Trade Registers, *Armstrade.Sipri.Org.*, 2019, armstrade.sipri.org/armstrade/page/trade_register.php.

16. Browne, "A Perspective On India–Israel Defence And Security Ties", 330.

17. Bitzinger, "Israeli Arms Transfer to India: Ad Hoc Defence Cooperation Or The Beginnings Of A Strategic Partnership?".

18. SIPRI Arms Transfer Database - Trade Registers, *Armstrade.Sipri.Org.*, 2019.

19. Ibid.

20. Ibid.

21. Tanvi Madan, "The U.S.-India Relationship And China". *Brookings*, 2014, www.brookings.edu/research/the-u-s-india-relationship-and-china/.

22. "CNN - U.S. Imposes Sanctions On India - May 13, 1998", *Edition.Cnn.Com.*, May 13, 1998, edition.cnn.com/WORLD/asiapcf/9805/13/india.us/.

23. Jane Perlez, "U.S. READY TO END SANCTIONS ON INDIA TO BUILD ALLIANCE". *The New York Times*, August 27, 2001, www.nytimes.com/2001/08/27/world/us-ready-to-end-sanctions-on-india-to-build-alliance.html.

24. Vivek Raghuvanshi, "India Lifts Blacklisting For Two Israel Defense Companies", *Defense News*, April 13, 2018, www.defensenews.com/global/mideast-africa/2018/04/12/india-lifts-blacklisting-for-two-israel-defense-companies/.

25. Shaurya Gurung, "Israeli Firms IAI And Rafael Taken Out Of Restricted List After Barak Corruption Case Closure", *The Economic Times*, April 5, 2018, economictimes.indiatimes.com/news/defence/israeli-firms-iai-and-rafael-taken-out-of-restricted-list-after-barak-corruption-case-closure/articleshow/63632344.cms?from=mdr.

26. "Heron Multi-Role MALE UAS", *Israel Aerospace Industries*, 2019 https://www.iai.co.il/p/heron.

27. SIPRI Arms Transfer Database - Trade Registers, *Armstrade.Sipri.Org.*, 2019.

28. "Heron TP MALE Unmanned Aerial System (UAS)", *Israel Aerospace Industries*, 2019, www.iai.co.il/p/heron-tp

29. Manu Pubby, "Government Approves $400-Million Plan To Procure Armed Heron TP Drones From Israel", *The Economic Times*, July 14, 2018, economictimes.indiatimes.com/news/defence/government-approves-400-million-plan-to-procure-armed-heron-tp-drones-from-israel/articleshow/48906195.cms?from=mdr.

30. "India Set To Buy 50 Israeli Heron-1 Long-Endurance Reconnaissance UAVs In Reported $500 Million Deal", *Military & Aerospace Electronics*, February 26, 2019, www.militaryaerospace.com/

unmanned/article/16711574/india-set-to-buy-50-israeli-heron1-longendurance-reconnaissance-uavs-in-reported-500-million-deal.

31. "Search Mk-III Tactical UAS", *Israel Aerospace Industries,* 2019, www.iai.co.il/p/searcher-mk-iii

32. SIPRI Arms Transfer Database - Trade Registers, *Armstrade.Sipri.Org.*, 2019.

33. "Adani Group inaugurates India's first drone building facility in Hyderabad", *Business-Standard.Com*, December 15, 2018, https://www.business-standard.com/article/current-affairs/adani-group-inaugurates-india-s-first-drone-building-facility-in-hyderabad-118121500588_1.html.

34. "Rafael: SPYDER FAMILY", *Rafael Advanced Air Defence Systems Ltd*., 2019, www.rafael.co.il/worlds/air-missile-defense/air-defense/.

35. Ankit Panda, "India Tests SPYDER Surface-To-Air Missile System", *The Diplomat*, May 14, 2017, thediplomat.com/2017/05/india-tests-spyder-surface-to-air-missile-system/.

36. "BARAK LRAD Long Range Robust Interceptor", *Israel Aerospace Industries*, 2019, www.iai.co.il/p/barak-lrad.

37. Shaurya Gurung, "Israel To Partner DRDO For Developing Missile Defence System For India", *The Economic Times*, July 14, 2018, economictimes.indiatimes.com/news/defence/israel-to-partner-drdo-for-developing-missile-defence-system-for-india/articleshow/59689811.cms?from=mdr.

38. "Python-5: Full Sphere IR Air-To-Air Or Surface-To-Air Missile", Python-5/UNC/22801/108/35/02, *Rafael Advanced Defense Systems Ltd.*, 2019, www.rafael.co.il/wp-content/uploads/2019/03/Python-5-Brochure-Eng.pdf.

39. Ashley Tellis, *Troubles, They Come In Battalions: The Manifold Travails Of The Indian Air Force*, Washington DC: Carnegie Endowment for World Peace (2016), 19-20.

40. "I-Derby: Short To Medium Range BVR Air-To-Air & Surface-To-Surface Missile". Derby/UNC/48763/0215. *Rafael Advanced Defense Systems Ltd*., 2019, www.rafael.co.il/wp-content/uploads/2019/03/I-Derby.pdf.

41. SIPRI Arms Transfer Database - Trade Registers, 2019.

42. "Israeli Spyder Used To Shoot Down Pakistani Drone In Gujarat", *Business-Standard.Com*, February 26, 2019, www.business-standard.com/article/news-ani/israeli-spyder-used-to-shoot-down-pakistani-drone-in-gujarat-119022600672_1.html.

43. "SPICE: Smart, Precise-Impact And Cost-Effective Guidance Kits". UNC/40643-071232/037. *Rafael Advanced Defense Systems Ltd*., 2019, www.rafael.co.il/wp-content/uploads/2019/03/Spice.pdf.

44. "IAF Inks Rs 300 Crore Deal To Procure Spice Bombs From Israel", *The Economic Times*, June 7, 2019, economictimes.indiatimes.com/news/defence/iaf-inks-rs-300-crore-deal-to-procure-spice-bombs-from-israel/articleshow/69694463.cms?from=mdr.

45. SIPRI Arms Transfer Database - Trade Registers, 2019.

46. "IAF Inks Rs 300 Crore Deal To Procure Spice Bombs From Israel."

47. In the military science of ballistics, circular error probable (CEP) is a measure of a weapon system's precision. It is defined as the radius of a circle, centred on the mean, whose boundary is expected to include the landing points of 50% of the rounds; said otherwise, it is the median error radius.

48. "Griffin III", *Israel Aerospace Industries*, 2019, www.iai.co.il/p/griffin-iii

49. "HAROP", *Israel Aerospace Industries*, 2019, www.iai.co.il/p/harop.

50. SIPRI Arms Transfer Database - Trade Registers, 2019,

51. "Government Approves 54 Killer Drones From Israel For Indian Air Force", *The Economic Times*, February 13, 2019, economictimes.indiatimes.com/news/defence/government-approves-54-killer-drones-from-israel-for-indian-air-force/articleshow/67971351.cms?from=mdr.

52. "AGM-142 Raptor / Have Nap / Popeye - Smart Weapons", *Fas.Org.*, 2019, fas.org/man/dod-101/sys/smart/agm-142.htm.

53. SIPRI Arms Transfer Database - Trade Registers, 2019,

54. "Decoding IAF's Lethal Arsenal That Destroyed Pakistani Terror Camps", *DNA India*, February 26, 2019. https://www.dnaindia.com/india/report-decoding-iaf-s-lethal-arsenal-that-destroyed-pakistani-terror-camps-2724402

55. Ibid.

56. "ELM-2248 MF-STAR Multi-Function Digital AESA Radar", *Israel Aerospace Industries*, 2019. www.iai.co.il/p/elm-2248-mf-star.

57. SIPRI Arms Transfer Database - Trade Registers, 2019.

58. "Kolkata Class Guided Missile Destroyers - Naval Technology", *Naval Technology*, 2019. www.naval-technology.com/projects/kolkata-class-guided-missile-destroyers/.

59. "EL/M-2221 STGR", *Deagel.Com.*, 2019, www.deagel.com/Sensor-Systems/ELM-2221-STGR_a001229001.aspx.

60. SIPRI Arms Transfer Database - Trade Registers, 2019.

61. "ELM-2032 Multimode Airborne Fire Control Radar", *Israel Aerospace Industries*, 2019. www.iai.co.il/p/elm-2032.

62. SIPRI Arms Transfer Database - Trade Registers, 2019.

63. A. B. S. Chaudhry, "Eyes in Southern Asian Skies", *Centre For Air Power Studies Issue Brief* (2009), capsindia.org/files/documents/ISSUE-BRIEF_12_EYES-IN-SOUTH-ASIAN-SKIES_15-September-2009.pdf.

64. SIPRI Arms Transfer Database - Trade Registers, 2019.

65. Philip Campose, "Modernising Of The Indian Army: Future Challenges | ORF", 2017, *Observer Research Foundation*. www.orfonline.org/expert-speak/modernising-indian-army-future-challenges/.

66. Bitzinger, "Israeli Arms Transfer to India: Ad Hoc Defence Cooperation Or The Beginnings Of A Strategic Partnership?"

67. "Decoding IAF's Lethal Arsenal That Destroyed Pakistani Terror Camps", *DNA India*, 2019.

68. Bitzinger, "Israeli Arms Transfer to India: Ad Hoc Defence Cooperation Or The Beginnings Of A Strategic Partnership?"

69. Browne, "A Perspective On India–Israel Defence And Security Ties", 331

70. "List Of Mous/Agreements Signed During The Visit Of Prime Minister Of Israel To India (January 15, 2018)", *Ministry of External Affairs, Government of India*, 2018, mea.gov.in/bilateral-documents.htm?dtl/29356/List_of_MoUsAgreements_signed_during_the_visit_of_Prime_Minister_of_Israel_to_India_January_15_2018.

71. Yoav Leitersdorf and Ofer Schreiber, "A Look Back At The Israeli Cyber Security Industry In 2018 – Techcrunch", *Techcrunch*, January 7, 2019, techcrunch.com/2019/01/06/a-look-back-at-the-israeli-cyber-security-industry-in/

72. "Tech Mahindra, Israel Aerospace Industries Team Up For Cybersecurity", *Moneycontrol*, October 3, 2018, https://www.moneycontrol.com/news/technology/tech-mahindra-israel-aerospace-industries-team-up-for-cybersecurity-3009091.html

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