EVOLUTION OF ISRAEL'S NUCLEAR PROGRAMME: IMPLICATIONS IN POST-IRAN NUCLEAR DEAL ERA

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Introduction

Israeli nuclear programme is considered a matter of extreme sensitivity and prime national interest domestically. Very few people have been able to openly talk and objectively write on the Israeli nuclear programme in Israel as well as the US. As a result, the subject is rarely approached by scholars from an academic viewpoint, probably in an attempt to avoid being labelled as anti-Semitic. Such problems create difficulties in evaluating Israeli nuclear programme because a lot of research on the subject is either based on conspiracy theories prevailing about the issue or a narrow subjective interpretation of the Tel Aviv's official position. The international influence of Israel also makes objective evaluation of the Israeli nuclear doctrine a difficult subject.[1] Strong and influential pro-Israel lobbies, pressure groups, media, and financial institutions discourage attempts at bringing Israel, its nuclear programme, or its atrocities against Palestinians into the limelight. Hence these issues remain shrouded in mysteries and secrets, which objective academics rarely debate. The Israeli nuclear programme was mostly funded by wealthy Jews of the world and was not just a nationalistic project as is usually projected in the media.[2] Many scholars even turn a blind eye to some very serious and unprecedented breaches and incidents of nuclear proliferation which would be analyzed in the paper. This behaviour clearly illustrates that nuclear proliferation concerns of most academics and scholars have different barometers when it comes to Pakistan,

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Iran, North Korea, and Israel. The Israeli nuclear programme mostly enjoys immunity from criticism and scrutiny in the media, and even at international forums, despite the fact that the Israeli story of acquiring nuclear weapons is much more contentious than other nuclear weapon states outside the Nuclear Non-proliferation Treaty (NPT).

This paper is aimed at exploring the role of different states in deliberately assisting Israel in acquiring nuclear capability, besides analyzing the historical and present geo-strategic aspirations/environments that shaped Israel's threat perception and conventional/nuclear response options.

Israel's history: an overview of regional hegemony

On 29 November 1947, UN announced the partition plan proposing a Palestinian and a Jewish state. Jews, expecting a much larger territory were dissatisfied with the plan. Therefore, they sought British and French help to arm themselves subsequently to forcibly expel the Arabs in a quest to expand the borders of the Jewish state.[3] The Jewish quest for expanding the borders resulted in armed clashes with the Arabs, leading to Arab uprisings against the British and the Jews. The British mandate on Palestinian land was to expire on 15 May 1948 but David Ben-Gurion announced the independent state of Israel on 14 May 1948, which resulted in the first Arab-Israeli war of 1948. Although the skirmishes continued for several years, the second major Arab-Israel confrontation erupted on 28 October 1956 after the nationalization of the Suez Canal by Egypt, which was used as a pretext by Israel to launch a surprise pre-emptive attack on the former with the collusion of Britain and France.[4] The war stopped only after a Soviet threat to intervene with nuclear weapons, thus prompting the US to enforce a truce.[5] Although the US intervention ended the war, it drew Israel and France closer over strategic and nuclear issues.

The famous Six Days War started on 5 June 1967 with the Israeli pre-emptive airstrikes on Egypt resulting in the destruction of more than half of Egyptian fighter aircrafts before they could actually become airborne. Later, in a blitzkrieg type manoeuvre Israeli mechanized forces captured Sinai from Egypt, Jerusalem from Jordan, and Golan Heights from Syria.[6] After the war, a long era of hostilities involving ground and air skirmishes—called the war of attrition—started between Israel and its neighbours, which lasted until 1973. The period from 1967 to 1973 was utilized by the defeated Arabs to arm themselves and overcome their defensive and offensive weaknesses. Confident of their capabilities, Syria and Egypt finally launched a surprise attack on Israel on 6 October 1973. The initial successes of Egyptian and Syrian armies did not last long though, especially after France and the US transported supplies through sea and air to help Israel regain the lost territories and pride. On the other hand, Soviet supplies helped Egypt and Syria to keep fighting and prolonging the battle. Fearing a spill-over of the war, the US and the USSR arranged a ceasefire, which was broken by Israel on the secret advice of the then US secretary of state Henry Kissinger on 23 October 1973, which prompted the Soviets to issue a direct ultimatum to intervene, thus bringing the war to an end on 25 October 1973.[7]

After years of diplomacy, Camp David accord was finally signed between Israel and Egypt in September 1978, which was seen by most in the Arab and Muslim world as an act of treachery by Egypt that had helped Israel in securing its most vulnerable front. This victory subsequently encouraged Israel to launch an attack against Lebanon on 6 June 1982, apparently to create a buffer zone against Palestinian militant activists from the north. However, the real Israeli intentions for the invasion were to extend Israeli hegemony over the region with the help of non-state actors like Maronite Christian Phalangists.[8] The war did not yield desired results for Israel and instead fetched international condemnation over its indiscriminate use of force resulting in thousands of innocent civilian deaths including women and children.

The most heart-breaking massacre took place at Sabra and Shatila refugee camps where thousands of women and children were brutally killed by Phalangists under the direct auspices of Israeli military commanders to be known subsequently as the most brutal acts in recent history.[9] Such incidents increased pressure on Israel. Amidst international criticism, Israel had to withdraw from the occupied Lebanese territories in 2000. This invasion, nevertheless, resulted in creation of new and more potent militant groups like Hamas and Hezbollah. The subsequent years saw a long trail of resistance from these armed militant groups against Israeli occupation.

On 12 July 2006, Israel launched an attack on Lebanon in retaliation to a raid by Hezbollah on its military patrol. This war also did not yield the desired results for Israel due to indiscriminate Israeli aerial and artillery bombing, which caused huge loss to innocent civilians as well as infrastructure. Therefore, according to some analysts, the moral cost outweighed any benefits Israel had perceived to achieve from this war.[10] Even more drastic was the result of repeated Israeli invasions of Gaza, first in 2008-09, second in 2012, and third in 2014. All of these resulted in thousands of innocent human fatalities including women and children, and consequently became counterproductive for Israeli image in the global community. Nevertheless, despite humanitarian calls from most of the world leaders to end occupation and bombing of innocent civilians in Gaza, it was the US support and the Israeli confidence in its nuclear weapons capability that enabled it to bomb innocent civilians with complete impunity. The consistent Israeli aggression and its lack of appetite for peace amid instability in the Arab world has not only become a source of concern for Israel, but has also, to some extent, isolated it within the international community.[11]

Construct of Israeli threat perceptions

Israel is considered a nation enjoying unqualified financial and moral support from the US and some EU states. It maintains a strong state of the art military, air force, and navy, which distinguishes it amongst some of the world's most heavily armed nations. Yet, despite receiving billions of dollars in aid from the US, Israel has not formally signed any defence treaty with the former and continues to follow the principle of self-help and self-reliance. Prevailing strategic mosaic quantifies Israeli threat perceptions in three broad categories: existential threat, a potential distant threat, and a persistent security threat.[12]

Israel regards its hostile Arab neighbourhood as an immediate threat, especially Iran and Syria; a potential existential threat is perceived from Egypt and Jordan; whereas any Arab state with a potential to arm itself with nuclear weapons is contemplated as an existential threat by Israel.[13] Iraq, prior to the US invasion of 2003, was regarded as a distant but serious threat by Israel. However, since the destruction of Iraqi military capability after the US invasion of 2003, Iraq has ceased to be a serious threat to the Jewish state.

Interestingly, Pakistan also emerges on the Israeli strategic calculus as a serious and credible threat, and has been mentioned from time to time in statements of Israeli politicians and officials.[14] Israel also perceives a persistent security threat from lightly armed militant groups like Hezbollah, Hamas, Islamic Jihad, Palestine Liberation Organization (PLO), Popular Front for Liberation of Palestine (PFLP), Al-Aqsa Martyrs' Brigade etc. which actually do not have the potential to pose a significant threat to the state of Israel. The contemporary Israeli threat perceptions were shaped due to the following factors:[15]

- An all-out initial Arab quest and plan to wipe off the state of Israel;
- Use of hostile language and overt threats from Arab governments against the state of Israel;
- Prevailing demographic and territorial asymmetry between Israel and its Arab neighbours;
- Perceived vulnerability of Israel to defend itself from all sides in a hostile neighbourhood.

Israeli response to perceived security and existential threats

Conventional

Israel maintains a sizeable, well equipped, and hi-tech conscript military, which is ranked 13th in the world.[16] The Israel Defense Forces (IDF) was organized from militant and terrorist groups like Irgun Haganah, Irgun Zvai Leumi (IZL), Palmach, Stern Gang etc. during the 1948 war.[17] IDF provides the first line of defence against the conventional existential and distant threats. Every Israeli citizen has to serve for a specified term (3 years for men and 2 years for women) in the military at the age of 18, with very few exceptions. After the compulsory service, one can either become part of the reservist cadre, required to attend training sessions of one month every year, or join the regular force as a profession. Despite facing a hostile neighbourhood with Lebanon in the north, Syria in the northeast, Jordan in the east, and Egypt in the southwest, Israel still enjoys qualitative land, air, and sea military superiority over its adversaries. This superiority always enabled Israel to maintain a winning edge over its Arab neighbours in almost all the battles since 1948. Not only has Israel ruthlessly employed its armed forces to brutally crush the Palestinian resistance, which it regards as a persistent security threat, but has also used or planned to use them against the distant potential threats like Iraq and Pakistan. In 1981,

Israeli Air Force bombed out the Iraqi nuclear reactor at Osirak. In 1982 and 1986, with Indian collaboration, Israel planned to carry out airstrikes against Pakistan's nuclear installations at Kahuta, but these were called off at the last minute by India fearing the cost of a retaliatory strike by Pakistan.[18] Israeli foreign minister is on record to have termed Pakistan as the biggest threat to Israeli security in 2009.[19]

Nuclear

Due to expansionist designs aimed at gaining more territory, Israel made the entire Arab neighbourhood hostile towards it. Threatened from all sides, Israel sought the ultimate weapon to ensure its security against existential threats. Possibility to employ nuclear weapons against an adversary is termed the 'Samson Option'. Samson, a biblical character in Jewish history, was imprisoned for public execution by the Philistines in a temple full of 3,000 spectators. However, before Samson could actually be executed, in an act of self-immolation, he rammed into the main pillar to bring down the whole structure on spectators, resulting in their instant death.[20] Consequently, the philosophy of Samson Option pivots around the fact that Israel, due to its size and demography, can't exist after a nuclear strike; therefore, before it perceives an end or surrender, it would destroy its enemies in a nuclear suicide.[21]

Evolution and development of Israeli nuclear programme

History of Israeli nuclear programme

After having rejected the UN partition plan in November 1947, Israeli leaders knew that they were on a confrontationist path with their Arab neighbours. Having no formal military, the Israeli leaders desired for weapons of mass destruction. The Israeli nuclear aspiration fermented back in April 1948 when the first prime minister of Israel David Ben-Gurion expressed hope to organize the Jewish scientists who could devise means both for 'mass scale killings' and 'cure'. He was optimistic that if the three Jewish scientists, Oppenheimer, Teller, and Einstein could discover the power of atom in the US, same could also be done by Israeli scientists in Israel.[22]

The beginning of Israeli nuclear programme can thus be traced back to 1948, when Israeli geologists were sent to Negev desert by the government in a quest to search for uranium reserves. In 1949, the Israeli government established its first Nuclear Research and Development Centre at Weizmann Institute in Rehovoth, and also encouraged students of the institute to go abroad in pursuit of higher degrees in nuclear-related fields. In 1952, Israel Atomic Energy Commission (IAEC) was established under the directions of David Ben-Gurion[23] whose earnest desire for nuclear weapons had started in early 1950s resulting from the conviction that Israel's continuous expansion and security in a hostile Arab neighbourhood was only possible after having acquired the weapon of last resort.[24] Meanwhile, former US president Dwight Eisenhower launched his famous nuclear initiative under the rubric of Atoms for Peace, which enabled

Israel to have its first nuclear research reactor of 10 MW at Nahal Soreq. This reactor was fuelled by highly enriched uranium (HEU), which was provided by the US on condition that it would remain under the international safeguards, an arrangement which still remains intact.[25]

The initial French cooperation with Israel started in early 1950s, but after the Suez Crisis of 1956, this cooperation deepened, which paved the Israeli path for acquisition of nuclear weapons. In 1956, France and Israel signed a secret agreement to build a 24 MW (according to other estimates up to 150 MW)[26] natural uranium reactor called Machon 1 at Dimona along with four components including a plutonium separation plant (Machon 2), a waste treatment plant (Machon 4), and a laboratory to test uranium purity levels (Machon 8). Although the reactor became operational around 1963 or 1964, its plutonium separation plant started functioning in 1969.[27] some reports revealed, however, that France had actually supplied Israel with enriched uranium, the plutonium separation plant, and even nuclear bombs in early 1960s, which were brought in a ready to use state during the Arab-Israeli War of 1967.[28] Dimona is believed to have a capacity of producing 20-40 kg of plutonium annually, sufficient enough to produce 5-10 nuclear bombs in a year depending upon their yields.[29]

Initially, Israel faced problems in obtaining critical materials and fuel for its secret nuclear facility at Dimona. Therefore, it had to rely on clandestine operations for seizing nuclear fuel and materials, besides secret uranium purchases from countries like Argentina, France, and South Africa.[30] Declassified documents in the UK reveal that in 1961 the British government sold 20 tonnes of surplus heavy water worth £1.5 million to Israel in a top secret deal.[31] Furthermore, in 1966 the UK government secretly sold tonnes of chemicals to Israel including uranium-235, plutonium, and other nuclear-related materials, which were intended to be used for making boosted fission devices. These illegal exports, or nuclear proliferation, clearly violated the safeguards established by the European Atomic Energy Community also referred to as EURATOM.[32] There were other reports suggesting that spent nuclear fuel, weighing up to 40 tonnes, was brought back to France from Dimona after being used in the reactor according to the deal, but up to half of it was secretly shipped back to Israel which was enough for manufacturing at least 15-20 nuclear bombs.[33]

After December 1960, when a US spy plane U-2 discovered Dimona, pressure started mounting on Israel, and Kennedy administration demanded Israel to come clean on its nuclear issue. Caught in a tight situation, Israel had to open up its facility at Dimona for US inspectors from 1961-1967. Israel, however, claimed Dimona to be a commercial industrial facility (textile factory) and blocked access to the underground floors housing nuclear facilities by building concrete walls at the entrance. Later on, the US scientists also acknowledged that they were neither given free access for the inspections nor were they able to establish whether the activities going inside Dimona had anything to do with the alleged clandestine nuclear issue.[34] After 1969, Israel flatly refused to grant permission for inspections, and despite rising controversy

over its clandestine nuclear activities, Israel remained committed to secret procurement of nuclear materials wherever it could lay its hands on them. There are at least four major cases of uranium theft or hijacking, which allegedly involved Israeli intelligence agencies.

The first major incident regarding theft of nuclear-related material by Israel was discovered in the US, which was later known as the 'NUMEC Affair' or 'Apollo Affair'. The case was discovered by the US intelligence agencies in 1965 during an investigation, which was primarily launched to account for approximately 206-392 pounds of HEU which remained unaccounted for from the Nuclear Materials and Equipment Corporation (NUMEC) in Apollo, Pennsylvania.[35] There were several rumours regarding the incident. First, NUMEC head Zalman Shapiro had sold the HEU to Israel through Rafi Eitan, who was a Mossad agent in the US.[36] Second, this diversion was done with the help of the CIA. Third, it was done with the tacit consent of the US government because for 11 years, until 1976, no proper or serious inquiry was conducted either by the FBI or the CIA, despite a formal request from the Department of Energy (DOE).[37]

Seymour Hersh, in his book *The Samson Option*, has refuted all these reports and has offered a very different explanation for the missing quantity of uranium. According to Hersh, the uranium had seeped into floors and some quantities had even flung into the air thus sticking with metallic sections of the nuclear plant. Thus once it was decommissioned in 1982, over 100 kg of enriched uranium was recovered from various parts of the plant, including the floor, during the dismantling operation.[38] But Hersh offers no documentary evidence to support his assumption, which thus can be contested on several accounts.

First, the scientific community should have been aware that such losses do occur as a routine in nuclear plants and thus there was no reason to raise an alarm. Second, while carrying out repeated inspections, the DOE should have found out these traces either on the metallic components or the floor of the nuclear plant. Third, if the FBI and the CIA were not aiming for a cover up, there was no plausible reason for their reluctance to conduct a thorough inquiry into the issue for 11 years. Fourth, if the lost uranium was recovered by 1990, there was no reason for the US Nuclear Regulatory Commission (NRC) to deny the Pennsylvanian Senator Arlen Specter's request to clear Zalman Shapiro from the uranium diversion issue in 2009.[39] Last, the *Pittsburgh Review* ran a piece of investigative journalism on the NUMEC affair in 2002, which revealed that the CIA and the FBI were actually involved in the cover up and once Mr. Zalman Shapiro was contacted to talk and clear his position on the issue, he declined the request.[40]

The second incident occurred in 1968, when a German-built freighter Scheersberg-A, carrying 200 tonnes of uranium oxide (yellow cake) in 560 drums along with other cargo equipment, started its journey from Antwerp, Belgium, for Genoa, Italy. The drums were disguised as paint cargo with 'Plumbat' written on the outer side.[41] Halfway during the voyage, the ship docked at Rotterdam where the old crew was discharged and Mossad agents—

disguised as the new crewmen—took over.[42] The ship never reached its final destination and was found abandoned and empty near the Turkish port of Iskenderun after 15 days without a single trace of uranium oxide.[43] This incident is usually referred as to 'The Plumbat Affair'.

In 1973, a Mossad agent Dan Aerbel was apprehended by the Norwegian police on account of a suspected murder. During investigation he revealed various other secrets including the fate of yellow cake on Scheersberg-A. According to Aerbel, the drums of uranium oxide were loaded onto an Israeli vessel and shipped to Israel, whereas Scheersberg-A was abandoned near the Turkish port.[44]

There have been other reported incidents of uranium theft by the Mossad agents who, after firing tear gas grenades in commando style attacks, hijacked trucks loaded with uranium at two separate places in Britain and France in 1968 and 1969, respectively, leaving empty trucks behind and shipping uranium to Israel.[45] Classified reports obtained under the Freedom of Information Act reveal that in 1975 Israel had offered the sale of Jericho missiles along with nuclear warheads to South African prime minister. Minutes of a top secret meeting held between former South African prime minister P.W. Botha and the then Israeli defence minister Shimon Peres disclosed that the South African prime minister had asked for missiles and nuclear warheads which Israeli defence minister offered in three sizes.[46] However, the deal could not be finalized due to the high cost of these warheads.[47]

In 1960s, Argentina provided Israel with more than 80 tonnes of enriched uranium. Intelligence agencies of at least three countries, i.e., Canada, the UK, and the US, had concluded after evaluating their intelligence reports that the transfer had actually taken place but no further action was taken by any of the governments even after this confirmation.[48] Besides the Argentinean sale, other reports claim that in 1970s South Africa sold over 600 tonnes of uranium to Israel in return for about 30 grams of Tritium, which was sufficient for up to 12 nuclear bombs.[49] FBI declassified documents further revealed that a systematic operation was carried out inside the US—involving some high-level Israeli officials in coordination with Mossad—to smuggle sensitive nuclear materials to Israel including more than 800 Krypton nuclear trigger switches known as 'Krypton Switches' from California-based trading company MILCO International Inc.

The operation involved Israel's current Prime Minister Benjamin Netanyahu, who had personally smuggled these switches from the US to Israel.[50] The president of MILCO Richard Kelly Smith disappeared from the US during investigation leaving behind his property and home. He was arrested in Spain in July 2001 and subsequently awarded 40 years in prison along with a fine of $20,000 but was bailed out only after four years of imprisonment. Moreover, the main accused in this illegal transfer, billionaire Hollywood producer Arnon Milchan, who served as a link between the Israeli Defence Ministry and MILCO, was never implicated in the case.[51]

In 2012, *Washington Post* published a report revealing that the US Army Corps of Engineers (USACE) had built a secret facility in Israel to handle

nuclear weapons. A month later, however, it partially retracted from the story, stating that although the USACE had acknowledged the construction of a five-storey underground facility named 'Site 911' at an Israeli air base, it would not be used for handling of the nuclear weapons.[52] The report did not cite the purpose for this five-storey underground military facility. In the same year, German magazine *Der Spiegel* ran a story regarding German sale of Dolphin class submarines, which were later to be fitted with nuclear-capable cruise missiles in Israel.[53] The deal between Germany and Israel was unique in the sense that the German government not only agreed to share one-third of the project cost amounting to $170 million, but also deferred the payments without consulting the EU. As of April 2015, four out of six submarines have been shipped to Israel while the fifth is almost ready to be dispatched; the remaining vessel is expected to be delivered by 2017.[54] There are rumours that Israelis have plans to buy three more Dolphin class submarines in future. These submarines are expected to be fitted with Popeye Turbo cruise missiles having a range of 1,500 km.[55] There are even reports in the American press indicating that the US actually helped Israel in acquiring critical technologies that could have possibly helped Israel in developing Thermonuclear or Hydrogen bombs.[56]

Consequently, success of the Israeli nuclear programme can rightfully be attributed to tacit support by states like Argentina, France, South Africa, the UK, and the US, which monumentally facilitated Israel in acquisition of nuclear weapons.

Nuclear testing

Israel has neither publicly proclaimed that it is a nuclear weapon state nor has it explicitly tested a nuclear device. There are reports of several Israeli nuclear tests secretly conducted within and outside the state of Israel though. It has also been learnt that while French nuclear scientists were facing problems regarding their nuclear research and development activities, Israeli scientists were known to have produced low-grade uranium from phosphate in the Negev desert, besides being able to develop an efficient technique to produce heavy water in low quantities. Therefore, Israeli and French scientists decided to share their expertise with each other. Consequently, in 1960 (1953 according to other sources) Israeli scientists were invited at a French nuclear test site in Sahara desert and were also given unrestricted access to the technical data of nuclear tests.[57] Some Western intelligence sources believe that Israel conducted its first underground nuclear test somewhere in Negev Desert in 1963.[58] Numerous other sources also report about a zero yield test, probably of an implosion device, secretly conducted at Negev Desert on 2 November 1966 by Israel.[59] Declassified documents of 1979 have further revealed that Israel had secretly carried out a nuclear test in the Indian Ocean, possibly in collaboration with South Africa, which was detected by a US spy satellite 'Vela'.[60] Although some analysts regarded it as a flash from some meteor, most concluded it to be a flash as a result of nuclear testing. Earlier in 1977, preparations of a nuclear testing site in the Kalahari Desert were picked up by a Soviet spy satellite and communicated to the US; thus the nuclear device could not apparently be tested

due to mounting international pressure.[61] Other reports hypothesize, however, that probably an extremely low yield device or a neutron bomb was tested in the Kalahari Desert, which had either failed to detonate[62] or could not be detected at the time due to technological issues. Although the detection techniques have improved to a great extent in recent years—with very few yields still remaining undetectable—this obviously was not the case a few decades ago.[63] Therefore, the possibility of an Israeli nuclear test at the Kalahari site cannot be ruled out entirely. The chronology of suspected nuclear tests conducted by Israel according to various sources is given below:

Testing Year	Venue	Source
1963	Negev desert	"How Israel got the bomb," *Time,* Special Report, 12 April 1976.
1966	Negev desert	Avner Cohen, *Israel and the Bomb,* p.403, note 42.
1977	Kalahari desert (joint test site by South Africa and Israel, possibly abandoned)	Gillian Bourassa, "South Africa's Nuclear Weapons Program," *International Studies Review,* Washington College, Vol. IV, 2007, p.85, 90. According to another source, "Israel's nuclear programme: An analysis of International assistance," by Atiq-ur-Rehman published in *Berkeley Journal of Social Sciences,* Vol. 1, Issue 3, March 2011, it is not sure whether the device was a Neutron bomb or it just fizzled out.
1979	Indian ocean (joint test by South Africa and Israel)	"The 22 September 1979 Event," *Director of Central Intelligence Agency,* Inter agency Intelligence Memorandum, December 1979, declassified in June 2004. Also Michael Karpin, *Bomb in the Basement,* p.343.

Main contours of Israeli nuclear policy and doctrine

Nuclear policy

Right from the outset, Israel has maintained a nuclear policy of 'strategic ambiguity', known as '*Amimut*' in Hebrew, which emanated from the slogan of 'never again' adopted by the Jewish Defence League. The never again motto means, "never again will Jews be victimized; never again will Jews be scapegoats; never again will [Jews] stand idly by while Jewish blood is spilled; never again will [Jews] be silent."[64] Therefore, nuclear weapons remain the Israeli insurance against regional and extra-regional threats.

Self-reliance

The core of Israeli defence policy is based on self-help and self-reliance. Although Israel enjoys very strong military ties with European and other states like China, India, and the US, it neither solely relies on their support nor has concluded any formal defence treaties with any of them. Israel believes that such an arrangement could limit its defensive and offensive options.[65]

Deliberate nuclear ambiguity

Israel neither confirms nor denies the existence of its nuclear deterrence. Although this policy of secrecy has kept Israel immune from international criticism to a great extent, scholars debate the efficacy of this doctrine in contemporary strategic environment.[66] In the near future, Israel is likely to continue with its policy of '*Amimut'* or nuclear ambiguity though.

No parallel regional nuclear rival

Israel has vowed that it will not permit another nuclear rival in the region even if it entails a pre-emptive airstrike. Not only has it destroyed nuclear sites and reactors of Iraq and Syria in the past, but has also threatened to bomb the Iranian nuclear facilities. In case Iran definitively reaches closer to making a nuclear bomb, or the hope for a diplomatic breakthrough withers away, such a strike becomes extremely likely even though the exact time of the strike remains contestable.[67]

Holding back from introducing nuclear weapons in the region

Israel has also reaffirmed that it would not be the first to introduce nuclear weapons in the Middle East, implying that it would neither be the first to publicly acknowledge the existence of its nuclear deterrence, nor the first to overtly test the device.[68] This Israeli policy has helped it to justify pre-emptive strikes against nuclear installations of other regional states.

Nuclear Harakiri

Israeli nuclear deterrence is also known by its alternate name, 'Samson Option', which implies, 'if we go, everyone goes' or in other words it warns, "We [Israel] may have to die, but this time we don't intend to die alone."[69] This concept of collective suicide comes from historical Jewish tradition and perfectly adds to the credibility of nuclear deterrence.

Nuclear doctrine

Although Israeli nuclear doctrine remains shrouded in mystery, the pattern of previous Arab-Israeli wars illustrates that Israel would not hesitate to use nuclear weapons in extreme circumstances as a last resort, regardless of whether the adversary has a nuclear capability or not. Consequently, 'first use but last resort' remains the corner stone of Israeli nuclear doctrine.[70] Israel has never acknowledged its nuclear weapons capability. Therefore, it remains an extremely challenging question whether Israel would resort to pre-emptive first strike or not. Analysts and think tanks have concluded, however, that using low

yield (tactical) nuclear weapons in a pre-emptive strike remains a plausible option for Israel.[71]

Pre-emptive and retaliatory options

Israel might use nuclear weapons in the following perceived scenarios either in defensive or pre-emptive manner:

- Capture of a large area by an adversarial force advancing deep into Israeli territory and populated areas;
- Successful annihilation of a major portion of the Israeli air force;
- Substantial destruction of Israeli cities in massive aerial attacks/strikes;
- Biological or chemical attack over an Israeli city;
- Use of a nuclear weapon over an Israeli territory;
- Perceived threat of a nuclear strike;
- Specifically targeted strike on Israeli nuclear installations;
- Grave nature of risk, which Israel considers as an existential threat.

Iran nuclear deal and Israeli nuclear posture: Heading for confrontation or cooperation?

Israel has been persistently making a case for military strikes against Iranian nuclear installations and vehemently opposes the Joint Comprehensive Plan of Action (JCPOA) alongside Saudi Arabia. This does not illustrate that Israel and Saudi Arabia have formed an alliance against Iran; rather both states share common concerns over Iran's nuclear expertise and ineffectual consequences of sanctions imposed on Iranian nuclear programme. Both states are apprehensive that the nuclear deal would enable Iran—which largely remains unaffected by the sanctions—to use its nuclear capability for blackmail and regional hegemony. Other Gulf Cooperation Council (GCC) states also share the concern that after the nuclear deal Iranian economy would considerably improve, thus bolstering Iranian desire to dominate the Persian Gulf and perpetuating regional instability and conflict. Core Iranian goals in the region are as follows:[72]

- Exercising regional dominance and gaining international significance;
- Maintaining the posture of a nuclear breakout state for economic, political, and strategic bargains without actually crossing the nuclear threshold;
- Improving economic ties with states within and outside the region;
- Using its existing nuclear capability as a strong bargaining chip to remain an important regional player;

- Supporting the pro-Palestinian proxies and militant groups to increase its sphere of influence and capabilities against hostile states, especially Israel;
- Promoting the Shiite ideology and influence in neighbouring and Shiite populated states.

After the deal, Iran could become more active in supporting pro-Shiite groups and militias in Sunni states in the Middle East, creating problems for the Sunni monarchies.[73] Israel also considers a nuclear-armed Iran an existential threat, as it could profoundly limit Israeli military options against Iranian allies and proxies in the region. The JCPOA, also known as Iran nuclear deal, does not obliterate Iranian technical expertise and capability in the nuclear field, but imposes some constraints for a specified period. Following are some key limits on Iranian nuclear programme under JCPOA:[74]

- Restriction on the level of uranium enrichment from 20 per cent to 3.67 per cent for 10 years;
- Reduction in the number of centrifuges from 10,000 to 5,060 for enrichment purpose;
- Reduction of low-enriched uranium stocks from 10,000 kg to 300 kg;
- Termination of uranium enrichment activities at all other sites except Natanz for a period of 15 years;
- Re-designating of the status of Fordow uranium enrichment centre to nuclear physics and technology centre, not allowing any enrichment activity at the facility;
- Introduction of design changes to Arak heavy water reactor to ensure that it is not able to produce weapons grade plutonium;
- Restriction on storage and procurement of heavy water other than essentially required at Arak nuclear reactor;
- Provisional application of additional protocol to Iranian comprehensive safeguard agreement;
- Round the clock permission to the International Atomic Energy Agency (IAEA) inspectors to access all the sites related to nuclear fuel cycle;
- Non-reprocessing of spent fuel for the next 15 years;
- Establishment of a joint commission to evaluate and assist in procurement of Iran's fuel and other requirements for peaceful nuclear activities through the Nuclear Suppliers Group (NSG), as allowed under the NPT;
- Sanctions related to nuclear activities to be lifted gradually after due verification of the agreed clauses in the nuclear deal by the IAEA and endorsement by the United Nations Security Council (most of the sanctions related to nuclear activities have already been lifted);
- Negotiation of a roadmap on the part of Iran to clear all past and present outstanding issues related to suspicious nuclear activities;

- Resolution of any issue with respect to providing IAEA access to a suspected or undeclared nuclear-related site through the joint commission within 24 days.

The deal initially was a divisive issue in Iran, despite getting eventually passed in the Majlis (the Iranian parliament) through a 161 vs. 59 vote, with 13 abstentions.[75] Iranian Supreme Leader Ayatollah Khamenei has termed some clauses of the deal as 'excessive' and 'insulting'. Iran also temporarily suspended the dismantling of centrifuges. As a result of lifting of the sanctions after the deal, Iranian economy would significantly improve, which is likely to make the deal popular within the Iranian nation besides strengthening Iranian stature in the region. Republicans in the US are also opposed to the deal and have threatened to scrap it once elected to power. However, reversing the deal and imposing sanctions again would not be an easy option for the Republicans.[76] The deal could nevertheless be threatened by some miscalculated Iranian action—like testing a long-range missile—or Syrian conflict escalating into a regional war as a consequence of an extremely provocative Iranian action. Thus in case the deal fails—even though less plausible—the probability of an Israeli strike on Iranian nuclear installations, with or without US support, would substantially increase.

Implications of Israeli nuclear programme and JCPOA for the region and nuclear non-proliferation regime

The possession of undeclared nuclear weapons by Israel could have numerous negative implications for the region as well as the global nuclear non-proliferation regime. Due to strict implementation and verification mechanism of the nuclear non-proliferation regime, however, the repercussions are not likely to be precipitous. With the growing sense of isolation amongst the GCC states, especially after Washington's renewed priorities in the region, these states are seeking to devise defensive mechanisms of their own against perceived regional and extra-regional threats. In response to Iran's suspected nuclear ambitions and capabilities alongside Israeli nuclear threat, the GCC states are likely to seek nuclear weapon capability in future, and the following consequences might trail thereon:

- Due to the undeclared nuclear weapons programme of Israel and Iranian nuclear capability, there is no possibility of Middle East becoming a nuclear free zone in future. Policies related to nuclear issues premised on discrimination could influence other states—most notably Iran, Saudi Arabia, and the UAE—to seek nuclear weapons.
- Iran's nuclear expertise and scientific skills would largely remain unaffected even after the successful conclusion of JCPOA. The deal only imposes a few limits on Iranian nuclear activities like uranium enrichment, heavy water production and stocks, and spent fuel re-processing etc. for 10-15 years. Consequently, Iran would have time to further improve upon the existing capabilities during the moratorium period. Iran—

which sees itself in strategic competition with other regional states, especially Israel, Saudi Arabia, and Turkey—would remain a threshold nuclear state,[77] in extremis, influencing the nuclear choices of other states in the region.

- Since the JCPOA, Iran is struggling to improve its relations with the West. If the deal remains a success story, Iran-Israel relations might also improve. Not only were Iran and Israel strategic partners prior to 1979 Islamic revolution, but they have also been discreetly interacting with each other even after that.[78] Therefore, emergence of the unique strategic equation between Israel and Iran under moderate governments on either side remains a plausible scenario in future.
- Israeli nuclear weapons programme would always remain at the heart of the nuclear non-proliferation debate in the region. This particular issue risks persuading other regional states seeking regional pre-eminence or security—like Egypt, Iran, Saudi Arabia, and Turkey—to contemplate the nuclear option; putting the future of nuclear non-proliferation regime in an indeterminate state.
- If other states in the region abandon NPT in pursuit of nuclear weapons, there could be a domino effect, with more and more states, both within and outside the Middle East, opting for nuclear weapons either due to security compulsions or for prestige and stature. North Korean nuclear and missile tests have already renewed the nuclear debate in Japan and South Korea.
- Abandonment of NPT by states in the Middle East or elsewhere would seriously undermine the nuclear non-proliferation regime, thus possibly rendering it redundant and irrelevant in the end.
- Nuclear weapons programmes, if so initiated by states in the Middle East, would ostensibly evoke Israeli pre-emptive strike policy. Such a scenario would profoundly deteriorate the security situation in the region, thus leading to a major regional war between Israel and its neighbours, presumably involving global powers.

Conclusion

Israel perceives considerable security threats due to its continued policy of occupying the Palestinian territories. But its nuclear weapons capability along with a sizeable conventional force provides insurance to its expansionist policies. Israel's acquisition of nuclear capability is attributed to its clandestine activities and operations, which enjoyed overwhelming support of some of the advanced Western countries. The ubiquitous Western support to Israeli nuclear ambitions makes it immune from criticism which encourages other regional states to contemplate the nuclear option. The complex security paradigm in the

region not only perpetuates conflict along sectarian lines but also accentuates inter-state and intra-state rivalries. A nuclear pursuit in the region, amidst Israeli and Iranian nuclear programmes, would be an extremely dangerous and destabilizing proposition. The growing instability in the Middle East at strategic and tactical levels would make it extremely difficult to keep an effective check on nuclear materials and proliferation. Iran nuclear deal only offers short-term solutions to the existing complexities, which cannot be solved without addressing the question of nuclear proliferation as a whole rather than being state specific.

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