AFFORDABLE AIR POWER IN AN ERA OF GUNS VERSUS BUTTER

AMIT GUPTA

We live in an era in which air power has become indispensable: it is used for a variety of missions; its users range from the armed forces to the civilian security sector; and it is also extremely expensive. Air power is no longer the sole function of air forces or restricted to the use of combat aircraft. In the United States, the Central Intelligence Agency (CIA) has built its own air force and used it to eliminate terrorists in Afghanistan, Pakistan, and Yemen. Police forces around the world now use unmanned aircraft for monitoring and surveillance, while border security forces employ them to track illegal immigration and trans-border crime. Yet, at the same time, buying and maintaining aircraft has become an increasingly expensive business—especially for democracies that have to balance the needs of the armed forces with the more immediate social welfare needs of domestic societies. Thus, in India, for over a decade, the defence budget has stagnated at around 2 percent of the Gross Domestic Product (GDP) (and this includes the pensions paid to the veterans). The question then arises: how do you build up your air power to cover both external and internal security situations in an age of budgetary constraints?

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THE NEED FOR AIR POWER

Air power is now required for a range of tasks and new types of aircraft are sought by non-traditional operators across the world. Apart from high costs, the fact is that countries' requirements from air power are far more complex than can be met by the simple demand for combat aircraft. This has led to the emergence of drones as a useful tool in the application of air power. The advent of drones for missions ranging from long-range surveillance to close air support to security surveillance of urban and coastal spaces is transforming the way air power is being used, and challenging the rationale for expensive manned aircraft.

Countries like Brazil and Norway now need Medium Altitude Long Endurance (MALE) drones to deal with their environmental concerns. Brazil has to surveil its large Amazon province to prevent poaching and environmental degradation, while Norway worries that given its vast off-shore oil resources, one day it may face a huge oil spill that would need to be monitored by the right type of aircraft. Other countries require drones to monitor human trafficking, and in the case of Italy, the flow of illegal migrants across the Mediterranean. The US uses drones along both its Canadian and Mexican borders to carry out surveillance and apprehension of illegal migrants, and the introduction of small, tactical drones is seen as a force multiplier by the US Border Patrol.[1] Drone aircraft are also being increasingly used by civilian agencies to ensure both urban security and port security.

In congested urban areas, drones offer law enforcement the ability to patrol a large swath of territory, overcoming the traffic delays that are prevalent in major cities. If, for example, the Mumbai police force had drones

1. "Small But Mighty," US Customs and Border Protection Press Release, November 9, 2020.

when the 2008 terror attack took place, it would have been able to mobilise its personnel more effectively and perhaps have limited the number of civilian casualties.

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The cost of drones and their flexibility of use—a First Person View (FPV) drone fitted with a camera can be bought on Amazon—make them particularly attractive to police forces since these FPV drones can be carried in squad cars and launched from small spaces. To put this in perspective, in the early days of the Russia-Ukrainian War, the Ukrainian forces used the FPV drones of wedding photographers, with some success, to surveil and track Russian forces.

But perhaps the biggest shift in air power has been the need to use Unmanned Aerial Vehicles (UAVs) in the fight against terror. It was the CIA that first decided to use UAVs for aerial surveillance operations and later for prosecuting air strikes against terrorists. The CIA sought the Pentagon's help in acquiring the drones but the American Defence Department claimed that it would take five to ten years to bring such a programme to maturity and would cost between half a billion to one billion dollars. Requiring an alternative that was quicker to field, the then CIA Chief Admiral Woolsey, therefore, started an in-house programme to build drones. An Israeli-American UAV designer, Abraham Karem, who had owned a drone company that went bankrupt, was asked to improve his Amber series of drones to make them quieter and stealthier. Within roughly six months, the improved version of the Amber, now dubbed the Predator, was flying over Bosnia and giving real-time surveillance coverage of a difficult battlefield terrain.

The Predator was a success since it was of low-technology, made out of off-the-shelf components, and was later armed to become an anti-personnel aircraft. Yet, despite its success, it met with institutional resistance from the United States Air Force (USAF) since the planes were slow, easy to shoot down over a contested air space and worse, they took the fighter pilot out

of the cockpit. Teed Michael Moseley, the then chief of the USAF, was not interested in drone procurement and instead wanted more F-22s. There was also institutional resistance to drones because, as former Secretary of Defence Robert Gates wrote, the USAF was lukewarm to inducting drones since it was pointed out that that people joined the air force to become pilots and drones were unmanned and, therefore, unappealing to new recruits and existing pilots.[2]

Terrorism and insurgencies have also brought out the limitations of modern combat aircraft and the need for more dedicated platforms that can counter such threats. Thus, in both Nigeria and Afghanistan, it became clear that aircraft like the Jaguar and F-16 were of limited value against insurgents. Nigeria, therefore, bought the turboprop Super Tucano to take on Boko Haram, while in Afghanistan, the USAF gave Super Tucanos to the Afghan Air Force because they have a long loiter time and were, therefore, more useful for fighting the Taliban. At the same time, however, air forces require advanced combat aircraft to carry out the missions that they have been created for, and here the problem is of the escalating cost of modern combat aircraft.

THE ESCALATING COST OF AIR POWER

Over the past 40 years, one secular trend in air power has been the escalating cost and complexity of aircraft. Back in the 1970s, the United States designed and developed the F-16 as a lightweight fighter—a low-cost plane that was highly manoeuvrable and could be a foil to the more expensive, complex, and versatile F-15 Eagle, thereby creating a high-low mix of aircraft. More than 4,500 have been built and sold around the world and the aircraft, in a much more complex and more expensive version is still being produced as the new Block 70/72 aircraft that are being sold to Bahrain, Slovakia, Bulgaria, Taiwan, Singapore, and Jordan.[3] The original plane was sold in the 1970s at around $3.9 million and the Block 70 version is still considered

2. Robert M. Gates, *Duty: Memoir of a Secretary at War* (New York: Alfred A. Knopf, 2014), p. 128.
3. "F-16 Fighting Falcon Fast Facts", Lockheed Martin Press Release, March 2022.

a steal when compared to expensive new planes like the F-35 Lightning and the Euro Fighter.

Since the F-16, however, there has been only one plane that has been developed to be part of a high-low mix and that is the Chinese JF-17 Thunder which was sold to the Pakistanis at a "friendship price" of around $26 million. In the rest of the world, however, the push has been to develop increasingly complex and expensive systems.

The US and its allies, therefore, are buying the exorbitantly priced F-35 Lightning, China is headed towards building more advanced J-20 and J-31 fighters, while Russia is now slowly starting to induct the Su-57 fifth generation fighter (this was the programme that India walked out of because the Russians were reluctant to incorporate Indian requirements in the final design and refused to permit a full transfer of technology) and is moving towards designing and producing a new state-of-the-art fighter—the Su-75 Checkmate. In the future, France and Germany are planning to develop a sixth generation future combat air system that will have an interface between artificial intelligence and human pilots. In fact, under the present contract, both manned and unmanned vehicles are to be developed. Yet while this happens, more and more countries are cutting back on the purchase of expensive airplanes and, instead, soldering on with their dated fleets. Most recently, Indonesia has stalled its purchase of used Qatari Mirage 2000s because of cost constraints and, instead, will continue with its fleet of F-16s and Su-30s.

If one looks at the present international aviation market, only two countries—the United States and China—have the budgets to buy even a portion of what their armed services want for modernisation. The United States is pressing ahead with the F-35 programme, asking Congress for the funds to produce a sixth generation fighter and, at the same time, building a new version of the Eagle, the F-15 EX. The F-15 EX incorporates all the recent developments of the plane for foreign customers and will also, no doubt, include avionics from the F-35.

Pakistan's JF-17 is a low technology, cheap fix for the needs of the Pakistan Air Force (PAF) (the plane, reportedly, was sold by the Chinese at the "friendship" price of $26 million). But what the PAF, by some accounts, has been able to do is integrate a beyond visual range capability into the plane.

China's own aviation development is impressive. It went from essentially reverse engineering 6,000 MiG-19s and MiG-21s, thus, laying the groundwork for an aviation industry, to subsequently building the J-10 and more futuristic planes like the J-20 and J-31. It also bought the production line from Ukraine for the An-225, presumably to develop an indigenous heavy lift capability.[4] Moreover, China's economic growth allows it to invest in the development and production of new aircraft—a luxury that most nations in the world no longer have. as seen in the case of the Western alliance and the joint development of the F-35.

Going into the 2020s and 2030s, the backbone of the North Atlantic Treaty Organisation's (NATO's) air power was supposed to be the F-35 Lightning which is an advanced fighter that would have given the alliance's air forces a common and interoperable platform. The problem was that because the cost of the plane ballooned, the Western nations, with aging populations and strong social welfare programmes, were forced to choose between buying aircraft or paying for the welfare of their people (the guns vs. butter dilemma). The Canadians were initially the first to bail out when they decided to cancel their F-35 purchase, despite the sunk costs, and, instead, bought the moth-balled F-18s from the Australians (in 2023, the Trudeau government once again decided to opt for the F-35). Italy followed, by stating that it would not buy additional F-35s and would even prefer to reduce its existing order.

And then there are all the sub-systems that now make for effective air warfare. Pakistan's JF-17 is a low technology, cheap fix for the needs of the Pakistan Air Force (PAF) (the plane, reportedly, was sold by the Chinese at

4. Mike Yeo, "Antonov Sells Dormant An-225 Heavy Lifter Program to China", *Aviation International News*, September 6, 2016.

the "friendship" price of $26 million). But what the PAF, by some accounts, has been able to do is integrate a beyond visual range capability into the plane, making it a more formidable opponent for the Indian Air Force (IAF).[5] Better data links and modern radars are also part of the package needed to now make an air force effective. With air power being both indispensable and expensive, what implications does it have for the IAF as it seeks to maintain air superiority over its opponents? To answer this question one must look at the existing strategic environment and the challenges it poses for force modernisation.

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INDIA'S STRATEGIC ENVIRONMENT

India's strategic environment consists of the challenges posed on two fronts by its nuclear armed neighbours, the internal challenge posed by insurgencies and terrorism, the fact that as a country of influence, India will be required to use air power to promote its broader global objectives as well as its international status, and that unlike Pakistan or Israel, it does not have a dependable strategic partner.

India's two-front dilemma is alleviated by the fact that India's political leadership does not seek to militarily resolve its territorial disputes. No Indian politician, since the ceasefire of 1948, has sought a military option to regain Pakistan Occupied Kashmir (PoK). Similarly, no serious Indian politician has ever suggested using military force to retake Aksai Chin for, in both cases, the Indian government envisages a diplomatic solution to the territorial disputes (even along the Line of Actual Control with China, the objective is not of seizing Chinese territory but, instead, of retaining control over Indian

5. Charlie Gao, "Why Is Pakistan Using Chinese JF-17 Fighter Jets Against India?" *The National Interest*, August 6, 2021.

territory which Beijing claims as its own). Instead, India's military objective has been to deter attacks on the country and making a force to achieve this result is both more realistic and affordable.

What complicates this two-front challenge, however, is that in the case of Pakistan, there is a willingness to use force to change the status quo as seen by repeated wars with India and the support to terrorist strikes, the most notable being the 2001 attack on the Indian Parliament and the 2008 attack on Mumbai. The fact that Pakistan is willing to use both unconventional and conventional means, and threatens to use nuclear weapons, makes deterring it a difficult task. As was seen with the Indian strike on Balakot, however, air power is one way to raise the cost for Pakistan of engaging in future unconventional actions. The advantage of using manned air power in these cases, rather than engaging in unmanned missile strikes, is that it allows the political leadership to call off an attack if it is deemed politically unwise.

The other crucial part of dealing with the two-front challenge is to have a dedicated space-based capability which is particularly useful against China where the long border and the increasing territorial depth that the Chinese can use to launch stand-off weapons require a greater surveillance capability than that afforded by aircraft. At present, the IAF has a dedicated satellite, and when needed, access to another, but against China, a more robust space-based capability would be required given the Chinese ability to use Anti-Satellite (ASAT) weaponry. While India also has ASAT capability, it does not have the redundancy of satellites that the Chinese presently enjoy and, thus, investing in building and launching more military satellites becomes a priority for the Indian armed forces.

Coupled with this challenge, however, is the internal security challenge where the IAF is involved in providing Intelligence, Surveillance and Reconnaissance (ISR) as well as evacuation of casualties as has been the case against the Naxalites. This requires a set of low-cost capabilities that are dedicated to provide the necessary options to the IAF. While these requirements are important for a future force structure, they are tempered by the continuing preference of the Indian government for butter over guns.

GUNS VERSUS BUTTER

In all democracies there is an inherent tension between procuring guns (military expenditure) and butter (social welfare and economic development expenditure) and the argument made is that democratic states tend to favour butter over guns. This is because, unlike authoritarian governments, democratically elected officials are accountable to the electorate and, therefore, will spend on those items that are likely to get them reelected. Around the world, democracies have tended to opt for butter, as seen by the way Western Europe took the post-Cold War peace dividend and rapidly downsized its expensive armed forces. In South America, the Argentinian military has found it difficult to buy new combat aircraft because the costs have forced the government to scuttle potential deals—although now, reportedly, the Argentinian Air Force may be getting second-hand F-16s.

Like all democratic nations India faces the problem of guns vs butter and as all real democracies do, it has opted to fund its social development initiatives. Both the Manmohan Singh and Modi governments have kept defence expenditure at around 2 percent of the GDP (which includes military pensions) even though the erstwhile Planning Commission used to plan for 3 percent of the GDP being allocated to defence. This has led to budgetary pressures being put on the armed forces as they seek to modernise their equipment to meet the two-front threat posed by China and Pakistan.

The impact of low military spending is apparent in how India has scaled back purchases from abroad when faced with the escalating costs of these systems. Thus, India reduced the Rafale purchase from 126 to 36 aircraft because the costs of procuring the original number had skyrocketed. Buying any modern weaponry will be constrained by this factor and this will impact the IAF's future plans which include the purchase of 114 fighters. Any future purchases will also be tempered by the need to invest in the Indian population and one way to reduce costs has been through indigenisation—the Make in India/*Aatmanirbharta* plan—and this brings up the issue of the domestic defence production lobby and its track record as a producer of weaponry.

Since the times of Nehru, successive Indian governments have recognised that indigenous weapons production provides a degree of autonomy and, therefore, the leadership has given political and financial support to these efforts. The record here, however, is mixed. Where India has not been able to get external suppliers, its indigenous weapons development programmes have by and large been successful. Thus, the country's nuclear and missile programmes, which faced Western embargoes and the fact that no nation was willing to provide these systems to India, were successful in providing weaponry for the armed services. On the other hand, where external suppliers have been available, it has provided an easy and attractive alternative to the long and difficult process of indigenous production.

Added to this is the problem that the basic sub-systems that make a weapon fieldable cannot be indigenously manufactured in the country. No aircraft engine is indigenously produced in the country nor are the radars for combat aircraft. Even a simple turboprop engine like the one that powers the HTT-40 trainers comes from the Lycoming company in Arizona. The Tejas, similarly, in all its versions, depends on an American engine and while India may get an 80 percent technology transfer with the F-414, it means that a critical part of the engine will still have to be imported and that leaves the country vulnerable to future sanctions.

The problem for the armed Services is that while the defence production sector claims it can produce anything and everything, in actual fact its output and achievements are far more modest than suggested by the public pronouncements of defence scientists. The Arjun Main Battle Tank (MBT), the Sitara Intermediate Jet Trainer (IJT), the failure to develop a Kaveri engine, a medium range transport aircraft, and the long drawn out saga of the Tejas are all examples of the lengthy delays and quality control issues associated with indigenous arms production.

Additionally, India's defence science establishment has been able to convince successive Indian governments to invest in the domestic production of weaponry and despite lengthy delays in producing indigenous systems, it

has not been easy to kill these programmes.[6] This approach puts the armed Services at a disadvantage since they have to wait for domestic programmes to reach fruition and come up to a standard that the Services consider acceptable for induction into their force structures. A simple example of this is the Tejas that was supposed to enter service in the early 2000s as a replacement for the MiG-21 but instead, the plane was given final operation clearance by the IAF in 2019. In the meantime, the IAF has faced a serious shortfall of combat aircraft and the force has gone from the authorised 42 squadrons to 31 squadrons.

India's solutions have lain in delaying weapons purchases as can be seen from the 15 years it took to buy the Rafale. Or, as again in the case of the Rafale, the government reduced the order because it could not afford to buy the full complement of aircraft. Further, all political parties have bought into the argument that modern weapons can be produced domestically. Lastly, despite very good assessments done by the Public Accounts Committee (PAC) and the Comptroller and Auditor General (CAG) with their reports on defence procurement, production, and usage, the Indian government continues with the same pathologies in its military modernisation efforts.

Thus, India's long, laborious, and ultimately self-defeating efforts at aircraft procurement have led to the weakening of the country's defence efforts. It took 20 years to procure the Hawk trainer and, in the meantime, the air force's efforts to train the incoming pilots were hindered. The Rafale should have been in service in a 2012-15 timeframe which would have meant that they could have been used in the Balakot attack but the lengthy negotiations substantially delayed the procurement of the aircraft. And now, there is the announced intention to procure 114 more aircraft although given the lengthy delays of the Indian procurement process, should we realistically expect these aircraft—whichever fighter is eventually chosen—to enter service in 2030? By that time, the air threat will have changed significantly as China's aircraft industry will have supplied the People's Liberation Army Air Force

6. For a discussion, see Amit Gupta, "Techno-Nationalism vs. Techno Globalization: India's Military Acquisitions and Arms Production Dilemma," *Comparative Strategy*, 41:2, pp. 212-228.

India's strategic environment is complicated by the fact that it no longer has a strategic partnership of the type Israel and Britain have with the United States or Pakistan has with China. Such partnerships have allowed for the transfer of weaponry, nuclear technology, economic subsidies (in the case of Israel and Pakistan), and political support in international fora.

(PLAAF) with a number of fifth and may be even sixth generation fighters.

Another factor complicating India's strategic environment is that the country is now seen globally as an influential actor and, therefore, expected to play its role as a stakeholder in the international system. In the past, when India had fewer resources, the country played its part in the international system by participating in UN peace-keeping operations. Now, the Indian Navy plays a major role in anti-piracy operations in the Indian Ocean and in ensuring the freedom of navigation in the ocean. In 2023, the IAF provided humanitarian assistance in Turkey, Syria, and Nepal and was able to repatriate endangered Indian citizens from Sudan.[7] This role of the IAF will continue to grow as the Indian government will receive more requests from across the world to provide humanitarian assistance. While such missions are laudatory, these are also expensive to carry out, and will require an increase in the IAF's operational budget.

Lastly, India's strategic environment is complicated by the fact that it no longer has a strategic partnership of the type Israel and Britain have with the United States or Pakistan has with China. Such partnerships have allowed for the transfer of weaponry, nuclear technology, economic subsidies (in the case of Israel and Pakistan), and political support in international fora. India had such a relationship with the erstwhile Soviet Union but that partnership ended in the 1990s and since then, the country has had to manage its foreign and security policies without any long-term support from a major strategic

7. Anil Golani, "Vignettes of the Indian Air Force: 2023", Expert View, Centre for Air Power Studies, January 2, 2024, https://capsindia.org/vignettes-of-the-indian-air-force-2023/. Accessed on January 2, 2024.

partner. Given these factors, what are the best options for the IAF to pursue to build an effective force structure?

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OPTIONS FOR INDIA

Firstly, the IAF and the government have to come up with a long-term plan wherein mission effectiveness and cost effectiveness are achieved. While the IAF has developed its Doctrine 2022 document which lays out force requirements, it is another matter to get the political leadership and bureaucracy to sign off on these needs of the Service and pay for them in a systematic manner. Without such systems, a doctrine just remains as talking points on a piece of paper. The way to achieve this is to decide what weapons and systems are needed quickly, what can be built at home, and where there should be collaboration with foreign partners.

The immediate requirement comprises new fighters that help make a qualitative difference between the IAF and PAF. The air skirmish after Balakot showed that the PAF can achieve tactical surprise, and the IAF needs to be ready for unforeseen scenarios in which it has to deter Islamabad. The way to begin this process is to purchase more Rafales since the aircraft would give the IAF a qualitative edge with its advanced avionics and the fact that it has beyond visual range weapons, particularly the Meteor missile. It is unfortunate that the Rafale deal took so long to come to fruition and then led to a much smaller purchase of 36 aircraft (barely 2 squadrons). Doubling the deal would be the first step for India to start to regain the qualitative edge against the PAF and this could make it easier to eventually procure 114 fighters.

Second, as the primary customer of Hindustan Aeronautics Limited (HAL) the IAF has to find a way to accommodate the aircraft manufacturer's interests without hurting the development of its long-term force structure. HAL has a history of developing promising aircraft designs but has trouble bringing them to fruition. In the 1960s, HAL was unable to make the

indigenously designed Marut supersonic aircraft while, more recently, the IJT Sitara, which first flew in 2003, has yet to enter service with the IAF or the Indian Navy (IN)—yet, as a subsonic trainer, the plane does not have to meet the critical technological requirements that the fourth generation Tejas fighter does. It should, therefore, have been much easier to bring the project to completion and successful production.

As for the Tejas, it has a difficult and lengthy developmental history, with the plane first flying in 2001 but, 23 years later, production on the plane is progressing slowly and it has been reported that the more powerful Mk.1a version will be delayed, thus, hurting the IAF's plans for modernising its fleet. Additionally, HAL is to design and develop a fifth generation Advanced Medium Combat Aircraft (AMCA) that will carry out its first flight within the next five years. Given HAL's record of delays, this is an ambitious target although it is a worthwhile project. In the middle of these problems, HAL has presented the mock-up of a supersonic trainer currently designated the HLFT-42. There is no need to develop a new supersonic trainer and, instead, the aircraft manufacturer should learn from the Chinese who have successfully created an indigenous aerospace industry by making what is achievable rather than seeking the perfect aircraft.

THE CHINESE EXPERIENCE

In the 1950s, while India was developing the Marut, the Chinese aircraft industry made a realistic appraisal of its capabilities and decided to produce the Soviet MiG-17. The plane was subsonic and technologically obsolete by the time it entered service in 1964 but the Chinese, strapped for cash and unable to secure Soviet technology, went ahead and produced 1,800 MiG-17s (to this day, HAL has not manufactured 1,800 units of any aircraft). By the early 1960s, the Chinese also started working on the MiG-19/Shenyang J-6 and eventually produced over 4,500 aircraft, and followed this up with over 2,400 J-7 fighters—the Chinese version of the MiG-21. Both the J-6 and J-7 sold in large numbers around the world with the Pakistan Air Force reportedly preferring the J-6 because of its aerobatic capabilities.

Unlike HAL and the Indian Air Force, the Chinese aircraft industry and air force did not attempt to produce, in the first instance, the perfect airplane. Instead, they engaged in the 'dumpling strategy' which is to make an aircraft, put it rapidly into service, and then build improvements into its subsequent versions. This approach has paid off for the Chinese who have gone on to manufacture the more capable J-10, J-11, and J-16 fighters before moving on to the fifth generation J-20 (of which China now reportedly has 200) and FC-31 fifth generation fighters.

In contrast, HAL has been hit by design, development, and production delays that have led the Tejas to become a 40-year project, with the Mk.1 version of the aircraft, which is underpowered, and without a first rate radar, finally entering service. Delays in the Mk1.a and the Mk.2 mean that the IAF will have to wait a long time to get the required 123 Tejas it expects to induct into service. At the same time, given India's notoriously glacial arms acquisition process, it is unlikely that the medium range fighter aircraft deal for 114 fighters will be finalised in the short to medium term. So what should India do in the meantime?

First, HAL's feet have to be held to the fire and it has to raise the annual production of the Tejas from 16 to 24 aircraft. While HAL has said it will open a second production line at Nashik, this process cannot be taken for granted. In this context, the government should penalise the aircraft manufacturer for delays since the plane has been in production—since the first prototype—for over 20 years. If HAL cannot deliver, then the government needs to make hard choices about imports.

Second, the IAF, instead of looking for the perfect plane, should accept what HAL is producing and seek improvements in the subsequent models—China's dumpling strategy has merit. As the Russians point out, quantity has its own quality and 123 Tejas, of whatever quality, add to the country's force structure and make the enemy face a greater number of aircraft. The planes can also be retrofitted with more advanced radars and better missiles giving the aircraft a more formidable capability.

The IAF has to project a high-low mix in its force structure which would be the Rafale and perhaps a fifth or sixth generation fighter at the upper end, Tejas as the medium level combat aircraft, and drones that can carry out functions like close air support and operations in areas like the Himalayas where a slow moving aircraft with ordnance would be invaluable if India faced another Kargil type situation of mountain warfare.

Third, since the Tejas is already under production and there is a two-seat version of the aircraft, there is no need for HAL to waste time and valuable resources on making yet another aircraft in the HLFT-42 trainer category. The plane adds little to the technological capabilities of HAL, is a waste of valuable resources, and will add to the financial costs for the IAF. It is not a fifth generation aircraft but a trainer that is meant to teach recruits and, therefore, it makes sense to convert the Tejas into an attack trainer. The plane can fly at supersonic speeds, it has a weapons payload for training, and can carry out aerobatics. Further, a trainer version does not need an expensive radar or the avionics that are required for a frontline combat aircraft.

As the Mk.1a comes into service, the earlier Mk.1 can be used for training and is likely to serve in that role for decades. HAL's Kiran basic jet trainer was inducted in 1968 and remains in service to this day, nearly 56 years later. The Tejas Mk1 and Mk1.a could have a similar life span for the IAF and not only fit into the country's demand for *Aatmanirbharta* but also reduce the spending of valuable hard currency on imported weaponry. HAL, therefore, not only needs to remove the Hanuman from its mock-up of the HLFT-42 but also scrap the plan for an unnecessary aircraft.

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DRONE ACQUISITION POLICY

All three Services require drones and it makes sense to indigenously produce MALE drones in large numbers to serve the needs of the armed forces. The Defence Research and Development Organisation (DRDO) had an indigenous programme, first called the Rustom and later the Tapas, but the drone did not meet the specifications of the Services and the decision has been taken to put it on the back-burner rather than continue to waste money on it. Given this failure, DRDO should be asked to seek partnerships with friendly nations of a comparable technological level which also face complex security challenges. Two nations that automatically come to mind are Brazil and South Africa which have excellent political relations with India, robust arms production capabilities, and are happy to work on collaborative projects to acquire working weapon systems.

The South African arms industry grew out of the apartheid regime's desire to be strategically autonomous and, consequently, produced a range of weapon systems. Currently, however, the industry is having financial shortfalls and is actively seeking external collaborations to survive.[8] Much like India, Brazil has a large landmass and a maritime space that can be best patrolled by UAVs. While it currently has a system of radars and surveillance aircraft to monitor the Amazon, it could use drones that are more cost-effective and have better loiter capabilities in the rain forest. Collaboration with these two countries would not only lead to economies of scale but allow for production to take place in a timely manner, thereby permitting a quicker induction into the armed Services.

A surveillance drone that is built for all three armed Services and the country's police forces would transform how the country conducts its

8. Ron Matthews and Collin Koh, "The Decline of South Africa's Defence Industry," *Defense & Security Analysis*, 37:3, 2021, p. 262.

security operations. Maritime surveillance is vital to prevent a repeat of the 2008 Mumbai terror attack where terrorists were able to slip undetected into Mumbai harbour in a fishing boat. Since Mumbai is the home of the Western Naval Command, the country's premier strike fleet, it was particularly embarrassing for the Indian Navy that such a terrorist incursion took place. Further, going back to India's growing international footprint, the country also needs to patrol its Exclusive Economic Zones (EEZs) in the Arabian Sea and the Bay of Bengal and this requires aircraft with a long endurance capability.

Fifth, the government should be looking at which used and moth-balled aircraft it can purchase from air forces around the world. The government has bought old Jaguars from other countries and is now thinking of buying moth-balled MiG-29s from Russia. One has to question why the MiG-29s are being sought since the Russians have a poor record with modernising aircraft and, in recent times, India has been treated harshly by Moscow. The Russians refused to transfer the technology for the Su-57 that was to be jointly developed and even locked the design to a single seater even though the IAF had stated that it wanted a two-seat version of the aircraft. The MiG-29 itself is seen by air forces as expensive to maintain, is vulnerable to the intake of external object debris, and has smoky engines that make the plane visible from a distance (after the reunification of East and West Germany, the Luftwaffe got rid of its MiG-29s, even though they were got for free, because they were a maintenance nightmare).

The planes the IAF should be looking for are second-hand versions of the Mirage 2000. Qatar, a few years ago, offered its Mirage fleet to India but the government claimed the price was too high. Now these planes are once again available since Indonesia has decided to postpone its purchase of the used Mirages from Qatar, citing the problem of high cost.[9] And then there are the older Mirages in the French Air Force that have been well maintained. The plane has a good war record, the IAF is happy with it, and if the then

9. "Indonesia Postpones Mirage 2000 Acquisition From Qatar," *Aviation Week*, January 4, 2024.

government had taken a different decision, the IAF would have had two more squadrons by the early 2000s.

The other future acquisition should be of more Russian S-400 anti-missile systems and potentially even the S-550 system. The S-400 has developed an impressive reputation and the Russians have been using it to strike targets in Ukraine. The mobility of the system is advantageous since it can be deployed in theatres that have a more intense threat environment.

CONCLUSION

Like most air forces across the globe, the IAF faces the challenge of maintaining air superiority without draining the government's budget. This requires making choices that are both hard and creative. If such a mix can be created, and some suggestions to achieve this have been made above, then the IAF can transition into the next decade as a fighting force that has the ability to deter threats along two fronts. To not help build this capability for the IAF, when the country faces threats on two fronts and a pressing need to build up its capabilities, can only be described as being strategically short-sighted and not understanding the requirements of modern air power.