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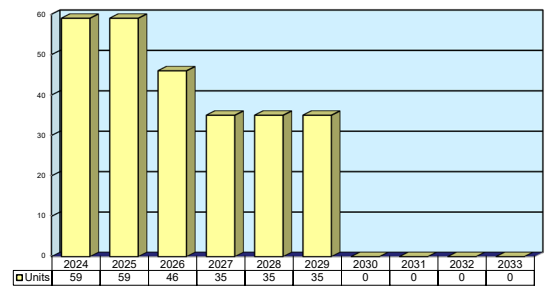
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Indian UAVs

Outlook

- Indian military investing more in UAVs
- New Delhi wants to purchase UAVs from domestic firms
- Not all domestic design programs enter production
- Orders for foreign systems still being placed

Unit Production Forecast
2024-2033



Orientation

Description. Unmanned air vehicle.

Sponsor. The Indian government, sometimes through Ministry of Defence and the Defence Research and Development Organization (DRDO).

Status. Programs are active and at different stages.

Total Produced. India built 16 Nishants (including RDT&E units) and six Kapothakas. Different UAV systems are being procured.

Application. Day/night aerial reconnaissance and surveillance operations, and possibly target identification, location, and designation.

Price Range. Prices of Indian UAVs are not always available. The Nishant air vehicle was once said to cost \$50,000; a complete system had a price of around \$1-\$2 million. The Nishant's current price may be somewhere between \$800,000 and \$2 million per air vehicle (without payload). Each complete system could cost around \$30-\$50 million.

Contractors

Prime

Hindustan Aeronautics Ltd (HAL)

<http://www.hal-india.co.in>, 15/1 Cubbon Rd, PO Box 5150, Bangalore, India,
Tel: + 91 80 223 2000 1, Fax: + 91 80 223 2075 8, Prime

NOTE(S): Aeronautical Development Establishment (ADE) developed the Nishant UAV system, but production will be the responsibility of Hindustan Aeronautics Ltd (HAL), Bangalore Complex, Karnataka, India. Bharat Dynamics provides most of the air vehicle's electronic components. Israel Aerospace Industries is cooperating with India on UAV projects.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

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Technical Data

	<u>Metric</u> Kapothishaka	<u>Metric</u> Nishant	<u>U.S.</u> Kapothishaka	<u>U.S.</u> Nishant
Dimensions				
Length	367 cm	460 cm	12.05 ft	15.1 ft
Wingspan	450 cm	650 cm	14.78 ft	21.34 ft
Weight	120 kg	360 kg	264 lb	794 lb
Payload	20-25 kg	45 kg	44-55 lb	99 lb
Performance				
Speed	180 kmph	144-216 kmph	112 mph	89-134 mph
Range	N/A	100 km	N/A	62 mi
Endurance	1.5 hr	4-5 hr	1.5 hr	4-5 hr
Altitude (max)	3,000 m	3,660 m	9,840 ft	12,000 ft

N/A = Not Available

Propulsion. The Nishant uses a UEL (ALVIS) AR801 55-hp engine driving a pusher propeller. UEL has since been acquired by UAV Engines Ltd. The production versions may be equipped with a license-manufactured unit. Engines designated RE-2-21-P and RE-4-37-P were said to have been offered to power the Nishant.

Control & Guidance. The Nishant uses a preprogrammed guidance system but is also outfitted with a datalink for remote control.

Launcher Mode. The Nishant uses a hydropneumatic launcher for takeoff. Each system consists of air

vehicles, a ground control station, an antenna tracking system, a launcher, and mission support vehicles.

Recovery. The Nishant can be recovered via an onboard parachute and airbag system or a net.

Armament. The Indian government planned to arm its Searcher and Heron UAVs under Project Cheetah. This project had a cost of Rs 10,000 crore (Israel ceased its involvement by 2022). By late 2023, India might have shelved this project.

New Delhi is also developing its own armed UAVs and looking to acquire foreign-made UAVs that are capable of carrying air-to-surface weapons.

Variants/Upgrades

There is a single production version of the Nishant, but India says it has plans for follow-on versions. Improvements could be incorporated into the air vehicle at a later date.

New Delhi also claimed to be developing two additional air vehicles based on the Nishant. One was a low-cost aerial target and reconnaissance system known as the Kapothishaka; the other, called the Ulka, was capable of being launched from a fixed-wing aircraft. The Kapothishaka was said to be smaller than the Nishant. The Ulka was an aerial target capable of simulating various aircraft types and performing missions between 50 feet and 13,000 feet at speeds of Mach 1.4.

The Puma was thought to be a follow-on to the Nishant, although its specifications and intended role were not officially revealed. This air vehicle was expected to have a longer-range system than the original version and possibly greater on-station endurance.

Israel offered assistance in improving the Nishant, possibly helping extend its range to 150 kilometers. Also, in early 2005, Israel and India were said to be

cooperating in the development of three new UAVs: the Rustom medium-altitude, long-endurance (MALE) unmanned air vehicle; the Pawan short-range UAV; and the Gagan tactical UAV system.

Some 10 members of the Defence Equipment Manufacturers Association formed a separate manufacturing entity called DEMA Mechatronics in 2008. The group's UAV will be an upgraded version of the Vihang Netra aerial target. This UAV is the first effort of the DEMA consortium using DRDO funds. The UAV will weigh 25-40 kilograms and possess a range of 10 kilometers. The air vehicle will fly at an altitude of 1.5 kilometers and a speed of 100 kmph. DEMA plans to use the UAV for the civil sector as well.

Piramal Enterprises invested \$7 million (INR38.47 crore) in Israeli UAV firm Bluebird Aero Systems in 2012. The former is expanding its business interests beyond health care and pharmaceuticals. The group purchased a 27.83 percent stake in Bluebird. The company also has an agreement with Bangalore's

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Dynamatic Technologies for the marketing and production of mini- and micro-UAVs in India.

Dynamatic Technologies is also teamed with AeroVironment to offer the Raven in the Indian market and develop the Cheel (Eagle) UAV. The team announced the joint project on February 17, 2015. The Cheel A version is for the Indian market, while the Cheel B is for customers in the United States. The Indian Army could acquire hand-launched UAVs for its infantry units (perhaps some 382 infantry battalions and 100-plus counterinsurgency units).

India's CSIR National Aerospace Laboratories (NAL) displayed the Suchan man-portable UAV at Aero India 2017. The UAV can fly for 120 minutes and operate at up to 15,000 feet (usual operating altitudes are 328-984 feet). Development of the Suchan began in 2012. The UAV was on display at Aero India 2017.

Hindustan Aeronautics offers the RUAV-200 vertical takeoff and landing (VTOL) UAV, while HAL is marketing the Archytas fixed-wing UAV. The RUAV-200 has a range of 100 kilometers, a three-hour endurance, and a weight of 200 kilograms. The Archytas has a wingspan of 6.4 meters, can reach a speed of 158 kmph, and carries a payload of 25 kilograms.

Garden Reach Shipbuilders and Engineers Ltd announced its shipborne autonomous UAV program in 2023. The company is partnered with TUNGA Aerospace Industries Pvt Ltd. Sea trials were planned to take place in 2023.

Skyhawk Aerospace unveiled its Pushpak and C35-E fixed-wing VTOL UAVs in July 2023. These UAVs can perform high-altitude cargo delivery operations.

Tata Advanced Systems Ltd (TASL) said in 2023 it planned to convert a Grob G180 SPn manned aircraft into a reconnaissance UAV.

Other companies participating in the Indian market are Paras Defense and Space Technologies, Aero360, Asteria Aerospace, Avian Aerospace, Drona Aviation, DroneAcharya Aerial, Endure Air Systems, Marut Drones, Skylark Drones, TechEagle, and Zen Technologies.

Israel Aerospace Industries (IAI) is teamed with India's Alpha Design Technologies to market the Bird-Eye series of UAVs to customers in India.

HAL is expanding its involvement in the commercial UAV market segment.

Hawking Defence unveiled its micro-UAVs in 2022. Each UAV weighs 400 grams. One of these UAVs is the Balidan, which has a speed of 65 knots and an endurance of 20 minutes.

Garuda Aerospace Pvt Ltd is offering small UAVs to the Indian Army. IIT Kanpur has developed a small unmanned helicopter, while Aero360 builds the Bhima VTOL UAV.

Aeroarc of India has teamed with Skydio, a U.S.-based firm. Cingularity Aerospace has developed UAVs, while EndurAir offers the Alakh nano UAV.

Program Review

Background. India is investing more in expanding the capabilities of its defense industry. Programs have included armored vehicles, ships, missiles, and a growing number of unmanned aerial vehicle systems.

India spends a considerable amount of money each year on internal and external security needs. The Indian security forces must deal with over a dozen militant groups scattered throughout the country, as well as conventional external military threats from countries such as China and Pakistan.

To better combat these threats, the Indian government is providing its police and military forces with additional equipment, including unmanned aircraft systems. Unmanned air vehicles are playing a more prominent role in Indian security operations – a role that will expand in the future.

Indian Expansion Plans. India has long planned to expand its UAV fleet by purchasing new UAVs from both foreign and domestic sources. These purchases

will include different types of UAVs, ranging from mini air vehicles to medium- and long-endurance systems.

India said in 2012 that it planned to acquire 95 mini-UAVs: 60 for the IAF and 35 for the Indian Navy. The Indian Army wanted 20 systems, but the initial buy would amount to 200 systems. Total procurement could amount to 600 mini-UAVs split between the Air Force, Navy, and Army.

Another report says mini-UAV procurement could reach 1,800 air vehicles to equip all frontline battalions of the Indian Army. The mini-UAVs will weigh no more than 2.5 kilograms, and the total operational kit will weigh no more than 15 kilograms.

Candidates to meet India's mini-UAV need include entries from Bluebird of Israel and AeroVironment of the United States, as well as a locally designed system. By 2014, Tata Advanced Systems Ltd (TASL) was the top contender to meet this need.

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India mentioned an interest in 2014 in a new UAV to perform long-endurance maritime surveillance missions.

The Indian Army issued a Request for Information (RFI) in 2021 for 1,750 tracked futuristic infantry combat vehicles (FICVs). These vehicles will replace the in-service BMP-1 and BMP-2 infantry fighting vehicles (IFVs). Among the capabilities these vehicles will possess is an onboard mini-UAV.

In late 2022, the Indian Army issued an emergency requirement for additional UAVs. New Delhi wants to procure these systems quickly.

The Indian Army wants cargo-hauling UAVs: 200 to operate at medium altitudes (3,000 m) with a 20-kilogram payload capacity; and 163 that can carry a 15-kilogram payload and fly at high altitudes (4,000 m). The UAV will weigh no more than 100 kilograms and have a range of 10 kilometers.

Other systems included in this request are:

- 1,000 battery-powered small unmanned helicopters with a range of 5 kilometers and a one-hour endurance.
- 750-850 UAVs that weigh 2 kilograms and can fly for 30 minutes.
- 80 mini-UAV systems with two air vehicles each able to perform tactical surveillance missions. The UAVs will have a range of 15 kilometers and an endurance of 90 minutes.
- 10 runway-independent UAVs, along with four ground control stations. The UAVs will have a 10-year service life and be used to direct artillery fire.

India wants local firms to meet these needs.

Police UAVs. India purchased UAVs to support the police in Lucknow. The Lucknow Police acquired five mini-helicopters capable of showering pepper powder on unruly mobs. The UAVs cost Rs 6 lakh apiece and can fly at 600 meters out to a radius of 1 kilometer.

India operated UAVs during the Republic Day parade in 2014.

Police in Thane began operating DJI-made UAVs in 2017 to locate illegal liquor dens. That same year, police units in Punjab received UAVs.

India's Central Reserve Police Force began to move toward procuring UAVs in 2017. The CRPF wants 25 micro UAVs to support its operations against Maoist rebels. The CRPF already operates 40 UAVs (including the locally made Netra).

The Mumbai police began receiving T20 UAVs in 2018. Quidich Innovation Labs (QIL) is the source for these systems. The Khyber Pakhtunkhwa government approved an allocation of 500 million rupees in 2022 to provide law enforcement with UAVs.

The use of UAVs by the Indian police continued to expand in 2020, 2021 and 2023.

Air Vehicle Models. India has developed its own UAVs, including the Kapothaka and Nishant, and is developing new systems. These programs have had a turbulent history, with almost annual changes in their status.

ideaForge Technology Ltd claimed in 2023 it had a 50 percent share of the Indian domestic market for unmanned air vehicles.

Bharat Drone Systems. UAVOS Inc is a U.S.-based company that has teamed with Bharat Drone Systems to offer fixed- and rotary-wing UAVs in the Indian market.



Borey-10

Source: Bharat Drone

The Bharat Drone Borey-10 is a fixed-wing tactical UAV. This UAV uses a 2,000-W electric motor and four lithium-ion batteries.

Borey-10 – Technical Data

Length	760 mm
Height	259 mm
Wingspan	3.57 m
Weight	15 kg
Payload	2 kg
Speed, max	30 m/sec
Speed, min	16 m/sec
Range	250 km
Altitude	3,500 m
Endurance	4 hr

Other UAVs produced by Bharat Drone include the IBIS-H, Sitaria and Albatros 2.2.

Bharat Drone Systems is also offering VTOL UAVs, including the Surveyor UVH-290E, the UVH-120E, and the UVH-EL.

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Technical Data

	<u>UVH-290E</u>	<u>UVH-EL</u>
Length	2,430 mm	2,230 mm
Rotor Diameter	3,200 mm	2,500 mm
Height	860 mm	630 mm
Weight	107 kg	25 kg
Payload	20 kg	5 kg
Speed, max	100 kmph	120 kmph
Range	300 km	150 km
Altitude	2,100 m	3,500 m
Endurance	6.6 hr	1.5 hr

The UVH-290E and UVH-120E use a Wankel-type four-stroke rotary engine. The UVH-EL is equipped with an electric motor and lithium-ion battery.

In addition, the team offers smaller VTOL UAVs, such as the Quadcopter UVM-E, Geo Hoverfly, Hoverfly, and Hawk Moth.

These UAVs use electric motors and lithium-ion batteries.

Indian officials said in July 2020 that the country planned to send Bharat drones capable of operating at high altitudes and mountainous terrain along the border with China.

Technical Data

	<u>UVM-1E</u>	<u>UVH-120E</u>
Length	1,620 mm	2,700 mm
Rotor Diameter	762 mm	2,600 mm
Height	510 mm	860 mm
Weight	21 kg	34.5 kg
Payload	1 kg	5 kg
Speed, max	55 kmph	100 kmph
Range	10 km	300 km
Altitude	1,600 m	2,500 m
Endurance	55 min	5 hr

The Indian Army would operate these systems along the Line of Actual Control in Eastern Ladakh.

Technical Data

	<u>Geo</u>	<u>Hoverfly</u>
Weight	1.7 kg	1.6 kg
Speed, cruise	10 m/s	5 m/s
Altitude	150 m	50 m
Endurance	25 min	25 min

Gagan. India plans to develop new UAVs with the assistance of IAI. The state-owned ADE will head up India's portion of these programs.

The Gagan is an improved version of the Nishant. Originally, Puma was thought to be the designation for a further enhanced Nishant UAV.

India could spend \$60 million developing the Gagan. The UAV is to have a range greater than the Nishant – in the area of 250 kilometers – but it might not exceed 200 kilometers.

Gagan – Technical Data

Range	250 km
Altitude	20,000 ft
Endurance	6+ hr

The Gagan is to carry a synthetic aperture radar (SAR) and electro-optical sensors supplied by Israel. India will develop its own electronic countermeasures systems.

The first prototype air vehicle was completed by early 2009. One source claimed India will procure 100 Gagan UAV systems.

In 2016, the Indian Navy said that it plans to spend \$55 million on the Gagan UAV system.

Imperial Eagle. The ADE unveiled the Imperial Eagle hand-launched, fixed-wing UAV in March 2013. This air vehicle uses a brushless DC (BLDC) electric motor. Payloads include a daylight or infrared camera with a gimbal.

India reportedly changed the name of this UAV to Indian Eagle. Another man-portable UAV is the Sly Bird, designed by India's National Aerospace Laboratories (NAL).

These UAVs may cost 5-10 lakh (\$7,850 to \$15,700), depending on the configuration.

Imperial Eagle – Technical Data

Wingspan	1.6 m
Weight	2.9 kg
Range	10 km
Altitude	10-2,000 ft
Endurance	50-60 min

The Indian Army mentioned plans in 2014 to acquire upward of 1,600 man-portable UAVs.

The Indian Army said in 2016 it was again seeking to purchase 200 man-portable UAVs. These UAVs will support Indian anti-terrorism operations in Jammu and Kashmir. The Indian Army wants two versions: one capable of operating at an altitude of 1,000 meters and another with a ceiling of 4 kilometers.

The Indian MoD issued an RFI on August 31, 2018, for 75 high-altitude mini-UAVs for the Indian Army. The UAVs will need to operate up to an altitude of 5,500 meters and fly for 120 minutes.

Each system will include three air vehicles and a single ground control station, as well as launch and recovery systems.

Kapothaka. India was recently developing a family of unmanned air vehicles capable of performing an array of missions. This effort was designated the Kapothaka program (also spelled Kapothaha); Kapothaka means "dove." Some claimed that the program's name was eventually changed to Falcon, but this is believed to be

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in reference to another air vehicle – the Nishant. Eventually, the Kapothaka was found to be a smaller version of the Nishant. The Kapothaka was capable of performing reconnaissance and surveillance missions, as well as target acquisition and designation. The air vehicle could also act as an aerial target after its payload was removed.



Kapothaka

Source: DRDO

The ADE, in cooperation with the DRDO, was responsible for development of the Kapothaka.

The Kapothaka was a very small, low radar cross-section air vehicle weighing 120 kilograms and launched from a rail with rocket assistance. The system had a 4.5-meter wingspan, a length of 3.67 meters, and a payload capacity of 20 to 25 kilograms. The air vehicle was powered by a 26-hp pusher-type engine and had a maximum speed of 180 kmph. Its operating ceiling was 3,000 meters, with a maximum endurance of 1.5 hours.

Reportedly, this air vehicle was used to prove the feasibility of India's UAV concept, and another larger air vehicle (the Nishant) was used as a production model. Yet later reports said that the Kapothaka was in service with the Indian military to enhance surveillance and targeting capabilities. This deployment may have been very limited, sufficient only to provide India with some UAV operational experience.

There have been reports that India used a new Nishant-based aerial target during missile tests. This may have been the Kapothaka. It is uncertain whether the Kapothaka was or is being procured in any number by the Indian military for use as a reconnaissance system or aerial target.

KDA UAVs. Kadet Defence Systems (KDA) is offering a line of unmanned air vehicles. The company already manufactures aerial target drones.

The Fire Bee is a battery-powered mini-UAV that weighs 7 kilograms, and has a wingspan of 2.4 meters and a range of 15 kilometers. The air vehicle's endurance is three hours.

The Garuda is a twin-boom tactical UAV system that weighs 35 kilograms and is powered by a 15-hp engine

provided by 3W Modellmotoren of Germany. The air vehicle has a 4-meter wingspan, an operational ceiling of 3,000 feet, and a range of 200 kilometers. The Garuda can remain aloft for six hours.

The Silver Bill is an expendable micro-UAV that weighs 2 kilograms. This air vehicle is intended for close surveillance operations by police and army units.

KDA and India's state-run NAL said in 2012 that they will cooperate on the development of a UAV, which will use the Hansa trainer aircraft as its basis. The Hansa is built by Taneja Aerospace & Aviation for NAL.

Wide Variety of UAVs

Netra. India developed a micro-UAV called the Netra. This vertical takeoff and landing air vehicle weighs less than 1.5 kilograms; the camera carried by this UAV weighs 300 grams. The air vehicle operates at 200 meters and can remain aloft for 30 minutes.

The Netra is designed for counterterrorism and counterinsurgency operations. The Indian armed forces and paramilitary units acquired the UAV.

India mentioned plans in 2014 for the purchase of the NetraV2, an improved version of the original Netra. Development of this system concluded in 2015. The new version offers a range of 4 kilometers and an endurance of 40 minutes.

The Netra UAV supported local security forces patrolling around the Ayyappa Temple at Sabarimala in January 2016. India's 105 Battalion of the Rapid Action Force of the Central Reserve Police Force operated the UAV.

The Netra system costs around \$50,000. The Indian Navy did procure this system (paramilitary forces plan to order 25 systems, but this is unconfirmed).

Indian government laboratories and private firms are working on the following systems:

- 12-inch Black Kite developed by NAL Propulsion Division
- 16-inch Golden Hawk developed by NAL Experimental Aerodynamics Division (EAD)
- 12-inch Pushpak developed by NAL EAD
- Global Hawk 800 developed by Arora Informatics Systems
- Red Hawk developed by DC Enterprises

India's program is reportedly known as the joint National Program for Micro Air Vehicles (NP-MICAV).

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The Indian government said in 2021 that it was operating the Netra UAV system.

ideaForge unveiled the Netra V4 PRO UAV in May 2023. The Netra V4 PRO can fly for over 90 minutes and has an operational range of around 10 miles.

Nishant. The Nishant ("Restless") is larger than the Kapothaka and was the main focus of India's reconnaissance UAV development effort over the last few years. The Nishant is an ADE project operating under the aegis of the DRDO, with some help from IAI. Hindustan Aeronautics Ltd (HAL) has been identified as its production agency. Private firm BEML of Bangalore was awarded a contract to produce airframes for three preproduction models. A total of 15 preproduction air vehicles were manufactured. The remaining airframes were provided by Taneja Aerospace, Bangalore. Most of the electronic parts were produced by Bharat Dynamics, Hyderabad.

The Nishant air vehicle prototypes used both a 38-hp Limbach engine and a UEL (ALVIS) AR801 engine. The UEL engine was selected over the Limbach because of its reduced acoustic signature and ability to carry the air vehicle's enhanced weight. This engine eventually would have been replaced by one built locally under license or one developed by India's Central Vehicle Research and Development Establishment, located in Pune. The Nishant prototypes were launched hydropneumatically and recovered by parachute – the inflatable underbelly bags protected the vehicles on landing.

The initial Nishant prototype was completed in 1994 and made its maiden flight in 1995. Three technology demonstrators completed flight trials in 1996. Tests of preproduction models began in 1997 and continued into 1999. User trials by the Indian Army began in 1999 and continued into 2001.

In January 2002, India announced it was abandoning the Nishant program. The air vehicle was unable to meet Indian performance requirements. Yet, India did not cease work on the Nishant. Although New Delhi said in early 2004 that the Nishant could not meet its requirements, by the following November it had placed a new order for the system. This was to be a limited series-production run.

Twelve Nishant UAVs (three systems with four air vehicles each) were ordered by the Indian Army. These air vehicles may be equipped with Israeli electronic payloads, possibly including the EL/M-2055 SAR/MTI system. Delivery of the first system and air vehicles was to occur by the end of 2006. Three years later, India had still not accepted the Nishant UAV.



Nishant

Source: DRDO

Tests of a further improved Nishant took place in November 2010, and India completed testing of the UAV in February 2011. The Indian Army performed a series of confirmatory trials at the Chandan ranges in Pokhran, Rajasthan. With the successful trials, the Indian Army took delivery of a set of four Nishant UAVs, together with ground systems. The first four UAVs delivered to the Indian Army cost INR800 million (\$17.9 million). The Indian Army acquired a further eight UAVs, with deliveries completed by 2014. The Indian Army said that it was forced to acquire the Nishant for political reasons.

India's Central Reserve Police Force decided to acquire the Nishant by 2014. The version for the CRPF uses a 55-hp engine, replacing the ALVIS AR-801 propulsion system.

Other Indian organizations involved in the Nishant program include the Dehradun-based Defence Electronics Applications Laboratory (DEAL), the Pune-based Research and Development Establishment (Engineers), and the Agra-based Aerial Delivery Research and Development Establishment.

The price of a complete system is \$4.47 million.

India is working on the Panchi UAV, which is a version of the Nishant capable of operating from semi-prepared runways. Preflight trials began in September 2014, with the UAV's maiden flight occurring in December 2014.

By 2015, the Indian Army reportedly announced the cancellation of any further Nishant purchases after a series of crashes. The DRDO quickly denied these rumors and said that development of the Panchi version is moving ahead.

P1 UAV. India unveiled its P1 low-altitude, long-endurance UAV in 2014. The P1 can fly for more than 10 hours at an altitude of up to 5,000 feet. The UAV has an operating radius of 150 kilometers.

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India plans to use this UAV to monitor its border with China.

Pawan. This short-range UAV is intended for use by Indian Army division commanders. The UAV is similar in configuration to the Elbit Systems Hermes 180.

As with the Gagan, the ADE will lead the design effort. The Pawan UAV will perform day/night reconnaissance and surveillance missions, as well as target designation.

Pawan – Technical Data

Weight	120 kg
Range	150 km
Endurance	5 hr

IAI will provide the Pawan's electro-optical sensors. Development of this UAV system is expected to cost \$30 million to \$50 million.

Meeting New Requirements

The status of the program is uncertain. In 2016, the Indian Navy mentioned plans to buy four Pawan UAV systems at a cost of \$33.2 million.

The Indian Army issued an RFI in November 2017 for the acquisition of 60 short-range UAV systems. The UAV will be required to operate at an altitude of 20,000 feet and offer a range of 200 kilometers. The minimum endurance of this system will be 10 hours. India wants the UAV system to be developed and manufactured in India and delivered within 24 months from issuance of a contract award.

New Delhi might have canceled the Pawan program by 2022.

India's state-run DRDO said in November 2023 it had tested a Short-Range Unmanned Aerial Vehicle - Weaponized, also known as Archer. Flight tests, including weapons launches, were scheduled to take place in 2024.

Switch UAV. The Indian company ideaForge offers a line of unmanned air vehicles, including the Switch. The Switch UAV is a hybrid VTOL-fixed wing UAV that can perform long-endurance surveillance and security, as well as inspection, missions.

Switch – Technical Data

Length	2.6 m
Wingspan	1.8 m
Weight	6.5 kg
Altitude, operating	1,000 m
Range	15 km
Endurance	120 min

The Indian Army placed an order for the Switch UAV in January 2021. Other competitors for this contract included Tata Group, Dynamatic Technologies Ltd, VTOL Aviation, and Elbit Systems. Systems manufactured by ideaForge were already in service with the Indian military.

The number of Switch UAVs ordered by India is "in the hundreds," according to company officials. The UAV will operate with Indian infantry formations deployed in high-altitude areas like Ladakh.

India awarded another new contract for the Switch in January 2022. This contract is worth around \$20 million and will deliver an unspecified number of VTOL UAVs. Deliveries were completed in 2022. Indian may have received 200 units.

Other UAVs offered by ideaForge are the Ryno, the Megaphone, the Ninja, the Q Series, the Netra V series, and the Netra Pro.

TREP. MKU made the strategic decision in 2008 to penetrate the UAV sector. The company has developed two products for this market: the TREP and the Erasmus.

The Tactical Reconnaissance Electrical Probe is an all-composite, backpackable UAV system that requires no tools for assembly. The system is designed to play a key role in military, paramilitary, and civilian deployments.

The Erasmus UAV is a high-performance tactical / strategic system designed for frontline operations. The system is transported in two ruggedized containers, and requires 45 minutes for assembly or disassembly. The Erasmus is equipped with an image exploitation system that enables the UAV to track or target objects based on a visual image reference.

Apart from these UAVs, MKU is developing high-performance target drones for use by various air defense systems. The drones offer several flight profiles, including steep climbs and dives.

Indian UAVs**Funding**

India wants to spend more on unmanned air vehicle programs. India's UAV plans include the Army's proposed acquisition of 200 man-portable UAVs to perform reconnaissance missions over mountainous terrain and urban areas.

In addition to the military, the Indian police and paramilitary forces want to purchase UAV systems. India has used UAVs in domestic disaster relief operations. The Indian Coast Guard said in 2008 that it needed more manpower and equipment to properly patrol the nation's extensive maritime border. This request followed the November 2008 attack on Mumbai in which terrorists entered India via a hijacked fishing vessel. The Coast Guard has an authorized strength of 106 vessels and 52 aircraft but fields only 92 ships, many of which are aging and in need of replacement. The airborne component numbers 45 aircraft. The Coast Guard said it needed some 268 ships, 113 aircraft, and 18 UAVs by 2017 to meet security needs.

In 2011, the Mumbai police requested 24 UAVs for use in counterterrorism operations. The Mumbai police could be the first force in India to deploy unmanned aircraft.

From 2004 through 2007, India lost seven UAVs during operations.

Indian Defense Budget Figures*

	<u>FY21</u>	<u>FY22</u>	<u>FY23</u>	<u>FY24</u>	<u>FY25</u>
Indian rupees	3,860.1	4,054.7	4,560.0	4,788.0	5,099.0
U.S. dollars	52.2	51.9	55.8	58.6	62.4

*All values are in billions.

Contracts/Orders & Options

In Sep 2023, the Indian Air Force announced a \$36 million order for 200 long-range swarm drones. The contract is with Veda Defense Systems. These UAVs have a range of 150 kilometers and can perform attack missions.

In Aug 2023, Dhaksha Unmanned Systems announced it had won a contract to deliver 200 UAVs to the Indian Army. The company will provide medium-altitude logistics UAVs. The contract ran for 12 months. The value of this award was not provided. Dhaksha Unmanned Systems is a subsidiary of Coromandel International.

In Sep 2021, Newspace Research and Technologies won a \$15 million contract for 100 swarm drones. This is a fast-track procurement contract from the Indian Army.

In Jan 2021, the Indian Army signed an Rs 140 crore (\$20 million) contract to procure an undisclosed quantity of Switch UAVs. This system is manufactured by ideaForge, and it will deliver "hundreds" to the Indian Army. The company will provide a high-altitude version of the Switch UAV. The contract will run for one year.

In Sep 2018, Cyient Solutions & Systems Pvt Ltd – a joint venture between Cyient Ltd and BlueBird Aero Systems – won an order from the Indian Army for its SpyLite mini-UAV system.

In May 2007, the Indian Army awarded the state-run DRDO a contract for 12 Nishant unmanned air vehicles. The value of this contract was not disclosed.

Worldwide Distribution/Inventories

India's Porbandar Airport will support operations to monitor the coastal border with Pakistan. The Indian Navy's first UAV squadron consists of Israeli-made Searcher and Heron UAVs from the Indian Air Force. The UAV squadron began operations by December 2009.

Indian UAVs

Sri Lanka contracted with an Indian firm in 2009 to provide an unmanned surveillance system. The country wants to closely monitor its coastline despite the defeat of the Liberation Tigers of Tamil Eelam (LTTE). The war may be over to some, but Sri Lanka does not want to take any chances. Sri Lanka awarded this contract to Barnas International.

User Country. The initial operator of the Nishant was the **Indian government**.

Forecast Rationale

India sees itself in a competition with China for influence in Southern and Southwestern Asia. These two nations are pouring billions of dollars into their respective militaries. Influencing their spending are the wars in Nagorno-Karabakh and Ukraine, especially concerning the deployment of unmanned aircraft systems.

New Delhi plans to spend billions of dollars acquiring hundreds of UAV systems from foreign and domestic sources. The Indian government will provide a diverse fleet of UAVs to its military, paramilitary, and civilian security forces. The timeframe for orders is fluid, but orders will occur over an extended period.

The Battalion UAV forecast represents the procurement of lightweight systems. India appears to be planning to meet this need with multiple systems, including ones from Bharat Drone and ideaForge. These different purchases are currently included in a single forecast line.

India originally said the Gagan could replace the Nishant. This program appears to have faded and New Delhi has moved on to other options.

Another indigenous program is the Pawan, a short-range UAV for use by Indian Army divisions. As with the Gagan, the status of the Pawan UAV program is uncertain and it may have been dropped.

India still has a need for new Gagan and Pawan class systems, but no specifics are available on how these needs will be met. New Delhi could select from among domestic and foreign candidates.

The schedule for the introduction of UAV systems remains fluid. Over the next few years, India will increase the size of its unmanned aircraft fleet. In the future, India could become one of the largest UAS operators in the world, possibly second only to the United States.

No export orders are included in the production projections.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			
	Thru 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Total
Bharat Drone Systems												
Battalion UAV												
	70	25	25	20	15	15	15	0	0	0	0	115
Battalion UAV GCS												
	24	9	9	6	5	5	5	0	0	0	0	39
Battalion UAV Payload												
	70	25	25	20	15	15	15	0	0	0	0	115
Subtotal	164	59	59	46	35	35	35	0	0	0	0	269
Total	164	59	59	46	35	35	35	0	0	0	0	269