

## **Rajnath Singh praises DRDO for developing technologies to enhance Indian forces**

New Delhi: Defence Minister Rajnath Singh today said that Directors Conference of Defence Research and Development Organization DRDO has empowered the country with cutting edge technology. He said, despite various restrictions, limited indigenous capabilities and lack of time, DRDO has succeeded in developing variety of systems, products and technologies needed to enhance the forces.

Addressing Directors Conference of DRDO, Mr. Singh said, Dr. A P J Abul Kalam's contribution to research and missile development programme brought India to list of countries known for their indigenous capabilities. .

National Security Adviser Ajit Doval said, niche technologies make India more secure. He said, technology has to be need-based and we along with our defence services and intelligence agencies have to make a hard assessment of our needs which will give us an edge over our adversaries. Mr. Doval said, armies that were better equipped with higher technologies always called the shots and decided the destiny of mankind.

Army Chief General Bipin Rawat complimented DRDO for making strides in ensuring that requirements of the services are met through home-grown solutions. General Rawat expressed confidence that we will fight and win the next war through indigenized weapons systems and equipment. General Rawat said, while looking at systems for future warfare, we have to start looking at development of cyber-space, laser, electronic and robotic technologies and artificial intelligence.

Navy Chief Admiral Karambir Singh suggested that impetus has to be on niche technology and we must take a closer look at models such as Defence Advance Research Project Agency, DARPA in the US. Admiral Singh said, small time innovators should be encouraged. Defence Minister also gave away Kalam Dare to Dream Award to a young innovators and startups for solving scientific challenges.

<https://theindianawaaz.com/rajnath-singh-praises-drdo-for-developing-technologies-indian-forces/>



## **Gear up for tech warfare, service Chiefs tell DRDO**

*By Ajay Banerjee*

New Delhi: National Security Adviser Ajit Doval along with Chiefs of three services on Tuesday asked the Defence Research and Development Organisation to be ready for future wars entailing different technology and suggested what conflict could mean some years down the line.

The NSA and the three Chiefs along with Defence Minister Rajnath Singh were at the DRDO 'Directors Conference' here. "The two-day conference that began today will debate multiple issues,"

said DRDO Chairman Dr G Sateesh Reddy as the country's top defence scientists heard out what the forces wanted.

The conference will be deliberating the way forward and the future needs. It will see industry collaboration, service requirements and how the academia will pitch in.

"Start preparing for a non-contact war... If you don't think now, it will be too late," said Army Chief General Bipin Rawat, asking the DRDO to focus on cyber, space, laser, robotics and artificial intelligence.

Air Chief Marshal RKS Bhadauria, Air Force Chief, suggested, "In five years, no one will talk about stealth. The radar development is such that it will pick up even 'low radar cross section' (military parlance for picking up stealth features). We will need data fusion, superb radars and ability to quickly launch missiles."

The IAF Chief, who has been a test pilot for light combat aircraft Tejas was effusive in praise. "The LCA helped technology grow, it's the best we have. The fly by wire and composites that are now 40 percentage of the structures will help in future," he said.

Navy Chief Admiral Karambir Singh made specific suggestions. He said the goal of getting local products to replace imported ones was best left to industry and the DRDO could focus on state-of-the-art weapons. "See, how an organisation like the DARPA of the US became a reality," he said. The DARPA (Defense Advanced Research Projects Agency) is responsible for development of emerging technologies for use by the military.

For his part, the Defence Minister heaped praise on former President and DRDO ex-Chairman Dr APJ Abdul Kalam on the occasion of his birth anniversary. He unveiled a bust of Dr Kalam at the main entrance of the DRDO. "We have to be operationally ready and reduce dependence on imports," said the minister.

<https://www.tribuneindia.com/news/nation/gear-up-for-tech-warfare-service-chiefs-tell-drdo/847708.html>

## THE TIMES OF INDIA

Wed, 16 Oct 2019

# DRDO must make indigenous fifth generation fighter project happen: IAF Chief

New Delhi: Lauding DRDO for successfully delivering indigenous weapon systems, IAF Chief RKS Bhadauria on Tuesday said that the defence research agency should make the indigenous fifth-generation fighter aircraft happen and it must succeed.

"The Advanced Medium Combat Aircraft (AMCA) must succeed and it needs a lot of attention... it has taken off, it is a DRDO project. In terms of technology, this is one project where DRDO must make it happen," the IAF Chief said while addressing the Defence Research and Development Organisation (DRDO) Director's Conference.

Asserting that the Indian Air Force wants to control the technology and other aspects of the programme, he said, "I am defining the technology of AMCA because it is where we lack. When we take a system from abroad, we get restricted by the technology and weapon available and there is a 10-year cycle if we have to change it. In AMCA, we want to have control."

"We will improve the technologies as we move on. We will ensure that we will maintain an edge," the IAF Chief said.

Bhadauria has already made it clear that the IAF will fully back the indigenous fifth-generation fighter aircraft project being developed by the DRDO.

The IAF Chief highlighted successful DRDO projects like the LCA Tejas plane and the INDRA radar.

"That is the first time a low-level radar (INDRA) was developed and we were able to utilise it on our critical areas and have a decent low-level pickup. In terms of technology, it was a hugely successful project," he said.

The IAF Chief termed the indigenous Airborne Early Warning and Control aircraft developed by DRDO as another major success for the service.

"It is a huge success, we are looking forward for further development of it. The advantage of indigenous technology is that we are in continuous dialogue and change the specifications and requirements as we go along and get higher performance," Bhadauria said.

<https://timesofindia.indiatimes.com/india/drdo-must-make-indigenous-fifth-generation-fighter-project-happen-iaf-chief/articleshow/71599900.cms>



Wed, 16 Oct 2019

## 'India was runner-up in defence tech, no trophy for that': Ajit Doval at DRDO meet

*NSA Ajit Doval made a strong pitch for the modernisation of India's security, calling for "need-based" development of military technology and improved intelligence networks*

*By Neeta Sharma*

New Delhi: Armies that are better equipped decide the destiny of mankind, National Security Adviser Ajit Doval said at a meeting of Defence Research and Development Organisation (DRDO) Chiefs in Delhi today. Speaking a day after he addressed heads of Anti-Terrorism Squads (ATS), where he attacked Pakistan for making terrorism "state policy" and highlighted pressure exerted by global anti-terror watchdog Financial Action Task Force (FATF) to rein in money laundering operations that financed terror activities, Mr Doval said technology and money were crucial to the success of any military operation.

"Either you're better than your adversaries or you're not there at all. In the modern world technology and money are the two things that influence geopolitics. Who wins... and who loses... depends on which side has preponderance over adversaries on these two factors," Ajit Doval said, adding, "Of these two, technology is more important".

"India's own historical experience on this (the race to develop military technology) has been sad, we were the runner-up. There is no trophy for the runner-up," he said, adding, "India's security vulnerabilities are much greater today and they are going to be much more greater in the times to come".

Making a strong pitch for the modernisation of the country's armed forces and intelligence networks, Ajit Doval also called for "need-based" development of military technology that targeted specific requirements of the Army, Navy, Air Force and other defence services.

"Niche technologies are something that make India more secure. These have to be need-based. We, with our defence services and intelligence agencies have to make hard assessments about what our needs are that will give us an edge over our adversaries," he said.

The Narendra Modi government has made defence modernisation a key agenda.

Earlier this month Defence Minister Rajnath Singh was in France for the delivery of the first Rafale fighter jet. Manufactured by Dassault Aviation, the advanced multi-role jets are widely seen as the best

in their class and offer a significant technological upgrade over the Soviet-era MiG 21s that form the backbone of the Indian Air Force.

The Army will also get upgrades - the S-400 defence missile system is scheduled to arrive from Russia in early 2021. And, earlier this year, the centre cleared a Rs. 40,000 crore plan to build six new submarines and acquire 111 new helicopters at a cost of Rs. 21,000 crore.

The Navy has also seen the commissioning of INS Khanderi, the country's second Scorpene-class attack submarine.

"There is a lot of new technology emerging... how can we integrate systems? Except DRDO no other organisations in the country can perform this task," Mr Doval added.

On Monday Mr Doval made similar remarks to ATS Chiefs, urging them to share evidence and data amongst themselves and build a bank of "quotable and sustainable" evidence that could be presented to global agencies like the FATF.

Modernisation and upgrade plans, however, have been constrained by a defence budget that is dwarfed by that of China. According to a report by news agency PTI, India's neighbours spent US\$175 billion on defence last year.

By comparison, in the 2019 Union Budget, Finance Minister Nirmala Sitharaman set aside only Rs. 3.18 lakh crore. However, import of defence equipment not manufactured in the country was exempt from basic customs duty, offering the armed forces savings of Rs. 25,000 crore.

Defence experts were unimpressed though.

"The capital allocation is not adequate to modernise the armed forces. Everyone was expecting a significant hike in allocation, but unfortunately it did not happen," Laxman Behera, Institute of Defence Studies and Analysis, said. (*With input from ANI*)

<https://www.ndtv.com/india-news/drdo-conference-no-trophy-for-runner-up-ajit-doval-on-developing-military-technology-2116994>

## THE TIMES OF INDIA

Wed, 16 Oct 2019

# We will fight and win the next war with indigenous weapon systems: Army Chief

### HIGHLIGHTS

- *Army chief General Bipin Rawat asserted that India will fight and win the next war with home-grown solutions*
- *In his address at the 41st DRDO Directors Conference, he also said the development of weaponry and other systems should be done keeping "future warfare" in mind*

New Delhi: Army Chief General Bipin Rawat on Tuesday pitched for greater inclusion of indigenous technology in the armed forces and asserted that India will fight and win the next war with home-grown solutions.

In his address at the 41st DRDO Directors Conference, he also said the development of weaponry and other systems should be done keeping "future warfare" in mind.

"And, if we are looking at the contours of future warfare, it may not necessarily be contact warfare. So, there is realm of non-contact warfare. We need to start looking at development of cyberspace, space, laser, electronic warfare and robotics... and, along with that Artificial Intelligence (AI), " Rawat said.

"And, if we do not start thinking on it now, it will be too late," he said.

He praised the Defence Research and Development Organisation (DRDO) for its achievements in the last few decades and said India is making great strides in research and development. "We are confident the services will greatly benefit from it," he said.

"India is one of the largest importers of weapons and ammunition, and after 70 years of Independence, it is not a very proud statement to make. But in the past few years, it is changing. DRDO is striving to ensure our requirements of services are met with home-grown solutions," Rawat said. "We are confident that we will fight and win the next war with indigenous weapon system," the Army chief said.

Defence minister Rajnath Singh was the guest of honour at the inaugural session of the two-day event held at the DRDO Bhawan here.

National Security Advisor Ajit Doval, Air Chief Marshal RKS Bhadauria, Navy Chief Admiral Karambir Singh and DRDO chief G Satheesh Reddy were also present on the dais on the occasion.

The defence minister earlier paid tribute to former president APJ Kalam by garlanding his bust at the DRDO premises as the event coincided with the 88th birth anniversary of the distinguished scientist.

"Let us get inspired by his life and work towards realising his dream of making India a developed country through scientific advancement," Singh said.

He also emphasised on the aspects of disruptive technologies that is changing the world and asserted that "India will have to emerge as a leader in this".

Singh also pitched for working on indigenous system towards making the country "fully self-reliant". "All stakeholders must come together and hold interactions and come up with action plans as far as research is concerned, so as to increase our defence capabilities to take India to a new height," the minister said. Doval said, to make a strong and secure India, the role of DRDO would be very important.

<https://timesofindia.indiatimes.com/india/next-war-will-be-won-through-indigenised-weapons-systems-army-chief/articleshow/71593735.cms>

**hindustantimes**

Wed, 16 Oct 2019

## **‘Home-made tech will win us future wars,’ says Army Chief Bipin Rawat**

*National security adviser (NSA) Ajit Doval also underscored the need to develop niche technologies to buttress national security, and retain an edge over India’s adversaries while drawing attention towards the country’s security vulnerabilities and stressing that there were no trophies for runners-up*

*By Rahul Singh*

New Delhi: Batting for greater indigenisation in the military sector, Indian Army chief General Bipin Rawat on Tuesday asserted that India would fight and win the next war with locally produced weapons and systems.

National security adviser (NSA) Ajit Doval also underscored the need to develop niche technologies to buttress national security, and retain an edge over India’s adversaries while drawing attention towards the country’s security vulnerabilities and stressing that there were no trophies for runners-up.



The two made the comments while addressing the country's top military scientists at the Defence Research and Development Organisation's (DRDO) 41st directors' conference.

In his address, defence minister Rajnath Singh asked the scientists to work towards developing cutting-edge technologies to make India not only self-reliant but also a global leader in defence manufacturing.

The comments come at a time when India has set a target of emerging as one of the top five countries in the aerospace and defence sectors in the coming years, with defence goods and services accounting for a turnover of ~1.7 lakh crore by 2025, according to the Defence Production Policy 2018.

The policy said that achieving the target would require an investment of ~70,000 crore and create up to three million jobs. Another goal is to clock military exports worth ~35,000 crore by 2025.

"We are looking at systems for future warfare. We have to start looking at the development of cyber, space, laser, electronic and robotic technologies and artificial intelligence," the army chief said, highlighting the need to sharpen the focus on non-contact warfare. He praised the steps taken by DRDO to meet the military's requirements through home-grown solutions.

Promoting indigenisation under the Make in India scheme and cutting the military's dependence on imported weapons is one of the top priorities of the National Democratic Alliance (NDA) government. India was the world's fourth biggest military spender last year behind the United States, China, and Saudi Arabia, according to data released in April by think tank Stockholm International Peace Research Institute (SIPRI).

Doval said India needed to take a hard look at what its military needed to have an edge over its adversaries as better equipped armies have decided mankind's history. He said, "India's own historical experience on this has been sad, we were the runner-up. There is no trophy for the runner-up. Either you are better than your adversaries or you are not there at all."

The NSA said technology and finances were the two key factors that would shape geopolitics. "Who wins depends upon who has preponderance over their adversaries on technology and money. Of the two, technology is more important," Doval stressed.

He said India also needed to scale up its capacity for technology absorption. "In the world of distributed production for manufacturing of items, systems integration becomes most important. India needs to enhance its capabilities for technology absorption not only in the laboratories but also in production of systems."

Speaking at the inaugural session on the theme, Technology Leadership for Empowering India, the defence minister said the world was changing fast and advanced and disruptive technologies were

## TOP 5 INDIGENOUS WEAPONS, SYSTEMS

**TEJAS**  
The Tejas light combat aircraft is in service. The Indian Air Force has already contracted for 40 aircraft and it will soon place an order with Hindustan Aeronautics Ltd for another 83 LCA Mk-1A jets



**NETRA**  
IAF inducted its first indigenously developed airborne early warning and control system in 2017. The Netra AEW&C system has a range of 200km

**ASTRA**  
The user trials of the homegrown Astra beyond-visual-range air-to-air missile have been completed successfully. It will be inducted into the air force

**ARJUN**  
The army raised its armoured regiment equipped with the indigenously built Arjun main battle tank a decade ago. The project earlier hit several lows

**AKASH**  
The locally developed surface-to-air missile system has already been inducted by the air force. State-owned Bharat Dynamics Limited manufactures the 25km range missile system



emerging at a swift pace. “Development of technology should be cost effective and time efficient,” the minister said. The top officials also paid tributes to former president, the late APJ Abdul Kalam, on his 88th birth anniversary. Singh asked the scientists to focus on developing technologies that would remain relevant over the next 15 to 20 years. “There are certain limitations in technology and there is a gestation period for development of products. It is possible that during the gestation period of complex systems, new technical requirements emerge. Spiral development should be given priority for such systems,” he said.

Navy chief Admiral Karambir Singh highlighted the need for the military to stay technologically current. “When we speak of warfare, it is changing at a rapid pace because it is being driven by technology. It is very necessary for us to have a technologically up to date force. For us, maintaining the right technological mix is crucial,” he said.

Experts said indigenisation was the key and had to be expedited. “Our efforts towards indigenisation have been sluggish. A lot more needs to be done to become self reliant in the defence sector and become less dependent on weapon imports. It is also equally critical to identify the best technologies in the world and infuse them into our system through the transfer of technology,” said former Northern Army commander Lieutenant General BS Jaswal (retd).

<https://www.hindustantimes.com/india-news/home-made-tech-will-win-us-future-wars-says-army-chief-bipin-rawat/story-NO3oUkx1uTwTF64uw15jLO.html>

## नवभारत टाइम्स

Wed, 16 Oct 2019

### अगला युद्ध स्वदेशी शस्त्र प्रणालियों के साथ लड़ेंगे और जीतेंगे : सेना प्रमुख

नयी दिल्ली: सेना प्रमुख जनरल बिपिन रावत ने मंगलवार को सशस्त्र बलों में स्वदेशी प्रौद्योगिकी को व्यापक रूप से शामिल करने की वकालत करते हुए कहा कि भारत अगला युद्ध देश में ही विकसित समाधानों के साथ लड़ेगा और जीतेगा। 41वें डीआरडीओ निदेशक सम्मेलन को संबोधित करते हुए जनरल रावत ने यह भी कहा कि शस्त्रों और अन्य प्रणालियों का विकास भविष्य के युद्धों को दिमाग में रखकर होना चाहिए। उन्होंने कहा, “अगर हम भविष्य के युद्धों की रूपरेखा की ओर देखें तो जरूरी नहीं कि ये आमने-सामने से लड़े जाएं। हमें साइबर क्षेत्र, अंतरिक्ष, लेजर, इलेक्ट्रॉनिक युद्ध और रोबोटिक्स के विकास के साथ कृत्रिम बुद्धिमत्ता (एआई) की ओर देखना होगा।” रावत ने कहा, “और अगर हम इस बारे में नहीं सोचते तो बहुत देर हो जाएगी।” उन्होंने पिछले कुछ दशकों में रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) की उपलब्धियों के लिए उसकी तारीफ की और कहा कि भारत अनुसंधान और विकास के क्षेत्र में नये कीर्तिमान गढ़ रहा है। सेना प्रमुख ने कहा, “हमें विश्वास है कि सेनाओं को इससे बहुत लाभ मिलेगा।” रावत ने कहा, “भारत हथियारों और गोला-बारूद के सबसे बड़े आयातकों में से एक है और आजादी के 70 साल बाद भी ऐसा कहना कोई गौरव की बात नहीं है। लेकिन पिछले कुछ सालों में यह स्थिति बदल रही है। डीआरडीओ सेनाओं की जरूरतों को पूरा करने के लिए प्रयासरत है जो स्वदेशी समाधानों से निकली हों।” यहां डीआरडीओ भवन में आयोजित दो दिवसीय उद्घाटन सत्र में रक्षा मंत्री राजनाथ सिंह विशिष्ट अतिथि थे। राष्ट्रीय सुरक्षा सलाहकार अजीत डोभाल, वायु सेना प्रमुख एयर चीफ

मार्शल आर के एस भदौरिया, नौसेना प्रमुख एडमिरल करमबीर सिंह तथा डीआरडीओ के प्रमुख जी सतीश रेड्डी भी इस अवसर पर उपस्थित थे। रक्षा मंत्री ने शुरुआत में डीआरडीओ परिसर में स्थित पूर्व राष्ट्रपति एपीजे कलाम की प्रतिमा पर माल्यार्पण कर उन्हें श्रद्धांजलि दी। कलाम की 88वीं जयंती के मौके पर सिंह ने कहा, “हम उनके जीवन से प्रेरणा लें और भारत को वैज्ञानिक उपलब्धियों के माध्यम से विकसित देश बनाने के उनके सपने को पूरा करें।” उन्होंने दुनिया को बदलने वाली विनाशकारी तकनीकों के पहलुओं पर भी जोर दिया और कहा कि “भारत को इसमें नेतृत्व की भूमिका में उभरना होगा”। सिंह ने देश को पूरी तरह आत्मनिर्भर बनाने के लिए स्वदेशी प्रणाली पर काम करने की वकालत की। डोभाल ने कहा कि मजबूत और सुरक्षित भारत बनाने के लिए डीआरडीओ की भूमिका बहुत अहम होगी।

(यह आर्टिकल एजेंसी फीड से ऑटो-अपलोड हुआ है। इसे नवभारतटाइम्स.कॉम की टीम ने एडिट नहीं किया है।)

<https://navbharattimes.indiatimes.com/india/the-next-war-will-be-fought-with-indigenous-weapons-systems-and-the-army-chief-will-win/articleshow/71596347.cms>

## EASTMOJO

Wed, 16 Oct 2019

# How DRDO's bio-digester tech will improve sanitation in Mizoram

*Patented system contains an aerobic microbial inoculum that degrades human excreta into water and gases; treated water can be used for gardening & flushing*

*By Ezrela Dalidia Fanai*

Aizawl: The Defence Research and Development Organisation (DRDO) handed over the bio-digester technology used for the development of bio-toilets to the Public Health Engineering Department (PHED) of Mizoram at Aijal Club in Aizawl recently.

The function was chaired by PHED secretary Amjad Tak. Addressing the function, Defence Research Laboratory, Tezpur, director Dr SK Dwivedi said that the introduction of bio-toilets in Mizoram is a milestone in the history of sanitation and that due to the abundance of water supply, the state will benefit much from the technology.



Dr Dwivedi explained that the bio-digester has been researched by the DRDO for 25 years. It contains the anaerobic microbial inoculum (AMI) that degrades human excreta into water and gases. He added that the technology is eco-friendly and easily adoptable for individual to community level for different climates and conditions -- from hot and plain regions to cold and mountainous terrains. He also stressed that continuous feedback mechanism must be maintained from scientists at Tezpur.

The bio-toilet is a preferable choice for space constrained urban areas and conserves water with a low maintenance cost. The treated water from the reactor tank becomes colourless and odourless which can be reused for gardening and flushing.

The bio-digester technology is patented by DRDO and can be replicated only by those having licence. At present, the department of Mizoram PHE is the only licensing authority in the state.

<https://www.eastmojo.com/mizoram/2019/10/14/how-drdo-bio-digester-tech-will-improve-sanitation-in-mizoram>