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Defence allocation rises to Rs 2.49 lakh cr

New Delhi: The Budget allocation for the defence zoomed to Rs 2.49 lakh crore in 2016-17 - the highest among all government departments.

However, the figure was not mentioned by Finance Minister Arun Jaitley in his Budget speech, making him the first in 15 years to skip military allocations.

The military allocation was later clarified on Twitter by Minister of State for Finance Jayant Sinha.

"Defence allocation rises to 2.49 lakh crores, an increase of Rs 24,463 crores over last year," tweeted Sinha. Last year's revised estimate was Rs 2.24 lakh crore as the defence ministry was unable to spend a large part of its budget.

The enhancement is just about Rs 2300 crore, but when compared against the revised estimate, the increase is much more.

The allocation in 2016-17 for capital expenditure, meant for purchasing new military hardware and payment for existing contracts has been pegged at Rs 86340 crore. This is substantially lower than the allocations under the same head in the last two fiscals, when the defence ministry could not spend the money it received.

The allocation for defence pension, however, has been enhanced this time by more than Rs 22,000 crore as the government is set to implement the one rank one pension scheme for the ex-servicemen. A special allocation of Rs 3600 crore was made in the telecommunications budget to set up an optical fibre network for the defence services.

Notwithstanding the hike, India's defence expenditure remains just about 2% of the GDP, which is lower than Pakistan and China that spent much more on the military affairs.

As India remains one of the world's most lucrative arms market, with 14% of global arms import, Jaitley provided some tax sops to spur growth in defence production. The NDA plans big on defence manufacturing as a key component of the 'Make in India' programme.

In 2011-15, India's imports were three times greater than either of its regional rivals: China and Pakistan.

A major reason for high level of imports is that India's arms industry has so far largely failed to produce competitive indigenously-designed weapons, says a new report from the Stockholm International Peace Research Institute. Between 2006-10 and 2011-15, imports increased by 90%.

**‘Defence allocation down to about 1.65 % of GDP,
lowest since the 1962 China war**

DEFENCE ALLOCATIONS: 2016-17				
REVENUE BUDGET				(₹ crore)
Salaries	2014-15 (Actual)	2015-16 (BE)	2015-16 (RE)	2016-17 (BE)
(a) Army *	67,576	73,068	71,683	82,174
(b) Navy	5,788	6,288	6,287	7,688
(c) Air Force	10,533	11,360	11,359	13,437
(d) DRDO	2,306	2,500	2,444	2,873
TOTAL SALARY	86,203	93,216	91,773	1,06,172
Other revenue expenditure	50,604	58,923	51,463	56,578
Total Revenue allocation	1,36,807	1,52,139	1,43,236	1,62,759
CAPITAL BUDGET				
Army	13,890	22,406	18,486	22,110
Navy	21,249	23,911	18,678	20,715
IAF	30,809	31,481	28,644	27,555
Defence R&D Org	7,483	7,788	6,480	6,866
Land & works	7,075	7,087	8,368	8,207
Other heads	1,381	1,915	744	888
Total Capital allocation	81,887	94,588	81,400	86,340
Total budget allocation	2,18,694	2,46,727	2,24,636	249,099
Total government spending	16,63,673	17,77,477	17,85,391	19,78,060
Gross domestic production	1,26,53,762	1,41,08,945	1,35,67,192	1,50,65,010
Defence budget as % of total spending (%)	13.15	13.85	12.50	12.60
As % of GDP (%)	1.73	1.75	1.66	1.65

* Including Rashtriya Rifles and J&K Light Infantry (shown in separate head)
Source: calculations from budget documents

ARMS SPECIFICS

India needs to modernise its armed forces as also bring its internal security apparatus up to date to protect its frontiers and homeland

SHOPPING SPREE

India is expected to spend ₹4.4 lakh crore on defence acquisitions by 2020

₹4,40,000cr.

₹99,000cr

■ The value of India's deal with France's Dassault

126

No. of Rafales to be supplied under the deal

9

No. of defence PSUs such as HAL for aircrafts

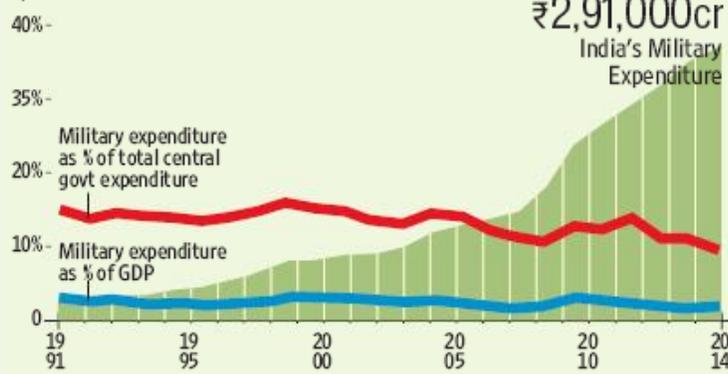
40

No. of ordnance factories that manufacture defence items

MILITARY MUSCLE

While the absolute value of India's military expenditure has increased, its ratio with GDP has remained almost constant

▼ Interest rates



ON GLOBAL FRONT

US trumps all other nations in terms of military expenditure. It is also biggest producer of arms in the world



Military modernisation needs more moolah

At Rs 2.5 lakh crore (approximately \$36.6 billion), the defence budget for 2016-17 accounts for 13 per cent of the total central government expenditure. The ratio of revenue to capital expenditure is now 65: 35, an increase in the revenue side as the earlier ratio was 60:40, possibly to cater to the 7th Pay commission.

The revenue expenditure has increased by 13. 6 per cent whereas there has been a subdued growth of 6 per cent in capital expenditure, over the previous years' revised estimates. This increase in capital expenditure of Rs 25,328 crore is more than neutralized by the annual inflation rate and the steep fall in the value of the rupee against the dollar.

It is not sufficient for the planned military modernisation that is necessary to meet the emerging threats and challenges, if the requirement of deployment of troops, training exercises with forces all over the world and movement of troops for internal security is going to remain as contemplated.

In this Budget, it was evident that the priority the government was to provide additional resources for vulnerable sections, rural areas and social and physical infrastructure creation.

In order to better utilize the limited capital outlay, the ministry of defence will have no option but to commence a process of reworking out inter service priorities – which has to start by ironing out the differences between the services.

It will have to plan for efficient financial management which would require reprioritization of acquisitions, review the process procurements to ensure that these get realigned to the countries needs of meeting internal security requirements, kick starting Make in India program for defence or to cater to the strategic imperative of increasing our area of influence and interest, all of which are important in their own sphere.

The MoD might as well also ensure that in future the funds from the capital outlay are not surrendered.

The 7th Pay Commission has had its effect on the Budget. To give an example, the pay and allowances of the three services and DRDO now constitutes more than 60 per cent of the revenue budget. Earlier this was 45 per cent of the revenue budget. The Budget has kept its focus of promoting private sector involvement in defence production.

Home Ministry gets Rs 77,383.12 cr, a 13% hike

New Delhi: The Union Home ministry will get Rs 77,383.12 crore in the next fiscal, an increase of 13%, with majority of the allocation going to the paramilitary forces involved in fighting insurgents in Jammu and Kashmir as well as north-east and Maoists.

The previous Budget had allocated a total of Rs 68,444.1 crore for the Union Home ministry.

In his Budget presented in Parliament on Monday, Finance Minister Arun Jaitley also allocated almost the same amount for modernisation of police as in the previous Budget.

According to the Budget documents, Rs 70184.58 crore has been allocated for the paramilitary forces and other police related expenditure, which is up from Rs 62124.52 crore allocated last year. Paramilitary forces alone gets Rs 50,176.45 crore.

CRPF gets the highest

The Central Reserve Police Force, which is in the forefront of anti-Maoist operations and anti-militant operations in Jammu and Kashmir, has been allocated the highest Rs 16,228.18 crore.

The next in order is the Border Security Force, which is guarding the international border with Pakistan and Bangladesh, with Rs 14,652.90 crore.

The Central Industrial Security Force, tasked with security of country's airports, nuclear installation and key government buildings, has been allocated Rs 6,067.13 crore. The Indo-Tibetan Border Police, guarding the Sino-Indian border, has got Rs 4,231.04 crore and Assam Rifles, deployed in Indo-Myanmar border and dealing with insurgents in the Northeast, will get Rs 4,363.88 crore.

Another Rs 2,490 crore has been allocated for erection of barbed wire fencing, construction of roads and induction of hi-tech surveillance on Indo-Bangladesh and Indo-Pak borders.

Under the special industry initiative for Jammu and Kashmir, Jaitley has earmarked Rs 70 crore, up from Rs 45 crore. The disaster management apparatus will get Rs 1,579.75 crore.

The Crime and Criminal Tracking Network System will get Rs 250 crore while the allocation for modernisation of police forces scheme will get Rs 1,753.90 crore.

The Intelligence Bureau will get Rs 1,410.45 crore while Special Protection Group, which guards Prime Minister Narendra Modi and former prime ministers, Congress leaders Sonia Gandhi and Rahul will get Rs 359.55 crore.

Another Rs 2,119.88 crore has been kept in the Budget for "providing support for research activities" in the Home ministry.

Funds in number:

Border Security Force gets 14,652.90 crore

CRPF, in the forefront of anti-Maoist operations and anti-militant operations in Jammu and Kashmir, allocated 16,228.18 crore

Paramilitary forces get 70184.58 crore

The Deccan Herald
1 Mar, 2016

Isro finds 'space' in Budget

The Indian Space Research Organisation (Isro) will receive fund from the Central government to carry out initial studies for conducting a space docking experiment, which will allow India to muster a critical technology, possessed by only a handful of nations, DHNS reports from New Delhi.

In the Budget, Union Finance Minister Arun Jaitley proposed to allocate a token money of Rs 10 lakh to the space agency for the docking experiment that aims at developing and demonstrating the technology required for docking of two small satellites in space.

India, US close in on logistics pact

India and the United States are closing in on an agreement to share military logistics after 12 years of talks, officials said, a sign of strengthening defence ties between the countries as China becomes increasingly assertive.

The United States has emerged as India's top arms source after years of dominance by Russia, and holds more joint exercises with it than any other country.

It is in talks with New Delhi to help build its largest aircraft carrier in the biggest military collaboration to date, a move that will bolster the Indian Navy's strength as China expands its reach in the Indian Ocean.

After years of foot-dragging by previous governments over fears that the logistics agreement would draw India into a binding commitment to support the United States in war, Prime Minister Narendra Modi's administration has signalled a desire to move ahead with the Logistics Support Agreement (LSA).

That would allow the two militaries to use each other's land, air and naval bases for resupplies, repair and rest, officials said.

Admiral Harry Harris, head of the US Navy's Pacific Command, said the two sides were working on the LSA, another agreement called the CISMOA for secure communications when the militaries operate together, and a third on exchange of topographical, nautical, and aeronautical data.

"We have not gotten to the point of signing them with India, but I think we're close," Admiral Harris, due in India this week, told the US House Armed Services Committee on Wednesday.

The progress comes as the countries consider joint maritime patrols that a US official said could include the South China Sea, where China is locked in territorial disputes.

Both sides, though, said there were no immediate plans for such patrols, which drew strong condemnation from Beijing.

An Indian government official said the main impediment to signing the LSA had been cleared, after Washington gave an assurance that New Delhi was not bound by it if the US went to war with a friendly country or undertook any other unilateral action that New Delhi did not support.

"It has been clarified that it will be done on a case-to-case basis; it's not automatic that either side will get access to facilities in the case of war," the official familiar with the negotiations said.

Asked whether China was concerned such cooperation was actually aimed at Beijing, Chinese Foreign Ministry spokesman Hong Lei said: "We hope the relevant cooperation is beneficial to regional peace and cooperation and should not be aimed at the interests of third parties."

India's previous center-left government was worried the agreements would undermine India's strategic autonomy and that it would draw it into an undeclared military alliance with the United States.

Concerns linger over the proposed communications agreement, with some branches of the military including the air force fearing it would allow the United States to access their communications network.

U.S. officials said they hoped that once the logistics agreement was signed, the others would follow.

A U.S. defense industry source engaged in business in India said there were expectations the LSA could be sealed by the time U.S. Defense Secretary Ash Carter visited New Delhi in April.

The source said Modi's office was directly involved in the matter and actively considering the agreements as a key for enhanced cooperation.

India has been alarmed by Chinese naval forays into the Indian Ocean and its involvement in maritime infrastructure on island nations that it traditionally considered its back yard.

It has moved to shore up naval forces and build defense ties with Japan and Vietnam, besides the United States.

"There is growing convergence between Obama's Asia pivot and Modi's Act East policy," said Saroj Bishoyi, an expert on the proposed India-U.S. collaboration at the government-funded Institute for Defense Studies and Analyses in New Delhi.

"The LSA currently appears to be a doable agreement."

The Hindu
1 Mar, 2016

Make In India initiative gets a leg up

Centre has decided to pay Employee Pension Scheme contribution of 8.33 per cent for all new employees

Finance Minister Arun Jaitley announced several proposals in the Union Budget 2016-17 to boost the government's Make in India (MII) initiative.

To help start-ups innovate, generate employment and be key partners in the MII programme, Mr. Jaitley proposed to back them through 100 per cent deduction of profits for three out of five years for start-ups set up during April 2016 to March 2019. He said Minimum Alternate Tax will apply in such cases.

In another initiative, Mr. Jaitley chose to follow advanced nations and proposed to grant foreign investors 'Residency Status' subject to certain riders. Currently, these investors are granted business visa only up to five years at a time, he pointed out.

To strengthen the MII initiative, there was an allocation of Rs.1,804 crore towards the scheme for Investment Promotion and Amended Technology Upgradation Fund.

He also proposed modification in Customs and Excise Duty structure to incentivise domestic value addition and push the MII campaign.

Changes were proposed in Customs and Excise Duty rates on certain inputs, raw materials, intermediaries/components and other goods while several procedures were simplified.

This was done to bring down costs and improve competitiveness of the domestic industry in sectors like information technology hardware, capital goods, defence production, textiles, mineral fuels and mineral oils, chemicals and petrochemicals, paper, paperboard and newsprint as well as in Maintenance Repair and Overhauling (MRO) of aircraft and ship repair, Mr. Jaitley said. Also, to incentivise the employers to recruit unemployed persons and bring into the books the informal employees and in turn, ensure new jobs

are created in the formal sector, the Centre has decided to pay the Employee Pension Scheme contribution of 8.33 per cent for all new employees enrolling in EPFO for the first three years of their employment.

To channelise this intervention towards the target group of semi-skilled and unskilled workers, the scheme will be applicable to those with salary up to Rs. 15,000 per month, Mr. Jaitley said. He said a budget provision of Rs. 1,000 crore had been made for this scheme. M.S. Mani, Senior Director, Deloitte in India, said while the government is yet to ensure the passage of the Goods and Services Tax Bill in Parliament, which is crucial for the success of MII, it has marginally increased Customs Duty on finished goods in some cases while reducing the duty on raw materials/components to push local manufacturing.

Also, maintaining Excise Duties has given a fillip to manufacturing in India as a move to increase such duties would have increased manufacturing costs.

Mr. Mani said a move which would indirectly push the MII initiative is the restoration of the benefit of service tax exemption, which was removed last year in several cases. This will help reduce the costs of building canals, dams, hospitals, educational institutes, airports and ports.

The Deccan Herald
1 Mar, 2016

'Driest area' may point to life on Mars

Washington: Nasa scientists are exploring the "driest place on earth" that provides a Mars-like environment to study the limits of life, and test drilling and life-detection technologies that may be sent to the red planet in the future.

In a harsh environment with very little water and intense ultraviolet radiation, most life in the extreme Atacama Desert in Chile exists as microbial colonies underground or inside rocks, researchers said.

The cold and dry conditions on Mars open the possibility that evidence for life may be found below the surface where negative effects of radiation are mitigated, in the form of organic molecules known as biomarkers, they said.

However, obtaining samples from below the surface of Mars will require the ability to identify a location of high probability for current or ancient life, place a drill, and control the operation robotically.

Despite being considerably warmer than Mars, the extreme dryness of the soil chemistry in the hyperarid core of the Atacama Desert, the "driest place on earth," are remarkably similar to that of the red planet.

"Putting life-detection instruments in a difficult, Mars-analogue environment will help us figure out the best ways of looking for past or current life on Mars, if it existed," said Brian Glass, a Nasa Ames space scientist and the principal investigator of the Atacama Rover Astrobiology Drilling Studies (ARADS) project.

"Having both subsurface reach and surface mobility should greatly increase the number of biomarker and life-target sites we can sample in the Atacama," Glass said.

Scientists worked in extremely dry and hot conditions with high winds during the first ARADS field deployment.

Their work was primarily at Yungay Station, a mining ghost town at one of the driest places in the Atacama.

They also evaluated two other Atacama sites - Salar Grande, an ancient dried-up lake composed of thick beds of salt, and Maria Elena, a similarly extremely dry region - to be considered along with Yungay as the host location for the future ARADS tests in 2017-19.

Scientists put several technologies to test under harsh and unpredictable field conditions: a Mars-prototype drill; a sample transfer arm; the Signs of Life Detector (SOLID); and a prototype version of the Wet Chemistry Laboratory (WCL).

They successfully used the ARADS drill and sample transfer robot arm at Yungay to acquire and feed sample material to the SOLID and WCL instruments under challenging environmental conditions.

Additionally, researchers from Johns Hopkins University and Nasa Ames collected samples for laboratory investigations of the extreme microorganisms living inside salt habitats in the Atacama.

Over the next four years, the ARADS project will return to the Atacama to demonstrate the feasibility of integrated roving, drilling and life-detection, with the goal of demonstrating the technical feasibility and scientific value of a mission that searches for evidence of life on Mars.

The Hindu
1 Mar, 2016

Exploring a Mars-like place on Earth

Atacama Desert, the driest place on the planet will gives clue to life on the Red Planet.

A Mars-like laboratory in the “driest place on Earth” is helping NASA scientists study the limits of life and test drilling and life-detection technologies that might be sent to Red Planet in the future.

In a harsh environment with very little water and intense ultraviolet radiation, most life in the extreme Atacama Desert in Chile exists as microbial colonies underground or inside rocks.

According to researchers at NASA, the same may be true if life exists on Mars.

The Atacama Rover Astrobiology Drilling Studies (ARADS) project has just completed its first deployment after one month of fieldwork in the hyperarid core of the Atacama Desert.

The extreme dryness the soil in this region is remarkably similar to that of the Red Planet.

Dr Brian Glass, NASA space scientist and principal investigator of the ARADS project, “Having both subsurface reach and surface mobility should greatly increase the number of biomarker and life—target sites we can sample in the Atacama.”

Biomarkers

The cold and dry conditions on Mars open the possibility that evidence for life may be found below the surface where negative effects of radiation are mitigated — in the form of organic molecules known as biomarkers.

But until humans set foot on the Red Planet, obtaining samples from below the surface of Mars will require the ability to identify a location of high probability for current or ancient life, place a drill, and control the operation robotically.

More than 20 scientists from US, Chile, Spain and France worked in dry conditions with high winds during the first ARADS field deployment.

Their work was primarily conducted at Yungay Station, a mining ghost town in Atacama, owned by Antofagasta University in Chile.

Augmented reality: Smart glasses offer users a keyboard to type Text

SEOUL, PTI: Scientists have developed smart glasses with stereo-vision that allow users to text a message or type in key words for internet surfing by offering a virtual keyboard for text and even one for a piano.

K-Glass is an even stronger model of smart glasses reinforced with augmented reality (AR) that were first developed by the Korea Advanced Institute of Science and Technology (KAIST) in 2014, with the second version released in 2015.

The latest version, which KAIST researchers are calling

K-Glass 3, allows users to text a message or type in key words for internet surfing by offering a virtual keyboard for text and even one for a piano.

Currently, most wearable head-mounted displays (HMDs) suffer from a lack of rich user interfaces, short battery lives, and heavy weight, researchers said.

Some HMDs, such as Google Glass, use a touch panel and voice commands as an interface, but they are considered merely an extension of smartphones and are not optimised for wearable smart glasses.

Recently, gaze recognition was proposed for HMDs including K-Glass 2, but gaze is insufficient to realise a natural user interface (UI) and experience (UX), such as user's gesture recognition, due to its limited interactivity and lengthy gaze-calibration time, which can be up to several minutes.

As a solution, Professor Hoi-Jun Yoo and his team from the Electrical Engineering Department developed K-Glass 3 with a low-power natural UI and UX processor to enable convenient typing and screen pointing on HMDs with just bare hands.



This processor is composed of a pre-processing core to implement stereo vision, seven deep-learning cores to accelerate real-time scene recognition within 33 milliseconds, and one rendering engine for the display.

The stereo-vision camera, located on the front of K-Glass

3, works in a manner similar to three dimension (3D) sensing in human vision.

The camera's two lenses, displayed horizontally from one another just like depth perception produced by left and right eyes, take pictures of the same objects or scenes and combine these two different images to extract spatial depth information, which is necessary to reconstruct 3D environments.

The camera's vision algorithm has an energy efficiency of 20 milliwatts on average, allowing it to operate in the Glass more than 24 hours without interruption.

Learn to fly a plane from experts' brainwaves

Los Angeles, PTI: Transmitting brain patterns of expert pilots via electrode-embedded head caps can improve learning in novices, according to a new study that suggests brain stimulation may be effective in accelerating practical learning.

"We measured the brain activity patterns of six commercial and military pilots, and then transmitted these patterns into novice subjects as they learned to pilot an airplane in a realistic flight simulator," said Matthew Phillips from the HRL Laboratories in California.

Researchers used transcranial direct current stimulation (tDCS) in order to improve learning and skill retention.

"We measured the average g-force of the plane during the simulated landing and compared it to control subjects who received a mock brain stimulation," said Phillips.

While previous research has demonstrated that tDCS can both help patients more quickly recover from a stroke and boost a healthy person's creativity, HRL's study is one of the first to show that tDCS is effective in accelerating practical learning.

Phillips speculates that the potential to increase learning with brain stimulation may make this form of accelerated learning commonplace.

"As we discover more about optimising, personalising, and adapting brain stimulation protocols, we'll likely see these technologies become routine in training and classroom environments," Phillips said.

"It's possible that brain stimulation could be implemented for classes like drivers' training, SAT prep, and language learning," he said.

The research was published in the journal *Frontiers in Human Neuroscience*.