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DB Original/Organic Mission: Watermelon, tomatoes growing at low temperatures in Leh-Ladakh, to become organic food hub by 2025

- *According to Dr. Stobden, Senior Scientist at the Defense Institute of High Altitude Research, watermelon production in Ladakh is almost double that of plains areas.*
- *Under the Mission Organic Development Initiative, three phases will cost 200 crores; the first phase will cover out of 38 villages out of 113*
- *With a yield of 30 to 40 tonnes per hectare without chemical, DRDO scientists are teaching farming techniques to the farmers*
- *According to Leh's Chief Agricultural Officer Tashi Setan, organic farming will double farmers' annual income.*
- *Currently farmers are earning 10 lakh to 12 lakh per hectare by growing watermelon*

Leh: Prime Minister Narendra Modi said in his August 15 speech that gradually we should reduce the use of urea in agriculture. His point was to increase organic farming, but farmers are not abandoning urea and fertilizer for fear of low yields.

Meanwhile, Leh-Ladakh is emerging as an example for the whole country. It is soon to become an organic food hub. Faced with geographical conditions, the farmers here are growing all the fruits and vegetables that can be grown only in a hot climate and along the river. Farmers in Leh with average temperatures of 5 to 6 degrees Celsius are producing watermelon, melon, and tomatoes the yield is very good.

The team of Defense Research and Development Organization (DRDO)'s Wing Defense Institute of High Altitude Research scientist Dr. T. Stobden, and the Department of Agriculture of Leh are working on this mission. Now Ladakh has also launched Organic Mission 2025. Only organic farming will be done here in the next 6 years. A plan has been prepared for this. Now its final draft is in the works. Its budget is initially Rs 200 crore.



First phase of organic mission will be completed this year

- According to scientist Dr. Stobden, there are 113 villages in Leh. These will be converted into organic farming in three phases. The first phase covers 38 villages. Chemicals are already not in use here. We are working right here to grow crops organically, Stobden said.
- According to Leh's Chief Agriculture Officer Tashi Setan, the first phase will be completed by the end of this year. We will get these villages fully certified in organic farming. For this, we have signed an MoU with the Government of Sikkim. Some people have received training in Sikkim as well, Setan said.

How is organic farming happening in Ladakh?

- Due to the Buddhist culture here, most people do not use chemicals. They believe that the use of chemical pesticides kills organisms. Therefore, most farmers rely only on organic methods.

- The temperature is the biggest obstacle for cultivation of vegetables and fruits. Hence cultivation is done by making greenhouses and polyhouses. By doing this the soil's temperature can be increased by 5 to 7 degrees Celsius.
- Organic manure and vermicompost are being used in place of chemicals. The weather is fit for farming for only 6 months of the year, so every year only one crop is cultivated.
- According to Leh's Chief Agriculture Officer Tashi Setan, we will start the second phase in 2022. It will cover about 30-40 villages. Here training will be provided to the farmers who use chemicals. Our team is already running awareness programmes for the right way of organic farming and team members are visiting villages and reaching out to farmers. After this, in 2025, we will cover the remaining villages. In this way, we will make the entire Leh organic by 2025, Setan said.
- Scientist Dr. Stobden explains that the Hill Council passed the resolution on 9 March 2019 for the organic mission. Its name is Mission Organic Development Initiative (MODI). Organic farming is still practiced in Ladakh, but it is not certified.

Farmers are earning 10-12 lakhs per hectare by growing watermelon, melon

The basic crops of Ladakh are wheat, barley and rajma. Now the production of vegetables has also started by developing the technique according to the environment of Ladakh. Watermelon and melon that are grown in hot climate and on river banks are also being produced here. Its annual yield is up to 30-40 MT per hectare, which is much higher than the rest of the country. Generally, the yield is about 25 metric tons per hectare. Due to this, the farmers here are earning 10 to 12 lakhs per hectare annually. This is almost four times the traditional crops. Apart from this, farmers are also producing other vegetables like cabbage, tomato, capsicum.



Rajma's price will double after getting organic certificate

According to Leh's Chief Agriculture Officer Tashi Setan, farmers here grow good quality kidney beans, that too organic. But due to not having an organic certificate, this 'Leh Rajma' sells for Rs 120 to 150/ kg. After the certificate, the same 'Leh Rajma' will be sold for Rs 300-400 rupees/ kg. This will increase the income of the farmers here. *(Story by Udit Bursale)*

<https://dbpost.com/db-original-organic-mission-watermelon-tomatoes-growing-at-low-temperatures-in-leh-ladakh-to-become-organic-food-hub-by-2025/>

Defence and security gold standard of bilateral partnership

Backed by a shared history of cooperation in defence technology and capacity building, India and Russia have been naturally inclined to build an enduring partnership to play an increasingly critical role in changing balance of power globally

By Poornima Bajwa Sharma

Defence cooperation has been one of the centerpieces of strategic partnership between India and Russia, which goes deeper than the conventional buyer-seller relationship. Based on mutual trust and respect, it is a special relationship that has endured the test of time. Time and again Russia has proven its worth as an all-weather friend of India, supporting the country whenever the situation demanded it. Be it forced wars, changing balance of power in the world, or a diplomatic situation arising at UN, almost every time Russia and India find themselves side by side lending support to each other to navigate the challenge.

Today, about 60% of Indian military equipment is of Russian origin and India continues to remain the second largest market for the Russian defence industry. With India setting up a roadmap for defence R&D and manufacturing to support 'Make in India' and achieve self-reliance in defence procurement, Indo-Russian defence relationship has entered a new paradigm which entails deeper collaborative effort through defence technology transfer and more collaborative effort in the spheres of research, design development and production of state of the art military platforms.



Joint Ventures in Defence

The BrahMos supersonic cruise missile – an Indo-Russian joint venture – remains the gold standard of defence collaboration between India and Russia. The successful test of the longer-range 450-km version is another feather in the cap for the collaboration. It is a joint venture between the Russian Federation's NPO Mashinostroyeniya and India's Defence Research and Development Organisation (DRDO), which have together formed BrahMos Aerospace. It is based on the Russian P-800 Oniks cruise missile and other similar seaskimming Russian cruise missile technology.

Some major deals signed have been for five S-400 Air Defence systems, four improved Krivak/Talwar class stealth frigates, and production of at least 200 Kamov- 226T utility helicopters in India. In March 2019, Indian Prime Minister Narendra Modi, dedicated to the nation, the Joint Venture of Indo- Russian Rifles Pvt Ltd, for Kalashnikov Assault Rifle Production, Amethi in Uttar Pradesh.

The new joint venture will manufacture world famous Kalashnikov assault rifles of the newest 200 series and eventually will reach full localization of production. Talking about the venture, Russian President Vladimir Putin said, "The Indian defence-industrial sector will have the opportunity to fulfill the needs of national security agencies in this category of small arms, resting upon advanced Russian technologies."

Some major deals signed have been for five S-400 Air Defence systems, four improved Krivak/Talwar class stealth frigates, and production of at least 200 Kamov-226T utility helicopters in India.

The agreement is one of the several new defence projects on which the two countries are working on, including under the ambit of 'Make in India' programme. In December 2018, India and Russia agreed to extend bilateral cooperation on defence joint-venture (JV) manufacturing projects at the 18th meeting of the India-Russia Governmental Commission on Military Technical Cooperation (IRIGC-MTC). The two countries also agreed to take forward inter-governmental arrangements for facilitating joint manufacturing of spares for Russian origin equipment in India, under the 'Make in India' initiative.

Technology Transfer

Russia and India share an outstanding level of confidence after decades of fruitful cooperation in the field of defence. In 2018, a number of Russian defence firms broadly agreed to facilitate speedy repair and overhaul of Russian-origin military platforms in India and manufacture their spare parts through joint venture and technology transfer with Indian companies.

The Defence Ministry said that Russian firms showed keen interest in taking 'Make in India' further by involving Indian firms in the process of providing after-sales support of Russian-origin equipment to the Indian Armed Forces through longterm supply agreements, repair, overhaul and manufacturing of some spare parts and components.

Russia's technology transfers to India in the defence sector have been without any strings attached and there is a scope for further deepening the ties, Vice Chief of the Indian Air Force Air Marshal S B Deo, said in July 2018.

In December 1988, an India– Russia co-operation agreement was signed, which resulted in the sale of a multitude of defence equipment to India and also the emergence of the countries as development partners. It also resulted in joint ventures projects to develop and produce the Fifth Generation Fighter Aircraft (FGFA) and the Multirole Transport Aircraft (MTA), between the two nations.

Make in India

'Make in India' programme is being used by the Government for defence procurements by categorising the capital acquisition proposals under 'Buy (Indian-IDDMM)', 'Buy (Indian)', 'Buy and Make (Indian)', 'Make' and 'Strategic Partnership Model' categories of Defence Procurement Procedure (DPP)-2016.

Government has notified the 'Strategic Partnership (SP)' Model which envisages establishment of long-term strategic partnerships with Indian entities through a transparent and competitive process, wherein they would tie up with global Original Equipment Manufacturers (OEMs) to seek technology transfers to set up domestic manufacturing infrastructure and supply chains.

India and Russia have deepened their 'Make in India' defence manufacturing cooperation by signing agreements for the construction of naval frigates, KA- 226T twin-engine utility helicopters, Brahmos cruise missile (JV with 50.5% India and 49.5% Russia). In a move aimed at boosting India's defence sector, 200 helicopters will be manufactured in the country with Russian collaboration as part of intensification and diversification of their strategic ties. The agreement, reached recently, is one of the several new defence projects on which the two countries are working on, including under the ambit of 'Make in India' programme.

BrahMos

BrahMos is a supersonic cruise missile that can be used against ship and land targets. It has a range of upto 300 kms and is uniquely configured for installing in ships, submarines and aircraft and on ground vehicles.

It is a joint venture between the Russian Federation's NPO Mashinostroyeniya and India's Defence Research and Development Organisation (DRDO), which have together formed BrahMos Aerospace.

It is based on the Russian P-800 Oniks cruise missile and other similar sea-skimming Russian cruise missile technology. The name BrahMos is formed from the names of two rivers, the Brahmaputra of India and the Moskva of Russia. India holds 50.5% share of the joint venture and its initial financial contribution was US \$126.25 million, while Russia holds 49.5% share with an initial contribution of US \$123.75 million.

In 2016, as India became a member of the Missile Technology Control Regime (MTCR), India and Russia are now planning to jointly develop a new generation of Brahmos missiles with 600 km-plus range and an ability to hit protected targets with pinpoint accuracy. Going by the latest development, the first prototype of the Brahmos-NG, a lighter sleeker variant of the Indo-Russian cruise missile, will be fielded in 2024. The NG or next generation will mark a quantum jump in the offensive abilities of the Indian armed forces. The five-metre-long, 50-centimetre-thick, and 1.5 ton Brahmod-NG is half the dimensions of the Brahmos missiles currently in service today with the Indian Air Force (IAF), Army, and the Navy.

Initially, Russia supplied 65% of the BrahMos' components, including its ramjet engine and radar seeker. Currently 65% of the missile is manufactured in India and there are plans to increase this to 85%. India and Russia intend to make 2,000 BrahMos supersonic cruise missiles over the next ten years through their joint venture company, and nearly 50% of them are expected to be exported to friendly countries.

Kalashnikov factory in Amethi

Prime Minister Narendra Modi recently inaugurated a factory that will manufacture modernised versions of the Kalashnikov rifle at the Korwa Ordnance Factory in Kauhar, Amethi, Uttar Pradesh. A shining example of Make in India, the joint venture Indo-Russia Rifles Private Limited—established between the Ordnance Factory Board (OFB), Kalashnikov Concern, and Rosoboronexport, the Russian state agency for military exports—is considered a milestone in Indo-Russian defence cooperation which will give a tremendous boost to the Uttar Pradesh Defence Corridor Project.

The Ordnance Factory Board in Amethi will produce AK-203, the latest derivative of legendary AK-47 rifle. The guns would replace the existing India-made INSAS assault rifles used by the Army, Air Force, and Navy. The rifle manufacturing project, worth around Rs 12,000 crores, came into being after India signed a deal with Russia to manufacture 750,000 of these assault rifles.

S-400

The S-400 Triumph, previously known as the S-300PMU-3, is an anti-aircraft weapon system developed by Russia's Almaz Central Design Bureau as an upgrade of the S-300 family, in the 1990s. It has been in service with the Russian Armed Forces since 2007. S-400 has been described as “one of the best air-defence systems currently made” by economists.

On 15 October 2016 during the BRICS Summit, India and Russia signed an Inter-governmental Agreement (IGA) for the supply of five S-400 regiments. The deliveries are expected to commence in 24 months, by the end of 2020, by which the S-400 is expected to be inducted into Indian service. An advanced surface-to-air missile system, S-400 Triumph can shoot down hostile aircraft and ballistic missiles. It has an estimated range of 250 kms and a possible upgrade is speculated to extend it to 400 kms.

<https://egov.eletsonline.com/2019/09/defence-and-security-gold-standard-of-bilateral-partnership/>

Russia, already India's biggest arms supplier, in line for more

\$12 billion of Make In India projects in hand, Moscow eyeing \$25 billion more

By Ajai Shukla

New Delhi: On the eve of his two-day visit to Vladivostok for a summit meeting with President Vladimir Putin, Prime Minister Narendra Modi proposed combining Russia's high technology with India's low production cost to build weaponry more cheaply. This is already happening, with contracts worth over \$12 billion in the pipeline.

In March, the Stockholm International Peace Research Organisation named Russia as India's biggest arms supplier from 2014-18, accounting for 58 per cent of India's defence imports. While no big defence announcements are slated for PM Modi's visit on Wednesday and Thursday, a slew of "Make in India" contracts could ensure Russia holds its position in the years ahead.

These projects are over and above the \$5.43 billion contract for five units of the S-400 Long Range Surface to Air Missile System, which was announced at the last Modi-Putin summit last October.

Kamov 226T helicopters

In 2015, on Putin's personal request, Modi agreed to buy 200 Kamov-226T utility helicopters for the IAF and army without competitive tendering. The \$2 billion deal involves building 140 Kamovs in Hindustan Aeronautics Ltd (HAL), after its joint venture (JV) partner, Russian Helicopters, supplies the first 60, fully built.

With this in hand, Russian Helicopters is fielding a "navalized" Kamov-226T in the Indian Navy's tender for 111 "naval utility helicopters". With its production facilities amortised over the first 200 Kamovs, Russian Helicopters could offer the navy a compelling price of around \$1 billion.

Kalashnikov AK-203

New Delhi and Moscow have signed an inter-governmental agreement (IGA) to build 750,000 Russian assault rifles for the Indian army, at a likely cost of about one billion dollars. In March, Modi inaugurated an Indo-Russian JV in Korwa, near Amethi, which will soon start manufacturing Kalashnikov AK-203 rifles.

The JV includes the Ordnance Factory Board, with a 50.5 per cent majority stake; Kalashnikov, with a 42 per cent stake, and Russia's state-owned export agency, Rosoboronexport, owning the remaining 7.5 per cent.

Krivak-III frigates

In October 2018, the cabinet approved the purchase of four Russian Krivak-III class frigates. The first two frigates are lying partially built in Yantar Shipyard, Russia and India will pay about \$1.5 billion to complete them, install Ukrainian Zorya gas turbine engines and sail them to India.

Meanwhile, a contract is being negotiated to build the next two Krivaks in Goa Shipyard Ltd.

DEFENCE PACT WITH RUSSIA			
Status	Weapons system	Quantity	Cost (\$bn)
Firm	Kamov 226T helicopters	200 + 111	3
	AK-203 Kalashnikov assault rifles	750,000	1
	Krivak-III frigates	4	3
	BrahMos missiles for warships	15 ships	2.6
	Igla-SVSHORADS	800	1.5
	Sukhoi-30MKI fighters	18	1.15
	Total		12.3
Up for grabs	Project 75-I submarines	6	7
	Medium fighters for IAF and navy	114 + 57	18-25
	Total		25-32

India already operates six Russian Krivak-class frigates. The first three, INS Talwar, Trishul and Tabar, were commissioned in 2003-2004. Subsequently, INS Teg, Tarkash and Trikand, were commissioned in 2012-2013.

BrahMos missiles

The BrahMos missile, which India and Russia co-developed and now co-produce in Hyderabad, is on order for several Indian warships. Last December, the MoD announced that the BrahMos would arm the four new Krivak-III frigates. Each vessel's BrahMos system, including the "vertical launch system" and missiles on board, will cost Rs 1,250 crore (\$175 million).

BrahMos missiles are also on order for the navy's four Visakhapatnam-class destroyers and will equip the seven Project 17A frigates under production. The total cost amounts to about \$2.6 billion.

Igla-S

Last November, the ministry of defence (MoD) announced it had chosen Russia's Igla-S missile as the "very short range air defence system" (VSHORADS) for the army, navy and Indian Air Force (IAF).

Russia's export agency, Rosoboronexport (ROE) bid \$1.5 billion for 5,175 Igla-S missiles and 800 launchers, beating out Sweden's Saab and French firm, MBDA.

The Igla-S VSHORADS, with a range of eight kilometres, will protect soldiers from enemy combat aircraft that have sneaked through the IAF's defences. While the Igla-S is an older system, with even the Russian military having switched over to the 9K333 Verba, it presents an affordable option.

Sukhoi-30MKI

With Hindustan Aeronautics Ltd (HAL) Nashik completing delivery of its contract to build 222 twin-engine, heavy Sukhoi-30MKI fighters, negotiations are under way for extending the licence to build an additional 18 aircraft.

At HAL's price of about Rs 450 crore (\$65 million) for each Sukhoi-30MKI, the IAF will pay about \$1.15 billion for 18 new fighters. Delivery of these could start next year and be completed by 2022, increasing the IAF's Su-30MKI fleet size to 14 squadrons, or 290 fighters.

Firm agreements between Moscow and New Delhi underlie the \$12.25 billion worth of Make in India production mentioned above comprise of. However, the real money lies in three procurements that Russia hopes to corner. These include:

Project 75-I submarines

Rosoboronexport is pursuing a navy tender, worth some Rs 50,000 crore (\$7 billion) for six new submarines, with "air independent propulsion", under Project 75-I.

The navy's 30-year submarine plan calls for building 12 vessels with foreign technology, and the next 12 indigenously. So far, only six Scorpene submarines have been built and Project 75-I is the last chance to obtain foreign technology.

Russia has promised a high degree of technology transfer for building its Amur-class submarines in India. It is competing for the contract with Thyssenkrupp Marine Systems from Germany, Naval Group from France and Kockums from Sweden.

Medium fighters

After the 2004 tender for 126 "medium multirole combat aircraft" (MMRCA) was aborted with the purchase of 36 Rafale fighters from Dassault, the IAF initiated a fresh acquisition for 114 medium fighters. Two Russian fighters are competing – the MiG-35 and Sukhoi-35.

Meanwhile, last year the navy initiated the procurement of 57 multi-role carrier borne fighters for its two indigenous aircraft carriers. The MiG-35 is competing for this too.

These are easily the biggest on-going Indian procurements, together worth an estimated \$18-25 billion. The Make in India component amounts to 50 per cent of the contract value

However, an obstacle to India's defence contracts with Moscow is an American law – Countering America's Adversaries Through Sanctions Act (CAATSA). This binds Washington to impose sanctions against countries that engage in "significant transactions" with Russian, Iranian and North Korean entities. While President Donald Trump can grant New Delhi a waiver from CAATSA, there is no certainty that he would.

https://www.business-standard.com/article/economy-policy/russia-already-india-s-biggest-arms-supplier-in-line-for-more-119090401471_1.html



Thu, 05 Sep 2019

Russia, India plan to jointly produce military equipment

The joint statement was adopted by the countries' leaders at the Eastern Economic Forum

Vladivostok: Russia and India plan to launch joint development and production of military equipment, spare parts and components, according to the statement "Through trust and partnership to new heights of cooperation" signed by Russian President Vladimir Putin and Indian Prime Minister Narendra Modi on the outcomes of their talks in Vladivostok on the sidelines of the Eastern Economic Forum (EEF).

"The sides have declared their commitment to boosting cooperation in the defense sphere, including establishing joint development and production of military equipment, spare parts and components as well as improving the system of aftersales services, and continuing regular joint drills between the two countries' military," the document reads.

Close cooperation between Russia and India in military and military-technical areas is a key pillar of bilateral and especially privileged strategic partnership, the two leaders said. The document also stated that Moscow and New Delhi confirmed the need to institutionalize mutual provision of logistical support and services for the two countries' armed forces. A decision was made to draw up a legal framework for cooperation on mutual material and technical support, the statement said.

Besides, Russia and India welcomed boosting cooperation between Russia's state space corporation Roscosmos and the Indian Space Research Organisation (ISRO), including on manned cosmonautics and satellite navigation. The sides agreed that there is the need to fully employ the potential of Russia and India in the sphere of rocket production, creation and utilization of various spacecraft and also exploring and using outer space for peaceful goals, including for research on planets.

Putin, Modi say no to looming arms race in outer space

Russian President Vladimir Putin and Indian Prime Minister Narendra Modi have voiced their concerns over a potential arms race in outer space, according to their joint statement after a bilateral summit on Wednesday.

Both are concerned that this possible arms race could eventually turn space into an arena of military confrontation, the document said. The two leaders confirmed that the prevention of an arms race in outer space would help prevent a serious threat to international peace and security. Moreover, they announced their intentions to continue further efforts in this direction.

Putin and Modi pointed out the paramount importance of fully observing international and legal agreements, stipulating that outer space should be used only for peaceful objectives, including for maintaining international peace and stability, as well as developing international cooperation and mutual understanding.

Russia and India called for introducing a legally binding multilateral instrument, providing guarantees of non-deployment of any types of weapons at Low-Earth Orbit. They also confirmed that the Conference on Disarmament is the only forum for holding multilateral talks devoted to international cooperation on preventing an arms race in outer space in all its aspects.

According to their official statement, the sides reached an agreement that universal, non-discriminatory measures for transparency and building confidence may supplement a legally binding tool on preventing an arms race in outer space.

Easing visa travel

Russia and India intend to continue the work to ease visa travel between the states, according to the statement. The leaders of the two states welcomed "the positive development of the process of easing visa formalities," in particular the extension to one year of the validity period for e-visas for Russian citizens who go to India on business and tourism purposes, as well as the introduction of free e-visas for Indian citizens for visiting the Kaliningrad Region and Vladivostok. "The sides expressed the intention to continue to carry out work to ease visa travel," the statement reads.

The document states the dynamic development of the Russian-Indian ties in the sphere of tourism. "The sides agreed to continue work to develop cooperation in this sphere," the statement says. The leaders also highly valued the implementation of the bilateral program of cultural exchanges "which directly contributes to the rapprochement of the two countries' peoples," and decided "to continue the successful practice of carrying out festivals of Russian culture in India and Indian culture in Russia, as well as Russian film festivals in India and Indian film festivals in Russia." "The sides reached mutual understanding on the necessity to extend the geography of cultural exchanges, involve the youth and folk art teams more, as well as continue the comprehensive popularization of the Russian language in India and the Hindi language in Russia, in particular through the development of contacts between relevant educational organizations of the two countries," the document continues.

The sides also welcomed the development of cooperation in the sphere of education and agreed to galvanize the preparation of intergovernmental agreements on the mutual acceptance of documents on academic qualifications. Putin and Modi's statement also included the development of cooperation between certain regions of India and Russia. In particular, the document stipulates the intention to organize an interregional forum of the two countries and the agreement to develop the system of twin cities of Russia and India.

The two state leaders noted in their joint statement that overall "Russian-Indian relations successfully sustained the turbulence of the modern world and neither depend nor will ever depend on external influence." The state leaders agreed to offer comprehensive support for unleashing the powerful potential of strategic partnership, noting its highly privileged character which served as the basis for stability in the difficult international situation," the document says.

Interaction in Arctic and Far East

India is committed to interacting with Russia in the Arctic and is ready to play an important role in the Arctic Council, according to the statement. "India is committed to interacting with Russia in the Arctic. India is watching development of the Arctic region with interest and is also ready to play an important role in the Arctic Council," the document reads.

The parties also expressed content with the cooperation between Moscow and New Delhi in the development of the Russian Far East. "The Russian side welcomed India's intention to expand its economic and investment presence in the Far Eastern region and Siberia. The parties are interested in developing cooperation in attracting skilled workers from India to the Far East on a periodic basis," the document says.

Adoption of chemical terrorism convention

Russia and India believe that it is necessary to reinstate the spirit of consensus in the Organization for the Prohibition of Chemical Weapons (OPCW).

"The parties voiced support for the Organization for the Prohibition of Chemical Weapons (OPCW), which had made its contribution to the effective implementation of the Chemical Weapons Convention. They confirmed the determination to back efforts and initiatives aimed at preserving the role of the convention and preventing the OPCW activities from being politicized. They called on the signatories to the convention to unite and [hold] constructive dialogue to restore the spirit of consensus to preserve the integrity and inviolacy of the convention," Russian President Vladimir Putin and Indian Prime Minister Narendra Modi said in the statement adopted following their talks in Vladivostok.

Moreover, "the parties support stronger Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction and particularly back adoption of a protocol to the document on establishing an effective and indiscriminate international mechanism of verifying compliance." Russia and India assured that "the functions of the convention, including the ones relating to the UN Security Council should not be replicated by other mechanisms."

"In the context of countering chemical and biological terrorism, the parties underscored the necessity to launch multilateral talks to adopt the International Convention on the Suppression of Acts of Chemical and Biological Terrorism at the conference," the document reads. Moscow and New Delhi also "confirmed their commitment to continue strengthening the global non-proliferation regime. Russia strongly supported India's membership in the Nuclear Suppliers Group."

Fight against terrorism

The statement particularly underlined that "Russia and India roundly condemned terrorism in all its manifestations and forms and called on the international community to create a united front in fighting this scourge, confirming their determination to take every measure to prevent and counter terrorism." "The parties insist that it is unacceptable to use double standards in the fight against terrorism and extremism or use terrorist groups to achieve political goals. The leaders called to perfect coordination of efforts of our countries in the framework of the international counter-terrorism cooperation, among other things aimed at beefing up efforts to prevent the exploitation of information and communication technologies for terrorist purposes," the document emphasizes.

The Russian president and the Indian prime minister "agreed to boost bilateral and multilateral counter-terrorism cooperation and called to complete the work on the Comprehensive Convention on International Terrorism as soon as possible." "Nowadays, there is not a single country that was not affected by the terrorist scourge. Russia and India need to jointly take measures to fight terrorism. The Russian side acknowledged the Indian side's proposal to hold a global conference on terrorism," the statement stresses.

Moscow and New Delhi "underlined the need to continue efforts aimed at improving the situation in the sphere of international security and work consistently to raise the level of inter-governmental trust and strengthen global and regional stability in all aspects as a basis for lasting peace rooted in the principle of equal and inseparable security for all with respect to interests and concerns of all states."

Putin and Modi "agreed to actively keep in touch on the whole array of issues of ensuring security through the Russian Security Council and the Indian National Security Council."

Dialogue on Iranian nuclear deal

Russia and India carry on mutually beneficial and legitimate cooperation with Iran, calling the international community to discuss the Joint Comprehensive Plan of Action on the Iranian nuclear program, the joint statement informs.

"The issues related to it [the Iranian nuclear program] must be resolved peacefully, through dialogue," the document notes. "The sides have expressed their commitment to carry on the mutually beneficial and legitimate trade-economic cooperation with Iran."

"The sides stress the importance of full and effective adherence to the Joint Comprehensive Plan of Action on the Iranian nuclear program to ensure regional and international peace, security and

stability, reaffirming their full commitment to Resolution 2231 of the UN Security Council," the statement reads.

Assistance for Syria's recovery

Russia and India are insisting that Damascus plays a key role in determining the conditions of the international humanitarian assistance to Syria, according to the statement.

"The parties underlined the importance of the fight against terrorist organizations in Syria, identified as such by the UN Security Council," the document reads. "They agreed to continue amplifying the assistance to Syria for the sake of the country's recovery, including establishment of conditions to resettle refugees and temporarily displaced people." "The parties reiterate the necessity to strictly adhere to the principles of provision of humanitarian assistance enshrined by UN General Assembly resolution 46/182, which stipulates that the recipient country's government plays a key role in determining the parameters of humanitarian assistance with respect to the national sovereignty of the receiving party," the statement underlines.

Putin and Modi welcomed stabilization in Syria, saying that they "insist that the sovereignty and territorial integrity of the Syrian Arab Republic should be respected and urge to resolve the Syrian crisis exclusively by means of politics and diplomacy."

Dialogue to establish peace on Korean Peninsula

Russia and India have called on all parties to the talks on the Korean Peninsula crisis to continue dialogue on the issue, according to the statement.

"The two sides highlighted the importance of continued peaceful dialogue between all parties concerned aimed at establishing a lasting peace and stability on a nuclear-free Korean Peninsula and urged all the parties to cooperate to achieve that goal," the document reads.

Putin and Modi also agreed to explore mutually acceptable and mutually beneficial areas of cooperation in third countries, primarily in Central Asia, Southeast Asia and Africa.

Call for end of violence in Afghanistan

In their joint statement Russia and India call for an immediate end of violence in Afghanistan. "In support of the efforts by all interested states facilitating large-scale peace process in the Islamic Republic of Afghanistan, constitutional order, long-lasting peace and the country's transformation into a peaceful, secure, stable and independent state, the sides have called for an immediate end of violence," the document notes.

Russia and India expressed their support for all measures aimed to implement the national peace process in Afghanistan under the leadership and with the participation of Afghani citizens. "The sides have stressed their commitment to the soonest peaceful settlement in Afghanistan, as well as their determination to continue cooperating within the framework of the SCO-Afghanistan Contact Group and other internationally recognized political venues with this aim. They also reaffirmed their support of the Inter-Afghan Dialogue that began in Moscow in February 2019," the statement informs. "The sides will continue an intensive discussion of Afghanistan."

Invitation to India from Indian PM

Indian Prime Minister Narendra Modi has invited Russian President Vladimir Putin to visit India in 2020, the joint statement informed.

"Prime Minister of the Republic of India Narendra Modi has thanked President of the Russian Federation Vladimir Putin for his kind hospitality shown to him and his delegation in Vladivostok, inviting the President of the Russian Federation to visit India next year to participate in the 21st India-Russia Annual Summit," the document notes.

In his statement to the press on the outcomes of the talks, Putin informed that the Indian PM had agreed to visit Russia in 2020 to attend the celebratory events timed to the 75th anniversary of Russia's victory in the Second World War.

"The sides were pleased to note that their approaches to foreign policy largely coincide, stressing the importance of further development of Russian-Indian special and privileged strategic partnership both in the context of current bilateral relations and regarding the issues on the regional and international agenda," the statement continues. "The sides have reaffirmed their mutual commitment to strengthen and expand cooperation for the benefit of the Russian and Indian people."

<https://tass.com/economy/1076389>



Thu, 05 Sep 2019

भारत-रूस के बीच हुए कुल 15 समझौते, पढ़ें साझा प्रेस वार्ता में क्या बोले मोदी-पुतिन

इस दौरान पीएम मोदी ने अफगानिस्तान के मसले पर कहा कि भारत हमेशा स्वतंत्र अफगानिस्तान की आशा करता है. इसके अलावा पीएम मोदी ने कहा कि भारत-रूस मानते हैं कि किसी देश के आंतरिक मसले में किसी तीसरे देश को दखल नहीं देना चाहिए.

नई दिल्ली: दो दिन के ऐतिहासिक दौर पर रूस के व्लादिवोस्तोक पहुंचे प्रधानमंत्री नरेंद्र मोदी ने बुधवार को राष्ट्रपति व्लादिमीर पुतिन के साथ द्विपक्षीय वार्ता की. साझा प्रेस वार्ता में दोनों नेताओं के सामने कई अहम समझौतों पर हस्ताक्षर हुए, साथ ही साथ दोनों नेताओं ने द्विपक्षीय और अंतरराष्ट्रीय मसलों पर चर्चा की. इस दौरान पीएम मोदी ने अफगानिस्तान के मसले पर कहा कि भारत हमेशा स्वतंत्र अफगानिस्तान की आशा करता है. इसके अलावा पीएम मोदी ने कहा कि भारत-रूस मानते हैं कि किसी देश के आंतरिक मसले में किसी तीसरे देश को दखल नहीं देना चाहिए.

बुधवार को हुई साझा प्रेस वार्ता में नरेंद्र मोदी ने कहा कि आज भारत-रूस के बीच 20वां समिट है, जब पहला समिट हुआ था तब मैं गुजरात के CM के तौर मैं अटल बिहारी वाजपेयी के साथ यहां आया था और तब भी व्लादिमीर पुतिन यहां के राष्ट्रपति थे. हमारी कोशिश दोनों देशों के बीच संबंधों को नई ऊंचाइयों पर ले जाने की है.

PM मोदी ने कहा कि भारत में रूस के सहयोग से न्यूक्लियर प्लांट बन रहे हैं, हमारे रिश्तों को हम राजधानियों के बाहर पहुंचा रहे हैं. पीएम बोले कि भारत-रूस डिफेंस, कृषि, टूरिज्म, ट्रेड में आगे बढ़ रहे हैं. स्पेस में हमारा सहयोग लगातार आगे बढ़ रहा है.

पीएम मोदी ने कहा कि भारत ऐसा अफगानिस्तान देखना चाहता है जो स्वतंत्र, शांत और लोकतांत्रिक हो. हम दोनों किसी देश के आंतरिक मामले में बाहरी दखल के खिलाफ हैं. अगले साल भारत-रूस मिलकर टाइगर कन्जर्वेशन पर बड़ा फोरम करने में सहमत हुए हैं.

विदेश मंत्रालय के प्रवक्ता रवीश कुमार ने ट्वीट कर बताया कि दोनों देशों के बीच कुल 15 MoU पर साइन हुए हैं. प्रधानमंत्री नरेंद्र मोदी अगले साल मई में एक बार फिर रूस के दौर पर जाएंगे. रूस के राष्ट्रपति व्लादिमीर पुतिन ने उन्हें वर्ल्ड वॉर-2 में रूस की जीत के 75 साल पूरे होने वाले जश्न में न्योता दिया है.

Scripting new chapters of India-Russia friendship!

President Putin and PM @narendramodi meet in Vladivostok. In a special gesture, President Putin accompanied PM to the Zvezda shipyard. pic.twitter.com/pwvvaSaK41

— PMO India (@PMOIndia) [September 4, 2019](#)

भारत से संबंधों को लेकर क्या बोले व्लादिमीर पुतिन

साझा प्रेस वार्ता में व्लादिमीर पुतिन ने भारत के साथ संबंधों की चर्चा की और पीएम मोदी की जमकर तारीफ की. व्लादिमीर पुतिन ने साझा प्रेस वार्ता में कहा कि दोनों देशों के बीच संबंध काफी सामरिक हैं, हम लगातार अपनी दोस्ती को मजबूत बना रहे हैं. हम लगातार संपर्क में रहते हैं और दोनों देशों के बीच लगातार कई बैठकें हो रही हैं. इससे पहले हम दोनों ओसाका में हुई थी, दोनों नेता लगातार खुले और बढ़िया वातावरण में बातचीत कर रहे हैं.

व्लादिमीर पुतिन ने कहा कि पिछली बैठक में हमने जो फैसला लिए थे, उसकी आज समीक्षा की. उन्होंने कहा कि हमारी प्राथमिकता निवेश और व्यापार है, दोनों के व्यापार में 17 फीसदी की बढ़ोतरी हुई है. मुझे विश्वास है कि दोनों देश कई और मोर्चे पर साथ आगे बढ़ेंगे.

रूस के राष्ट्रपति ने कहा कि आज सुरक्षा, व्यापार और ऊर्जा में समझौते हुए हैं. पुतिन ने कहा कि हम भारत की कंपनियों का रूस में स्वागत करना चाहते हैं. भारत और रूस के बीच हथियारों को लेकर काफी अच्छे संबंध हैं, हम भारत में मिसाइल सिस्टम और रायफल बनाने की ओर कदम बढ़ा रहे हैं. व्लादिमीर पुतिन ने कहा कि सामरिक तौर पर दोनों देशों का इतिहास काफी पुराना है.

गौरतलब है कि बुधवार को दोनों देशों के बीच भारत और रूस के बीच कई अहम समझौतों पर हस्ताक्षर हुए, इनमें डिफेंस-व्यापार-टूरिज्म-ऊर्जा से जुड़े क्षेत्र अहम रहे.

<https://aajtak.intoday.in/story/pm-narendra-modi-russia-vladimir-putin-vladivostok-summit-press-statement-1-1116531.html>

THE ECONOMIC TIMES

Thu, 05 Sep 2019

Iran set to make new cut in nuclear commitments

The efforts have been led by French President Emmanuel Macron, who has been trying to convince the US to offer Iran some sort of relief from crippling sanctions

Tehran: President Hassan Rouhani said Iran will announce a new step in scaling back its nuclear commitments by Thursday despite a diplomatic push for relief from US sanctions. Iran and three European countries — Britain, France and Germany — have been engaged in talks to save a 2015 nuclear deal that has been unravelling since the US withdrew from it May last year.

The efforts have been led by French President Emmanuel Macron, who has been trying to convince the US to offer Iran some sort of relief from crippling sanctions it has reimposed on the Islamic republic since its pullout. “I don’t think that... we will reach a deal so we’ll take the third step and we will announce the details today or tomorrow,” Rouhani was quoted as saying on Wednesday by the presidency website.

The Iranian president said the two sides were getting closer to an agreement on a way to resolve burning issues. “If we had 20 issues of disagreement with the Europeans in the past, today there are

three issues,” he said. “Most of them have been resolved but we haven't reached a final agreement.” Iran has hit back with countermeasures in response to the US withdrawal from the 2015 deal, which gave it relief from sanctions in return for curbs on its nuclear programme.

In July, it said it had increased its stockpile of enriched uranium to beyond the maximum set by the deal. It later announced it had exceeded a cap on the level of enrichment of its stocks. Iran has long been threatening to carry out a third step by Friday unless other parties to the deal offset the effect of US sanctions in return for its continued compliance. A deputy foreign minister said Iran would resume full compliance with the Joint Comprehensive Plan of Action (JCPOA) if it is allowed to sell its oil or get a \$15-billion credit line guaranteed by future crude sales.

Abbas Araghchi expressed doubt, however, that such a plan could be agreed by the deadline set by Iran for sanctions relief. “Iran... will return to full implementation of the JCPOA only if it is able to sell its oil and to fully benefit from the income from these sales,” said Araghchi.

<https://economictimes.indiatimes.com/news/international/world-news/iran-set-to-make-new-cut-in-nuclear-commitments/articleshow/70983606.cms>



Thu, 05 Sep 2019

चांद छूने को तैयार विक्रम लैंडर, 35 KM दूर लगा रहा है चक्कर

ISRO के वैज्ञानिकों ने आज यानी 4 सितंबर को तड़के 3.42 बजे विक्रम लैंडर को चांद की सबसे

नजदीकी कक्षा में डाल दिया. अब विक्रम चांद से सिर्फ 35 किमी दूर है. करीब 45 घंटे बाद

विक्रम चांद के दक्षिणी ध्रुव पर उतरेगा. विक्रम की सेहत अच्छी है.

भारतीय अंतरिक्ष अनुसंधान संगठन (ISRO) के वैज्ञानिकों ने आज यानी 4 सितंबर को तड़के 3.42 बजे विक्रम लैंडर को चांद की सबसे नजदीकी कक्षा में डाल दिया. अब विक्रम लैंडर चांद से सिर्फ 35 किमी दूर है. करीब 45 घंटे बाद विक्रम लैंडर चांद के दक्षिणी ध्रुव पर उतरेगा. अब विक्रम लैंडर चांद के चारों तरफ 35 किमी की एपोजी और 101 किमी की पेरीजी वाली ऑर्बिट में घूम रहा है. इसरो वैज्ञानिकों ने बताया कि विक्रम लैंडर की सेहत अच्छी है.

वहीं, ऑर्बिटर चांद के चारों तरफ 96 किमी की एपोजी और 125 किमी की पेरीजी वाली अंडाकार कक्षा में चक्कर लगा रहा है. चंद्रयान-2 के विक्रम लैंडर और ऑर्बिटर चांद के चारों तरफ करीब 2 किमी प्रति सेकंड की गति से चक्कर लगा रहे हैं. चंद्रयान-2 तीन हिस्सों से मिलकर बना है - पहला- ऑर्बिटर, दूसरा- विक्रम लैंडर और तीसरा- प्रज्ञान रोवर. विक्रम लैंडर के अंदर ही प्रज्ञान रोवर है, जो सॉफ्ट लैंडिंग के बाद बाहर निकलेगा.

5 और 6 सितंबर तक लगातार होगी विक्रम लैंडर के सेहत की जांच

4 सितंबर को दूसरी बार चांद की कक्षा बदलने यानी चांद के सबसे नजदीकी कक्षा में पहुंचने के बाद 6 सितंबर तक विक्रम लैंडर के सभी सेंसर्स और पेलोड्स के सेहत की जांच होगी. प्रज्ञान रोवर के सेहत की भी जांच की जाएगी.

7 सितंबर होगा सबसे चुनौतीपूर्ण, चांद पर उतरेगा विक्रम लैंडर

- 1:30 से 1.40 बजे रात (6 और 7 सितंबर की दरम्यानी रात) - विक्रम लैंडर 35 किमी की ऊंचाई से चांद के दक्षिणी ध्रुव पर उतरना शुरू करेगा. तब इसकी गति होगी 200 मीटर प्रति सेकंड. यह इसरो वैज्ञानिकों के लिए बेहद चुनौतीपूर्ण काम होगा.
- 1:55 बजे रात - विक्रम लैंडर दक्षिणी ध्रुव पर मौजूद दो क्रेटर मैजिनस-सी और सिंपेलियस-एन के बीच मौजूद मैदान में उतरेगा. करीब 6 किमी की ऊंचाई से लैंडर 2 मीटर प्रति सेकंड की गति से चांद की सतह पर उतरेगा. ये 15 मिनट बेहद तनावपूर्ण होंगे.
- 3.55 बजे रात - लैंडिंग के करीब 2 घंटे के बाद विक्रम लैंडर का रैंप खुलेगा. इसी के जरिए 6 पहियों वाला प्रज्ञान रोवर चांद की सतह पर उतरेगा.
- 5.05 बजे सुबह - प्रज्ञान रोवर का सोलर पैनल खुलेगा. इसी सोलर पैनल के जरिए वह ऊर्जा हासिल करेगा.
- 5.10 बजे सुबह - प्रज्ञान रोवर चांद की सतह पर चलना शुरू करेगा. वह एक सेंटीमीटर प्रति सेकंड की गति से चांद की सतह पर 14 दिनों तक यात्रा करेगा. इस दौरान वह 500 मीटर की दूरी तय करेगा.

ऑर्बिटर: चांद से 100 किमी ऊपर इसरो का मोबाइल कमांड सेंटर

चंद्रयान-2 का ऑर्बिटर चांद से 100 किमी ऊपर चक्कर लगाते हुए लैंडर और रोवर से प्राप्त जानकारी को इसरो सेंटर पर भेजेगा. इसमें 8 पेलोड हैं. साथ ही इसरो से भेजे गए कमांड को लैंडर और रोवर तक पहुंचाएगा. इसे हिंदुस्तान एयरोनॉटिक्स लिमिटेड ने बनाकर 2015 में ही इसरो को सौंप दिया था.

विक्रम लैंडर: रूस के मना करने पर इसरो ने बनाया स्वदेशी लैंडर

लैंडर का नाम इसरो के संस्थापक और भारतीय अंतरिक्ष कार्यक्रम के जनक विक्रम साराभाई के नाम पर रखा गया है. इसमें 4 पेलोड हैं. यह 15 दिनों तक वैज्ञानिक प्रयोग करेगा. इसकी शुरुआती डिजाइन इसरो के स्पेस एप्लीकेशन सेंटर अहमदाबाद ने बनाया था. बाद में इसे बेंगलुरु के यूआरएससी ने विकसित किया.

प्रज्ञान रोवर: इस रोबोट के कंधे पर पूरा मिशन, 15 मिनट में मिलेगा डाटा

27 किलो के इस रोबोट पर ही पूरे मिशन की जिम्मेदारी है. इसमें 2 पेलोड हैं. चांद की सतह पर यह करीब 400 मीटर की दूरी तय करेगा. इस दौरान यह विभिन्न वैज्ञानिक प्रयोग करेगा. फिर चांद से प्राप्त जानकारी को विक्रम लैंडर पर भेजेगा. लैंडर वहां से ऑर्बिटर को डाटा भेजेगा. फिर ऑर्बिटर उसे इसरो सेंटर पर भेजेगा. इस पूरी प्रक्रिया में करीब 15 मिनट लगेंगे. यानी प्रज्ञान से भेजी गई जानकारी धरती तक आने में 15 मिनट लगेंगे.

<https://aajtak.intoday.in/story/isro-chandrayaan-orbit-vikram-lander-moon-mission-india-1-1116395.html>

Chandrayaan-2 update: After 2nd de-orbiting maneuver, all eyes on Sep 7 landing

- *If all goes as planned, Chandrayaan-2 would be on the moon at precisely 1:55 am on September 7*
- *Rover 'Pragyan' will carry out experiments on the lunar surface for 14 days*

New Delhi : After two successive de-orbiting maneuvers, Indian Space Research Organisation's (ISRO) Chandrayaan-2 spacecraft is now all set to land on the moon anytime in between 1:30 am and 2:30 am on September 7.

Although Russia, USA and China have achieved a soft landing on the moon previously, India wants to become the first one to explore the south pole of the Moon.

With the second maneuver today, the required orbit for the Vikram Lander to commence its descent towards the lunar surface is achieved, ISRO said. The Lander is scheduled to make a powered descent between 1am and 2 am on 7 September, followed by touch down of the Lander in between 1:30 am and 2:30 am.

If all goes as planned, the spacecraft would be on the lunar soil at precisely 1:55 am on the intervening night of Thursday and Friday this week. Prime Minister Narendra Modi is likely to be present at ISRO headquarters in Bengaluru to watch the historic landing of Chandrayaan-2. Sixty students have also been selected from all over the country to watch the event live with PM Modi.

ISRO The second de-orbiting maneuver for #Chandrayaan spacecraft was performed successfully today (September 04, 2019) beginning at 0342 hrs IST.

For details please see <https://t.co/GiKDS6CmxE>

— ISRO (@isro) September 3, 2019

ISRO Chairman K Sivan has said the proposed soft-landing on the Moon is going to be a "terrifying" moment as it is something the space agency has not done before while the Lunar Orbit Insertion (LOI) manoeuvre was successfully carried out during the previous Chandrayaan-1 mission.

Following the landing, the rover 'Pragyan' will roll out from the lander between 5.30 and 6.30 am on Saturday, and carry out experiments on the lunar surface for 14 days, which is equivalent to one lunar day.

The mission life of the lander is also one lunar day, while the orbiter will continue its mission for a year.

According to the ISRO, the objective of India's lunar mission is to develop and demonstrate the key technologies for end-to-end lunar mission capability, including soft-landing and roving on the lunar surface.

On the science front, this mission aims to further expand knowledge about the moon through a detailed study of its topography, mineralogy, surface chemical composition, thermo-physical characteristics and atmosphere, leading to a better understanding of the origin and evolution of the moon, the space agency had said.

<https://www.livemint.com/news/india/chandrayaan-2-update-lunar-mission-moon-landing-date-time-1567581318145.html>

Destination Moon: If Chandrayaan-2 succeeds in its mission, Indian space science will have proved its mettle

Indian space science is inching towards a historic feat with the Chandrayaan-2 Moon mission entering its last and crucial phase. It will be recalled that Chandrayaan-2 was successfully launched on July 22 with Isro's GSLV MK-III-M1 rocket. Subsequently the 3,840 kg spacecraft, comprising an orbiter, a lander and a rover, left Earth orbit on August 14 and was transferred to a Moon orbit through a manoeuvre called trans lunar insertion. Then in the last few days, the lander – christened Vikram – successfully separated from the orbiter and was put in a lower Moon orbit. Finally, on September 7, Vikram will attempt to soft land near the south pole of the Moon.

If that is successful, the rover Pragyan will roll out of the lander and begin conducting experiments on the lunar surface. With that India will become only the fourth country to put a rover on the Moon and the first to reach the Moon's south pole in its first attempt. Additionally, Chandrayaan-2 is expected to enhance our understanding of our natural satellite and the origins of our solar system. In fact, one of the objectives of the mission is to further findings of its predecessor Chandrayaan-1, which in 2008 had confirmed the presence of water on the Moon.

And if Chandrayaan-2 does find substantial reserves of Moon water along with any other valuable minerals in lunar soil, it would be contributing towards the creation of a future Moon colony. All of this on a budget – Rs 978 crore – that is less than what it cost to make the Hollywood movie Interstellar. Thus, Chandrayaan-2 could be the model for low-cost Moon missions of the future. As the entire nation waits for the historic soft-landing – a complex manoeuvre that Israel failed to pull off earlier this year – India's second Moon mission has already set the tone for the proposed Indian manned space flight by 2022.

<https://timesofindia.indiatimes.com/blogs/toi-editorials/destination-moon-if-chandrayaan-2-succeeds-in-its-mission-indian-space-science-will-have-proved-its-mettle/>

चांद की धरती में छिपा हो सकता है मूल्यवान धातुओं का भंडार

टोरंटो, 4 सितंबर (भाषा)।

धरती और चांद पर मूल्यवान धातु की मौजूदगी के संबंध में किए गए एक अध्ययन के मुताबिक, पृथ्वी के इकलौते उपग्रह के गर्भ में मूल्यवान धातुओं का बड़ा भंडार छुपा हो सकता है।

कनाडा के डलहौजी विश्वविद्यालय में प्रोफेसर जेम्स ब्रेनन का कहना है कि हम चांद पर मौजूद ज्वालामुखी पत्थरों में पाए जाने वाले सल्फर का संबंध चांद के गर्भ में छुपे आयरन सल्फेट से जोड़ने में सफल रहे हैं।

ब्रेनन का कहना है कि धरती



कनाडा के डलहौजी विश्वविद्यालय में प्रोफेसर जेम्स ब्रेनन चांद पर मौजूद ज्वालामुखी

पत्थरों में पाए जाने वाले सल्फर का संबंध चांद के गर्भ में छुपे आयरन सल्फेट से जोड़ने में सफल रहे हैं।

पर मौजूद धातु भंडार की जांच और विश्लेषण से पता चलता है कि प्लैटिनम और पलाडियम जैसी मूल्यवान धातुओं की मौजूदगी के लिए आयरन सल्फाइड बहुत महत्वपूर्ण है।

वैज्ञानिकों का लंबे समय से अनुमान है कि चांद का निर्माण धरती से निकले एक बड़े ग्रह के आकार के गोले से करीब 4.5 अरब साल पहले हुआ है। दोनों के इतिहास में समानता की वजह से ऐसा माना जाता है कि दोनों की बनावट भी मिलती-जुलती है। नेचर जियोसाइंस में प्रकाशित अध्ययन में चांद को लेकर किए गए अध्ययन का ब्योरा दिया गया है। ब्रेनन ने कहा 'हमारे नतीजे बताते हैं कि चंद्रमा की चट्टानों में सल्फर की मौजूदगी, उसकी गहराई में आयरन सल्फाइड की उपस्थिति का अहम संकेत है। हमारे विचार से, जब लावा बना तब कई बहुमूल्य धातुएं पीछे दब गईं।'