



# CSIR IN Media

*A Daily News Bulletin*

4<sup>th</sup> July, 2016, Page: 1

## Many vital elements of Tejas developed by CSIR-NAL

### **CSIR-NAL**

As the indigenously developed Light Combat Aircraft Tejas was formally inducted into the Indian Air Force today, it was a proud moment for the CSIR-National Aerospace Laboratories (CSIR-NAL) that developed vital elements for the aircraft.

The NAL, a Bengaluru based laboratory under the Council for Scientific and Industrial Research (CSIR), a premier body under the Ministry of Science and Technology (S&T), developed vital elements for the aircraft like designing, developing and certifying the fly-by-wire flight control laws, algorithms and fabricated composite structures for the LCA, CSIR officials said.

The technology developed at CSIR-NAL not only reduces the cost but also improves the structural efficiency of the aircraft by minimising the number of mechanical joints.

With this innovation, composite aircraft structures have become cost effective and structurally far superior to conventional aircraft structures. It may be noted that Tejas airframe is 45 per cent composites (mostly carbon-epoxy) by weight contributing to its reputation as the world's smallest light weight fighter aircraft, the officials said.

This also makes it very agile and light while the fly-by-wire, a semi-automatic and computer-regulated system for controlling the flight of an aircraft or spacecraft which makes it a 4.5 generation plane.

The National Control Law (CLAW) team had implemented the autopilot modes, simulation and modelling, including wake encounter simulation and advanced parameter identification techniques for flight validation/update of the aerodynamic database leading to safe flight envelope expansion for LCA force variants.

Another notable contribution by the CSIR-NAL has been the development of aircraft 6-degree-of-freedom simulation technology, which is a key requirement for Control Law development.

The CSIR-NAL team also piloted real-time assessments in simulator. The Engineer-in-loop Simulator (ELS) is a friendly real-time simulator and a single window projection based facility developed at CSIR-NAL.

---

<http://economictimes.indiatimes.com/news/defence/many-vital-elements-of-tejas-developed-by-csir-nal/articleshow/53011814.cms>

PTI | 1 July, 2016

## Many vital elements of Tejas developed by CSIR-NAL

---

### CSIR-NAL

As the indigenously developed Light Combat Aircraft Tejas was formally inducted into the Indian Air Force today, it was a proud moment for the CSIR-National Aerospace Laboratories(CSIR-NAL) that developed vital elements for the aircraft.

The NAL, a Bengaluru based laboratory under the Council for Scientific and Industrial Research (CSIR), a premier body under the Ministry of Science and Technology (S&T), developed vital elements for the aircraft like designing, developing and certifying the fly-by-wire flight control laws, algorithms and and fabricated composite structures for the LCA, CSIR officials said.

The technology developed at CSIR-NAL not only reduces the cost but also improves the structural efficiency of the aircraft by minimising the number of mechanical joints.

With this innovation, composite aircraft structures have become cost effective and structurally far superior to conventional aircraft structures. It may be noted that Tejas airframe is 45 per cent composites (mostly carbon-epoxy) by weight contributing to its reputation as the world's smallest light weight fighter aircraft, the officials said.

This also makes it very agile and light while the fly-by-wire, a semi-automatic and computer-regulated system for controlling the flight of an aircraft or spacecraft which makes it a 4.5 generation plane.

The National Control Law (CLAW) team had implemented the autopilot modes, simulation and modelling, including wake encounter simulation and advanced parameter identification techniques for flight validation/update of the aerodynamic database leading to safe flight envelope expansion for LCA air force variants.

Another notable contribution by the CSIR-NAL has been the development of aircraft 6-degree-of-freedom simulation technology, which is a key requirement for Control Law development.

The CSIR-NAL team also piloted real-time assessments in simulator. The Engineer-in-loop Simulator (ELS) is a friendly real-time simulator and a single window projection based facility developed at CSIR-NAL.

---

[http://www.business-standard.com/article/pti-stories/many-vital-elements-of-tejas-developed-by-csir-nal-116070101203\\_1.html](http://www.business-standard.com/article/pti-stories/many-vital-elements-of-tejas-developed-by-csir-nal-116070101203_1.html)

PTI | 1 July 2016

## Pride of India, Tejas fighter jet finally takes to the skies

### **CSIR-NAL**

*The first squadron will be raised at Bengaluru with two planes, six more will be added by December this year*

*The IAF also wants to induct over 80 Tejas Mark 1A, which are airplanes with better specifications.*

After 33 years, state-owned Hindustan Aeronautics Ltd and Aeronautical Development Agency handed over the first indigenously built two Light Combat Aircraft Tejas to its customer Indian Air Force. The first squadron will be based in Bengaluru for two years, before being moved to Sullur in Tamil Nadu. The idea of having an indigenous fighter aircraft was conceptualised in 1970s, the work started only in 1983.

Named as Flying Daggers 45, the LCA is considered superior to Pakistan's JF-17 built jointly with China. IAF officials said the plane is made of composite materials which makes it light and very agile. It also comes with smart ammunition and bombs which help it to hit targets in a precise manner. "In any complex aerospace platform development process, three decades seem a long time. The LCA is technologically not the most advanced system; at best it is a close fourth-generation platform and should have been ideally delivered and inducted into service by the mid-2000," explained a military aviation expert to FE.



Often, the LCA falls into the trap of indigenous versus imported debate, which is unfortunate. There is limited indigenous content; all that is needed is a stable, technologically sound and competitively priced system. And an indigenous aero engine to formally complete the platform. It will be another year or so before the indigenous LCA gets combat ready and will be replacing the MiG jet fighter aircraft (MiG 21, MiG-23 and MiG-27) and will be used for air-to-air fight and ground attack and could also be a compliment to bigger fighter planes such as Su 30 MKI. The IAF is targeting six aircraft this financial year and about eight in the next.

Registering more than 2,500 hours of clean flights, the first Tejas squadron will consist of 20 airplanes in total, with four in reserve. The IAF plans to induct 20 LAC under the “Initial Operational Clearance” and 20 more would be inducted at a later stage. Out of the 43 deficiencies highlighted by the customer in the fighter related to critical flight safety norms, it's down to 18.

The IAF also wants to induct over 80 Tejas Mark 1A, which are airplanes with better specifications. They will have improved capabilities, including critical necessity of missile firing to Beyond Visual Range (BVR). It will also have specifications like mid-air refueling, modern internal radar warning receiver and external self-protection jammer pod to enhance survivability and an active electronically scanned array radar.

There are 358 line-replaceable units (components) in the Tejas aircraft, out of which 53% of total line-replaceable units are indigenously developed in India. It is equipped with helmet-mounted display and fly-by-wire, a semi-automatic and computer-regulated system for controlling the flight of an aircraft or spacecraft which makes it a 4.5 generation plane. However, the upgraded version with Active Electrically Scanned Array Radar, Unified Electronic Warfare Suite, mid-air refueling capacity and advanced beyond the vision range missiles, will cost between Rs 275 crore and Rs 300 crore each.

The cockpit has two 76 x 76 mm colour liquid crystal multifunction displays developed by Bharat Electronics, a head-up display developed by the government-owned Central Scientific Instruments Organisation (CSIO) in Chandigarh and a liquid crystal return-to-home-base panel and keyboard.



A helmet-mounted display and sight (HMDS) is also included, while the hands on throttle and stick control system minimises pilot workload and maximizes situational awareness. It has a quadruplex fly-by-wire digital automatic flight control and its navigation suite includes Sagem SIGMA 95N ring laser gyroscope inertial navigation system with an integrated global positioning system.

The communications suite includes VHF to UHF radio communications with built-in counter-countermeasures, air-to-air and air-to-ground data link, as well as a HAL information friend-or-foe interrogator. In addition, the cockpit includes an environmental control system developed by Spectrum Infotech of Bengaluru. The avionics suite has an integrated utility health-monitoring system, ground proximity warning system, terrain referenced navigation system, instrument landing system, global positioning system, stores management system and three 1553B 32-bit mission computers.

### **TEJAS AT A GLANCE**

- \* Wing span: 8.20 m
- \* Length: 13.20 m
- \* Height 4.40 m
- \* Weight: 6,560 kg
- \* Maximum speed: Supersonic at all altitudes
- \* Tejas is a multi-role aircraft capable of comprehensive air superiority and air defence roles
- \* This single engine, tailless aircraft is designed and developed by ADA with HAL as the principal partner
- \* The LCA is equipped with a quadruplex digital fly-by-wire flight control system to ease handling by the pilot
- \* The LCA National Control Law (CLAW) team developed India's own flight control system for Tejas
- \* Its multi-mode radar (MMR) has been developed by DRDO
- \* ADA has developed and manufactured the carbon-fibre composite structures and the glass cockpit

<http://www.financialexpress.com/article/economy/pride-of-india-tejas-fighter-jet-finally-takes-to-the-skies/305465/>

Huma Siddiqui | July 4, 2016

## **CSIR-NAL give technology inputs for LCA Tejas**

---

### **CSIR-NAL**

As the indigenously developed light combat aircraft Tejas was formally inducted into the Indian Air Force (IAF) today, it was a proud moment for the CSIR-National Aerospace Laboratories (CSIR-NAL) which had designed, developed and certified the fly-by-wire flight control laws and algorithms for Tejas. The CSIR-NAL, based in Bengaluru, also developed and fabricated the composite structures for the LCA Tejas, using innovative technology to keep the weight low while retaining the strength.

It goes to the credit of the CSIR-NAL that the flight test program for Tejas has today successfully completed a total of over 2400 flights, carried out on 14 different prototypes by 17 test pilots over a continuously expanding flight envelope meeting the IOC 2 requirements in full.

The National Control Law (CLAW) team had implemented the autopilot modes, simulation and modeling, including wake encounter simulation and advanced parameter identification techniques for flight validation/update of the aerodynamic database leading to safe flight envelope expansion for LCA air force variants. Another notable contribution by the CSIR-NAL has been the development of aircraft 6-degree-of-freedom simulation technology, which is a key requirement for Control Law development.

The CSIR-NAL team also piloted real-time assessments in simulator. CLAW team has developed and fine-tuned the simulation models for LCA-Tejas. Engineer-in-loop Simulator (ELS) is a friendly real-time simulator and a single window projection based facility developed at CSIR-NAL.



The composite wing development for Tejas was also undertaken by the CSIR-NAL, which has pioneered the development and fabrication of composite structures for the fighter, using innovative and cost-effective fabrication technologies including co-curing and co-bonding construction.

The technology developed at CSIR-NAL not only reduces the cost but also improves the structural efficiency of the aircraft by minimizing the number of mechanical joints. With this innovation, composite aircraft structures have become cost effective and structurally far superior to conventional aircraft structures. It may be noted that Tejas airframe is 45 per cent composites (mostly carbon-epoxy) by weight contributing to its reputation as the world's smallest light weight fighter aircraft. Composites offer a very attractive option in modern aircraft development because they are lighter than metal and just as strong.

The National Trisonic Aerodynamic facility of CSIR-NAL also houses a 1.2 m trisonic wind tunnel and every Indian aerospace vehicle has graduated out of this wind tunnel, which has completed more than 40,000 blowdowns over the past 50 years. Extensive six-component aerodynamic force and moment data needed for Control-Law development of LCA Tejas were generated in the 1.2 m trisonic wind tunnel which led to freezing of the aerodynamic design of the LCA, including sizing of wing and control surfaces.

The success of CSIR-NAL technologies in this indigenous LCA is another unique contribution of CSIR towards Make in India program of the Government of India

---

<http://www.aviation-defence-universe.com/csir-nal-give-technology-inputs-lca-tejas/>

July 4, 2016

## Going micro to tackle HIV

### CSIR

*“In diseases such as cancer and HIV, where cells proliferate uncontrolled or virus cells multiply enough to overwhelm the body’s defence mechanism, microRNA could throw light on whether they are aiding or impeding the normal function of the cell.”*

**Indian scientists inch closer to finding out whether infected patients would go on to have full-blown AIDS or not.**

Scientists from India have stumbled on a trail so faint that it could well be a dead end but were it to bear out, could mean a new way to understand the AIDS-causing Human Immunodeficiency Virus (HIV). For over a decade now, Beena Pillai, a researcher at the New Delhi-based Institute of Genomics and Integrative Biology, has been looking at how ribonucleic acid (RNA) — a close cousin of deoxyribonucleic acid (DNA) — controls the production of proteins from the genetic instructions encoded by DNA. However there are other kinds of RNA that don’t directly play a role in the protein-manufacturing process. One of them, called microRNA, is like the address on an envelope that tells the RNA where exactly to latch onto to tweak the synthesis of a protein.

Thus, in diseases such as cancer and HIV, where cells proliferate uncontrolled or virus cells multiply enough to overwhelm the body’s defence mechanism, microRNA would be found in unusual concentrations — either very high or very low — and throw light on whether they are aiding or impeding the normal function of the cell.



## MicroRNA as an indicator

To better understand the link between microRNA and HIV, Ms. Pillai and her colleagues teamed up with Y.R. Gaitonde Centre for AIDS Research and Education (YRG CARE), an HIV/AIDS care and support centre in Chennai that was once led by Dr. Suniti Solomon, who identified India's first HIV case in 1986. Being one of the few places in India that maintained systematic records of how soon HIV patients progressed to contracting AIDS, says Ms. Pillai, meant that YRG had identified a rare group of patients — called long-term non-progressors (LTNPs) — who had tested HIV positive more than seven years ago but were yet to contract AIDS. After scanning and comparing the DNA of patients who progressed extremely rapidly to AIDS with LTNPs, it emerged that the latter had extremely low levels of two specific kinds of microRNA, miR-155-5p and miR-382-5p. Previously too, other researchers from India and elsewhere have identified 13 of these “anti-HIV” microRNA that seemed to significantly increase or decrease in HIV patients depending on how fast they contracted AIDS. While that doesn't imply that low microRNA means better resistance to HIV, it is now possible to build a predictive, genetic test with this data set to check if people responded differently to HIV — and going forward, if they would contract AIDS.

“Therapies based on this knowledge are still very far off but we could have drug-like molecules that are designed to target HIV molecules through this microRNA or engineered stem cells that have altered, protective levels of the microRNA,” says Ms. Pillai.

To Samir Brahmachari, former Director General, Council of Scientific & Industrial Research (CSIR) — who was involved with the work and sparked off Ms. Pillai's investigation in 2005 — more than new drug targets or improved therapies for HIV, this was an example of a theory conceived, executed and tested in India. “It is early days but we were the first to show that microRNA can interact with HIV genes. We thought it always blocked HIV but the behaviour is more complex,” he says, emphasising that work now remained to identify the entire network whereby more such RNA combined to impede the progress of HIV.

<http://www.thehindu.com/opinion/op-ed/going-micro-to-tackle-hiv/article8801647.ece>

JACOB KOSHY | June 3, 2016

## Not letting solid waste go waste

### **CSIR-IICT**

*Banking on renewable energy:A. Gangagni Rao, senior principal scientist, explaining the project to his students at CSIR-Indian Institute of Chemical Technology in Hyderabad.*



### **CSIR-IICT comes out with Anaerobic Gas-lift Reactor that helps convert solid waste into biogas and bio-manure with better efficiency**

Hazardous open dump yards or expensive landfills? While local governments continue to scratch their head about garbage disposal with power plants too not taking off, the CSIR-Indian Institute of Chemical Technology (IICT) has come out with a novel high-rate Anaerobic Gas-lift Reactor (AGR).

The reactor helps convert solid waste into biogas and bio-manure with better efficiency when compared to earlier versions of the digesters.

The new age AGR, inspired by its modern versions in Europe, developed for Indian conditions by Gangagni Rao and his team ensures high rate of biogas production through appropriate mixing, biomass high density, buffering capacity, slurry concentration, microbial culture inhibition mechanisms etc.

“Earlier version of small conventional digesters using cattle manure to generate gas and bio-fertiliser became inoperable after a while because of accumulation of scum, choking and poor biogas quality. They could not be scaled up too,” explains Dr. Rao, senior principal scientist, bioengineering and environmental sciences division, IICT.

He points out that since food waste or fruits and vegetable waste are available in large quantities and highly bio-degradable, they can be utilised for generating renewable energy, biogas, instead of taking them to landfills thereby saving land and conserving energy.

After obtaining the patent, the AGR technology was transferred to a local firm, Ahuja Engineering Services Pvt. Ltd, to execute the projects on turnkey basis.

The IICT provides technical guidance and supervision besides getting royalty.

Initially a biogas plant was tested using poultry litter at Pedda Shivanoor, Chegunta mandal, Medak district, where for one tonne of poultry a day, 200 kg of bio-manure was produced and 89 kWh power was generated for operation of farm pumps, Dr. Rao says.

Though it is shut now, Akshaya Patra Foundation, which runs the mid-day meals scheme, is successfully running AGR plants with investment of less than Rs. 50 lakh each at Bellary and Ahmedabad utilising up to 1.5 tonnes of food waste a day and replacing LPG cylinders with biogas for kitchens. Another plant is coming up at Hubli.

More enterprising is the proposed Rs. 2.5 crore biogas plant at KL University in Vijayawada (AP) utilising up to seven tonnes of organic waste to generate power up to 300 kWh a day, besides 10 tonnes of bio-fertiliser. It was also among the nine out of 140 chosen for the PACESetter Fund under Indo-US Science and Technology Forum (IUSTF).

The forum is funding Rs. 2 crore while KL University's grant is Rs. 50 lakh, says Dr. Rao, adding that the cost of any plant depends on the quantity and quality of waste treated and the location. An alumnus of IIT Delhi (M.Tech) and AU (B.Tech), he has patent for a 'biofilter' too for purification of waste and gases emanating from industry that could adversely affect health of people living nearby.

<http://www.thehindu.com/news/cities/Hyderabad/not-letting-solid-waste-go-waste/article8805786.ece>

## Benefit twice from NIIST waste treatment plan

---

### **CSIR-NIIST**

*Lab to transfer technology to Pune-based company on June 4*

The National Institute for Interdisciplinary Science and Technology (NIIST) here, a constituent laboratory of the Council of Scientific and Industrial Research (CSIR), is joining hands with a Pune-based company for the production of a compact domestic waste treatment unit that also generates biogas for household use.

The technology for the improved anaerobic digester developed by scientists at NIIST will be transferred to Mailhem Ikos Environment, a company specialising in waste management solutions, at a function to be held here on July 4.

The pilot plants that have been in operation for more than two years produces up to 500 litres of methane-rich biogas daily from one to three kg of biodegradable household waste, enough for more than two hours of cooking.

The plant works on the principle of anaerobic digestion for treatment of biodegradable biomass and the recovery of biogas.

“Unlike conventional biogas plants for treatment of household waste, it does not need water and does not discharge smelly effluents,” says senior principal scientist and project leader V.B. Manilal.

## The process

The treatment involves a slow digestion process extending up to 100 days. The intensive biochemical reactions by the microbial growth in the digester break down the particulate matter, fats and complex molecules and lead to production of biogas.

The slurry produced as a by product can be used as manure in homestead vegetable gardens or flower pots. The pollution free system also prevents mosquitoes from breeding.

NIIST is transferring the technology to the Pune-based company for a licence fee of Rs.10 lakh and 5 per cent royalty on sales.

A. Ajayghosh, Director, NIIST, said the unit costing Rs.25,000 would be eligible for subsidy from the Central and State governments.

“The initial investment can be offset by the saving on cooking gas,” says Dr. Manilal, who claims to have cut LPG consumption by one-third on the pilot plant installed at his residence.

A larger version of the digester designed by NIIST for hotels and canteens is undergoing tests.

---

<http://www.thehindu.com/news/cities/Thiruvananthapuram/the-niist-way-to-household-waste-treatment/article8799853.ece>

T. NANDAKUMAR | July 3, 2016



## Coal India records 10 per cent production growth in June 2016

---

### CSIR-CIMFR

Coal India BSE 1.11 % recorded a 10 per cent growth in production during June 2016 at 42.72 million tonnes. Sales registered a near 7 per cent growth take for the month at 44.96 million tonnes.

CIL BSE 1.11 % as a whole produced 125.65 million tonnes of coal during April-June 2016, against to 121.35 million tonnes during same quarter of 2015 - an absolute increase of 4.30 million tonnes. High coal stock inventory at coal fired power utilities as well as pitheads of Coal India restrained the company to go for higher production during the months during the period. Sales for the quarter ending June 2016 has been 133.19 million tonnes against 129.39 million tonnes - a near 3 per cent growth.

Sluggish demand from power utilities was a constraining factor which resulted in muted off-take. Coal fired thermal power stations continue to be comfortable with a coal stock of 30.51 million tonnes ending June 2016 which is 22 days stock with no power station in critical or supercritical condition.

Over Burden Removal, an important performance criterion in exposing coal seam for future mining, registered a 13.3 per cent growth during the quarter ending June 2016.

"With coal ready for mining on the shelf, CIL would be able to raise production levels once its demand picks up. The entire machinery can be deployed to extract coal to match the demand," a CIL statement said.

Average rake loading per day during April-June 2016 registered a growth of 4.7 per cent. Rake loading by Coal India went up to 216.1 rakes per day during Q1 of 2016 against 206.4 rakes per day, same period last year.

---

<http://economictimes.indiatimes.com/industry/indl-goods/svs/metals-mining/coal-india-records-10-per-cent-production-growth-in-june-2016/articleshow/53010997.cms>

Debjoy Sengupta | ET Bureau | Jul 01 2016

## A smart move towards a greener, cleaner city

---

### CSIR-NEERI

City's environment will now be conserved in a better way. For the first time, Nagpur Municipal Corporation (NMC) and city-based National Environmental Engineering and Research Institute (Neeri) have come together for protecting environment under the Smart City project.

The agencies signed a Memorandum of Understanding (MoU) on June 27 wherein NEERI will act as a knowledge partner and provide technical assistance to NMC for 'smart environment' agenda of the project. Confirming the news, municipal commissioner Shravan Hardikar said, "We have signed a general MoU and will soon work on its details. We are willing to work very closely with Neeri and will be banking on its expertise in environmental issues. With the institute's headquarters here, this collaboration will hugely benefit the city."

NMC sources said that apart from this, city's environment status report (ESR) will also be prepared by the premier institute. As reported by TOI earlier, ESR 2014-15 came under the scanner when some flaws were detected in its findings. In a general body meeting, Bharatiya Janata Party's (BJP) senior corporator Prakash Totwani had also raised doubts over the findings stating that they were in contrast with position on the ground.

TOI learnt that after scrutinizing the report prepared by private agency — Maharashtra Enviro Power Ltd, NEERI categorically stated that it was 'not satisfactory'. "The agency will submit a revised report based on suggestions of the institute after which it will not be given any give further assignment. Henceforth for best results, we are in talks with Neeri to prepare ESR report," said an official from NMC.

Though detailed technical aspects and scope of work of the MOU are yet to be defined, NEERI will largely help the civic body in pollution abatement in the city. "Under this joint venture, continuous monitoring will be done for measuring air, water and noise pollution. NEERI will guide us on various avenues like solid-waste management, bio-medial waste management, sewage treatment plant, rejuvenation of lakes and other environment related issues. Focus will also be on Nag River rejuvenation project," NMC officials added.

He added that an air quality monitoring station is also proposed to be set-up at Bhandewadi. "The station will have an instrument for measuring obnoxious gases like carbon dioxide, carbon monoxide, methane and other pollutants through Differential Optical Absorption Spectroscopy (DOAS) system," he said. On May 14 this year, TOI had reported about the unscientific burning of garbage at Bhandewadi dumping yard. Local doctors had confirmed that residents of the area were facing common health ailments like pneumonia, cough, tuberculosis, asthma, skin allergies and burning of eyes.

---

<http://timesofindia.indiatimes.com/city/nagpur/A-smart-move-towards-a-greener-cleaner-city/articleshow/53026662.cms>

Manka Behl | Jul 03 2016

## A smart move towards a greener, cleaner city

---

### **CSIR-NEERI**

For the first time, Nagpur Municipal Corporation (NMC) and city-based National Environmental Engineering and Research Institute (Neeri) have come together for protecting environment under the Smart City project. NMC sources said that apart from this, city's environment status report (ESR) will also be prepared by the premier institute. Henceforth for best results, we are in talks with Neeri to prepare ESR report," said an official from NMC. As reported by TOI earlier, ESR 2014-15 came under the scanner when some flaws were detected in its findings.

Confirming the news, municipal commissioner Shravan Hardikar said, "We have signed a general MoU and will soon work on its details.

City's environment will now be conserved in a better way. For the first time, Nagpur Municipal Corporation (NMC) and city-based National Environmental Engineering and Research Institute (Neeri) have come together for protecting environment under the Smart City project. The agencies signed a Memorandum of Understanding (MoU) on June 27 wherein NEERI will act as a knowledge partner and provide technical assistance to NMC for 'smart environment' agenda of the project. Confirming the news, municipal commissioner Shravan Hardikar said, "We have signed a general MoU and will soon work on its details.

We are willing to work very closely with Neeri and will be banking on its expertise in environmental issues. With the institute's headquarters here, this collaboration will hugely benefit the city." NMC sources said that apart from this, city's environment status report (ESR) will also be prepared by the premier institute. As reported by TOI earlier, ESR 2014-15 came under the scanner when some flaws were detected in its findings.

---

<http://www.nyoooz.com/nagpur/527627/a-smart-move-towards-a-greener-cleaner-city>

PTI | July 03, 2016

## Waste is good when modern technology utilizes it in a productive manner

### CSIR-CRRI

The modern human sits on the pile of garbage, thanks to the modern lifestyle that generate immense amount of non-biodegradable waste like plastic, thermo coal, metal and paper and Delhi, the capital of India produces so much waste that Ghazipur, on its eastern flank, is the largest garbage dump of north India.

It is 50 feet tall and steadily growing and the residents living in nearby colonies like Anand Vihar and Kaushambi have to bear the emissions, groundwater contamination and the stench from this landfill that they have submitted a petition to the National Green Tribunal to remove it.

This landfill started in 1984 is spread across 70 acres, having at least 12 million tons of waste. The good news is that the scientists of Central Road Research Institute (CRRI) have joined hands with the National Highways Authority of India (NHAI) to utilize the solid waste from Ghazipur in the construction of Delhi-Meerut Expressway that will put this seemingly waste material into a great use. First, it will dry the solid waste and pass through different sieves that will separate plastic, glass, metal and paper from this waste and the rest will be used to lay the foundation of this Expressway.





The percentage passing from the 16 mm sieve contains 44 to 48 percent of municipal solid waste which can be directly used in embankment construction. For utilizing the municipal solid waste passing through 32 mm sieve, the segregation of plastic material and PVC etc. will have to be blown by using high capacity blowers at the segregation plant.

Elsewhere in the country, plastic waste is being used to make roads as in Jamshedpur where the Jamshedpur Utility and Services Company, a subsidiary company of Tata Steel, using bitumen technology, their scientists used waste plastic, including biscuit packets, poly bags, etc. to construct 12-15 km roads in the steel city and widened 22 roads using this environmentally-friendly technology.

Bitumen, also commonly known as Asphalt, is a sticky, black and highly viscous liquid or semi-solid form of petroleum. The primary use of bitumen is in road construction where it is used as the glue or binder mixed with aggregate particles to create asphalt concrete.

This technology was also used in Dehradun where plastic wastes were used to build 200 m long road on an experimental basis and this road proved to be a sturdy, long lasting that withstood its massive rains, so the authorities took the decision to use this technology more often.

Technology is really a double-edged sword as while it made the modern living a waste generating civilization, it is also paving ways to utilize this waste in a fruitful manner. It is up to us how to use this sword!

---

<http://www.americanbazaaronline.com/2016/07/02/waste-is-good-modern-technology-can-utilize-waste-in-a-productive-manner414618/>

July 2, 2016

## **Mandi waste to be used for highways construction: Nitin Gadkari**

---

### **CSIR-CRRI**

Solid waste from Ghazipur mandi in the national capital will be used in construction of highways, while plans are afoot for landscaping of two peripheral expressway projects worth Rs 8,037 crore, Union Minister Nitin Gadkari said today.

"Eastern and Western bypasses, which the government plans to build in 400 days will be the first pilot projects and architects will design beautification of these. This will involve landscaping and other works," the Road Transport and Highways Minister said here on the sidelines of an event to launch plantation drive under National Green Highways Mission.

Prime Minister Narendra Modi had laid the foundation stone of these two projects last year with a combined length of 271 km last year.

Gadkari also asked the Haryana government to come forward for the venture saying that the projects will be implemented in such a fashion that driving will be a pleasure through these roads as is the case in various countries.

He said the projects when complete will ease congestion in DELHI and reduce its pollution by at least 50 per cent.

The Eastern Peripheral Expressway will be 135 km long and cost Rs 5,763 crore while the 136 km Western Peripheral Expressway will cost Rs 2,274 crore.

The minister also said that to minimise pollution in Delhi, NHAI will utilise the waste from Ghazipur in construction of highways. The famous Ghazipur mandi, which supplies vegetables and fruits to a large portion of Delhi and adjoining areas, is known as a major contributor to air pollution in the region because of the landfill gases from the garbage dump caused by the waste from the market.

NHAI is already utilising fly-ash up to 30 per cent of earth filling in the Eastern Peripheral Expressway and using other slag materials elsewhere.

Gadkari said the government had entrusted the assignment of technically verifying whether Solid Waste Material generated from Municipal/city waste can be utilised for highway construction to Council of Scientific and Industrial Research (CSIR)-Central Road Research Institute (CRRI).

He said the report suggest it can be utilised by segregating the waste.

"Our department has taken a good initiative in Ghazipur. Plastic, glass, bottle, garbage these all will be segregated. I had a talk with Delhi Chief Minister and sought Delhi government's cooperation," he said.

Earlier CSIR and CRRI had conducted a study by collecting 70 tonnes of municipal solid waste from different locations of 5/10/15 years old from Ghazipur Land fill site of Municipal Corporation of Delhi.

It recommended that the municipal solid waste contains about 65 to 70 per cent of soil components which can be used in embankment construction after segregation.

## **Mandi waste to be used for highways construction: Gadkari**

### **CSIR-CRRI**

Solid waste from Ghazipur mandi in the national capital will be used in construction of highways, while plans are afoot for landscaping of two peripheral expressway projects worth Rs 8,037 crore, Union Minister Nitin Gadkari said today.

"Eastern and Western bypasses, which the government plans to build in 400 days will be the first pilot projects and architects will design beautification of these. This will involve landscaping and other works," the Road Transport and Highways Minister said here on the sidelines of an event to launch plantation drive under National Green Highways Mission.

Prime Minister Narendra Modi had laid the foundation stone of these two projects last year with a combined length of 271 km last year.

Gadkari also asked the Haryana government to come forward for the venture saying that the projects will be implemented in such a fashion that driving will be a pleasure through these roads as is the case in various countries.

He said the projects when complete will ease congestion in Delhi and reduce its pollution by at least 50 per cent.

The Eastern Peripheral Expressway will be 135 km long and cost Rs 5,763 crore while the 136 km Western Peripheral Expressway will cost Rs 2,274 crore.

The minister also said that to minimise pollution in Delhi, NHAI will utilise the waste from Ghazipur in construction of highways. The famous Ghazipur mandi, which supplies vegetables and fruits to a large portion of Delhi and adjoining areas, is known as a major contributor to air pollution in the region because of the landfill gases from the garbage dump caused by the waste from the market

NHAI is already utilising fly-ash up to 30 per cent of earth filling in the Eastern Peripheral Expressway and using other slag materials elsewhere.

Gadkari said the government had entrusted the assignment of technically verifying whether Solid Waste Material generated from Municipal/city waste can be utilised for highway construction to Council of Scientific and Industrial Research (CSIR)-Central Road Research Institute (CRRI).

He said the report suggest it can be utilised by segregating the waste.

"Our department has taken a good initiative in Ghazipur. Plastic, glass, bottle, garbage these all will be segregated. I had a talk with Delhi Chief Minister and sought Delhi government's cooperation," he said.

Earlier CSIR and CRRI had conducted a study by collecting 70 tonnes of municipal solid waste from different locations of 5/10/15 years old from Ghazipur Land fill site of Municipal Corporation of Delhi.

It recommended that the municipal solid waste contains about 65 to 70 per cent of soil components which can be used in embankment construction after segregation.

---

[http://www.business-standard.com/article/pti-stories/mandi-waste-to-be-used-for-highways-construction-gadkari-116070100904\\_1.html](http://www.business-standard.com/article/pti-stories/mandi-waste-to-be-used-for-highways-construction-gadkari-116070100904_1.html)

Bismah Malik | July 1, 2016