



Geep GLOBAL ENVIRONMENTAL EDUCATION PARTNERSHIP

Sharing ideas to create a more just and sustainable future through the power of environmental education

CASE STUDY

Spreading Climate Change Literacy on Wheels: Science Express – Climate Action Special

Ahmedabad, India

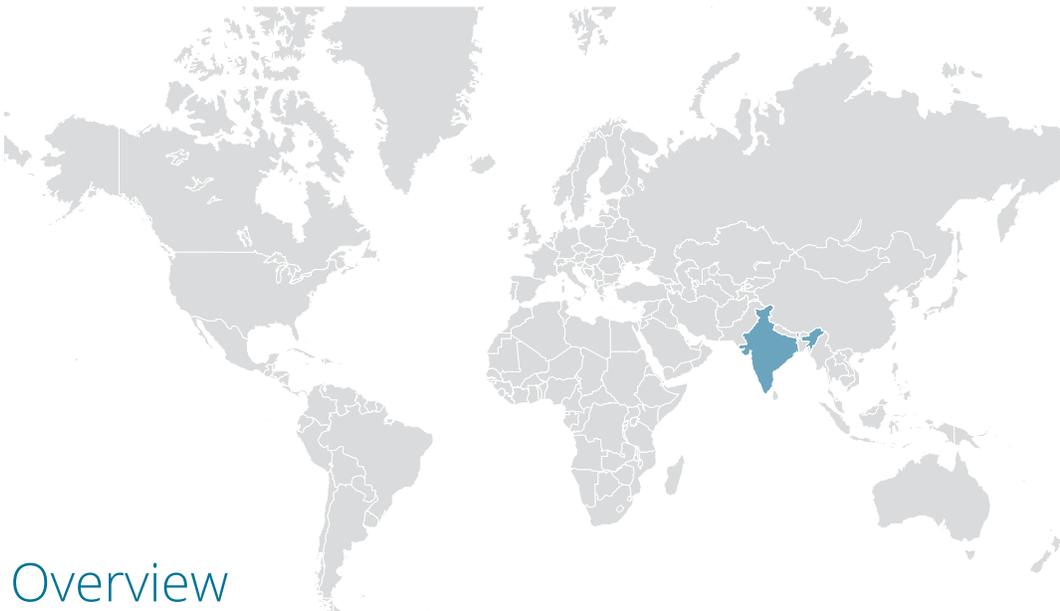
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GEEP is a partnership of the U.S. Environmental Protection Agency, the Environmental Protection Administration of Taiwan, and the North American Association for Environmental Education.



**Spreading Climate Change Literacy on Wheels:
Science Express – Climate Action Special**



GOALS KEY

[United Nations Sustainable Development Goals](#) addressed

Overview

Science Express Climate Action Special is a one-of-its kind of mobile science exhibition led by the Government of India’s Department of Science & Technology (DST) and managed by the Vikram A. Sarabhai Community Science Centre (VASCSC). Since 2007, this 16-coach air-conditioned train has traveled across India to explore a variety of environmentally-themed topics. It has travelled 1.5 million kilometers and been featured at 483 locations across India, reaching over 16.2 million visitors. Science Express has become the largest, the longest running, and the most visited mobile science exhibition in India, according to the Limca Book of Records.

Science Express Climate Action Special is more than just an exhibition train—it has become a movement. It is an innovative method to educate people, and especially students, about the effects of climate change and how small steps can help mitigate them.

This case study illustrates how:

- Several public and private sector partnerships have enabled this mobile exhibition to achieve greater reach and impact.
- A focus on adaptive management (continuous improvement) has enabled the exhibit to modify exhibit themes to address pressing environmental issues, including biodiversity and climate change.
- Through a comprehensive evaluation, research has shown that participation in Science Express Climate Action Special leads to an increased understanding of scientific facts, impacts of and solutions to climate change, an increased understanding of actions individuals can for tackling climate change, as well as an increase in willingness to act.



Background

Science Express is an innovative mobile science and environmental education exhibition designed to engage young people in the fields of science and technology. The 16-coach air-conditioned train was developed by India's Department of Science & Technology (DST) and is managed by the Vikram A. Sarabhai Community Science Centre (VASCS). Since its inception in 2007, this unique mobile exhibition has completed eight phases—four phases of 'Science Express', three phases of 'Biodiversity Special' (SEBS), and one phase of 'Climate Action Special' (SECAS). Science Express is currently running its ninth phase—a second Climate Action Special. With over 16.2 million visitors to date, it has become the largest, the longest running, and the most visited mobile science exhibition, with six entries in India's famous Limca Book of Records.

From 2007 to 2011, Science Express displayed the world of micro and macro cosmos, spreading awareness about the ability of science to solve global problems, and highlighting the latest discoveries and innovations in the field of modern science. Visitors had the opportunity to learn through exhibits, models, and audio-visual displays.

With the United Nations declaration of 2011-2020 as the 'Decade on Biodiversity' and with India hosting the 11th Conference of Parties (COP 11) to the Convention on Biological Diversity (CBD), in 2012 Science Express was redesigned around the theme 'Biodiversity'. Running from 2012 to 2014, it was a unique collaboration between Department of Science & Technology (DST) and Ministry of Environment, Forests & Climate Change (MoEFCC). The exhibit showcased India's biodiversity with eight coaches focusing on the different bio-geographical zones of India. The remaining coaches included exhibits on climate change, biodiversity and water, sustainability, and energy conservation. The 'Energy Conservation' coach included DST's panels on Science Education in India. The three phases of 'Science Express Biodiversity Special' travelled over 54,000 kilometers and received over 6.9 million visitors.



2015

redesigned to coincide with
the UN Climate Change
Conference in Paris

2.3+ million
visitors and growing

65+ locations
through out India

In 2015, Science Express was redesigned as 'Science Express Climate Action Special (SECAS)', which coincided with the United Nations Climate Change Conference in Paris, France. India initiated SECAS to increase understanding of climate change science, the observed and anticipated impacts, and different possible responses. The exhibition aboard SECAS aimed to create awareness among various sectors of society, especially students, as to how climate change can be combated through mitigation and adaptation. With over 2.3 million visitors, including more than 589,000 students and 30,000 teachers, SECAS became the largest climate change awareness program in the country.

Due to overwhelming popularity, the ninth phase of Science Express was launched to run once again as Climate Action Special (SECAS II), from February to September, 2017, and is slated to visit nearly 70 locations throughout India. This current exhibit has already been visited by over 1.1 million visitors through mid June, 2017.

Approach

Climate change is a global, complex, and interconnected challenge. India is faced with the challenge of sustaining its rapid growth while also improving living standards and reducing vulnerability to the impacts of climate change. However, as a developing country, India also has a unique opportunity to avoid the errors of following a conventional, carbon-intensive path towards development.

Climate action is not just about mitigation of greenhouse gas emissions, but also about adaptation and disaster resilience. India has a history of following a moderate lifestyle that relies on adapting to a changing climate. Because of these values, India's national plan includes working toward an alternative development path that is less carbon intensive than that of developed countries. India is working with other nations to address this challenge in a positive, constructive, and forward-thinking manner. Education and awareness are essential drivers for climate action, so SECAS is an effort to raise awareness of climate change and actions that are being taken at local, national, and international levels. It inspires people to become a part of the solution by offering ideas on how to lessen the impact of climate change and contribute to climate resilience.

VASCS's team of qualified, trained, and motivated Science Communicators travels with the train to explain and interpret the exhibition, answer questions, and conduct activities. While the exhibition is open to all, it primarily targets students and teachers.

In order to broaden the reach of Science Express, activities are planned at every station to engage visitors across different age groups. An exciting and much sought-after activity—the Outreach Program—is conducted in local schools and institutions to reach students who are not able to visit the train. Depending on celestial events, astro-nights are conducted at some stations.

A series of activities taking place on the train platform are designed to engage students waiting to board the exhibition coaches. Important national and international days related to science, mathematics, and the environment, like World Ozone Day, World Environment Day, etc., are celebrated on the platform to generate awareness among students and the public.

The SECAS exhibition covers various aspects of climate change in a manner that is both interesting and easy to understand. The broad themes covered in each exhibition coach are as follows:

- **Coach 1: Understanding Climate Change**—Insights into the climate as a system, the greenhouse gas effect, and the underlying reasons for climate change, with a key message that climate change is the result of human activities
- **Coach 2: Impacts of Climate Change**—How temperature rise, monsoon variations, and sea level rise are predicted to affect vital sectors such as water, agriculture, forests, biodiversity, and human health
- **Coaches 3 & 4: Adaptation**—Strategies for adapting to climate change with examples from everyday life, options for urban and rural contexts, and India’s adaptation actions
- **Coaches 5 & 6: Mitigation**—Methods for reducing the impacts of climate change, with an emphasis on restoring balance, enhancing sinks, and reducing emission through renewable energy
- **Coach 7: International Negotiations for Climate Change**—Introduction to UNFCCC, IPCC, Kyoto Protocol, COP, and internationally agreed-upon actions and targets; explanation of common but differential responsibility
- **Coach 8: Positive Actions**—Recommendations for individual lifestyle changes with the key message of ‘Increase Your Handprint, Decrease Your Footprint’
- **Coaches 9 & 10: Exhibition by the Department of Biotechnology (DBT), Government of India**, covering Biotechnology for bio-resources and nature conservation, with emphasis on tiger conservation and chemical ecology
- **Coach 11: Exhibition by the National Innovation Foundation (NIF)** showcasing select innovations in science and technology, science education, and technological solutions for societal development, including a project that uses augmented reality techniques
- **Coach 12: Kids Zone for children from Std. 5** (age 11 years) and below to participate in activities, games, and puzzles focused on science, mathematics, and the environment
- **Coach 13: Joy of Science (JOS) Hands-on Lab**—A space for students from Std. 6-10 (Age 12 to 16 years) to perform experiments and activities that teach concepts in science, mathematics, and the environment in an interesting manner, as well as a training facility for teachers
- **Solar panels** have been installed on the rooftops of three coaches in a collaborative effort of DST and CEL.



Photo: © VASCSC, Ahmedabad

More information is available at: <http://www.scienceexpress.in/>

Evaluation Plan

Research was conducted to determine if the level of climate change awareness had increased among school children who had visited the Science Express, and to what degree it was attributed to SECAS. The research also examine whether learning about the 'Handprint' message (the theme of Coach 8 discussed above) during SECAS triggered Handprint actions in their school, homes, or community.

The study was carried out four months after the train had stopped at a station in 20 schools and five colleges in Lalkuan (Uttarakhand), Barrackpore (West Bengal), Agra Cantt (Uttar Pradesh), and New Bongaigaon (Assam). At each school, the team selected one class that had visited the train and another class of the same level and from the same institution that had not visited the train. The study was conducted through personal visits to the schools and colleges, and through phone calls to teachers.

SECAS is more than just an exhibition train—it has become a movement. It is an innovative method to educate people, and especially students, about the effects of climate change and how small steps can help mitigate them.

Outcomes

- The first phase of Science Express Climate Action Special was visited by more than 2.3 million people, including **more than 589,000 students** and **30,000 teachers**, with representation from more than **6,000 schools and colleges**.
- The research conducted has shown that participation in SECAS leads to **an increased understanding of scientific facts, impacts of and solutions to climate change**, and options for personal actions for tackling climate change, as well as an increase in willingness to act.
- Students who visited SECAS had significantly **higher climate change awareness** than those who did not visit SECAS.
- Students studying in **schools affiliated to the State board with Regional Language as a medium of instruction had significantly higher climate change awareness** than students studying in schools affiliated to the National boards with English as a medium of instruction.
- Climate change **awareness was highest for students when the number of Science Express visitors per day was between 10,000 and 15,000** (crowds were often much larger).

Lessons Learned

SECAS is effective in raising mass awareness on critical environmental issues, such as climate change. In terms of costs, it is highly effective at less than two dollars per visitor. Activities at the stations along with the take-away kit of materials make a difference—climate change awareness is higher for students who received materials than for students who did not.

SECAS is more than just an exhibition train—it has become a movement. It is an innovative method to educate people, and especially students, about the effects of climate change and how small steps can help mitigate them. The exhibits, models, and audio visuals in SECAS were designed in a way that even a small child could understand the message and make simple changes in his lifestyle to reduce greenhouse gas emissions and conserve limited resources. In the long run, these small changes can have big impacts, and the more people are educated about making these changes, the greater their impact will be.

Resources

- <http://www.sciencexpress.in>
- <http://envfor.nic.in/sites/default/files/press-releases/Press Release of SECAS.pdf>
- <http://ceeindia.org/devcee/?q=slider/science-express-climate-action-special-secas-flagged-15th-october-2015>
- <http://sciencexpress.in/ScienceExpressVIII/pdf/SECAS-Booklet-English.pdf>
- <https://www.youtube.com/watch?v=BvCIZO0pp6w>
- <https://www.youtube.com/watch?v=dHGLJ89JhKE>

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