GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
STARRED QUESTION NO. *255
TO BE ANSWERED ON WEDNESDAY, 15TH DECEMBER, 2021

CLOUD SEEDING

*255. SHRI PARVESH SAHIB SINGH VERMA:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) the progress made in the plan/project/proposal of 'Cloud Seeding' for drought-prone regions of the country, State-wise;
(b) whether the 'Cloud Seeding' project proposed by IIT Kanpur to induce artificial rains to clear smog in Delhi was put on hold due to non-availability of technical support and aircraft from the Central Government;
(c) if so, the current status in this regard; and
(d) whether the Government has studied the adverse effects, if any, that 'Cloud Seeding' could have in the long run on the health of the environment and if so, the details thereof?

ANSWER
THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)

(a)to (d): A Statement is laid on the Table of the House.

STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY TO (a) to (d) OF STARRED QUESTION NO. *255 REGARDING "CLOUD SEEDING" TO BE ANSWERED ON, DECEMBER 15, 2021

(a)-(d) The Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX) started by theIndian Institute of Tropical Meteorology (IITM) an autonomous research institution under the Ministry of Earth Sciences (MoES) in 2009, to address the need for protocols for rain enhancement through cloud seeding. CAIPEEX has followed the World Meteorological Organization (WMO) recommendations to scientifically evaluate the impact of cloud seeding, the statistical significance of the seeded versus unseeded clouds, and to derive strategies for its application.

The key factor was to document background observations needed for the planning and execution of the Phase IV 2017-19 experiment over the rain shadow region. The experiment involved two aircraft and ground-based instrumentation. A suitable area for seeding was selected and the CAIPEEX experiment collected data on cloud seeding, illustrated scientific evidence of the impact of seeding, and evaluated seeded/unseeded clouds statistically. The experiment resulted in 276 randomized cloud seeding cases with hygroscopic (cloud base) seeding, where calcium chloride particles with suitable sizes are used as seeding material. The experiment has also conducted cloud top seeding and evaluated 62 clouds. Protocols for cloud seeding are derived.

This experiment is essentially a study on the science of cloud seeding. The cloud seeding protocols formulated from the experiment could be used for planning effective operational cloud seeding programs.

Further, operational cloud seeding was conducted by the following State Governments, by hiring private agencies, during the deficit monsoon rainfall years:

- 2012 Three river basin project in Karnataka state
- 2003-2016 Andhra Pradesh Cloud seeding
- 2017, 2019 Varshadhaare project in Karnataka state
- 2019 Maharashtra Rainfall Enhancement Project

The adverse effects for the environment due to seeding have been under investigation in several cloud seeding experiments around the world. As per the WMO peer review report on the advancement of cloud seeding and precipitation enhancement research, there has been an absence of evidence of toxicological hazards over forty years of cloud seeding.

******