

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
UNSTARRED QUESTION NO. 2737
TO BE ANSWERED ON 10.07.2019

ALTERNATIVE USE OF ATOMIC ENERGY

2737. SHRI RODMAL NAGAR:
SHRI PARVESH SAHIB SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has formulated/proposes to formulate any scheme for alternative use of atomic energy and if so, the details thereof;
- (b) whether India has been utilizing atomic energy in development of agricultural, biology, industry and medicine and if so, the details thereof;
- (c) if not, the steps taken by the Government to encourage fundamental research for utilization of atomic energy in the above mentioned field; and
- (d) the steps being taken by the Government for furtherance of studies in nuclear sciences and developing manpower for development of atomic energy programmes?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND
PRIME MINISTER'S OFFICE (Dr. JITENDRA SINGH) :

(a),(b)&(c) Yes, Sir. Atomic Energy is being used for various applications which are beneficial to mankind. Nuclear energy is also used for the production of radioisotopes in the country. Radioisotopes are used in medicine, industry, hydrology, agriculture and research and constitute one of the important peaceful uses of nuclear energy. Some of the technologies developed by Department of Atomic Energy (DAE)are:-

1. **Agriculture:** Using radiation induced mutagenesis along with cross breeding, DAE has developed 44 varieties in oilseeds (groundnut, mustard, soybean and sunflower), pulses (urdbean, mungbean, pigeonpea, cowpea), rice and jute, which have been released and notified for commercial cultivation across the country. Some of the desirable traits in these crops include higher yield, seed size, improved agronomic and quality traits, early maturity and resistance to biotic and abiotic stresses. Several of these varieties have high patronage from the farming community and are extensively grown in the country.

2. Food preservation: Preservation of food forms another important area for National Food Security. Feasibility of food irradiation for preservation has been studied for a number of agricultural and food commodities for several years. Food Safety and Standards Authority of India (FSSAI) notified “Food Safety and Standards (Food Product Standards and Food Additives) Sixth Amendment, 2016 and the Food Safety and Standards (Packaging and Labeling) Fourth Amendment, 2016” related to standards and labeling requirements for irradiated foods.

3. Municipal Waste Sludge Hygienisation:DAE has set up the first dry sludge Hygienisation Plant at Ahmedabad, Gujarat for treatment of 110 ton/day dry sludge. This would enable use of safe sludge for agricultural applications.

4. Health Care

(i) **Radioisotopes:** The Radiation Medicine Centre (RMC), Parel, Mumbai, started in 1963 is in the forefront of practicing Nuclear Medicine for health care.

Nuclear Medicine uses radioactive isotopes (radio-isotopes) for the non-invasive diagnosis of several human diseases, including cardiology, oncology (cancer), neurology, psychiatry and infectious diseases and for the treatment of thyrotoxicosis, thyroid cancer, neuroendocrine tumours, neural crest tumours, bone-pain palliation etc. The benefit to the patient from an early and improved diagnosis and treatment far outweighs the risk from the radiation exposure due to the administered radiopharmaceutical.

(ii) **Imaging:** PET-imaging has revolutionized cancer diagnosis by making possible early detection. Several thousand patients are referred to RMC each year and the average for the last three years is close to 25,000 per year. This includes PET-imaging for cancer diagnosis, staging, therapy planning and management. The cost to the patient is the lowest, compared to any other nuclear medicine centre in India. RMC has the largest registry in India for radio-isotope therapy for thyroid cancer and neuroendocrine tumours.

(iii) **Bhabhatron:** Bhabhatron is an indigenous tele-cobalt machine developed by DAE for cancer treatment with High Source Capacity of 250

RMM (Roentgen/min. at 1 meter). The design of machine is as per the compliance to requirements of International Electrotechnical Commission (IEC) and the extensive clinical trials at Tata Memorial Centre have been carried out successfully.

Further, an automated multi-leaf collimator with treatment planning system has been developed and implemented in Bhabhatron-II.

- (d) Trained manpower requirement is a key factor for the Department. In order to meet the manpower requirements for the atomic energy programme, AEET Training School (now called BARC Training School) was set up in 1957 to train and recruit the engineering and science graduates in to the DAE. The BARC Training Schools and its affiliates conduct one year orientation course for engineering graduates and science post-graduates (OCES). These in-house human resource development programmes proved successful for the department in empowering scientific & research personnel.

DAE has taken further steps to promote and create more awareness among the various users by establishing a training centre called Global Centre for Nuclear Energy Partnership (GCNEP) at Bahadurgarh, Haryana. The mandate of the centre includes conducting research, design and development of nuclear systems that are intrinsically safe, secure, proliferation resistant and sustainable. In addition to this, the centre organizes training, seminars, lectures and workshops on topical issues by Indian and International experts, in order to develop a pool of trained human resource. The centre also promotes global nuclear energy partnership through collaborative research and training programs.

The Board of Radiation and Nuclear Sciences (BRNS), an advisory body of Department of Atomic Energy, sponsors R&D projects to universities, academic institutions and national laboratories to promote scientific research in the areas of alternative uses of atomic energy (Applications of radioisotopes and radiation technology). The BRNS was recently reorganized to meet the various sustainable goals set by Government of India and provide further thrust to alternative uses of atomic energy.
