India's National Statement by
Ambassador Shambhu S Kumaran
at the IAEA Ministerial Conference on Nuclear Science, Technology, Applications and the Technical Cooperation Programme
(26-28 November 2024, Vienna)

Co-Chairs, Excellencies, Ladies & Gentlemen,

Namaste!

On behalf of the Government of India, I extend my warm greetings to all the participants from the International Atomic Energy Agency and its Member States. It is a privilege for me to represent India and deliver this national statement.

This conference is happening at an opportune moment, when there is renewed and growing interest in nuclear science and technology not just for its role in meeting growing energy needs in a sustainable manner, but also in terms of the multifaceted benefits it can bring towards addressing persisting challenges in key sectors such as health and agriculture. We appreciate the work of all those behind the organisation of this Conference and wish to specifically acknowledge the efforts of the Co-Chairs in thisregard.

India has been a leading nation in utilising nuclear science, technology and applications for national development. This year we are celebrating the 70th year of the establishment of the Department of Atomic Energy in India, which is dedicated in the true spirit of atoms in service of humanity.

Further, India's achievements in this sector have been made almost entirely through domestic efforts. This has led to the creation of a varied framework of capabilities and considerable depth in our capacities, especially in the domain of non-power applications of atomic energy. I wish to highlight a few significant initiatives in some key areas.

Firstly, in the the health sector, remarkable successes have been achieved in cancer care, diagnostics and imaging as well as radiopharmaceuticals. India's National Cancer Grid (NCG), which is now a 310 member network across the country spearheaded by Tata Memorial Centre, treats approximately 60% of country's total cancer load.

We are now building the international network of the program NCG Vishwam to offer high standard yet cost-effective cancer care. Much like India's success in the pharmaceutical sector, our objective is to make such care accessible to vulnerable sections of the society globally.

The SEACanGrid – a network of countries / cancer centres in the WHO South East Asia region coordinated by WHO SEARO have recently decided to study best practices developed by India's NGC. We are confident that this will enable ASEAN and other countries in the region to improve cancer control. We look forward to similar partnerships with other partner countries as well as regions with the support of IAEA.

India has also in recent years supplied Bhabhatron systems for cancer treatment to Zimbabwe, Mongolia, Tanzania, Kenya, Kyrgyz Republic, Uganda and Madagascar.

For the first time in India, the Variable Energy Cyclotron Centre in collaboration with Board of Radiation and Isotope Technology (BRIT), recently carried out trial production of the SPECT radioisotope Lead-203 (Pb-203) for imaging and cancer therapeutic applications.

Ruthenium-106 plaques for eye cancer treatment have been fabricated from purified Ru-106 recovered from radioactive waste. A methodology has also been developed for formulation of medical grade 64CuCl2 as an alternative PET radiopharmaceutical for investigating recurrent prostate cancer and neuroblastoma.

High specific activity clinical grade Yttrium-90 Acetate in the range of ~140-160 milli Curie has been separated from Strontium 90-Ytrrium 90 generator system for radiopharmaceutical applications. Bhabha Atomic Research Centre (BARC) has secured a US Patent Publication on

‘Deuterated – 3-3’ Di-seleno-di-propionic Acid (D-DSePA) and its use as an Anticancer or Radioprotective Agent’. A novel Gallium 68-based radiopharmaceutical has been indigenously developed and clinically evaluated in human patients for non-invasive monitoring of breast cancer and lung cancer by PET imaging.

Institute of Plasma Research (IPR) has set up and is operating an accelerator based 14 MeV neutron facility, for producing medical radioisotopes (Mo-99, Cu-64, Cu-67 etc).

Overall, these initiatives in the health sector, which are but a selection of the extensive work being done in India, reflect the potential for active engagement with international partners, including under the IAEA’s flagship ‘Rays of Hope’ programme.

A second area of great priority has been agriculture. India has been successful in ensuring food security for the world’s largest population of over 1.4 billion people. India has developed Radiation processing technologies for food involving controlled application of energy from ionizing radiations such as gamma rays, electrons and X-rays for food preservation. Recently, BRIT commissioned an irradiator which can be operated at low temperature using Cobalt-60 radiation source to irradiate marine products at low and sub-zero temperature to increase the shelf life of marine products and also improve quality by eliminating pathogens.

Using radiation-induced mutagenesis, hybridization, and tissue culture techniques multiple varieties of crops have been developed and approved for commercial cultivation. These include two new high yielding and multiple disease resistant blackgram crop varieties and two stress tolerant rice varieties. A total of 70 varieties have been released by BARC so far.

In terms of food processing and preservation, an eco-friendly protocol for increasing the shelf life of mangoes stored in cold storage facilities has been successfully tested for preservation of Kesar mangoes for upto 40 days. Similarly delay in ripening up to 23 days of some varieties of tomato when irradiated and stored at 10 ºC was achieved. The total shelf life of

tomatoes stored at 10 ºC was around 60 days while retaining nutritional parameters.

Other lines of effort in this area include development of techniques for biological control for pests and pathogens as well as development of Nisargruna biogas technology for agricultural and slaughterhouse waste management and recycling.

Here again the opportunities for partnership are evident. Some of you would recall the awareness session we had organised with BRIT together with IAEA earlier this year titled 'Atoms for Humanity' showcasing India's advanced Radiation Technology and products in support to Agency's Flagship Program Atoms4Food". The models had also been exhibited at the 68th IAEA - General Conference in September 2024.

Lastly, allow me to mention a key achievement in the domain of clean energy. There is now a specific focus on developing the hydrogen production ecosystem in India. DAE has also been actively involved in this domain with the commissioning of a pilot scale facility of four step Copper – Chlorine thermochemical cycle for hydrogen production from water splitting.

Co-Presidents,

India has long been actively involved in international capacity building efforts in nuclear applications through expert missions, fellowship programs and other training. The Global Centre for Nuclear Energy Partnership (GECNEP) has recently renewed its Memorandum of Understanding (MoU) with IAEA and continues to host various Multilateral Programs. In last two years nearly 150 foreign nationals participated in various IAEA Programs at GCNEP. We are confident that in the coming days the engagement with friendly countries will be further strengthened.

Over the past decades India has contributed tens of millions of US dollars in TC funding through IAEA. India is not a recipient country for TC projects but a donor despite our limited resources, as we are committed to genuine shared development and prosperity. In future, we envisage a

greater focus and look forward to a leading role for India on South-South cooperation. We hope the IAEA TC programme can find the synergies between India's cost effective solutions and the pressing needs of developing Member States of IAEA. Only then can we decisively take forward our shared objectives for societal well-being and the protection of our planet.

Thank you!