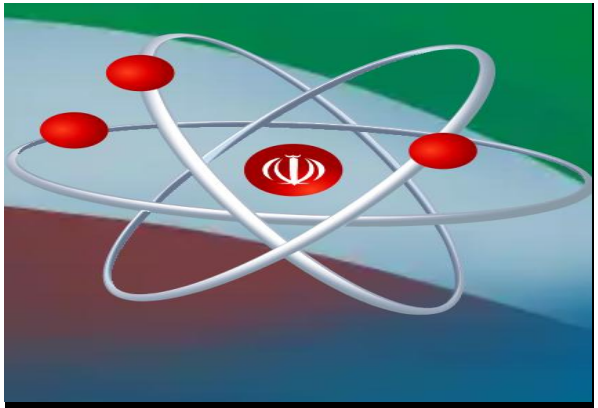
Iran's nuclear program is one of the key drivers of **sustainable development**, **prosperity**, and **progress** in the country. As a semi-arid country with limited access to freshwater, Iran faces real challenges in meeting the needs of its growing population. This is where nuclear technology steps in—not just in terms of energy, but in ways that touch the daily lives of its ordinary people.

In agriculture, nuclear technologies support ensuring our **food security**. Nuclear techniques are being used to help improve crop yields, fight pests without heavy use of chemicals, and manage scarce water resources more efficiently. Farmers can use these methods to grow more food with fewer inputs, leading to better harvests and more affordable food for everyone.

In **medicine**, we use nuclear technology to diagnose and treat diseases like cancer. Many hospitals across Iran use nuclear medicine for **early detection** of illnesses, which greatly increases the chances of successful treatment. Radiotherapy, made possible through nuclear science, has saved countless lives and continues to give hope to patients and their families.



Iran's peaceful nuclear program as a source of national pride, goes beyond towering power plants, buzzing electricity grids, or industrial enrichment facilities—it has a more subtle, everyday impact on civilian lives. It's about improving the quality of life for millions of Iranians - through improving their access to better health, and enhancing quality of their food and environment, among others. Find out more!

Iran-IAEA Cooperation

Our cooperation with the Agency is so close and intense, its people probably know our facilities better than their own coffee machines. Iran's atomic industry isn't just monitored—it's **the** *most heavily inspected and frequently verified peaceful nuclear program on the planet. If transparency had a gold standard, we'd be shining like a freshly polished reactor!*

Iran's Nuclear Program

Welfare & Prosperity for Development

Medicine and Health

Each year, the Atomic Energy Organization of Iran produces and supplies over 68 medical products, with exports to 15 countries. Currently, around 20 new pharmaceutical products are under research and clinical trials.

Enabled by nuclear science, Plasma plays a vital role in medicine by enabling advanced diagnostics, cancer treatment, and the sterilization of medical equipment.

Stable isotopes serve as essential raw materials for producing many diagnostic and therapeutic radiopharmaceuticals, as well as for radiography. After a decade of dedicated effort, the AEOI has successfully developed the indigenous knowledge and technology for stable isotope production. Key projects in this field include the following:

- Use of a cold plasmajet system for cancer treatment and plasma therapy for wound healing.
- Production of new radiopharmaceuticals meeting international standards for the diagnosis and treatment of diseases, including cancer and osteoporosis.
- Design, construction, and commissioning of the:
- Production chain for **stable isotope Tellurium-130**, **Iridium 191**, **Xenon-124, and Xenon-129, required for medical purposes**;
- Feed unit necessary for the production of stable tellurium and Iridium isotopes;
- A **TeO_2 powder conversion and packaging unit** for Iodine-131 radiopharmaceutical production;
- production unit for **metallic iridium** enriched in the stable isotope Iridium-191 for medical use.

Agriculture & Food Security

Amid a fragile environment and agricultural landscape, nuclear agriculture research activities, which dates back to 1974 are definitive in Iran's food security.
The improvement of both the quality and quantity of soil, water, crops, horticultural plants, as well as aquatic, poultry, and animal products through the application of nuclear science and technology are the main areas of expertise with a focus on:

- Production and introduction of crop and horticultural plants with superior qualitative and quantitative traits;
- Improving the quality and quantity of livestock, poultry and aquatic animals;
- Control of plant pests, diseases, and weeds and increase the shelf life of agricultural products;
- Soil fertility management and plant nutrition, soil conservation, water and environment;
- Producing hydrophilic superabsorbent, a 3D polymeric network of high capacity for water absorption and retention. It plays a pivotal role in water efficiency;
- Manufacturing of 60 kw Microwave Drying and Insect Disinfestation Device to disinfect and dry agricultural commodities (Aflatoxin detoxification in pistachios for example);
- Manufacturing of X-ray Irradiation System for agriculture, Biology and Sterile Insect Technique (SIT).

Environment & Clean Energy

Beyond health and food, nuclear technology also helps monitor and protect the environment, improve industrial processes, and support scientific research that benefits education and innovation.

Stretching over an area of more than 1.6 million square kilometers, Iran stands as the 17th largest country in the world. The aridity, exacerbated by climate change and global warming, has pushed the environment to the brink of fragility. On the other hand, the country is industrializing fast, needing more and more energy.

Plasma technology offers a clean path towards **environmental sustainability** and **clean energy** by providing the following services:

- Treatment of various types of **landfill leachate** and **industrial wastewater** from pharmaceutical factories, livestock farms, textile industries, refineries, and petro-refineries;
- Reduction of microbial load and contamination indicators in wastewater;
- Industrial wastewater recyclability;
- Effective removal and treatment of complex pollutants;
- Using environmentally friendly techniques free of secondary sludge.