Italian Science Diplomacy in India

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"*Principles for the Development of a Complete Mind: Study the science of art. Study the art of science. Develop your senses - especially learn how to see. Realise that everything connects to everything else.*" Leonardo da Vinci.

We greatly value Science Diplomacy, whose growing importance in foreign policy relies on its capacity to harness the soft power of science in maintaining peaceful relations between countries. Science has the intrinsic ability to support teamwork above and across boundaries, which is a crucial instrument in maintaining an open dialogue between people, even at conflicting times. International scientific cooperation also represents an effective strategy to address global challenges that no single nation can solve on its own (e.g. global warming, pandemics, etc.), while the resulting technological progress and its industrial applications ultimately impact the economy and society as a whole.

The Italian Ministry of Foreign Affairs and International Cooperation (MAECI) is promoting the internationalisation of Italian research and scientific diplomacy as essential tools for developing joint strategies between Italy and the rest of the world. To do so, it draws on a network of attachés and experts who showcase and capitalise on the sectors of excellence in scientific and technological research and support Italian companies operating in advanced technology sectors. Most science and technology experts and attachés are from Italian research bodies and universities.

MAECI's policy stems from the rationality that there can be no economic development without innovation. Maintaining competitiveness in increasingly complex global markets requires continuous enhancement of new technologies to create innovative and high-added-value products. It leads to increasingly careful use of resources in this sector as an investment in the country's growth with positive effects on the economy and trade.

In 2018, MAECI in partnership with the Ministry of Education, University and Research and the Ministry of Health, launched the "Italian Research Day in the World", to internationally promote the contributions of Italian scientists. Since then, on the birth anniversary of the Italian genius Leonardo da Vinci (15 April 1452), the Embassies and Consulates support the initiative by celebrating the image of Italy's Science worldwide.

The main instruments of Italian Science Diplomacy are the *Executive Protocols* on bilateral cooperation in science and technology. These are direct applications of specific bilateral agreements and have multiyear validity. The *Executive Protocols* specify the areas to which Italy and a partner country are to dedicate joint research. They select scientific projects, which can be of two types: Researcher Mobility Projects (bilaterally financed projects in which travel and living expenses for researchers are covered) and Projects of Major Importance, eligible for annual co-financing.

In particular, I wish to highlight the importance of researchers' exchange to fulfil the objectives of

Science Diplomacy. Mutual visits are essential to internationalisation, especially for young scientists, who are encouraged to establish and consolidate valuable relations outside their home country. These efforts are rewarding in the long term, as they can generate innovation through synergies.

The bilateral cooperation between Italy and India in science and technology lies in the solid foundations of past and present co-actions between the research institutions of our two countries. More than 250 bilateral agreements have been signed over the years between universities and research institutes, thus creating a collaborative environment and achieving the excellent level of cooperation witnessed today. India is, therefore, strategic for Italy, not only for the successful and longstanding partnership in fundamental and technological research but also for the importance that both countries assign to technology transfer as a key enabler to promote innovation.

On 12 January 2020, Italy and India signed the bilateral Executive Protocol for FY 2022-2024. It further expands the priority themes of mutual interest and develops additional funding schemes called "Networks of Excellence". Such an innovative tool aims at establishing bilateral consortia composed of three or more institutions from each country, possibly including private partners. These networks are expected to create a stable Indo-Italian core group, focusing on key scientific issues with multidisciplinary approaches, and to mobilise funding from national and international, public and private entities so as to continue their collaborative activities well beyond the initial three-year funding period.

From the viewpoint of Science Diplomacy, this joint effort not only represents strong support for international dialogue but also paves the way for new developments and technologies that can be transferred to the industrial sector in the longer term. The Protocol is financing 13 Researcher Mobility Projects, 8 Projects of Major Importance and 3 Networks of Excellence. Some of the selected areas of mutual interest are:

- research topics related to the ecological transition, aiming at reducing atmospheric pollutants while increasing renewable/ green energy sources to prevent the devastating effects of climate change;
- health research, leading to preventive as well as therapeutic applications to communicable and non-communicable diseases and proved to be especially important during the pandemic emergency;
- science and technology applied to cultural and natural heritage, an area of special relevance as it exploits the scientific expertise of our scientists towards the noble and crucial objective of preserving the remnants of ancient traditions of both countries;
- physics of matter, which includes a remarkable joint initiative within the Italian synchrotron facility ELETTRA. It was implemented by the Indian government with two sophisticated diffraction beamlines for advanced material research. Indian scientists are the third highest users of this sophisticated infrastructure that represents a best practice of international cooperation in science, technology and innovation.

Finally, I also wish to mention our bilateral cooperation in the field of innovation, leading to synergies on industrial projects with the Indian Global Innovation and Technology Alliance (GITA). Within this funding scheme, we are presently supporting two projects in the thematic areas of mutual interest "Advanced Manufacturing and Materials" and "Clean Technologies".