

Jerusalem, December 2019

## **Report on the State of the Sciences in Israel 2019 - Managerial Abstract**

The triennial Report on the State of the Sciences in Israel serves two principal purposes. The first is to describe the basic research being carried out in the State of Israel and its important contributions to the state's society, economy and security. The second is to set out the challenges faced by those involved in the pursuit of basic research in Israel and offer recommendations to decision-makers regarding possible ways to facilitate dealing with those challenges, for the good of basic research in particular and of Israel's future more generally. The report depicts the current state of affairs and surveys developments in the three years finishing in 2019, like the two previous reports, "The State of the Sciences in Israel – 2016" and "The State of the Sciences in Israel – 2013."

The Committee on the State of the Sciences was appointed for the purpose of composing the triennial report by the President of the Israel Academy of Sciences and Humanities, Prof. Nili Cohen. The committee appointed eight specialized subcommittees to examine the following subjects: international scientific relations, national laboratories, the state of the humanities, the state of the social sciences, medical research, relations between the academic institutions and the Planning and Budgeting Committee of the Council for Higher Education, relations between the academic institutions and the government, and costs vs. productivity.

Maintaining and developing Israel's international scientific relations is crucial to nurturing the country's basic scientific research. In light of the huge importance of the various European programs – especially Horizon 2020 and Horizon Europe – to advancing research and development in Israel, and in light of the impressive achievements of Israeli scientists participating in these programs, it is crucial for Israel to do its utmost to allocate the resources required for continuing its ramified activities within these programs. The committee recommends getting ready for the inauguration of the European Union's new programs, probing their anticipated influence upon scientific research and the economy in Israel, and allocating the resources required for participation in them.

In the context of Israel's international scientific relations, the committee was also asked to look into its binational foundations. Binational research foundations with selected countries that harbor high-powered science are vital for reinforcing the international competitiveness of Israel's scientists. One such organization, the German-Israeli Foundation for Scientific Research and Development (GIF), was caught up in a budgetary crisis in the last few years, in addition to a political controversy that occurred on its account. Scientific cooperation with Germany is vitally important to Israeli science and has generated high-level joint research

projects. In order to save this foundation, the State of Israel must approve the special budgetary increment that has been promised it. The committee additionally recommends increasing the fund itself in order to stabilize it, inaugurating new joint programs for the foundation and taking steps to prevent further conflicts between politics and science, by making the requisite institutional arrangements. Beyond that, the committee recommends establishing binational research programs with countries like Britain and Switzerland, which are known for their scientific excellence.

Most of Israel's basic scientific research takes place with the walls of its research universities, but the committee also attaches importance to research carried out in the "national laboratories," as is the practice in well-ordered countries around the world. A "national laboratory" is a specialized, extra-university research facility in which joint research is carried out by scientists based in the academic institutions, in industry and in the facility itself. The committee recommends recognizing the existing "national laboratories": the Soreq Applied Research Accelerator Facility (SARAF) and the central laboratory of the Israel Antiquities Authority in Jerusalem. These institutions cooperate with universities in Israel and abroad to train specialized practitioners and carry out research activities. The committee believes that strengthening these research frameworks by defining them as "national laboratories" and allocating them complementary funding to augment their activities will enable them to meet the highest international standards and give a unique edge to research in Israel.

The crisis of the humanities and the social sciences in institutes of higher education and research institutes is a global phenomenon that has confronted the academic systems in developed countries in recent decades. To overcome this crisis, the committee recommends acting on two parallel axes. First, it proposes instituting a new competitive program for outstanding researchers in the humanities and social sciences, on the order of about NIS 400,000–800,000 per year for four to five years. Second, the committee recommends rectifying the distortions that exist in the budgeting model of the Planning and Budgeting Committee and activating the "She'ar ru'ah" program proposed in 2018 by the Shain Committee.

Recent years have witnessed breakthroughs in medical research. In Israel and around the world, medical research stands on the threshold of a revolution that could lead to significant improvements in the health services. However, doctors both in the hospitals and in the community have a hard time engaging in the medical research that would enable the enormous potential promised by advanced studies in this field to be fulfilled. For example, on account of budgetary and other difficulties, the "physician researcher" program in the institutes of higher education has not been fully realized. The committee suggests that the Israel Academy of Sciences and Humanities sponsor some brainstorming among all the relevant factors in this area, to find ways of facilitating medical research by physicians in general and specifically

those in the public service. The committee also recommends expanding the “physician researcher” program into an M.Sc. program in the research institutions.

Improving the quality of the civil and public service in Israel depends to a large extent on enhancing the educational level and research abilities of their professional staff. The committee recommends that government ministries encourage their professional staff members to acquire advanced degrees and to engage in dedicated research to facilitate the goals of their ministries, in cooperation with the institutes of higher education. For this purpose, the committee proposes that the Planning and Budgeting Committee consider establishing dedicated research foundations under the joint auspices of government ministries and the universities, on the model of the Pazy Foundation and the foundation of the chief scientist in the Ministry of Agriculture – supplemental foundations that do not detract from the budgets designated for basic research.

In the framework of the committee’s work, comparisons were made between data from Israel and from similar-sized countries in Europe and Asia. These comparisons showed clearly that public investment in academic research is relatively lower in the State of Israel than in other enlightened nations. In relation to their GDP, those countries invested 14%–79% more than Israel in academic research, and the output of their scientific systems was therefore generally better than Israel’s scientific output. Nevertheless, that Israel does belong to the company of the enlightened nations comes to expression, among other things, in its outstanding achievements in basic research, as measured by objective parameters: important prizes, successful engagement in projects of the European Research Council (the ERC), citation ratings of Israeli scientists, and so on.

Israeli science is regularly subjected to peer review by foreign colleagues, ensuring that it is conducted with transparency and integrity. Nevertheless, basic research has a hard time achieving the status it deserves on Israel’s public agenda. Although basic research is what keeps Israel at the forefront of the developed, enlightened nations, with all that implies, it is subject to severe budgetary constraints. It is vital to ameliorate that situation by means of supplemental investment. We entreat Israel’s decision-makers to give the conclusions of this report the attention they deserve and to work toward accomplishing its recommendations as soon as that can be done.