

THE ABSTRACT OF

Science and Technology Assessment in the

Islamic Republic of Iran:

The First Macro Assessment Program –2003

GENERAL TRENDS IN SCIENCE AND TECHNOLOGY IN IRAN

Theoretically, science has acquired a high status in the Islamic and Iranian culture. The brilliant scientific history of Iran asserts the importance given by Iranians to this item. The assessment program revealed that there were potentially good human resources and facilities for improving the indicators of science and technology in Iran. The achievements so far have been satisfactory; nevertheless, when compared with other countries, it is found out that Iran is still far behind successful countries and even the average international level.

Iran's researchers still play a marginal role in the scientific production of the world and encounter problems in publicizing the scientific productions of Iran, particularly in non-applied and non-experimental sciences. Nonetheless, some of the indicators of science and technology have rapidly improved in recent years. At the moment, Iran has a better condition with regard to the production of science compared to the past.

Despite all these – and the strong interest of the Iranian community to acquire higher academic degrees – no consistency is observed in the perspective of scientific research in Iran, due to the unavailability of reliable stimuli and motivating forces. Although there are some indications that the quality of scientific production has increased, there is still more emphasis, in Iran, on the quantity rather than the quality.

With regard to technology, effectiveness of science, the commercial aspects of science and their applications, there has been found a large gap between Iran and industrial countries.

THE MAIN RESULTS OF THE QUANTITATIVE STUDIES

Based on the approved indicators of the High Council for Cultural Revolution (in five domains, namely human resources, financial, structural, performance and productivity indicators) different aspects of Iran's science and technology have been studied together with the changes occurred in the years 1996, 1998 and 2000. The results were compared with similar information related to other countries.

The analysis of the statistics depicted the following results:

- 1- The number of R&D personnel has been increasing during the past years.
- 2- The number of Iranian researchers in the year 2000 showed a 64% increase compared to the year 1998.

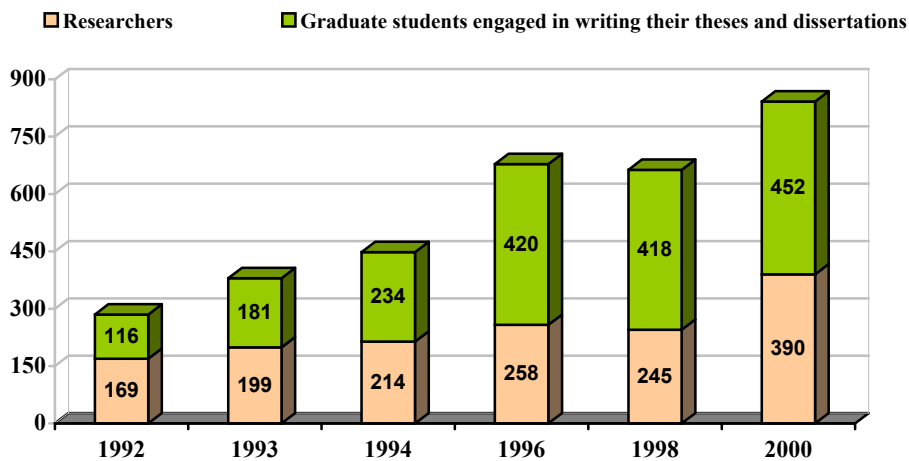


Figure (1): Total researchers, including graduate students writing their theses and dissertations per million populations

- 3- A comparison of statistics related to researchers and faculty members shows that a number of potential researchers are not active in the area of research.
- 4- Total researchers per capita population in Iran is higher than the average level in Asia but lower than that in the world.

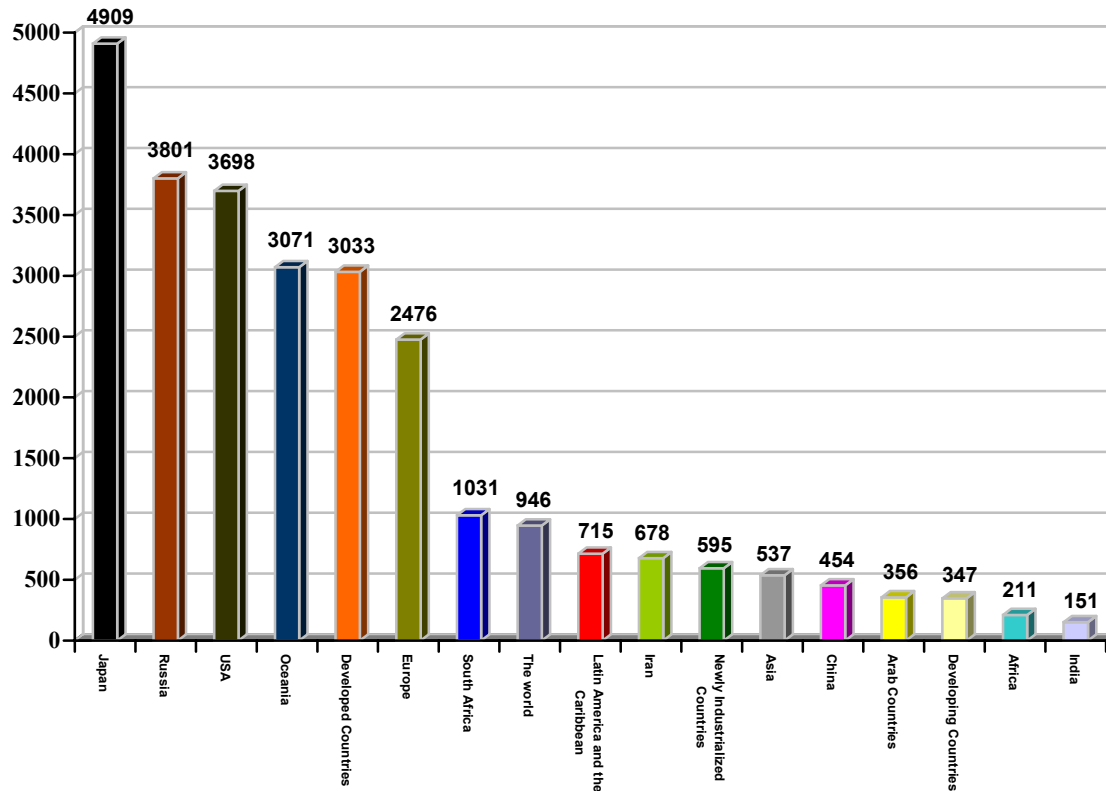


Figure (2): The number of researchers per million populations in different countries of the world in 1997

- 5- Although the R&D budget provided by the government has increased during the past years, that is still very low taken the GDP.

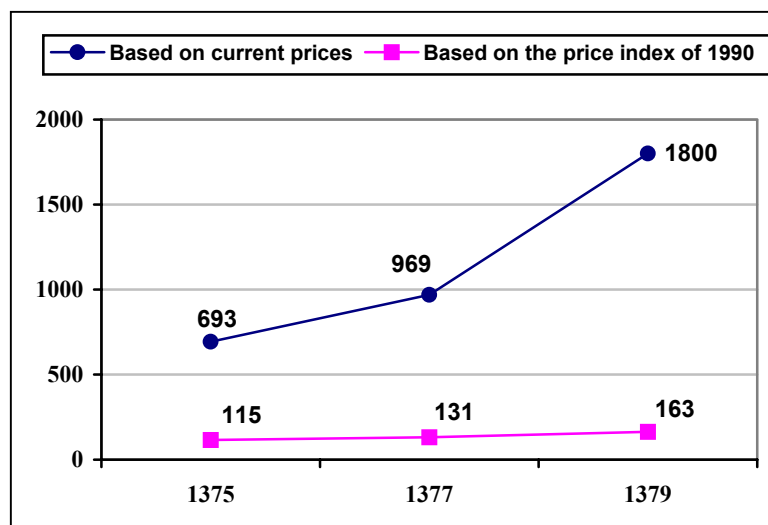


Figure (3): R&D budgets (milliard rials)

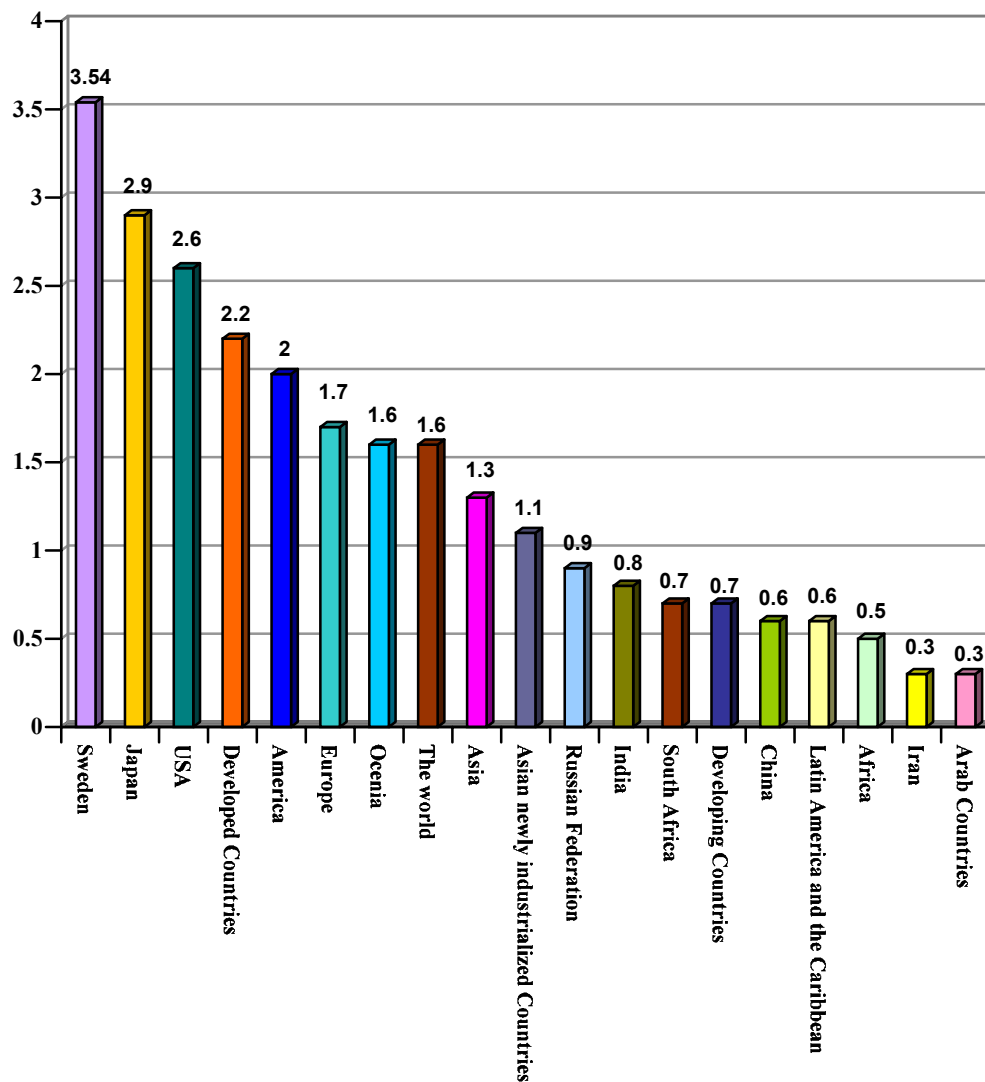


Figure (4): Expenditure on R&D as a percentage of GDP in 1997

- 6- Private sector participates marginally in providing R&D expenditures.
- 7- The number of research centers increased slightly between 1996 and 2000.
- 8- The number of scientific societies is increasing in Iran.
- 9- The number of online computer databases and networks connected to the World Wide Web has increased satisfactorily.
- 10- The number of active research projects is increasing.
- 11- The growth in the number of articles published in journals has been satisfactory.

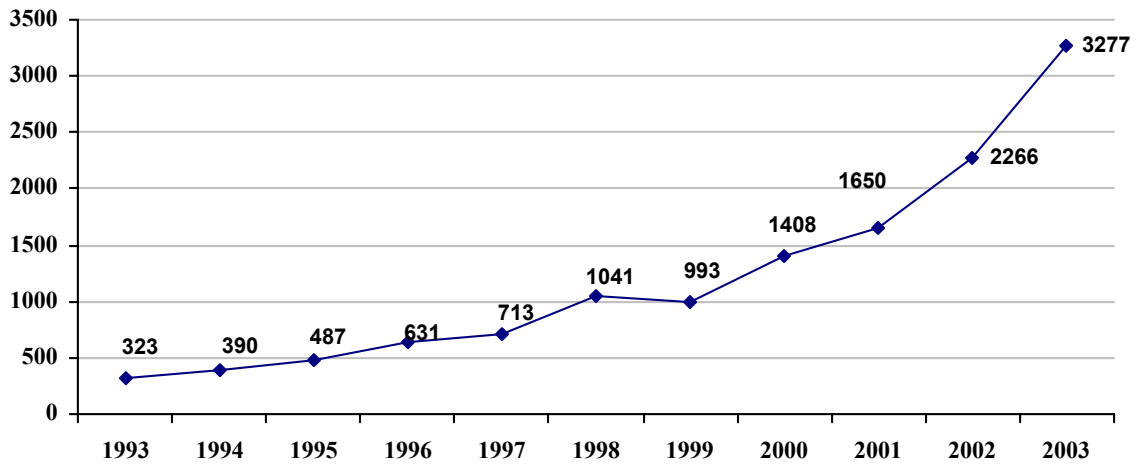


Figure (5): Total scientific publications of Iranian researches indexed in ISI between 1993 and 2003

12- Although Iran embodies one percent of the world population, the percentage of its scientific productions indexed in ISI was no more than 0.18% in the world in the year 2003. Of course, this rate is continuously increasing.

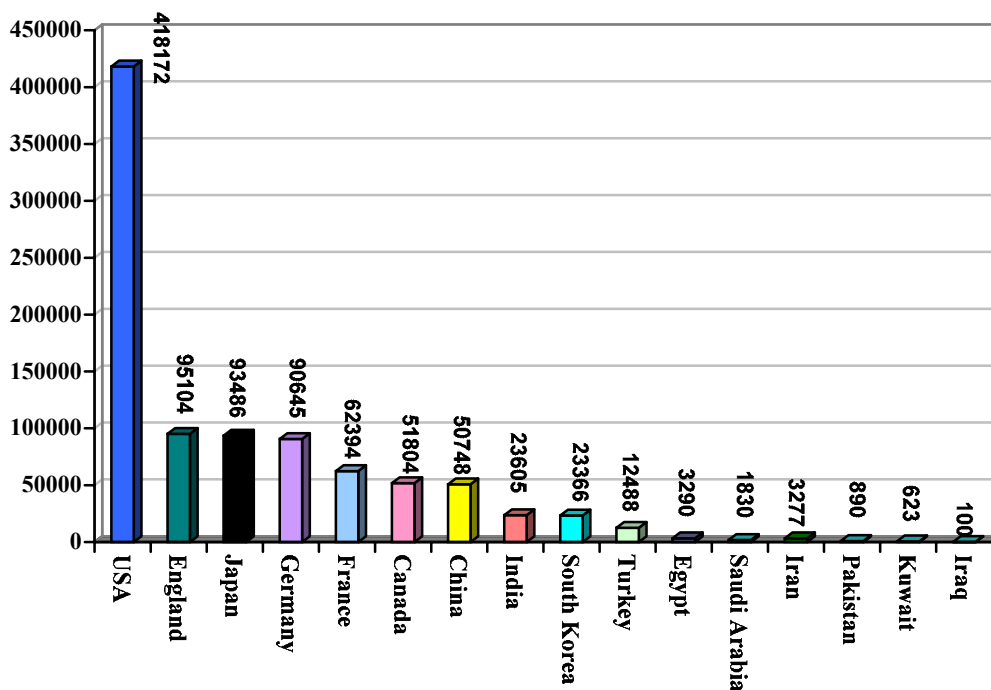


Figure (6): The contribution of each country in the scientific productions indexed by ISI for the year 2003.

13- Total R&D budget per researcher in Iran is much lower than the international level.

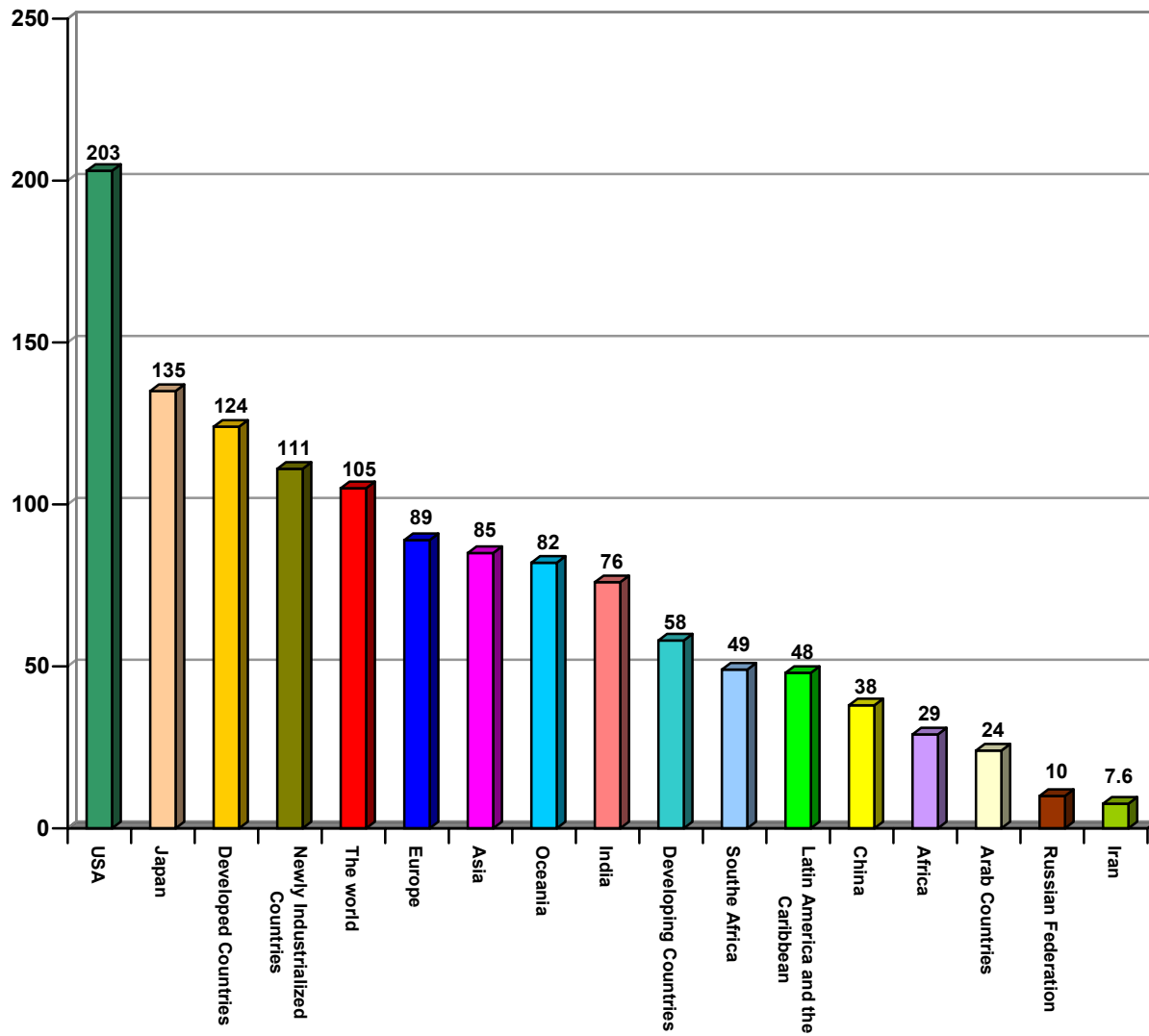


Figure (7): Expenditure on R&D per researcher in 1996 (1000 U.S. \$)

OBSTACLES IN THE DEVELOPMENT OF SCIENCE AND TECHNOLOGY IN IRAN

The quantitative analysis of the results revealed a number of problems and obstacles in the development of science and technology as follows:

- 1- No nation-wide policy or strategy has been devised for science and technology. For this reason, the distribution of facilities as well as the appropriation of R&D resources and budgets do not necessarily fulfill national objectives and do not systematically take future needs into consideration.
- 2- The economy of Iran is not, due to historical reasons, knowledge-oriented. For this reason, science and technology are not much under the influence of business and economy, and that is why their production is not economical. In fact, there is not much motivation for producing them.
- 3- Management in Iran, is not that much knowledge-dependent.
- 4- Iran's system of science and technology lacks internal unity and coordination. The missions and responsibilities of scientific and technological organizations, including universities, research and industrial development centers and scientific research organizations have not clearly been set and well defined, and there is not much cooperation between them.
- 5- There are not efficient national and legal mechanisms for safe-guarding the material and intellectual rights of scientists, researchers, inventors, innovators and discoverers of Iran.
- 6- R&D comprises merely a small part of the whole GNP.
- 7- Private sector plays no more than a marginal role in carrying out R&D activities as well as in financing them.
- 8- The technical and support research staff do not usually possess the speciality needed and lack deserved job status.
- 9- Iran's role in the production of science and technology, at the international level, is very low.
- 10- There is no suitable mechanism for publicizing information in the area of science and technology in Iran.

SUGGESTED PROCEDURES

In order to improve the indicators of science and technology, to remove the obstacles and to attain to a deserved status amongst the world countries, the following items are suggested:

- 1- Making a correspondence between scientific and technological policies and procedures, on the one hand, and economic and political strategies dominating Iran's industry, services, business and foreign policies on the other.
- 2- Making a distinction between the responsibilities of universities, research scientific organizations, research and industrial development centers as well as scientific parks with regard to research activities and the production of science and technology, and also encouraging cooperation between such institutions.
- 3- Revising research laws and regulations inside and outside the system of science and technology; transferring widespread power and authority to researchers in order to activate potential human resources in universities – these include, faculty members and graduate students.
- 4- Revising the laws related to salaries of outstanding scientists and researchers based on performance indicators with the objective of increasing the salaries to international levels.
- 5- Devising and approving new and substitute laws for safeguarding the rights of inventors, discoverers, authors, ... based on international regulations.
- 6- Organizing a system for collecting statistics about science and technology in Iran, in order to use them in setting policies, designing programs and making assessments.
- 7- Increasing total R&D budget as a percentage of GNP.
- 8- Prepare of necessary motivations and law circumstances for increase of participation of foreign and Iranian private sectors in Iran's research activities.

Compiled by:

The Committee for the Supervision and Assessment of Cultural and Scientific Affairs