

# Science and Technology Policy in Turkey National Strategies for Innovation and Change, 1983 - 2003 and Beyond

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## Introduction

Policy-relevant studies in Research and Development (R & D) in science and technology (S & T)<sup>1-6</sup>, technology competencies and innovation<sup>7-10</sup> have been quite widespread in Turkey in recent times.

This paper attempts to describe the framework of the Turkish S & T policy with specific fields of investment and priority areas from 1983 to 2003 as well as an overview of the first national S & T foresight exercise the "Vision 2023 Project". An attempt has also been made to evaluate the outcomes of policy measures in the last decade using several indicators of science, technology and technological innovation.

## Methods

The essence of the method followed in the present work resides on studying national documents to track the Turkish practice in S & T over the last two decades. More specifically, fields of investment, areas of priority for S & T activities, and (regulatory) measures taken to attain the socio-economic goals of the country are identified. Trends in input for R & D, research performance as measured by the national publication output in all areas of S & T and patent data are studied for the implications of the national S & T policy from 1980s to the early 2000s

## Results

An examination of the policy documents in the early phase up to the 1990s indicates that the main targets of national S & T policy were to broaden R & D infrastructure almost exclusively in the academic sector to catch up with the critical values of the R & D indicators.

The main document in the 1990s titled "Project for Impetus in S & T- 1995" has proposed the establishment of a National Innovation System as a fulcrum for Turkey to be able to evolve, going beyond threshold of industrialization, into the information era. Priority areas considered in this project ranged from information/communication technologies, flexible manufacturing and defense industry, genetic engineering/biotechnology with particular emphasis on the agricultural applications in relation with the "South Anatolian Project", environment friendly technologies and renewable

energy systems, advanced materials to earthquake related problems and risk management.

The vision 2023 project involves the first-ever national foresight exercise which aims at building a Turkish S & T vision for development of S & T policies for the next 20 years. It has been detailed in order to determine strategic technologies and priority areas of industrial R & D, while getting a wide spectrum of stakeholders involved in the process as well as creating public awareness on the importance of S & T for socio-economic development.

Some of the preliminary findings on the outcomes of policy measures in terms of R & D inputs and outputs in the last decade are as follows: (1) Total R & D expenditure (% of GDP) increased from 0.32% in 1990 to 0.67% in 2002. (2) Expenditures in R & D financed by industry/business sector rose from 27.5% in 1990 to 44.9% in 2001. (3) The fraction of R & D in the expenditure for technological innovation increased from 6.6% in 1995 to 29.2% in the year 2000. (4) The number of publications in the journals indexed in the Science Citation Index (SCI) database of the Institute for Scientific Information (ISI) was only 464 in 1983 with the 41<sup>st</sup> position in the ranking of countries elevated to 12160 in 2003 with ranking 22<sup>nd</sup>- a more than 26-fold increase in the last two decades.

## Conclusion

In summary, over the past two decades, there have been substantial developments/changes in the Turkish S & T policy along with those in the economy, namely:

- Turkish economy rose to upper echelons of (intermediate) technology producing countries, after a long period of manufacturing under license. The Customs Union Agreement with the European Community in 1995, helped to further improve the competitive environment, which is essential for an innovative economy.
- Instead of regarding the R & D policy as synonymous with the S & T policy, as was the case up to the 1980s, a new approach emerged in 1990s that placed emphasis on innovation-oriented national policies.

- As a reaction to the changing nature of innovations, the hierarchical transfer of tasks between actors on the S & T stage has left its place to cooperation between university, industry, and government.

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