



The Higher Council for Science & Technology

The National Policy and Strategy for Science, Technology and Innovation (2013-2017)

Document One: The Executive Summary

The Higher Council for Science and Technology develops policies that will contribute to building a national scientific and technological base, until the acquired and growing technological expertise turns into an effective tool in stimulating the economic, social and cultural development in the Kingdom. Since its inception, the Council has worked through the Secretariat to develop a national policy for science and technology, with the participation of a wide base of the Jordanian scientific and technological community, and to formulate that policy in line with the requirements of the development sectors stated in the national economic and social development plans.

In response to the Royal visions for promoting the role of scientific research and development in the economic and social development process in the Hashemite Kingdom of Jordan, with regard to the pillar of scientific research, emerged the project "identifying the scientific research priorities in the Hashemite Kingdom of Jordan for the next ten years (2011-2020 AD)" to pave the way for national institutions and researchers in Jordanian universities and in the research and development centers, to contribute to realizing the sustainable comprehensive national development to keep pace with scientific and technological development.

The projects' detailed objectives were as follows:

1. To identify the scientific research priority subjects in various science, technology, and innovation fields for the next ten years.
2. To identify research issues of highest priority and those which are of a lower priority among the key subjects.
3. To gear the researchers towards scientific research paths, through the identification of high priority research issues among the key subjects.

The prior identification of scientific research and development priorities supports the ability to make decisions, especially if those priorities were based on the vision and insight of qualified experts that were outsourced. Therefore, these priorities are highly credible, which motivates researchers in the research institutions and centers to adopt them in the preparation of research projects proposals to obtain support from stakeholders at the national and global levels.

The research topics of a national priority allow for collective work by the scientific research institutions and researchers to promote research, development and innovation, whether among these institutions and their researchers, or among them and globally prestigious scientific research institutions, which promotes the enabling environments necessary for scientific research and knowledge

The Higher Council for Science and Technology is looking forward for this important national project to be the first step in crystallizing an integrated national vision for the role of scientific research and development in promoting comprehensive economic development. The council aspires to make this vision a common denominator among all the concerned individuals and institutions of the scientific and technological community, as well as the beneficiaries in the economic and social sectors, and the decision makers, in order to boost the research and development priorities that have been identified in this project.

It is hoped that the results of this project would have identified the accurate framework of the national policy in guiding the national efforts and initiatives to support R & D projects, finance and sponsor them, and allocating the necessary resources for them, to achieve the economic and social development in Jordan.

To enable the Higher Council achieve its goals to contribute in the advancement of the economic and social development, the government decided to allocate 1% of the GDP to finance R & D activities. This support is a cornerstone for the success of the HCST efforts in implementing its strategies and programs designed to use science, technology & innovation to serve the national economy and move to knowledge economy.

Upon reviewing the current national policy for science and technology (2006-2010), it was found that it included declared policies in various aspects of science and technology, as well as an implicit policy with respect to innovation. This made the board of the Higher Council consider including in the new policy (2012-2016) a special pillar on innovation and even include that in the title. This stemmed from the importance of innovation in transforming the national economy into a knowledge economy.

The General Secretariat of the Higher Council for Science and Technology has embarked on preparing the national policy and strategy for science, technology and

innovation for the years (2012-2016) by forming a specialized committee to study and review the programs and projects included in the document of the national scientific and technological policy and strategy (2006 – 2010). This committee submitted a report stating that the percentage of completion of projects was about 50%. The Deputy Chairman of the Higher Council decided to form the Steering Committee for the preparation of the policy and strategy for the years (2012-2016), headed by the Secretary General of the Higher Council and with the membership of the Secretary General of the Ministry of Planning and International Cooperation, the Secretary General of the Ministry of Higher Education and Scientific Research, and representatives from the public and private sectors. The action plan was adopted by the project's steering committee and comprised many actions, activities and outputs which included being exposed to the experiences of a number of countries in preparing policies and strategies for science, technology and innovation, by inviting to Jordan experts in this field to present their expertise and the experiences of their countries (Lebanon and Egypt), or by visiting the institutions involved in science, technology and innovation policies in other countries such as Turkey and Finland.

It is worth mentioning that the performance of the system of science, technology and innovation depends on the availability of the necessary elements and on the way the system's representatives perform their tasks and interact together to develop and apply the creative knowledge. Therefore, the elements of the science, technology and innovation system in Jordan that have been focused on are as follows:

- a) The institutional framework (the Actors).
- b) The policies and legislations frameworks.
- c) The infrastructure for science, technology and creativity.
- d) The human resources.
- e) The science, technology and innovation environment.

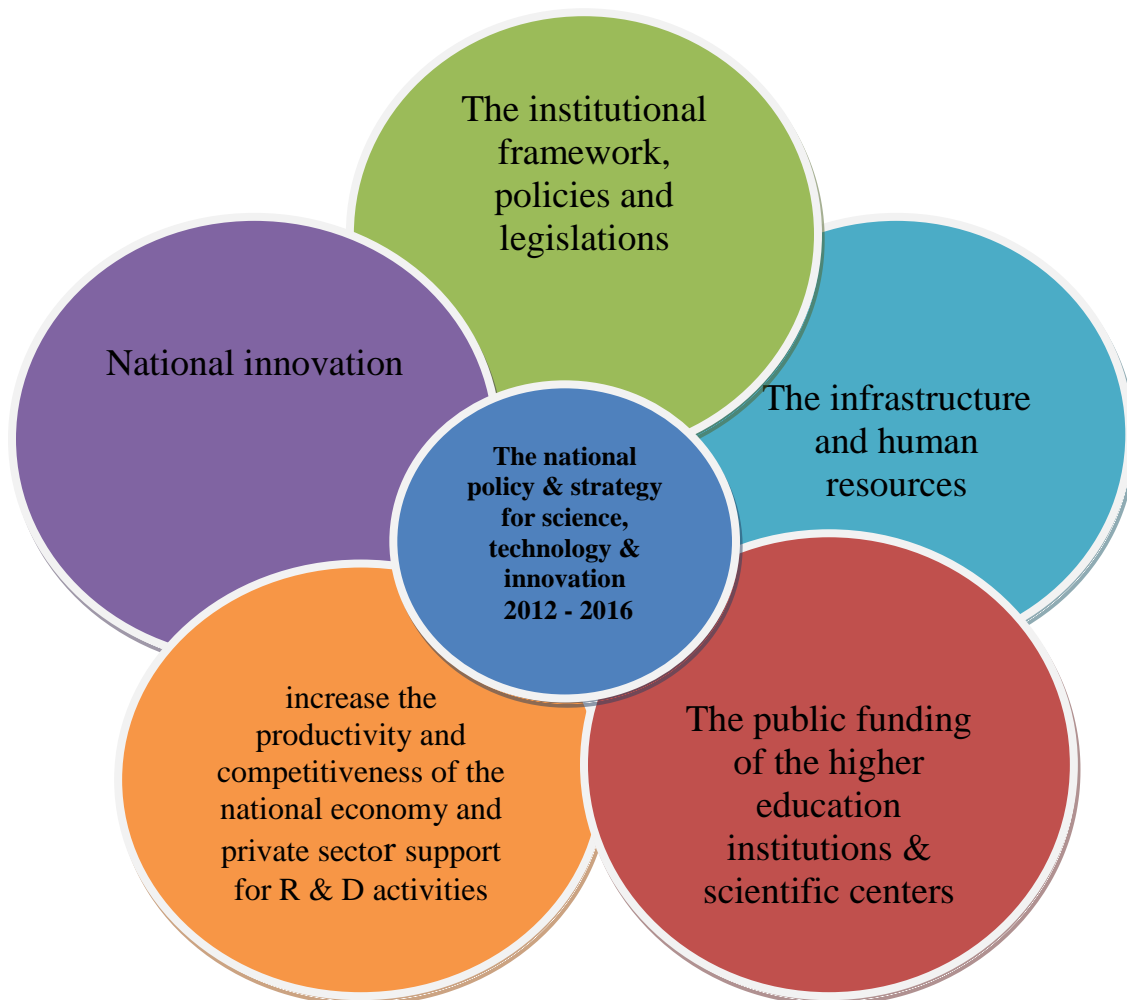
The main functions of the system's institutions and the main interactions between them have been identified in order to develop a framework for the SWOT analysis that produced the strategies and programs that must be contained in the national policy and strategy for science, technology and innovation (2012-2016).

An analysis of the strengths, weaknesses, opportunities and threats was conducted for the system of science, technology and innovation in Jordan, and priorities areas for the drivers of change in Jordan for the 21st century were identified. This analysis resulted in identifying eighteen general strategies, which were combined into fourteen alternative strategies, while five detailed strategic goals were extracted and translated into five main programs for the new policy and strategy (2012-2016).

We can notice that the basic pillars of the policy are also the titles of the programs derived from the SWOT analysis.

Five working groups were formed, whose tasks were to develop the goals, objectives and expected outcomes for each one of the five major programs, and for the projects included in those programs, and identify the key activities and years of implementation as well as the estimated cost for each of these projects.

The programs were as follows:



- **First program:** The institutional framework, policies and legislations
- **Second program:** The infrastructure and human resources
- **Third program:** The public funding of the higher education institutions, scientific centers, and science and technology environment
- **Fourth program:** To increase the productivity and competitiveness of the national economy and private sector support for R & D activities
- **Fifth program :** National innovation

Innovation was added to the themes of the current policy and strategy, due to the special importance of innovation with regard to contributing to fostering the economic and social development. This addition was represented in the allocation of a special theme or program for innovation, in addition to the activities and actions related to innovation in the other themes and programs

The main concept of innovation is associated with the renewal or development, so as to produce something innovative or unprecedented. For this to occur, people must change the way they make decisions or choose between alternatives, away from the traditional methods. Some say that innovation changes the values of the systems. Therefore, innovation is the overall, partial or radical change in the ways of thinking, of production, of operations and of managing institutions. Innovation is often looked at as the economy's main driver, especially when it leads to new products or increases productivity. The factors and circumstances that lead to innovation are very important for decision makers. Innovation is considered the only guarantee to benefit from peoples' ability to innovate and develop, as without it, many efforts and opportunities are wasted.

With regards to the technological innovation arising from R & D activities in Jordan, we can say that that they are still in their debuts, especially that most of the existing scientific research in universities is basic (Supply-driven) research and not (Demand-driven). At the same time, effective partnership relations were not formed between business and production sectors and scientific and technological community to solve the problems of these sectors, by exploiting the research capacity and knowledge of researchers and academics. High-level research projects, even if they were few, rarely find a favorable opportunity to convert research results into business and commercial products. Also, researchers and

academics successful in research rarely turn into entrepreneurs establishing their own entrepreneurial projects.

We must take advantage of the enormous opportunities offered by technological innovation and others, by combining all the efforts to create wealth for the national economy to prosper and become a knowledge economy, and lead the knowledge economy to higher levels of the (Value chain). This will also result into a more qualified manpower and will increase the value-added businesses and improve the level of exploitation of technology and knowledge.

Thus, the efforts of the Higher Council for Science and Technology are focused on the development of an enabling environment for the prosperity of innovation and its introduction into all the activities and businesses that would replenish the national economy and contribute to the process of economic and social development. These efforts include:

- Increasing the level of effective partnership between the scientific and technological community and the productive and business sectors.
- The effective contribution in transforming the scientific research outputs into products and commercial services.
- Effecting real development in the education and higher education curricula in order to introduce the concepts of innovation, entrepreneurship and self-employment to the minds of students.
- Allowing the students to experience the innovative commercial work and provide them with support.
- Improving the legislative environment governing the registration and launching of SMEs, supporting them and providing them with incentives.
- Providing tax incentives and venture capital for to innovators and entrepreneurs.
- Providing innovators and entrepreneurs with training and awareness opportunities in management, marketing and funding.

□ Increasing the effectiveness of the incubators' network and providing the technical assistance and necessary studies required to start entrepreneurial projects.

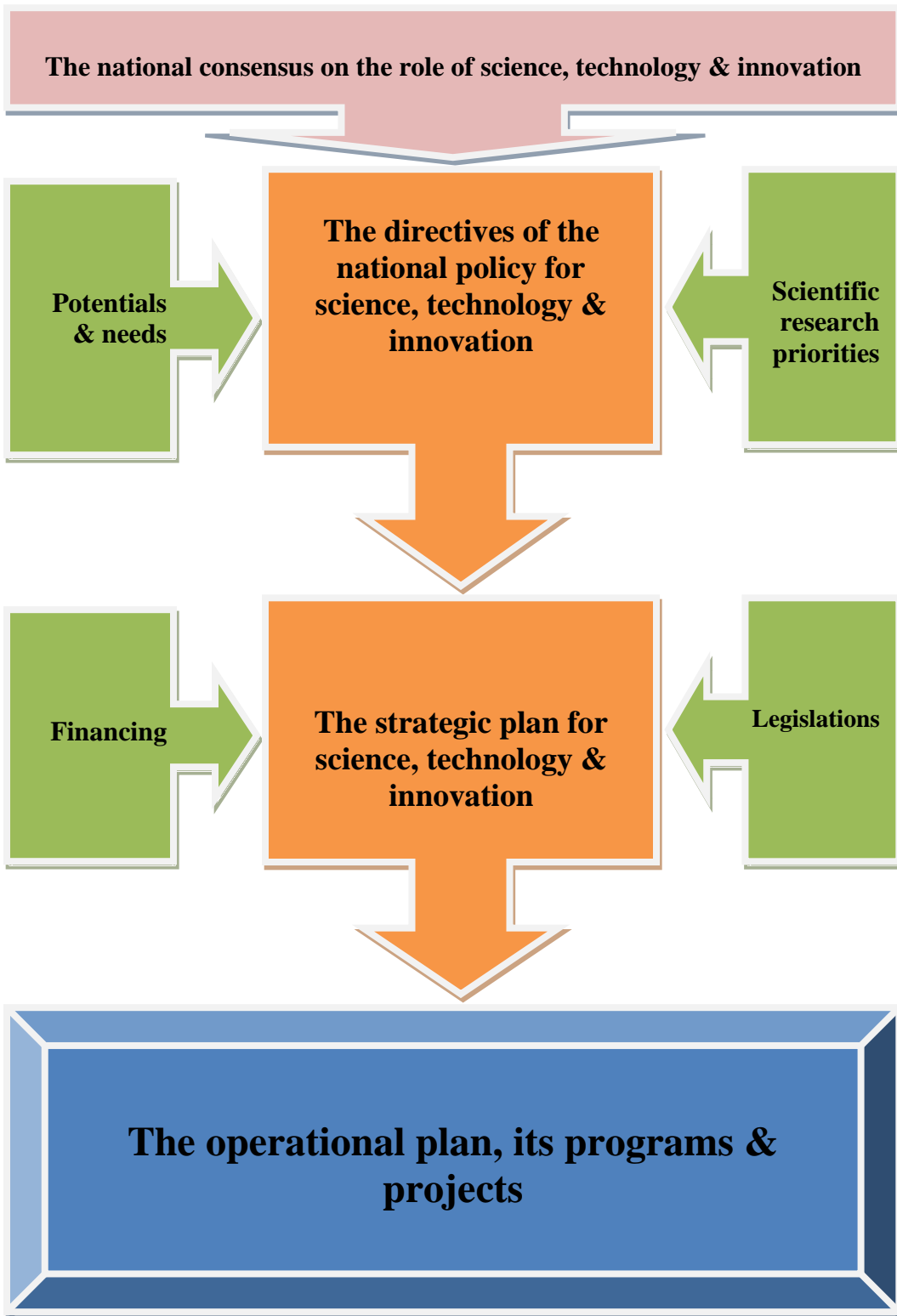
□ Adopting innovative approaches in supporting and financing scientific research activities in high priority areas for the economy of Jordan, such as, the joint support, the provision of (Seed money), promoting the sabbaticals for university professors, and providing scholarships to scientists and students.

□ Contribution of the Higher Council in the development of innovation policy and the method of sponsoring and institutionalizing the commercial creativity and entrepreneurship as catalysts for the national economy.

□ Restructuring the institutions involved in innovation, in order to include all types of innovation among their tasks, including technological and commercial innovation, and even creativity in the methods and modalities the government and the private sector function with.

□ Institutionalizing and improving the cooperation between the HCST and the other institutions, such as the Export Development Corporation and others, to complete the cycle of supporting innovation, starting with nurturing the innovative idea and ending with a commercial project based on an innovative idea.

It should be noted that any national policy should comprise major trends which constitute the general framework of this policy and serve as the basic features that the policy makers envisage to significantly affect the drafting and contents of the policy. The following graph illustrates how the new trends of science, technology and innovation will be formed according to the current structure in Jordan.



These main directives, related to Jordan, include points extracted from one or more of the following references:

- Governmental economic or social directives to meet the next stage.
- The accumulated experience from the current or last policy, especially with regards to the drawbacks and failures.
- The situation of Science, Technology and Innovation in Jordan compared with the countries of the region or the world in general.
- The availability of a political decision and the ability to make the necessary allocations.
- The experience of other countries in the field of national policies for science, technology and innovation.
- The availability of regional and international cooperation opportunities in the fields of science, technology and innovation.
- Regional and international trends in the field of science, technology and innovation.
- The political and economic regional and international trends.