المجلـس الأعلـى للعلـوم والتكنولوجيـا
The Higher Council for Science and Technology

Strategy of The Higher Council for Science and Technology 2005 - 2010

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Table of Contents

*1- **Background***

The Higher Council for Science and Technology (HCST) was established in 1987 under Law Number 30 as a public independent institution acting as a national umbrella for all science and technology (S&T) activities in Jordan.

The HCST sponsors and carries out activities and events which enforce and enhance the role of S&T in the socio-economic development process in Jordan.

Since its inception the HCST has launched numerous initiatives. The main activities are briefly described in the following paragraphs:

- The HCST ratified the National Science and Technology Policy in early 1995. The policy formed the basis for executive programs for each of its four main elements: information, human resources, transfer of technology, and research and development (R&D).
- In realization of the objective for which the HCST was established, namely, building a national science and technology base, the HCST offers financial support to R&D projects. These projects are chosen in accordance with national R&D priorities and implemented by Jordanian researchers. During the period 1995-2004 the HCST provided around 4 million JDs as a financial support to more than 160 R&D projects in different fields.

- The Jordan Science week is an annual event, which has been convening since 1993. This important event represents a forum for dialogue and deliberation on national developmental issues, and involves the three major players of the socio-economic development, which are the government, the science and technology community, and production and services sectors. Latest developments in S&T world wide are introduced, with specific theme related to the Jordanian economy.
- The Jordan Badia Research and Development Program (BRDP), is a national program aiming at contributing to the sustainable development of the Jordanian Badia to enhance the quality of life for its inhabitants. Since its establishment in 1992, as a result of a memorandum of understanding signed between the Higher Council for Science and Technology (HCST) and the British Royal Geographic Society (RGS), the program implemented numerous R&D projects, human resources development programs, and entrepreneurial projects.
- The Industrial Scientific Research and Development Fund was established by the HCST in 1994, with the overall objective of enhancing the competitiveness of Jordanian industries through utilizing the research and development capabilities available at the national academic and research institutions. Since its establishment the fund provided financial support to 263 projects with a total amount of about 2 million JDs.

- In appreciation of the distinguished role of HRH Prince El Hassan Bin Talal in supporting science and technology in Jordan, the HCST founded the El Hassan Bin Talal Award for Academic Excellence in 1995. The award is granted to national institutions that participate in the development of the educational and training systems (General education institutions, higher education institutions, and vocational and technical institutions).
- The HCST has established the National Fund for Enterprises Support (NAFES) in 2001. This Fund is one of the fruits of the Jordan-Japan Industrial Development Program, which was implemented by the HCST. NAFES was created with the objective to assist in the management modernization of Small and Medium Enterprises (SMEs) to increase their competitiveness and enhance productivity and efficiency. NAFES initiated activities by approving 10 local consulting firms as business service providers to the private sector in 2001. By the middle of 2004 NAFES has enlisted the services of more than 75 local consulting and training firms, and has assisted in the establishment and successful launch of 7 new consulting firms. Up to the end of June 2004, NAFES has received and reviewed (424) applications for support from SMEs, and has supported (149) projects with approximately 685,000 JDs.

- The HCST has established the National Consortium for Technology and Incubation of Business (NACTIB) end 2002 to create an environment conducive to the development and growth of knowledge-based enterprises, and promote R&D activities in the private sector. This is in addition to improving success opportunities of start-up companies and assisting entrepreneurs through incubation and linking to technical and managerial know-how and financing.

  The Consortium includes University of Jordan, Royal Scientific Society, Princess Sumaya University for Technology, Royal Geographic Centre, and King Abdullah II Fund for Development.
- The HCST has established in 2004 a National Water Quality Monitoring System with the assistance of JICA comprised of a fully automated on-line system, and upgrading of existing water-testing laboratories. The ultimate goal of this system is to provide a data collection platform for national water quality to improve decision making in the water and environment sectors.
- Finally the HCST has given the scientific cooperation with international agencies and with other countries great attention. This has been translated in signing several cooperation agreements and memoranda of understanding with several counterpart institutions. Cooperation with these entities includes joint research projects, and joint seminars and workshops.

2- ***Purpose of the Strategy***

The intent of this strategy is to achieve the following:

- Chart a long term course of action for the integration of S&T into all national development plans and programs.
- Set the strategic direction of the General Secretariat of HCST and carry out necessary restructuring measures.
- Enhance partnership and synergies between the S&T community and stakeholders.
- Identify and employ appropriate resources to enable the implementation of action plans and activities.

3- ***Vision***

Achievement of internationally reputable capacity in frontier sciences and technologies, and maximum benefit of their applications for the sustainable socio-economic development of Jordan.

4- ***Mission***

The HCST sets the national science and technology policy, strategies, plans and programs, and plays a catalytic role in enhancing and accelerating the interaction among the S&T community, production and services sectors, and government. This is in addition to transforming science and technology ideas into commercial enterprises through supporting innovation, entrepreneurship, and technology commercialization. Furthermore, The HCST supports the development of national human resources related to R&D, centers of excellence, research networks, and partnerships of

alliances. The HCST's ultimate goal is to improve the livelihood of the people in Jordan.

5- ***Goals and Objectives for 2005-2010***

5-1 Strategic goals for science and technology in Jordan.

- Build up an advanced science and technology base.
- Convert S&T ideas and R&D results into tangible assets, and create sustainable job opportunities for the Jordanian citizens.

These strategic goals are challenged by the following:

- Continuously increasing capacity and innovation of human stock.
- New and different non-conventional demand for S&T contributions to economic development.
- The interdisciplinary character of emerging and enabling technologies.
- Rapid developments of markets and products to follow the changing consumer needs and behavior.
- Rapid developments of technologies that create changes in demand.
- New distributed nature of organizations and research networks.
- Ineffective communication and cooperation channels among all S&T stakeholders.

- Increased demand of public and private sector enterprises, for result-based management.
- The need for changing the attitudes of stakeholders towards the role of S&T in development.
- Effective employment of mechanisms and instruments, which suit the characteristics and salient features of the Jordanian economy.

This mindset acknowledges that these challenges require the creation of an environment that leads to advances in S&T which maximizes the benefit to the Jordanian economy.

In addition to current activities the HCST will focus, during the strategy period, on the following S&T priority areas:

- Information and Communication Technology (ICT).
- Biotechnology.
- Advanced Materials and Nanotechnology.

In realizing these goals, the HCST will adopt the following approaches:

- Participatory approach with the involvement of all S&T stakeholders.
- Multi-disciplinary, inter-disciplinary and multi-institutional teams.
- Matching R&D fund.
- Seed capital fund.

- National, regional and international networking.

5-2 Objectives.

Objective 1:

National Science and Technology policy formulation and review.

Strategies:

S.1. Participation of all Stakeholders.

S.2. Knowledge-based review and amendment.

Mechanisms:

***M.*1.** National sectoral committees/Task forces.

***M.*2.** Periodical National S&T Requirements and Potential surveys.

***M.*3.** International expertise.

Performance indicator:

- National S&T policy is reviewed and amended by the end of 2005, and periodically every 5 years.

Objective 2:

Establish and strengthen the linkages between the S&T community and the industry.

Strategies:

S.1. Strengthening available linking mechanisms

S.2. Prioritizing areas for cooperative projects between research centers and industry.

S.3. Developing technology information and dissemination system.

S.4. Enhancing partnerships between research centers and industry.

Mechanisms:

M.1. Industrial Scientific Research & Development Fund (ISRDF).

M.2. Industrial Development Unit (IDU) at the General Secretariat of the (HCST).

M.3. National Consortium for Technology and Incubation of Business (NACTIB).

M.4. Jordan Science Week.

Performance indicators:

- 150-200 proposals of joint projects are evaluated annually.
- 40-50 qualified joint projects are supported annually.
- Annual sub-sector consultation meeting is convened.
- Impact assessment study is performed every five years.

Objective 3:

Development of Small and Medium Enterprises' (SMEs') businesses.

Strategies:

S.1. Assessing and identifying potential areas for SMEs' businesses.

S.2. Involving all concerned parties in developing and implementing training courses and workshops on modernized business management.

S.3. Contributing to the formulation of legislations to ensure successful SMEs' businesses.

S.4. Identifying market opportunities.

Mechanisms:

M.1. National Fund for Enterprise Support (NAFES).

M.2. National Consortium for Technology and Incubation of Business (NACTIB).

M.3. Industrial Development Unit (IDU).

Performance indicators:

- 80-100 proposals for SME's business development are evaluated annually.
- 30-40 SME businesses are supported annually.
- 5-6 training courses and workshops on business management are conducted annually.
- Guidelines for establishing new businesses are developed, published and distributed to potential candidates.

Objective 4:

Supporting innovation, entrepreneurship, joint R&D, and commercialization of R&D output.

Strategies:

S.1. Promoting the establishment of technology business incubators among NACTIB members.

S.2. Building the technical and managerial capacity of these incubators.

S.3. Promoting the technology business incubators among entrepreneurs and start up companies.

S.4. Providing for the appropriate financial environment.

S.5. Building alliances between NACTIB and accomplished companies.

Mechanisms:

M.1. National Consortium for Technology and Incubation of Business (NACTIB).

M.2. Seed Capital Fund.

Performance indicators:

- Graduate 100 incubatees.
- Develop 25-30 products through R&D.
- Commercialize 10-15 of these R&D products.

Objective 5:

Augmentation of strategic national resources.

Strategies:

S.1. Enhancing the national early warning water pollution system.

S.2. Enhancing water desalination, treatment, and harvesting activities.

S.3. Capitalizing on Jordan comparative advantage in new and renewable energy.

S.4. Capitalizing on Jordan comparative advantage in mineral resources.

Mechanisms:

M.1. National Water Quality Monitoring System.

M.2. HCST R&D budget.

Performance indicators:

- Periodical technical reports on water pollution monitoring are produced and provided to concerned institutions and organizations in the country.
- 3 projects on water desalination, treatment, and harvesting are implemented.
- 5 projects on new and renewable energy are implemented.
- 2 projects on exploration and beneficiation of mineral resources are implemented.

Objective 6:

Regional RTD based socio-economic development.

Strategies:

S.1. Institutionalizing the Jordan Badia R&D Program.

S.2. Exploring and expediting income generating activities for the different communities.

S.3. Supporting and encouraging research for development projects, focusing on the improvement of the community livelihood.

S.4. Developing integrated pilot sites to demonstrate the comprehensive approach in the development of these marginal areas.

S.5. Demonstrating successful technological interventions with community participation.

S.6. Introducing new technologies for sustainable and integrated resource management.

Mechanisms:

M.1. Jordan Badia R&D Centre.

Performance indicators:

- 10 income generating activities are identified and implemented.
- 100 families benefited from these activities.
- 10 new technologies are transferred to the community.
- 100 farmers/users adopt these technologies.

Objective 7:

Knowledge creation and R&D capacity building.

Strategies:

S.1. Setting S&T research priority areas in consultation and participation of all stakeholders.

S.2. Developing criteria that ensure that supported research projects will lead into commercial products and technologies.

S.3. Encouraging team spirit at inter- and intra-institutional levels.

S.4. Exposing Jordanian community to the new S&T developments world wide.

S.5. Encouraging fair competition between institutions in public and private sectors to improve their work and creativity.

S.6. Enhancing knowledge and technology transfer.

S.7. Identifying and disseminating areas of cooperation available in the existing agreements.

S.8. Seeking cooperation and partnership with new centers of excellence at the regional and international levels.

Mechanisms:

M.1. HCST R&D budget.

M.2. National S&T Requirements and Potential surveys.

M.3. National R&D plans.

M.4. Jordan Science Week.

M.5. El Hassan Bin Talal Award for Scientific Excellence.

M.6. Industrial Development Unit (IDU).

M.7. Intellectual Property Rights Unit (IPR) at the General Secretariat of HCST.

M.8. Jordan Badia R&D Centre.

M.9. National Consortium for Technology and Incubation of Business (NACTIB).

M.10. Regional and international science and technology cooperation agreements.

Performance indicators:

- Research priority areas are reviewed annually.
- 10 projects results are utilized by the industry and yield commercial products.

- Jordan Science Week is held annually and the resulting executive work program implemented.
- EL Hassan Bin Talal Award for Scientific Excellence continued to play a major role in generating quality scientific achievements and covered new areas.
- 10-12 technologies are transferred.
- 30 joint S&T activities are implemented under regional and international cooperation agreements.
- 5-6 new cooperation agreements are signed.

Objective 8:

Enhancement of collaboration among government, S&T community, and production and services sectors.

Strategies:

S.1. Providing proper modalities for the enhancement of dialogue among S&T community, production and services sectors, and government.

Mechanisms:

M.1. Jordan Science Week.

M.2. Sectoral committees/Task forces.

M.3. Conferences, seminars, and workshops.

Performance indicators:

- National S&T policy is reviewed.
- Detailed work plans to implement the strategy are developed.
- National R&D budget is set annually.
- National R&D plan is developed.

Objective 9:

Organization of national S&T activities.

Strategies:

S.1. Identifying supply and demand in S&T sector in terms of staff and facilities.

S.2. Establishing mechanisms that will ensure the utilization of available resources at the national level.

Mechanisms:

M.1. National S&T Requirements and Potential surveys.

M.2. National networks:
ICT, Biotechnology, and Advanced Materials and Nanotechnology.

Performance indicators:

- A study is conducted to identify the supply and demand in S&T, and will be updated every 5 years.
- 3 national frontier technologies networks are established in participation of all concerned parties.

Objective 10:

Planning and evaluation of national R&D investment.

Strategies:

S.1. Setting R&D priority areas that lead to commercial products, in participation of all concerned.

S.2. Developing a research matching fund with universities, scientific centers and private sector, to address R&D priority areas.

S.3. Integrating national R&D investment.

Mechanisms:

M.1. Sectoral committees/Task forces.

M.2. National S&T Requirements and Potential surveys.

M.3. National Research Budget.

M.4. Seed Capital Fund.

Performance indicators:

- 10 institutions and companies participated in the research matching fund.
- One million JDs are secured for this purpose.
- Monitoring and evaluation system for the funded projects is developed and implemented.
- 10 research results are conveyed to the private sector and converted into commercial products.

Objective 11:

Protection of intellectual property rights.

Strategies:

S.1. Ensuring the intellectual property rights of researchers and institutions at national and international levels.

Mechanisms:

M.1. Intellectual Property Rights Unit (IPR).

M.2. National Consortium for Technology and Incubation of Business (NACTIB).

M.3. International specialized firms.

Performance indicators:

- 50 patents are evaluated at the national level.
- 3-5 patents are registered at the international level.

6- Implementation plan

In order to implement this strategy HCST needs to form a task force for each objective. The task forces must span all the S&T institutions and have representation from all stakeholders. Each task force will have a member from the General Secretariat of HCST to guarantee proper coordination, communication, and exchange of information. These task forces will be given a definite time period of not more than 6 months within which they must submit detailed work plans to HCST. The detailed work plans will be organized in a logic frame in order to implement the strategy in an effective manner.