

Qatar National Research Strategy

and a Strategic Plan for Implementation

October, 2012

The Qatar National Research Strategy (QNRS 2012) reflects extensive input from Qatar's research leadership, researchers and other stakeholders. The consensus vision and mission statements, research goals and objectives, and initial implementation steps are presented below.

"We want our people to have a stake in their country, and we are working to ensure that leaders emerge from each and every Qatari generation."

Her Highness Sheikha Moza bint Nasser
Chairperson, Qatar Foundation for Education,
Science and Community Development

Vision Statement: *Qatar will be an international center for research and development excellence and innovation.*

Mission Statement: *The national research program will be based on inclusiveness and intellectual merit to:*

- *Develop the capabilities of Qatar's people and institutions*
- *Build and maintain a competitive and diversified economy*
- *Improve the health and social well-being of Qatar's population*
- *Support Qatar's distinctive culture and the security of its people*
- *Preserve and improve the natural and built environment*

Goals and Objectives: Enterprise-Wide Pillar (EW)

Goal EW.1—Governance and vision: *Improve R&D governance through transparent and efficient organization and management of research and in fulfillment of the QNV 2030 and QNDS 2011-2016*

- EW.1.1: Align research portfolios and investments with Qatar's vision for research and development.
- EW.1.2: Clarify organizational structure, goals and relationships of research entities.

Goal EW.2—Monitoring and evaluation: *Provide high standards of research and efficient resource allocation through regular and systematic monitoring and evaluation*

- EW.2.1: Develop a process for systematic review and evaluation of the Qatar Foundation's research institutes, QNRF and QSTP on a regular basis.
- EW.2.2: Establish a national observatory on science, technology and innovation to track research.

Goal EW.3—R&D eco-system: *Improve the infrastructure, systems, processes and institutions that impact the R&D environment in Qatar*

- EW.3.1: Improve purchasing and procurement processes for research needs.
- EW.3.2: Improve the management of intellectual property emerging from Qatar's research entities.
- EW.3.3: Create and implement policies to ensure that research methods meet global standards.
- EW.3.4: Promote a vibrant research culture through communication and outreach activities.

Goal EW.4—R&D workforce and education: *Develop Qatar's current and future capacity to execute the QNRS through a well-developed R&D workforce and improved quality of education*

- EW.4.1: Draft and implement a comprehensive 5-10 year National Research Workforce Plan.
- EW.4.2: Strengthen K-12 and undergraduate programs in the fundamental sciences & mathematics.

- EW.4.3: Enhance and create new graduate programs in areas of national interest.

Goal EW.5—R&D partnerships: Develop a productive R&D and innovation ecosystem in Qatar through knowledge sharing, collaboration and cooperation.

- EW.5.1: Develop and strengthen interdisciplinary and multidisciplinary research partnerships between the academic, private and public components of the research enterprise both within Qatar and internationally.

Goals and Objectives: Energy and Environment Pillar (EE)

Goal EE.1-- Oil and gas: Sustain economic prosperity through oil and gas diversification and expanded demand for natural gas; optimal exploitation of hydrocarbon resources; long-term maintenance of strategic reserves

- EE.1.1: Develop the knowledge base and technology required to enhance the recovery and processing of Qatar's petroleum and natural gas resources.
- EE.1.2: Establish a basic and applied research program in natural gas conversion to higher value products.
- EE.1.3: Develop technologies that offer to expand the global market for natural gas.

Goal EE.2—Renewable energy: Achieve sustainable development through economic diversification, including solar energy and alternative fuels

- EE.2.1: Create and implement a comprehensive solar energy research program to include solar electric and solar thermal applications.
- EE.2.2: Develop technology for converting carbon dioxide to useful fuels and/or chemicals using biological/biochemical approaches.

Goal EE.3—Energy efficiency: Sustain economic prosperity, development, responsible use of natural resources, and a proactive role in climate change mitigation

- EE.3.1: Improve the efficiency of energy use in Qatar, with special emphasis on reducing greenhouse gas emissions. [see also EE.6]

Goal EE.4—Understanding and protecting Qatar's natural environment: Provide a sustainable environment for future generations

- EE.4.1: Understand and, where appropriate, restore Qatar's marine and terrestrial natural resources.
- EE.4.2: Understand and, where appropriate, restore Qatar's natural resources. Develop more efficient approaches to agriculture within Qatar.

Goal EE.5—Environmental sustainability: Improve quality of life, protect health, and promote sustainable development within Qatar's built environment

- EE.5.1: Conduct research to identify and understand potential adverse impacts of air, water, and food quality in Qatar on health. [see also HE.1.12]
- EE.5.2: Conduct research needed to ensure that Qatar's population is protected from the adverse impacts of air pollution. [see also HE.1.12]
- EE.5.3: Conduct research directed at improving water security including the quantity, quality and management of water available to Qatar.

- EE.5.4: Conduct research that informs and enables more sustainable urbanization and a healthier living environment.
- EE.5.5: Develop improved approaches for solid waste management in Qatar, to include reducing waste generation, increasing waste recycling, and mitigating the adverse impacts of waste disposal.

Goal EE.6—Addressing global climate change: Sustain the environment for future generations, take a proactive and significant regional role in assessing the impact of climate change and mitigating its negative impacts, support international efforts at mitigation

- EE.6.1 Lower Qatar's emissions of greenhouse gases.
- EE.6.2: Understand the potential impacts of climate change on Qatar's natural and built environment.

Goal EE.7—Cross-cutting basic research and applications: Support innovation and enhanced research capabilities in energy, environment and health

- EE.7.1 Develop a national research program in material chemistry, material sciences and nanotechnology.

Goals and Objectives: Computer Sciences and Information Technology Pillar (ICT)

Goal ICT.1—Infrastructure: Improve the research eco-system through essential computing infrastructure and information security for the research community and other stakeholders in Qatar

- ICT.1.1: Adopt a needs-driven, phased approach to developing a National Computing Infrastructure for Research (NCIR) with an integrated, national-scale, computing and data capability and connect it to the worldwide computing infrastructure through appropriate agreements, partnerships, and participation in the international scientific computing organizations.

Goal ICT.2—Computing and data analytics: Create local knowledge and support innovation aligned with national priorities

- ICT.2.1: Build on the established research program on advanced data management technologies, real-time data management, and data mining and analysis.
- ICT.2.2: Build a research program on distributed, data intensive and service oriented computing.

Goal ICT.3—Arabic language technologies (ALT) and social computing: Support Qatar's distinctive culture and harness Qatar's comparative advantage in ALT and social computing

- ICT.3.1: Become a global Research Center of Excellence in Arabic language technologies.
- ICT.3.2: Organize a multi-institutional social computing initiative with academia, industry, and international partners.

Goal ICT.4—Systems, applications and robotics: Develop technology applications and services developed that support existing industries, promote new industries, and encourage economic diversification

- ICT.4.1: Develop a research and development program on wireless networking to develop and employ an integrated, next generation, wireless sensor network, including research on mobile applications and services.

- ICT.4.2: Develop a research and development program on embedded and integrated systems and sensor networks as an enabler for development in many sectors.
- ICT.4.3: Build a research and development program on applied robotics with use-inspired applications to include work on computer vision and the integration of state-of-the-art robotics systems.

Goal ICT.5—Cross-cutting enabling research: Develop research programs that support & enable other research sectors

- ICT.5.1: Develop a research program on information security.
- ICT.5.2: Develop a demand-driven bioinformatics research program serving both genomics-driven investigations and emerging research effort in energy and environment.
- ICT.5.3: Develop a national research program in high-performance modeling, simulation, and data analysis which crosscuts a variety of scientific areas.

Goals and Objectives: Health Pillar (HE)

Goal HE.1—Addressing national health priorities: Improve health services, increase prevalence of healthy behaviors in the population, and improve health outcomes

- HE.1.1: Develop and implement comprehensive research programs to improve services, behaviors and outcomes related to diabetes Type II.
- HE.1.2: Implement the National Cancer Research Strategy to improve basic knowledge, services, behaviors and outcomes related to cancers.
- HE.1.3: Develop and implement research programs to reduce infectious disease transmission in communities and hospitals.
- HE.1.4: Develop and implement child health research programs to address the most pressing issues related to child health, including stillbirths.
- HE.1.5: Develop and implement maternal health research programs to address the most pressing issues related to maternal health, including complications of maternal health.
- HE.1.6: Create a dedicated research program focused on the understanding of the genetic causes of diseases and conditions in Qatar.
- HE.1.7: Implement research programs on cardiovascular diseases, including integration with diabetes research and translational and health services research.
- HE.1.8: Develop and implement research programs to understand the causes and reduce the occurrence and impact of road traffic accidents (motor vehicle injuries).
- HE.1.9: Develop and implement research programs to reduce the occurrence and improve services and outcomes of mental health conditions, brain injury and epilepsy.
- HE.1.10: Develop and implement research programs to increase participation in & health benefits from sport.
- HE.1.11: Actively engage the community to raise health awareness, promote healthy behaviors, and create a culture of human subjects participation.
- HE.1.12: Conduct cross-sector, multi-disciplinary research to reduce the adverse effects of the environment on health. [see also EE.5.1 and EE.5.2]

- HE.1.13: Conduct research on public health security and contingency planning in relation to major international sporting events

Goal HE.2—Building enabling health research platforms: Build enabling platforms for medical and public health research that are able to provide an evidence base for public policy and medical practice in Qatar

- HE.2.1: Establish a national translational research center and implement a robust translational research network to address nationally significant health challenges.
- HE.2.2: Conduct public health research to inform public policy and guide evidence-based population health programming.
- HE.2.3: Regularly review and revise, on an annual basis, the strategic plan for the Biobank to ensure it remains a well-aligned research-enabling infrastructure that meets national needs.
- HE.2.4: Regularly review and revise, on an annual basis, the strategic plan for the Cardiovascular Research Center to ensure its scope and activities meet national needs.
- HE.2.5: Establish health research training programs to ensure opportunities for dedicated research time away from service responsibilities.
- HE.2.6: Advance e-health research and implementation.
- HE.2.7: Establish a set of enabling research platforms consisting of: Stem cells, genomics, proteomics, metabolomics, bioinformatics, imaging, biomedical engineering, and vivarium, to be established as shared platforms for Qatar-based research institutions.
- HE.2.8: develop an efficient regulatory framework to govern the ethical conduct of medical research.

Goals and Objectives: Social Sciences, Arts and Humanities Pillar (SAH)

Goal SAH.1—Society: Support economic, social, and human development of individuals, families, and communities through evidence-based research

- SAH.1.1: Develop a knowledge base in the science of learning.
- SAH.1.2: Develop a knowledge base in families and gender issues.
- SAH.1.3: Develop a knowledge base in labor and migration in Qatar and the Gulf.

Goal SAH.2—Culture: Foster cultural learning through evidence-based research and promoting a vibrant cultural and intellectual life in Qatar

- SAH.2.1: Develop a knowledge base in the development of culture in Qatar and the Gulf.
- SAH.2.2: Develop a knowledge base in the impact of social, printed, and broadcast media on the Gulf and the world.
- SAH.2.3: Promote and study creativity, the arts, and design.
- SAH.2.4: Develop a knowledge base in sports in Qatar.

Goal SAH.3—Public and economic life: Advance public, private, and economic management through providing evidence-based research

- SAH.3.1: Develop a knowledge base in international affairs that are relevant to Qatar.
- SAH.3.2: Support the development of public policy, governance and regulation in Qatar.
- SAH.3.3: Develop a knowledge base in business and innovation in Qatar.

- SAH.3.4: Develop a knowledge base in economics relevant to Qatar and the Gulf.
- SAH.3.5: Develop a knowledge base in public safety and security in Qatar.
- SAH.3.6: Apply social science to urban development and planning in Qatar and the Gulf region.

Goal SAH.4—Capabilities, coordination and cross-cutting: Develop the policy, funding, collaboration, and capability mechanisms necessary to successfully conduct social science, arts, and humanities research in Qatar

- SAH.4.1: Develop the existing capacity for research in the social sciences, arts, and humanities.
- SAH.4.2: Develop methodological innovations, new data sources, and new measurements in the social sciences, arts, and humanities.
- SAH.4.3: Enhance access to information in Arabic and English, including translation of key books and documents.

QNRS Implementation

The next steps for the QNRS implementation will involve commitment by Qatar Foundation leadership and key stakeholders in the research community. Specific actions will be to:

- Build capacity within the Qatar Foundation to facilitate QNRS planning and implementation;
- Develop the R&D and innovation eco-system capacities and capabilities across research institutions and other relevant organizations;
- Mobilize actors and resources around the research objectives; and
- Carry out high-quality research.

QNRS 2012 is envisioned as a ‘living document’ that will be reviewed annually and refined/refreshed as needed. The ultimate aim is to carry out research and innovation that will fulfill the Qatar National Vision for 2030 and enrich the country’s social, human and economic development and environment.

Qatar’s R&D Entities will Help Implement QNRS

